

**A COMPREHENSIVE ANALYSIS OF BUSINESS
FRAMEWORKS IN CORPORATE **REAL** ESTATE
SECTOR OF INDIA**

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DECLARATION

I, Sathyanarayana K (42000161) hereby declared that the presented work in the thesis entitled “A Comprehensive Analysis of Business Frameworks in Corporate Real Estate Sector of India” in fulfilment of degree of **Doctor of Philosophy (Ph. D.)** is outcome of research work carried out by me under the supervision Dr. Veer P. Gangwar, working as Assistant Professor, in the Department of Marketing, Mittal School of Business of Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of another investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.



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CERTIFICATE

This is to certify that the work reported in the Ph. D. thesis entitled “A Comprehensive Analysis of Business Frameworks in Corporate Real Estate sector of India“ submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the Management, Mittal School of Business, is a research work carried out by Sathyanarayana K, 42000161, is bona fide record of his original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

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ABSTRACT

Over three decades, the Real Estate Sector (RES) in India has undergone significant growth and transformation, facilitated by economic shifts from Tier 1 to Tier 2 and Tier 3 cities. The Corporate Real Estate (CRE) and Commercial Real Estate (CoRE) sectors in India exhibit considerable promise, owing pivotal role that technology plays adjusting market trends, the ongoing challenges faced by businesses across all industries and sectors. The initial framework that was developed has become obsolete due to the rapid evolution and multifaceted nature of technology. Despite the development of more recent frameworks, they fail to meet the requirements of a global context and are either temporary or designed for a particular objective.

The term "Corporate Real Estate" can also refer to the functional execution, division, or profession that deals with the strategic planning, procurement, architectural design, construction, management, and overall administration of assets in Real Estate assets for a company. In realm, corporate real estate, professionals typically adopt an owner-occupant standpoint when engaging with the real estate market. This perspective encompasses both leasing and purchase activities, with a primary focus on demand dynamics. This approach bears resemblance to the practices observed in corporate purchasing or procurement. Consequently, their primary objective is cost containment, and they may have advantages in economic contexts commonly characterized as "fragile". Technology has become a crucial component in the Real Estate industry, with its influence extending to related sectors such as PropTech and FinTech. These industries leverage technology to enhance their branding efforts, particularly in the context of multifaceted buildings. The transition from conventional buildings to Smart Buildings, including those owned by the government, significantly contributes to the overall advancement of real estate sector, allowing to demonstrate its capabilities on a global scale. While corporate real estate shares similarities with Facilities Management (FM) and Property Management (PrM), it typically encompasses a wider range of corporate functions while maintaining a narrower focus within real estate department. For example, specialists in the field of corporate real estate, as well as the corresponding departments, tend allocate a significant amount of attention resources to the practice of multi-site planning, which is sometimes known as Portfolio Planning (PP) or Strategic

Planning (SP). Nevertheless, CRE mostly concentrates on commercial property types, predominantly office spaces, with the inclusion of industrial assets and also retail assets depending specifically on organization. Properties that are residential are infrequently found within business related portfolios.

Finding a more functional and effective framework through use of Technology Acceptance Model (TAM) 3.0, this thesis investigates the framework encompasses the most recent practically used market ratio to make it Technology Ready (TR) in both Corporate and Commercial Real Estate; and over 350 participants from the Government of India filled out the survey and contributed their thoughts on designing and modelling the framework so that it can be utilized by both large enterprises and smaller and medium-sized organizations. The participants possess a diverse array of experiences and are recognized authorities and Subject Matter Experts (SME) in their fields, hailing from various industries. In addition to gaining practical experience in their daily work, they have also obtained academic credentials in the field of Real Estate (RE). When establishing a new organization or company in any industry, encompassing Information Technology (IT) and industries related to Info Tech-enabled Services (ITeS), this framework may serve as a guide.

The Real Estate Maturity Model (REMM) addresses the highlighted gap in this research by examining the level of maturity and the value it contributes to real estate operations and implementation, resulting in smoother and more efficient delivery. One of the fundamental components comprising the REMM is integration, which pertains to the way technology is integrated and interacts with one another. The others are significance of Environmental, Social, and Governance (ESG) factors along with handling Knowledge Management (KM) that falls directly under Data Management (DM). Impact of Innovation-Ventures (IV) on Real Estate Industry (REI). This inquiry explores the novel advancements and updates that contribute value to the real estate sector through technology considering Regulatory Frameworks and Compliance Measures (RFCM) in the Real Estate Industry: This question delves into the features and implementations of Real Estate Regulatory Authority (RERA) and other governmental organizations in India about regulations and compliance in real estate

sector. The models have been thoroughly investigated in the context of this thesis, have revealed certain deficiencies which is improved in this research.

Following an extensive review of over 700 research papers published within the past three and a half years, this study is organized around three primary objectives: firstly, to identify the core value that each article from multiple publishers contributes in terms of Technology Acceptance (TAc); secondly, to determine which Technology Adoption (TA_b) are utilized, adopted, and accepted; and finally, to assess impact of emerging technologies like blockchain and metaverse on technology acceptance and utilization. The investigation also encompasses locating citations and bibliographies pertaining to real estate from prior years, as well as examining the fluctuating values that result from a multitude of factors. A year-by-year analysis of citations and keyword searches can provide a remarkable assortment of insights into the ways in which global transformations have impacted the skills that have been documented and studied. For instance, during the pandemic that occurred in 2020, over 300 papers were authored and researched on real estate Ways of Working (WoW). Terms such as New Norm (NN), Hybrid Working (HyW), and Work from Home (WFH) gained popularity that had not been observed in any of the preceding years. Similarly, when the RERA implemented reforms and published its standards and policy, approximately 29 papers were published within three months, all from India, to highlight the significance of the current trend, this proves the change envisioned is in line with the research content that are written, researched and published.

This domain pertains to the technological progressions that have brought about a paradigm shift in the real estate sector, including both corporate and commercial entities. Not only has the incorporation of state-of-the-art technologies optimized operations, but it has also created fresh opportunities for advancement and expansion.

- a. Products and services: Real estate buyers, sellers, and agents use more mobile apps and digital platforms. Interactive mapping, virtual property tours, and customized suggestions improve these sites' user experience. Smart home technology including climate control, lighting, and security has transformed home use.

- b. Mobile Technology: For property listings, virtual tours, and real-time updates, realtors require smartphone apps. Buyers may see their dream homes without visiting with location-based apps and AR.
- c. IoT has transformed real estate agent property management and client connections. Smart-building technologies like automatic energy management and predictive maintenance save money and resources. Security and access control with IoT improve tenants and property safety.
- d. Cloud Hosting: This key real estate component provides scalable, secure data storage, collaboration, and remote access. IaaS lets real estate companies use virtual computer resources, whereas PaaS lets them build and distribute software. Real estate brokers can use cutting-edge tools and applications without owning hardware with SaaS models.
- e. IoTaaS lets property managers and owners adopt IoT without upfront fees, revolutionizing real estate. Hardware, software, and connectivity from IoTaaS businesses enable smart building and remote monitoring.
- f. Security Cameras as a Service (SCaaS): Real estate agents adore this economical and scalable property surveillance and security option. Security cameras deployed, maintained, and monitored by SCaaS vendors help real estate firms boost safety without investing much.
- g. Future Technologies: AI, ML, Data Science, Blockchain, Cybersecurity, Human Computer Interaction (HCI), Generative AI will improve real estate.

Innovatively, the framework has been enhanced and made more dynamic to accommodate the real estate market. This marks the inaugural iteration of a framework redesign and update that incorporates Real Estate Technologies (RET), which have the potential to be implemented across diverse sectors. The proposed offering is designed to be implemented as software, taking advantage of the growing prevalence of the internet, and offered as service (Software as a Service or SaaS). This model is fundamental to the framework construction process, upon which independent architects, developers, and designers will construct their future endeavours.

In this extensive and diverse investigation, carried out over a four-year period as part of a doctoral dissertation, I have undertaken a thorough exploration of corporate real estate (CRE) field, with specific emphasis on identifying the gaps in existing research. The study's methodology is characterized by its rigorous and multidimensional nature, which includes wider range of methodologies for collecting data and frameworks analysis. The main dataset was collected by conducting a thorough examination of Scopus-indexed scholarly articles, which included both original research and systematic reviews. This study utilized a combination of literature analysis and in-person interviews, together with carefully designed questionnaires. These instruments were strategically used to gather information from a group of key committee members and experts, in order to understand their detailed perspectives on the importance of corporate real estate departments and possible ways to improve their efficiency in the future. The study's main goal was implemented by pursuing the following set of research objectives: 1. To analyse existing business frameworks - Corporate Real Estate and Space Management via a thorough and evaluative manner. 2. To determine the possible benefits and advantages of a new business framework for Corporate Real Estate. 3. To explore present and future technology use in the Corporate Real Estate businesses. The study utilized bibliometric analysis to combine and classify pertinent scholarly publications, demonstrating a high level of methodological complexity. The approach described by Zupic and Čater (2015) allows for a quantitative evaluation of the literary landscape. It helps to identify important works, developing trends, and intellectual clusters in the subject (Zupic and Čater, 2015). In addition, the implementation of thematic clustering algorithms facilitated the extraction of core conceptual themes present in the body of literature. The research's empirical aspect was supported by two theoretical frameworks: Technology Acceptance Model version 3 (TAM3) and Service Quality (ServQual) model. The TAM3, published by Venkatesh and Bala (2008), offers a comprehensive structure for understanding the components that impact adoption of technology in organizational, settings Venkatesh and Bala (2008). The ServQual model, initially formulated by Parasuraman et al. (1988), provides a detailed perspective for assessing service quality in the CRE field. The quantitative data analysis was conducted using Smart PLS, a robust method for structural equation modeling enabling simultaneous research of relationships between

several variables (Hair et al., 2017). This was enhanced by conducting correlation analysis and Analysis of Variance (ANOVA) tests to clarify the complex interaction between factors and identify statistically significant differences across subgroups within the sample. To match the study's exploratory nature with the specific target group, approached by non-probability sampling called purposive sampling were used. The approach, described by Etikan et al. (2016), enables the intentional choice of cases that include abundant information, which can offer profound understanding of the processes being studied. The combination of several analytical approaches has resulted in comprehensive, detailed comprehension of the corporate real estate environment. Results obtained from this research study does not only add the current knowledge but provide practical data points for professionals and policymakers in the sector.

This research is motivated by the complex difficulties and/or opportunities in Indian corporate real estate (CRE) business, specifically related to human value, satisfaction, and productivity. The problems can be classified into three key areas: assessed worth, durability, and efficiency of workstation activities. There are important gaps in our knowledge about these topics in the Indian context, so a thorough examination is needed. The research focusses on three main sub-categories within the field of determined value: 1. Physical Value: This includes the concrete elements related in commercial real estate, as physical infrastructure, office spaces, government buildings, and IT facilities. Roulac et al. (2005) assert that the physical environment has significant impact both organizational success and staff well-being (Roulac et al., 2005). 2. Technological Value: This sub-category examines established technologies and emerging advancements from Machine Learning (ML), Artificial Intelligence (AI), to Blockchain, mobile applications, Robotics, Internet of Services (IoS), and to Software as a Service (SaaS). The use of these technologies in commercial real estate (CRE) has the capacity to transform space management and utilization (Ghaffarianhoseini et al., 2017). 3. Human Value: This aspect centres on the contentment of employees and the fundamental skills and abilities they contribute to the organization. As per Appel-Meulenbroek et al. (2018), the significance of the human in dimension in CRE strategies is frequently underestimated, despite its crucial role in organizational performance (Appel-Meulenbroek et al., 2018). 4. Functional Value: This sub-category includes the practical worth of CRE functioning, such as the

standards, policies, procedures, and frameworks. The aspects mentioned constitute the fundamental basis for efficient CRE management (Lindholm et al., 2006). Capital Projects encompasses capital expenditure (CAPEX), operational expenditure (OPEX), capital planning, budgeting, future work, and financial management within the field of Corporate Real Estate (CRE). Efficient capital project management is essential for maximizing the financial and its performance of CRE portfolios (Oladokun, 2010). The second primary classification, sustainability, is further broken into: 1. Economic sustainability refer to long-term financial possibility of CRE policies and their linkage with broader organizational goals (Eichholtz et al., 2010). 2. Social Sustainability: This aspect examines the ways in which CRE might enhance social welfare, promote inclusion, and foster community growth (Newell, 2008). 3. Environmental Sustainability: This sub-category assesses the ecological consequences of CRE, encompassing aspects such as energy efficiency, waste management, and usage of environmentally friendly construction procedures (Zhang et al., 2018). The third area, workspace operations and optimization, deals with: 1. Performance: This aspect centres on quantifiable measures and tactics to improve the overall efficiency of CRE activities (Haynes, 2007). 2. Productivity: This element focusses on Analyzing the difficulties and possibilities of enhancing staff productivity by implementing CRE initiatives (Haynes, 2008).

In order to validate and analyse these categories, the study utilizes two theoretical frameworks: The Technology Acceptance Model version 3 (TAM3) is model used to assess acceptance and/or adoption of the technology. The model proposed by Venkatesh and Bala (2008) expands on previous models by including additional elements and connections as per Parasuraman et al. (1988). TAM3 provides a more thorough comprehension of how technology is adopted in organizational environments, specifically in the context corporate real estate (CRE). Model comprises the following fundamental variables: Perceived Ease of Use, Perceived Usefulness, Perceived Value, Perceived Risk, and Perceived Trust. The advantage of TAM3 above previous versions is its incorporation of supplementary factors influence perception of ease of use and the other that is usefulness, along with novel connections between these factors. This facilitates a more intricate examination of technology acceptance in intricate organizational environments such as CRE and CoRE (Venkatesh & Bala, 2008). The

Service Quality (SERVQUAL) Model is a framework to assess the quality related to service provided by companies. The model, initially created by Parasuraman et al. in 1988, has extensively utilized for several service settings as Parasuraman et al. (1988) indicated. This study centres on the subsequent fundamental principles: The five factors that determine the quality of service are speed, tangibility, reliability, control, and satisfaction. This study attempts to provide complete analysis of Indian commercial real estate (CoRE) industry by combining theoretical frameworks with the identified research gaps. The study intends to give significant insights for practitioners, policymakers, and scholars. The results are anticipated to make a substantial contribution to the advancement of more efficient, enduring, and people-centred corporate real estate strategies in India.

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INTRODUCTION

INTRODUCTION

“You never change the things by fighting existing reality. To change something, build new model that makes existing model obsolete” - R. Buckminster Fuller

Real Estate a comprehensive term that includes land, structures, and other tangible properties, as well as the associated rights and interests. It is a primary and essential category of investment that vital; the role plays in the economy and individual lives. Investments in real estate encompassing a diverse array of properties, as residential residences, commercial / corporate landscapes, industrial facilities along with unoccupied land. Real estate industry comprises wide array specialists, including shareholders, developers, agents, lenders, and property leaders.

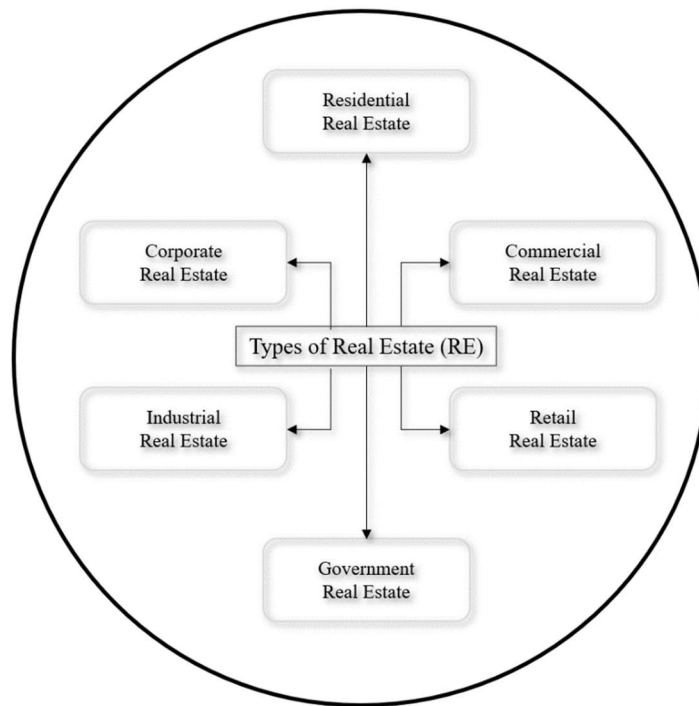


Fig. 1.1: Types of Real Estate, Source: Author.

Within the real estate sector, there exist different subdivisions that categorize properties based on their specific characteristics and attributes. Several typical divisions include

Residential Real Estate, this sector focuses on properties designated for residential use, including detached houses, apartments, and condominiums. The Commercial Real Estate division specializes in properties utilized for commercial activities, including buildings of the offices, spaces of retail, along with warehouses of industrial. Government Real and Estate is a division of Commercial Real Estate that focuses on the buildings created and managed by the Government like Tahsildar house, Parliament. Industrial Real Estate division focuses on properties utilized for manufacturing, production, and distribution, such as factories and warehouses. The Retail Real Estate division focuses on properties specifically designed for retail purposes, including shopping centres, malls, and standalone stores. Corporate Real Estate is a division which do oversees the real estate of management assets corporations. This includes office buildings, data centres, and other facilities.

1.1. Departments in Real Estate:

Industry of Real Estate - complex field that includes various departments and sectors. These components work together to effectively manage, develop, and facilitate the sale of constructed assets. According to (Hiang, 1998), complexity in estate activities requires strategic integration of many specialized tasks, each of which has a crucial role in guaranteeing smooth operations and achieving corporate goals. The divisions encompass range broadly areas as property and management, leasing, tenant relations, acquisitions and dispositions, development and construction, asset management, marketing and sales, legal and compliance, and facilities management (Roulac, 1995). The property management sector is accountable for the daily supervision of real estate assets, including tasks such as maintenance, rent collection, and tenant relations. On the other hand, the leasing and tenant relations department concentrates on acquiring and retaining tenants by implementing successful marketing and relationship management strategies (Amaratunga & Baldry, 2003). The acquisitions and dispositions section are essential for optimizing the portfolio by finding and carrying out strategic property transactions that match with the organization's aims. The development and construction sector are responsible managing overall stages of estate projects, including conceptualization, feasibility study, construction management, and project delivery. Real estate firms can enhance their performance by

promoting collaboration and integration among different departments. This allows them to utilize their combined expertise, allocate resources effectively, and provide exceptional value to stakeholders.

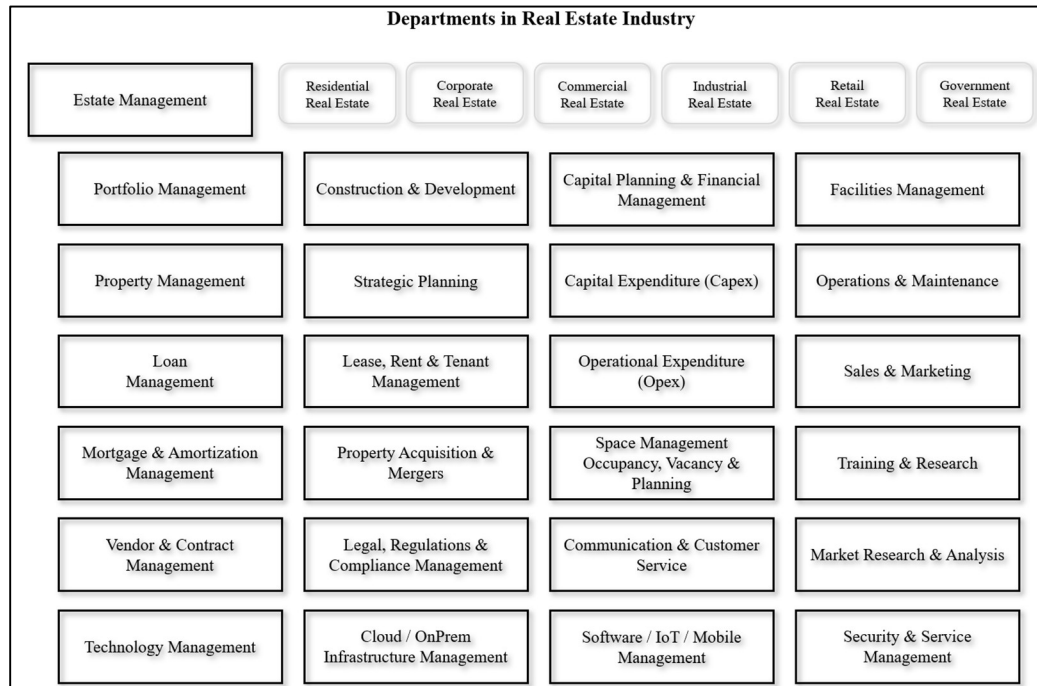


Fig. 1.2: Departments in Real Estate, Source: Author.

Estate management is essential for the effective functioning, upkeep, and improvement real and estate space assets and in the topmost hierarchy in real estate. Efficient estate management, whether for residential, commercial, or mixed-use properties, guarantees the maintenance of property value, the best possible use of space, and the contentment of inhabitants and stakeholders. This chapter will explore the fundamental elements and tactics associated with management in estate sector. Estate management involves thorough supervision, management of real estate assets, encompassing their physical, financial, and operational elements. Property management encompasses the strategic planning, daily administration, and upkeep of properties to optimize its worth and fulfil the goals of property owners and stakeholders. Scope and its responsibility encompass broader range tasks, such as property maintenance, lease and tenant leadership, financial managers, risk

assessment, regulatory compliance, and strategic planning for property improvements and upgrades.

Portfolio and property management essential aspect of the estate sector, involving the strategic watcher and operational administration managing of estate assets. (Baum, 2015) explains that portfolio management encompasses the deliberate acquisition, administration, and disposal of property assets to achieve specified investment goals, whereas property management is concerned with the daily operations and upkeep of individual properties. To excel in this multidimensional field, one must possess a thorough comprehension of market dynamics, financial analysis, risk assessment, tenant relations, and regulatory compliance. Efficient portfolio management involves carefully choosing and diversifying properties to maximize profits and reduce risks. Property management requires a meticulous approach to maintaining and increasing the value of individual assets through efficient operations, cost control, and proactive asset management strategies. The collaborative interaction between these two areas is crucial in enhancing financial gain, guaranteeing tenant contentment, and maintaining the enduring sustainability of estate investments. Loan mortgages and amortization are crucial components of the estate in market, enabling the purchase of properties and supporting the complex financial aspects of owning a home. According to (Brueggeman & Fisher, 2016), a mortgage loan is debt type which are secured by property, with the property itself being used as collateral. Amortization is a key concept in mortgage financing that involves the gradual repayment of the loan principal over time. This is made by regular payments that include both interest and principal amounts. The structured repayment method guarantees both the complete repayment of the loan and influences the overall borrowing cost and the pace of equity accumulation in the property. Moreover, the complex relationship between mortgage terms, interest rates, and amortization schedules has significant consequences for borrowers and lenders. Essential to comprehensive understanding of topics to negotiate the complexities of estate finance successfully.

Vendor contract management is crucial aspect in estate sector, as it supports effective coordination and supervision of external service providers and contractual responsibilities.

According to (Ventovuori, 2006), effective vendor management is crucial in the industry of estate industry due to the numerous specialized services and complex contractual arrangements involved in property development, construction, and operations. This discipline involves the comprehensive process of strategically choosing, assessing, and overseeing vendors to ensure they comply with contractual terms, quality standards, and regulatory requirements. Furthermore, it is crucial to have strong contract management techniques, as they regulate the complex legal and financial interactions between real estate organizations and their suppliers, reducing risks and protecting the interests of stakeholders. By applying vendor and contract management principles effectively, real estate organizations can utilize external expertise, allocate resources efficiently, and establish long-term, mutually advantageous partnerships. This ultimately leads to the successful completion of real estate projects and the sustainable growth of the industry.

Construction and development management is a crucial in estate business by overseeing the complex procedures required to successfully complete real estate projects. (Hendrickson & Au, 1989) define construction management as the comprehensive process of planning, coordinating, and controlling a project from its beginning to its end. To excel in this complex field, one must possess a thorough grasp of project planning, scheduling, cost estimation, risk management, and stakeholder coordination. Efficient construction management solutions are essential for maintaining compliance with budget limitations, quality benchmarks, and regulatory frameworks, while also maximizing resource allocation and avoiding project delays. Development management involves the simultaneous coordination of strategic planning, evaluation of feasibility, and implementation of real estate development projects. This includes activities such as acquiring land, securing funding, obtaining necessary permits, and positioning the project in the market. The collaborative interaction between construction and development management is crucial in maximizing value, reducing risks, and achieving successful real estate projects that cater to the changing requirements of communities and stakeholders.

Strategic planning management is a crucial element of estate business, playing a vital role driving long-term growth, resilience, and competitive advantage. (Roulac, 2020) states that strategic planning in real estate is a complex process that involves aligning an organization's vision, objectives, and resources ever-changing dynamics that shape of industry. In requirements of proactive field thorough comprehension of market trends, regulatory landscapes, technological progress, and stakeholder demands. Efficient strategic planning management entails developing proactive strategies that predict and address upcoming opportunities and challenges, while also maximizing resource allocation and promoting organizational agility. Furthermore, the incorporation of strategic planning with risk management, portfolio optimization, and performance evaluation is of utmost importance. This allows real estate firms to effectively navigate the intricacies of the sector, take advantage of competitive benefits, and provide long-lasting value to stakeholders. By applying strategic planning management principles, real estate enterprises can position themselves as leaders in innovation and ensure long-term success in a constantly changing business environment.

Leasing, renting, and managing tenants are the fundamental pillars of the real estate sector, overseeing the complex dynamics between property owners and occupiers. According to (Sirmans & Benjamin, 1991), effective management of tenants is essential for increasing the profitability and long-term sustainability of real estate assets. This comprehensive field involves the complex procedures of acquiring tenants, negotiating leases, collecting rent, and maintaining ongoing tenant relationships. Strong lease management techniques are essential since they create the legal and financial guidelines that regulate the occupation of a property, protecting the interests of both parties and reducing the likelihood of problems. Moreover, implementing proactive rent management measures is crucial for preserving a consistent income flow and guaranteeing long-term financial viability of estate operations. Effective management of tenant goes beyond basic transactions and requires a thorough grasp of tenant requirements, preferences, and levels of satisfaction. Real estate firms can reduce vacancy rates, increase property values, a competitive gain in business promoting great tenant experiences and building long-term partnerships.

Property acquisition and mergers are important strategic goals in the ever-changing real estate sector. They allow firms to grow their portfolios, diversify their assets, and create synergistic value. (Ling & Archer, 2008) explain that property acquisitions and mergers are important company strategies that enable growth, market expansion, and the maximization of operational efficiencies. To excel in this complex field, one must possess a thorough grasp of market dynamics, due diligence procedures, valuation methods, and legal and regulatory frameworks. Efficient property acquisition strategies require a thorough assessment of possible targets, considering their compatibility with corporate goals, financial feasibility, and potential for expansion. Simultaneously, mergers in the real estate sector frequently seek to consolidate market dominance, use synergistic advantages, and achieve cost efficiencies. However, the accomplishment of these strategic ambitions depends on strong integration plans, cultural compatibility, and careful management of issues that arise after an acquisition or merger. By strategically acquiring and integrating properties, real estate businesses may position themselves at the forefront of industry innovation. This allows them to take advantage of emerging possibilities, reduce risks, and provide long-lasting value to stakeholders.

The legal frameworks, rules, and compliance processes are the foundation on which the real estate industry runs. They protect the interests of stakeholders and ensuring commercial activities conducted in ethical and responsible way. According to (Bright & Flanfunan, 2016) emphasize that a thorough comprehension of the complex network of legal and regulatory obligations that regulate property ownership, development, and administration is essential due diverse estate transactions nature. Multifaceted field covers a wide range of factors, including zoning restrictions, environmental regulations, fair housing laws, and tax effects. To successfully navigate this intricate terrain, one must possess a profound understanding of the intricacies of real estate law. This knowledge allows professionals in the field to minimize risks, safeguard property rights, and fulfil their fiduciary duties. Moreover, it is essential to have strong compliance systems in place, as they foster openness, accountability, and adherence to the most effective methods used

in the business. Real estate businesses can promote trust, preserve their reputation, and establish themselves as responsible corporate citizens by promoting a culture of compliance. This will ultimately contribute to long-term viability and moral industrial management.

Management of Capital project planning, financial mgmt. are crucial factors in the estate business, as they support strategic deployment resources and the long-term viability of operations. According to (Grover & Grover, 2015), effective capital planning requires carefully assessing capital expenditures (CapEx) and operational expenditures (OpEx) to find the best balance between acquiring assets, maintaining them, and managing continuing operational costs. CapEx refers to investments made in long-term assets, such as acquiring properties, making repairs, and upgrading infrastructure, goal of improving the value and functionality of estate assets. On other hand, OpEx refers to ongoing expenses related regular functioning of properties, such as utilities, maintenance, and personnel costs. The complex interaction between capital expenditures (CapEx) and operational expenditures (OpEx) has significant consequences for the management of cash flow, profitability, and the overall financial well-being of real estate enterprises. Effective capital planning and financial management methods are crucial for optimizing resource allocation, reducing risks, and aligning investment decisions with organizational goals and market conditions. Real estate enterprises can achieve long-term growth and sustainability, as well as provide value to stakeholders and contribute to the economic viability of communities, by adopting solid financial practices and promoting a culture of fiscal responsibility. Space, occupancy, vacancy, and planning management are closely connected to the fundamental operations of the estate sector, overseeing effective use and/or optimization in physical assets. (Kooymans & Jain, 2020) argue that efficient space management is crucial for optimizing the value of real estate investments. It involves allocating and utilizing spatial resources in accordance with organizational goals and market conditions. This field involves the comprehensive assessment of spatial needs, occupancy levels, and vacancy rates, allowing real estate experts to make well-informed choices about property purchases, leasing tactics, and portfolio enhancement. Effective proactive planning

management is crucial as it enables the prediction of future spatial requirements, taking into consideration aspects such as business expansion, technology progress, and changing workplace patterns. Real estate organizations can improve operational efficiencies, lower costs, and create a better environment for occupants by implementing strong practices for managing space, occupancy, vacancy, and planning. This ultimately leads to long-term sustainability and profitability of their real estate assets.

Operations and maintenance management is a crucial field in estate sector. It focuses on maintaining the functioning, efficiency, and value of built assets throughout time. According to (Shohet & Lavy-Leibovich, 2018), having effective operations and maintenance plans is crucial for prolonging the lifespan of real estate facilities, optimizing resource usage, and ensuring well-being in tenants. This diverse field includes a broad range of tasks, such as proactive maintenance, responsive repairs, energy conservation, environmental regulation, and compliance. Proactive operations management involves the establishment of thorough rules and systems to oversee and uphold essential building systems, including HVAC, plumbing, and electrical infrastructure. Simultaneously, maintenance management requires a comprehensive method for planning, prioritizing, and carrying out repair and renovation projects, with the goal of minimizing disturbance to residents and operations. By incorporating cutting-edge technology like building automation systems and predictive analytics, the effectiveness of operations and maintenance techniques is significantly improved. Monitoring and decision-making data-driven, and proactive asset management strategies. Real estate organizations can enhance resource allocation, minimize risks, and provide superior occupant experience by promoting operational excellence and adopting comprehensive approach – mgmt. of property assets. This ultimately leads to the long-term sustainability and value growth of their real estate portfolios.

Role in sales and marketing management is utmost importance in complex estate business, it drives revenue production, builds brand equity, and ensures a lasting competitive advantage. For (Hosie, 2007) states that effective sales and marketing methods play a

crucial role in distinguishing real estate products, attracting potential purchasers or tenants, and eventually increasing profitability. This complex field requires thorough market dynamics comprehension, consumer Behavior, and strategic use in promotional strategies. Effective sales management methods involve the process of recruiting, training, and motivating sales teams to successfully handle the intricacies of real estate transactions and cultivate enduring client relationships. Marketing management is the simultaneous planning and implementation of campaigns that effectively appeal to certain target audiences. This is achieved by utilizing both traditional and digital media to highlight the distinctive features, services, and selling points of a property. Furthermore, the fusion of analytics related to data and research in market are crucial, it allows real estate firms to get valuable knowledge about consumer preferences, detect upcoming trends, and customize their services accordingly. Real estate organizations may maximize their return on investment by adopting a customer-centric strategy and implementing innovative sales and marketing methods. This will help them create brand loyalty and attract high-quality leads. Training, research, market research, and analytics are essential components for making informed decisions and maintaining a competitive edge in the ever-changing real estate sector. According to (Ziering & Viswanathan, 2012) argue that the successful implementation of these interconnected components is crucial in promoting a culture of ongoing learning, insights based on data, and strategies supported by evidence. Thorough training programs offer real estate professionals with necessary skills and to effectively traverse knowledge the intricacies of the industry, improving their capacity to deliver outstanding service and adjust to changing market conditions. Simultaneously, thorough research efforts contribute to the progress of industry knowledge, revealing new viewpoints and optimal methods that influence the future direction of real estate operations. Market research is a fundamental aspect of strategic planning. It entails the methodical gathering and examination of data related to customer preferences, market trends, and competitive environments. This process facilitates well-informed decision-making and creation in customized products and/or services. In addition, these efforts, sophisticated analytics methods, such as predictive modelling and data mining, enable real-estate organizations

get useful understanding from big volumes of information, thereby aiding in risk reduction, portfolio optimization, and the identification of emerging opportunities. Real Estate organizations may develop a dynamic and knowledge-driven workforce, remain ahead of industry trends, and provide exceptional value to stakeholders by promoting a collaborative relationship between training, research, market research, and analytics.

Technology management has been crucial necessity in estate businesses, supporting the smooth integration of digital solutions and facilitating the improvement of processes, decision-making, and stakeholder experiences. According to (Isikdag, 2015), the careful implementation and control of technologies, including infrastructure, hosting, software, security, and service management, is crucial for improving operational efficiencies, gaining valuable insights from data, and providing exceptional value to customers and renters. To excel in this complex field, one must possess a thorough comprehension of the intricate interactions of hardware, software, and networking elements. This knowledge is crucial assuring secure and dependable provision to estate services. Strong infrastructure management procedures are crucial for preserving the reliability and performance of essential systems, while good hosting strategies allow for the flexible deployment of applications and efficient use of computing resources (Bayliss et al., 2012). Moreover, the careful choice and integration of software solutions, such as property management systems, building automation systems, and customer relationship management tools, are crucial for optimizing operations, enabling data-based decision-making, and promoting smooth stakeholder interactions (Pathak & Sahu, 2021). The foundation of these efforts is the necessity of cybersecurity and risk management, which involves protecting sensitive data, maintaining compliance with regulations, and reducing the possible effects of cyber threats. Real estate firms may leverage the benefits of digital transformation, stimulate innovation, and position themselves as leaders in the technology-driven industrial landscape by adopting a comprehensive strategy to technology management.

A vital discipline in estate is facilities management that involves overseeing and managing constructed environments to maximize functionality, meet legal requirements, and improve the experiences of occupants. As (Pathirage et al., 2008) have pointed out, good facilities

management is essential in balancing the intricate interplay among people, operations, and physical infrastructure. This finally helps to keep the value of assets and accomplish corporate goals. Facilities management is a broad field with activities ranging from space design to maintenance and repair operations, energy management to health and safety protocols and sustainable practices (Chotipanich, 2004). Modern technology including Internet of Things (IoT) technologies and building automation systems has fundamentally changed facilities management. This connection lets one predict maintenance needs, monitor facilities in real-time, and apply data to guide decisions (Pärn et al., 2017). Moreover, the emphasis on the welfare of residents and design that gives user demands priority calls for a careful knowledge of ergonomics, indoor environmental quality, and accessibility issues. By using a complete approach to facilities management, real estate companies may maximize resource use, lower operating risks, and produce sustainable and productive built environments that enhance the quality of life for stakeholders and occupiers.

CoRE specialists dispose of properties that no longer meet the company's demands. Market circumstances, property valuation, and sale or lease termination are assessed. Real estate assets produce firm value with good asset management. Corporate real estate includes strategic planning, property acquisition, space management, lease and portfolio management, facility operations, and asset disposal. Businesses may optimise space utilisation, minimise expenses, and support core activities by managing real estate assets. Results of basic technological developments are economy, culture, real estate industry in general, and its business models in particular are changing significantly. Occupational health is a hot topic, scientific research on “healthy workplaces” is limited. Artificial Intelligence and other modern technologies could help us break through this barrier. The aim of this study is to undertake a comprehensive review of the literature on the relationship between office interior space, real estate technology, and physical, psychological, and social well-being. The goal of the study is to create a single system maturity model as a software program that can be applied in both the public and private sectors to offer empirical data and identify components of interior office technology and space that have

been investigated in respect to employee health. Together with analytics, the study aims to provide a fresh framework, paradigm, and method as well as to better grasp how people use technology and how digital media influences them. As Real Estate Technology (RET) technology shapes human behaviour and what the future of corporate real estate will look like, the partnership brings together people from a variety of fields, including adaptation, use, digital psychology, behavioral science, human habits and behaviour's, satisfaction levels, and efficiency.

Large companies and governments with numerous offices across the world depend heavily on Corporate Real Estate (CRE). The global workforce of this department is responsible for designing, developing, managing, and supporting a variety of functions in and out of the office premises. Commercial Real Estate (CoRE) is vital in the expansion of towns, states, and nations as well as the development of enterprises since creating highways, bridges, railroads, airways, roadways, and other associated activities help boost businesses and society. Internal staff receives first-class treatment, visitors receive second-class treatment, and consumers and vendors receive third-class treatment. For many different stakeholders including Human Resources (HR), Marketing and Communications (M&C), Sales, Research and Development (R&D), and Real Estate Technologies (RETs), Corporate Real Estate offers a complete suite of Facility Management (FM) services. In all these there are hardware, software, network, telecoms, internet, desktop, server, procurement, sales, research, and cyber teams involved in delivering the result to business. The CRE mgmt. team is responsible for all actions that happen in global locations to maintain one point of truth in terms of delivery and usage. The payback from IT investments has long been a topic of academic debate and academic study. Furthermore, there are a range of scarcity in scientific practice that demonstrates impact of eBusiness technology on strategic measures Managerial expectations for eBusiness technology are higher than actual performance.(Ghouri & Mani, 2019)

1.2. Importance of Real Estate:

Significance of Real Estate in society are substantial due to various factors. First and foremost, it fulfils the fundamental human requirement for shelter by providing residential properties for individuals and families to inhabit. Furthermore, estate plays vital role in business industry by offering physical locations for various commercial purposes, including offices, retail establishments, and storage facilities. Additionally, estate mgmt. can serve as investment instrument, enabling individuals to generate income through rental properties or make a profit from property appreciation. Real estate assets make a substantial contribution to both personal and national wealth. Businesses use real estate to support their operations. To achieve its goals, it plans, acquires, operates, sale and manage real estate. The importance of real estate goes beyond only physical structures; it represents the fundamental aspects of society, economy, and the environment, serving as a crucial foundation of human existence. Real estate, as a physical type of investment, acts as a central point where individuals, communities, and economies come together, promoting range of economic, social interactions and enabling the accumulation and distribution of wealth. Empirical studies highlight the crucial importance of real estate in generating and safeguarding wealth (Case & Shiller, 2004), as well as its ability to serve as a protection against inflation (Hoesli, Lizieri, & MacGregor, 2008). In addition, the physical aspect of estate has significant influence on ways cities are developed, how resources are used, and the sustainability of the environment (Ewing, 1997). Therefore, comprehending the significance of real estate goes beyond its tangible forms, including a diverse range of environmental, social and economic necessities that influence structure of contemporary communities.

1.3. Business Models that standardize the world:

The idea of a business model is currently gaining attention in many sectors. Researchers are showing increasing interest in this field of banking and other financial sectors as seen by the rising count of references to papers on banking business models (Hanafizadeh & Marjaie, 2021). This more concentrated attention is most likely connected to the response

to evaluating the bank business model prompted from financial upheavals of 2007–2009, and as so, banks' revenue worries, statistical risk, and post-crisis viewpoints (Hanafizadeh & Marjaie, 2019). In response to our second study question, "What are the banking business model types?" after comprehending the financial business model. We want to identify distinct forms of micro foundation orchestrations in the form of different business model types. Typology is a system for organising ideas that simplifies complex and interwoven notions (Sohl, Vroom & Fitza, 2020).

Current frameworks that include:

- a) Business Frameworks
- b) Management Frameworks
- c) Technology Frameworks

1.3.1. Current Business Frameworks:

Conceptual framework is suggested to investigate the creation of value by means of expanding corporate structures. The literature on business models, business model concepts, and their development is critically reviewed. This assessment highlights the fact that most people see business model themes as fixed. On the other hand, the paradigm under investigation reveals how corporate real estate business models and value creation business model themes coexist in response to society changes. Among many other factors, the framework outlines the ways in which companies can generate value by entering an industry, tackling imitators, and adjusting along with consumer business plans and environmental conditions. This paper adds to the body of knowledge already in use on value creation under many business model ideas (Costa Climent & Haftor, 2021).

Since they span several company processes, business models act as "connecting point" (Ritter & Lettl, 2018) for many ideas (Freudenreich et al., 2020); (Wirtz et al., 2016). The thorough and systematic desire of SBMs (Evans et al., 2017); (Stubbs & Cocklin, 2008) suggests that the development and execution of the value proposition must take into account links between social, environmental, and financial issues along supply chains

(Boons & Lüdeke-Freund, 2013); (Stubbs & Cocklin, 2008). A business model for helps describe, analyse and manage 1. a business's sustainable value proposition to its participants, 2. the way it generates and supplies value, 3. where it records economic value by preserving or recovering natural, social, and financial assets outside of its organizational boundaries. Lettl and Ritter, 2018.

Inspired by companies' usage of developing technology (Teece, 2010), ideation of modelled business (Zott, Amit & Massa, 2011) explains firm success or failure. It enhances conventional ideas of the worth of the value chain, money, and position in the company (Massa, Tucci & Afuah, 2017). Consensus is that the company's business model is an "architecture of value creation, shipment, and recapture mechanism" (Foss & Saebi, 2017), (Teece, 2010). Intended as a firm's boundary-spanning operation structure, value development and appropriation were carried out by a set of individuals interconnected by transactional structures (Zott & Amit, 2010); (Foss & Saebi, 2017). This architecture can allow one or more themes, or designs, to provide value by innovation, efficiency, mutual benefit, or lock-in a (Zott & Amit, 2007). Recent studies have turned the emphasis from a fixed analysis of the business simulation to a dynamic analysis of the company's structure, its innovative nature (Foss & Saebi, 2017) (Hacklin, Björkdahl & Wallin, 2018), and the improvement (Achtenhagen, Melin & Naldi, 2013); (Kranz, Hanelt & Kolbe, 2016). Conversely, this kind of research has focused on internal business model challenges such actor and event organization and how they evolve (Demil & Lecocq, 2010). (Foss & Saebi, 2017) also show this. Comparatively, among calls for more research, the changes in the themes of a business model have gone unseen (Zott & Amit, 2007). This trend in literary works is regrettable businesses can have to address several issues under various conditions to survive. Facebook's originally fresh business model theme—which later evolved into complementarity and significant lock-in examples this theory (Boshuijzen-Van Burken & Haftor, 2017); (Ogbanufe & Kim, 2018); (Lin & Lu, 2011). Explaining product variability (Sohl, Vroom & Fitza, 2020) indicates that a business model has same effects as its industry.

The business model canvas is a helpful instrument for clearly and consistently grasping a company concept. This canvas can help you discover more about your customers, what value propositions your company provides across multiple platforms, and how you generate income. (Joyce & Paquin, 2016) Abstract by providing a design tool to organize sustainability issues in corporate model creation, this new instrument supports responsible business model research.

The eclectic theory, created by British economist J.H. Dunning, is a commercial and financial technique for evaluating the appeal of Foreign Direct Investment (FDI). Three stages of the system are the control, place, and internalization (OLI) system. According to (Sharmiladevi, 2017) research article, some theories seek to explain the reason and intention behind the existence of multinational companies (MNEs).

1.3.2. Current Management Frameworks:

Porter's three generic methods are as follows: Cost in leadership, in difference and concentration are three broad strategies that can help a firm achieve above-average performance in a market. These strategies are based on the two fundamental types of competitive advantage and the various activities that a company wants to excel in. As stated by (Porter, 1998), fundamental elements including the point of entrance for new rivals, the availability of alternative goods, the impact of suppliers, the ability to negotiate with consumers, and the degree of competition among current competitors define the dynamics of competition within an industry. These elements taken together help to explain the fierce intensity of industry competitiveness. The authors are Manteghi and Zohrabi, and the study was conducted in 2011.

SWOT analysis Environmental management relies on is a vital tool for strategies management in environmentally managed since it provides the main basis for examining the situation and creating future treatments, both of which are important in a strategic mentality. is a crucial tool for strategic planning. It serves as a fundamental foundation for evaluating the current situation and developing future protocols, both of which are essential

components of strategic thinking. (Nikolaou & Evangelinos, 2010). A Strength, Weakness, Opportunity, Threats (SWOT) matrix is utilized to assess internal strengths and weaknesses, together with external opportunities and threats, for the purpose of developing effective solutions. (Rauch, 2007). Based on the correlation between the above factors, four types of techniques can be identified: SO, ST, WO, and WT. The SWOT matrix was utilised in this study to construct an initial instructional organisation strategy.

The VRIO system A strategic analysis tool helps companies discover and safeguard the assets and capabilities that give them a lasting competitive advantage. (Chatzoglou et al., 2018) found that there are three separate kinds of impacts that influence "firm performance". These include strategy or "utility" impacts, and these are influenced by the chosen planning; company-specific implications, which are influenced by the resources and capabilities of the organization; and organizational effects, which are impacted by the implemented structure of the organization. Empirical evidence unequivocally confirms the argument that "strategy follows structure."

Blake and Mouton's Managerial Grid is a widely used paradigm for considering a leader's "task versus individual" orientation. According to (Blake, Mouton & Bidwell, 2021) a. Organizational and human needs for development and benefit b. Human needs for mature and safe relationships - using values of 1-9, the authors locate 5 simple managerial attitudes and control types on a collection of coordinates.

Fiedler's Contingency Model of Leader-Situation Matches, leaders are either mission- or relationship-focused. It says that once you know your style, you can match it to circumstances where it is most successful. (Ayman, Chemers & Fiedler, 1995) argues that model contingency was one of first theoretically multi-level and methodologically multi-source models in leadership research.

The Hersey and Blanchard Situational Leadership Theory, Hersey-Blanchard model proposes that the most effective leadership style is determined by the circumstances in which leaders are placed. They assert that a leader's capacity to lead is dependent on a

multitude of variables. According to (Hambleton & Gumpert, 1982), it is theoretically said that managers who perform well will receive higher ratings in terms of leader effectiveness and style flexibility, both from themselves and from their subordinates and superiors.

1.3.3. Current Technology Frameworks:

A software system or technology framework is a specialised environment designed for the development of software applications. It establishes the foundation for software developers to build apps for a certain platform. While there are various automation frameworks and custom-built models and frameworks available in the market, there is currently no specialised solution tailored to corporate real estate. In order to shift from traditional to intelligent estate, the sector needs to enhance implementation of disruptive technologies. This article explores the implementation of novel technology in the estate industry. (Ullah, Sepasgozar & Wang, 2018) reported that collective results illustrate the present condition of how each technology is being used and applied in the real estate sector. This study examines several distribution channels, including mobile technologies, blogs, and social media-based online networks. It also focusses on the fundamental elements of sustainability, innovation, and user-centeredness in SRE. The text outlines four primary participants in the real estate sector: consumers, brokers also associations, government including regulatory teams and supplementary foundations. It also identifies specific requirements such as property transactions, income, taxation, industry regulations, and other relevant elements. The reference is (Ullah et al., 2017). Indeed, digital technology has made its way into the real estate market However, the potential uses of future immersive technologies like virtual and augmented reality have not yet been fully investigated. Limited availability of literature in particularly this topic, serves as a stimulus for additional research. In order to keep up with the current technical and internet requirements, the real estate industry needs to transition from traditional to intelligent real estate management. Currently, there is a lack of literature or established frameworks for implementing disruptive technology in the estate industry (Ullah et al., 2017).

Businessman and Researcher (Tatiana S. Manolova, 2020) found that our online business has more than doubled, while our wholesale business has gone away. Last year, our online business made up a third of our income. We might be able to make more money if we could refinance our debt and turn our business into an all-online one with better margins. There isn't much written about the main question of what themes in a business plan led to success and when (Foss & Saebi, 2017) along with (Massa et al., 2017). Filling in this gap in research using an exploratory method to answer that very question. The answers to this question are very important for managers who want to come up with new ideas and keep an eye on the business plan of their company. This is important because the themes of the business plan show sources of value creation that a company should try to tap into. A novel approach to conceptualizing business model themes within an industry has been developed through the integration of research on business models, their themes, and evolutionary economics. This approach specifically examines the co-evolutionary processes occurring inside the industry. For our research, we employed the conventional approach of constructing knowledge of propositions as outlined by (Dubin, 1978). A thorough study of the literature first showed that there was a theoretical gap. Critical review of all original studies on themes in business model showcased that we don't know enough about how these themes have changed over time. After that, the snowball method was used to look over all the studies that cited the original paper. This method found the few papers that have talked about this subject (Nelson, 2018). Because of this, more study is needed to prove or disprove these claims. So, the main problem with this study is that it combines new ideas. In the end, this artistic process doesn't promise anything (Popper, 1979).

Current Corporate Real Estate Technology Trends: Each component in this study that contributes to a business model that combines networks, packages of software and growing modern technologies like Artificial Intelligence (AI) and another technology like Internet of Things (IoT) to work as a programme or code that can combine networks is gathered, along with satisfaction, productiveness, and adoption trends and research gaps that would help develop this business model.

1.4. Industry 4.0 Framework for ReSaaS (Real Estate Software as a Service):

Middle-level manager importance seen in corporate success is critical, and their perceptions related to operations-related, and technology is critical. Previous research, on the other hand, has not looked at middle-level managers' impressions of current technologies and related issues like Real-Time Information Sharing (RTIS) and hosting services like Software as a Service (SaaS). The influence of RTIS with consumers via SaaS technology on middle-level managers' purchase behaviour is examined in this study. (Ghouri & Mani, 2019). Firstly, RTIS is not new; it has been utilised in prior research, since the capture and exchange of real-time data is an important tool for gauging employee attitudes, improving supply chain performance, increasing production control, and traffic and transportation industries or organisations. However, due to different constraints such as government rules and sector preferences, the implementation of RTIS in the food and beverage, accommodation, hotel, and space management unit sectors has been limited. This study aims to thoroughly examine the possible advantages of Real-Time Information Systems (RTIS) in several areas, including wholesale and retail trade purchasing behaviour, food and/or beverage consumption and lodging utilization.

Information as a service: Offering is a lucrative tool for businesses, and expanding the service to include self-delivery has led to a surge in both earnings and revenue. New technology has altered the way we do things. People interact with businesses, necessitating a completely new e-marketing strategy. within the context of a broader multidisciplinary service science (Bardhan et al., 2010). When it comes to technology, when innovation is integrated with elements of service, it is more likely to succeed. achieve success in customer communication. The clause in question the dynamic creation and evolution of services could be one of them. new services that rely on old ones. (Turner, M., Budgen, D., & Brereton, 2003).

Recently, computer science and IT researchers have examined various aspects of decision support services settings, services management, service-level agreements and their negotiation, knowledge management, business valuation, company modeling, business process analysis, and applications services. Significant research is conducted on service-

oriented architectures in the field of services-oriented technology. These consist of data grids, Web services, grid services, component technology, middleware, and agent technology. They collaborate to create a technical framework that arranges software services into applications and an infrastructure that fulfils the requirements of service users. As research by (Turner, M., Budgen, D., & Brereton (2003).

There are numerous framework models available for various categories around the world; however, what is lacking is a framework that can assist us in predicting and adapting to the future of work. In today's world, where the majority of employees in both corporations and non-profits operate from home, it's more important than ever to recognize how the space you've invested yields a Return on Investment (ROI) and to stay secure with the capital budgets you've set aside for the industry. Along with benefit, human habits and attitudes that use the paradigm as their day-to-day practices play a significant role. Mood shifts in human behaviour are commonly seen when any structure that implemented a pattern change. In Society technology role is critical today; humans cannot live without it. The smart phone in your hand has evolved from a simple phone to a device that offers a broader range of services. Online smartphone apps have made life much easier for the average person, which has been both a triumph and a failure in science and upcoming technology. Today globally, the amount of data, information, and the pace at which we can access it has greatly increased; we have achieved new speeds and gone to places where data was previously unavailable. The research study uses a variety of frameworks to determine the future condition, way of working, and whether the organization's output increases as a result of the increased productivity. Hence for creating a business framework specifically catering to Corporate Real Estate and deep analysis for Space Management 3 key datapoints are taken, researched and a prototype would be developed. The three key datapoints are Human as Employee, Technology as current and future trends and core corporate real estate data aid the productivity of the organization, technology adoption, satisfaction of the staff, core values and finally Return on Investment are researched.

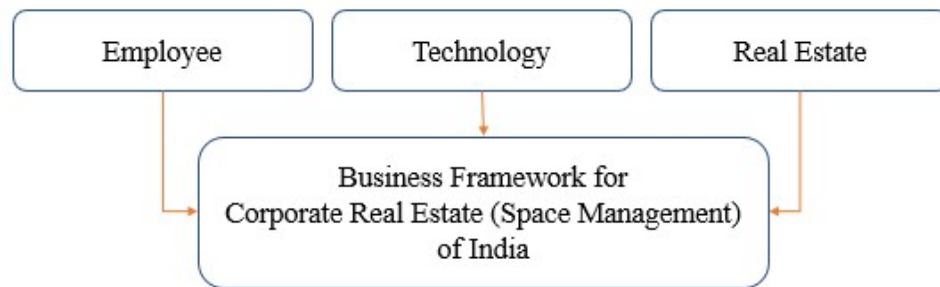


Fig. 1.3: Business Framework key datapoints identified, Source: Author.

1.5. Employee Satisfaction and Organization Productivity:

The link between employee satisfaction and organizational productivity and performance is clear today, as evidenced by various studies. Companies have a rare opportunity to create competitive advantage and distinctiveness by using their most valuable asset: their staff, according to research findings. The consequences of creating a pleasant working environment and making room for employee happiness within the firm. The leadership team is a vital factor in achieving the intended results. Today this has extensively increased in the space to cater for employee wellbeing, mental health and physiological health and even extends to financial health by organizations to manage employee workforce.

In this area, corporate real estate plays a critical role. Employees work in offices, back offices, retail outlets, hotels, airports, and schools, and real estate company models, plans, and strategies are developed as a result. The key tactics are expanding spaces, franchising, and opening additional offices. This is to meet the growing demand of the workforce and, as a result, the overall productivity of the business. A wide-ranging satisfaction poll is also done to determine how proud employees working for larger firms like as Google, IBM, and HSBC, as well as government institutions such as the Life Insurance Corporation, Indian Railways, and our armed services like Navy, Army and Airforce. Building architecture is another way for builders and construction companies to demonstrate the potential of working with brands. The government parliament offices, Rastrapathi Bhavan, The New Indian Parliament Building, Secretariat Building's, Supreme court of India, All

the National Museums, Shastri Bhawan, Municipal Corporation Houses, National Libraries, Parks, The New Indian Parliament Building, Secretariat Building's, Supreme court of India, All the National Museums, Shastri Bhawan, Municipal Corporation Houses, National Libraries, Parks, Police stations, Raj Sabha, and other official buildings that highlight the importance of space and the satisfaction it provides to the staff are examples of how brands around the world want to specifically showcase their strength in the way they showcase the buildings.

In order to help the organisation put them in place, it also includes making, implementing, managing, and communicating standards for evaluation (Demir, 2020). There are different kinds of intrinsic benefits, but they all make workers happier and more productive on the job. Some of these benefits are job involvement, having a say in decisions, job autonomy, work relevance, and being recognised. Businesses are paying more attention to how happy and motivated their employees are at work. Research in extensive been done to find out how job happiness and rewards affect how much work gets done. The present study's purpose is to find what should be changed in the target company and how to make employees value work daily. This study talks about what kinds of things affect employee happiness and what kinds of things can make office workers unhappy at work. For instance, the power of office workers as an incentive will be brought to light. Need-based theories, reward plans and process theories elaborately found motivational theories that are used to visualize into why people do their jobs and how happy they are with their jobs. On the other hand, it's hard to explain what employee drive means. People who are motivated and happy at work are more likely to be successful, which is important for any business. People often get the ideas of drive and job happiness wrong (Pananrangi et al., 2020).

It was perceived and noted as motivation and happiness in job aren't the same thing, but they are related. They realised that job happiness is one thing that motivates people. Motivation is mainly about acting in a way that helps you reach your goals, while work satisfaction is about feeling fulfilled, which we can get from different rewards and activities linked to our jobs (Anwar, 2017). Another possibility is that an employee loves everything

about their job, including the office they work in, the city where they work, or the company perks like a cell phone, iPad, or laptop, but still lacks drive (Ha et al., 2020). Competitive, market-related pay and benefits make employees loyal to the company. This means that a company can only have a good retention strategy if it offers competitive, market-related pay, facilities like houses, and benefits. If workers are happy and valued at work, it could mean they are being treated well. The company thinks that happy workers will do a better job, which will change the results of the company (Smith et al., 2020). According to (Paais & Pattiruhu, 2020), there is a belief among researchers that employees who possess high motivation, exhibit strong loyalty towards the organization, and experience job satisfaction are more inclined to engage in behaviour's that contribute to the success of the business. Herzberg's Theory of Needs and Maslow's Hierarchy of Needs provide insights for addressing employees' needs and maintaining cleanliness in the workplace.

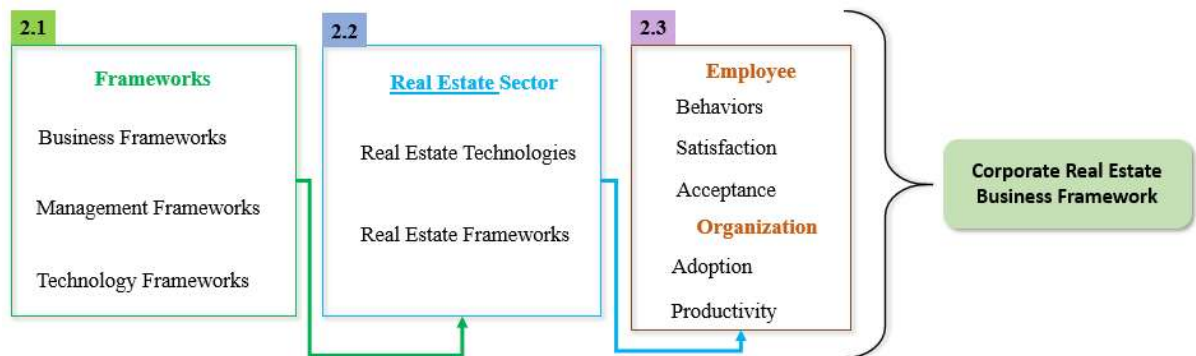


Fig. 1.4: Formation of CRE Technology Business Framework, Source: Author.

A strategic framework is the best way to understand all of real estate's many aspects, dimensions, and importance to the business. Most of the writing on real estate has a narrow and limited view of what real estate is now and what it might be in the future (Roulac, 1994). This way of thinking is fairly new to those studying the subject. Similarly, at least 21 alternative theories and paradigms were visible to forward as ways to describe the field of real estate (Roulac, 1996). Lots of people who work in the real estate business have a limited or one-dimensional view of things, which makes it harder for them to understand the breadth, depth, and variety of the field. So, it's not a surprise strategies, choices, and

actions based such a poor understanding leading involvement that isn't very useful and results that aren't very good. We need a strategic framework that combines, summarises, and covers everything because there isn't agreement or coherence in the real estate field about what real estate is all about and what the main paradigms are for understanding and organising the field. This study presents a theory that brings together the different ways that the six main sub-sectors of the estate field make decisions: occupancy staff, financial investors, managers, provider of services, public interest staff, developers (Roulac, 1981). Each of the six sectors has its own set of integrated and systemically consistent strategic models. These six sub-models form the basis of a bigger strategy framework to estate field. These models put a lot of weight on the people who take part, the choices they make, and the things that affect those choices. This paper wants to give everyone a modern look at real estate markets so that they can be involved and make choices about their direct and/or indirect links with process tools and market players in real estate. These papers (Roulac, 1993); (Roulac & Muldavin, 1994) and (Roulac, 1995) summarise the ongoing study on strategic of frameworks, paradigms and decision models that can be used in real estate. They were presented at meetings of the American Real Estate Society in 1993, 1994 and 1995. This study adds to earlier research that found a link between business in strategy and real estate in strategy (Nourse & Roulac, 1993). This work is very important and valuable because it won the American Real Estate Foundation Award for the best research paper given by working professionals in 1995. The paper's title was Strategic Decision Models: Multiple Perceptions, Unifying Structure. This is what estate strategic and development plans are built on. (Roulac & Stephen, 1996).

1.6. Corporate Real Estate Technology Trends:

In a short amount of time, big technological advances can become commonplace. As fast-growing Internet companies like HSBC, Google, Infosys, Life Insurance Corporation (LIC), Indian Railways, and Airports bring their tech products to more markets, they are having a bigger impact on many information-based service industries. The different kind of rivals and many new digital age technologies that have changed world in the last 20

years have had an effect on the real estate business, which is now an information-based service. At the moment, the Internet of Things (IoT) is taking over real estate technology. The market for digital crowd funding is being taken over by artificial intelligence (AI), which is bringing new data and methods with it. Because they don't have to worry about assets, these Internet companies can offer amazing goods at much lower prices than traditional brick-and-mortar businesses. This is possible because they have access to huge amounts of data. Robotics Process Automation (RPA) is a new area of technology that aims to make tasks more automated. Blockchain technology (BcT) has changed the real estate market in many ways. For example, it has created a new way for buyers and sellers to talk to each other and cut out middlemen, which lowers the costs of deals.

New technologies are changing how people behave because smart phone apps and uses affect how people talk to each other and do business. Lot of effects and opportunities are for estate managers. In asset, wealth, and financial management, a number of trends are already becoming clear. Advice and study will be done automatically by AI algorithms, software robots, and "Big Data," which is free, unstructured data from websites like social media. This will not only get rid of the need for human input, but it will also turn the industry into a commodity. Advice and study will not be worth as much as they used to be as the cost of technology goes down and the cost of labour goes up. As the cost of doing business goes up, more people will use robo-advisors to help them allocate their assets and give them regular advice.

As buildings become smarter and more connected, management and care tasks will need fewer people to do them and more will be watched from afar. This will make things run more smoothly and save money, and smart buildings and furniture will collect useful information that can be sold, which could lead to new ways to make money. Based on the living cost to be high in Indian towns, more millennials may choose to work from home, which could affect the need for office space. As the sharing economy grows, more and more people will rent because these "digital natives" will have a lot of debt. This is shown

by the large number of rooms that companies like OYO, Treebo, Fabhotels, and Holiday Inn have in India and around the world.

As more goods are sold online, stores will need less floor space, but there will be a move towards more call centres and logistics hubs. A lot of stores will switch to a show room model so that customers can look at and try out goods before they buy them online. Because they are so automated, they will also be great places to click and gather. More pop-up websites that can be used as real stores are likely to become popular, and shorter-term leases that are flexible will become more common. Real estate companies and the Government of India will need to come up with creative and smart ways to deal with this changing technology. They will need to improve their digital skills and set up ways to provide services both online and offline. Those things could be done by building up their own skills, buying other companies' skills through mergers and acquisitions, or teaming up with other technology platform providers.

1.7. Technology domain and development in Real Estate:

This area is about the changes in technology that have caused a paradigm shift in the real estate industry, affecting both businesses and corporations. Adding cutting-edge technologies has not only made processes run more smoothly, but it has also opened up new ways to grow and improve.

1.7.1. Products and Services: The real estate industry has witnessed a surge in digital platforms and mobile applications that cater to the needs of buyers, sellers, and real estate professionals alike. These platforms offer virtual property tours, interactive mapping, and personal recommendations, enhancing the overall user experience. In addition, the emergence of smart home technology has revolutionized our interaction with our living spaces, integrating functionalities such as automated lighting, temperature regulation, and home security systems. The article by (Yoo & Hardin, 2021) asserts that the incorporation of smart home technology in the real estate sector would significantly influence property values and consumer preferences, hence playing a pivotal role in shaping future Real Estate transactions.

1.7.2. Mobile Applications: Mobile applications have become indispensable tools in the estate industry, providing on-the-go access to property listings, virtual tours, and real-time updates. These applications leverage location-based services and augmented reality (AR) to offer immersive property viewing experiences, enabling potential buyers to visualize their dream homes without physically visiting the site (Kumari, R., & Kumari, S., 2020).

1.7.3. The Internet of Things (IoT): The IoT has revolutionized the way real estate professionals manage properties and interact with clients. Smart building and its technologies, such as automated energy management conservation systems and predictive maintenance solutions, have optimized resource utilization and reduced operational costs. Furthermore, IoT-enabled security systems and access control measures have enhanced tenant safety and property protection (Seyedzadeh, S., et al., 2018).

1.7.4. Cloud Hosting: Cloud hosting has become an essential component of the real estate industry, (Saini, S., & Patel, S., 2019) providing scalable and secure solutions for data storage, collaboration, and remote access. Infrastructure as Service (IaaS) offers enables real estate firms to leverage virtual computing resources, while Platform as Service (PaaS) solutions facilitate the development and deployment of custom applications tailored to their specific needs. Software as a Service (SaaS) models have gained traction, providing real estate professionals with access to cutting-edge tools and software without the need for extensive hardware investments.

1.7.5. IoT as a Service (IoTaaS): has emerged as a game-changer in the estate industry, enabling property managers, owners to leverage the power of IoT without the need for substantial upfront investments. (Xu, L. D., He, W., & Li, S., 2014) IoTaaS providers end to customer solutions that include software, networking, hardware, middleware and related connectivity offerings, facilitating the seamless integration of smart building technologies and remote monitoring capabilities.

1.7.6. Security Cameras as a Service (SCaaS): has gained prominence in the real estate industry, offering a cost-effective and scalable solution for property surveillance and security. SCaaS providers manage the installation, maintenance, and monitoring of security

cameras, allowing real estate firms to enhance safety measures without the burden of significant capital expenditures (Shen, C. C., & Chen, J. Y., 2021)

1.7.7. Future technologies: In real estate will alter the way in which we maintain and manage the industry. Real estate will no longer be merely a commodity, but an integral part of our daily lives, requiring justification and application.

a. Artificial Intelligence and Machine Learning: The real estate industry is poised to benefit from ongoing advancements in various cutting-edge newer technologies, like Artificial Intelligence (AI), Machine Learning (ML), data science, blockchain, cybersecurity, human-computer interaction (HCI), and generative AI are being leveraged to analyze vast amounts of real estate data, enabling more accurate property valuations, predictive market analysis, and personalized recommendations for buyers and sellers (Ullah, F., Sepasgozar, S. M., & Ali, T. H., 2021)

b. Data Science: Data science techniques are being employed to gain insights from vast datasets, including property listings, market trends, and demographic information. These insights inform strategic decision-making processes and drive targeted marketing efforts (Nguyen, G., Mukherjee, S., & Tran, T. 2022).

c. Blockchain: Blockchain technologies have potential to revolutionize estate transactions by introducing transparency, immutability, and trust into the process. RE Smart contracts, procurement and tokenization of estate assets could streamline processes and open up new investment opportunities. (Veuger, J., 2018)

d. Cybersecurity: As per (Zou, P. X., & Yang, R. J. 2022). The real estate industry has become increasingly digitized, the need for robust cybersecurity measures has become paramount. Advanced techniques, such as access controls, encryption and threat alert monitoring, are essential to backup and provide safety to sensitive data and protect against cyber threats.

e. Human-Computer Interaction (HCI): Innovative HCI technologies, including voice-controlled interfaces, gesture recognition, and augmented/virtual reality (AR/VR), as per

(Kim, J., & Suh, J., 2021) are enhancing the way real estate professionals and clients interact with properties and digital platforms, enabling more immersive and intuitive experiences.

f. **Generative AI:** Generative AI models, such as language models and image generators, are poised to revolutionize the way real estate listings are created, marketed, and presented. (Pantano, E., & Trigueros, A. I., 2022) These models can generate high-quality property descriptions, virtual tours, and visual assets, streamline the marketing process and enhance the overall user experience.

As technological advancements continue to shape the estate industry, it is crucial for professionals and organizations to embrace these innovations and adapt to the ever-evolving landscape. By leveraging cutting-edge technologies, the estate industry can unlock new market opportunities for growth, sustainability, efficiency along with satisfaction to the end user, while staying ahead of the competition in an increasingly digitized world.

1.8. Integrated Workplace Management Systems in Real Estate:

CRE participates critical role in supporting organisational objectives and optimising workplace environment in the contemporary business environment. Many organisations are turning to Integrated Workplace Management Systems (IWMS) in order to administer the various aspects of CRE in an efficient manner. This chapter examines the IWMS concept and its relevance to corporate real estate management.

1.8.1. IWMS Software Components: IWMS is a comprehensive software solution that incorporates multiple functional areas of corporate real estate management onto a single platform. IWMS incorporates various modules, including real estate portfolio management, space management, facility management, lease administration, maintenance management, and sustainability management. IWMS seeks to consolidate processes, optimise resource allocation, boost operational efficiency, and provide actionable insights for strategic decision-making.

1.8.2. Principal Elements of an IWMS: An IWMS consists of a number of essential elements that facilitate comprehensive corporate real estate management: IWMS enables organisations to manage their real estate portfolios effectively by providing a centralised platform for property monitoring, lease management, financial analysis, and strategic planning. Real-time data and analytics enable organisations to optimise space utilisation, monitor lease terms, and make informed decisions regarding real estate investments. IWMS facilitates space planning, allocation, and optimisation of utilisation. It provides tools for visualising and managing space utilisation, tracking occupancy levels, and planning for changes in the workplace. IWMS assists organisations in comprehending their space needs, implementing flexible working environments, and optimising space utilisation. IWMS simplifies facility management operations by automating work order administration, asset tracking, preventative maintenance, and vendor management. It enables organisations to manage service requests efficiently, monitor maintenance activities, and ensure compliance with safety and regulatory standards. IWMS also facilitates services pertaining to space, such as movements, adds, and changes (MAC). IWMS provides modules for lease administration, including the monitoring of lease agreements, crucial dates, and financial obligations. It permits businesses to manage lease negotiations, monitor lease performance, and ensure compliance with lease provisions. IWMS facilitates the automation of rent increases, the generation of accurate lease reports, and the simplification of lease accounting processes. IWMS facilitates proactive administration of building maintenance and repairs. It allows businesses to create and track work orders, schedule preventive maintenance duties, manage asset lifecycles, and ensure regulatory compliance. IWMS facilitates the optimisation of maintenance activities, the reduction of delay, and the extension of the service life of vital assets. IWMS aids organisations in monitoring and enhancing their sustainability performance. It monitors energy usage, greenhouse gas emissions, waste management, and water consumption. IWMS provides insight into energy-saving opportunities, identifies enhancement areas, and assists organisations in reaching their sustainability objectives.

1.8.3. IWMS Advantages in Corporate Real Estate: Implementing IWMS in corporate property estate administration provides numerous of benefits: Enhanced Operational Efficiency: The IWMS automates manual processes, facilitates workflows, and enhances departmental collaboration. It eliminates redundant data entry, reduces errors, and improves overall real estate operations management efficiency. IWMS provides organisations with insights into space utilisation, occupancy patterns, and asset performance, enabling optimal resource allocation. This data enables informed decision-making for optimising resource allocation, lowering expenses, and enhancing productivity. Compliance and Risk Management: IWMS facilitates organisations' adherence to lease conditions, safety regulations, and sustainability requirements. It allows businesses to monitor lease obligations and ensure compliance with industry standards. IWMS produces real-time data and analytics to facilitate data-driven decision making. It provides actionable intelligence regarding space utilisation, cost administration, maintenance activities, and sustainability performance. IWMS contributes to an enhanced tenant experience by optimising space allocation, providing self-service portals for service requests, and facilitating effective tenant communication. It improves tenant happiness and strengthens landlord-tenant relationships. IWMS implementation requires meticulous planning and consideration. Organisations must define their objectives, identify key stakeholders, evaluate vendor solutions, and develop a roadmap for implementation. Successful implementation requires strategies for system integration, data migration, change management and user training.

Integrated Workplace Management Systems (IWMS) have become indispensable instruments for effective corporate real estate management. IWMS simplifies processes, improves operational efficiency, optimises resource allocation, and facilitates data-driven decision making. By providing a centralised platform for real estate portfolio management, space management, facility and management, lease administration, maintenance and management, and sustainability management, IWMS facilitates the achievement of corporate estate objectives and creation of productive, sustainable, and cost-effective work environments.

1.9. Post Covid – India Real Estate Technology Trends:

In the wake of the global pandemic COVID-19, the building industry will undergo a transformation. To keep up with fast urbanisation, globalisation, and economic development, the construction industry has already begun to migrate to automation, industrialization, and the internet of things, though the process has been slow and sluggish. This transition has been caused by the covid-19, which has expedited upheavals that will define the building industry's future and next normal. Market characteristics, such as changes in technology regulation, cyber policies, hardware and software version updates and changes, and no single model that can be used by all, such as government to build smart cities or retailers to build smart buildings, are primarily catalysing the fundamental changes. Internet of Things (IoT) solutions, such as BIM, smart infrastructure, and digital solutions: The Internet of Things (IoT) will enable efficient operations in smart buildings and infrastructure. Building-information modelling (BIM) is already being used in construction to build a comprehensive digital three-dimensional model (a "digital twin") with time and cost as factors. Product-based approach: Like the automotive industry, growing proportion of buildings and related services will be provided and promoted as standardized products. Promotion of branded offers with standardised yet configurable designs that can improve from one product generation to the next, as well as delivery using modularized parts and standardised components manufactured in factories, will be the way of the future. The modules and pieces will be transported to the job site and assembled on-site. The production process will employ assembly line techniques in an environmentally friendly and sustainable manner, ensuring a high level of consistency and reproducibility. Specialization: Agencies will focus on specific niches and segments in order to acquire a competitive advantage. These may include luxury single-family houses, multi-story residential complexes, hospitals, or processing industries. They'll also specialise in particular materials, sub-segments, or construction processes. To sustain their competitive advantages, organisations will need to build and retain knowledge and competencies as they move toward specialisation. Obviously, players will have to weigh the benefits of increasing specialisation in terms of effectiveness, efficiency, and brand positioning

against the risk or cyclical benefits of a more diversified portfolio. The latest standard for building is DFMA (design for manufacture and assembly). Companies will have greater ownership or control over critical operations in the value chain, including design and engineering, production of select components, management of the supply chain, and assembly at the site.

Indian Real Estate Before COVID-19: Indian real estate faced issues before the pandemic. Delays, liquidity shortages, regulatory changes, and slow sales plagued the sector. Rapid urbanisation, a young population, and government initiatives like Real Estate Regulatory Authority (RERA) also helped its rise. COVID-19 disrupted the Indian real estate industry. Construction, property transfers, and real estate demand were all affected by the nationwide lockdown. Sales, project launches, and development slowed. The pandemic also hurt developers, buyers, and lenders. The epidemic changed the Indian real estate market. Changes include:

Demand: The epidemic has increased demand for big homes and a focus on health, safety, and well-being. Villas and townhouses are in demand, but compact apartments in densely crowded areas are not.

Rise of Remote Work: Working remotely and realisation that work-from-home arrangements have changed workplace requirements. Many corporations are reassessing their office space demands, which may lower commercial real estate demand, especially in key business areas.

Technology Adoption: Real estate agents use virtual property tours, online transactions, and digital marketing to showcase homes and reach potential buyers and tenants.

Safety first: Real estate now prioritises safety. To address these concerns and attract purchasers, developers are adding touchless entry, air purification, and green spaces.

Government Reforms: The pandemic prompted the Indian government to promote the real estate sector. These include relaxing regulatory norms, lowering stamp duty rates in some jurisdictions, and creating a stress fund to help stalled enterprises. The administration continues to prioritise affordable housing for everybody.

Companies will be able to achieve this goal by implementing collaborative contracting, more closely aligned incentives, vertical integration, strategic alliances, and partnerships. The interaction model will change as a result of digital technology: BIM models will enable more early-stage decision-making, distribution will migrate to online platforms and improved logistics management, and end-to-end software platforms will provide enterprises with greater power and flexibility. The value and supply chains should be interconnected. Controlling or unifying the value chain will reduce interface frictions and boost the speed of innovation.

1.10. “Goal No: 11 Sustainable Cities and Communities”:

The key framework that this research paper highlights. The need of combining Human Behavior in using modern technology, patterns, models that aid in creating an employee productive, satisfaction and then predict the future technologies that can be implemented in the office space future of work. It has been research over the last decade that suggests the real estate industry isn't adequately training its practitioners to cope with rapid content changes in customer dynamics, customer level demographic in shifts, and emerging technologies, understanding artificial intelligence and machine learning implemented to estate processes, that are currently happening in the marketplace. Practitioners face a problem in integrating sustainability into organizational business processes and frameworks. They must comprehend what factors must be considered to accomplish effective in sustainability implementation. Few studies look at contemporary sustainable company models and identify important criteria that they must have. The purpose of this study is to examine the numerous sustainable business models that are available and determine the important aspects of each. This study employs conceptual research to summarize the available literature on a sustainable business framework for corporate real estate. Sustainability, information technology, core data points, value creation, and stakeholder engagement are among the important issues to explore in the study. The proposed business framework would aid practitioners in capturing key elements of sustainable implementation.

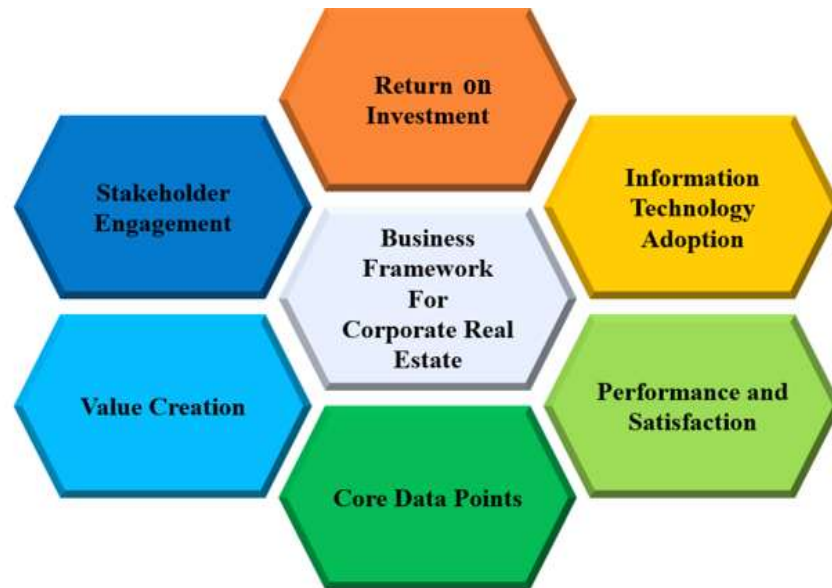


Fig. 1.5: Proposed Business Framework values based on research gaps, Source: Author.

The Indian government uses new technology for Block Chain, Artificial Intelligence, the Internet of Things (IoT) along with Building Mechanics (BME) to manage spaces in various forums, let it be the parliament house or the Raja Sabha or the small or apartment parties' offices in each village, state has a dedicated agenda in handling the space and governed centrally. This is especially true given the and demand better data and faster speed data to access in order to basically determine the most appropriate service monitoring levels and facilities. We've progressed from 3G to 4G, and now 5G is ready to launch in India, and data and speed penetration represents the growth of each Indian state.

1. The study's scope includes Human Behaviours, such as Productivity, Satisfaction, and Moods, as well as Technology, such as Adoption, Satisfaction, and Expertise, and Real Estate, which includes Framework, Models, Facilities, and Adoption.
2. The aim of the scope is to build a working algorithm prototype using software tools and technology, or a working product that can provide a structure based on the findings and hypothesis.

3. The aim is to compile the findings and publish the results in a prestigious journal as a springboard for future research.

1.11. Scope:

The scope includes a combination of previous studies, surveys included in and as a part of Sustainable Framework and maturity model for corporate real estate. The United Nations Sustainable Development Summit (UNSDS15) in September 2015 adopted a new framework, named "Transforming our World: the 2030 Agenda for Sustainable Development," to direct development efforts between 2015 and 2030. The 2030 Agenda includes 17 Sustainable Development Goals (SDGs) and 169 targets. The SDGs incorporate the social, economic, and environmental dimensions of growth as their interrelationships, aspects of peaceful societies and successful institutions, and implementation methods (finance, technology, capacity development etc.).

1.12. Government of India (GoI) and Digital India (DI) Initiatives:

The real estate industry is widely recognized as one of the most prominent in the world. The housing, grocery, hospitality, and industrial subsectors are the four subsectors that are present. There has been an increase in demand for office space as well as urban and semi-urban hotels, which has contributed to the expansion of this business. This need has been fuelled by the emergence of the corporate world. Among the 14 important sectors, the construction industry comes in third place in terms of the direct, indirect, and mediated impact it has on all other sectors of the economy. (IBEF, 2021).



Fig. 1.6: India Real Estate Market Size, Source: (IBEF, 2023).

Below are the key government of India indicators shared from (IBEF, 2023):

- The real estate industry is projected to grow to Rs. 65,000C (US\$ 9.30B) by 2040, compared to Rs. 12,000C (US\$ 1.72 billion) in 2019. It is projected that India's real estate industry will grow to US\$ 1 trillion by 2030, a significant increase from its current value of US\$ 200 billion in 2021. Additionally, it is expected to contribute 13% to the country's GDP by 2025. The sectors of retail, hospitality, and commercial real estate are experiencing significant growth, contributing to the development of India's expanding infrastructure.
- India's seven major cities collectively sold about 1,700 acres of land within a span of one year. The cumulative value of foreign investments in commercial real estate amounts to US\$10.3 billion throughout the period from 2017 to 2021. Following the replacement of the SEZs legislation in February 2022, developers anticipate an increase in demand for office space in SEZs.
- ICRA predicts that Indian firms will raise more than Rs. 3.5 trillion (equivalent to US\$ 48 billion) through infrastructure and real estate investment trusts in 2022, which is an increase from the current amount of US\$ 29 billion.
- Between July 2020 and December 2020, the total area of office transactions in the top eight cities was 22.2 million square feet, while the newly completed office spaces amounted to 17.2 million square feet. During the latter half of 2020, the Information

Technology (IT/ITeS) sector accounted for 41% of occupiers, with BSFI, Manufacturing, Other Services, and Co-working sectors following suit.

- In 2021, India completed the construction of 40 million square feet in 2-3 years, the country is projected to capture a market share of 40%. India is projected to complete the construction of 46 million square feet by the year 2022.
- Savills India forecasts a demand of 15-18 million square feet of data center real estate by 2025.
- Manufacturing occupied 24% of the total office space in 2020, which amounted to 5.7 million square feet. The cities of Pune, Chennai, and Delhi NCR saw the highest rental activity from small and medium-sized enterprises (SMEs) and electronic component makers. Following this, the car sector had the highest leasing activity in Chennai, Ahmedabad, and Pune. The sectors of e-commerce, third-party logistics (3PL), and retail occupied 34%, 26%, and 9% of the total office space, respectively. In the fourth quarter of fiscal year 2021, offices accounted for 71% of private equity real estate investments, with retail, residential, and warehousing sectors receiving 15%, 7%, and 7% respectively.
- India's leading seven office markets rented a total of 11.55 million square feet in the first quarter of 2022. A total of 55,907 newly constructed residences were purchased in eight specific regions of India over the period from July to September 2021, representing a significant year-on-year growth rate of 59%.
- In the July-September period of 2021, the number of newly built homes in the top eight cities increased by 228% compared to the same period in 2020, reaching a total of 65,211 units, up from 19,865 units.
- There is expected to be an increase in commercial investments in the year 2021-22. In October 2021, the Chintels Group allocated Rs. 400 crores (US\$ 53.47M) towards the construction of a commercial complex spanning 9.28 lakh sq. ft. in Gurugram.
- The Economic Times Housing Finance Summit revealed that the current rate of housing development is three houses per 1,000 people per year, falling short of the necessary five. Urban areas have a deficit of 10 million housing units. The growth of urban

population necessitates the provision of 25 million affordable dwelling units by the year 2030. The source of this information is IBEF, and the year of publication is 2022.

1.12.1. *Deeply rooted issues in the Indian real estate market:*

- Brokerage - Concepts and concerns, including ethics and professional behaviour. Buying/selling/leasing/renting procedure responsibilities of a broker. Transaction management that is effective. Lease agreements, agreements to sell, transactions involving NRIs, and property title searches are all examples of real estate contracts (provisions). In the event of a sale, purchase, or lease, documentation is required. Documents must be registered. A basic comprehension of the Municipal Corporation's revenue records. Negotiation skills; closing transactions
- Real Estate Financing - this includes the process of obtaining and closing a loan, mortgages, foreclosure laws (such as the National Housing Act), lending policies, protocols and documents facilitates the availability required by financial bank, institutions and markets.
- Real Estate Appraisal - Theoretical concepts, principles, and criteria for property appraisal, as well as real estate market behavioural patterns.
- Planning, Zoning, and Development — Basic knowledge of land planning, zoning, and subdivision. Subdivision-related provisions and rules. Housing and construction industry-specific planning standards and guidelines. Fundamental understanding of construction principles, including efficient design, suitable construction materials, and proper installation techniques. Architectural structures and compounds Administration Proficiency in construction materials and technologies.
- The Apartment Ownership Act, the Indian Registration Act of 1908, the Stamp Act, the Co-operative Societies Act, the Rent Control Act, the Wealth Tax Act, the Building bye-laws, the Punjab Schedule Roads and Controlled Areas Restriction of Unregulated Development Act, the Consumer Protection Act of 1986, the Law of Contract, the Municipal Laws, and the Law of Agency are all components of the legal framework that governs apartment ownership in India. In addition to the

recommendations made by the Reserve Bank of India (RBI) regarding property investment, the relevant laws of the Income Tax Act and FEMA regulations that deal to properties.

- Escrows refer to bonds, deeds, or other documents that are held by a third party and only become effective until a specific condition has been met.
- Urban Infrastructure - Strategies for the advancement of urban infrastructure, including the utilization of public-private partnerships, the implementation of social infrastructure responsibilities, and the establishment of accountability measures.
- Business Management encompasses various aspects such as marketing tactics, dynamics of customer satisfaction, communication skills, personality development, and after-sales service, among other topics.
- Vaastu Shastra - is a historic Buddhist belief system that incorporates traditional Hindu architecture and design. It literally means science of dwelling, ' and it tries to bring harmony and prosperity into one's life by removing negative energy and boosting favourable ones.
- Seismic effects and protection in the construction of buildings.

1.13: Corporate Real Estate and Its Importance in National Growth:

Corporations use corporate real estate to run their businesses. This chapter will examine corporate real estate's economic, social, and environmental contributions to a nation's growth.

1.13.1. Economic Impact: Corporate real estate investments and operations create jobs in construction, property management, maintenance, and related services. Corporate real estate investments produce direct and indirect jobs, boosting economic growth and unemployment.

- *Tax Revenue:* Corporate real estate generates significant tax revenue for governments. Property, corporate income, and real estate transaction taxes fund public infrastructure, social programmes, and other services.

- *Business Growth and Innovation:* Corporate real estate allows businesses to grow, open new offices or production facilities, and innovate. Adequate and well-located real estate promotes business growth, investment, and entrepreneurship, boosting economic development.
- *Foreign Direct Investment (FDI):* When investing, multinationals examine infrastructure, commercial space, and business-friendly policies. Well-developed corporate real estate markets attract FDI, boosting economic activity and job creation

1.13.2. Social Impact:

- *Improved Infrastructure:* Corporate real estate developers build office complexes, industrial parks, and commercial centres. These improvements improve infrastructure for businesses, employees, and the public.
- *Community Development:* Amenities, green areas, and social infrastructure in corporate real estate projects can improve communities. Residential, retail, and recreational spaces in mixed-use complexes create lively communities and improve people's quality of life.
- *Urban Revitalization:* Corporate real estate investments in metropolitan regions can revitalise underutilised areas into flourishing business districts. These developments attract businesses, people, and visitors, boosting local economies and community pride.

1.13.3. Environmental Impact:

- *Sustainable Development:* Corporate real estate is vital to Energy-efficient buildings, green design, and renewable energy integration reduce carbon footprints, resource use, and environmental implications. Sustainable corporate real estate aids the nation's green economy and environmental aims.
- *Urban Planning and Smart Cities:* Corporate real estate developments can help build smart cities. Corporate real estate initiatives can increase urban liveability, efficiency, and sustainability with intelligent infrastructure, energy management systems, and smart transportation solutions.

1.13.4. Government Policies and Business-Friendly Policies: Governments foster corporate real estate expansion. Ease of doing business, regulatory simplification, and real estate incentives attract domestic and foreign enterprises, boosting economic growth.

- *Infrastructure Development:* Governments must invest in transportation, utilities, and communication to assist corporate real estate investments. Strong infrastructure boosts business, accessibility, and investment.
- *Sustainability Initiatives:* Government incentives for energy-efficient buildings, green certifications, and environmental legislation can support sustainable corporate real estate practises. Supportive policies can promote sustainable growth and environmental leadership.

Corporate real estate helps nations grow. The economy, society, and environment depend on it. Corporate real estate boosts economies, communities, and nations by encouraging economic growth, job creation, and sustainable development. Governments, firms, and stakeholders must recognise and capitalise on corporate real estate for long-term success.

1.14. Corporate Real Estate Driven values:

An organization's corporate estate has significant positive impact on overall worth of the organization. By taking proactive measures to select and improve workspaces, businesses have the potential to maximize both employee satisfaction and productivity. The value of the building can also be directly increased through the implementation of effective financial management, which includes reduction of money expenses and enhancement of adaptability. When a positive related work in environment is created, when employee satisfaction, productivity are increased, and when the actual value corporate estate is aligned with organization's financial objectives, then the ultimate value of estate is completely realized. It's possible for organization to be significantly strengthen its competitive in advantage through implementation effective corporate real estate (CRE) practices, which aim to reduce property-related costs specifically. The optimization of real estate services through outsourcing and the implementation of effective cost management measures are two ways that businesses can reduce the expenses associated with their

workplaces. By comparing and adapting service approaches to match the requirements of various market segments, Corporate Real Estate (CRE) can also serve as a strategic advantage, allowing businesses to concentrate on certain property specializations. This is accomplished by comparing and adjusting service approaches. Organizations can cultivate socially responsible workplaces by including sustainability in their corporate real estate strategy. To accomplish, it's necessary to comply with social sustainability criteria and to create workspaces that are favourable to the environment. Moreover, the concept of main Corporate Social Responsibility (CSR) is an essential component in the process of achieving environmentally sustainable performance standards. Because it provides workspaces that are both ethical and environmentally responsible, corporate real estate (CRE) has potential to significantly boost productivity on both the individual and organizational levels. Work environments that are efficient lead to increased employee productivity, which then leads to improvements in qualitative performance measurements and an overall improvement in work processes. The influence of CRE extends to the overall financial, innovative, and operational performance of the organization, which ultimately results in enhanced bottom-line results.

LITERATURE REVIEW

LITERATURE REVIEW

2.1. Overview:

This chapter examines theoretical underpinning for corporate real estate research. The corporate estate department is vital to company value. It covers the concept's evolution and the importance of corporate estate for organizations, supported by research. This article discusses the key factors in real estate that affect company financial performance and corporate real estate strategies. Next, the article discusses the newest studies on corporate real estate's impact on technology use, adoption and adapting to the new technologies, sustainability, and workspace effectiveness. Prior corporate real estate methodologies and results reveal research gaps.

2.2. Introduction:

The corporate estate industry plays crucial role globally, encompassing a broad range of activities such as property asset development, investment financial, management including sales. As this sector continues to evolve and face various challenges, the need for effective frameworks becomes paramount. Frameworks in real estate provide structured approaches and methodologies to address complex issues, enhance decision-making processes, and optimize outcomes. This literature review aims to explore in significance for frameworks in the estate domain, highlighting the need for their development and implementation. By examining existing research and scholarly works, this review will identify key variables and gaps in current body of knowledge. Additionally, it will propose a comprehensive framework for future research, which can serve as a valuable resource for academics, professionals, and policymakers involved in the estate industry.

The writing flow of this chapter:

- a. Detailed analysis of review performed.
- b. Objectives that define the research work
- c. Hypothesis related to objectives.
- d. Methods and materials used.
 - a. SEM

- b. TAM
- e. Creation of a framework
- f. Identification of Variables
- g. Questionnaire formation and validation
 - a. Pilot questionnaire
 - b. Final questionnaire
- h. Content Validation
- i. Analysis of the literature review
- j. Gaps Identified

2.3. Literature Review in Detail:

Real Estate Theoretical Foundation: Contemporary companies respect corporate real estate for its ability to customize the workspace for the occupier. ‘Workspace research is fragmented because it must examine multiple concepts and debate them from diverse workspace management viewpoints and academic fields. Four major ideas in corporate real estate emphasize the significance of managing workspace operations to distribute organizational resources, including real estate workspace. (Hart, 1995); (Parasuraman et al. 1988); (Fred Davis, 1989) and (Kaplan & Norton, 1996) proposed the natural resource-based view (NRBV), SERVQUAL and TAM theories.

Corporate real-estate oversees a company's workspace, building amenities, human capital, technology, and financial capital (Lassala et al., 2017). Corporate real-estate decisions include how to run and maintain workspace facilities in line with environmental requirements. The 4 theories provide a framework for estate research. Based on integrated framework of real estate, theories align as follows:

- The natural resource-based view (NRBV) theory is used to ‘manage the physical workspace’.
- Service Quality (SERVQUAL) theory is used to ‘manage human capital’.
- Technology Acceptance Model (TAM) theory is used to ‘manage technology’.
- The balanced scorecard (BSC) theory is used to ‘manage financial capital’.

A strategic approach to managing the physical workspace is needed to ‘maximize organizational staff resources including labor, capital gains, and estate to support and cater in operations’ (Haynes et al., 2017). (Anthony, 2019) states that organizations workspace mgmt. plan relies on resource distribution. The NRBV theory provided by (Hart, 1995) is ‘highly supported by’ (Seyler, 2020). Hart observed that ‘an organizations workspace and resource allocation approach affects corporate real estate performance. This study validates’ (Joy & Haynes, 2011) conclusions that ‘corporate real estate improves company facilities operations performance through effective workspace along with management’. Therefore, ‘organizations should build workspace management of indicators for efficiently handle workspace issues. (Warren, 2018) found that ‘good corporate estate improves the economic element of corporate real estate options, improving physical workspace and workspace management at a lower cost’.

‘Effective human capital management involves improving occupant contentment with workspace amenities (including gender equality and sustainability) and workspace safety’. The social aspect of corporate real estate decisions improves human resource efficiency. (Gluch & Bosch, 2016) report that ‘sustainability, contemporary trends, and global corporate practices are being used to improve corporate buildings. This meets evolving occupier and management needs. (Koleoso et al., 2017) claimed that the FM-SERVQUAL model, based on (Parasuraman et al., 1988), can assess corporate building service quality. The FM-SERVQUAL approach empirically assessed facility management service quality and occupier satisfaction. (Jose & Saraf, 2013) found ‘companies commercial performance depends on quality of workspace facilities and occupant satisfaction with their design’. (Wyeth & Nulkar, 2014) studied how occupational design affects satisfaction. Based on workspace services, major corporations are classified as premium or midrange (Grade A and Non-Grade A). ‘Organizations use a strategic strategy to guarantee their integrated workspace management (corporate real-estate) initiatives are sustainable’. These dimensions ‘aim to improve business operations, performance, and occupant happiness’. This helps retain knowledge workers, especially in IT (Harris, 2015).

To ‘effectively manage technology in corporate real estate, innovative office design and facilities must meet occupier and corporate needs. (Rauniar et al., 2014) examined the primary elements influencing stakeholders' adoption of new technologies in workspace design. The study extensively evaluates relevant literature. (Fred Davis, 1989) designed theory-based Technology Acceptance Model (TAM) to study technology use and acceptance in a system. Model informs stakeholders about technology adoption and acceptance. (Davis, 1989) identified 5 key components of the technology acceptance model: includes perceived utility, perceived ease of use, attitude toward using, Behavioral intention to use, and actual system use. According to (Fred, 2017), perceived utility showcases how much a system can improve a client's business. Thus, stakeholders' adoption of technology depends on its perceived business value and capacity to meet end-user needs (Abankwa et al., 2019). (Alhazmi, 2018) and (Sepasgozaar et al., 2017) have not completely studied the technology acceptance model in office space corporate real-estate, despite its widespread use in other industries. The study by (Alzubi et al., 2018) ‘addresses the need for empirical evaluation of TAM adoption in corporate real estate (particularly workspace management)’.

‘Controlling workspace maintenance costs within budget and assessing the company's financial wealth are key to real estate financial capital management’. (Kaplan & Norton, 1996) created the Balanced Scorecard (BSC) to evaluate strategy performance. Its main goal is ‘to align financial and non-financial strategic objectives, providing a framework for monitoring strategic performance’. (Abatecola & Cafferata, 2014) say assessing strategy performance is crucial to assess its effectiveness. Workspace Performance measurement evaluates firm value. A scorecard evaluates financial (profitability), customer (satisfaction), internal company operations (meeting or exceeding customer expectations) and learning along with growth (areas for improvement) (Voordt & Jensen, 2018). ‘Business process directed to perspective is based on learning and development. This improves the workspace for customer usability. Business procedures strive to reduce operational costs and satisfy clients, benefiting workspace stakeholders. Customers' perspectives affect occupier (client) interactions and satisfaction’. The financial perspective comes from the other three perspectives and consumer

satisfaction. (Kaplan & Norton, 1996) recommend including client satisfaction in strategy maps for measuring firm effectiveness.

According to research, 'good corporate real estate requires a healthy office contact balance and few distractions. It also requires a thorough understanding of workspace tasks. 'Implementing organizational change without systematic planning raises the risk of failure or unfavourable outcomes' (Mahmoud et al., 2021); (Ahmad, 2020). Corporate real estate in an occupied office space is examined in the above theories. However, (Roskams & Haynes, 2021) 'used person-environment fit theory and current research to examine corporate real estate's involvement in workspace design'. According to (Brown et al., 2011), the Person-Environment (P-E) fit workspace development significantly affects firm success and employee productivity. This is done by strategically allocating organizational staff along with spaces. Industry uses a dynamic approach to manage labor staff, capital, and estate to support maintenance operations (Mahmoud et al., 2021). Thus, corporate real estate 'involves numerous disciplines and is based on diverse perspectives empirically tested in different markets' (Haynes et al., 2017).

2.4. Studies related to department of Real Estate and Management:

Corporate estate encompasses facilities asset (infrastructure), property management, according to (Lindholm et al., 2006). This management is a cost and value for the company. He believed that a successful corporate real estate (REM) strategy must link the business plan to the need for a real estate portfolio (workspace, infrastructure, and land) that can boost the company's financial performance and shareholder value. (Ali et al., 2008) found that Real Estate Management (REM) helps achieve three objectives that improve Workspace Performance depending on tenant needs. These goals are (a) delivering a cost-effective and productive workspace, (b) efficiently and effectively managing workspace facilities, and (c) preserving the property in compliance with changing building environmental norms to suit occupier needs.

According to (Furest, 2009), REM is changing from a fixed design to a changeable workspace, from a focus on physical elements to usefulness, and from an investor-driven market to one dominated by occupiers. According to (Haynes & Nunnington,

2010), REM focuses on organizational structure and company success. He said the company's strategic workspace decisions should be based on its needs. (Taylor, 2013) developed a model showing how corporate real estate may boost revenue and productivity, enhancing shareholder value. This approach follows shareholder value theory. The next sections discuss estate management's history and REM research, emphasizing on value-adding aspects in corporations.

2.4.1. The progression of studies – Corporate Real Estate:

At a late nineteenth-century seminar, "corporate real estate" was coined. In 1993, Nourse & Roulac investigated how integrating corporate real estate into a non-property company could improve its financial performance, as per current literature. (Hakfoort & lie, 1996) said corporate real estate optimizes workspace use to satisfy organizational needs. Due to 'changes to business environment for its technical developments', the corporate real estate sector faces resource allocation challenges to meet market demand, according to the report. (Carn et al., 1999) stressed 'estate management 'in the technical field of building engineering'. It portrayed estate management as a taskmaster who minimizes building rent and maximizes workspace usage for the corporation.

In corporate real estate, the role of REM as a 'discipline' was debated until the late 1990s. The study claimed that corporate real estate activities vary by corporate portfolio size. (Hiang & Ooi, 2000) did research in the early 20th century that shed light on REM's changing role. They stressed that the 'CRE manager must match the company's workspace portfolio and infrastructure facility services to its needs to enhance operational cost effectiveness'. This study helped REM change from 'managerial to strategic' in response to the corporate paradigm shift.

Founders (Krumm & de Vries, 2003) found that a company's real estate department is a strategic advantage. It can save the company money if managed well. 'The CRE staff manager must be really creative and firstly proactive in responding to business developments and improve operating costs and profits. Globalization and IT drove this success, he said. REM's "cost-centric" 'approach to operational cost optimization' was largely using the corporate real estate department until late 2005. (Lindholm, 2008 thesis was the first to investigate corporate real estate as a value-added corporate

strategy component, according to the literature. The thesis shows that corporate real estate in non-property enterprises in the country works. A 'profit-centric' study was conducted. Market-oriented thinking caused this result. After a market downturn, the corporation downsized. They used a strategic strategy to assess how corporate real estate affects company success and tenant satisfaction.

2.4.2. Studies on Real Estate functions and its impact with results:

Multiple authors have identified and quantified benefits of 'integrating corporate estate strategy with business plan' and the company's real estate assets' economic potential. This analysis compares corporate real estate value quantification methods. The goal is to establish how 'non-real estate enterprises combine financial and non-financial measures to increase shareholder wealth and meet occupier expectations. The category identified the ways real estate may add value to a corporation and the characteristics that would boost value. If the company met one or more conditions, it would benefit from the added value. According to (Lindholm, 2008), corporate real estate 'helps organizations achieve their strategic goals through business strategy, operational planning, and performance planning'. Using assets, the business plan formulation step evaluates stakeholder value from operational and competitive strategies. The REM method helps achieve financial asset efficiency and customer brand support goals. Effective operational planning, which defines the company's business strategy's major operational objectives and property management competencies, is REM's second value. REM's technique raises energy efficiency and helps occupiers learn to handle challenging real estate circumstances. Performance planning establishes tasks and personal goals for business unit divisions, departments, and teams. This comprises strategic decision-makers. REM helps the 'business unit's energy efficiency and inhabitants' personal improvement'. (Lindholm, 2006) stressed the importance of a company's estate department. Department must guarantee that the business plan matches commercial real estate value measures.

Table 2.1: Departmental data and its key parameters.

Real Estate Departments	Key Knowledge Metric / Parameters
Estate Management Portfolio & Property Management Construction & Development	Property, Sub Property, Size, Location, Branding.
Capital Planning & Financial Capital Expenditure Operational Expenditure	Budget, Expenditure, Profit, Maintenance
Loan Mortgage & Amortization Lease, Rent & Tenant Property Acquisition & Mergers	Mortgage, Size, Value, Amortization, Schedule
Vendor & Contract Legal, Regulations & Compliance	Contract Start, End, Size, Value, Laws, Policies and Standards
Technology Management Cloud / On Prem / Hybrid Infrastructure Software / IoT / Mobile	Technology usage, Hosting Solution, Data Storage & Analysis, Reporting and Dashboards
Facilities Management Strategic Planning Space, Occupancy, Vacancy & Planning	Satisfaction Index, Net Promoter Scores, Performance, Customer Surveys, results and Gaps.

Real Estate Departments	Key Knowledge Metric / Parameters
Communication & Customer Service Sales and Marketing	Branding, Support and Maintenance,
Operations and Maintenance Security & Service Management	Ongoing support, Cybersecurity, Values, Laws, Policies and Standards
Training and Research Market Research and Analytics	Materials, Reach, Branding, Vision and Focus, Analysis, Reporting & Dashboards,

It is important to note that (Nourse & Roulac, 1993) linked ‘real estate operational management decisions to business performance’. They found eight ways for a successful corporate real estate asset base that maximizes shareholder wealth through profitability and revenue growth. The researcher empirically tested business strategy value-added criteria. These parameters include how the estate and Facilities Management (FM) strategy increase company asset value, promote marketing and sales by creating an environment that supports sales and reflects the brand image, foster innovation by improving workspace usability, increase employee satisfaction by providing conveniently located real estate workspaces and desired amenities for a pleasant working environment, and boost workspace productivity and operations.

Researcher (Miller, 2014) defined the ‘role of the estate department are enabling, managing operational and service department service production, operation, and delivery’. The study's three main conclusions show how REM may benefit operational and service departments. Real estate property design improves operational efficiency, enabling smooth product and service delivery. Additionally, locate and develop important real estate assets to improve client service. To improve operational efficiency, select and build a real estate asset near service providers and employees. CoreNet Global (2020, p. 17 ff.) interviewed chief financial officers and corporate real

estate managers in top managerial posts worldwide. The real estate department's role in cost and budget control, particularly occupancy charges, was highlighted. The eight research findings showed that Real Estate 'are essential for cost-cutting corporate estate within budget'. The real estate asset's architecture initially 'reduces the company's operational costs. The real estate property's design 'optimizes space planning within budget'. Third, choose 'a property that allows contract renegotiation to reduce lease costs. Consider moving the property to a cheaper location. Additionally, extra real estate space might be sold or subleased. A sixth alternative is to sell owned real estate and lease back the necessary space for operations. Consider outsourcing corporate real estate and budget for it as a seventh stage. 'Use modern technologies like AI and ML to manage real estate operations within budget'.

(Joy & Haynes, 2011) examined how the estate department 'increases building value by improving functionality and use'. The study found three research findings and suggested ways to measure RE's building functionality benefits. First, the company's real estate 'portfolio should include adaptable furniture and amenities to allow space to be configured for various functions. The company's real estate portfolio should also be 'functionally flexible to handle a variety of corporate functions and promote job rotation and worker training'. Due to its capacity 'to negotiate short-term contracts with lessors and suppliers, the company's real estate portfolio is financially flexible'. The researchers examined the real estate department's impact on HR. Effective corporate real estate improves workspace performance and human resource goals. Many investigations, including (Sirola et al., 2022); (Harris, 2015); (Glatte, 2014), (Thompson, 2015) and (Zavadskas, 2010), support these conclusions. The study examined how real estate 'design affects productivity, including attrition, talent retention, learning hours, job satisfaction, work-life balance, employee convenience, and facility quality'. The goal is also 'to evaluate how real estate design affects firm performance by establishing a conducive environment'. This includes defining a performance standard, attracting high-value clients with assets over \$100 million, and expanding operations.

According to (Haynes & Nunnington, 2010), the estate department plays significant role by fulfilling an organization's corporate social responsibility requirements by

following environmental regulations in building construction. The study concluded measurement of five indices where the importance of the estate department is considered important – to measure the amount of sustainable real estate (green buildings); measure the amount of certified sustainable CRE in India by IGBC/ LEED; reduction in company's energy consumption, water management, waste management; reduction in company's carbon footprint; power utilization efficiency (for example, what percentage of total operations run on LED lighting and saved how many million units of electricity); benchmarks achieved in sustainability indices (for example, Tata Consultancy Services is the first company in India to participate in the carbon disclosure project (CDP), MSCI Global Sustainability Index; FTSE4 Good Emerging Index); commitment towards environment and social causes (for example, TCS ranked on 1st position for best environmental stewardship and most committed to Social Causes); commitment towards corporate governance and investor relationships. Multiple research studies emphasize the significance of the estate department for the marketing and sales department. Corporate real estate (CRE) plays crucial role by promoting marketing messages, reflecting brand image, and facilitating sales and selling operations (Makori, 2017); (Gluch & Bosch, 2016) and (Paola & Rosenthal, 2014). The four research outcomes encompass diverse metrics that delineate the significance of REM in an organization. The design of real estate is a direct representation of the company's product or service. Furthermore, 'the design of the real estate directly mirrors the brand image of the organization. Furthermore, the geographical position of estate property serves as a direct representation of the company's corporate identity. Furthermore, the design of real estate can entice clients and effectively stimulate sales.

2.4.3. Studies on Determined Value on Real Estate parameters:

Corporate Real Estate is a 'balance sheet asset' (Zhang & Dhaliwal, 2009). Prior research in Real Estate highlights the need for CRE managers to identify both tangible and intangible assets as capabilities (Kämpf & Pfnür, 2014) and (Schöne, 2009). 'Organizations must have certain traits to succeed in today's occupier-driven global business environment. These include workspace flexibility, employee satisfaction with workspace design, and productivity'. Over the previous decade, Corporate Real Estate has gained importance, according to (Masalskyte et al., 2014). The research concludes

that CRE supports occupier organizations. Their methods vary by company portfolio size and industry. The study also found that REM's tangible effects can be quantified directly and easily (like cost reductions) or indirectly and somewhat veiled (like workspace design's effect on staff productivity). Furest developed a literature-based approach in 2009 to examine how organizations use CRE strategy to improve their business in strategy. The study surveyed 200 international US CRE managers. They noted that REM, especially in corporate settings, helps companies maximize office space and create a vibrant, stimulating workspace. REM value parameters changed from cost reduction to human resources (occupiers) in the study. Table 2.2 shows (Jensen & Voordt 2016) scale for evaluating the corporate real estate (REM) department's impact on shareholder wealth. (Pfnuer et al., 2021) tested this scale using France's 100 top-ranked companies globally.

Table 2.2: RE Determined Value (scale), Source: Jensen & Voordt (2016).

No.	Variables	Items (to measure the impact of variables)
1	Physical	Workspace usage, site selection
2	Financial	financial flexibility, cost reduction
3	Human	employee satisfaction, value-added
4	Strategic Management	workspace design, technology
5	Capital Planning	shareholder wealth
6	Facilities	Operations, Maintenance, hospitality.
7	Innovation & Research	Values, Goals, Gaps and responses
8	Marketing & Communications	Branding, Selling, Leads, Group communications
9	Training	Courses, Grades and benefits

2.4.3.1 Real Estate Physical Workspace Management:

Office space is needed for business activities and administrative workers. Research shows that workspace expenses are approximately equal to employee salaries (Opoku & Egbu, 2018). This requires corporations to carefully distribute organizational

resources like personnel, currency, and real estate to manage the physical workspace. This underlines the importance of hiring experts with the skills to manage the physical workspace. Corporate real estate comprises 30% to 52% of a company's assets, according to research. Additionally, 50% of a company's net operating expenses come from real estate workspace. This property can provide 25% to 41% net operational income for the corporation if managed well. Effective workspace management is a critical part of corporate real estate to enable successful corporate operations. (Gluch & Bosch, 2016) define corporate real estate as the place where technology and people do business. This resource is tangible. The physical environment includes place, which is the site selection, and workspace, which is the manufacturing workspace. Many scholars have noted that economic competitiveness and globalization have necessitated reassessing corporate needs. Companies' real estate departments are valued for maximizing workspace use and choosing suitable sites when the market shifts (Makori, 2017).

Workspace Usage: Workers' growing need for tangible improvements is forcing companies to quickly fix workspace usability difficulties. Rapid advances in real estate administration have changed workspace utilization, forcing organizations to modify their corporate real estate needs. Workspaces, organizations, and building layouts have changed as a result. Technology, digitization, and hybrid-workspace models have reduced physical workspace use (Jayantha & Oladinrin, 2019). Companies worldwide have realized that staff may perform without an office. Instead, employees want a flexible work environment that lets them use Wi-Fi technology in coffee shops or recreation areas. (Harris, 2015) argued that corporations must align in workspaces with needs by corporate residents with supply cost-effective asset solutions via successful corporate estate to improve corporate building quality to meet evolving occupant and management needs. The speaker claimed that corporate real estate value criteria (flexible collaborative workspace design) play a major role in developing a workspace management plan that improves a company's sustainability performance.

An empirical study by (Bruyne & Beijer, 2015) found that activity-based in flexible workspaces influence estate portfolio mgmt. and lower workspace at usage in German firms. The activity-based in flexible office (AFO) is a new office for style that stresses

efficiency with flexibility. This strategy gives workers freedom to work where, when, and how (Bäcklander et al., 2019). AFOs provide cost-effective solutions and a sustainable working environment that supports organizational change. They also foster business occupier-specific collaborative work practices (Sirola et al., 2022). In Sweden, (Korkmaz & Singh, 2012) tested corporate real estate managers' corporate real estate technique to address worker mobility and inefficient buildings. The analysis found that remodelling office space in combine inefficient buildings to a high-quality admirable workspace would unite dispersed workforce towards providing a variety of workspaces that exhibit flexible and desk-bound staffs.

2.4.3.2 Real Estate and selection of Physical Site:

The company's premises convey its brand and identity. Thus, firms prefer renowned headquarters locations that match their brand and identity (Haynes & Nunnigton, 2010). The workspace site is chosen based on client accessibility and labor force availability to enable efficient operations. (Haynes et al., 2017) found that integrating residents' requirements with corporate management in working site selection can improve creativity, productivity, health, and well-being. According to (Rymarzak & Siemińska, 2012), corporate real estate managers must translate management's workspace needs into criteria based on three variables to meet occupier needs. The building's placement depends on global, micro, and building-level considerations.

Founder (Riratanaphong, 2021) found that real estate managers in companies strongly influence the workspace location within a country or city, whether for international or national searches. The study also indicated that micro-level location considerations, such as city potential and site characteristics, can alter the office's physical location. Considerations include motorway accessibility, traffic congestion, proximity to the main estate railway building station, bus stand along with tram related services, lighting-based security, and proximity near to hotels and shops/services. No info. Corporate real estate managers evaluate cash dispensers and dry-cleaning facilities when choosing a corporate office location. (Haynes et al., 2017) define building-level attributes as its design and layout. Considerations include lighting specifications, air handling capacity, reception area, access control system, fire safety system, natural

sunlight, 24/7 building operation, and ease of maintenance and cleaning. These building-level metrics help corporate real estate managers determine the building's operational needs.

2.4.3.3. Real Estate and Building, Construction Management:

Primary objective the way we pursue corporate estate department to enhance the value the building by optimizing its functional and physical utilization (Brown et al., 2011). The utilization of the building is intricately linked to the interior space, arrangement, design, and furniture, which collectively establish the ambiance and efficiency of the work environment. For instance, offering adaptable furniture and adjustable space arrangements to accommodate various company requirements. The physical usefulness of the workspace is determined by the design of the workspace. The building's functional purpose is linked to the technology employed on the premises, which facilitates communication and processing of property information. For instance, automated property management enhances building functionality by integrating property information supplied by several company divisions, facilitating seamless operations across the company's portfolio. Addressing major issues requires collaboration and coordinate between construction mgmt. side by urban development experts. In their work, (Craig S. Thomson et al., 2024) advocate using ecological conceptualizations to understand collaboration. The contributions of these ideas to this field are unknown. This paper reviews how natural ecosystem principles used in construction mgmt. and new urban nearby development research. Book divides conceptualizations into seven types and evaluates their potential to advance ecological ideas. A research agenda for ecosystems may link several subjects theoretically. Article also highlights critical potential to build environment ecosystem research to advance management for organization evidence research. Project-based or location-based near time ecosystem conceptualizations advance ecosystem research. (G. Aksenova et al., 2019) Government agencies, public organizations, industry, and scholars have struggled to change business legislation to accommodate networked technologies first proposed in the 1980s with building information modelling. Despite the industry's advanced technology, BIM has largely been employed to improve corporate efficiency.

The Finnish Architectural, Engineering and Construction (AEC) business climate has not changed significantly.

2.4.4. Studies on Financials in Real Estate:

Reducing costs and/or boosting income increases a company's financial worth, creating additional value. (Harris, 2015) article explored corporate real estate's role in a company's economic balance between costs and benefits. Real estate managers must find a property that protects a company against rent increases and service charges while requiring less money. (Tuomela et al., 2015) claimed that real estate expenses often rank second only to employee pay in a firm, notwithstanding other spending categories. Thus, corporate real estate must always weigh the pros and downsides of buying versus leasing. Corporate real estate managers must understand macroeconomics, institutional ideology, opportunity cost, and real estate markets. It needs continuing financial review of a firm's buy or lease choice. Real estate is a financial asset since it may be sold or used as collateral. A company with spare funds and no expansion plans can buy real estate to build reserves. Thus, financial flexibility and cost reduction while choosing between buying and leasing might indicate how corporate real estate affects financial management.

Corporate real estate's main goal is to strategically reduce purchase costs including transaction costs, depreciation, and leasing fees. It optimizes administrative expenditures to give the organization more financial flexibility based on management needs. (Paola & Rosenthal-Sabroux, 2014) evaluated corporate real estate managers' freehold versus leasehold property procurement decisions and their strategic implications. Due to short leases or break provisions, leasehold property allows operational flexibility towards adapting to company cycles based on time and financial fortunes. Rental charges, which may prove uncertain in occupied certain retail market conditions are difficult in forward forecast, are a significant operational cost that reduces fixed assets on the financial statement. Jensen & Voordt (2016) evaluated how corporate real estate manages freehold and leasehold property finances. The research found that leasehold property allows more site, landlord, building design, and configuration choices. Leasing the property allows the corporation to better use its

capital, increasing its ROI. Freehold properties can claim capital allowances against corporate tax. However, businesses should buy property that fits their plan.

2.4.4.1. Real Estate and Capital Cost Management:

Corporate real estate managers must negotiate lower rents because of their financial responsibilities. Multiple empirical studies show that corporate real estate is evaluated by its capacity to reduce property provision costs and operational costs (McAllister, 2020); (Miller, 2014). Corporate real estate managers optimize property service cost-benefit ratios throughout property operations. The goal is to find the best debt-equity balance for property operations to maximize cost-benefit. A company's CFO oversees its corporate real estate department. Its main purpose is to combine property management with finance, saving the organization money. (Pfnuer et al., 2016) examined corporate real estate managers' role in financial management based on three value parameters: (1) improving the work environment and minimizing repair expenses to improve productivity, (2) efficiently directing staff and office space functionality within budget constraints, and (3) maximizing real estate space utilization at all times. The study also suggested that these value characteristics reduce corporate workspace ambitions needs and estate portfolio financial costs providing a space not including without sitting. According to Taylor (2013), a corporate real estate manager improves company strategy by providing value to assets and operations. The study suggests analysing the company's portfolio to optimize office space usage and reduce property operating costs. Extent by property to company's corporate estate strategy contributes to business success, the relationship with its core business and its estate, actual portfolio management expenditure compared to the budget and revenue and its impact on the business should be considered in this analysis. Real estate has attracted global investment in recent years. Since 2015, real estate technology startups have received US\$75.2 billion in finance, with India contributing US\$6.5 billion (Colliers, 2020; NAREDCO, 2021). (Nourse, Roulac 1993) used stock prices to evaluate corporate real estate by linking shareholder wealth with the company's real estate strategy. (Voordt & Jensen, 2018) examined how business real estate strategy affects shareholder wealth in a longitudinal case study. They assessed the company's growth and revenues to determine corporate real estate's capital market significance. The study also found that

corporate real estate boosts capital market property values, increasing shareholder wealth.

2.4.4.2. Real Estate and Shareholder Returns:

Researchers (Voordt & Jensen, 2018) examined how facilities management, a part of corporate real-estate, affects corporate value. They studied how the company's real estate strategy influenced society, employees, consumers, and owners—essential stakeholders for corporate real estate. The study examined 36 Nordic corporate real estate practices. Study found that corporate estate's key benefit is shareholder wealth. Increase revenue and/or profitability. (Lindholm, 2008) found seven corporate real estate strategies that boost shareholder wealth. Asset appreciation, innovation, and marketing and sales promotion boost revenue. The following three techniques increase the company's worth by increasing production, decreasing costs, and increasing property flexibility. The seventh strategy emphasizes people and improves corporate property occupiers' happiness. It seeks to boost employee satisfaction, which boosts sales and profits. (Surya, T., Taufik., & Malinda, S., 2024) examined how free from cash flow, financial leverage, and price liquidity affect dividend-based policy and current profitability in managed property enterprises and estate, taking them into account as intervening variables. Purposive sampling yielded 50 samples from 10 companies. Hypothesis was tested using path by analysis and Sobel test. Estimated Free formed cash flow, financial leverage, and price liquidity did not affect dividend made policy, according to research. Free managed cash flow and liquidity mitigated profitability's effect on managed dividend informed policy. Leverage and dividend policy were not mediated by profitability. Dividends can be paid regardless of free cash flow, leverage, or business liquidity. No factors that directly affected dividend policy were found in the study. Further research should include notable other informed factors that may affect dividend made policy.

2.4.5. Studies on Human Resources on Real Estate:

Workspace layout affects labor efficiency. Multiple empirical studies have shown that corporate real estate design can affect staff productivity by 15%–25%. (Haynes, 2007) proposes that office structure can boost innovation by encouraging creative thinking and information exchange. (Arvanitis et al., 2016) found that physical work environment components affect corporate real estate employee satisfaction. According to the report, a corporate real estate manager must guarantee that occupant needs match organizational needs. The approach should improve employee well-being, engagement, and motivation to satisfy occupiers and meet building environmental standards for the firm to function efficiently. Thus, corporate real estate strategy's impact on HR is measured by employee happiness and productivity.

2.4.5.1. Real Estate and Employee Satisfaction:

(Budie et al., 2019) examined how corporate real estate affects employee happiness in German non-property enterprises. The survey indicated that the office campus budget for mental and physical employee happiness has grown. This is because employees are significant stakeholders and vital to company success. In addition to office workspaces, the survey found service improvements in prayer rooms and conference rooms with wide screens. (Kaur et al., 2022) stressed importance of corporate real in creating a cutting-edge work environment that maximizes office portfolio utilization, improves workspace services and infrastructure facilities, boosts employee productivity, minimizes technology expenses, improves employee engagement and satisfaction, aligns workspace design for brand, harnesses technology iformed facilitates a globally connected work staffs for importance. (Graebert & Fischer, 2014) studied Adobe's U.S. corporate real estate manager's role in employee satisfaction. The corporate real estate operations in charge officer informed they looked Adobe's technology roadmaps towards find IP telephony innovations that would boost mobility and user experience. Several suggestions to cut financial costs. For instance, in shared and informed workspace, organization may allocate a couple of wired connectors per workspace other than of Adobe's six. At a cost of ₹1200 each jack, we save Rs 1800 per employee, or

₹2,60,000. The corporate real-estate manager created workspace specifications, which the company offered to Adobe IT to save operational costs. Thus, a corporate real estate strategy helped Adobe, a software company, improve employee happiness while solving complex technological and business issues.

Officers (Gracheva & Groen, 2024) examine the pros and cons of adding coworking to large office-based enterprises' real estate portfolios. This study covers external and internal coworking solutions. They evaluated (Krumm et al., 2000) four perspectives on the pros and cons of adding coworking spaces to large companies' estate portfolios. (Jensen & Van der Voordt., 2017) employed 12 real-estate added value metrics to operationalize these perspectives. Facility management finds that external coworking options boost adaptability most. Internal coworking's biggest benefit is fostering innovation, creativity, and information sharing towards mgmt. perspective). External working and internal collaborate coworking have similar negative effects on business culture (general management perspective).

2.4.5.2. Real Estate and Employee Productivity:

Numerous studies demonstrate the importance of corporate real estate in workspace design. This data can assess how the workspace influences productivity. (Budie et al., 2019) noted that these techniques are widely used. The study also evaluated how corporate real estate managers might create an energy-efficient and sustainable workspace to obtain a competitive edge. Adobe's U.S. corporate real estate manager improves employee productivity by redesigning the environment. After the workspace makeover, staff survey results showed various favourable outcomes, according to (Graebert & Fischer, 2014). Specifically, 82% of employees reported improved indoor based air net quality and sustainable comfort. In addition, carbon net and per energy usage were cut 50%, saving 16 million kilowatts, 16,000 metric tons of CO₂. The case study showed that adjusting to workspace trends and satisfying tenant needs was vital to provide varied workspaces for different enabled work in styles along with business managed needs. These spaces included open, partial semi-enclosed, enclosed, based multi-purpose, clean and quiet IT services sections. An employee poll found that 75%

reported increased productivity and 91% said the adjustment improved their job environment. (Tolofari, Kurotimi Diseye et al., 2024) examined how motivation affects employee performance in Abuja real estate firms. Survey research was used to acquire primary data. Five Abuja real estate firms, including Osakwe & Associates and Wale Adewusi Associate, delivered 66 organized questionnaires to their employees. Multiple regression was used to analyse the data. Employee motivation positively and significantly affects job effectiveness in Abuja's real estate sector. Additional findings showed that job stability improves Abuja real estate work efficiency but not significantly. Awards and salaries boost Abuja's real estate sector's efficiency. The report says Abuja real estate companies should continue to engage people by assuring job stability, fair salary, and prizes, which boost productivity.

2.4.5.3. Real Estate and Employee Stress:

(P. Lakhani et al., 2024) The real estate market, notably in Mumbai, is booming in India and internationally. This industry depends on its front-line sales force's dedication and passion. This study seeks to identify work-life balance factors that significantly affect employee engagement. The real estate industry's long-term success depends on dedicated sales teams that generate revenue. Technological advances and organizational changes make it harder for people to balance work and life. Peer pressure, business culture, and technologies like artificial intelligence and machine learning have hurt employee satisfaction and performance. Work-life balance and employee engagement in the real estate business are examined to see if work-life balance affects engagement. Results showed a high association between work-life balance and employee engagement. A balanced plan boosts worker dedication, drive, job performance, and production. This balance boosts organizational productivity and performance. Promote work-life balance to encourage employees and boost organizational performance. Understand and manage the subtleties of work and personal life to maximize employee commitment and ensure the real estate industry's long-term success. (N. Bikmetova et al., 2024) Experience, qualities, selling strategies, and incentives affect real estate brokers' sales success. This article also explores how personal stressors like bankruptcy and criminal histories affect productivity. The

empirical method evaluates search marketplace pricing and liquidity simultaneously. Full sample and repeat sales studies discriminate between agents and temporary Behavior changes, as well as client selection and treatment. The inquiry focuses on listing-selling agent differences. Bankruptcy and crime reports affect people differently. The data imply that bankruptcy (or crime report) indicates a certain type of person with distinct business practices who change their Behavior during stress.

2.4.6. Studies on Real Estate Workspace Benefits:

Architecture has traditionally prioritized efficiency and affordability. However, digital technologies and advanced technologies have made buildings vital to the firm's earnings. This is done by encouraging workspace innovation and productivity. As energy markets incorporate demand response technologies and compensate energy customers for their ability to alter energy usage, buildings have become revenue generators for their owners. (Baglio et al., 2019) link workspace utility to real estate space and asset management firms' performance measures. Based on the company's main business goals, these methods focus on cost reduction or capital reduction. (Abatecola & Cafferata, 2014) found that workspace utility affects worker productivity. Productivity is highly influenced by workspace usability, particularly how well it supports work processes. The survey also found that workspace productivity directly affects company profitability. In 2020, Allen & Macomber established a workspace utility scale for corporate real estate. This scale, shown in table 2.5, evaluates how corporate real estate strategies affect workspace utility, concentrating on productivity and performance. The study also found that a firm's efficacy and employees' experience directly affect the workspace's usefulness and productivity. These two variables make up the overall assessment of corporate real estate's impact on workspace effectiveness.

Table 2.3: Corporate Real estate Workspace Optimization (scale)

No.	Variables	Items (to measure the impact of variables)
1	Workspace Productivity	Employee productivity, Qualitative productivity, Work-Process productivity

2	Workspace Performance	Financial performance, Innovative performance, Operational performance, Technology performance.

2.4.6.1. Real Estate and Workspace Productivity:

A company's corporate real estate efficiency depends on its tenants. (Harris, 2015) stated that corporate real estate design aims to improve productivity by creating a work environment that meets occupant needs. (Brown et al., 2011) state that workspace design, which encompasses resource and workspace distribution, drives sustainable performance and staff productivity. Organizations use a strategic approach to manage labor, currency, and real estate for operations. According to (Mahmoud et al., 2021), a productive workspace boosts individual and organizational production. This involves creating workspace which may meet the needs of staffs and employer management. When analysing company productivity in REM, personnel productivity, quality productivity, and work-process productivity are the main factors.

A. Real Estate and Employee Productivity:

This component measures real estate tenants' productivity. The corporate real estate manager role. Commercial Real Estate (CoRE) contributes 12% to the world economy, making it important socioeconomically. It also affects tenants' quality in terms of life sustainability and clean well-being (Gluch et al., 2014). Kaur and (Solomon, 2022) found that usability-based benchmarking measures (UBM) that prioritize occupant socio-economic needs and India's lower office space utilization attract many foreign firms. Any company must manage corporate real estate and provide good working conditions in today's business environment. Thus, a corporate real estate manager improves occupant satisfaction and staff efficiency. This is done by designing a workspace that meets client needs and makes them happy.

B. Real Estate and Qualitative Productivity:

Real estate tenants' efficiency is measured by this factor. (Haynes et al., 2017) found that knowledge workers' productivity is linked to their physical work environment. The study suggested that a corporation needs functional flexibility, or the capacity to fulfil

various business roles and duties. This allows job rotation and training, improving workspace productivity. The study also found that workspace functional flexibility boosts competitiveness. Occupiers worldwide judge leading firms based on the quality of their corporate buildings, which focus increasing occupier experience and effectiveness as part of their corporate strategy.

C. Real Estate and Work process Productivity:

This component measures individual and aggregate real estate occupant productivity. Simpler work processes use less organizational resources and boost employee productivity, according to (Baglio et al., 2019). Because employees are more engaged and can complete their tasks more easily, employee satisfaction increases. According to the report, corporate real estate must build a modern, collaborative workspace that improves communication and streamlines operations to make employees feel connected and involved. For instance, adjustable furniture for mobile workers can reduce the organization's workspace needs while allowing them to operate as they like. Increasing shared workspaces and meeting rooms might also reduce employee need for work desks and cubicles. This can reduce meeting demand, boost employee engagement for organizational tasks, and reduce workspace requirements.

2.4.6.2. Real Estate and Workplace Performance:

Manager (Mahmoud et al., 2021) stated that a corporation's corporate estate performance tied to corporate estate manager's ability to provide effective services. Efficiency measures like cost per square meter show cost reduction. Increasing company value is how well the CRE department performs. The revenue per square meter measures effectiveness. This could be measured using hybrid metrics like profit per square meter. Performance metrics must demonstrate efficacy and efficiency. Thus, financial, inventive, and operational success are the main indicators of company performance in corporate real estate.

A. Real Estate and Financial Performance:

This section assesses corporate real estate solutions' cost-saving effects on non-property companies. Research shows that Workspace Performance is measured by the

company's main goals of cost reduction or capital reduction (Baglio et al., 2019). This assertion claims that resource management affects firm profitability and productivity. Corporate real estate managers propose methods to cut expenses or give effective space solutions for a non-property company's real estate workspace, resulting in operational value through net savings on operational costs, according to (Sirola et al., 2022). Benchmarking, a standard financial analysis approach, compares space per employee in square feet and real estate cost per person to similar companies with similar business models.

B. Real Estate in Innovative Learning and Growth and its performance:

This factor examines corporate real estate systems' ability to generate operational profits from real estate property for a non-property company or organization. According to (Randhawa & Scerri, 2015), innovative performance measures non-property enterprises' learning and growth in real estate workspaces. The business processes perspective emphasizes learning and growth. This improves the workspace for customer usability. Business procedures strive to reduce operational costs and satisfy clients, benefiting workspace stakeholders. The corporate real estate department can advise management on meeting retailer and customer needs to boost mall sales and value. This involves using demographically appropriate design and tenant mix.

C. Real Estate and Operational Performance:

Corporate real estate methods' ability to generate income for non-property organizations is assessed in this section. (Baglio et al., 2019) suggested that this aspect measures corporate value generated by internal business practices that meet or exceed client expectations. Implementing efficient property management practices to optimize common area maintenance (CAM) charges, investing in property management technology, and organizing product events to increase footfall were found to improve operational performance in corporate real estate. (3) Change the mall tenant mix to attract more knowledgeable customers, especially retailers. (4) Encourage collective

marketing methods like free parking to increase mall customer spending, especially for non-property merchants.

D. Real Estate and Technology Performance:

Technologies (Shukla et al., 2019) defines real estate technology as digital platforms, electronic devices, and computer programs used by industry professionals. Participants include investors, brokers, lenders, property owners, consumers, and managers. This technology collects and distributes real estate data. Automation in real estate operations has changed corporate real estate (CRE) office architecture (Smollan & Morrison, 2019). AI is the best technology for modern business management. Computer-based artificial intelligence integrates human routines to determine, solve issues, and draw conclusions. Research shows a lack of literature on corporate office property management technology. This field of study is crucial since it includes large expenditures and focuses on tenant and/or informed customer satisfaction (Karvigh et al., 2019) and (Mukherjee, 2019). Several academics have adopted Technology Acceptance Model to study technology adoption (Alzubi et al., 2018) and (Rauniar, 2014). The CRE sector needs AI for operations. AI could transform office work and property information sharing among commercial office players. Replace humans along with robots to foresee machine for learning techniques to conduct regular activities, eliminating human interaction in property management towards functions. The capabilities include the management of property data using web applications and software, the exploitation of virtual reality tools to present prospective buyers with immersive 3D property tours, and the deployment of cutting-edge preventative measures in the real estate industry.

2.5. Studies on current Corporate Real Estate Practices:

Michael Porter's competing strategies are considered a landmark in corporate competitive strategy (Porter, 1980). (Haynes, 2012) divides corporate real estate strategy into value-add and standardization. Value-add refers to the real estate department's decisions that boost the company's business plan. These decisions affect staff happiness and consumer satisfaction. Standardization establishes industry standards to manage and coordinate real estate activity to boost competition. The main

purpose is to foresee employee, and client needs and adapt workspace practices to competitive dynamics to acquire a competitive edge (Porter, 1985). Maetle (2017) confirmed (Porter, 1985) findings that corporations use corporate real-estate to boost their competitiveness. The researchers used Porter's competitive advantage value parameters and the model to experimentally study corporate real estate strategy as a competitive advantage. They weighed the pros and cons of each corporate real estate strategy that could be industry wide. Table 2.3 shows the study's comprehensive scale for analysing corporate real estate's competitive advantage. This scale incorporates numerous elements to evaluate corporate real estate operations, giving a corporation a competitive edge. Three of main competitive aligned strategies—cost leadership, value in differentiation, and focused work with standardized estate process.

Table 2.4: Corporate Real Estate Budget (scale).

No.	Variables	Items (to measure the impact of variables)
1	Management Cost	Outsourcing, Property Information
2	Management Differentiation	Operational Model (Owning Vs Leasing Vs Sale and Leaseback)
3	Management Focus	Benchmarking, New Working Approaches (Workspace Flexibility)

2.5.1. Corporate Real Estate Costs:

Porter's competitive strategies suggest that the cost strategy emphasizes minimizing production costs for the company. It encompasses a general range of wider areas which caters to multiple market segments. It is a strategy adopted by the entire industry with the objective of achieving a competitive advantage through cost leadership. (Heywood & Kenley, 2008) provided a theoretical model that explains how corporate real estate can be aligned with competitive strategies. According to their model, the key factors that contribute to achieving the lowest production costs include accumulating expertise, economies of scale, and control of operating expenses. The company's extensive range of markets is crucial since it allows for the development of economies of scale. The study conducted by (Cabral & Dhar, 2019) asserted value-based system or solution to incorporate estate strategies focused on cost leadership was implemented in the

Netherlands and U.K. from 2007 to 2014. This strategy involved outsourcing non-essential tasks to a property management company and digitizing information during significant business changes.

A. Real Estate Outsourcing:

In a competitive market, companies worldwide are outsourcing non-core tasks to cut costs and gain strategic advantages (Maetle, 2017). In corporate real estate, outsourcing means "vendor management" for non-core functions allocated to property management businesses, according to the report. These companies provide property-related services to non-property enterprises at lower pricing. They further claimed that non-property firms outsource property-related tasks they cannot handle. Outsourcing involves managing costs, lowering risks, and maintaining vendor quality, according to (Jylhä et al., 2019). Vendor management involves contract administration, collaboration, innovation, and performance monitoring. A corporate real-estate manager must select vendors, carefully evaluate them, collaborate, communicate, and monitor performance. Cost leadership is essential throughout vendor management. Selection of a service vendor is based on skill, aptitude, and cost. Consider the time and cost of switching vendors while assessing the outcomes. Financial ramifications are included in the collaborative technique for a win-win collaboration. Communicating effectively involves cost leadership methods to reduce misunderstandings, ensure accountability, and encourage feedback. Finally, performance monitoring involves using vendor management scorecards and cost-versus-benefit scorecards to evaluate providers.

B. Real Estate Property Information:

Access to reliable property data is crucial to a company's real estate strategy. Property-related information must be reliable and high-quality to attract clients and help them make smart decisions. (Veale, 1989) found that firms lacked real estate asset information in the 1987 MIT University survey on corporate real estate practices in the US. This caused excessive corporate real estate asset management expenditures due to poor management. Big data drives efficient corporate real estate, according to empirical studies by (Kok et al., 2017). Big data is used to collect important information from third-party sources, burgeoning data from market organizations, and unreliable or

non-structured sources like social web media. Involves layering factual empirical numerical data onto an organizations financial or transactional finance records and analysing them finding newer patterns and/or opportunities.

2.5.2. Corporate real estate Differentiation:

According to (Porter, 2012), 5 forces of competition, the differentiation strategy tries to reach a large market by creating a superior product or end service that outstands in its field. Following that, company or department unit can decide a fee or charge more towards its goods. In simple terms, it's a business goal that everyone in the field shares. It focuses on how buyers see what makes a company's product or service unique. (Rymarzak & Siemińska, 2012) did real-world research and found that property management companies around the world use the location of the property and the operational model as their major corporate real-estate strategies to make the property stand out in the market. At the moment, the built environment business is being affected by the debate over whether to sell, lease, or do a sale and leaseback deal. The Real Estate Operational Model compares sale, lease, and sale-and-leaseback methods. (Harris & Cooke, 2014) stated that the operational model in corporate real estate involves using a property (workspace) for operational purposes rather than financial gain. They also stated that a corporate real estate must decide whether to buy, lease, or sell and lease back property based on the company's operating needs. (Hornbaek & Hertzum, 2017) found critical factors in buying vs. leasing. They claimed that buying a property with more land or expansion potential and the opportunity to sell, which is usually only possible in good markets, is advantageous. Buying the land can be of use and may seem appropriate for plant and equipment machinery is lived longer or hard to transfer. Thus, corporate real estate must carefully assess the strategic implications of buying or leasing a facility. In a sale and/or leaseback as a financial arrangement, the primary owner of an asset property willingly sells it to a 3rd party and then rents it back. The transaction is a rent-based loan (Jensen & Voordt, 2016).

2.5.3. Corporate Real Estate Focus:

According to Porter's competitive strategies, the niche strategy focuses on a certain segment or market. Competitive strategy involves serving a target market efficiently and

effectively to get a competitive edge over competitors (Porter, 1985). With cost and differentiation emphasized, these two factors become the only competitive advantages. (Heywood & Kenley, 2008) examined Australian corporate real estate practices using the focus approach in corporate real estate. The report lists benchmarking in corporate real estate and innovative workspace flexibility activities as the main corporate real estate strategies that support the focus approach.

A. Real Estate and Benchmarking Standards:

(Warren, 2002) states that benchmarking workspace usage comprises assessing real estate demands including staff count, space needs, and workspace area. This technique helps management design workspace efficiency strategies. (Kaur & Solomon, 2022) discovered that benchmarking is increasingly considered essential in the workspace, especially during operation and maintenance. This tool helps companies uncover performance improvements and make strategic decisions. Benchmarking can also reduce a company's carbon footprint and space needs. (Voordt & Jensen, 2018) suggest that non-real estate companies must measure operational space performance to manage portfolios and support their main business. Benchmarking tactics manage Corporate Real Estate (CRE) to increase a company's value or wealth. Systematic creation, coordination, management, and monitoring of all real estate-related tasks aligns the portfolio and services with company needs (Kwon et al., 2019).

B. Real Estate and New Norm:

Different types of work arrangements, such as activity-based working, hot-desks, co-working spaces, flexible hours, and telecommuting, are continuously gaining popularity. Because of this tendency, the frequency of workplace design is subject to regular modifications (Harris, 2015). According to (Harris, 2015). Expenses that are linked with the maintenance of assets have been decreased because to the implementation of collaborative and open-plan workplaces, co-working spaces, and hot-desking. According to (Garter et al., 2013), technological advancements have made it easier to engage in the practice of telecommute and to construct virtual workplaces, which has led to a reduction in the demand for physical workspace. Because there is a shortage of raw materials and an increase in the demand for energy, it is vital to upgrade

the systems that were previously used to manage energy and resources. Several studies have found that firms must adopt a NAW (New Age Workforce) model based on sustainable growth to succeed competitive environment related to businesses. (Budie et al., 2019) found that modern work methods focus on sustainable facilities management to improve occupant well-being and business productivity. It was found that NAW needs sustained development to show succeeded in a business operated competitive environment. The poll also found that many companies worldwide are trying to apply sustainable operational practices to reduce space use. This study analyses non-property firms' strategic changes in work practices (New Approaches to Work or NAW) in the U.K. and U.S. Sustainable techniques lower brick-and-mortar office space and carbon emissions, influencing these improvements.

2.6. Real Estate and Sustainability Goals:

Nowadays, corporations must lower their carbon footprint and prioritize sustainability in managing their real estate, technical, and infrastructural assets (Sharma, 2018). Companies are incorporating sustainable practices into their workspace operations as a strategy. This method maintains office operations during and after crises. Corporations today understand the importance of adjusting the workspace to corporate tenant needs and providing cost-effective asset space options via smart corporate estate. Corporate sustainable corporate estate includes several eco-friendly building facility management methods. This method reduces carbon emissions as natural resources diminish (Gluch & Bosch, 2016). By organizing, coordinating, and managing property operations, sustainable corporate real estate solutions help organizations increase their value (Opoku & Egbu, 2018). The term 'sustainability' changes throughout time and between nations. According to study implies triple bottom line development - economic, environmental, and social impacts related development—is the phrase's genesis by (Brundtland, 1987). The 3 pillars of development related to sustainable provides complete model for corporate occupier assessments of sustainability. Corporate asset occupiers analyse prominent firms based on their sustainable business strategies (Seyler, 2020). Therefore, organizations should strive for global sustainability. Due to the growing acknowledgment of sustainable corporate practices, (Korkmaz & Singh, 2012) suggested changing the approach to planning, building, and administering a

corporation. Globalization and technology advancements in company have made workspace and resource optimization essential. This has changed work patterns and changed building designs to maximize operational efficiency and minimize staff workspace consumption.

2.6.1. Goal No: 11 Sustainable Cities and Communities:

The need of combining Human Behavior in using modern technology, patterns, models that aid in creating an employee productive, satisfaction and then predict the future technologies that can be implemented in the office space for next future of work. The real estate industry is not training its practitioners to handle rapid changes in customer dynamics, changes in demographics, and emerging technologies like artificial intelligence and machine learning that are being integrated into real estate processes, according to a decade of research. Practitioners struggle to integrate sustainability into business procedures and structures. They must comprehend the factors to implement sustainability effectively. There is little research on modern green business models and their essential traits. This study evaluates sustainable business models and identifies their main characteristics. This study uses conceptual research to synthesize corporate real estate sustainable business framework literature. Sustainability, information technology, core data points, value creation, and stakeholder engagement are among the important issues to explore in the study.

2.6.2. Real Estate – Green Buildings and Sustainability Frameworks:

These frameworks place an emphasis on the implementation of ecologically responsible and sustainable practices into real estate efforts. The LEED (Leadership in Energy and Environmental Design) rating system, the 7 standards of named in WELL Building Standard, and the BREEAM (Building Research Establishment Environmental Assessment Method) rating system are all examples of rating systems that fall under this category. These rating systems offer standards and criteria for the design, construction, and operation of sustainable buildings. This framework provides an outline of the sequential processes that comprise the process of real estate development, beginning with preliminary feasibility studies and site purchase and progressing

through design, construction, leasing, and property management responsibilities. The evident analysis and informed decision-making processes in the estate business facilitated by these frameworks, which offer structure and direction. When it comes to investments, development projects, property management, and market analysis, they help professionals in analysing opportunities, identifying risks, and making judgments based on accurate information.

2.6.3. Real Estate Sustainability Scale:

In (Fauzi et al., 2021) presented a sustainable corporate real estate scale (table 2.4). This scale measures how corporate real estate affects economic, social, and environmental sustainability. These aspects match the 1987 Brundtland report's notion of sustainability. Additional empirical testing confirmed that workspace sustainability management improves business commercial performance. Sustainable buildings can support business goals by improving corporate estate services. As per (Fauzi et al., 2021), corporate estate decisions include workspace facility operation and maintenance in conformity with environmental regulations. Sustainability is fundamental to workspace management. Effective corporate real estate affects economic, social, and environmental sustainability. The study also found that ISO 41001:2018 combines real estate and facilities management to provide intelligent and adaptable work methods that can effectively manage organizational operations (such as people, place, and process) across three sustainability dimensions.

Table 2.5: Sustainable Corporate Real Estate (scale)

No.	Variables	Items (to measure the impact of variables)
1	Economic Dimensional Goal	Better infrastructure at a low cost
2	Social Dimensional Goal	Social compliance
3	Environmental Dimensional Goal	Environmental compliance

2.6.3.1. Real Estate and Economic Dimensional Goal:

The economic side of corporate real estate involves using technology and money to improve the workspace. The corporate real estate manager helps reduce operational costs and promote sustainability through workspace management. Corporate real estate directly affects sustainability's economic aspect. (Sharma, 2018) used a casual study approach to examine the effects of free workspace infrastructure. This study implemented an economic corporate real estate approach to improve workspace sustainability.

Numerous research studies have indicated that facilities management, a profession within corporate real estate, contributes to economic sustainability through value metrics. These include optimizing energy consumption in workspace facilities (such as HVAC, security, and building maintenance), streamlining the leasing approval process and negotiating leases at a lower cost, subleasing excess workspace, implementing efficient workspace management strategies that minimize company resource use (such as subleasing, activity-based workspace design, and co-working), and fostering facility management innovation to improve workspace management. Real estate technology improves building functionality through workspace innovation and automated property administration. Corporate real estate includes property management. (Fauzi et al., 2021) stated that ISO 9001:2015 addresses the impact serve of service quality in estate on business related performance and enhances sustainable corporate real estate economically. ISO 41001:2018 includes ISO 9001.

2.6.3.2. Real Estate and Social Dimensional Goal:

Social judgments in corporate real estate improve human resource efficiency. Corporate real estate aims to establish a productive workspace that promotes social sustainability, according to (Gluch & Bosch, 2016). This is done by fostering a happy, healthy, and productive workspace. This underlines the necessity of meeting workers' needs. Corporate real estate helps ensure social compliance by improving workspace occupant happiness, promoting gender equality, and maintaining workspace safety, according to Fauzi et al. (2021). ISO 26000:2010 addresses impact related corporate estate service quality occupier satisfaction contributes to socially sustainable corporate real estate, according to the study. ISO 26000 is part of ISO 41001:2018 and addresses workspace

social sustainability. Regarding the selection of materials, (Kaur et al., 2022) emphasized that sustainable estate designers need to take into consideration the social and ecological costs concerned. When it comes to revenue, engineers may prioritize cost-effective approaches over environmentally beneficial ones. A lack of sustainability initiatives causes many stakeholders to overlook the benefits of sustainable development and its potential for social gain. However, with good management and strategic planning, real estate projects can be sustainable without additional costs.

2.6.3.3. Real Estate and Environmental Dimensional Goal:

The environmental part of corporate real estate decisions focuses on maintaining an environmentally friendly workspace. Whether the firm provides a safe and sustainable workspace for employees is the environmental side of sustainable corporate real estate, according to (Park et al., 2020). Many companies are developing NAW (Natural Airflow Windows) in an era of natural resource depletion, global environmental based change, corporate social responsibility and demand environmentally friendly solutions. These windows can significantly lower building operations expenses. Environmental, social, and governance (ESG) advancements have linked commercial real estate (CRE) management to organizational transformation in recent years. ESG measures have made corporations realize corporate real estate is strategic. (Warren, 2018) defines smart corporate real estate as focusing on user needs, sustainability, and using advanced technology to achieve benefits that cannot be achieved by following environmental standards in workspace facility maintenance. The study also showed how typical corporate real estate strategies help the environment. These strategies involve following building environmental standards and toxic waste management policies and establishing internal green management practices. Corporate real estate improves workspace safety by following building environmental rules, according to (Fauzi et al., 2021). According to the research, ISO 14001:2015 addresses the impact related corporate estate service quality workspace safety increases the environmental impact of sustainable corporate estate encompassing ISO 41001:2018 includes ISO 14001.

2.7. Real Estate Research Studies and its Issues:

The literature review examines real estate aspects. The literature recommends reviewing 10 years of research to identify key market challenges (Jylhä et al., 2019). A detailed critical analysis of estate literature shows main research areas are the value added by corporate estate strategies and their alignment with business strategy, corporate estate managers' operational challenges including sustainability. As detailed below, each corporate real estate research issue faced by non-property enterprises in the commercial real estate industry is handled individually and linked to the literature.

2.7.1. Corporate Real Estate Strategies:

Researcher (Haynes, 2012) used exploratory factor analysis to determine whether U.K. corporate estate strategy matches company strategy. Corporate estate specialists were interviewed, surveyed for this research. He believed that corporate real estate should evaluate the theoretical framework and CRE strategy to link estate strategy for business strategy. Proposed 7 Ps are important workspace considerations. People (examining workspace psychology), processes (examining operational activities), paradigm (evaluating workspace culture), place (assessing location and work environment), procurement (examining property ownership and vendor quality), purpose (studying the organizations mission adding overall business operative strategy), position (analysing workspace's competitive position), and planet (Jensen & Voordt, 2016) claim that corporate real estate evaluates workspace performance and implements the best techniques. They claimed that assessing workspace effectiveness requires balancing real estate strategy pros and cons. This requires qualitative and quantitative assessments of the organization's strategic success, taking into consideration stakeholder and societal interests and demands. However, the main goal is to standardize corporate real estate value-added standards to evaluate comparable firms in the industry.

Researcher (Zhao et al., 2019) propose using Value Engineering (VE) to improve a company's financial situation through corporate real estate. VE-based facility-selection calculates the added value of each facility by utilizing the $\text{Value} = \text{Function}/\text{Cost}$ formula to value a vendor-outsourced product or service. This article introduces a new way for enterprises to choose facilities. Value engineering in corporate real estate lets

organizations evaluate each facility's real estate strategy's cost and advantages. (Whyman et al., 2015) found that British private sector workspace corporate real estate should prioritize firm success. His ethnographic study used data from the British Workspace Employment Relations Survey 2014 to evaluate how workspace flexibility, a key part of corporate real estate, may maximize shareholder wealth by utilizing untapped real estate resources. They claimed that improving corporate real estate-financial management collaboration would increase a company's capital market value (shareholder wealth) and recognize corporate real estate's many benefits.

(Gluch & Bosch, 2016) examined environmental experts' growing influence in corporate real estate. The researchers used narrative inquiry to obtain data from 50 interviews across three research projects covering the top 100 Swiss companies. The study suggested that corporate real estate managers' growing influence in non-property groups boosts their finances. (Shahzad et al., 2015) recommends focusing on property management that attracts occupiers to integrate estate strategy towards business strategy. Importance of corporate estate and its impact on occupier/client satisfaction can be measured. The authors recommend using comprehensive quality management and ServQual dimensions to aid this effort. The study suggests four measures: property physical qualities, service attributes, maintenance, security, and communication and comprehension requirements. He also said that property managers often fail to communicate with occupiers when developing real estate strategy, causing a discrepancy in service quality and delivery. He also stated that the firm's corporate real estate function relies on amenities to strategically increase property value. (2015) said corporate real estate should evaluate how indoor environment quality affects occupant productivity. He suggested prioritizing indoor environmental quality in the company's real estate strategy. His research showed that adapting the physical environment to occupant needs increases productivity. To assess how corporate real estate strategy affects worker productivity, the study provides four metrics: decreased absenteeism, increased engagement, self-evaluated (individual) productivity, and objective (office-wide) productivity.

The quality of logistic facilities in Italy's corporate real estate plan was assessed by (Baglio et al., 2019). The study also sought to determine these facilities' main purposes. Qualitative and quantitative methodologies were used, including a literature analysis,

Delphi expert opinions, and model validation through pilot testing on 27 logistics buildings. Real estate managers evaluate a facility's quality and functionality based on four key indicators: location of the asset property, places around its surroundings, and related integrated connections, the space outside as externals, the assets technical details like specifications and the internal named space areas, countable utilities, and green aided systems. Spanish manufacturing companies were studied by (Bayo et al, 2017) to determine how corporate real estate affects information technology demands and interpersonal growth. Job autonomy, teamwork, and job breadth combined with ICT and AMT boost worker productivity, they say.

2.7.2. Real Estate and Operational issues

(Kwon et al., 2019) surveyed 27 IFMA chiefs. Health and indoor climate evaluation for functionality and productivity is the biggest operational concern for enterprises worldwide, according to the poll. The manager of estate must measure the value added in terms of estate department managing and using these parameters. They said workspace design should highlight occupier-satisfaction features that improve functionality and energy performance. (Kattman et al., 2012) examined three case studies of Estonian, British, and American businesses. The study examined working behaviours in competitive firms as the main operational concern in corporate estate. CRE managers also argued the department requires information management to track property operating obligations and analyse deviations. (Voordt & Jensen, 2018) describe benchmarking tactics in corporate real estate (REM) as an operational issue that organizations should handle step-by-step. This method can help create cost-effective space solutions, identify occupier demands, and boost employee performance. The report offered three systematic methods to solve the operational problem and apply best workspace practices. First, analyse the strategic brief that compares workspace performance and usage to industry benchmarks and involve employees in workspace strategy decisions to assess organizational need. To adopt the CREM strategy in a business, managers must create communication strategies and change management programs that meet changing environmental needs. Additionally, every employee must be informed of the benefits of sustainable practices.

Researcher (Miller, 2014) advises corporate real estate managers to adjust to workspace consumption trends. Significant trends affect future office demand and property values. He merged commercial real estate operators' and corporate space planners' perspectives. The study suggests that occupant needs should determine the availability of open collaborative areas, semi-enclosed or partial and enclosed collaboration or fully closed spaces, multi-purpose or different use workspaces, quiet or silent areas, and IT service or operational areas to suit different work or activity styles and business managed needs. He also found that this corporate real estate strategy reduces costs associated with maintaining the real estate portfolio, integrates technology needs with employee needs to reduce technology costs, reduces infrastructure and facilities aiding to management costs and creates a comfortable environment for knowledge or subject matter expert workers or staffs based on workspace trends. (Laing & Bacevice, 2013) examined how corporate real estate office design influences interprofessional environments in three sectors. It examined UK case studies of Google, GlaxoSmithKline, and SAP AppHaus. The research emphasizes the need of involving employees in workspace management decisions to address interprofessional concerns in the organization. The study found four corporate real estate characteristics that foster interprofessional competences in the firm. Job rotation and training encourage multitasking. Additionally, the organization has a lower average space utilization per employee. Selection is another element, since the corporation hires skilled individuals over manual or semi-skilled ones. Finally, the corporation uses teamwork and autonomy in many workspaces.

Innovative workstation design must balance thermal comfort and energy economy, according to (Shahzad et al., 2015). This balance is important operational factor that is used in assessing a firm corporate real estate department. To evaluate the operational workspace design, the business used thermal comfort and energy efficiency criteria. The workspace's size and shape contribute to a comfortable work atmosphere. (2) Workspace density—It contains fewer workstations than employees to accommodate hot-desking. The office offers high-quality air-conditioning, making it comfortable per square foot. (4) Workspace lighting quality - The company provides enough and comfortable lighting with a sufficient lumens per square foot. (5) Workspace noise

level—The company has many quiet conference places and suitable acoustic workstations for concentration.

Technologies (Cheah et al., 2019) used ethnographic research to measure customer satisfaction with real estate workspace management to assess building quality (grade A versus non-grade A). A framework was developed to objectively examine and confirm the association between responsive and proactive customer orientation and office space performance (tenant happiness and loyalty). Inertly (Durdyev et al., 2018) examined Cambodian property management organizations to evaluate the elements that affect real estate service quality. To improve occupant happiness, the goal was to analyse workstation quality operationally. The FM-SERVQUAL paradigm should be used to evaluate corporate real-estate services, he proposed. The methodology improved workspace quality assessment using five indicators: (1) Building energy management solutions create smart, sustainable workspaces. (2) Maintaining workspace facilities according to the client charter ensures reliability and occupier satisfaction. (3) Simplifying legal processes connected to workspace amenities, making them user-centered, understanding user demands, and improving communication shows empathy. (4) Safe, secure, and healthy working conditions are guaranteed. (5) Working facilities follow energy policy and adapt to technology, ensuring responsiveness. (Abatecola & Cafferata, 2014) used a mixed study technique to examine corporate real estate's relationships with construction, real estate, financial, and technical (MEP) services in Europe. The goal was to align the real estate strategy with the business plan. They also claimed that inefficient corporate space management and growing activity complexity are driving real estate administration complexity.

(Blok et al., 2012) studied how corporate real estate may adapt to changing work styles for occupant productivity. They examined how this alignment affected corporate outcomes using (Lindholm, 2008) four parameters: human resources, IT, finance, and physical workspace. The Cambodian study found that corporate real estate improves organization, management, and work culture. It reduces technology, operating costs, and workspace use. (Zavadskas et al., 2010) suggested that organizations should follow environmental standards and sustainability to improve working conditions, access property information, and reduce IT needs. This includes quality standards, job rotation, open conversations on work organization, and flexible hours. They said sustainability,

current trends, and innovative working habits are crucial to upgrading workspaces to fulfil company management and occupant needs. A practical study by (Jayantha & Oladinrin, 2019) examined Asian companies' adoption of hot-desking and co-working. Office space reduction was the goal to optimize workspace and resource use. They also said that creative work methods should change work patterns and physical structures, focusing on operational efficiency and worker space reduction.

2.7.3. Contribution of Corporate Real Estate towards Sustainability:

Workstation quality and its environmental impact have been extensively studied. For a case study on corporate real estate in a firm, Leeds City Council (LCC) United Kingdom was studied. Study examined how creative workstation design benefited employees and knowledge transmission. The end goal was to optimize the company's real estate cost-benefit ratio with this design. (Wyeth & Nulkar, 2014) interviewed the top 18 CII and facilitating organization property professionals for case studies. They examined reports from the top 100 Indian manufacturing organizations to see how they measure and evaluate corporate workspace sustainability. (Sharma, 2018) surveyed workspace practices that reduce carbon footprint and promote sustainability. The ISO 4101-registered 7 significant Indian enterprises with high-quality infrastructure were surveyed. The study explained ISO 41001:2018, which blends real estate and facilities management to provide intelligent and adaptable work. These approaches can manage people, place, and operational processes with a sustainability focus. (Müller et al., 2019) examined how corporate real estate strategy affects organizational productivity. Former usage metrics including absenteeism: away from work, employee turnover intent: come back to office, self-assessed performance: self-evaluation, job happiness: satisfaction in the job, health: energy to perform optimal and well-being: proactive measure for health, and facilities manager complaints: issue, risks were discussed. However increased importance of sustainability has changed the perspective. The study examined ways to improve building space design and in house operation, including ventilation, sensor, lighting, and green sustainable building related certification. These techniques address productivity and corporate sustainability.

Technologies (Park et al., 2020) proposed five ways to study corporate real estate and sustainability. Hot-desking is one method when the company has fewer workstations

than employees. The second method is hoteling or using an open-plan office. The third option is activity-based working, which requires more meeting spaces in the business. The fourth strategy is outsourcing, where the company outsources some tasks. Fifth, create adaptive work environments where employees share workstations and change frequently. They claimed that these five corporate real estate strategies specifically workspace management help companies meet their corporate social responsibility and carbon emission goals. The study found that REM promotes company sustainability. (Ionaşcu et al., 2020) in Switzerland research how corporate real estate promotes sustainability. It examines how occupiers view major firms for implementing SDGs in their corporate strategy. The researchers examined how transparent European Union (EU) corporate real estate firms are in adopting the 2030 sustainable development goals (SDGs) and meeting stakeholder information needs. EU corporate real-estate companies only quantitatively reported 3 SDGs using KPIs, according to the study. Companies scored 2.99 out of 5 for reporting quality. SDG 11, which promotes sustainable marketplace, cities and assets of communities, SDG 13, which addresses climate managed change, and SDG 8, which promotes capable yet decent offerings like jobs and economic financial growth, are discussed. They said that voluntary carbon disclosure by some governments has led to a discrepancy between corporations' sustainable development aspirations and actions.

(Masalskyte et al., 2014) discovered that corporate real estate sustainability maturity assessments vary by industry in Finland. However, sustainable corporate real estate practises increase asset and portfolio value. A model that shows how corporate real estate affects a company's sustainability and provides a thorough overview of sustainable corporate real estate strategies was offered. A case study by (Harris & Cooke, 2014) examined the pros and cons of environmental management systems in corporate real estate organizations. The survey concluded that developing countries like India had not tested ISO14001, a corporate environmental management system. Organizations in poor nations are not required to obtain the ISO 14001 accreditation; it is voluntary. Therefore, the material came from industrialized countries like the US, UK, and China, where enterprises must have ISO certificates. Sustainable corporate real estate in emerging nations like India and Sweden was compared based on building

environmental laws. Thus, this case study recommends that REM should prioritize ISO 14001 as an essential environmental management system component.

(Baumann et al., 2013) says a corporate real estate plan's viability depends on firm size. The study of Swiss companies found that the size measurable of the employee firm (measured by employee count) and costs of adopting sustainability practices affect corporate social responsibility implementation between evidently large multinational enterprise corporations and small and medium corporation enterprises. In Malaysia, (Kalu et al., 2016) found four factors that affect developing economies' voluntary carbon disclosure. Social considerations, financial market variables, economic pressure, and institutional/corporate ownership pressure are included. The study has crucial implications for developing a "relationship network" to improve decision-making and foster corporate carbon reporting and climate change mitigation. Policy, procedural, and social factors, not technology, hinder sustainable building, according to (Gluch et al., 2014). They advised organizations to use life cycle analysis (LCA) to evaluate stakeholders' influence on environmental activities. They also suggested that companies evaluate the positive and negative consequences of environmental initiatives on company performance and operational costs.

2.8. Real Estate Evolution in India: A Sectoral and Temporal Narrative:

India's real estate market, which combines both corporate and commercial properties, is a meticulous plan and execution of the reflection of the country's aspirations for infrastructure and socioeconomic changes. In the pre-British era, communities were usually based on agricultural land, royal estates, and places of worship, and land and constructed property were primarily managed by customary ownership and community-based practices. There was no such thing as "real estate" in the contemporary economic sense. In the Western building codes, city layouts, and official land registration were introduced during the British colonial era, when organized urban planning and property rights systems were made as a standard. The colonial architecture and early types of public infrastructure, such as hospitals, train stations, post offices, and banks, started to show in the urban centres of Chennai, Kolkata, and Mumbai (then known as Bombay) were a part of this.

Post independence to India as a separate country in 1947, From 1950's to the 1980's the Indian government prioritized affordable housing programs and housing for public sector workers. The majority of real estate was still housing, residential, with single-family homes and joint-family homes predominating in cities and joint-families in rural cities. There was a dynamic change in the liberalization era after 1991. Money from foreign investments, the expansion of the IT sector, and urbanization all contributed to the opening of the economy and accelerated the growth of commercial real estate, especially in major cities like Bengaluru, Hyderabad, Pune, and Gurugram. As businesses began constructing IT parks, SEZs, and multi-tenant office spaces during this time, corporate real estate management also began to take shape. There were no computers in locations or programs that people began using even during this period.

Hence, due to growing land constraints and population density growing, the housing segment changed concurrently from single-family homes to gated communities or row-houses as residential real estate was in high demand and high-rise apartments started sparkly building up the nation's economy. According to Masalskyte et al. (2014), Indian real estate has been progressively rapidly and high-quality infrastructure into its value proposition, particularly in major cities where ISO 41001 frameworks and green building standards including LEED are becoming more widely accepted. The industry saw a storm of health and safety from labourers to managers with insurance being a part of active growing. During this time, the West was concentrating on quality standards and putting governance in place for infrastructure, policies, and procedures for the real estate industry and its employees.

Technology, Digital infrastructure, intelligent building design like smart buildings and IoT-enabled real estate services were previously adopted by Indian urban centres because of national policy initiatives like the Smart Cities Mission. Models such as TAM 1, 2, and 3, which are increasingly used to evaluate stakeholder and end-user readiness for digital transformation in line with the lineage to use computers to search spaces have moved to lease, rent, buy and sell spaces via mobile devices, that are hand held, highlight global trends of technology acceptance in real estate, which are reflected in these developments. Today's Indian real estate market includes a variety of sectors,

including residential, commercial, industrial, logistics, retail, hospitality, and data centres, with high concentration centres like Space Management, Data Centre's that entirely build-up on Real Estate Technology. (CREDAI, 2024) Technology is crucial to design, sustainability, cost effectiveness, and user experience. Along with this came the service quality standards that help us manage more relevant data and psychology play an important role in human satisfaction and organization productivity. More sophisticated technologies are available here that facilitate online buying, selling, and leasing as well as space searches.

Finally, as a result, Indian real estate and its services has a long history that spans from remote residential areas to cohesive urban ecosystems, and from ancestral landholding to cloud-connected smart spaces which becomes a part of corporate and commercial real estate management. This confirms the need for a multi-variable, integrated real estate model that takes into account the Indian context of economic reform, policy development, digital aspirations, and sustainability requirements, as well as international theoretical frameworks that includes acceptance of the technology, adoption of the technology framework along with satisfaction to the staff working using it as the end user and the organization productivity in offering it to the stakeholders. (CREDAI, 2024) The pertinent data is shared in the timeline chart and table below:

Table 2.6: Indian Real Estate Multi-layer development timeline chart with Related Theoretical Models

Period	Key Developments	Associated Models
Pre-1857	Agrarian land systems, community-based settlements, informal land ownership	Traditional land practices (pre-theoretical)
1858–1947	Colonial town planning, property registries, institutional buildings	Colonial governance models; beginnings of structured infrastructure frameworks
1950–1980	PSU housing, government townships, plotted layouts	Early facility management concepts; groundwork for service quality thinking
1991–2005	Economic liberalization, IT/ITES boom, SEZs, corporate offices	NRBV (1995), BSC (1996), TAM 1 (1989), TAM 2 (2000)

2005–2015	High-rise apartments, gated communities, organized retail, metro housing	TAM 3 (2008), Real Estate Management Model (Lindholm, 2008)
2015–2025	Smart cities, coworking, sustainability, PropTech, digital transformation	FM-SERVQUAL (2017), Real Estate Tech Model (2018), Integrated Model (2025)

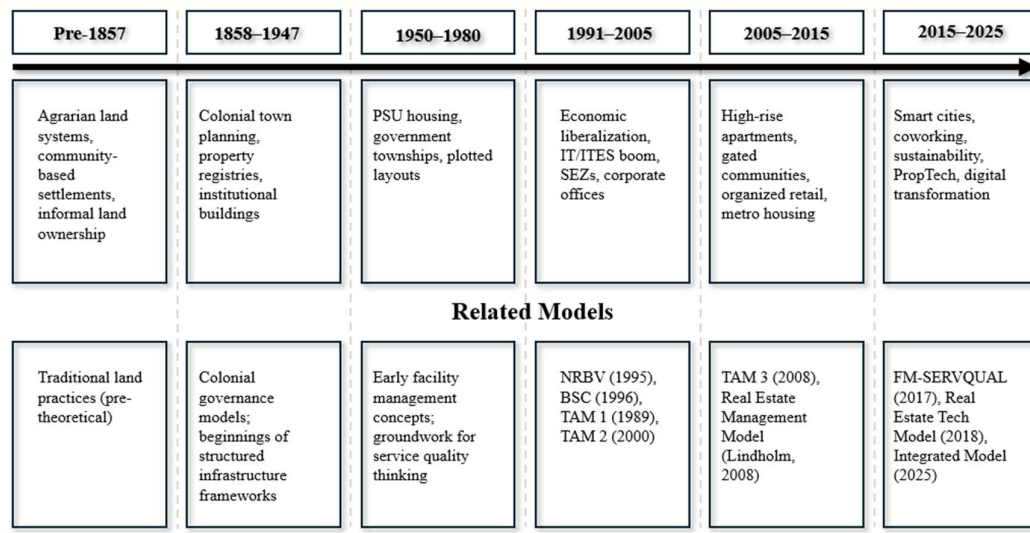


Fig. 2.1: Timeline and related models employed in India. Source: (CREDAI, 2024)

2.9. A Critique sight on the Real Estate Management Framework

A number of studies have examined various real estate management models over the years. Each model has contributed helpful but frequently lacking details or not specific to real estate management or a model dedicated only for real estate. Classical approaches such as the Natural Resource-Based View (NRBV), SERVQUAL, Technology Acceptance Model (TAM), and Balanced Scorecard (BSC) have greatly influenced our understanding of how to manage people, technology, finances, and resources in the workplace. It was challenging to apply these frameworks in regular organisations since they frequently operated in individual ways, despite the fact that they assisted people in thinking and design principles strategically about real estate management

The one common criticism of current models is that they don't fully connect real estate strategy with the larger goals of the business, growth or regulatory or compliance

related. For example, the NRBV is mainly about making the most of physical workspace, and SERVQUAL is mainly about measuring service quality. However, they don't consider how hybrid work models are changing, how sustainability, health and safety needs are changing, or how new technologies are changing. Real estate also doesn't use Technology Acceptance Model enough, even though it gives important information about how stakeholders use technology in workplace design. Alzubi et al. (2018) point out this gap.

The Multi-Criteria Decision-Making (MCDM) which helps in combined theoretical frameworks to bring a standard framework for specific industries like real estate is missing. Balanced Scorecard helps align strategy with performance, but it is still focused on money and can't quickly respond to changes in employee needs, remote work trends, or ESG (Environmental, Social, Governance) compliance. The Real Estate Net Promoter Score (RE-NPS) provides metering related to Satisfaction of the customer or end users and in alignment with services offered. Recent studies that call for more flexible, feedback-driven frameworks for real estate applications in rapidly evolving business environments showcases this problem at large.

From early researchers like (Hart's, 1995) and (Kaplan & Norton's, 1996) to more modern and recent studies by (Haynes, 2017), (Gluch & Bosch, 2016), and (Fauzi et al., 2021), we can see a noticeable shift in research methodology both in theoretical and conceptual model from cost, value, and sustainability focused approaches along with a parallel focus in writing and publishing that interprets data related to human centric decisions, safety features and certifications. Particularly when it comes to bridging the operational divide between the company's real estate departments and other divisions like finance, human resources, and technology, there are still large gaps. The suggested integrated model truly shines in this regard. (NAREDCO, 2023) It creates a single, flexible, and scalable approach by fusing the best aspects of existing theories and connecting them to contemporary business needs. It makes use of practical tools such as workplace utility metrics, TAM validation, and benchmarking. Additionally, it emphasizes productivity, stakeholder satisfaction, and sustainable design.

Additionally, the framework and the previous models discuss immediate actions, such as utilizing data analytics to manage facilities proactively, responsive design to increase employee satisfaction, and smart building systems to reduce environmental impact

along with the Environmental, Social and Governance related activities and its certifications. It advances from theoretical alignment to quantifiable, real-world implementation, something that earlier models hardly ever accomplish. To sum up, while legacy models have each offered us helpful perspectives on and methods for handling corporate real estate, the integrated framework put forth in this document is superior because it not only enumerates the components of effective real estate management but also demonstrates how they all function in concert. It turns real estate from a fixed asset into a strategic tool that helps companies stay afloat, generate new ideas, and growth in the current world. What is ultimately required in a timeline is a model that grows for a specific sector like real estate and improvises on the current trends like the Hybrid model working and less space or efficient space usage.

The below table and its chart are a combination and visually represent highlights how each model is built, its relevancy in usage upon the earlier models, culminating in a more holistic and adaptive framework for today's complex real estate industry. (NAREDCO, 2023) The current gap identifies the broad 35 years plus to indicate the growth and stability the models evolved over the period. The Corporate Real Estate Business Framework (2020 – 2025), the current thesis fills the previous gaps in two chief ways, one in establishing the current technology adoption and acceptance and Second on the use of Service Quality to end customers.

Table 2.7: Model's Lineage Data vs gaps in usage.

Model Name	Year	Relevance Level
SERVQUAL (Parasuraman et al., 1988)	1988	1
TAM 1 (Fred Davis, 1989)	1989	1
NRBV (Hart, 1995)	1995	1
BSC (Kaplan & Norton, 1996)	1996	2
TAM 2 (Venkatesh & Davis, 2000)	2000	2
TAM 3 (Venkatesh & Bala, 2008)	2008	3

Real Estate Management Model (Lindholm, 2008)	2008	3
FM-SERVQUAL (Koleoso et al., 2017)	2017	3
Real Estate Technology Model (Alzubi et al., 2018)	2018	4
Integrated Real Estate Framework (Current Study)	2025	5

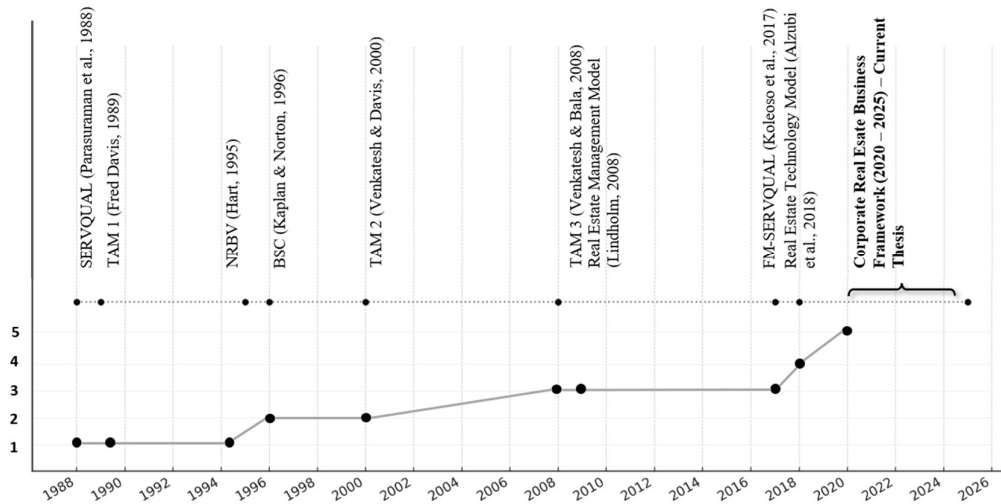


Fig. 2.2: Model's Lineage Data vs gaps in usage. Source: (NAREDCO, 2023)

2.10. Global Evolution of Real Estate as a paramount industry:

As we have seen the overall growth and contribution in India, the research presented here is on the global view of markets have evolved in the last 25 plus years and their contribution to economic growth.

2.10.1. Regional Split on Real Estate Contribution:

The use of strategic models that have directed value creation, stakeholder engagement, sustainability, and technology adoption has greatly changed the global real estate industry, in addition to standards and technological advancements. In terms of economic maturity, sustainability, health and safety, policy frameworks, and digital readiness, the influence of foundational models like the Natural Resource-Based View (NRBV), Balanced Scorecard (BSC), Technology Acceptance Models (TAM 1, 2, and

3), Real Estate – Net Promotor Score (RE-NPS), Real Estate Multi Criteria Decision System (REMCDS), and SERVQUAL has varied by region.

Americas: The early use of the Balanced Scorecard (Kaplan & Norton, 1996) helped connect organizational strategy and real estate performance across North and South America, especially in the United States and Canada. With the use of this approach, businesses were able to evaluate real estate as a strategic asset that enhances productivity, brand value, and shareholder returns rather than only as a cost center. The digitization of facilities management and real estate operations was made possible in large part by the TAM series, which began in the United States in the 1980s and developed into TAM 2 (2000) and TAM 3 (2008). As user acceptability grew, smart building technologies, BIM (Building Information Modelling), and workplace analytics platforms gained traction, demonstrating the region's ability to foresee future developments. SERVQUAL also discovered especially in sectors like healthcare, financial sector, marketing, sales, customer satisfaction, education, and hospitality.

Europe: The NRBV had a major influence on the early push for sustainable real estate practices in Europe, especially in Western and Northern nations. The focus on environmental compliance, circular economy principles, and green infrastructure made NRBV a useful tool for coordinating workplace design with environmental goals. These concepts have been applied to commercial buildings and public infrastructure in nations like the Netherlands, Germany, and the Nordic region, promoting performance standards like LEED and BREEAM. Furthermore, SERVQUAL was widely utilized in PPP (public-private partnership) models to gauge the quality of services provided in facilities and real estate held by the government. After the 2008 financial crisis, when real estate risk management became a board-level concern, balanced scorecard systems in Europe have expanded to incorporate ESG (Environmental, Social, Governance) components. Both the real estate specific model like the Real Estate – Net Promotor Score (RE-NPS), Real Estate Multi Criteria Decision System (REMCDS) are used extensively in the corporate and commercial real estate departments across Europe.

MENAT: In the past, the MENAT area has placed a strong emphasis on real estate as a mechanism for capital investments, particularly in rapidly expanding economies like

the United Arab Emirates, Saudi Arabia, and Qatar. However, there has been a noticeable movement towards experience-centric and smart city real estate with the introduction of massive infrastructural projects like NEOM and Dubai Expo 2020. When preparing for end-user adoption of digital building services like integrated command centres, AI-driven property services, and contactless building access, TAM models—particularly TAM 3, which include both individual and system-level factors—became more relevant. To gauge socioeconomic returns, visitor engagement, and infrastructure lifespan efficiency, BSC frameworks were modified. Despite being comparatively underutilized, Real Estate – Net Promotor Score (RE-NPS), Real Estate Multi Criteria Decision System (REMCDS) were considered for smart buildings like the high-rise buildings for IoT automation and has been an example for other countries to use. SERVQUAL's modified versions are now used to evaluate tenant and visitor experiences in renowned developments in the hospitality and luxury housing sectors.

Asia-Pacific: Megacities in China, Japan, South Korea, and increasingly Southeast Asia have been the main drivers of Asia's rapid real estate boom. NRBV found significant usage in high-density urban settings for adopting eco-conscious architecture, optimizing land use, and controlling resource restrictions. Real estate developers and government organisations were able to better connect space planning with national productivity targets with the aid of Balanced Scorecard models, especially in Singapore and Japan. Banking and financial sectors have seen growth in India and other countries using the TAM principles were crucial in determining whether China's push for smart cities and South Korea's use of ubiquitous city (u-City) frameworks were prepared for widespread adoption of digital amenities like IoT-based energy management and facial recognition for entry control. Real Estate Multi Criteria Decision System (REMCDS) was proven to help in offices being set due to hybrid working or the new normal which dictates on how the industry moves forward utilizing these technologies. In order to measure service responsiveness and dependability across a range of socioeconomic categories, modified SERVQUAL methodologies were used in public housing and mixed-use buildings.

Table 2.8: Global Framework Deployment Timeline

Time Period	Key Events / Framework Deployments
1980s	TAM 1 developed in the U.S. to understand tech adoption in corporate environments.
1990s	NRBV (1995) and BSC (1996) gain traction across Europe and North America.
2000–2008	TAM 2 and TAM 3 introduced; applied in smart buildings and workplace systems globally.
2008–2015	SERVQUAL integrated into PPP real estate and customer-focused sectors (e.g., healthcare, hospitality).
2015–2025	Smart cities, PropTech platforms, and ESG-led real estate strategy utilize integrated models.

2.10.2. Global Real Estate Contribution to GDP (1990–2025):

The real estate sector has long been a significant economic engine, contributing significantly to GDP and employment creation in both developed and developing countries worldwide. (IBEF, 2025) Frameworks like NRBV, BSC, and TAM have enabled structured growth, strategic alignment, and the worldwide digital revolution of this business.

Americas: The U.S. real estate sector, which encompasses residential, commercial, rental, and leasing activities, has consistently contributed roughly 13.8% of GDP as of Q1 2025. This stability is a result of the early adoption of strategic models like BSC for performance measurement and TAM for technology integration in smart buildings, property portals, and tenant services.

Canada: From the 2010s to 2025, the real estate and rental industry in Canada will account for about 13% of the country's GDP. Growing urbanization, especially in Toronto and Vancouver, steady regulatory laws, and a developed mortgage industry are all factors contributing to this contribution's regularity.

China: One of the main drivers of China's economic growth, the real estate industry formerly accounted for up to 24% of GDP (2018) when indirect connections like finance and construction are considered. As a result of attempts to deflate speculative bubbles and move towards more sustainable urban growth, direct real estate activity currently accounts for 6–7% of GDP.

India: One of the biggest contributors to India's GDP, the real estate industry is expected to contribute 7.3% in 2021, 10% by 2030, and maybe 13% by 2025,

contingent on policy implementation and infrastructure improvements. This growth is driven by residential demand, affordable housing programs, IT corridor expansion, and Smart Cities initiatives. Strategic frameworks like SERVQUAL and TAM are increasingly pertinent as India adopts PropTech platforms, green certification standards, and tenant-experience technologies.

United Kingdom: Over the past few decades, the UK's real estate, rental, and leasing industry has consistently contributed between 9 and 10% of GDP. London continues to be a major global center for real estate investment trusts (REITs) and commercial real estate. The effect of NRBV and BSC is seen in the UK's early adoption of sustainability regulations and digital land registries, as well as the expanding use of TAM frameworks in property technologies (such as energy monitoring, smart lettings, and digital concierge services).

Thailand: 8–10% of Thailand's GDP comes from real estate, which saw notable increases after COVID-19. With the help of FDI inflows and regulatory relaxation, Bangkok's high-rise residential area and industrial logistics parks are expanding.

Saudi Arabia: Saudi Arabia's sector, which accounted for 9.4% of GDP in 2023, is essential to Vision 2030 and initiatives like NEOM. The adoption of AI-enabled infrastructure and smart cities is supported by TAM 3 models, which demonstrate the acceleration of technological integration.

Spain: About 10.4% of Spain's GDP is derived from the real estate industry (2022). Digital rental platforms, housing connected to tourism, and urban redevelopment initiatives have made the sector more resilient despite earlier shocks from the 2008 recession.

Ghana: In 2023, the real estate industry in Ghana made up around GHS 1.6 billion (~USD 120 million) of the country's GDP, demonstrating consistent growth through mixed-use housing projects and urbanization in the Accra area.

Bangladesh: The Dhaka and Chattogram urban corridor are a major driver of Bangladesh's sector, which currently contributes 7–8% of GDP. Digital permit systems and supportive housing financing regulations have contributed to the formalization of this formerly unorganised sector.

Table 2.9: Comparative Real Estate Contribution to GDP

Country	Real Estate % of GDP (Recent)	Peak / Growth Insights

USA	~13.8% (2025)	Stable due to institutional depth & tech integration
Canada	~13% (2021–2025)	Consistent urban growth, mature mortgage ecosystem
China	6–7% direct, ~24% peak (2018)	Massive boom post-1994 housing reforms, now stabilizing
India	~7.3% (2021), aiming 10–13%	Driven by Smart Cities, IT corridors, and infra reforms
UK	~9–10%	Steady post-Brexit; London remains a real estate powerhouse
Thailand	8–10%	Rebounded post-COVID, driven by FDI and high-rise housing
Saudi Arabia	~9.4% (2023)	Strategic projects and digital urban planning (NEOM)
Spain	~10.4% (2022)	Stabilized after 2008; digitalization & tourism boost
Ghana	~GHS 1.6B (2023)	Urban expansion and formal housing demand
Bangladesh	~7–8%	Growing middle class, regulatory push for digital compliance

Here's the timeline graph showing how the real estate sector has contributed to GDP across key countries from 1990 to 2025.

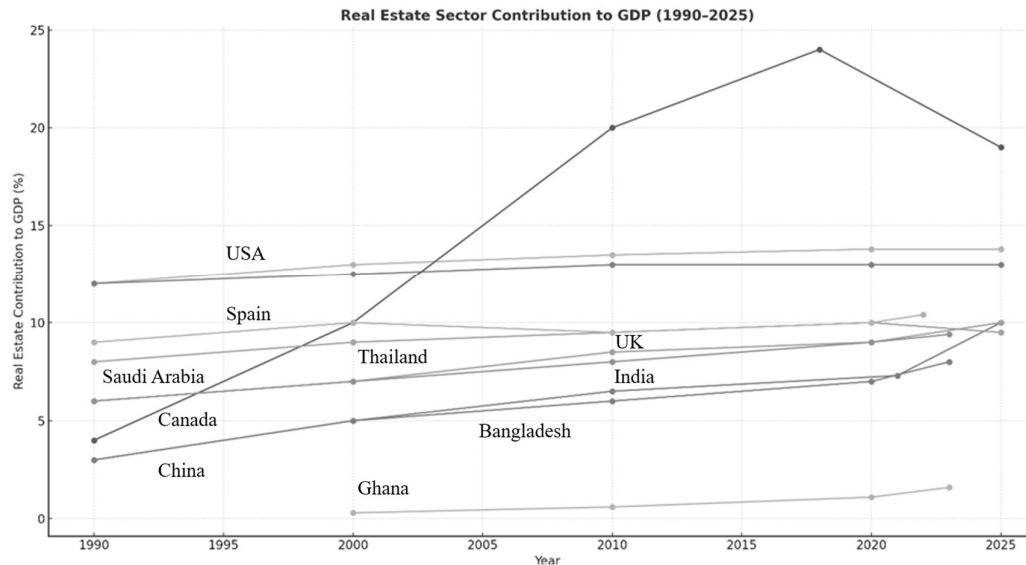


Fig. 2.3. Real Estate Sector Contribution to GDP (1990 – 2025) Source: (IBEF, 2025)

Around the world, the use of real estate models has progressed from scholarly theory to the strategic and operational heart of the sector. These frameworks have been modified by each region to suit its distinct policy environment and developmental trajectory. In a time when real estate is about more than simply "space," but also about providing value, experience, and agility in a world that is changing quickly, the models are essential because of their capacity to measure intangible factors like service quality, sustainability, and digital readiness.

2.11. Studies in Real Estate via Technology Acceptance Model:

The important Technologies Adoption Model (TAM) demonstrates and identify user adoption of newer technologies. Many changes and expansions of the original TAM proposes to improve its explanation and just providing a prediction. Three real estate market adaptations, TAM 1, TAM 2, and TAM 3, offer promising chances to understand and promote innovative technology.

2.11.1. TAM Model and its comparison:

2.11.1.1. TAM 1: The Technology Acceptance Model (TAM) was developed to predict individual behaviour and provide a theoretical basis for technology uptake and use.

Designed to help practitioners prepare for system implementation, TAM links external features, such as information system attributes, to practical use. The Theory of Reasoned Action provided the psychological framework for interpreting human behaviour, which was previously lacking in Information Systems literature (Davis, 1989; Davis, 1993).

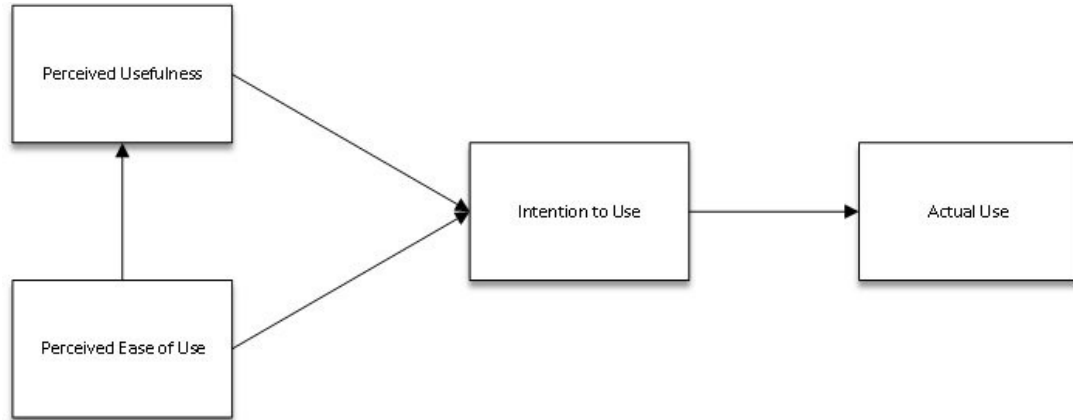


Fig. 2.4: TAM 1 Conceptual Framework Diagram (Source: Raeisi, Soheila, 2016).

2.11.1.2. TAM 2: The TAM2 expansion introduced five additional external factors and two moderators, totalling eight factors. These included subjective norm, image, job relevance, output quality, result demonstrability, experience, and voluntariness. Subjective norm refers to an individual's perception of whether they should perform a behaviour based on the views of significant others in their social circle. Venkatesh and Davis (2000) noted that subjective norm influences intention both directly through image use and indirectly through perceived usefulness. Ajzen (2011) highlighted that subjective norms have a direct effect on behaviour, supporting their inclusion in the extended TAM. The Theory of Reasoned Action, which underpins both TAM and the Theory of Planned Behavior, explains how these norms drive behaviour (Davis, 1989; Ajzen, 2011).

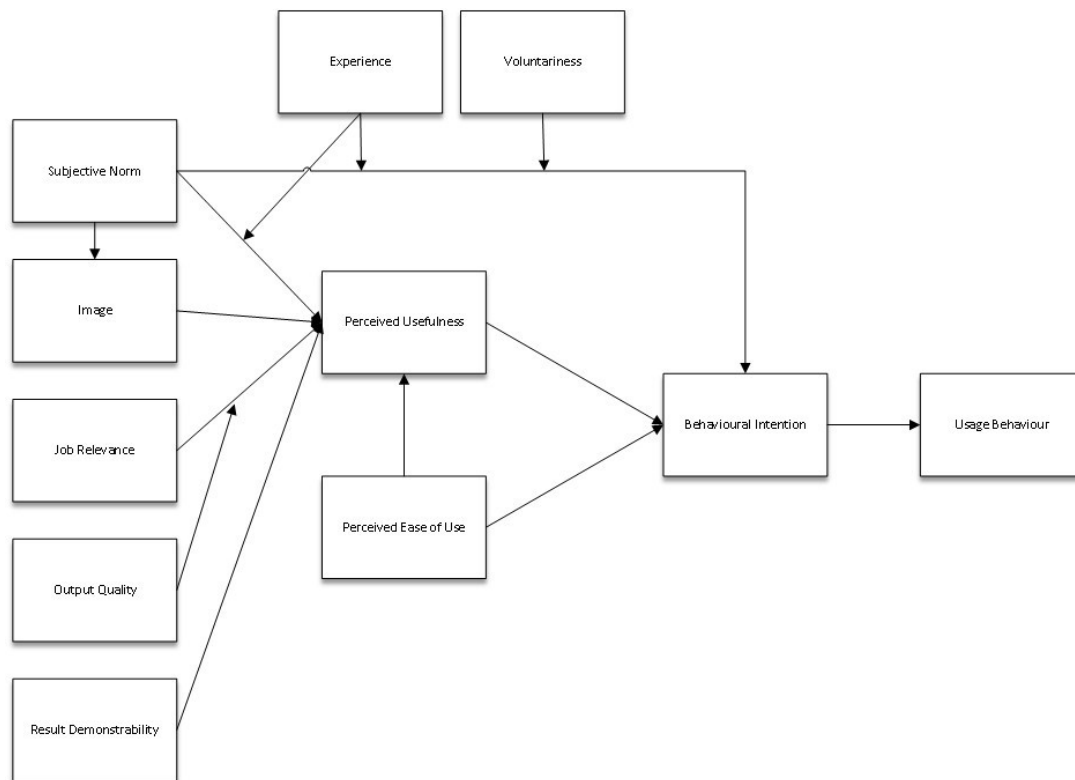


Fig. 2.5: TAM 2 Conceptual Framework Diagram (Source: Marikyan, D. & Papagiannidis, S., 2023).

2.11.1.3. TAM 3: The TAM, its successor TAM2, and subsequent studies have highlighted the key elements influencing technology use. However, few studies have explored interventions to increase technology adoption (Venkatesh & Speier, 1999). Practitioners have criticized TAM for its lack of practical guidance (Lee, Kozar & Larsen, 2003). To address this, Venkatesh and Bala (2008) combined the antecedents of perceived usefulness and perceived ease of use into a structured model of perceived value.

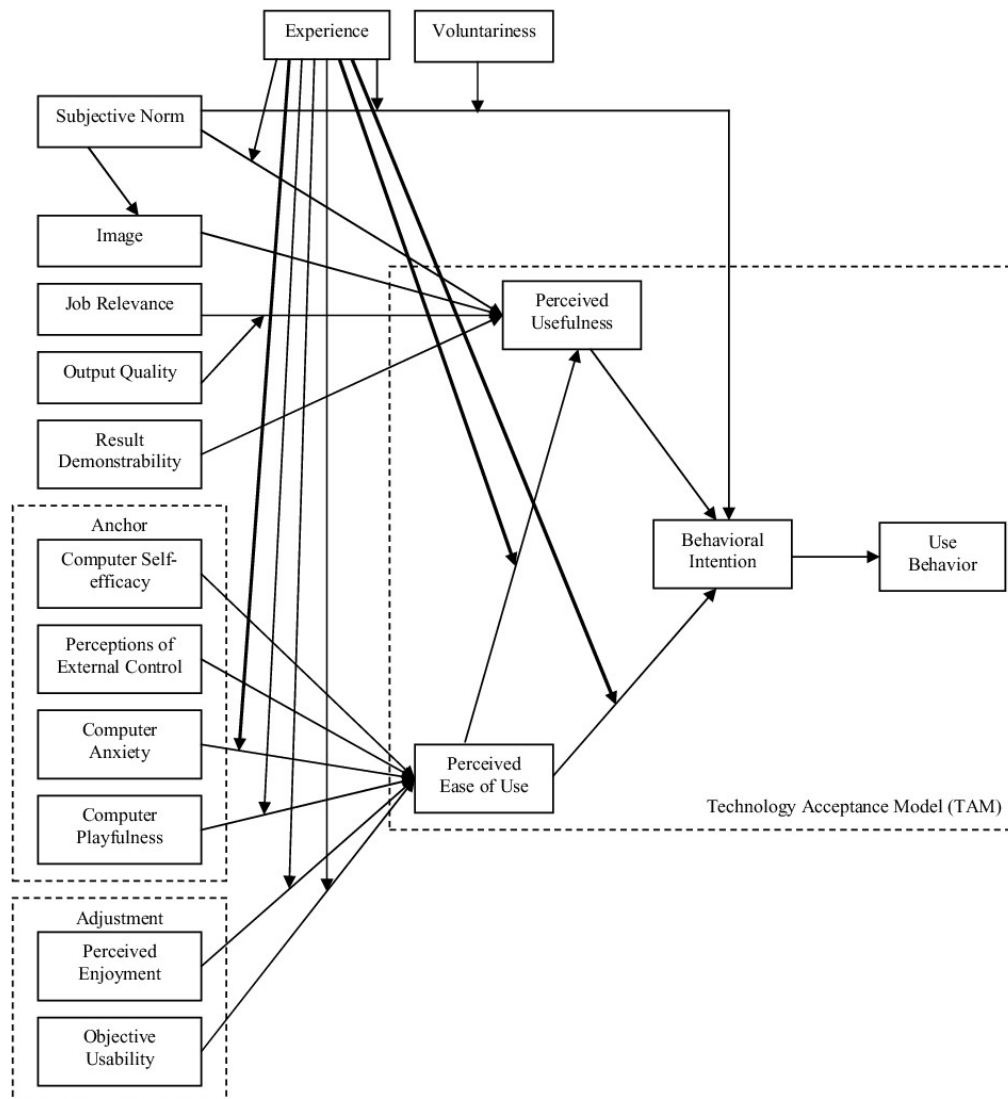


Fig. 2.6: TAM 3 Conceptual Framework Diagram (Source: Marikyan, D. & Papagiannidis, S., 2023).

2.11.2. Applications of TAM: The Technology Acceptance Model (TAM) and its variants are valuable frameworks for predicting user behaviour across various fields, including information systems management, marketing, and e-commerce. TAM helps understand user perceptions of technologies like robots, e-commerce platforms, and online shopping tools (Gefen, Karahanna & Straub, 2003; Araújo & Casais, 2020). It has been shown to significantly impact trust and user behaviour towards Information

Systems (IS) tools. However, its predictive accuracy is higher for users with prior online shopping experience (Gefen, Karahanna & Straub, 2003; Bruner & Kumar, 2005). Scholars have also applied TAM to study mobile banking, telecommunication technology, virtual reality, and e-learning systems. While perceived usefulness is generally high, ease of use varies. For example, text-mining tools need to be both valuable and easy to use (Demoulin & Coussement, 2020). TAM components significantly affect behavioral intention in web acceptance (Mathieson, 1991) and virtual reality adoption (Singh, Sinha & Liébana-Cabanillas, 2020). However, factors influencing TAM's perceived usefulness and ease of use vary by context and technology. For instance, objective usability did not impact e-learning acceptance (Al-Gahtani, 2016), and subjective norm did not affect medical system technology use (Kummer, Schäfer & Todorova, 2013). In e-government adoption, only image and output quality influenced system usefulness (Sang, Lee, & Lee, 2009). TAM3's predictive power in mobile commerce was limited by factors like perceived quality, image, self-efficacy, and external control.

2.11.3. TAM Strengths: In the US, Japan, India, and the Netherlands, TAM elements have been tested for their ability to predict behaviour. TAM has reliably explained website acceptability and usage in the Netherlands (Van der Heijden, 2003) and India (Singh, Sinha & Liébana-Cabanillas, 2020). Al-Gahtani (2016) and Baker, Al-Gahtani & Hubona (2010) found that TAM2 and TAM3 were effective in Arabian culture and provided reliable managerial interventions to improve e-learning management. Straub (1994) found that technology acceptance antecedents vary between nations with different cultural norms and socioeconomic development. Individualism-collectivism affects mobile commerce acceptance, with Faqih & Jaradat (2015) finding it moderates the relationship between perceived ease of use, perceived usefulness, and behavioral intention. Hung et al. (2010) found that power distance and masculinity affect the degree of factors' effects on behavioral intention.

Vendors can use TAM to estimate demand for new IT products (Davis, 1989). Practitioners can improve technology adoption by understanding how technology benefits and user-friendliness influence consumer-oriented IT solutions (Davis, 1989).

Understanding TAM2 and TAM3's antecedents of perceived usefulness and ease of use helps managers make informed technology deployment decisions. These models guide pre-implementation activities and post-implementation interventions to improve acceptance rates (Venkatesh & Davis, 2000; Bala, 2008).

2.11.4. TAM Limitations: Previous research has criticized the Technology Acceptance Model (TAM) for its simplicity and lack of understanding of perceived usefulness and perceived ease of use, which influence technology acceptance. The original TAM was seen as incomplete, prompting scholars to test new characteristics like trust, technology fit, external variables (subjective norms, social impact), and technology-specific characteristics (compatibility, relevance) (Venkatesh, 2008). Information systems (IS) research has advanced due to TAM's widespread use, but this has also led to repeated findings and hindered growth (Benbasat & Barki, 2007; Venkatesh, Davis & Morris, 2007). The focus on technology adoption overlooked how technology influences performance, and the assumption that technology use boosts performance has been proven false (Goodhue, 2007). Additionally, system design and user work alignment are crucial for technology acceptability and performance (Goodhue, 2007; Benbasat & Barki, 2007). Scholars agree that TAM has matured and should not be replicated (Benbasat & Barki, 2007; Venkatesh, Davis & Morris, 2007).

2.11.4.1. Critiques of Technology Acceptance Model: Research highlights methodological issues, practical limitations, and an overemphasis on system use in TAM, detracting from other important factors. Despite these limitations, TAM's theoretical durability and predictive power in assessing usage intention have been proven for nearly 30 years. Goodhue (2007) noted that TAM fills a gap in information systems research and practice.

2.11.5. Variable Selections from TAM Model Concepts:

Dimensions of Perceived Value of Smart Technology: The subjective value of technology refers to the benefits people or organizations believe they gain from using

it. Several aspects influence how individuals evaluate technological utility (Alzoubi et al., 2022; Cole et al., 2019; Ullah, 2018).

Perceived Ease of Use: This refers to how simple users perceive the technology to be. If technology is easy to understand, learn, and use, users are more likely to succeed and have positive attitudes towards it (Alzoubi et al., 2022). Usability perception depends on users' background knowledge, technical proficiency, and cognitive capacities (Adegoke et al., 2021; Madakam, 2019).

Perceived Usefulness: This is how much a user believes technology will improve their performance or simplify their job. If technology is advantageous, users are more likely to value and use it (Adegoke et al., 2021; Alzoubi, 2022; Madakam, 2019). Users' evaluation of technology's utility reflects its perceived help in achieving their goals (Ullah, Sepasgozar, Thaheem, & Al-Turjman, 2021). According to TAM, consumers' intentions are strongly influenced by technology usability and simplicity (Ullah et al., 2018). Beliefs about ease of use and usefulness affect technology adoption and use (Adegoke et al., 2021; Saull et al., 2020).

Perceived Risk Leads to Adoption of Smart Technology: Technology acceptability is heavily influenced by risk perception, which is a person's subjective assessment of potential downsides like financial losses, privacy breaches, and social repercussions (Kostow, 2021; Kushwaha, 2021; Singh & Kushwaha, 2022). Fear of the unknown and uncertainty about technology efficacy and compatibility induce perceived risk. Prospective losses often outweigh gains, leading to reluctance in adopting new technology (Kushwaha et al., 2021; Singh & Kushwaha, 2022). Complex technology can be overwhelming, causing concerns about efficient use (Kiu et al., 2022; Shrouf & Miragliotta, 2015).

Perceived trust leads to the Adoption of Smart Technology: Trust in new technology, its supplier, and the ecosystem influences adoption. Customers trust well-known companies with a history of reliable products (Cuc et al., 2023; Singh & Kushwaha, 2022). Transparency in operation, data use, and development boosts confidence (Sanderson & Read, 2020; Sladić et al., 2021). Adequate security measures protect

personal data, reducing concerns (Kushwaha, Tyagi, & Singh, 2022). Compliance with privacy regulations and user control over data sharing increase trust (S Shastri et al., 2022). Positive feedback from other users and consistent performance also build trust (Ullah et al., 2018; Ullah, Sepasgozar, & Thaheem, Wang, et al., 2021).

2.11.6. Concepts In TAM: The following are TAM concepts used to build the Real Estate Maturity Framework Model:

Table 2.10: Technology Acceptance Model variables

Concept	Variable Type	Description	From
Perceived Usefulness	Independent	This is how much someone thinks that using a certain method would help them do their job better.	(Davis, 1989)
Perceived Ease of Use	Independent	How much someone thinks that using a certain method would not require any work on their part.	(Davis, 1989)
Intention to Use	Dependent	Person's opinion of how likely it is that he will do something.	(Fishbein & Ajzen, 1975)
Subjective Norm	Independent	An individual's perception of the opinions held by significant individuals in their life regarding whether they should or should not engage in a particular action.	(Fishbein & Ajzen, 1975)
Image	Independent	Perceived social status enhancement resulting from the use of an innovation.	(Moore & Benbasat, 1991)
Job Relevance	Independent	How someone thinks the target system can be used in their job.	(Venkatesh & Davis, 2000)

Concept	Variable Type	Description	From
Output Quality	Moderator	How knowledgeable a person is about how well they think the system does their job.	(Venkatesh & Davis, 2000)
Result Demonstrability	Independent	How real the results of using the idea are.	(Moore & Benbasat, 1991)
Voluntariness	Moderator	How much possible adopters think they don't have to make a decision about adoption.	(Venkatesh & Davis, 2000)
Experience	Moderator	The amount of time that has passed since a person first used a device.	(Venkatesh, Thong & Xu, 2012)
Computer Self-Efficacy	Independent	How sure someone is that he or she can do a certain job or task on the computer.	(Compeau & Higgins, 1995)
Perception of External Control	Independent	How much someone thinks that there are technical and organizational tools available to help them use the system.	(Venkatesh et al., 2003)
Computer Playfulness	Independent	How much cognitive spontaneity there is in encounters with microcomputers.	(Webster & Martocchio, 1992)
Computer Anxiety	Independent	How nervous or even scared a person is when they think about using computers	(Venkatesh, 2000)
Perceived Enjoyment	Independent	What percentage of people think that using a certain method is fun on its own, without taking into	(Venkatesh, 2000)

Concept	Variable Type	Description	From
		account how it affects their performance.	
Objective Usability	Independent	A comparison of systems based on the actual amount of work that needs to be done to finish certain jobs, rather than how much work people think it takes.	(Venkatesh, 2000)
Attitude	Independent/ Dependent	The number of evaluate-related feelings a person has when they use the goal system at work.	(Davis, 1993)

2.11.7. TAM for Real Estate:

Digital disruptive technologies are essential today, transforming industries from traditional to innovative and flexible. However, the global real estate sector lags in technological improvements (Fahim Ullah et al., & Tauha, 2019). This delay prevents end-users from receiving timely information, leading to empty areas and client dissatisfaction. This paper introduces the Real Estate Stakeholders Technology Acceptance Model (RESTAM) using TAM concepts to address the needs of end-users, government bodies, agents, and ancillary businesses. Technologies like drones, SaaS, IoT, big data, VR & AR, AI, and robotics are used to meet stakeholder needs. The RESTAM framework aims to implement the Big9 disruptive technologies in real estate, transforming it from traditional to smart, reducing post-occupancy guilt, and improving stakeholder relations (Fahim Ullah et al., & Tauha, 2019). Many information technologies used in building and property management have failed. Prior research identified factors driving technology adoption (TA) but overlooked the dynamics regulating real estate IT adoption over time. This chapter introduces a system dynamic (SD) model for real-estate TA, incorporating factors related to real-estate websites and categorizing them into clusters such as system quality, information quality, service quality, and perceived ease of use. The model includes key group utility, user happiness,

and website BIU, with system, information, and service quality as crucial components (Ullah & Samad, M. E., 2019).

2.12. Studies in Integrated Real Estate via Service Quality Management:

The Integrated Real Estate Service Quality Management Plan (IRESQMP) ensures exceptional service quality across the real estate sector. It addresses the complex nature of transactions, and the varied stakeholders involved, such as agents, buyers, sellers, property managers, and service providers. The IRESQMP is based on three principles: Customer-Centricity, Process Optimization, and Continuous Improvement.

Speed of Service: Speed can significantly affect service quality. Faster response times in customer support and online transactions improve user experience (Saull et al., 2020; Tamrakar & Badholia, 2022). Slow websites and responses can lower service quality perceptions (Setia et al., 2013; Wu et al., 2021). Balancing speed, dependability, and user expectations is crucial for a good customer experience (Mahdjoubi et al., 2013; Tamrakar & Badholia, 2022).

Tangibility: Tangibility in technology and service quality refers to how consumers can see and interact with a product's physical components. While technology services are immaterial, their design and UI can make them seem tangible, enhancing usability and appearance (Saull et al., 2020; Sladić et al., 2021). Devices like smartphones and IoT gadgets affect service quality through their design, durability, and aesthetics (Rabby et al., 2022; Yoon, 2020). A well-designed product boosts customer satisfaction and confidence in the service's value and reliability (Kasprzak, 2021; Saull et al., 2020).

Reliability: Technology reliability greatly impacts service quality by improving efficiency, accuracy, and client experience. Reliable technology ensures consistent service delivery, automates tasks, reduces errors, and streamlines operations (Badi et al., 2021; Tamrakar & Badholia, 2022). It enhances accuracy by eliminating human errors, crucial in sectors like healthcare, finance, and manufacturing (Setia et al., 2013; Yoon, 2020). Maintenance, upgrades, and robust IT infrastructure are essential to maintain reliability and service quality (Ghansah et al., 2021; Neuhofer, 2015).

Satisfaction: Technology enjoyment significantly impacts healthcare by improving customer satisfaction and making benefits more intuitive and user-friendly. Enjoyable technology encourages active use and positive experiences, leading to higher engagement and recommendations (Ghansah et al., 2021; Karimi et al., 2021). Emotional connections formed through engaging technology can increase brand loyalty and service provider bonding. Happy users are more likely to promote the service, boosting clientele and reputation (Neuhofer et al., 2015). Service providers should prioritize user-centred design, usability testing, and ongoing feedback to enhance user experience and service quality over time.

Control: Technical control significantly impacts service quality by automating processes and reducing human error (Ghansah et al., 2021; Neuhofer, 2015). It ensures consistent service delivery and quicker response times. Effective control helps standardize procedures, improving service quality (Mahdjoubi et al., 2013; Sanderson & Read, 2020). Companies can adapt to changing client needs and offer innovative services. In healthcare and education, technology enables effective remote service delivery, maintaining service quality for all customers.

Frequent outages, crashes, and performance issues can frustrate users and lower adoption rates. Technology adoption requires service excellence, including user experiences, efficient help, dependability, customization, security, and a robust feedback loop. Bahia & Nantel (2000) created a reliable scale to evaluate banking services, addressing SERVQUAL's shortcomings. They added Parasuraman's (1998) factors to the five SERVQUAL components, creating 15 measurements, including product/service, representative interactions, atmosphere, price, and promotion.

Meuter et al. (2000) analysed nearly 800 self-service banking occurrences across various sectors through an online survey. Innovations included ATMs, online shopping, pay-at-pump terminals, automated hotel check-ins, online banking, and service provider telephone utilities. Jun & Shaohan Cai (2001) investigated Internet banking customers' perceptions of quality, identifying 17 indicators related to web-based banking service quality, categorized into customer service, online system, and financial product. Kumar et al. (2009) re-examined the SERVQUAL model to identify key characteristics affecting bank service quality, proposing a redesigned model with four

dimensions: tangible quality, reliability, competence, and convenience. Pole et al. (2009) evaluated how three management quality components affect web banking service quality and end-user satisfaction, using a modified SERVQUAL model with four dimensions: physical assets, reliability, responsiveness, and sympathy.

2.13. Service Quality in Real Estate:

How technology is introduced, supported, and maintained significantly affects user perceptions and interactions. Users have a better experience with technology that provides superior services, simplicity, effectiveness, and intuitiveness (Mahdjoubi et al., 2013; Setia et al., 2013; Tamrakar & Badholia, 2022). Adequate client support enhances confidence in the system, while performance and dependability heavily influence adoption (Adegoke et al., 2021; Badi et al., 2021; Xu et al., 2002). In the dynamic property brokerage industry, service quality is crucial. Brokers benefit from utilizing facility information, and improved service quality benefits buyers and sellers. Allowing clients to evaluate representatives based on personal experiences enhances service delivery. Despite the advantages of service quality architecture, there have been limited inquiries into real-estate service quality in the past decade (Araloyin & Olatoye, 2011; Powell & Vorotnikov, 2012; You et al., 2012; Serfontein et al., 2013; Chuang & Chen, 2013; Nasar & Manoj, 2013; Lin & Lin, 2020; Koutroumanis, 2021; Oluwatofunmi et al., 2021).

2.14. Real Estate Frameworks:

There are numerous frameworks and methodologies in the field of real estate that provide structured approaches for analysing, evaluating, and making decisions regarding various aspects of the industry. Here are some of the various real estate frameworks commonly employed: SWOT Analysis: Strengths, Weaknesses, Opportunities and Threats analysis is a framework used to evaluate the internal and external factors affecting a real estate endeavour or investment. It assists in identifying the assets and weaknesses related to property or market, as well as potential opportunities and threats. PESTEL Analysis: Political, Economic, Social,

Technological, Environmental, and Legal analysis is a framework for evaluating the macroenvironmental factors that influence real estate. It investigates the political, economic, social, technological, environmental, and legal factors that may have an impact on real estate investment or development. Real estate investments' financial viability and performance are evaluated utilizing frameworks for financial analysis. This includes metrics such as net operating income, cash-based flow analysis, return on investment, internal rate of return, and discounted cash flow analysis. Frameworks for market analysis concentrate on evaluating the supply and demand dynamics, trends, and market conditions of a particular real estate market. It requires analysing demographics, population growth, employment rates, vacancy rates, rental rates, and market competition. Highest and Best Use Analysis: A framework used to determine the most valuable use of a property. It identifies the most profitable use of a property by considering zoning regulations, market demand, development feasibility, and financial viability. Assessment of Risk: Risk assessment frameworks aid in evaluating and mitigating hazards associated with real estate investments. This includes identifying and analysing risks associated with market conditions, project development, financing, legal compliance, and environmental factors, as well as other potential risks that may affect investment returns.

2.14.1. Sustainability and Green Building Frameworks: These frameworks emphasize the incorporation of environmentally responsible and sustainable practises into real estate initiatives. They include rating systems such as LEED (Leadership in Energy and Environmental Design), WELL Building Standard, and BREEAM (Building Research Establishment Environmental Assessment Method), which provide guidelines, regulations and policy criteria for the design, construction, and operation of sustainable buildings. This framework outlines the sequential steps of the real estate development process, from initial feasibility studies and site acquisition to design, construction, leasing, and property management. These frameworks provide structure and direction for analysis and decision-making in the real-estate industry. In relation to investments, development projects, property management, and market analysis, they aid professionals in evaluating opportunities, assessing risks, and making informed decisions.

Hence for creating a business framework specifically catering to Corporate Real Estate and deep analysis for Space Management 3 key datapoints are taken, researched and a prototype would be developed. The three key datapoints are Human as Employee, Technology as current and future trends and core corporate real estate data aid the productivity of the organization, technology adoption, satisfaction of the staff, core values and finally Return on Investment are researched. It involves establishing, implementing, overseeing, and communicating criteria for assessment to help the company in implementing them. (Kader & Hossain, 2020) based on Figure 2.1.

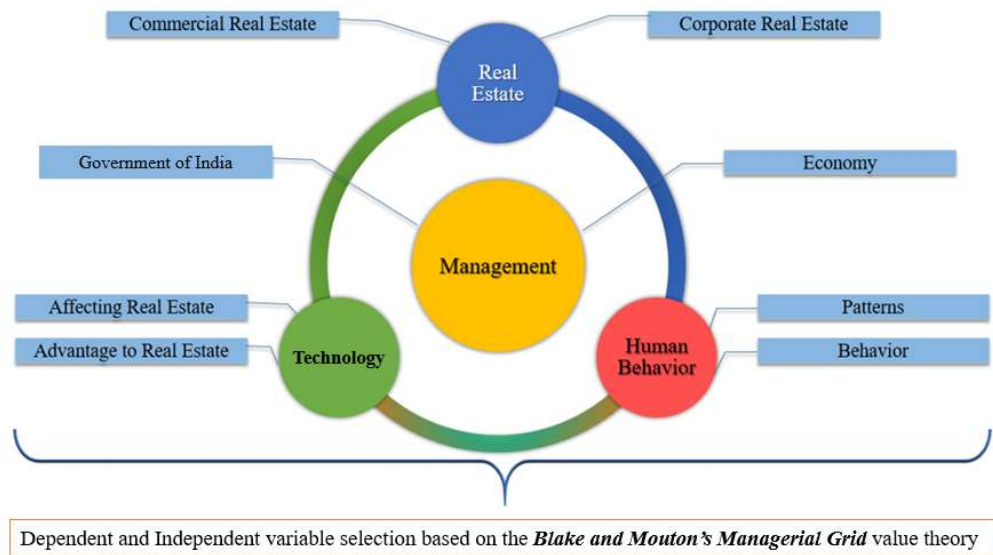


Fig. 2.7: Data points Blake and Mouton's Marginal Grid. Diagram: Author.

The theory for bringing in a model is entirely based on the research gaps found and the researcher's expertise. There is a central component of management that spans three important essential data points: a. Real Estate, which is where the core decision and research is focused. According to this study, real estate is classified into two types: corporate and commercial. B. Technology, where adoption and acceptance are a criterion for any new tool being produced and deployed, and Technology is separated into Affecting and Advantage genuine activities that can be tracked back to deployment and delivery. C. Human Behavior, which determines how the tool is used. Is once again offering vital data points that determine the research's patterns of use and Behavior. This is a crucial framework that determines who is allowed to use it and where it must

be used. This is a crucial data point that determines the research's main utility. c. Human Behavior, which determines how the tool is used. Is once again offering vital data points that determine the research's patterns of use and Behavior.

Information systems literature uses "business modelling" and "process modelling" interchangeably. Different purposes, though. (Lambert, Susan, 2008) Process modelling illustrates value-creating activities. Business modelling shows Elements of a company's economic choices. Business related modelling shows the true essence of the business explains entity's business logic as indicated in the below figure (Gordijn, Akkermans et al., 2000) and (Osterwalder, Pigneur et al., 2005)

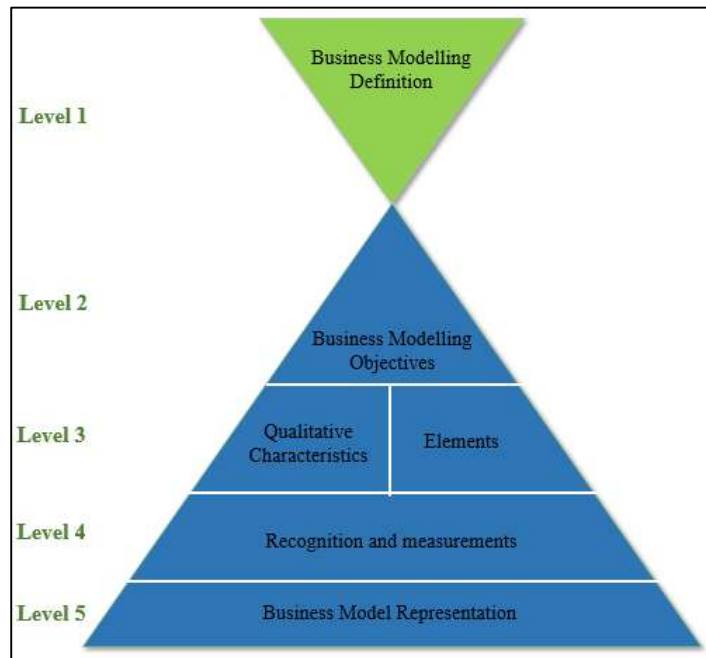


Fig. 2.8: Business Model Conceptual Framework (BMCF), Source: Lambert, Susan, 2008.

2.15. Value proposition-derived business model elements:

- Value Proposition: Customer's value(s). It can be items, services, information, or all three.
- Customer: The targeted entity. Consumers or corporations can join. When demand or service needs alteration, a new customer category must be identified.
- Value in Return: The entity's compensation for the value proposition. Money refers to currency, such as rent, sales money, or commission. Non-monetary

objects of worth can include things like advertising space or future contracts.

Viral infection replication (VIR) can occur at different time points.

- Channel: How value is exchanged. It sends Value Propositions and Value in Return. Multichannel transactions are possible.
- The Value Proposition is formed by integrating the entity's resources, activities, and competencies. It is a process that involves production, sale, or provision of goods or services. This text elucidates the concept of the Value Proposition. The concept of Value-Adding Processes can be accurately described, allowing for the construction of a comprehensive process model. The presence of external users and the inputs and outputs of value-adding processes will be visually represented at various management levels.
- Supplier: An entity that delivers inventory, machinery, and consumables.
- Ally: Additional entities within the value domain assist the entity in delivering the Value Proposition to the client, typically by providing the channel or enabling the entity to delegate some aspects of the Value Adding Process (Weill and Vitale 2001). Occasionally, the Ally functions as a regulatory entity inside the realm of values. Ally potentially functions as a third-party supplier of Value in Return.

Essential elements encompass explaining a business idea and contrasting different business frameworks. In order to comprehend company requirements or assess new business initiatives, including e-business initiatives, it is necessary to get further knowledge about the Value Adding Process component. The Value Adding Process integrates these aspects to generate the value proposition and channel.

- Resources: Software, hardware, intellectual properties, physical, financial, and human resources provided by vendors or created internally.
- Activity: Converting resources into Value Propositions or operationalizing a transmission route using the entity's and its allies' capabilities.
- Capabilities: The entity's expertise to perform actions. Resources supply them (both human and others). Allies supply capabilities.
- Strategies: These apply to the Value Proposition and the entire entity. This element deals with decisions about Value Adding Processes, how and who will perform activities.

- Organizational structure: Like strategies, it affects entities and Value-Adding
- Processes. Deterministic and consequential of Value-Adding Processes.

2.16: Literature Review Summary:

The findings of this study were derived from an exhaustive review of previously conducted research as well as a comprehensive analysis of relevant materials. Through the process of conducting an in-depth analysis of published material as well as original sources, we have discovered major gaps in the existing body of knowledge. An exhaustive search was conducted on the Scopus and Simango databases in order to locate research publications that were published between the years 1986 and 2022 that primarily focused on service quality in the real-estate industry. Over 300 papers, but only 150 were selected after careful consideration based on specific criteria. These criteria included keywords associated with service quality and real estate, subject areas within the social sciences, business management, arts, economics, and engineering, and document types such as research articles, innovative conference papers, verified book chapters and research reviews. All the studies were disregarded because they did not have all of the necessary bibliographic information. The development of a structured questionnaire was influenced by these ideas, which served as instructions. A particular group of individuals was then surveyed using the questionnaire in order to acquire both qualitative and quantitative data from them. The information that was acquired was subjected to a detailed analysis, which revealed patterns, trends, and developing issues. As a result, a comprehensive understanding of the study problem was established. The use of this all-encompassing method made it possible to construct a robust research framework, which ensures that the study makes a significant contribution proved to the existing body of knowledge.

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

3.1. Chapter Overview:

Research topic is presented in this chapter, and the necessity of conducting research in the industry of real estate management is justified. Chapter also focuses on research issue that is being investigated. To construct the research questions, an analysis of the existing gaps in the subject matter that was being investigated was performed. Following the formulation of these questions comes the formulation of the research objectives, which are designed to satisfy the research inquiries. After that, a comprehensive analysis is presented concerning the methodology research was utilized to find out the real investigation on proposed theoretical model (conceptual framework), the research design that was implemented for the purpose of data collection, and the statistical tools or techniques that were utilized in order to accomplish the objectives related to research. In conclusion, it offers a detailed description of the ethical issues that were considered throughout the course of the scientific investigation that was conducted for the study.

3.2. Defining the Research Problem:

The author's understanding of real estate management in India is limited, as past research has focused on the United States and European markets. To effectively manage their CRE portfolio, Indian non-real-estate firms must be able to establish a RE strategy that aligns with company overall goal. A successful real estate management strategy requires a thorough understanding of all factors, including real estate management's added value and industry practices that improve non-property companies' long-term performance and functionality (Haynes et al., 2017).

Little literature is available on practicality and maintenance of working facilities in Indian office real estate management, according to research. This study is crucial since it requires significant financial commitment and focuses on tenant staff or staff or end user satisfaction (Karvigh et al., 2019). Understanding office processes is essential for proper maintenance. During transitions, incomplete planning might cause an

organization to disintegrate or worsen (Mahmoud et al., 2021); (Roskams & Haynes, 2021) and (Ahmad, 2020). Several studies have shown that corporate real estate (CRE) managers can effectively address real estate workspace maintenance expenses and portfolio management benefits for an organization. Based on Indian office space data, this study provides a detailed review of value criteria that affect workspace design. We know of no Indian study on real estate management and sustainability and workspace usefulness. This study provides preliminary evidence that a management for workspace strategy can improve an organizations performance for sustainability in India, where no empirical data exists.

This study examines how Indian office real estate management affects business value, competitive advantage, sustainability, and workspace usefulness. Research studies from property guides like NAREDCO (2021), CBRE (2020), Knight Frank (2020), and scientific publications in literature review explore the function of estate management in growth of Indian firms. However, the variables of real estate management that ensure the selected practice or strategy aligns with the business goal and maximizes shareholder value are unknown. Lack due to Indian RE management knowledge in professional journals, empirical research was needed. This study investigates why real estate management is becoming more important in Indian non-property firms. The study's latent components and items were adapted from past research to examine how real estate management strategy and practices affect tangible value, competitive advantage, sustainability, and workspace usefulness. The literature survey found these research gaps:

1. Indian real estate literature is limited. However, most real estate and management studies are from the US and Europe.
2. Real estate issues that affect Indian IT enterprises must be examined.
3. IT companies' real estate management techniques must be examined.
4. India has little literature on real estate management technologies that can improve IT workspace efficiency and sustainability.
5. Technology plays a grand role in both accepting and adopting new hardware and software and hosting in the cloud.

3.3. Research Questions:

1. Does a global Framework for Real Estate and Space Management exist, and what research references have made direct impact to India's growth?
2. Does a global framework have significant value in terms of Return on Investment (RoI), end user happiness, and employer productivity.
3. How do the employer and staff accept and adopt to new technology?
4. The impact of real estate practices, including rules and policies, on Indian consumers, how satisfied are the customers both from usage and deployment?
5. What is impact on Real Estate technologies on workspace sustainability, workspace efficiency and how are they being considered?

3.4. Research Objectives:

The chief goal of research is towards gaining a combined and comprehensive knowledge in understanding of the existing business frameworks and their impact and value in the value of Corporate Real Estate. This includes examining their influence on standards, procedures, and management practices. The research also investigates the impact of RE professionals and the use and embrace of technology in improving the sustainability of Indian corporate real estate companies, specifically in space management. The investigation gains to clarify the influence core contribution of Corporate Real Estate on the established value, sustainability, and utility of the workspace. The study examines the factors associated with the frameworks, standards, procedures, and practices followed by management in the real estate company. The research also investigates the extent to which technology might enable or hinder its application by internal and external stakeholders.

Three objectives are established, with each subsequent objective examining the association to achieve the goal of this study.

1. To examine current business frameworks in Corporate Real Estate and Space Management
2. To determine value of new business framework for Corporate Real Estate.
3. To check use of technology in Corporate Real Estate.

3.5. Scope of Study:

The study deliberately focuses in describing selected geographical region where the investigation was conducted. Selection of this region was primarily based on its suitability for the study core purpose and its provision of extensive data that will be leveraged for the creation and validation of the research model. Furthermore, the research investigation specifies the chosen sampling unit and the period of the study.

The research is separated into two distinct portions.

- a. To accomplish objectives 1 and 2, the research employed the Bibliography approach to locate pertinent journals. Additionally, the research utilized Service Quality Analysis, which may be applied to Objective 3.
- b. To accomplish Objective 3, the researcher employed a questionnaire based on the SERVQUAL and TAMv3 model.

A pilot survey was carried out utilizing the variables of the TAM 1 model. The final survey was done utilizing the TAM 3 model and SERVQUAL factors to have a comprehensive understanding of technology usage. The below table is created to understand the breakup of scope and research approach and appropriate methodology followed:

Table 3.1: Objective 1 and Objective 2 research approach.

Research Methodology	Bibliometric Analysis.
Tools	Smart PLS 4 and MS Excel
Schedule	3 Months
Population	1986 – 2022 Scopus and Simango published research articles.
Sampling Units	151 papers

Geographic Area covered	Global

Table 3.2: Objective 3: Pilot Survey research approach.

Research Methodology	TAMv1, Qualitative and Quantitative Simple Random Sampling
Tools	Anova, Correlation and Regression using Excel and IBM SPSS
Questionnaire	Google Forms, 5 Point Likert Scale
Schedule	6 to 8 months
Population	2010 – 2022, Scopus and Simango published research articles. / Tier 1 and Tier 2 cities and Bombay Stock exchange (BSE) enlisted RE & IT companies headquartered capital in India.
Sampling Units	138
Geographic Area covered	India

Table 3.3: Objective 3: Final Survey research approach.

Research Methodology	TAMv3, Service Quality Model (SERVQUAL). Qualitative and Quantitative using non-probability sampling – Purposive sampling
Tools	Anova, Correlation and Regression using Excel and IBM SPSS
Questionnaire	Google Forms, 7 Point Likert Scale

Schedule	6 Months
Population	2010 – 2024, Scopus and Simango published research articles. / Tier 1 and Tier 2 cities and Bombay Stock Exchange (BSE) enlisted RE & IT companies headquartered capital in India.
Sampling Units	387
Geographic Area covered	India

3.5.1. Schedule:

A. Science Mapping and Thematic Clustering (SM&TC): Bibliometric Analysis is performed for in a 3-month period starting from July 2023 to September 2023.

B. Pilot Duration: The researcher acquired study data over the course of a period of 6 to 8 months, starting from June 2022 to February 2023, which coincided with the time frame of their Ph.D. program. When the researcher was collecting data from corporate real estate managers and department workers

C. Final Duration: The researcher acquired study data over the course of a period of 4 to 8 months starting from June 2023 to Dec 2023 and occurred simultaneously with the duration of their Ph.D. program. The data duration collection period for the researched gathered data from CRE managers, workspace operation managers, facility leaders, RE property staffs, specifically Subject Matter Experts and holding prestigious position in their companies was selected based on the specific circumstances and constraints encountered by the researcher.

3.5.2. Target Population and Sampling:

A. Science Mapping and Thematic Clustering:

Article Section and Filtering: The articles for this investigation were accessed from the largest indexing database, i.e., Scopus. One of the largest database is Scopus which contains the bibliographic information of indexed documents.

3.5.2.1. Search Term Definition:

The articles for this research were obtained from the primary indexing database, namely Scopus. Scopus is a vast database that houses bibliographic information for indexed documents. The data was retrieved on July 18, 2023, utilizing the search query "Service Quality, quality of service, ISO, SERVQUAL, TQM, quality management, Customer Service, Resident Service AND real estate." These terms are employed interchangeably by researchers in this specific field of study. Additionally, the study focuses exclusively on the real estate sector, as well as academic institutions, universities, and educational institutes. These terms are also interchangeably used by many academics.

3.5.2.2. Inclusion and Exclusion Criteria:

Table 3.4: Document Search and Selection Protocols Applied.

Criteria	Reject	Accept
Search Date: 25-07-2023 Database: Scopus Search Term: ("Service Quality" OR "quality of service" OR "ISO" OR "SERVQUAL" OR "TQM" OR "quality management " OR "Customer Service" OR "Resident Service") AND ("real estate") Search Team: ("Technology Acceptance Model" OR "TAM") AND ("Real Estate")	-	201
Subject Area: Accounting, Arts and Humanities, Business Management, Economics, Econometrics, Social Science, Engineering and Material Science	46	155
Document Type: Articles, Book chapter Conference paper and Review articles	1	154
Language: English	3	151
Erroneous Record: Document with incomplete bibliographic data	10	141

We implemented the four steps of the searching and filtering methodology suggested by (Donthu et al., 2021): The process has four steps: (in) Establishing specific search keywords, (ii) Conducting a search of the database for relevant documents, (iii) Applying specific criteria to filter the results, and (iv) Removing any irrelevant or erroneous documents. Table 3.4 illustrates the document search and selection processes that were implemented. Using the specified search term, we discovered a total of 201 documents in the Scopus database during the initial search. We utilized multiple criteria to determine the exact number of documents that will be utilized for the final investigation. After using the 'subject area' filtering criteria, 46 documents are excluded, and 155 documents are kept. In addition, one document was excluded based on the selection criterion of document type, specifically including articles, conference papers, book chapters, and reviews. Furthermore, three manuscripts were rejected due to being written in a language other than English. Ultimately, three papers that lack comprehensive bibliographic information or have duplicate entries are eliminated. Total of 141 documents were finally selected for examination in this inquiry.

3.5.2.3. Bibliometric Analysis Technique:

Bibliometric analysis analyses the publication and thematic trends, understanding of research development, and impactful contributors using the bibliographic data of indexed documents. This study uses authorship analysis to understand the social collaboration networks and citation analysis to know the impactful contributors in SQ in real estate research. Bibliographic coupling develops thematic clusters of SQ in real estate research. Further, Co-citation analysis determines service quality Research's citation pattern in Real estate. Core Co-occurrence analysis is employed to develop the final thematic enabled trends of SQ literature in real estate.

3.5.2.4. Pilot Population:

Major stakeholders include Indian participants in Tier 1 and Tier 2 cities and international participants. 250 questionnaires were distributed, with 182 replies. The cities of Chennai, Delhi, Mumbai, Pune, Coimbatore, Madurai, Trichy, Hyderabad,

Kurnool, Indore, and Gurgaon as well as London, Manchester, Birmingham, Leeds, Bath, Chicago, Texas, Japan, Singapore, China, and Hong Kong are represented among the 182 responders. There are more males than females in this age group, which spans from 28 to 47 years old.

Considering 182 responses as 100% population and a confidence level of 95% and a response distribution at 50%, have used a sample random sampling for a selection of 124 to be considered for Pilot survey, this has been created using Sample Calculator (Source-A: www.raosoft.com/samplesize.html). Using Alternative Analysis from the website the (A) Acceptance of Error and (B) Confidence level is established is 124

Simple Random sampling using MS-Excel formula rand ()

Header information is available in A1 column; data is available in A2:A188

Step 1: Create a new column B2 and drag it down to B188 and use the rand () function

Step 2: Sort the entire range (A1:B188) by column B (random values) in ascending order and expand the selection.

Step 3: Select the top 124.

3.5.2.5. Final Target Population:

The final study selects the top 100 BSE (Bombay Stock Exchange) Real Estate Companies in India that utilize IT for their day-to-day operations. The survey excludes overseas clients from consideration. The questionnaire is distributed to 450 employees of the Top 100 CRE BSE Companies, and the list is published in the appendix section under: List of participating staff and organisation. (Bureau of Indian Standards, 2020) study reported that there were 119 businesses listed on the Bombay Stock Exchange (BSE). These companies are categorized based on their corporate presence, with a large-size corporate presence defined as having a market capitalization exceeding 1,00,000 crore (Cr.) and a real estate workspace exceeding 15 million square feet (MSF.). These companies also have real estate operating expenses amounting to ₹7,910 crores (Cr.). There are twenty-seven Indian companies that fall into this category. The mid-size corporate presence category includes companies with a market capitalization ranging from 10,000 to 1,00,000 crore (Cr.) and a real estate workspace ranging from 8 million square feet (MSF.) to 15 million square feet (MSF.). The real estate operating

expenses for these companies amount to ₹1,697 crores (Cr.). There are twenty-seven Indian companies in this category. Lastly, there are eighty-seven Indian companies that have a small-size corporate presence, defined as having a market capitalized of less compared to 10,000 crores (Cr.) and a real estate space of less than 8 million square feet (MSF.). The real estate operating expenses for these companies amount to ₹446 crores (Cr.). The source of this information is MoneyControl, and the year is 2021. Final Sample Size based on modified Likert 7-point scale: 378 as 100%. 412 finals received.

3.5.2.6. Geographical area:

The researcher has gathered research data from individuals employed at the main branches and subdivisions of Indian real estate companies. This was done through face-to-face interactions as well as online methods such as email, telephone, and virtual meetings using Google Meet and Zoom technology. The data was collected from cities in India categorized as Tier 1 and Tier 2, as indicated in table 3.2. The rationale for choosing the Indian metropolitan cities like Bangalore, Chennai, Delhi/NCR, Hyderabad, Kolkata, Mumbai, and Pune. as opposed to core Tier 2 cities is the exceedingly rapid in expansion of the cities and widespread and prominent visibility in real estate growth. This is attributed to the extensive range of assistance offerings, industries, IT companies, banking institutions, human resources, legal and tax services, which are accessible to facilitate the operations of corporations. Additionally, the presence of technologically advanced facilities in relation to workspace, highly demanding infrastructure and a very advantageous location contribute to the low operational finance costs. Corporate real estate services in metropolitan cities in India can satisfy the requirements of international corporations, particularly those in the IT sector (Deloitte, 2020).

The above cities are then used under National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) to find the top 100 who work for Real Estate including Property Management, Technology, Banking and related industries based on purposeful sampling.

Table 3.5: Population for research study.

Tier 1 (8)	Tier 2 (102)								Zones (4)
Ahmedabad	Agra	Bhopal	Faridabad	Jabalpur	Kollam	Mysore	Rajkot	Tirunelveli	North
Bengaluru	Ajmer	Bhubaneswar	Firozabad	Jaipur	Kota	Nagpur	Ranchi	Tirupati	South
Chennai	Aligarh	Bijapur	Ghaziabad	Jalandhar	Kottayam	Nanded	Raurkela	Tirupur	East
Delhi	Allahabad	Bikaner	Goa	Jammu	Kozhikode	Nashik	Salem	Ujjain	West
Hyderabad	Amravati	Bilaspur	Gorakhpur	Jamnagar	Kurnool	Nellore	Sangli-Miraj & Kupwad	Vadodara	
Kolkata	Amritsar	Bokaro	Gulbarga	Jaunpur	Lucknow	Noida	Shimla	Varanasi	
Mumbai	Asansol	Chandigarh	Guntur	Jhansi	Ludhiana	Palakkad	Siliguri	Vasai-Virar	
Pune	Aurangabad	Coimbatore	Gurgaon	Jodhpur	Madurai	Patna	Solapur	Vellore	
	Belgaum	Dehradun	Gwalior	Kannur	Mangalore	Pondicherry	Surat	Visakhapatnam	
	Bhavnagar	Dhanbad	Hamirpur	Kanpur	Mathura	Purulia	Thiruvananthapuram	Warangal	
	Bhilai	Durgapur	Hubli–Dharwad	Kochi	Meerut	Raipur	Thrissur		
	Bhiwandi	Erode	Indore	Kolhapur	Moradabad	Rajahmundry	Tiruchirappalli		

3.6. Comparing Large and Medium Organizations for Geographic Study:

Comparing medium and large real estate companies is significant, especially in real estate, corporate real estate, and commercial real estate. Medium-sized companies have fewer resources, impacting efficiency, market reach, and competitiveness. Large companies benefit from economies of scale, greater capital access, and extensive networks, enhancing their market position and ability to undertake large projects. Medium-sized companies often focus on niche markets or specific areas, developing specialized expertise and strong local relationships but face challenges in scaling and competing with larger firms. Large companies like DLF Ltd and Godrej Properties in India have diversified portfolios, mitigated risks and providing stable revenue streams. They leverage brand reputation and networks to attract high-profile clients and secure lucrative deals.

Corporate real estate involves managing a company's real estate assets, including office spaces, industrial properties, and retail locations. Medium-sized companies may have a simpler portfolio, which can ease management but limit growth opportunities. Large corporations can optimize their extensive real estate holdings through strategic acquisitions, disposals, and lease negotiations, and invest in advanced technologies and sustainability initiatives to enhance property efficiency and value.

Commercial real estate, including office buildings, shopping centres, and industrial parks, is crucial in India's growing economy. Medium-sized firms may focus on specific segments and be more agile in responding to market changes but may struggle to compete with large firms that can undertake large-scale developments and attract multinational tenants. Large companies like Prestige Estates Projects and Oberoi Realty benefit from their ability to finance and manage extensive projects, driving significant economic growth and urban development. While medium-sized companies in the real estate sector may face challenges in scaling and competing with larger firms, they can leverage their specialized expertise and local knowledge to carve out niche markets. Large companies, with their extensive resources and diversified portfolios, are better equipped to undertake large-scale projects and drive significant economic growth. Both

types of organizations contribute to the dynamic and evolving landscape of real estate, corporate real estate, and commercial real estate in India.

3.6.1. Large Real Estate Companies: Large real estate companies, such as institutional investment firms, brokerage houses, and lending shops, have several advantages that attract clients and employees. They have a proven track record, well-established processes, and a large employee base, enhancing credibility and career prospects. Large firms prefer hiring individuals pre-vetted by other big-name companies, easing transitions into senior roles or starting their own firms. These organizations offer opportunities to learn from experienced professionals, focus on developing specialists, and invest in advanced technologies and sustainability initiatives, enhancing their competitive edge.

3.6.2. Medium-Sized Real Estate Companies: Medium-sized real estate companies often focus on niche markets or specific geographic areas, developing specialized expertise and strong local relationships. They offer personalized service and flexibility in responding to market changes but face challenges in scaling and competing with larger firms. One key advantage is providing a higher level of personalized service, with more direct interaction with senior management and tailored approaches to client needs. Additionally, they can be more agile in adapting to market trends and implementing innovative solutions.

3.6.3. Real Estate in the Indian Context: In the Indian context, the commercial real estate market is set for substantial growth, driven by urbanization, economic development, and government initiatives like the Smart Cities Mission and the Real Estate Regulatory Authority (RERA). Large companies, such as DLF Ltd and Godrej Properties, are well-positioned to capitalize on these opportunities due to their extensive resources and diversified portfolios. However, medium-sized firms also play a crucial role in addressing specific market needs and driving innovation. These firms may focus on segments like retail or office spaces and benefit from strong local relationships and a deep understanding of regional markets. Conversely, large companies can leverage their brand reputation and extensive networks to attract high-profile clients and secure lucrative deals. While medium-sized companies may face challenges in scaling and

competing with larger firms, they can leverage their specialized expertise and local knowledge to carve out niche markets. Large companies, with their extensive resources and diversified portfolios, are better equipped to undertake large-scale projects and drive significant economic growth. Both types of organizations contribute to the dynamic and evolving landscape of real estate, corporate real estate, and commercial real estate in India.

The comparison between enterprise-wide IT/ITeS organizations and large organizations is a significant area of study, particularly in the context of their operational efficiency, market reach, and overall competitiveness. Enterprise-wide IT/ITeS organizations typically focus on providing specialized IT services and solutions, while large organizations may have diversified operations across various sectors.

3.6.3.1. Enterprise-Wide IT/ITeS Organizations: Enterprise-wide IT/ITeS organizations, such as Infosys and Wipro, are primarily focused on delivering IT services, software development, and business process outsourcing (BPO) solutions. These organizations benefit from a large pool of skilled professionals, advanced technological infrastructure, and a strong emphasis on innovation. They often operate in a highly competitive global market, providing services to clients across various industries. The IT/ITeS sector contributes significantly to India's export revenue and GDP, highlighting its importance in the national economy.

3.6.3.2. Comparison related to Corporate and Commercial Real Estate: In the realm of real estate, enterprise-wide IT/ITeS organizations may focus on providing specialized IT solutions for real estate management, such as property management software and data analytics tools. Large organizations, on the other hand, may have significant real estate holdings and engage in large-scale commercial real estate projects. They can optimize their real estate portfolios through strategic acquisitions, disposals, and lease negotiations, leveraging their extensive resources and networks.

3.6.3.3. Indian Stock Exchange NSE and BSE Real Estate Comparison: When comparing medium and large real estate companies, several key factors come into play: market capitalization, stock performance, profitability, and operational scale. Medium companies, such as Coral India Finance and Housing Ltd, Eldeco Housing and Industries

Ltd, and Marathon Nextgen Realty Ltd, typically have market caps ranging from ₹202.68 Cr to ₹2,890.70 Cr. In contrast, large companies like DLF Ltd, Phoenix Mills Ltd, and Oberoi Realty Ltd boast market caps exceeding ₹50,000 Cr¹. This stark difference in market cap reflects the larger companies' ability to attract more significant investments and undertake larger projects.

3.6.4. Forms of Comparison: The comparison between medium and large companies can be approached through various forms:

1. **Financial Metrics:** Analyzing metrics such as market cap, PE ratio, net profit margin, and net income provides insights into the financial health and performance of these companies.
2. **Stock Performance:** Examining stock prices and historical returns helps gauge investor confidence and market perception.
3. **Operational Scale:** Assessing the scale of operations, including the number of projects, geographical reach, and workforce size, highlights the operational capabilities of these companies.
4. **Market Influence:** Evaluating the influence on market trends, pricing, and innovation within the real estate sector.

3.6.5. Impact on Tier 1, Tier 2, and Tier 3 Cities: The activities of medium and large real estate companies significantly impact Tier 1, Tier 2, and Tier 3 cities in India:

- **Tier 1 Cities:** These cities, including Mumbai, Delhi, and Bangalore, benefit from large-scale projects and high-end developments by large companies. The influx of investments and infrastructure development enhances the urban landscape and attracts more businesses and residents².
- **Tier 2 Cities:** Cities like Pune, Jaipur, and Kochi see substantial growth driven by medium-sized companies. These companies often focus on affordable housing and commercial projects, catering to the rising middle class and improving the quality of life².
- **Tier 3 Cities:** Smaller cities such as Nagpur, Coimbatore, and Indore experience growth through the expansion of medium and large companies. The focus on

affordable housing and infrastructure development in these cities helps bridge the urban-rural divide and promotes balanced regional development².

3.6.6. Real Estate Growth in India (2020 - 2024):

Tier 1 Cities: In India, including Mumbai, Delhi, Bengaluru, Chennai, Hyderabad, Kolkata, Pune, Ahmedabad, Surat, and Jaipur, have experienced significant real estate growth from 2020 to 2024. These cities are characterized by their large populations, robust infrastructure, and substantial economic activity.

Statistics and Growth Factors:

- **Residential Sector:** The residential real estate market in Tier 1 cities saw a surge in demand, driven by urbanization, rising incomes, and favorable government policies. For instance, Mumbai witnessed a 1% yearly rise in housing sales, with approximately 155,335 units sold in 2024. The overall sales value of housing units in these cities increased by 16% from ₹4.88 lakh crore in 2023 to ₹5.68 lakh crore in 2024.
- **Commercial Sector:** The commercial real estate sector remained vibrant, with consistent demand for office spaces, especially in IT-centric cities like Bengaluru and Hyderabad. Leasing activities saw an upward trajectory, supported by the return to workplaces and increasing office space absorption.
- **Infrastructure Development:** Significant investments in infrastructure, such as metro rail projects, expressways, and smart city initiatives, have enhanced connectivity and accessibility, further boosting real estate growth.

Tier 2 Cities: Includes Pune, Jaipur, Lucknow, Coimbatore, Chandigarh, Indore, Nagpur, Bhopal, Vadodara, and Visakhapatnam, have emerged as pivotal growth hubs for real estate from 2020 to 2024. These cities are characterized by their growing infrastructure, employment opportunities, and real estate development.

Statistics and Growth Factors:

- **Residential Sector:** Tier 2 cities have seen substantial growth in housing developments, driven by affordable financing options and a younger demographic entering the housing market. The urban homeownership rate is set

to increase to 72% by 2025, up from 65% in 2020. Green-certified buildings are expected to account for 30% of new residential projects by 2025, doubling from 15% in 2020.

- **Commercial Sector:** The commercial real estate market in Tier 2 cities has also grown, with increased demand for retail and office spaces. Cities like Pune and Jaipur have seen significant investments in commercial projects, driven by the expansion of retail and e-commerce sectors.
- **Government Initiatives:** Government policies promoting affordable housing and urban development, such as the Pradhan Mantri Awas Yojana (PMAY) and Smart Cities Mission, have played a crucial role in driving real estate growth in Tier 2 cities.

Tier 3 Cities: Includes Mysuru, Mangalore, Jalandhar, Udaipur, Dehradun, Guwahati, Bhubaneswar, Ranchi, Raipur, and Gwalior, have also experienced notable real estate growth from 2020 to 2024. These cities are typically regional hubs for trade, agriculture, or small-scale industries.

Statistics and Growth Factors:

- **Residential Sector:** The demand for affordable housing has driven real estate growth in Tier 3 cities. Government initiatives and affordable financing options have made homeownership more accessible for the middle class and first-time buyers.
- **Commercial Sector:** The commercial real estate market in Tier 3 cities has seen growth, with increased investments in retail and industrial projects. The rise of e-commerce and logistics sectors has further boosted demand for warehousing and industrial spaces.
- **Infrastructure Development:** Investments in infrastructure, such as road and rail connectivity, have improved accessibility and attracted real estate investments in Tier 3 cities.

3.6.7. Factors driving Real Estate Growth: Several factors have contributed to the growth of the real estate sector in India from 2020 to 2024:

1. **Economic Growth:** India's economy has shown resilience and growth, creating a conducive environment for real estate development.
2. **Government Policies:** Favorable government policies, such as RERA, PMAY, and Smart Cities Mission, have promoted transparency, affordability, and urban development.
3. **Urbanization:** Rapid urbanization has increased the demand for residential and commercial properties in urban centers.
4. **Technological Advancements:** The adoption of technologies like AI, VR, AR, and IoT has transformed property management, transactions, and customer experiences.
5. **Foreign Investments:** Increased foreign direct investment (FDI) and private equity investments have fueled real estate growth.
6. **Infrastructure Development:** Significant investments in infrastructure projects have enhanced connectivity and accessibility, driving real estate growth.

3.6.8. Impact of Technology on IT and ITeS Sectors:

The IT and ITeS sectors have been profoundly transformed by technological advancements, driving growth and innovation.

- **Digital Transformation:** The shift towards digitalization has enabled IT and ITeS companies to offer a wide range of services, including cloud computing, data analytics, and cybersecurity. Companies like Infosys and TCS have leveraged digital technologies to enhance their service offerings and improve operational efficiency.
- **AI and Automation:** Artificial intelligence (AI) and automation have revolutionized business processes, enabling companies to streamline operations, reduce costs, and enhance customer experiences. AI-driven chatbots and virtual assistants have become integral to customer support services.
- **Remote Work:** The COVID-19 pandemic accelerated the adoption of remote work technologies, allowing IT and ITeS companies to maintain productivity and continuity. Tools like video conferencing, collaboration platforms, and virtual private networks (VPNs) have become essential.

The comprehensive framework for the Corporate Real Estate sector benefits both medium and large organizations by aiding strategy development, planning, and creating value streams. Integrating TAM 3 and SERVQUAL models ensures robust technology adoption and service quality, while focusing on ESG principles and workspace optimization enhances sustainability and efficiency. This framework provides a strategic roadmap for navigating the real estate market, optimizing assets, and achieving long-term success. The Real Estate Maturity Model can be applied across Tier 1, Tier 2, and Tier 3 cities in India to drive growth and optimize operations, especially in Tier 1 cities with their robust infrastructure and economic activity. In Tier 2 cities, the Real Estate Maturity Model helps medium-sized companies optimize operations, improve service quality, and enhance sustainability, addressing the growing demand for residential and commercial properties. In Tier 3 cities, the model can be customized to focus on affordable housing, infrastructure development, and community engagement, driving balanced regional development and improving residents' quality of life.

3.6.9. Implementation Points:

1. **Strategic Planning:** Develop a comprehensive strategic plan that aligns with the Real Estate Maturity Model. This plan should include clear objectives, timelines, and performance metrics to guide real estate operations.
2. **Technology Adoption:** Invest in advanced technologies such as AI, VR, AR, and IoT to enhance property management, customer experience, and operational efficiency. Implementing these technologies can streamline processes, reduce costs, and improve decision-making.
3. **Sustainability Practices:** Integrate ESG principles into real estate operations by adopting green building certifications, energy-efficient designs, and sustainable materials. Focus on climate resilience, social impact, and governance practices to enhance marketability and attract eco-conscious investors.
4. **Workspace Optimization:** Utilize data-driven space planning, real-time occupancy monitoring, and flexible workspace designs to optimize the use of space and improve employee productivity. Implement smart building technologies to enhance facility management and reduce operational costs.

5. Stakeholder Collaboration: Engage with stakeholders, including government bodies, industry associations, and community organizations, to gain valuable insights and support for real estate projects. Collaboration can help navigate regulatory requirements, secure funding, and drive community engagement.
6. Continuous Improvement: Regularly review and update the Real Estate Maturity Model based on feedback, market trends, and technological advancements. Continuous improvement ensures that the model remains relevant and effective in driving real estate growth.

By adopting the Real Estate Maturity Model, organizations can achieve greater efficiency, customer satisfaction, and sustainability, while also providing valuable insights for other industries. This framework provides a strategic roadmap for navigating the complexities of the real estate market, optimizing assets, and achieving long-term success.

3.7. Research Approach:

In accordance with the recommendations made by Creswell (2014), the research made use of the study of a combination of research design including methodology. As shown in Figure 3.1, the process of developing a model that is founded on interviews with experts in the field of study is broken down into five distinct stages here. To develop a conceptual framework and establish foundational constructs, this method involves linking qualitative data obtained from interviews with relevant literature and a theoretical foundation. Furthermore, it comprises the formulation of hypotheses, which are assumptions, to experimentally test the conceptual model. Subsequently, it involves testing the model by collecting quantitative data on the scale of measurement in order to get comprehensive information about a population based on empirical observations.

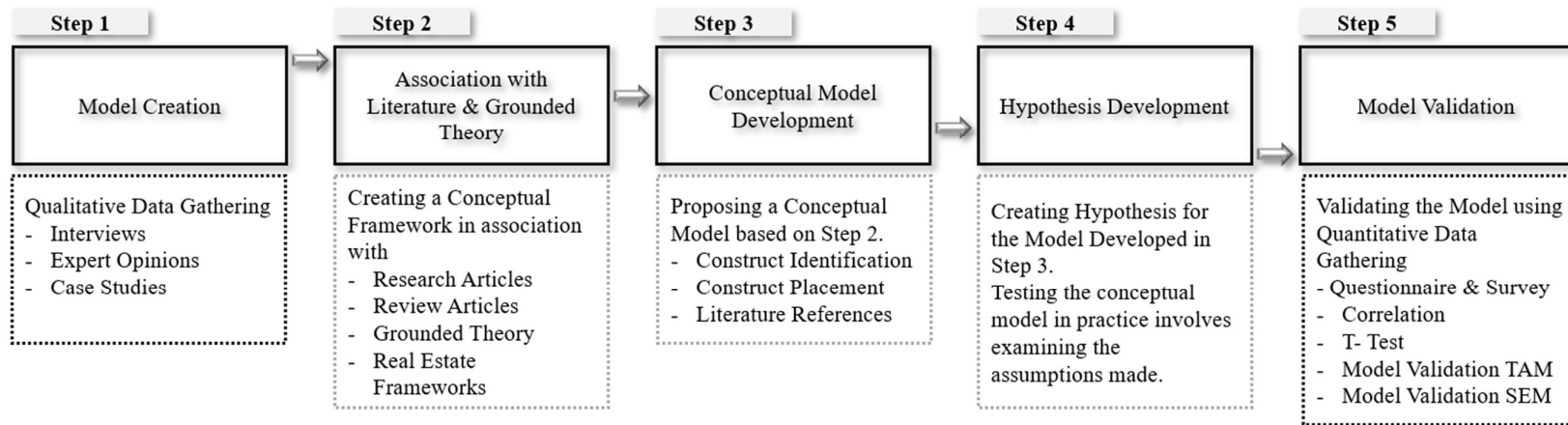


Fig. 3.1: Research Approach, Source: Author.

3.7.1. Step 1: Model Creation:

Objective of research is to comprehend how the RE sector adapts to the business strategy framework of both commercial and non-commercial enterprises in India, whether they are enlisted on the Bombay Stock Exchange (BSE) or not. There is a scarcity of research on how the Indian IT sector perceives adaptable real estate in relation to workspace changes. Creswell (2014) established the utilization of the exploratory strategy in research when there is limited information accessible, and the researcher desires the ability to perform future exploration with flexibility. The initial stage of the research methodology is characterized by a qualitative approach that adheres to the foundational theory approach. Data for the research was gathered through a combined way of offline and/or online semi-structured based interviews. These interviews were conducted with fourteen subject matter experts who provided consent for their interviews to be published. The interviews are available for public viewing on the YouTube channel snarasoft research and are targeted towards both working professionals and the team responsible for managing corporate real estate workspaces. The bibliometric study was done over a 3-month period using data from 1986 to 2022. The research articles published by Scopus and Simango resulted in 151 papers that contributed to analysis and development forms first step in establishing a model for this study.

The study employs an exploratory in research design, utilizing the grounded theory technique proposed by (Corbin & Strauss, 2008). The grounded theory technique aims to carefully acquire and analyse data to develop a theory that is firmly based on empirical evidence. Hence, this methodology aligns with the research goal of study, which is to construct a conceptually defined framework of RE management's impact on the Dimensions of Service Quality: a. Speed of Service, b. Tangibility, c. Reliability, d. Satisfaction, e. Technological Control, f. Technology acceptance, and Dimensions of Technology Acceptance Model 3 encompasses several factors that influence it's a. adoption, b. perceived ease of use, c. perceived usefulness, d. perceived risk of adoption, e. perceived trust and f. determined value. This is enhanced by incorporating the SERVQUAL Model, which provides a competitive advantage. Sustainability is also a key aspect, encompassing the a. economic, b. social, and c. environmental dimensions (ESG) in both commercial and corporate workspaces. These factors are explored by

qualitative research. Moreover, grounded theory is appropriate cause the study data is derived from pertinent pre-existing theories, literature, and knowledge gained from professional work experiences, which act as a framework for comprehending confirmed universal ideas (Corbin & Strauss, 2015). Adopting a similar methodology as a previous study, an exploratory research design allows for future investigation with a limited existing data and information. There is a scarcity of research on the impact of RE on the sustainability, performance and efficiency of Indian Real Estate market (Huang et al., 2021).

3.7.2. Step 2: Associating Literature and Grounded Theory:

During Step 2, data was gathered through interviews conducted both online and offline. The collected data was then uploaded on a YouTube channel with the participants' approval. Snarasoft Research now employs the abductive (inductive) research approach known as systematic combing method. This method involves the researcher continuously analysing data collected on various themes to establish connections between theory and empirical literature. The goal is to construct a theoretical model, as recommended by (Creswell, 2014). The researcher methodically gathered data by analysing scholarly literature, conducting interviews, and administering surveys to Indian corporate real estate professionals. The purpose is to examine the core impact of real estate on service-based quality, technology acceptance and adoption, and sustainability in the corporate real-estate workspace. Analysed the online publications such as research papers, articles, Ph.D. theses, and investigative reports from property guides of Deloitte, CBRE, JLL, Arcadis, Cushman and Wakefield, NAREDCO, Bureau of Indian Standards (BIS), and Knight Frank. The analysis covered the period from 2010 to 2023, as well as any relevant material prior to the interview. The research utilized a search strategy outlined in table 3.4 to investigate dimensions associated with Service Quality and the Technology Acceptance Model. Additionally, table 3.5 presents the search strategy employed to explore Real Estate terminology, Technology use, frameworks, policies, and procedures in the context of real estate.

Table 3.6: Search Terminologies.

Source	Search filters and Strings used	Library / Category	Subcategory	Total
Research Articles, Review Articles, Journals and Conference papers	Period: 2010-2022, Search Topics: Real Estate, Corporate, Commercial Real Estate, Property Management, Facilities Management, Workspace Management, Real Estate Management, Real Estate in India, Real Estate application in IT, Value Added by Real Estate Strategy OR Real Estate Practices OR Corporate	Google Scholar, Web of Science, Scopus, Taylor and Francis, Emerald Insight, Science Direct, ASCE Library, SAGE, SaS, Harvard Business Review, IEEE Explore, Wiley and Journal of Corporate Real Estate, Journal of Real Estate Literature, Journal of Real Estate Review, Journal of Real Estate Portfolio Management and Journal of Real Estate Practice and Education	RE based Journals (DOCUMENT TYPE: Article OR Abstract OR Proceedings Paper)	85
			Case Studies	37
			Review Papers	12

Source	Search filters and Strings used	Library / Category	Subcategory	Total
	Real Estate OR Real Estate Sustainability OR Workspace Utility Enhancement by Real Estate OR Real Estate Frameworks OR Real Estate Business Frameworks OR Real Estate Technology Acceptance Model OR Real Estate Service Quality.			
Online Sources	Period: 2010-2022, Search Topics: Real	Knight Frank, Deloitte, Prop Tech, CBRE, NAREDCO, IT company reports	Research Reports	17

Source	Search filters and Strings used	Library / Category	Subcategory	Total
	Estate, Corporate, Commercial Real Estate, Property Management, Facilities Management, Workspace	Propmodo: propmodo.com, CoreNet Global: corenetglobal. or, C&W: cushmanwakefield.com, CBRE: cbre.com, JLL: jll.com, Colliers International: colliers.com	Webpages	35
	Management, Real Estate Management, Real Estate in India, Real Estate application in IT, Value Added by Real Estate Strategy OR Real Estate Practices OR Corporate Real Estate OR Real Estate Sustainability OR	IFMA: ifma.org, CRE Leader: corenetglobal.org/blog, Tenant Advisor: tenantadvisorblog.com, CRE Strategies: corporaterestrategy.com/blog, Occupier: theoccupier.com, CRE Tech: cretechblog.com, PropTiger: proptiger.com/corporate-blog, JLL RE Blog: jll.co.in/en/trends-and-insights/blog, CBRE Blog: cbre.co.in/research-and-reports/our-blogs, Colliers India Blog: colliers.com/en-	Blogs	30

Source	Search filters and Strings used	Library / Category	Subcategory	Total
	Workspace Utility Enhancement by Real Estate OR Real Estate Frameworks OR Real Estate Business Frameworks OR Real Estate Technology Acceptance Model OR Real Estate Service Quality.	in/insights, RealtyMyths Blog realtymyths.com/corporate- real-estate-blog		
Secondary Sources / References	Period: 2010- 2022, Search Topics: Real Estate, Corporate, Commercial Real Estate, Property	TU Delf University: repository.tudelft.nl/, Harvard University: library.harvard.edu/ OR Online Digital repository OR Shodhganga: shodhganga.inflibnet.ac.in/	Thesis	6

Source	Search filters and Strings used	Library / Category	Subcategory	Total
	Management, Facilities Management, Workspace Management, Real Estate Management, Real Estate in India, Real Estate application in IT, Value Added by Real Estate Strategy OR Real Estate Practices OR Corporate Real Estate OR Real Estate Sustainability OR Workspace Utility Enhancement by Real Estate OR	Google Books, Web of Science, Scopus, Taylor and Francis, Science Direct	Book Chapters	6

Source	Search filters and Strings used	Library / Category	Subcategory	Total
	Real Estate Frameworks OR Real Estate Business Frameworks OR Real Estate Technology Acceptance Model OR Real Estate Service Quality.			

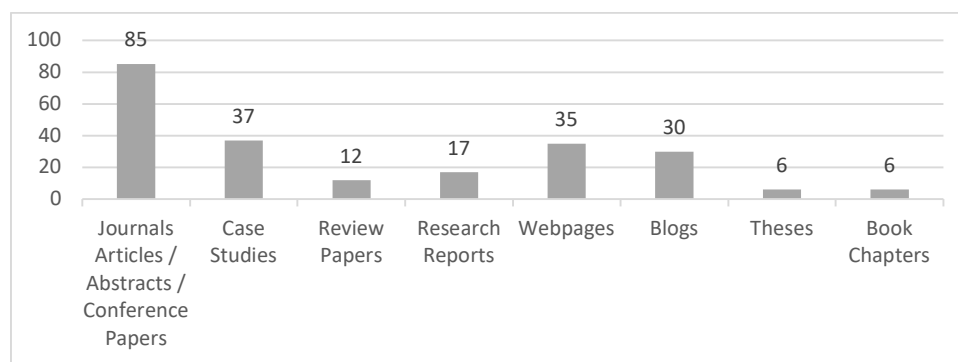


Fig. 3.2: Source split by Share and Percentage.

Table 3.7: Sources Split by Share and Percentage.

Sources	Total	Share (%)	Percentage (%)
Journals Articles / Abstracts / Conference Papers	85	37	58
Case Studies	37	16	
Review Papers	12	5	
Research Reports	17	8	36
Webpages	35	15	
Blogs	30	13	
Theses	6	3	6
Book Chapters	6	3	

3.7.3. Step 3: Conceptual Model Development:

According to (Corbin & Strauss, 2015), after collecting and analysing grounded theory and literature in a systematic manner, the next step in the grounded theory approach is to construct a theoretical model using a validated scale of themes through qualitative research that aligns with the research objective. They reiterated the need of utilizing established and verified scales for the structures. Therefore, based on their approach, the study proposed a theoretical model (refer to figure 3.2) for the value framework of real estate in office spaces. This model establishes the relationship between: (1) real estate and its determined value, using a validated scale recommended by (Jensen & Voordt, 2016); (2) real estate and the advantages of service quality and technology acceptance, using a verified scale recommended by (Maetle, 2017); (3) real estate and sustainability, using a validated scale suggested by (Fauzi et al., 2021); and (4) real estate and the utility of the workspace, using a validated scale proposed by (Allen & Macomber, 2020). The objective was to establish a connection between the value parameters (themes) that influence changes in workspace design in the Real Estate industry and how they support corporate real estate professionals in making strategic decisions for their company. This

was achieved by utilizing grounded theory and existing literature on real estate in corporate real estate and space management.

In the below figure 3.3. you can see the simple form of how the proposed model has been created and further figures explain the expansion of variables that provide the key knowledge base for the research.

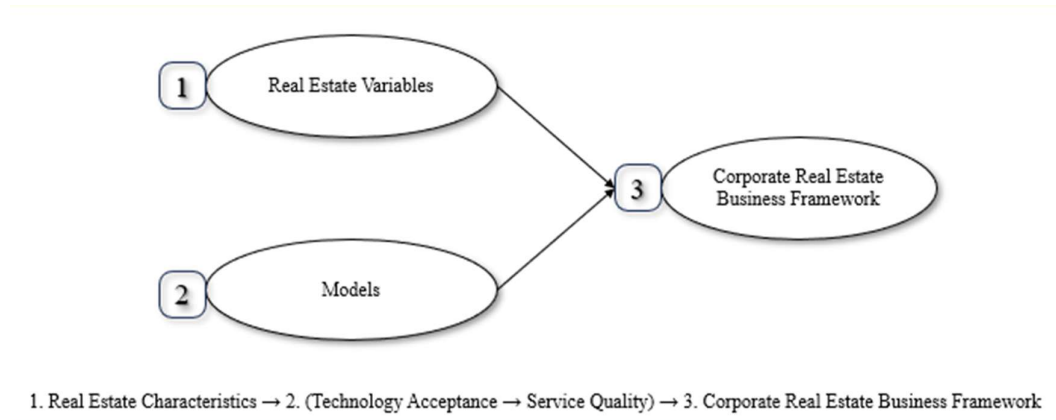


Fig 3.3: Basic Variables – Proposed Model. Source Author.

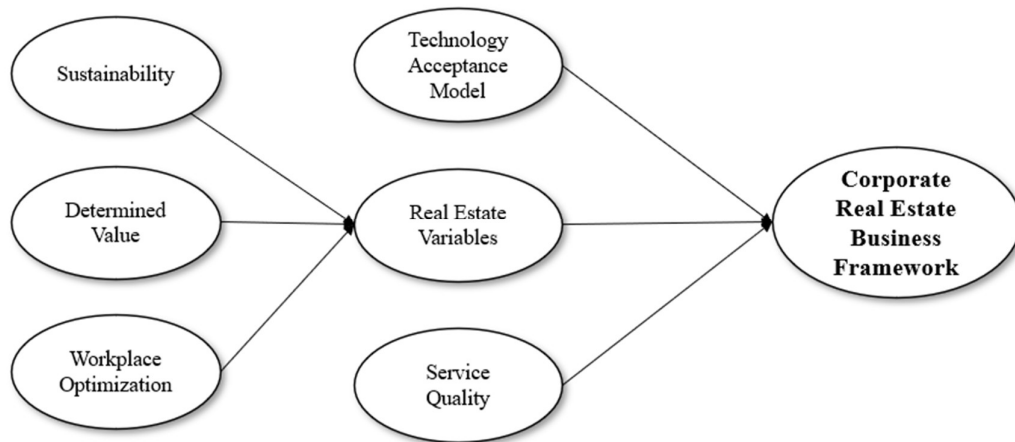


Fig. 3.4: Extended Variables Proposed Theoretical Model, Source Author.

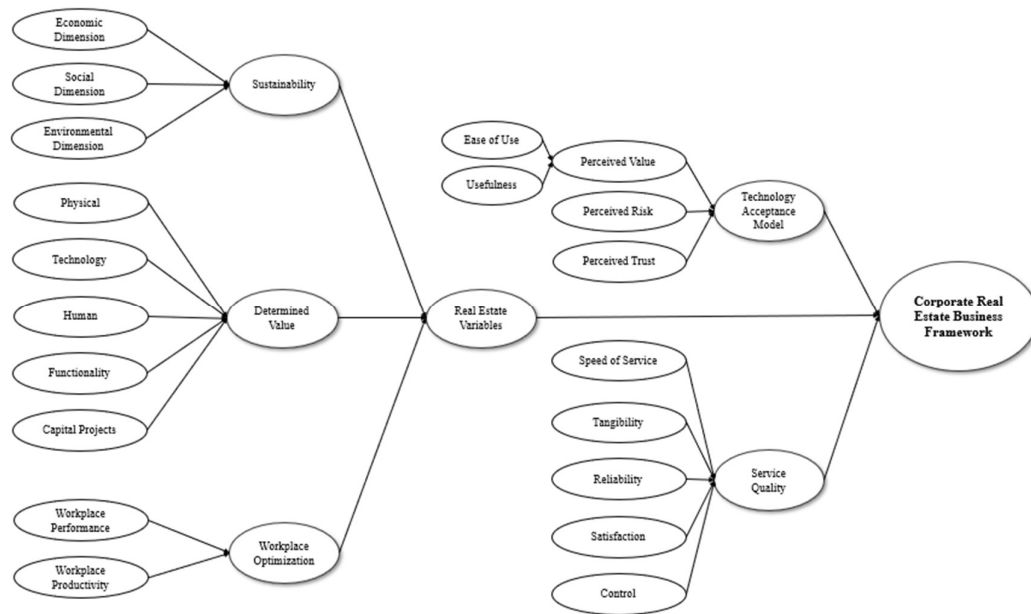


Fig. 3.5: Proposed Theoretical Model, Source: Author's construction based on (Jensen & Voordt, 2016); (Maetle, 2017); (Fauzi et al., 2021) and Allen & Macomber (2020).

Demographic / Social Variables

Name, Age, Gender, Organization, Designation, Experience in Real Estate, email

3.7.4 Step 4: Hypotheses Development:

H1: Determined Value: Real estate management positively contributes to the *determined* value of the company.

H1a: Physical: The organization's physical value positively contributes to the building, construction, and in accordance with GREEN and LEED global workspace standard.

H1b: Technology: The organization's technology standards positively contribute to the easy use, adoptability, and acceptability of new technology.

H1c: Human: The organization's human values, standards and culture positively contribute to employee satisfaction of the company.

H1d: Functionality: The organization's building functionality positively contributes to use of workspace usage of the company to provide productivity to employee and organization.

H1e: Capital Planning: The organizations positively contribute to financial stability, growth and lower operating costs in a sustainable model.

H2: Sustainability: Corporate Real Estate positively contributes to the overall sustainability of the company.

H2a: Economic Dimension: The organization 's standards and priorities positively relate to economic sustainability and compliance for the organization.

H2b: Social Dimension: The organization's policies positively influence social sustainability and compliance within the organization.

H2c: Environmental Dimension: The organization 's properties positively impact environmental sustainability and compliance for the organization and its staff.

H3: Workspace Optimization: Corporate real estate department positively contributes to the workspace culture of the company.

H3a: Workspace Productivity: The productivity of the workspace has a positive effect on the organization's optimization in achieving the full potential of the technologies and services it offers.

H3b: Workspace Performance: The performance of the workspace has a favourable impact on the organization's ability to optimize the value of the technology and services it provides.

H4: Corporate Real Estate (CRE): Corporate real estate core values, constructs, dimensions on determined value (RDV), Sustainability (RSB) and Workspace Optimization positively contributes towards adoption and acceptance with satisfaction and productivity of technology implementation

H5: Technology Acceptance: Corporate real estate positively contributes towards adoption and acceptance of emerging technology.

H5a: Perceived Value: CRE positively impacts the perceived value on adoption of current and emerging Technology.

H5a1: Perceived Ease of Use: CRE positively provides ease of use for current and future technology uses.

H5a2: Perceived usefulness: CRE positively impacts perceived usefulness in usage of current and emerging Technology.

H5b: Perceived Risk: CRE positively impacts on the perceived risk in adoption of emerging Technology.

H5c: Perceived Trust: CRE positively impacts on the perceived trust in adoption of future Technology.

H6: Service Quality: Corporate Real Estate Service Quality Positively Impacts the Adoption of Technology in creating a framework.

H6a: Speed of Service: Corporate Real Estate Speed of Service positively impacts the Adoption of Technology in creating a framework.

H6b: Tangibility: Corporate real estate tangibility of service positively impacts the adoption of technology in creating a framework.

H6b: Tangibility: Corporate real estate tangibility of service positively impacts the adoption of technology in creating a framework.

H6c: Reliability: Corporate real estate's reliability in technology adoption positively impacts the creating a framework.

H6d: Satisfaction: Corporate real estate's satisfaction in technology services positively impacts the adoption of technology in creating a framework.

H6e: Control: Corporate Real Estate's Technological control variable positively impacts corporate real estate service quality in creating a technology maturity framework.

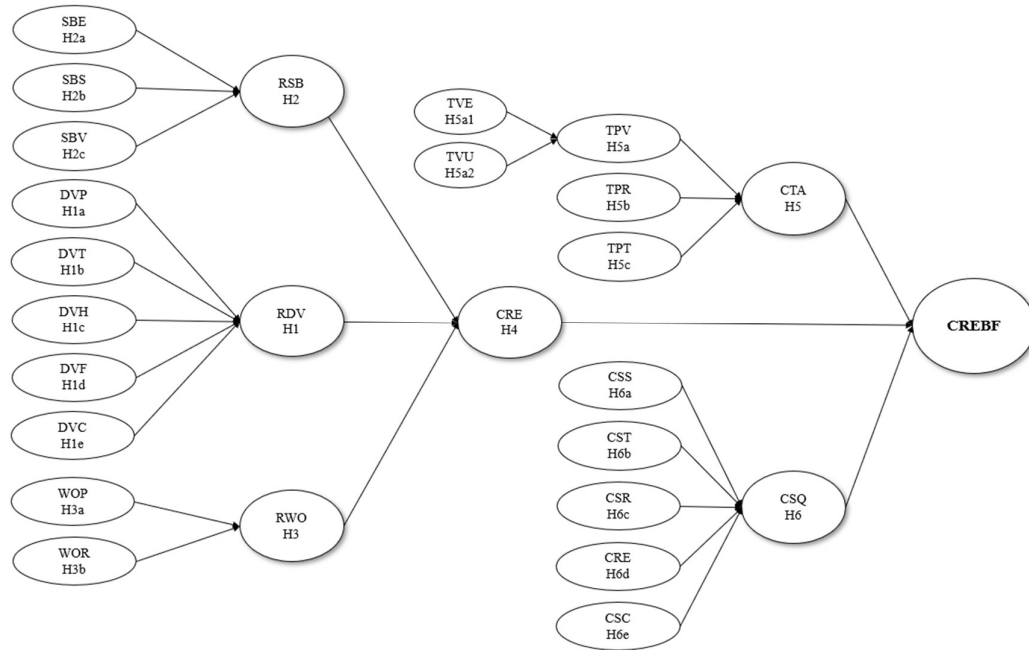


Fig. 3.6: Proposed Theoretical Model with TAGS. Source: Author.

3.8. Formation of tags:

Tags function as an efficient means of organizing recurring variables and elements. The following table outlines the procedure of creating tags, while the implemented naming conventions and labels aid in efficient tracking inside the research framework.

Table 3.8: Tag creation techniques.

Construct	Abbreviation	Formation	TAG
Corporate Real Estate	CRE	Real Estate	RE
Determined Value	DV	RE + DV	RDV
Physical	P	DV+P	DVP
Technology	T	DV+T	DVT
Human	H	DV+H	DVH
Functionality	F	DV+F	DVF
Capital Project	C	DV+C	DVC

Construct	Abbreviation	Formation	TAG
Sustainability	SB	RE + SB	RSB
Economic Dimension	E	SB + E	SBE
Social Dimension	S	SB + S	SBS
Environmental Dimension	V	SB + V	SBV
Workplace Optimization	WO	RE + WO	RWO
Workspace Productivity	P	WO + P	WOP
Workspace Performance	R	WO + R	WOR
Technology Acceptance	TA	RE + TA	CTA
Ease of Use	VE	T + VE	TVE
Usefulness	VU	T + VU	TVU
Perceived Value	PV	T + PV	TPV
Perceived Risk	RT	T + RT	TRT
Perceived Trust	PT	T + PT	TPT
Service Quality	SQ	C + SQ	CSQ
Speed of Service	SS	C + SS	CSS
Tangibility	ST	C + ST	CST
Reliability	SR	C + SR	CSR
Satisfaction	SE	C + SE	CSE
Control	SC	C + SC	CSC

3.9. Data analysis:

The study utilizes a mixed research methodology, which involves collecting two types of data: qualitative data and quantitative data. Hence, the data analysis entailed examining the data gathered on two distinct facets in order to derive the research findings:

- (1) The process of analysing qualitative data by developing a model using the research tool NVivo.

(2) The process of analysing quantitative data involves validating the model. This is done using SPSS for demographic data and Smart PLS-SEM for the responses collected on the variables or data indicators.

Phase I of qualitative data analysis involves the creation of a model. The qualitative data from the recorded interviews were transcribed in their entirety. Deductive content analysis was employed to examine the transcriptions, following the approach outlined by (Clarke and Braun, 2016). The responses were classified by segregating the adverse and favourable perspectives on workspace transformation based on the effective procedural elements outlined in the literature (Ozuem et al., 2022) and subsequently consolidating all similar expressions and organizing them into themes. The primary analysis tool used was thematic analysis in Nvivo-12, which was supplemented with coding approaches to determine the structure of the interview results and the connections between the coded items (Saldaña, 2013).

According to (Clarke & Braun, 2016), thematic coding is the main study strategy. This study used a three-phase grounded theory classification approach (Saldaña, 2013) to analyse interview data. Open coding began with data classification to detect trends. This was done before the interviews and prepping for qualitative interview questions. The initial real estate valuation model was created during this time. In the axial code portion of the interview, common traits and patterns were detected to define real estate's involvement in property management for each company. The initial model was crucial to this step, and study data was linked to overarching themes to improve axial coding accuracy. Finally, a novel office space real estate valuation model links patterns and interview insights from selective coding. This step connected the office space real estate management value model categories by combining the components.

3.9.1. Quantitative Data Analysis (Phase II: Validating the Model):

3.9.1.1. Test of Normality: Prior to assessing the quantitative data obtained from the structured questionnaire, it is crucial to verify that the sample taken from the population accurately represents the entire population and follows a normal distribution. The test necessitates a precise assumption about the population (parameter) to serve as a

statistical foundation for selecting the sample (statistic). Furthermore, the researchers obtained comprehensive information regarding the population parameter, namely the number of Indian Real Estate companies, by conducting a thorough literature review. Consequently, the study employed parametric tests, assuming that the sample was derived from a population with a normal distribution (parameter). The study utilized a one-sample T-test (univariate analysis) and one-way Anova (F-Test) as parametric tests to assess the normality of the sample data. A one-sample T-test, which is a form of univariate analysis, entails comparing the average scores of a randomly selected sample to a population mean. The process entails illustrating the normal distribution of each component/variable/construct by calculating the mean, standard deviation, skewness, and kurtosis for each factor. It is employed to determine if there is minimal disparity between the sample and the population, assuming that the sample is drawn from a normal distribution. A one-sample T-test was conducted using "real estate" as the variable in this study. Analysis of Variance (ANOVA) is a statistical method used to determine the disparities between two or more populations, specifically in the context of IT company offices located in different metropolitan cities. When there is only one categorical independent variable, such as "real estate" with at least two classifications, and a quantitative dependent variable that is measured separately along with dimension measures, the appropriate technique to employ is one-way ANOVA. The process entails determining the dependent and independent factors, breaking down the overall variation, quantifying the impacts, doing significant tests, and interpreting the findings.

3.9.1.2. Demographic data analysis: The initial part of the questionnaire contains the demographic indicators which include, Age, gender, company name, years of experience, highest level of education, job profile, work experience, income category, time spent in real estate workspace, and involvement in real estate workspace strategic decisions, were analysed using descriptive statistics. The data collected from the structured questionnaire was analysed using the frequency tallies method in IBM SPSS version 24. A chi-square non-parametric test was employed to examine the association between the observed categorical data and the proposed model regarding the impact of real estate in Indian real estate companies.

3.9.1.3. Multivariate data analysis: The data obtained from the real estate stakeholders in the second part of the structured questionnaire, which used a seven-point Likert scale to measure data indicators, was analysed using inferential statistics. Specifically, the method of confirmatory factor analysis and hypothesis testing were employed through Smart PLS version 3.0. The PLS-SEM approach employs a two-stage analysis. In the first stage, the validity and reliability of the model are assessed using the measurement model (outer model). In the second stage, the path coefficients of the hypothesized model are tested using the structural model (inner model).

3.10. Research Work - Diagrammatic Representation:

A single graphic created which delineates a comprehensive research methodology for developing a Corporate Real Estate Maturity Model spanning from 2020 to 2025, one can discern a meticulously structured Journey of life in academic inquiry. This framework, reminiscent of a research scholar's heuristics, systematically addresses the fundamental interrogatives of Why, What, Who and When within the research paradigm and includes the detailed work undertaken during the time of research study.

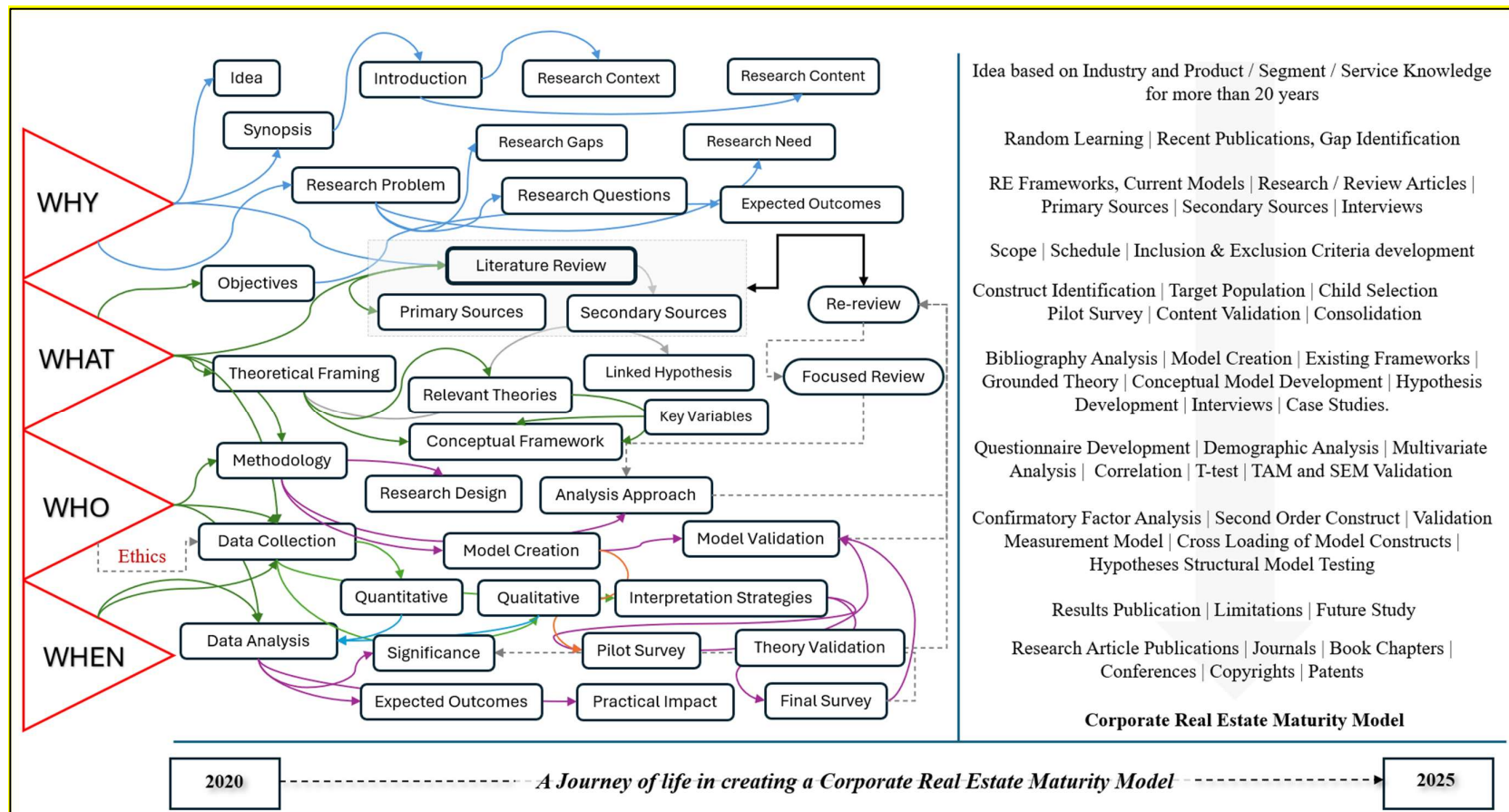


Fig. 3.7: A timeline journey of Research work conducted in creating a Corporate Real Estate Maturity Model, Source: Author

The Why section meticulously unpacks the genesis of the research, commencing with an Idea based on Industry and Product / Segment / Service Knowledge for more than 20 years. This robust grounding in experiential insight is further refined through a Synopsis that leads to the identification of the Research Problem and Research Questions. These, in turn, are informed by a thorough Research Context and Research Content, allowing for the pinpointing of Research Gaps and the articulation of a clear Research Need. The expected outcomes are implicitly linked to addressing these foundational deficiencies. Transitioning to the What of the research, the diagram emphasizes a rigorous Literature Review, encompassing both Primary Sources and Secondary Sources. This iterative process, subject to Re-review and leading to a Focused Review, is instrumental in developing Theoretical Framing and identifying Relevant Theories. The culmination of this theoretical scaffolding is the formulation of Linked Hypothesis and the elucidation of Key Variables within a Conceptual Framework. The What stage also implicitly involves a Bibliography Analysis and the Model Creation, which could entail Existing Frameworks, Grounded Theory, Conceptual Model Development, or Hypothesis Development. The Who aspect of the research zeroes in on the methodological approach and data acquisition. It begins with the broad Methodology, branching into Research Design and Analysis Approach. A critical component here is Data Collection, which is explicitly highlighted with an Ethics consideration, underscoring the scholarly imperative for responsible conduct. The data collected subsequently feeds into Model Creation and Model Validation. The methods for data collection are categorized into Quantitative and Qualitative approaches, suggesting a mixed-methods design, with subsequent Interpretation Strategies guiding the analysis. Specific techniques such as Questionnaire Development, Demographic Analysis, Multivariate Analysis, Correlation, T-Test, TAM and SEM Validation, Confirmatory Factor Analysis, Second Order Construct, Validation Measurement Model, and Cross Loading of Model Constructs are enumerated, illustrating a sophisticated analytical toolkit. Finally, the When dimension outlines the progression and dissemination of the research. Data Analysis follows data collection, leading to the assessment of Significance and the formulation of Expected Outcomes and Practical Impact. Crucially, the Pilot Survey and Theory Validation precede the Final Survey, suggesting an iterative and validating approach to the model's refinement. The ultimate tangible outputs, as indicated on the

right, include Research Article Publications, Journals, Book Chapters, Conferences, Copyrights, and Patents, signifying the comprehensive dissemination strategy characteristic of a robust academic endeavour.

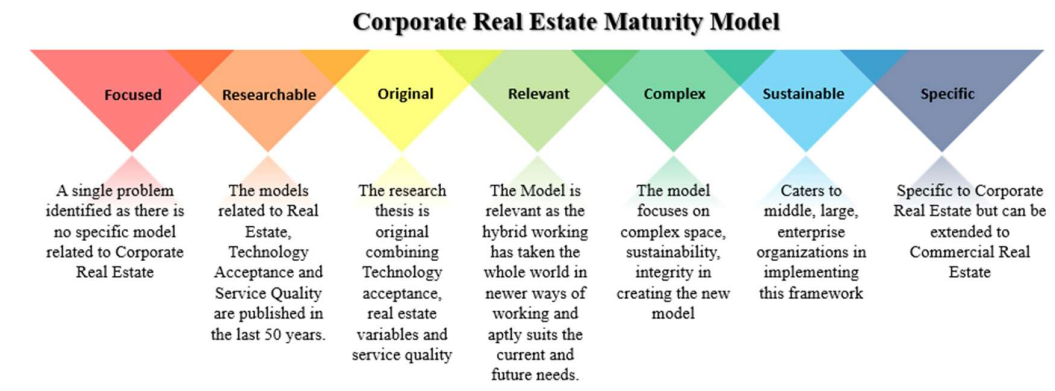


Fig. 3.8: Responsible research work - Ethics used in this thesis, Source: Author.

Responsible and impactful research extends beyond mere content and ethics; it encompasses a structured and accountable journey. The provided figure, A Journey of life in creating a Corporate Real Estate Maturity Model (2020-2025), exemplifies these principles in action.

1. Scientific Integrity, Accountability, and Openness (Why, What, Who, When):

Honesty & Objectivity: The figure explains an idea based on Industry and Product / Segment / Service Knowledge for more than 20 years, suggesting an informed, objective starting point. The progression from Research Problem to Research Questions, Literature Review, Data Collection, and Analysis Approach highlights a systematic and objective process. The Re-review and Focused Review steps demonstrate an openness to refining the research based on findings, minimizing bias.

Carefulness: The detailed steps like Scope | Schedule | Inclusion & Exclusion Criteria development, Construct Identification, Bibliography Analysis, Grounded theories, Questionnaire Development, and various statistical analyses (e.g., Multivariate Analysis, Confirmatory Factor Analysis) indicate a meticulous and careful approach to avoid errors.

Openness & Accountability: The journey culminates in Research Article Publications | Journals | Book Chapters | Conferences | Copyrights | Patents, which signifies sharing findings openly and taking accountability for the published work. The inclusion of Expected Outcomes and Practical Impact also speaks to being accountable for the research's contribution.

2. Respect for Intellectual Property:

The Literature Review, Primary Sources, and Secondary Sources steps emphasize building upon existing knowledge and proper attribution. The explicit mention of Copyrights and Patents as an outcome (When) directly reflects respect for intellectual property rights and ensuring the proper safeguarding of new intellectual contributions. The Bibliography Analysis and Existing Frameworks further reinforce the need to acknowledge and utilize previous works appropriately.

3. Responsible Publication Practices:

When section clearly outlines Research Article Publications | Journals | Book Chapters | Conferences | Copyrights | Patents as final outputs. This commitment to diverse publication channels suggests a goal of disseminating knowledge broadly. The rigorous preceding steps (e.g., Model Validation, Theory Validation, Significance) imply that publications are based on sound, validated research, not solely for personal gain or duplicative purposes.

4. Data Management and Confidentiality (Who, When):

Data Collection is a distinct phase under Who, which would necessitate robust data management practices for integrity and security. The mention of Target Population | Child Selection implies considerations for sensitive data and participant selection, underscoring the need for confidentiality and informed consent, which are often addressed under the Ethics box linked to Who. Pilot Survey and Final Survey indicate structured data gathering, which implies planned data handling.

5. Adherence to Guidelines and Regulations (Who):

The explicit Ethics box, prominently connected to Who (Methodology, Data Collection), signifies that regulatory and ethical approvals (like IRP or ethics committee clearances)

are an integral part of the research process, particularly concerning human subjects or sensitive data.

6. Addressing Conflicts of Interest:

While not explicitly shown as a box, the systematic progression from Idea through Research Context and Objectives, along with the emphasis on Objectivity in the text, implies a structured approach to minimize biases that could stem from conflicts of interest. A well-defined research journey, as depicted, provides transparency that can help mitigate such conflicts.

7. Responsible Conduct of Research (Why, When):

The entire Journey of life in creating a Corporate Real Estate Maturity Model (2020-2025) reflects a commitment to responsible conduct. The process starts with a WHY (Idea, Research Problem, Objectives) leading to Expected Outcomes and Practical Impact (under WHEN), illustrating consideration for the societal relevance and potential benefits of the research. The development of a Corporate Real Estate Maturity Model itself suggests a practical application, implying a focus on useful and beneficial outcomes.

The figure provides a concrete illustration of how the principles of scientific integrity, intellectual property respect, responsible publication, data management, adherence to regulations, and overall responsible conduct are interwoven into the fabric of a long-term research project, from its inception to its final impact and publication elucidates a scholarly journey towards the development of a Corporate Real Estate Maturity Model, epitomizing a structured, multi-faceted research process that seamlessly integrates theoretical underpinning, rigorous methodology, ethical considerations, and impactful dissemination over a five-year trajectory.

3.11. Research Methodology Summary:

A combination of qualitative and quantitative methodologies to examine research problem. The research began by conducting a thorough literature assessment using

bibliographic and thematic analysis methodologies to identify areas where information is lacking (Braun & Clarke, 2006). A conceptual framework was established based on existing theories and empirical findings from the analysis conducted (Glaser & Strauss, 1967). Following that, research objectives were developed to tackle the identified deficiencies and enhance the current knowledge base. A quantitative research design was utilized to empirically examine the formulated hypotheses. The study population consisted of individuals that fit the description of population description. From this population, a sample size participant was chosen using the sampling method. The data was collected using a structured questionnaire that used a 7-point Likert scale. Before this, pilot research was conducted to refine the questionnaire, which used a 5-point Likert scale (DeVellis, 2017). In order to guarantee the reliability and accuracy of the data, a thorough process of scale development and psychometric testing was carried out (Hair et al., 2010). In addition to the quantitative results, qualitative data was gathered through in-person interviews. The qualitative data was analysed using thematic analysis to detect recurring patterns and themes (Braun & Clarke, 2006). The process of data analysis encompassed the utilization of both descriptive and inferential statistical methods for quantitative data, employing statistical software. Thematic analysis was conducted on qualitative data to provide in-depth understanding of the research phenomenon. The study's credibility and trustworthiness were improved by combining quantitative and qualitative data through triangulation (Creswell, 2014). This study aims to enhance the existing body of knowledge and guide future research and practice by integrating several methodological techniques to gain a thorough grasp of the research problem.

DATA ANALYSIS AND INTREPRETATION

DATA ANALAYSIS AND INTREPRETATION

4.1. Chapter Overview:

The following chapter provides an examination of the study data that has been gathered, presenting the outcomes and offering an explanation of those outcomes. The research data analysis entailed examining the acquired data, which comprised qualitative and quantitative data. to obtain the research findings: (1) The process of Analyzing qualitative data involves the creation of a model using the research tool NVivo. (2) The process of analysing quantitative data involves validating the model using the research tools SPSS for demographic data and Smart PLS-SEM for responses collected on the variables/data indicators. The text outlines the ethical issues taken into account while assessing the normalcy of the quantitative data and determining if the sample provides a thorough representation of the population. This is done through the use of the one-sample t-test (univariate analysis) and ANOVA test (F-test). In addition, Objectives 1 and 2 are based on literature theory and have employed PLS-SEM to validate the replies. Objective 3 utilizes technology to enhance acceptance and adoption. This is achieved through the application of the Technology Acceptance Model (TAM) and the Sequential Evaluation and Questionnaire (SEQ) Model. To measure the impact of these models, we employ statistical analyses such as the one-sample t-test for univariate analysis and the ANOVA test.

4.2. Introduction:

The perspectives of Corporate Real Estate stakeholders and subject matter experts, who have contributed to crafting this thesis, are based on their extensive experience and constitute the foundation of this research. The perspective obtained is from esteemed personnel that oversee the real estate department. The primary objective of the research was to develop a comprehensive global framework for effectively managing real estate, which can be applied by enterprises, medium-sized businesses, and the Government of India. The researcher began by thoroughly examining various primary sources such as research papers, articles, and conference papers that were published over the past two decades. In addition to this, several interviews were performed using online platforms such as Zoom and Google Meet, as well as offline methods including face-to-face,

telephone, email, and chat sessions. These interviews were qualitative in nature. The data collection process involved obtaining consent and accurately reproducing the information obtained from the source. This initial level of analysis serves as the primary evidence for the report. In addition, numerous literature studies have been undertaken to develop, test, and validate the model in order to obtain results, which are presented here. The theme analysis identifies the overarching categories and subcategories that are relevant to this research and highlights the areas that require more attention. The Determined Value (DV), Sustainability (SN), and Workspace Optimization (WO) offer valuable insights into how real estate can enhance the services provided through SERVQual and Acceptance of Technology and Adoption. A. Value addition by the department is both satisfying and productive. B. Aligning practices within the company yields positive outcomes for both the employees and the organization, positioning it as a leader in the industry. C. Demonstrates sustainability, which entails increased accountability for employees and organizations to become more responsible citizens in India. Lastly, D. The workspace enhancement replies provide insights into the organization's viewpoint on the strengths of the current phase and the necessary actions for the future. It takes into account efficiency and effectiveness from both the customer and employer perspectives. The data has been evaluated by employing Partial Least Squares Structural Equation Modelling (PLS SEM) and IBM SPSS to perform the t-test and examine the correlation between variables. The analysis aims to determine the impact of these variables and identify positive results that are regarded favourable for further action, as well as results that require attention and may necessitate adopting appropriate measures. The regressions offer evidence of the determined value, which aids in comprehending the fundamental disparities in data treatment between employees and employers in the real estate sector. The Service Quality and Technology Acceptance Model utilizes essential factors to define, categorize, and offer reference values that are crucial in this research.

4.3. Data Analysis – Qualitative:

This section provides the interview findings, including verbatim statements from the interviews, presented in the chronological sequence in which they were analysed. This section examines the value parameters derived from the recurring themes identified in

the interview results. These themes were based on the research objectives of the study and were collected from expert stakeholders in Indian Real Estate companies. The stakeholders included corporate real estate managers, property managers, operations managers, facility managers, building managers, and construction managers. The study aimed to understand how these parameters support the organization's need for workspace real estate administration. The main analysis tool utilized was Nvivo-12 for conducting thematic analysis. Three-phase hierarchical coding approaches were employed to find the structure of the interview findings and the relationships among the coded items, as described by (Saldaña, 2013). The interviews were performed on the subjects of value addition, management role, practices and strategies chosen, sustainability practices and their value, and workspace operations for optimization. The qualitative analysis begins by presenting the key findings of the interview, which focus on the four main themes that align with the primary objectives of the study (Haynes et al., 2017). Following this, the analysis delves into the model that was developed through a systematic process of combining and categorizing the interview result themes using a three-phase hierarchical coding approach. Additionally, the Bibliography serves as evidence of the wide range of literature available worldwide, which aids us in conducting thematic analysis to construct a model.

In order to evaluate the effectiveness and efficiency of the process of acquiring literature, many methods such as citation and co-citation analysis, bibliographic coupling, crossword references, occurrence analysis, word cloud analysis, and year mapping are utilized (Karvigh et al., 2019). The utilization of these methods offers a direct understanding of the objectives that have been specified, particularly with regard to the quality of service, for both the current and the upcoming years. Consequently, this would suggest that the data must be utilized in quantitative analysis by employing structural equation modelling (SEM) and partial least squares (PLS) in order to illustrate the results that were obtained.

4.3.1. Results from Interviews:

4.3.1.1. Corporate Real Estate Value Addition:

A detailed analysis of the interview results, organized by themes and commonly discussed subjects. The value parameters related to the theme of value-added by corporate real estate in the Indian Real Estate workspace. The interviewees emphasized that real estate management is an asset that enhances the core business by increasing the value of the physical workspace, the financial worth of the company's portfolio assets, and by contributing to the overall value of the company's people resources.

A. Enhances Workspace Value:

The Corporate Real Estate (CRE) division enhances and supports the primary operations of the business by overseeing the development and upkeep of the company's physical facilities. A1: Stated. The purpose of CRE is to actively manage the real estate portfolio in order to effectively navigate the constantly evolving business environment. - A3: Asserted. CRE offers efficient and practical workspaces and manufacturing facilities. - A7: Referenced. The CRE offers a cost-effective and efficient work environment. A2: highlighted. The Corporate Real Estate (CRE) division enhances business operations through its focus on real estate core activities and the development of facilities to improve efficiency and usability. – A5: Clarified.

B. Reduces Workspace Value:

"CRE promotes the optimal utilization of resources (workspaces)." A8: Mentioned. "CRE evaluates the cost of occupying a space per square foot/meter and assists in reducing it." A3: Stated. "CRE minimizes expenses by comparing the proportion of operational space to non-operational space." A1: asserted. "CRE assists in reducing the amount of unused space within a building." - A6: referenced. CRE, or Corporate Real Estate, reduces occupancy expenses and workspace utilization by streamlining the production of real estate services through outsourcing. A2: declared. "CRE offers negotiation rooms equipped with state-of-the-art technology, resulting in significant cost savings on travel expenses." The user mentioned the topic of A4. The Corporate Real Estate (CRE) division enhances business operations through its focus on real estate

core activities and the development of facilities to improve efficiency and usability. A5: clarified

The objective of CRE is to optimize the utilization of resources, particularly in the context of workspaces. - A8: referenced. "CRE evaluates the cost of occupying a space per square foot/meter and assists in reducing it." The statement is as follows: A3. "CRE reduces expenses by comparing the percentage of operational space to non-operational space." – A1: asserted. "Commercial Real Estate (CRE) assists in reducing the amount of unused space within a building." - A6: referenced. "CRE reduces the cost of occupying space and utilizing workspaces by optimizing the production of real estate services through outsourcing." A2: declared. The CRE offers discussion rooms equipped with advanced technology connections, resulting in significant cost savings on trip expenses. - A4: stated

C. Workspace strategic selection improves value:

"CRE enhances marketing and sales strategies by assisting in the process of selecting optimal sites." A2: declared. "CRE addresses location concerns, which have been acknowledged by IT Industry leaders, Research and Training managers as a crucial factor in achieving financial success." – A3: Informed. CRE plays a crucial role in selecting suitable sites that enhance the corporate image. The location of the site reflects the company's culture and values. – A4: asserted "CRE enhances logistics by optimizing site selection and strategic planning." - A1: referenced. CRE assists in identifying appropriate sites for various essential business operations. - A7: declared. "CRE enhances workspace productivity by carefully choosing a location that offers an ideal working environment, including factors such as lighting, sensors, temperature, and related facilities, to benefit employees." A5 stated.

D. Enhance workspace financial value:

CRE reduces expenses associated with real estate and facilities. - A3: stated. "CRE offers a productive work environment at a low expense." A5: Informed. "CRE offers affordable facilities and services at a reasonable price." A3: Claimed. CRE assists the core business in enhancing customer service by offering high-quality workspaces,

efficient services, and effective real estate management methods at an appropriate cost. - A1: declared. "CRE possesses a comprehensive understanding of the macro-economic environment, organization philosophy, opportunity cost, and real estate markets. This knowledge is utilized to enhance the financial value of buildings." A1: highlighted.

E. Creates financial flexibility to boost building value:

The primary objective of CRE is to optimize financial gains by minimizing the expenses associated with real estate operations, with a specific emphasis on reducing acquisition costs. - A8: asserted. CRE assists the firm in making informed choices on the acquisition of property, specifically whether to purchase property outright or lease it. These decisions significantly impact on the company's financial performance and overall success. - A3: declared. The implementation of CRE generates economies of scale, resulting in cost-effective contracts, which in turn enhances the financial adaptability of the organization. - A4: referenced. CRE is allocated to cover administrative costs and offer the company financial flexibility according to the management's requirements. A1: Stressed. The CRE department addresses financial matters related to transaction expenses, amortization, and leasing fees in order to enhance the company's financial flexibility. A2: Affirmed. CRE assists the corporation in acquiring property that aligns most effectively with their organizational plan. - A7: Asserted.

F. Reduces operational costs to boost building value:

CRE designs and constructs efficient workspaces and industrial facilities that facilitate the main company processes, hence minimizing operational costs. - A5: emphasized. "CRE offers solutions that decrease operating costs of workspace." A3: asserts. CRE creates a productive work environment by reducing operational expenses. A7: Asserted. "CRE holds an economic perspective when it comes to purchasing services." - A4: acknowledged "CRE reduces operational expenses by offering timesaving or cost-saving services." - A1: Asserted. "CRE generates economies of scale (resulting in more affordable contracts) in order to reduce operational expenses." A1: Stated. CRE offers operational activity to fundamental businesses that reduce their expenses. - A2: Referred.

G. Increases Human Value:

CRE department enhances the worth of individuals inside the organization by assisting the company's senior management and business units in achieving their immediate and long-term goals. A1: Asserted. CRE enhances the ability of the core business to effectively cater to clients by offering high-quality work environments that enhance the productivity of employees. A3 Declared. The use of CRE enhances human well-being by creating a more productive and streamlined workspace for the primary operations of a firm. A5: Stated. CRE facilitates the alignment of occupier requirements with the company's management demands through proactive management of the real estate portfolio. - A6: Asserted.

G1. Human Value by Employee Satisfaction:

CRE department enhances the ability of business units to provide excellent customer service by offering cost-effective solutions, high-quality workspaces, professional advice, acquisition services, and effective management policies. A7 Declared. "The use of CRE enables our company to effectively navigate the dynamic business landscape and promptly address employee Requirements related to workspace management matters." – A6: Confirmed. CRE plays a crucial role in effectively addressing the Requirements of employees by offering a workspace environment that specifically aims to improve employee well-being, engagement, and motivation. - A4: Referenced.

G2. Human Value by Employee Productivity:

The primary focus of CRE is to provide comprehensive training to our staff, enabling them to effectively undertake more advanced responsibilities. AA7: Asserted. CRE enables them to create efficient work environments that enhance the productivity of their staff. According to A3. CRE allows them to deliver high-quality facilities management services, resulting in a productive and uninterrupted work environment. A4: Noted. According to A5, CRE is responsible for the physical arrangement of work and has a substantial influence on labor productivity in the workspace. CRE handles

workspace design problems in order to provide the most effective spatial design for employees. This design aims to facilitate innovative activities like creative thinking and information exchange." A1 stated,"

4.3.1.2. Corporate Real Estate Processes aids in value addition:

The interview findings were analysed and organized according to themes and commonly mentioned subjects. This analysis identified the value criteria related to the theme of real estate management techniques in the Real Estate workspace. The interviewees stated that corporate real estate involves predicting the demands of employees and clients and implementing workspace practices in response to competitive dynamics in order to gain a competitive edge. Therefore, real estate practices have a significant role in achieving three key competitive advantages: (1) strategic cost, (2) strategic distinctiveness, and (3) strategic focus.

A. Corporate Real Estate Gains competitive advantage:

CRE serves as a center of excellence, enhancing the core company's competitive advantage and creating long-term value. A1: Stated. CRE offers superior services to both internal and external clients. A7: claimed. "CRE provides a standardized real estate strategy that supports all three competitive strategies: lowest costs, differentiation, and focus" A5: mentions. "CRE provides real estate strategies standards (practices) that can be established as a competitive advantage by stating the advantage and disadvantage of each corporate real estate strategy that can be standard across the industry." A4: highlighted

B. CRE strategically reduces expenses related to property:

A3: asserted that "The CRE provides us with a well-defined real estate strategy, but our standards focus on reducing space costs and efficiently meeting the requirements for the physical working environment." A4: expressed that CRE prioritizes manufacturing with the utmost efficiency and cost-effectiveness for the organization. CRE plays a significant role in achieving high-volume manufacturing at the most economical prices

through the acquisition of expertise, advantages of scale, and management of operational expenses. A2: was mentioned.

C. Optimizing real estate services to lower workspace cost by Outsourcing:

CRE helps us offer infrastructure that meets the core of our operation by acquiring properties and facilities at the lowest price and selling the ones we don't need for the most. A3: highlighted. CRE finds external contractors to manage non-core corporate operations and deliver operational services for a negotiating minimal fee. - A4: stated that CRE efficiently manages operational vendors using cost-versus-benefit scorecards or vendor management scorecards. - A1: stated.

D. Control Workspace costs by managing efficiently:

CRE generates economies of scale, resulting in more cost-effective contracts. - A4: asserted. CRE plays a crucial role in providing our company with dependable property information, which is a key determinant of the effectiveness of our corporate real estate strategy. - A7: stated. The use of CRE enables us to acquire pertinent and enough data concerning the company's real estate assets, hence facilitating the control of costs associated with managing corporate real estate assets through improved property management. A2: expressed.

E. CRE Strategically differentiates competitors:

CRE primarily targets the general market by developing a product or service that is well recognized within its industry as being distinct. A8: stated that CRE assists in identifying the specific location of the real estate property that clients perceive as distinctive in the company's product or service offering. A3: stated that CRE offers real estate strategies standards that can be utilized as a competitive edge by outlining the pros and cons of any corporate real estate strategy that can be adopted as a standard in the industry. The importance of A4: was highlighted.

F. CRE Operational Model enhances to differentiate workspace processes:

"CRE allows us to efficiently oversee the property (workspace) used for operational requirements instead of acquiring it for investment objectives." A1: expressed. "CRE facilitates the acquisition or disposal of property in accordance with the operational needs of the company." - A4: stated. CRE guarantees that maintenance operations do not have a negative influence on the core company by making judgments regarding the options of selling, leasing, or engaging in a sale and leaseback arrangement. A2: asserted.

G. CRE Strategically targets property niches:

According to A4, CRE focuses on implementing a niche approach inside a certain segment or a limited number of chosen markets. A5: asserted that CRE pros recommend incorporating both cost and differentiation strategies in all aspects of real estate matters to enhance the main company. A1: expressed that CRE is dedicated to effectively and efficiently serving a certain target, giving them an advantage over their competition.

H. Using property benchmarking for niche markets. "CRE assists in identifying property benchmarks, which are now recognized as a crucial tool in the workspace at the operation and maintenance stage." A1: highlighted. CRE enables us to implement property benchmarking, which allows us to identify opportunities within our business and real estate portfolio by providing us with educated strategic options to enhance business performance. A3: asserted that CRE benchmarks aid in decreasing the carbon footprint and physical space needed for the company's portfolio. A2: was stressed.

I. Changing methods to service specific markets:

CRE enables the adoption of innovative work methods, such as collaborative and open-plan workspaces, co-working spaces, and hot-desking. These approaches have reduced the expenses associated with maintaining assets. A1: was mentioned. CRE introduces innovative working methods that are grounded in sustainable principles. A3: declared.

4.3.1.3. Corporate Real Estate adds value in incorporating Sustainability:

The interview results were analysed and organized by themes and frequently mentioned topics. The findings are presented, which includes the value parameters related to the theme of the role of real estate management in improving the sustainability for real estate workspace. The interviewees stated that real estate management contributes to workspace sustainability primarily through adherence to building regulations related to three key aspects of sustainability reporting: (1) providing cost-effective infrastructure that is economically sustainable; (2) ensuring compliance with social sustainability reporting by developing real estate strategies that prioritize employee well-being, engagement, and motivation to meet occupier satisfaction and international certifications; and (3) meeting environmental building regulations outlined in the company's sustainability reporting by designing a healthy workspace. Furthermore, the interviewees asserted that real estate plays a crucial role in improving company productivity and performance by enhancing workspace usability.

A. CRE provide socially responsible workspaces:

A5 claimed that Corporate Social Responsibility (CSR) initiatives help enhance the efficiency of our workforce and contribute to the long-term well-being of society. A2 asserted that CRE maintains the office design and company environment to provide a productive and pleasant working environment.

B. CRE helps to satisfy social sustainability compliances:

CRE, or Corporate Real Estate, plays a crucial role in ensuring social compliance and enhancing tenant happiness in workspace amenities. A1 stated that CRE offers a sustainable working environment that includes gender equality as a component of social compliance. A7 asserted that CRE offers workspace safety as a component of fulfilling social compliance requirements. A3 declared.

C. CRE provides green workspace:

A1 stated that CRE offers a secure and environmentally friendly workspace for its occupants. A5 noted that CRE is responsible for upholding environmental standards in maintaining the physical workspace.

D. CRE helps in reaching sustainable environmental standards

"CRE enables us to promote environmental sustainability by adhering to building regulations and maintaining the workspace." "At our workspace, Corporate Real Estate (CRE) is actively focused on implementing innovative work strategies such as co-working, hot-desking, and telecommuting to decrease operational costs in the building," as stated A3. The A7 document specifies the policies of CRE for water management, toxic waste management, and institutional sustainability management to preserve workspace facilities in accordance with building environmental regulations. CRE focuses on ensuring environmental compliance and enhancing workspace safety by adhering to building environmental regulations.

4.3.1.4. Corporate Real Estate Workspace optimization enhances value addition:

The interview answers were subjected to analysis and thereafter categorized according to recurring themes and commonly discussed subjects. The given findings include the value characteristics associated with the role of real estate in enhancing the workspace for real estate. According to the interviews, real estate management plays a role in enhancing the overall office experience for both employees and employers. a. Offering accountable work environments, b. Facilitating the achievement of workspace benchmarks for expansion, c. Boosting workspace efficiency, d. Elevating workspace effectiveness, e. Enhancing workspace productivity by augmenting qualitative metrics, and f. Amplifying corporate productivity through working-process optimization. Moreover, the interviewees emphasized that real estate is essential in promoting organization productivity and performance by improving workspace usability.

A. CRE provides responsible workspaces that adds value:

“CRE helps us promote environmental sustainability by preserving the workspace premises per building norms” A1 claimed. “Our workspace CRE is increasingly focused on developing new working methods like co-working, hot-desking, and telecommuting to lower building operations costs” A3 mentioned. “CRE specifies policies for water, toxic waste, and internal green management to maintain workspace facilities according to build environmental norms.” A7 mentioned. CRE ensures environmental compliance and occupational safety by following construction environmental standards. A1 emphasized.

B. CRE helps reach workspace standards that are sustainable:

"Corporate real estate (CRE) enhances workspace functionality, which is linked to the usability of the workspace." A5 remarked that CRE offers workspace solutions that have an impact on the productivity and creativity of employees. A3 stated that CRE offers a more streamlined and effective working environment for the primary company operations. A1 expressed. CRE offers services that effectively reduce time, expenses, or effort. A2 was highlighted. The CRE (Corporate Real Estate) offers highly efficient and appealing workspaces that are designed to attract employees. - A4 asserted. The Corporate Real Estate (CRE) department at our workspace is dedicated to enhancing occupiers' productivity and improving the overall usefulness of the company's workspace. A7 stated that Corporate Real Estate (CRE) enhances occupiers' productivity by effectively allocating workspace based on workers' work task requirements. - A6 asserted

C. CRE enhances workspace productivity:

A2 was mentioned: The focus of CRE at our office is to enhance workspace efficiency, which directly impacts the productivity of the employees. A7 stated that CRE serves the management of workspace strategy, which is connected to the human capital (occupiers) of the company's real estate property. CRE focuses on assessing the level of productivity exhibited by each individual employee in the company. A4 asserted that

CRE has a profound effect on the overall happiness and welfare of the individuals who occupy it. A5 highlighted that Corporate Real Estate (CRE) plays a crucial role in enhancing staff productivity by implementing a workspace design that effectively meets the needs of the occupiers, hence ensuring customer satisfaction. - A3 said

D. CRE aids in increasing the workspace productivity by increasing employee productivity:

A2 stated: The focus of CRE (Corporate Real Estate) at our workspace is dedicated to enhancing workspace efficiency, which directly impacts the productivity of the employees. A7 asserted that CRE (Corporate Real Estate) serves the management of workspace strategy, which is connected to the human capital (occupiers) of the company's real estate property. CRE focuses on assessing the productivity of individual employees in the workspace. A4 asserted that CRE has a profound effect on the overall happiness and welfare of its inhabitants. A5 highlighted that Corporate Real Estate (CRE) plays a crucial role in enhancing staff productivity by creating a workspace design that effectively meets the needs of the occupiers, hence ensuring customer happiness. - A3 said.

E. CRE helps in workspace productivity by increasing Qualitative measures:

The focus of CRE at our office is to assess the operational efficiency of individuals or organizations occupying real estate properties. A4 declared. The level of productivity in the workspace is directly related to the quality of the physical work environment that supports knowledge workers. A7 asserted. The concept of Corporate Real Estate (CRE) promotes functional flexibility, which refers to the ability of workers to perform a variety of corporate functions and multitask. This approach encourages job rotation and worker training, ultimately leading to improved qualitative productivity in the physical work environment. - A6 was referenced. The Center for Research and Education (CRE) asserts that promoting functional flexibility in the workspace enhances the competitive advantage of the firm. A4 declared.

F. Increases corporate productivity through work-process performance:

“CRE at our workspace is dedicated to increasing employee productivity, which is closely linked to workspace usability.” A1 noted that CRE focuses on workspace assistance for work processes to increase corporate profitability. A3 stated that CRE experts understand core business and provide facilities to support it. According to A5, CRE offers services that save time, money, or effort. A2 said

G. CRE aids in corporate workspace performance:

A1 mentioned “CRE at our workspace improves company performance (effectiveness) and workspace utility.” “CRE offers effective and efficient corporate real estate services” A1 said. A4 claimed “CRE ensures the portfolio is suitable for core business (not too much capital tied up)”. “CRE helps acquire properties at low prices and sell surplus assets” A7 mentioned. A1 said “CRE offers effective and efficient corporate real estate services”.

H. CRE contributes to financial performance by improving corporate performance. “CRE increases the value of assets” – A4 claimed “CRE involves financial management in real estate issues” – A3 mentioned “CRE provides alternatives to meet financial objectives” – A1 stated “CRE involves cost reductions or capital minimization strategies” – A2 mentioned.

I. CRE: Contributes to innovative performance for improving corporate performance:

"CRE offers workspace solutions that impact the productivity and creativity of employees in our workspace." The mention of A5 was made. Corporate Real Estate (CRE) involves the use of creative methods to assess the learning and growth aspects of how non-property companies utilize real estate workspaces. A7 asserted. CRE, or Corporate Real Estate, assists in the development of office spaces and provides recommendations for enhancing user experience and functionality. A3 declared. CRE offers real estate solutions that facilitate revenue-generating

opportunities through innovations. – A1 asserted. CRE leverages synergistic advantages by strategically assigning individuals to job assignments that align with their skills and expertise. - A2 stated. "CRE offers enjoyable work environments that are also highly user-friendly, resulting in a high level of usability." "A8 stated,"

J. CRE contributes to operational performance for improving corporate performance:

"Commercial real estate professionals understand the importance of timing (knowing when to sell) and offering alternative solutions to achieve operational goals." A3 highlighted that the objective of CRE is to capture the generation of corporate value through internal business processes, which are designed to meet or beyond client expectations. A1 asserted that CRE is responsible for converting the business requirements into practical real estate operating strategy. A7 expressed that CRE (Corporate Real Estate) supports business operations that strive to achieve excellence in operational cost savings, with the goal of satisfying clients and, as a result, stakeholders of the workspace. - A1 highlighted

Table 4.1: Thematic Coding – CRE. Source: Author

Corporate Real Estate Thematic Coding			
Level 1 Coding (<i>Value Parameters</i>)	Level 2 Coding (<i>RE + Model</i>)	Level 3 Coding (<i>Key Variables</i>)	Level 2 Coding (<i>Model</i>)
Enhances Workspace Value Reduces Workspace Value Workspace strategies selection improves value Enhance workspace financial value Creates financial flexibility to boost building value Reduces operational costs to boost building value Increases Human Value Human Value by Employee Satisfaction Human Value by Employee Productivity CRE Gains competitive advantage CRE strategically refines expenses related to property Optimizing RE services to lower workspace cost by Outsourcing Control Workspace costs by managing efficiently CRE Strategically differentiates competitors CRE Strategically targets property niches Using property benchmarking for niche markets Changing methods to service specific markets Provide socially responsible workplaces Helps to satisfy social sustainability compliances Provides green workplace Helps in reaching sustainable environmental standards CRE provides responsible workspaces that adds value Helps reach workspace standards that are sustainable Enhances workspace productivity Aids in increasing the workspace productivity by increasing employee productivity Helps in workspace productivity by increasing qualitative measures Increases corporate productivity through work-process performance Aids in Corporate workplace performance Contributes to financial performance for improving corporate performance Contributes to innovative performance for improving corporate performance Contributes to operational performance for improving corporate performance TAM model aids and supports in real estate technology adoption and acceptance TAM's perceived value enhances the values in technology delivery TAM enhances the value perceived and facilitates in current and emerging technology TAM improves real estate services and helps and adds value in delivery TAM's Trust dimension supports value in real estate technology delivery TAM's QoS dimension enhances the SQ for technology adoption SQ Impacts the Adoption of Technology SQ's SoS advances in delivery of technology services SQ's tangibility dimension aids in CRE technology adoption SQ's reliability dimension helps in CRE technology adoption SQ's enjoyment supports in ease of use and usefulness in technology adoption SQ's control dimension helps in risks being foreseen and supports technology adoption	CRE Value Addition CRE Processes aids in value addition CRE adds value in incorporating Sustainability CRE Workspace optimization enhances value addition TAM brings value addition in both adoption and acceptance SQ dimension improves the quality of deliverable and adds value	Physical Technology Human Functionality Capital Projects Economic Dimension Social Dimension Environmental Dimension Workspace Performance Workspace Productivity Perceived Risk Perceived Value Perceived Trust Speed of Service Tangibility Reliability Satisfaction Control	Determined Value Sustainability Workspace Optimization Technologies Adoption Service Quality

4.3.2. Results from Literature - Bibliography analysis:

4.3.2.1. Citation analysis:

Citation analysis is the method of evaluating the influence or "quality" of an article by quantifying the frequency with which other authors refer to it in their own research. Citation analysis entails quantifying the frequency with which an article is referenced by other scholarly works in order to gauge the influence of a publication or author. The research activity selected 151 research papers and published them primarily in highly regarded journals indexed in Scopus.

Table 4.2: Top Author, Institution, and Country in real estate literature.

TC	Author	TP	TC	Institution	TP	TC	Country	TP
328	Tseng M.L.	1	328	Mingdao Uni., Taiwan	1	756	United States	33
210	Anselin L.	1	210	Arizona State Uni., US	1	391	Taiwan	6
88	Dabholkar P.A.	1	210	Uni. of Illinois, US	1	199	France	4
61	Fregonara E.	1	175	Uni. Montesquieu-Bord. Iv, France	1	128	Italy	6
50	Morello E.	1	175	Uni. of Illinois Urbana-Champ., US	1	105	Australia	7
43	Low S.	1	88	Florida State Uni., US	1	63	United Kingdom	11
40	Kuo T.-H.	1	88	Uni. of Tennessee, US	1	56	China	12
35	Sardinha I.D.	1	78	Politecnico Di Torino, Italy	2	54	Netherlands	2
31	Kethley R.B.	1	50	Politecnico Di Milano, Italy	1	49	Portugal	2
29	Janečka K.	1	50	Massachusetts Inst. of Tech., US	1	41	Turkey	4

Table 4.1 presents the primary author, affiliated institution, and place of origin for scholarly works pertaining to service quality (SQ) literature and models used by Technology acceptance model version 3 (TAM) within the field of real estate. The authors who have made the most significant contributions in terms of citations are Tseng, M.L., with a total of 328 citations from a single publication, and Anselin, L., with 210 citations from a single publication. The universities that have demonstrated significant effect and productivity are Mingdao University in Taiwan, Arizona State University in the United States, and the University of Illinois in the United States. These institutions have achieved notable scholarly output, with one publication and citation counts of 328, 210, and 210, respectively. The United States exhibits a high level of productivity and influence, as seen by its 33 publications and 756 citations. In comparison, Taiwan has a relatively lower level of productivity and influence, with six publications and 391 citations.

Table 4.3: Most Impactful literature sources in real estate.

Source	TC	TP	H-index	Quartile	SJR
Expert Systems with Applications	328	1	249	Q1	1.87
Empirical Economics	210	1	63	Q1	0.66
Spatial Economic Analysis	175	1	36	Q1	0.63
Int'l Journal of RE Service Industry Mgmt.	88	1	98	-	-
Sustainability (Switzerland)	66	3	136	Q1	0.66
Buildings	61	1	45	Q1	0.61
Int'l Journal of Geo-Information	55	2	62	Q1	0.74
Total Quality Management	52	2	74	Q1	0.73
Computers, Environment and Urban Systems	50	1	105	Q1	1.57
Land Use Policy	44	4	138	Q1	1.66

Table 4.2 presents a comprehensive overview of the primary sources of service quality research that have had a significant impact on the field of real estate. The journal Expert Systems with Applications has been identified as having the highest impact, as seen by its 328 citations and one publication. It is closely followed by Empirical Economics, which has garnered 210 citations and also has a single publication. Most of the journals ranked at the top have an H-index over 36 and an SJR surpassing 0.61. The majority of prestigious academic journals are classified within the Q1 quartile, indicating their high impact and influence within the field. These journals tend to focus on the publication of scholarly works pertaining to the literature on service quality and technology acceptance model practises within the real estate industry.

Table 4.3 presents an overview of the most highly cited articles in the field of sustainable quality (SQ) literature within the domain of real estate.

Table 4.4: Most Cited articles in real estate.

Author (s)	Title	TC	CPY
Tseng (2009)	A causal and effective decision-making model of service quality expectation using a grey-fuzzy DEMATEL approach	328	23.43
Anselin & Lozano-Gracia (2008)	Errors in variables and spatial effects in hedonic house price models of ambient air quality	210	14.00
Anselin & Le Gallo (2006)	Interpolation of air quality measures in hedonic house price models: Spatial aspects.	175	10.29
Dabholkar & Overby (2005)	Linking process and outcome to service quality and customer satisfaction evaluations: An investigation of real estate agent service	88	4.89
Fregonara et al. (2017)	Economic-environmental indicators to support investment decisions: A focus on the buildings' end-of-life stage	61	10.17
Morello & Ratti (2009)	Sunscapes: 'Solar envelopes' and the analysis of urban DEMs	50	3.57

Author (s)	Title	TC	CPY
Low et al. (2020)	Smart digital marketing capabilities for sustainable property development: A case of Malaysia	43	14.33
Kuo & Kuo (2010)	The effect of corporate culture and total quality management on construction project performance in Taiwan	40	3.08
Sardinha et al. (2011)	Using corporate social responsibility benchmarking framework to identify and assess corporate social responsibility trends of real estate companies owning and developing shopping centres	35	2.92
Kethley et al. (2002)	Improving customer service in the real estate industry: A property selection model using Taguchi loss functions	31	1.48

Note: TC=Total Citations, TP= Total Publications, CPY=Citations Per Year

Table 4.3 presents the publication that has had the most influence on service quality and technology acceptance model research within the real estate domain. The investigations that have had the greatest impact are (Tseng's, 2009) research, as well as the studies conducted by (Anselin & Lozano-Gracia, 2008) and (Anselin & Le Gallo, 2008). (Tseng's, 2009) paper on the concept of service quality expectation has garnered significant attention within academic circles, as seen by its substantial citation count of 328. In light of their objectives for service excellence, it is common for other real estate agents to utilise the rankings of top agents as a significant source of reference. The approaches employed to solve this issue include assessing the relative significance of requirements and options, evaluating the quantity of ambiguous possibilities, utilising the Decision-Making Trial and Evaluation Laboratory (DEMATEL) technique, and considering the impact of real estate service quality on customer expectations. The study conducted by (Anselin & Lozano-Gracia, 2008) has garnered the second highest number of citations, specifically 210. A study was undertaken on hedonic models of housing pricing. The results obtained exhibit consistency across various geographical scales and kernel techniques, suggesting that the omission of variability in interpolation data could lead to substantial bias.

The study undertaken by (Anselin & Le Gallo, 2006) focused on the interpolation of air quality indices. Significant variations were noted among the interpolators in relation to the ozone coefficients and the evaluations of willingness to pay. When taking into account forecasts, model fit, and comprehension, the Kriging method consistently yields the most significant outcomes. There is additional evidence suggesting that employing a fixed ozone measurement is more beneficial in comparison to utilising a continuous approach. Based on (Tseng's, 2009) analysis, the study has garnered the highest number of citations per year, specifically averaging 23 citations annually. The scholars have focused their emphasis on the conceptual framework pertaining to service quality expectations.

4.3.2.2. Co-citation analysis:

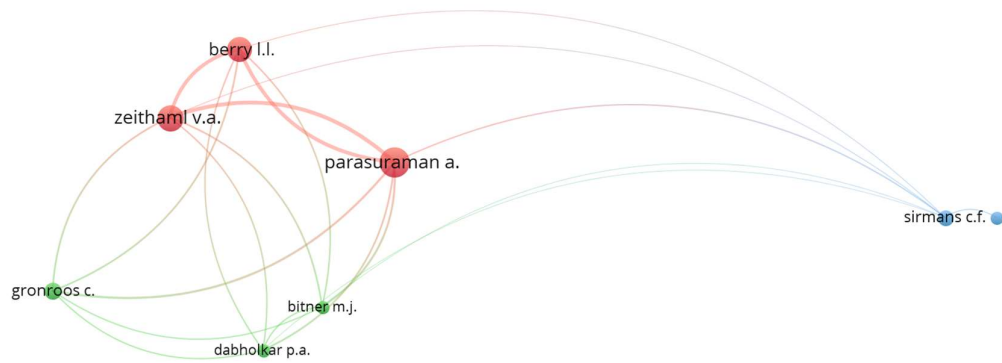


Fig. 4.1: Co-citation network of real estate literature. **Source:** Author

Fig. 4.1 presents the co-citation analysis of references pertaining to the literature on sustainable quality (SQ) in the field of real estate. The data suggests the presence of three distinct clusters of frequently cited documents. The interconnecting lines among the nodes symbolise the co-citation relationships that exist within each author. The close proximity of the two nodes suggests a significant level of co-citation between the two writers. The cluster containing red nodes is a collection of extensively cited articles pertaining to service quality in the real estate sector. Specifically, (Parasuraman et al., 1988) is a prominent study within this cluster, which primarily examines the utilisation of the SERVQUAL scale as a means of measuring service quality along with Technology Acceptance Model version 3 (TAM). Likewise, the green nodes represent prominent sources such as (Gronroos A., 1984); (Bitner M.J., 1990) and (Dabholkar et

al., 2000), who have conducted extensive study on topics like service quality models, service encounters, and conceptual and measurement considerations in the field of service quality research. The cluster containing the blue node represents a collection of scholarly works in the field of real estate that focus on the relationship between professional licencing and grievances in the property business sector. Specifically, (Shilling J.D. & Sirmans C.F., 1988) are highly cited authors within this cluster, highlighting their significant contributions to the literature on service quality in real estate.

4.3.2.3. *Bibliographic Coupling:*

Bibliographic coupling is the phenomenon where two works make reference to the same third work throughout their bibliographies. It suggests that there is a possibility of the two works addressing a comparable topic matter. Bibliographic coupling occurs when two documents share one or more cited references.

Table 4.5: Thematic Clusters real estate in literature.

Cluster	Author(s)	Title	TC
Service Quality Expectation	(Tseng, 2009)	A causal and effective decision-making model of service quality expectation using a grey-fuzzy DEMATEL approach	328
	(Zhang et al., 2005)	Dynamic and personalized web services composition in E-business	27
Customer Satisfaction Evaluations	(Dabholkar & Overby, 2005)	Linking process and outcome to service quality and customer satisfaction evaluations: An investigation of real estate agent service	88
	(Kethley et al., 2002)	Improving customer service in the real estate industry: A property selection model using Taguchi loss functions	31
Hedonic Price Models	(Anselin & Lozano-Gracia, 2008)	Errors in variables and spatial effects in hedonic house price models of ambient air quality	210

Cluster	Author(s)	Title	TC
	(Anselin & Le Gallo, 2006)	Interpolation of air quality measures in hedonic house price models: Spatial aspects	175
Total Quality Management	(Sarathy, 2013)	TQM practice in the real estate industry using AHP	21
	(Shieh & Wu, 2002)	The relationship between TQM and project performance in the building planning phase: An empirical study of real estate industries in Taiwan	21

Table 4.4 displays the examination of themes in the literature on SQ in the real estate sector. The four primary topic clusters are identified through the utilisation of bibliographic coupling and are derived from existing literature in the field. The four theme clusters encompass service quality expectation, customer satisfaction evaluation, hedonic price models, and total quality management.

Within the cluster of Service Quality Expectation, the works of (Tseng, 2009) and (Zhang et al., 2005) have received the highest number of citations, with 328 and 27 citations, respectively. The work authored by (Tseng, 2009) pertaining to the paradigm of service quality expectation has garnered significant attention within the academic community, as seen by its substantial citation count of 328. In light of their objectives for service excellence, it is common for other real estate brokers to utilise the rankings of top agents as a pivotal point of reference. The strategies employed to solve this issue include assessing the relative relevance of needs and options, evaluating the number of grey possibilities, utilising the DEMATEL technique, and considering the impact of real estate service quality on client expectations. In their study, (Zhang et al., 2005) examined the progress of new applications aimed at enhancing compatibility and cooperation among E-business partners. The authors found that the creation of composite Web services has the potential to significantly save both time and expenses. This paper presents a recommended framework for the development of internet services that offers flexibility and customization options. This framework encompasses the passive elements of Internet services, including service prerequisites, service quality,

and the options and constraints faced by individual service users, with the pragmatic features of Internet services.

Within the cluster of Customer Satisfaction Evaluations, the works of (Dabholkar & Overby, 2005) and (Kethley et al., 2002) have received the highest number of citations, with 88 and 31 citations, respectively. (Dabholkar & Overby, 2005) conducted a survey in the real estate industry to examine the evaluation of service quality by house sellers towards real estate agents. The aforementioned analysis demonstrates that outcome aspects have a clear correlation with customer satisfaction, whereas process factors are intricately associated with the level of service quality. Furthermore, as recommended, in the context of standard performance evaluations, the prioritisation of customer satisfaction ratings precedes that of service quality, however in the case of rigorous service evaluations, the causal relationship is inverted. The utilisation of TLFs in a broker's selection of real estate assets has been examined and discussed by (Kethley et al., 2002). The suitability of TLFs in the context of real estate property selection is also demonstrated. The significance of the buyer/broker relationship and the level of customer service and satisfaction should be enhanced as this tool facilitates the identification of properties that align more accurately with the buyer's preferences, selection criteria, and needs.

The cluster of Hedonic Price Models is primarily characterised by the influential works of (Anselin & Lozano-Gracia, 2008) and (Anselin & Le Gallo, 2006), which have garnered 210 and 175 citations, respectively. The study conducted by (Anselin & Lozano-Gracia, 2008) has received a significant number of citations, specifically 210, which ranks it as the second most cited work in its field. A survey was conducted on hedonic models used in the analysis of home prices. The results obtained exhibit consistency across several geographical scales and kernel techniques, suggesting that the omission of variability in interpolation data may lead to a substantial bias. (Anselin & Le Gallo, 2006) conducted a study on the interpolation of air quality indicators. Considerable discrepancies were seen between interpolators in terms of the ozone coefficients and willingness to pay predictions. In general, when considering projections, model fit, and comprehension, the Kriging method tends to produce the

most significant results. There exists data supporting the notion that employing a fixed ozone measurement is more advantageous compared to utilising a continuous method.

Within the cluster of Total Quality Management, (Sarathy, 2013) and (Shieh & Wu, 2002) identified the most frequently mentioned publications, with 21 citations each. (Sarathy, 2013) conducted a study on the implementation of overall quality practises in the real estate sector, utilising the Analytic Hierarchy Process (AHP) methodology. The researchers discovered that staff engagement is a crucial factor in the implementation of Total Quality Management (TQM) practises in India. Considering the underwhelming performance of the real estate industry, it is readily comprehensible. Hence, it is imperative to prioritise the restoration of confidence in the Total Quality Management (TQM) approach within the real estate sector in order to ensure the effectiveness of the overall plan. The impacts of Total Quality Management (TQM) on project performance have been investigated by (Shieh & Wu, 2002). It was discovered that the methodologies employed by the three groups in constructing architectural designs exhibit notable similarities. However, it has been observed that there are substantial variations in terms of customer satisfaction, equipment profitability, product utilisation, and accessibility of maintenance.

4.3.2.4. Occurrence Analysis:

A systemic occurrence analysis approach aims to expand the scope of an investigation beyond human involvement to include a review of the underlying factors inside the organization that establish the backdrop for the event.



Fig. 4.2: Occurrence Analysis of Real Estate SQ literature. **Source:** Author

Fig. 4.2 depicts the investigation of the occurrence of literature on service quality (SQ) in the real estate industry. There exist six distinct clusters that represent the most frequently occurring keywords during the given time period. The magnitude of nodes corresponds to the frequency of their occurrences. The connection between the nodes symbolises their simultaneous appearance within a shared publication. The proximity of two nodes in close proximity suggests a high frequency of co-occurrences between the two terms. The red node is characterised by a high frequency of the keyword "service quality research," specifically pertaining to the intersection of Artificial Intelligence (AI) and service quality. Moreover, the predominant themes observed in the green nodes are to land management and housing marketing. The blue nodes, on the other hand, are associated with regional planning and life cycle considerations. The violet nodes are primarily concerned with building practises and sustainability, while the sky-blue nodes are indicative of complete quality management.

4.3.2.5. Word Cloud Analysis:

Word cloud analysis is a graphical depiction of the frequency of words in a given text dataset. It is alternatively referred to as tag cloud or term cloud analysis. A word cloud utilizes the size of a word or phrase to represent its frequency of occurrence within the text. Word clouds are a useful tool for analyzing qualitative data, specifically open-ended responses obtained from surveys or interviews. They can assist in identifying

prominent patterns, concepts, and subjects that are frequently referenced. As an illustration, a visual representation of consumer survey responses known as a word cloud may reveal that words such as "real estate," "management" or "smart" hold the highest significance for customers.



Fig. 4.3: Word Cloud of Topics in real estate literature. **Source: Author**

Fig. 4.3 depicts the word cloud representation of the subject matter pertaining to research on service quality within the real estate domain. The utilisation of a word cloud in the present study serves the purpose of analysing the predominant terms within the title of the article and subsequently presenting a visually condensed representation of the textual content. The size of the font is indicative of the frequency of its occurrence. Cloud analysis results in the formation of four distinct groups. The title that is most commonly utilised in keywords is visually represented by the colour violet. The current research trends primarily revolve around the examination of keywords such as services analysis, satisfaction, management, method, and procedure.

4.3.2.6. Bibliometric Analysis and Interpretations: Productivity analysis

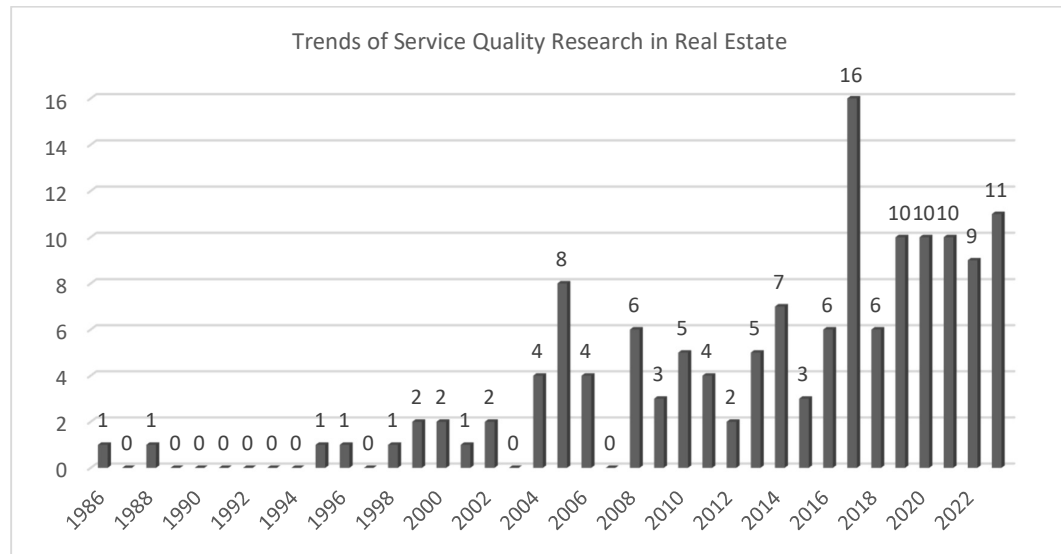


Fig. 4.4: Publication Trends in real estate. **Source: Author**

Fig. 4.4 illustrates the patterns of publication in the field of sustainable quality (SQ) literature within the real estate sector. The inception of the scientific journal took place in 1986. However, a lack of publications in this particular domain was seen from 1989 to 1995. Moreover, throughout the early sixteen years, advancement was characterised by a slow pace, as just one to two publications were published annually. Following the year 2016, a discernible rise in the quantity of scholarly articles pertaining to this particular investigation was seen. The years of highest productivity are observed in the year 2018. The journal has been consistently featuring 9-11 documents on an annual basis since 2020, with a total of 11 articles within the initial seven months of 2023.

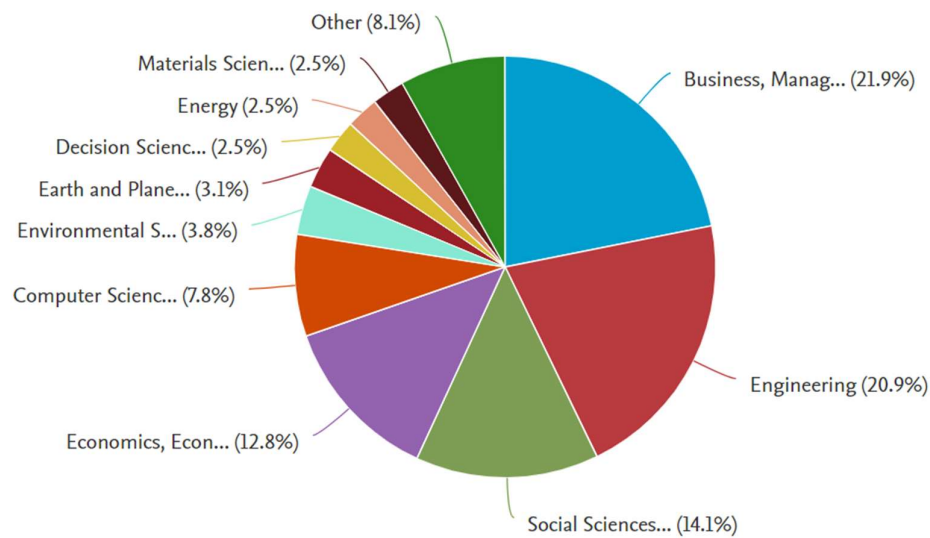


Fig. 4.5: Subject Area-wise publications in real estate literature. **Source:** Author

Fig. 4.5 illustrates the distribution of publications on SQ literature in the field of real estate, categorised by subject area. The data indicates that a significant proportion of publications, specifically 21.9%, are focused on the subject area of business management. This is closely followed by engineering, which accounts for 20.9% of publications, and economics, which represents 12.8% of publications. Sufficient research has been conducted in the fields of social sciences (14.1%), computer science (7.8%), and other disciplines (8.1%). Despite the relatively limited amount of scholarly inquiry conducted in the field of arts and humanities, there exists a considerable scope for additional investigation and exploration.

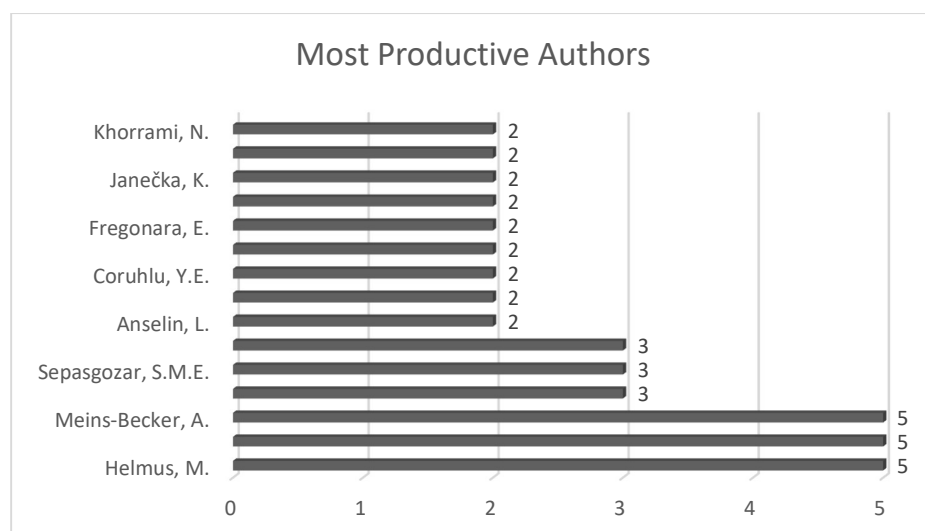


Fig. 4.6: Prolific Authors in real estate literature.

According to Fig. 4.6, the authors with the highest number of publications in the field of real estate in literature are identified. The maximum number of articles published by any individual is five. Helmus M., Meins-Becker A., and Sepasgozar S.M.E. are the most prolific authors in the field of real estate literature, having each published five works in the files.

4.4. Data Analysis - Quantitative:

This section presents an analysis of the numerical data gathered from participants. The content is partitioned into six sub-sections: The first step involves analysing the demographic characteristics of the participants in order to determine the descriptive statistics of the sample. The second step entails utilizing G Power software to assess the dependability of the data collected from the sample. (3) Perform confirmatory factor analysis to evaluate the goodness of fit indices for the components in the study model by validating the factors using a Chi-Square test. (4) The measurement model is employed to evaluate the dependability and accuracy of the model. (5) Performing a univariate analysis, especially a one-sample t-test, to evaluate the skewness, kurtosis, mean, and standard deviation of the specified components. (6) An analysis of variance (ANOVA) test is performed to assess if there is a statistically significant disparity in the mean values of specific segment components, based on the independent variable and its measurements, among the study participants. (7) A Structural Model is employed to evaluate the accuracy of the model by utilizing the bootstrapping technique for hypothesis testing on the variables gathered for Determined Value, Sustainability, Workspace optimization, technology acceptability, and service quality.

The demographic data obtained in the first part of the questionnaire was examined using descriptive statistics in IBM SPSS version 24. A total of 387 respondents were surveyed to gather data on their demographic profile. The survey focused on four parameters: organization work profile, work experience, role and time spent in real estate, involvement in real estate, education connected to real estate, and designation in real estate. These parameters are deemed appropriate for examining the outcomes and their influence on the strategies of the real estate industry in connection with the study

inquiries. A total of 134 groups participated and collectively submitted 387 responses. Out of the 10 organizations, 12 individual applications had a greater rate of response. Among these, there were 52 distinct answers, with each answer being provided just once. Every organization that had more than 5 participants gave an average of 12 responses. Table 4.5 displays a frequency table illustrating the demographic professional characteristics of the selected respondents for the research project. The data largely comprises responses from corporate real estate managers and teams (22% of the total sample) and facilities managers and teams (16% of the total sample) who are employed by the top 5 IT companies in India. According to the statistics, out of the 387 responses in the Real Estate IT industry, 81 individuals identified themselves as Real Estate Technology Managers, while 65 respondents stated that they are directly involved in making real estate decisions. Out of the 74 responses received from facility managers, it was discovered that 12 of them acknowledged their lack of active participation in real estate activities. The total population coverage of both Commercial and Corporate Real Estate Manager is 16%, however, they represent 32% of the overall responses. Among the 387 replies, 68% of them are directly involved in decisions, functional changes, and strategies, while the remaining 32% have different functions that indirectly assist in decision making and support the function.

Table 4.6: Job Position Frequency distribution.

Job Position	Total Sample (n-387)		Directly Involved in Real Estate		Indirectly Involved in Real Estate	
	%	Frequency	%	Frequency	%	Frequency
Commercial Real Estate Manager	16	61	10	40	5	21
Corporate Real Estate Manager	16	61	10	37	6	24
Facility Manager	19	74	16	62	3	12
Others	1	5	1	2	1	3
Real Estate Broker / Agent	14	55	12	47	2	8
Real Estate Technology Manager	21	81	17	65	4	16
Space Planner/Designer	13	50	3	12	10	38
Total		387		68 265		32 122

Among the 387 respondents, 57% indicated direct involvement in RE functions and decisions, while 43% reported indirect involvement by offering aid and guidance when

needed. 31% of the personnel are under the age of 24 and have less than 5 years of experience. The greatest response rate is 34%, with 220 people reporting having approximately 25 years of experience. Additionally, 167 respondents indicated having close to 40% of experience, which accounts for 35% of the whole population. A total of 118 individual participants, each with 24 years of experience, verified their capacity to make decisions and strategize in real estate functions, specifically in areas related to sustainability and workspace experience. Table 4.6 displays the relevant data.

Table 4.7: Age Frequency distribution.

Age	Total Sample (n=387)		Directly Involved in Real Estate		Indirectly Involved in Real Estate	
	%	Frequency	%	Frequency	%	Frequency
18Y to 24Y	31	119	6	24	25	95
25Y to 45Y	34	132	20	78	14	54
45Y to 60Y	35	136	30	118	5	18
Total		387		220		167

The table above presents a novel perspective on the hours spent on decision making in the field of real estate, considering the respondents' work experience. It specifically focuses on the frequency distribution of the demographic profile of respondents' time spent in the real estate company (number of hours spent in a typical week at their current workspace) that was chosen for the research study. The data collected predominantly spans a duration of over 40 hours but less than 48 hours every week, encompassing weekends as well. Out of the total respondents, 220 individuals (57%) were actively engaged in the decision-making process of real estate and spent more than 40 hours on it. Out of the 167 respondents (43%), it was clarified that they worked for more than 40 hours but did not directly participate in executing what was indicated to them. This is particularly evident among Real Estate Technology Managers and Commercial and Corporate Real Estate Managers, as well as Facility Managers, who have extensive experience ranging from 24 to 40 years and have dedicated more hours to their work in the field of real estate. These professionals are involved in decision making related to financials, sustainability, workspace design standards, and strategy implementation.

Table 4.8: Designation / Experience Frequency distribution.

Designation/ Work experience and Age comparison on Time spent	Total Sample (n-387)		Directly Involved in Real Estate		Indirectly Involved in Real Estate	
	%	Frequency	%	Frequency	%	Frequency
Less than 20 hours	10	40	5	20	5	20
20 - 40 hours	29	111	16	60	11	41
More than 40 hours	61	236	36	140	27	106
Total		387		220		167

4.4.1. GPower:

The confidence level is tested at 2 levels, one with 95% confidence and the other with 99% confidence for t test, liner multiple regression.

4.4.1.1. Data Analysis on 95% Confidence level:**Table 4.9:** Confidence Level at 95% using GPower software.

t tests - Linear multiple regression: Fixed model, single regression coefficient.			
Input:	Tail(s)	=	Two
	Effect size f ²	=	0.38
	α err prob	=	0.05
	Power (1- β err prob)	=	0.95
	Number of predictors	=	1
Output:	Noncentrality parameter δ	=	3.5411862
	Critical t	=	1.23989
	Df	=	30
	Total sample size	=	34
	Actual power	=	0.9887686

4.4.1.2. Data Analysis on 99% Confidence level:

Table 4.10: Confidence Level at 99% using GPower software.

t tests - Linear multiple regression: Fixed model, single regression coefficient			
Input:	Tail(s)	=	Two
	Effect size f^2	=	0.38
	α err prob	=	0.01
	Power (1- β err prob)	=	0.99
	Number of predictors	=	1
Output:	Noncentrality parameter δ	=	4.6946778
	Critical t	=	1.61167
	Df	=	58
	Total sample size	=	60
	Actual power	=	0.9988734

4.4.2. Demographic basic Data Analysis:

4.4.2.1. Gender Analysis:

Table: 4.11: Gender Analysis.

Gender	Count (f)	(%)
Female	170	44
Male	217	56
Total:	387	100

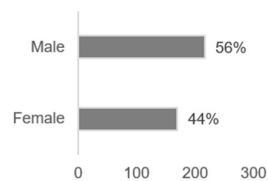


Fig. 4.7: Gender Analysis

Gender breakdown:

- Males: 217 individuals, representing 56% of the sample
- Females: 170 individuals, representing 44% of the sample

A. Gender disparity: There is a slight imbalance in the gender distribution, with males outnumbering females by 47 individuals or 12 percentage points.

B. Representation: The sample shows a relatively balanced gender representation, with both males and females constituting substantial portions of the population studied.

C. Majority: Males form the majority in this sample, albeit by a modest margin.

4.4.2.2. Age Analysis:

The data is categorized into three age groups: 18-24 years, 25-45 years, and 45-60 years.

Table: 4.12: Age Analysis.

Age	Count (f)	%
18Y to 24Y	119	31
25Y to 45Y	132	34
45Y to 60Y	136	35
Total	387	100

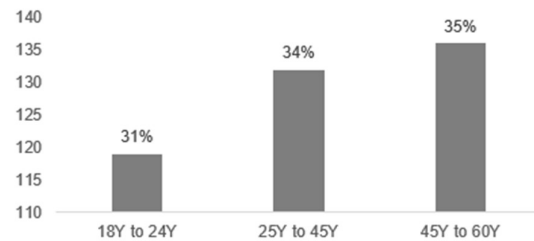


Fig. 4.8: Age Analysis.

Age group breakdown:

- 18 to 24 years: 119 individuals, representing 31% of the sample
- 25 to 45 years: 132 individuals, representing 34% of the sample
- 45 to 60 years: 136 individuals, representing 35% of the sample

A. Age distribution: The sample shows a relatively even distribution across the three age categories, with each group comprising approximately one-third of the total sample.

B. Slight skew: There is a minor skew towards older age groups, with the 45-60-year category having the highest representation at 35%.

C. Adult-focused sample: The sample exclusively consists of adults, with no representation of individuals under 18 or over 60 years old.

D. Working-age population: The age range (18-60 years) suggests that this sample primarily represents the working-age population.

4.4.2.3. Education Analysis:

Table 4.13: Education Analysis.

Highest level of education?	Count (f)	%
Bachelor's degree	79	20
Doctorate degree	27	7
Master's degree	281	73
Total	387	100

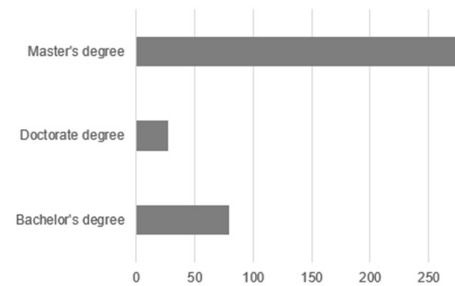


Fig. 4.9: Education Analysis.

The data is categorized into three educational levels: Bachelor's degree, master's degree, and Doctorate degree.

A. Educational level breakdown:

- Bachelor's degree: 79 individuals, representing 20% of the sample
- Master's degree: 281 individuals, representing 73% of the sample
- Doctorate degree: 27 individuals, representing 7% of the sample

B. Predominance of advanced degrees: A striking 80% of the sample (308 individuals) hold postgraduate degrees (Master's or Doctorate).

C. Master's degree dominance: Nearly three-quarters of the sample (73%) have a master's degree as their highest level of education, making it the most common educational attainment in this group.

D. Doctoral representation: While comprising the smallest group, individuals with Doctorate degrees still represent a notable 7% of the sample.

E. Highly educated sample: The entire sample consists of individuals with at least a bachelor's degree, indicating a population with high educational attainment.

This educational distribution data reveals a sample population with an exceptionally high level of formal education. The predominance of postgraduate degrees, particularly master's degrees, suggests a group that has invested significantly in higher education. The data indicates a specialized or elite sample, which may not be representative of the general population. This high level of educational attainment could be indicative of a specific professional field, academic environment, or a selective sampling method. Given this distribution, any conclusions drawn from this sample should carefully

consider the potential influence of the high educational levels on the studied variables or outcomes.

4.4.2.4. Job Designation / Position Analysis:

Table 4.14: Job Analysis.

Job Position	Count	%
CoRE Manager	61	16
CRE Manager	61	16
Facility Manager	74	19
Others	5	1
RE Broker / Agent	55	14
RE Tech. Manager	81	21
SP / Designer	50	13
Total	387	100

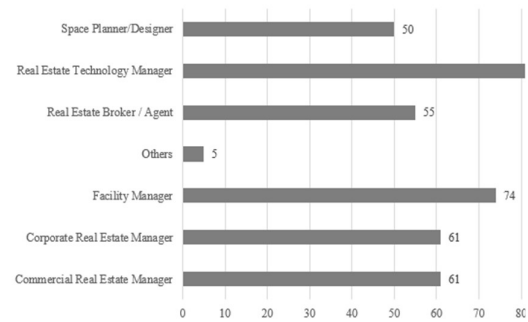


Fig. 4.10: Job Analysis.

The data is categorized into seven distinct job roles within what appears to be the real estate or facilities management sector.

A. Job position breakdown:

- RE Tech. Manager: 81 individuals (21%)
- Facility Manager: 74 individuals (19%)
- CoRE Manager: 61 individuals (16%)
- CRE Manager: 61 individuals (16%)
- RE Broker / Agent: 55 individuals (14%)
- SP / Designer: 50 individuals (13%)
- Others: 5 individuals (1%)

B. Diversity of roles: The sample represents a range of positions within the real estate and facilities management field, suggesting a comprehensive cross-section of the industry.

C. Dominant positions: RE Tech. Manager and Facility Manager are the most prevalent roles, collectively accounting for 40% of the sample.

D. Managerial focus: A significant portion of the sample (at least 53%) holds managerial positions (RE Tech. Manager, Facility Manager, CoRE Manager, CRE Manager).

E. Equal representation: CoRE Manager and CRE Manager positions show identical representation at 16% each.

F. Minor representation: The "Others" category represents only 1% of the sample, indicating that the predefined categories capture the vast majority of job positions in this field.

This job position distribution provides valuable insights into the professional composition of the studied population. The data suggests a focus on technical and managerial roles within the real estate and facilities management sector. The relatively even distribution across most categories (ranging from 13% to 21%) indicates a balanced representation of various job roles, which could be beneficial for comparative analyses between different positions within the industry. It's worth noting that the specific nature of these job titles (e.g., CoRE Manager, CRE Manager) may require further clarification to fully understand their roles and responsibilities within the industry context.

4.4.2.5. Income Analysis:

Table: 4.15: Income Analysis.

Income Category / Annum	Count (f)	%
11 to 25 Lacs	148	38
26 to 50 Lacs	118	30
Above 51 Lacs	6	2
Less than 10 Lacs	115	30
Total:	387	100

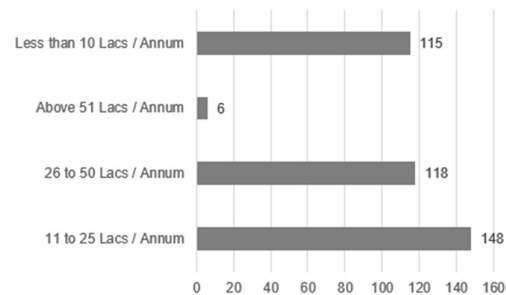


Fig. 4.11: Income Analysis.

The data is categorized into four income brackets, with amounts expressed in Lacs (where 1 Lac = 100,000 in Indian currency).

A. Income category breakdown:

1. 11 to 25 Lacs: 148 individuals, representing 38% of the sample
2. 26 to 50 Lacs: 118 individuals, representing 30% of the sample

3. Above 51 Lacs: 6 individuals, representing 2% of the sample
4. Less than 10 Lacs: 115 individuals, representing 30% of the sample

B. Income distribution:

1. The most common income bracket is 11 to 25 Lacs, encompassing over a third of the sample (38%).
 2. There is an equal representation (30% each) in the 26 to 50 Lacs bracket and the Less than 10 Lacs bracket.
 3. Only a small fraction (2%) of the sample reports earnings above 51 Lacs per annum.
- C. Income disparity: There is a notable disparity between the highest and lowest income categories, with the highest earners (Above 51 Lacs) representing a much smaller portion of the sample compared to other categories.
- D. Middle-income predominance: The two middle income brackets (11 to 25 Lacs and 26 to 50 Lacs) collectively represent 68% of the sample, suggesting a concentration in the middle-income range.
- E. Lower-income representation: A significant portion (30%) of the sample falls into the lowest income category (Less than 10 Lacs), indicating substantial representation of lower-income individuals.

This income distribution data provides valuable insights into the economic composition of the studied population. The concentration in the middle-income brackets, coupled with significant representation in the lower bracket and minimal representation in the highest bracket, suggests a sample that largely represents middle to lower-middle income groups in the context of the Indian economy. It's important to note that this income distribution may be specific to the particular industry or professional field from which the sample was drawn and may not be representative of the broader population.

4.4.2.6. Respondents' vs Organizational Contribution Analysis:

The total sample consists of 387 responses from 134 unique companies.

A. Total unique companies: 134

B. Response distribution:

- a. 1 company provided 10 responses
- b. 2 companies provided 9 responses each
- c. 3 companies provided 8 responses each
- d. 5 companies provided 7 responses each

- e. 7 companies provided 6 responses each
- f. 12 companies provided 5 responses each
- g. 13 companies provided 4 responses each
- h. 14 companies provided 3 responses each
- i. 25 companies provided 2 responses each
- j. 52 companies provided 1 response each

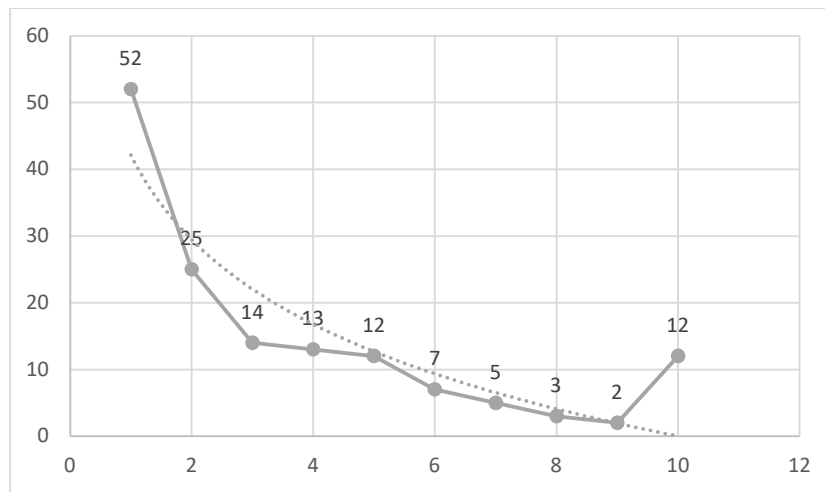


Fig. 4.12: Respondents vs Organization Contribution Analysis.

C. Response patterns:

- a. The majority of companies (52, or 38.8%) provided only one response.
- b. There's a general trend of fewer companies providing higher numbers of responses.
- c. The maximum number of responses from a single company is 10.

D. Average responses per company: The mean number of responses per company is approximately 2.89 (387 total responses / 134 companies).

E. Variability in participation: There's considerable variation in the level of participation across companies, ranging from single responses to multiple responses.

This data suggests a study with broad participation across many companies, but with varying levels of engagement. The high number of companies providing only one or

two responses indicates a wide reach, while the smaller number of companies providing multiple responses suggests more in-depth participation from a subset of the sample. The distribution pattern could imply different levels of interest, relevance, or capacity to participate among the surveyed companies. It may also reflect variations in company size or the number of eligible participants within each organization. This type of response distribution is valuable for assessing the breadth and depth of the study's reach and can inform interpretations about the representativeness and potential biases in the overall dataset.

4.4.3: Basic and Advance Statistics data analysis from IBM SPSS:

Have used the IBM Statistical Package for the Social Sciences (IBM SPSS) for sharing basic and advance statistical information from the questionnaire collected with response. A total of 378 responses were collected, and the report would contain the following hierarchy:

- a. Rating in actuals, Frequency of the data and its related percentage as a Frequency Distribution Table.
- b. Ratings and Frequency in a bar chart.
- c. Descriptive Statistics - Mean, Median, Mode, Standard Deviation Minimum, Maximum and Range for each set of question responded.
 - Mean: This is the average value of the dataset.
 - Median: This is the middle value when the data is ordered, meaning half the data points are above it and half are below it.
 - Mode: This is the value that appears most frequently in the dataset.
 - Standard Deviation: This measures the typical amount of variation or dispersion of data points around the mean; a smaller value indicates data points are closer to the mean.
 - Minimum: This is the lowest value in the dataset.
 - Maximum: This is the highest value in the dataset.
 - Range: This is the difference between the maximum and minimum values, indicating the spread of the entire dataset.

d. Advance Statistics - 25th Percentile, 50th Percentile, 75th Percentile, Skewness and Kurtosis data.

- 25th Percentile: 25% of the data falls at or below the value of 4.
- 50th Percentile: This is the median, meaning 50% of the data falls at or below the value of 6.
- 75th Percentile: 75% of the data falls at or below the value of 6.
- Skewness: This value is very close to zero, indicating the data distribution is nearly symmetrical. A good range for skewness is generally considered to be between -1 and +1, with values closer to 0 indicating better symmetry.
- Kurtosis: This negative value suggests the distribution has lighter tails and is flatter than a normal distribution. For a normal distribution, kurtosis is 0. A common range for "good" kurtosis (meaning not extremely heavy or light tails) is often considered to be between -3 and +3, with values closer to 0 being ideal for approximating normality.

A descriptive analysis based on the data analysed are added.

Table: 4.16: Q3.1. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are effective in maximizing operational efficiency?

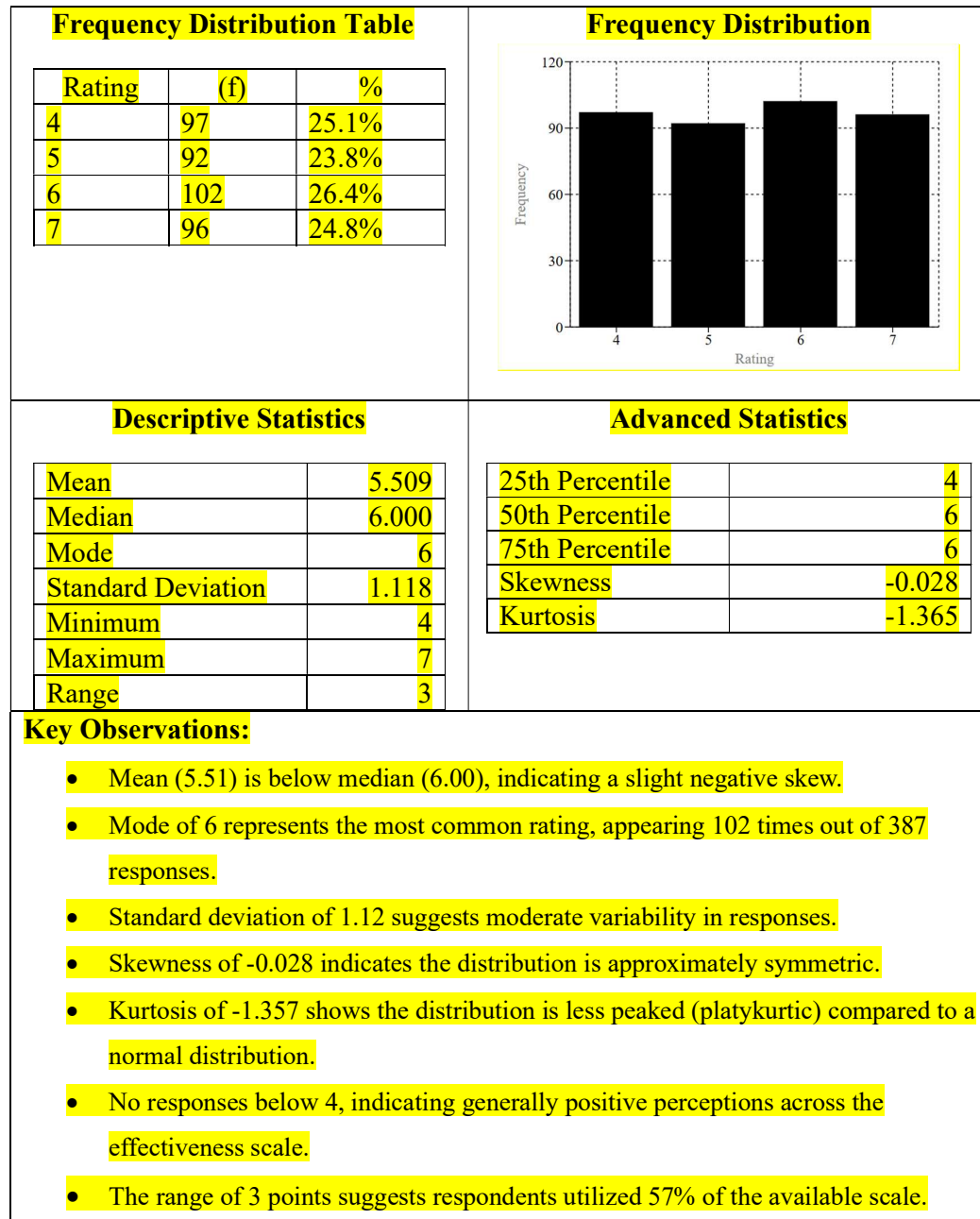


Table: 4.17: Q3.2. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are effective in reducing costs?

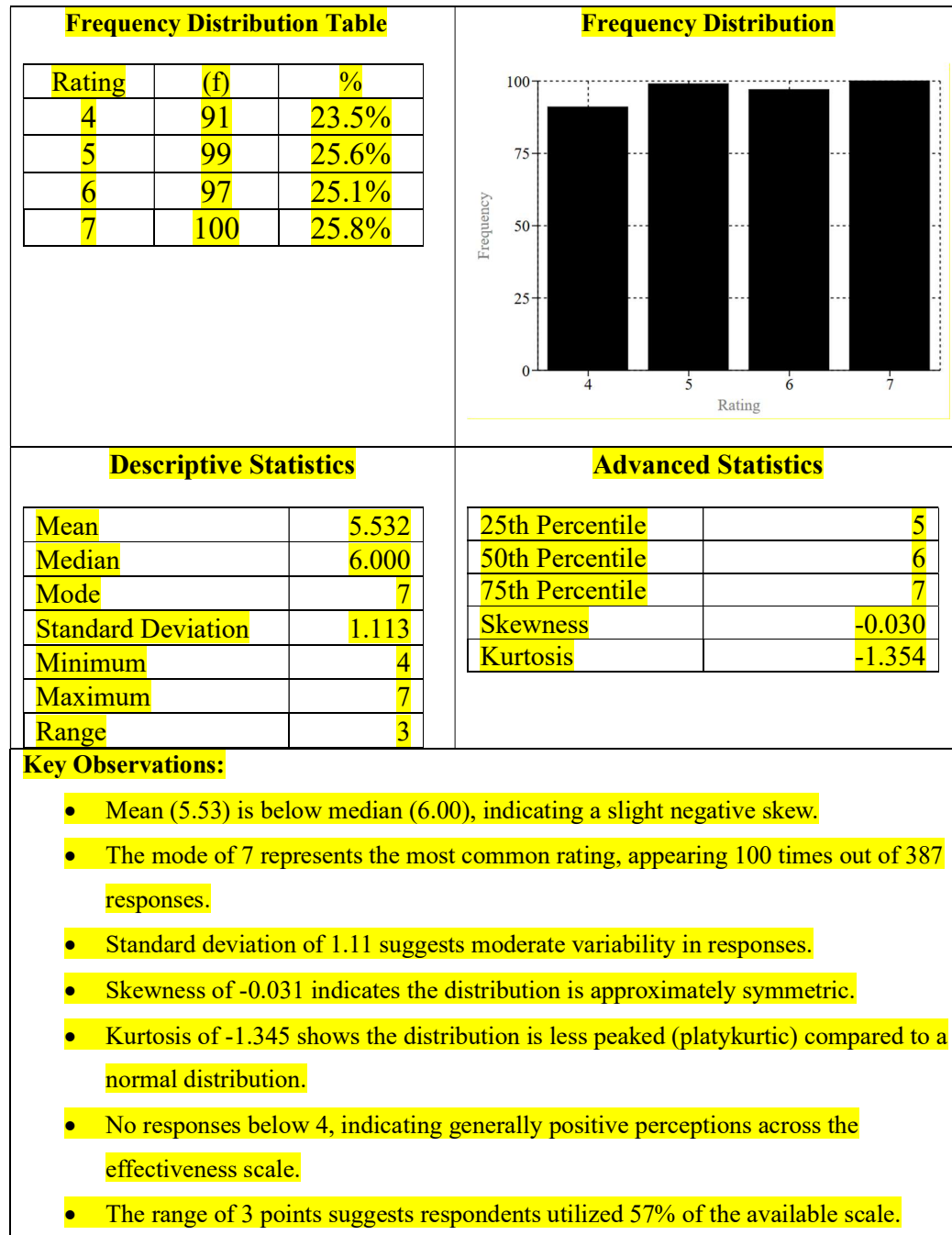


Table: 4.18: Q3.3. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management in creating a positive workplace culture?

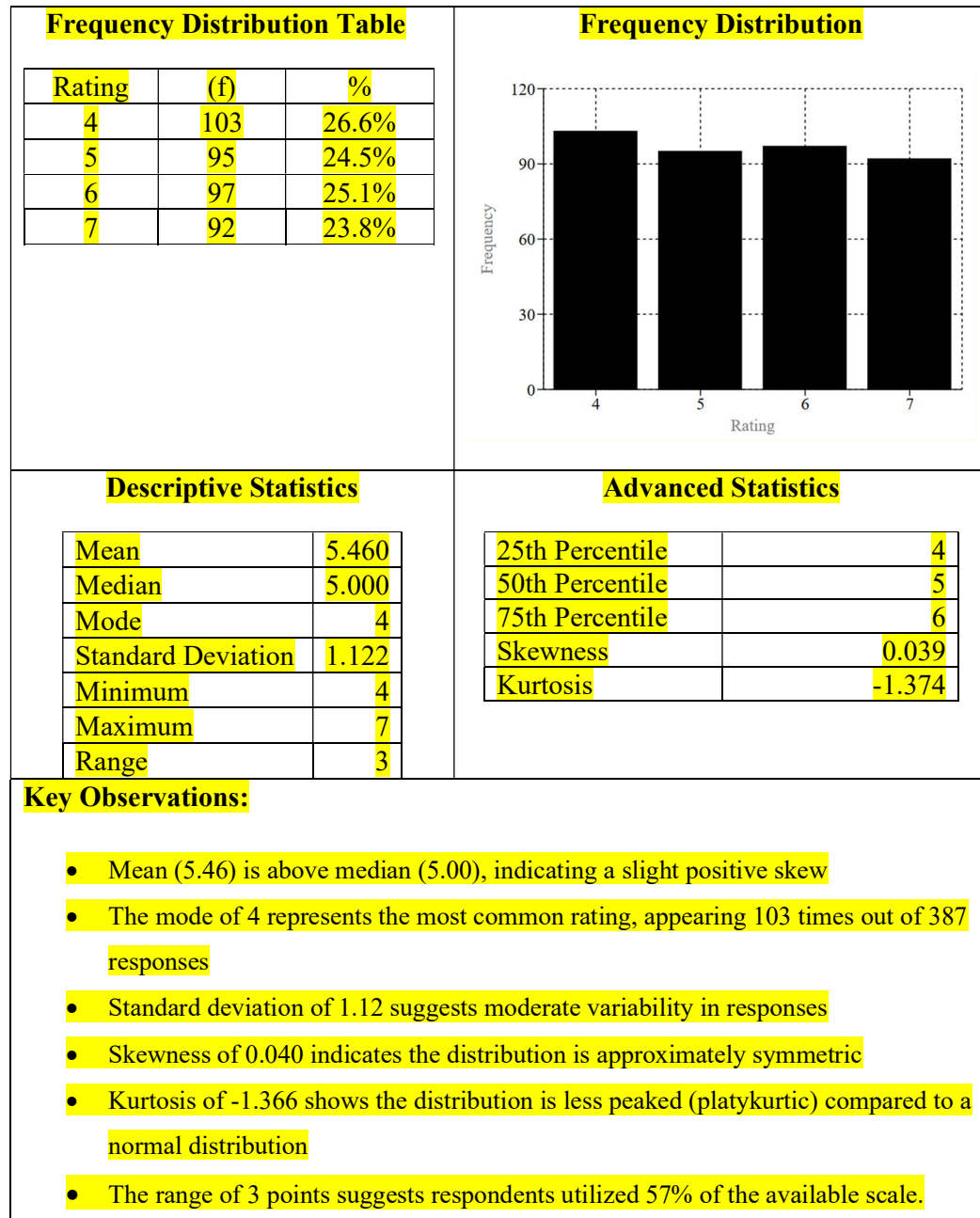


Table: 4.19: Q3.4. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management in enhancing employee productivity?

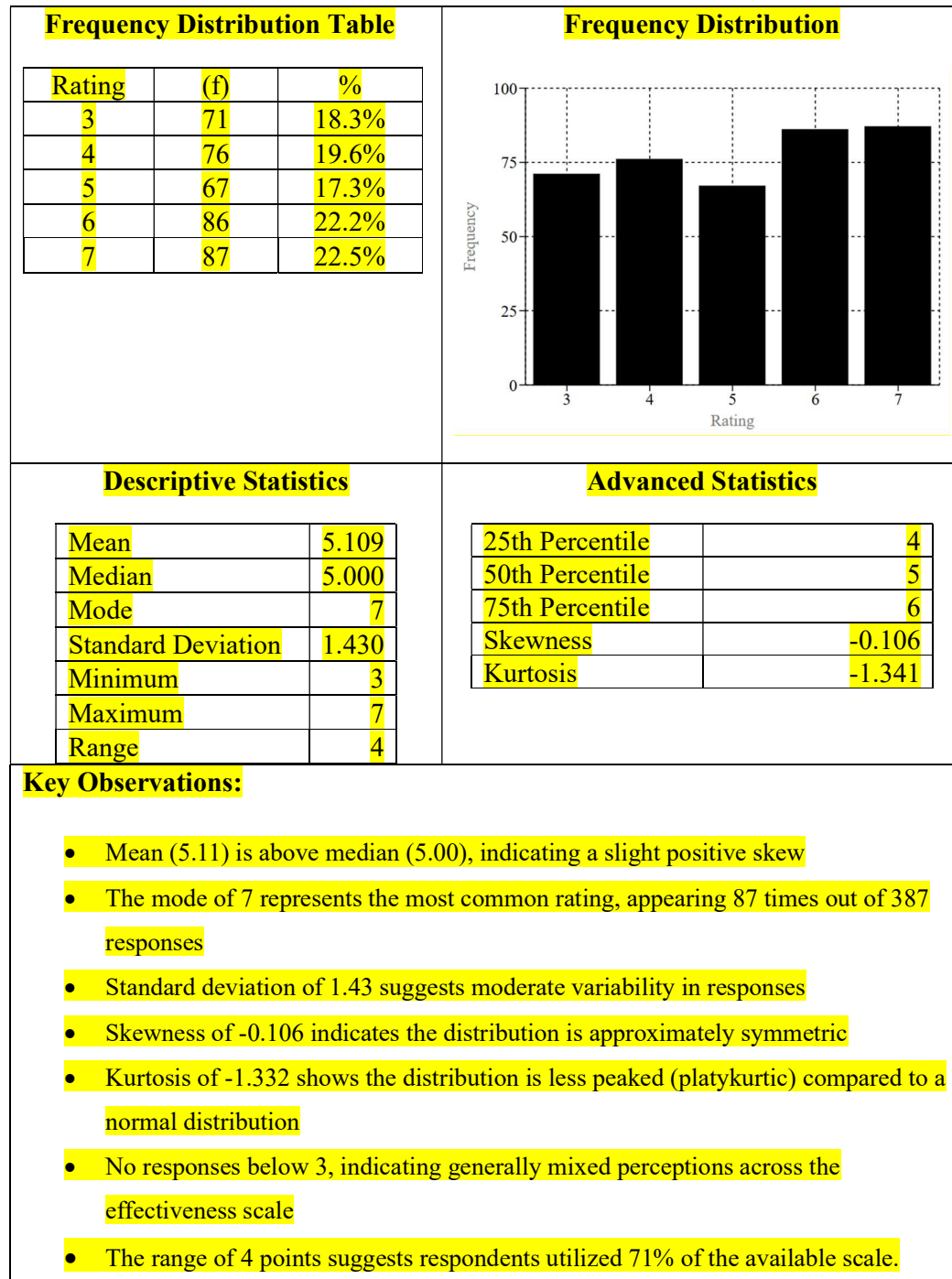


Table: 4.20: Q3.5. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management in attracting and retaining talent?

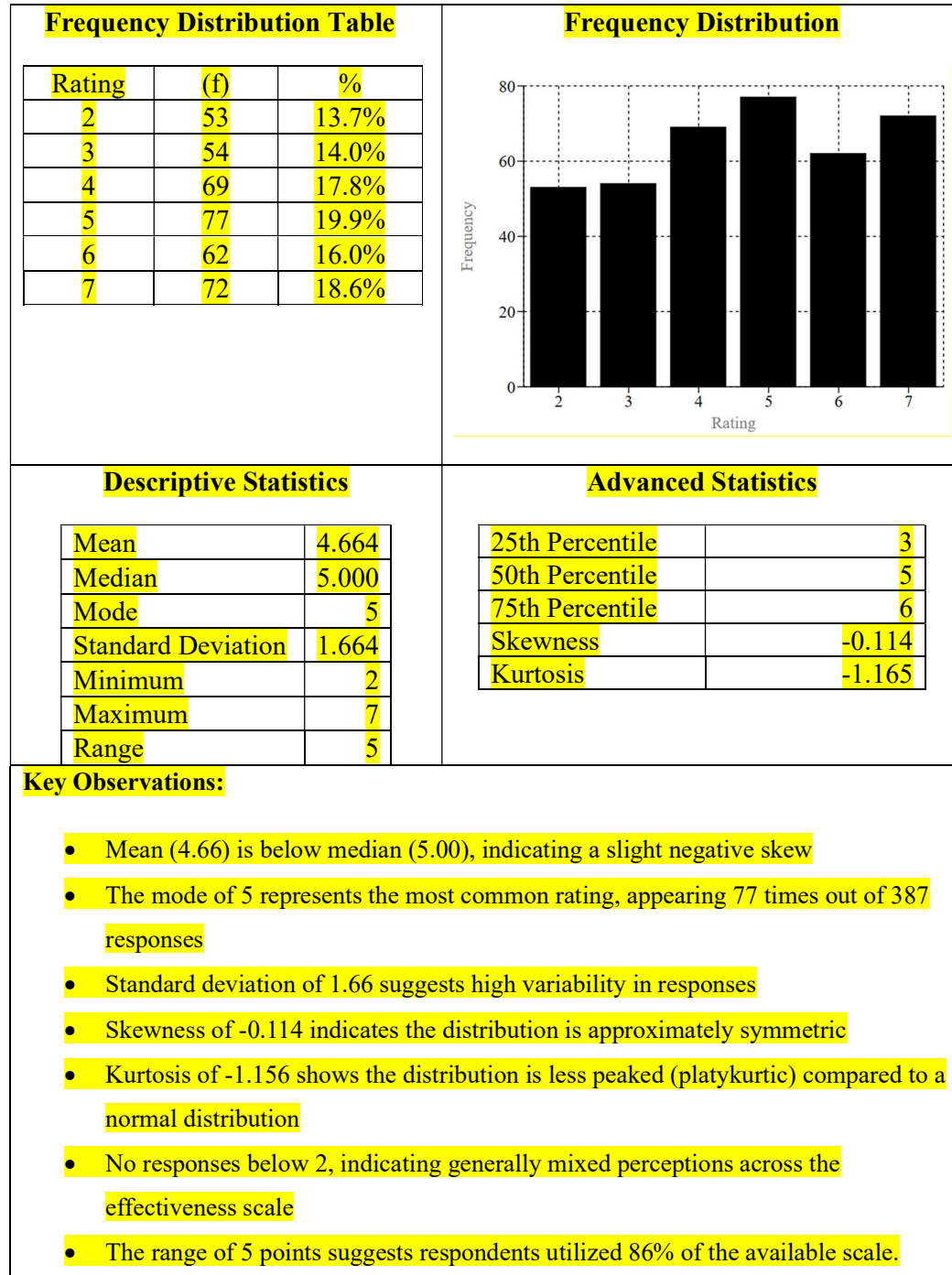


Table: 4.21: Q3.6. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management in promoting collaboration and innovation?

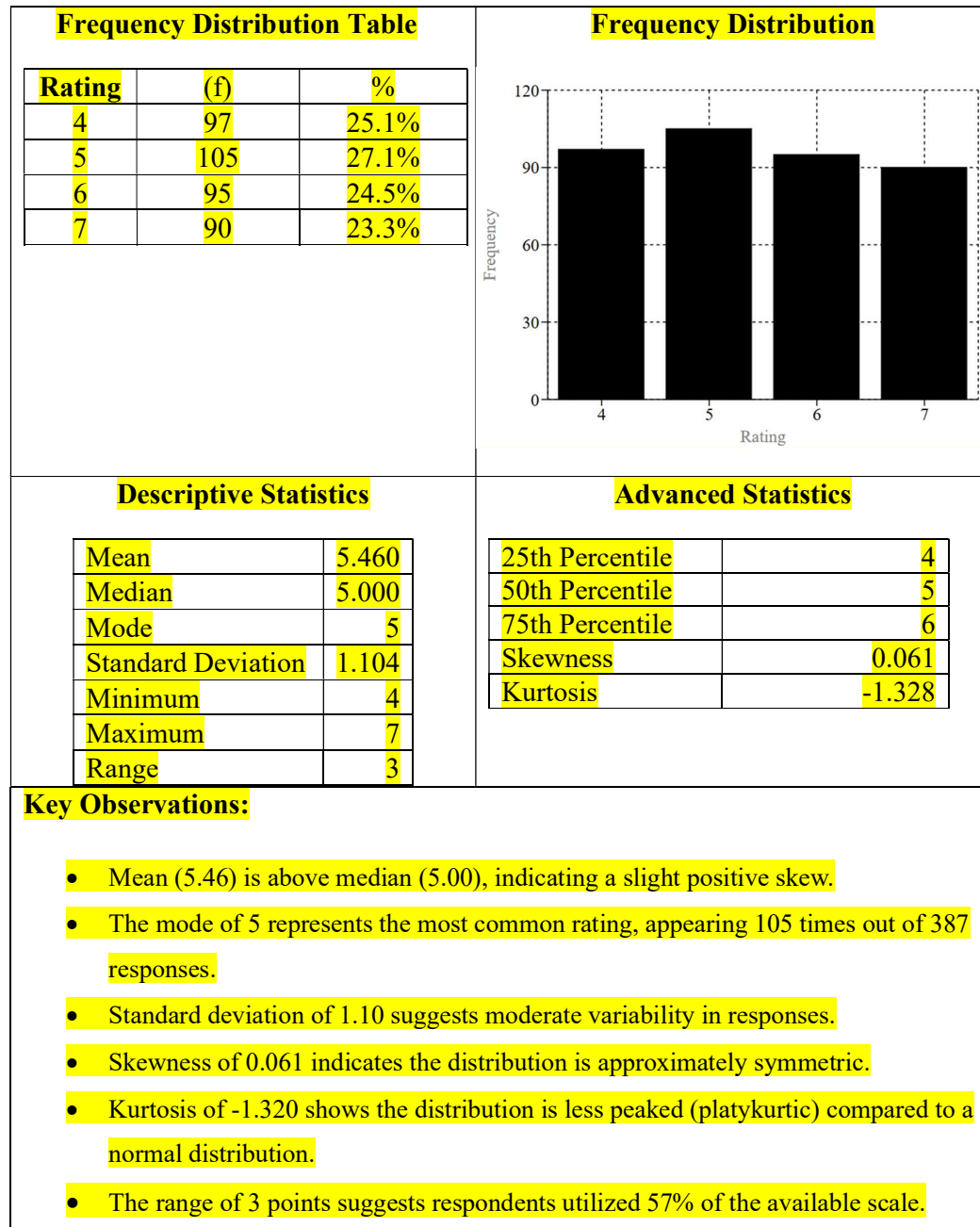


Table: 4.22: Q3.7. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are adaptable to changing business needs?

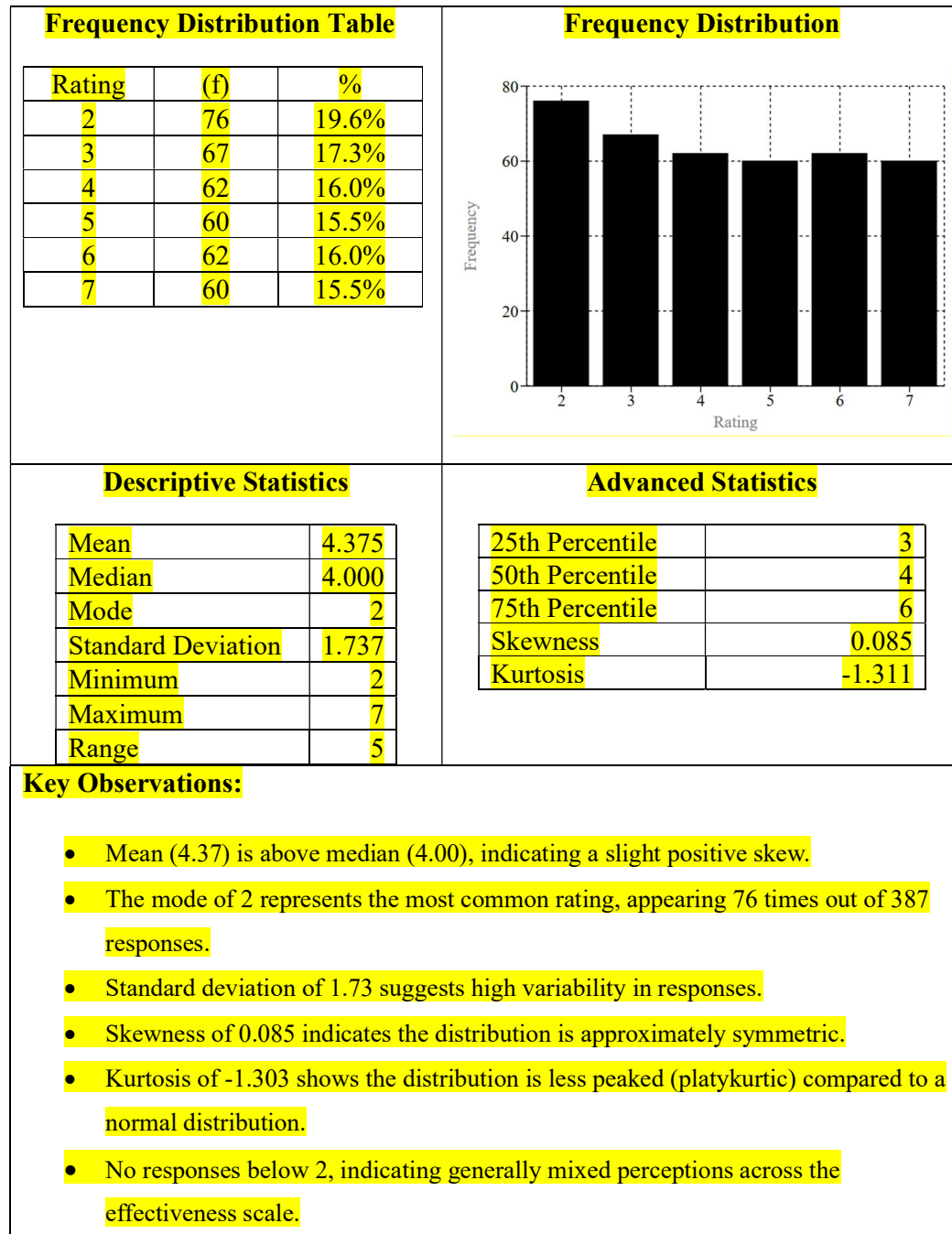


Table: 4.23: Q3.8. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are aligned with company values and mission?

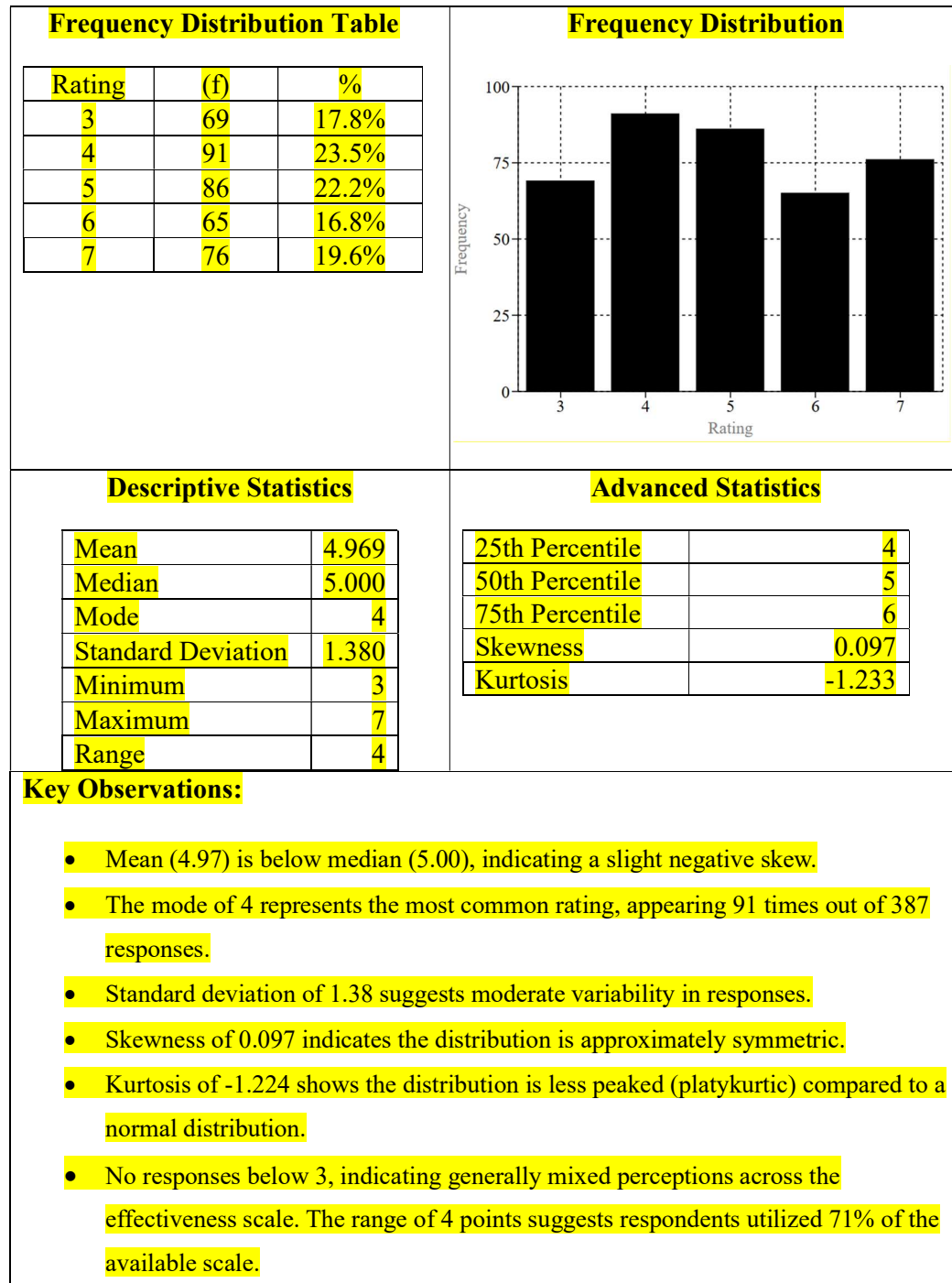


Table: 4.24: Q3.9. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management prioritize sustainability and environmental responsibility?

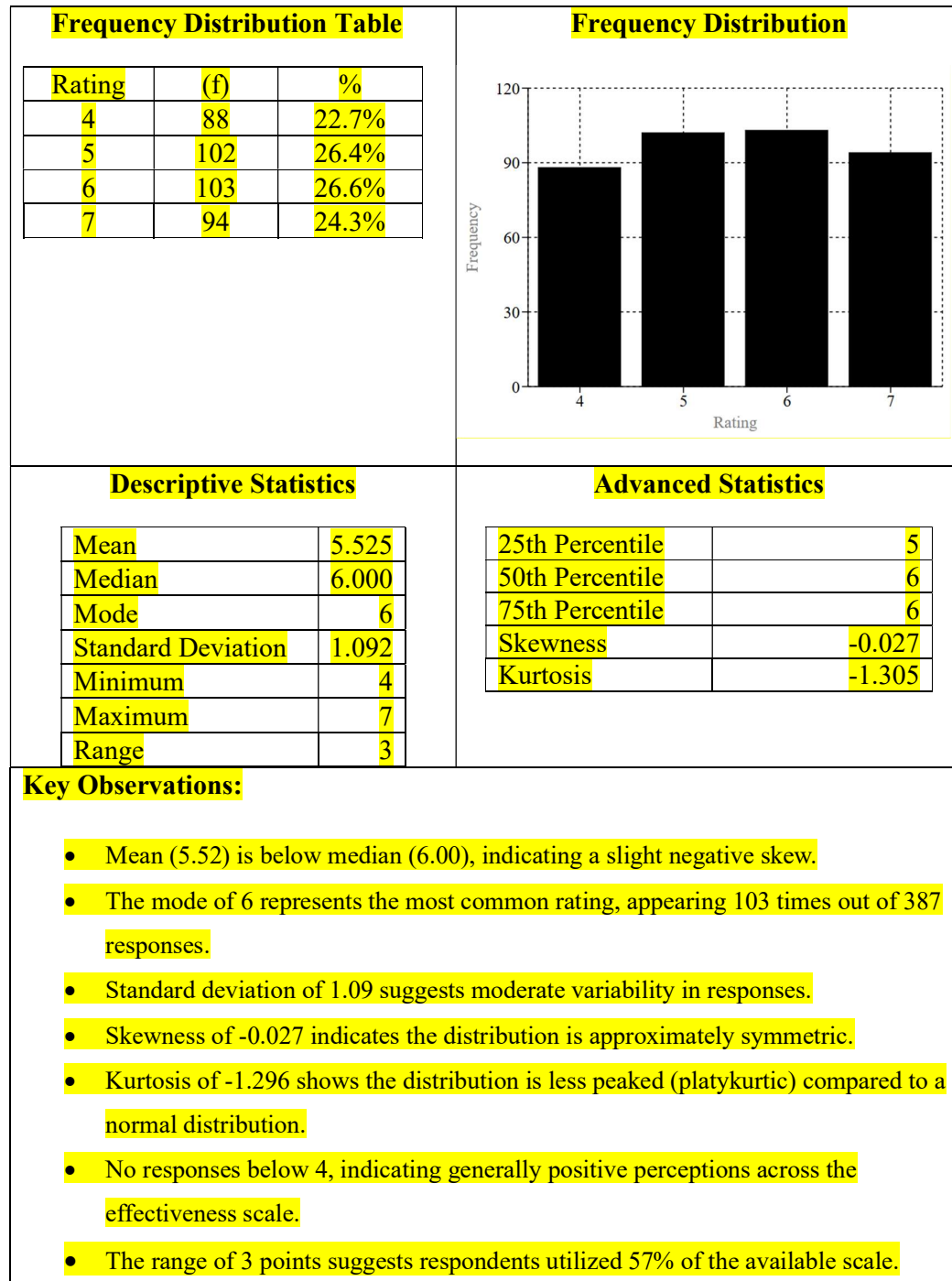


Table: 4.25: Q3.10. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are compliant with relevant regulations and standards?

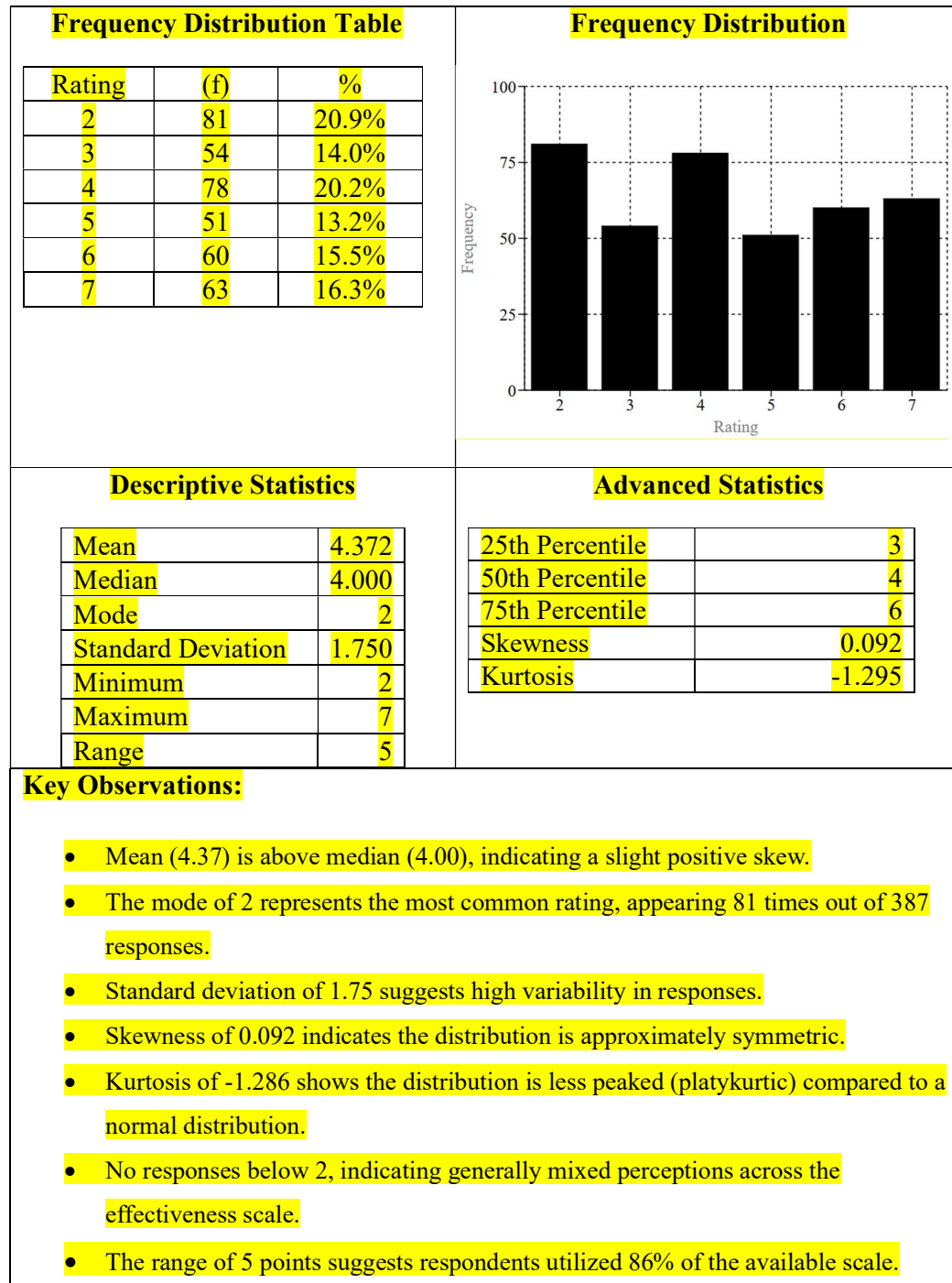


Table: 4.26: Q3.11. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management take into account the needs and preferences of different generations of employees?

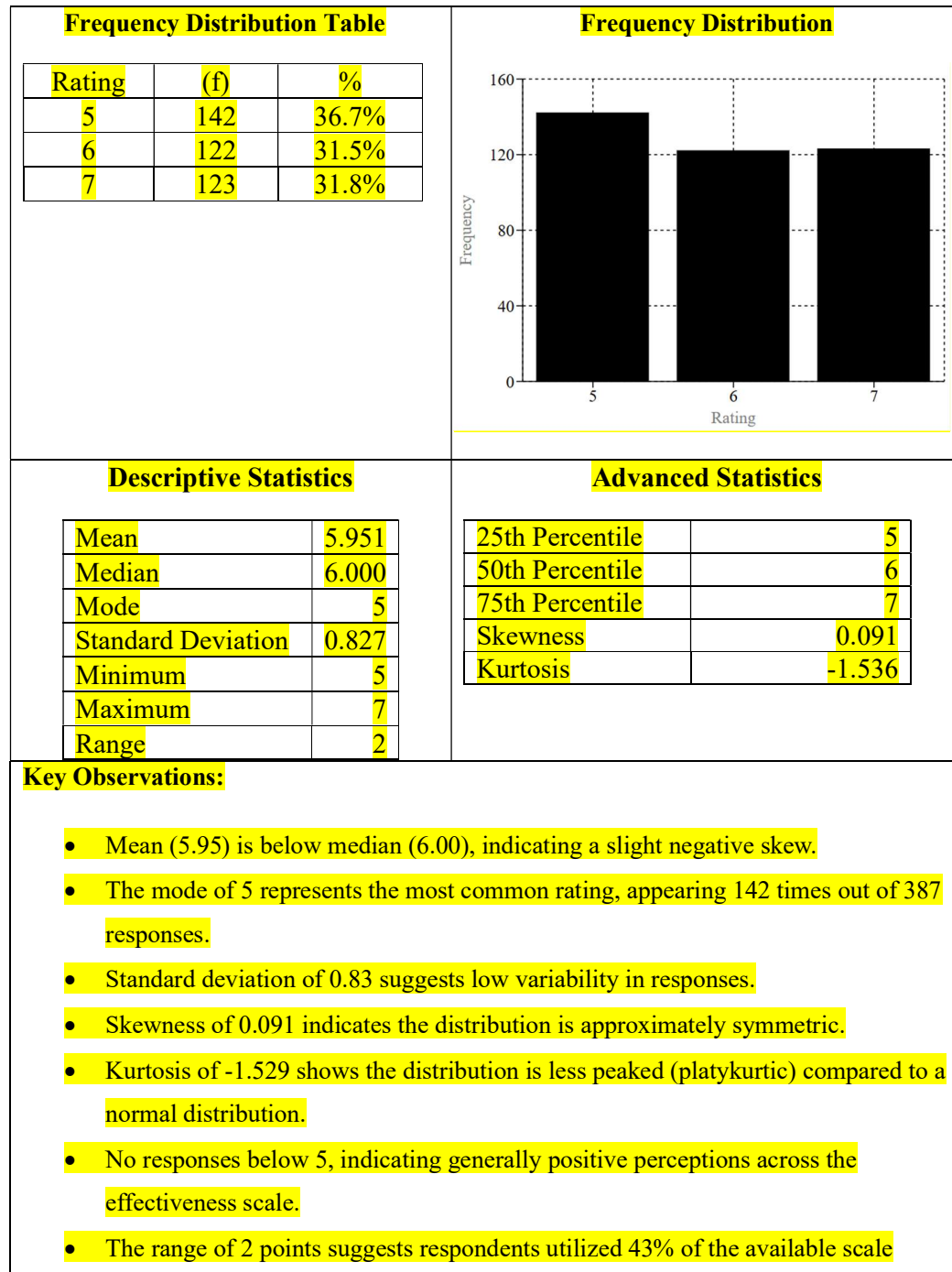


Table: 4.27: Q3.12. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are transparent and accountable?

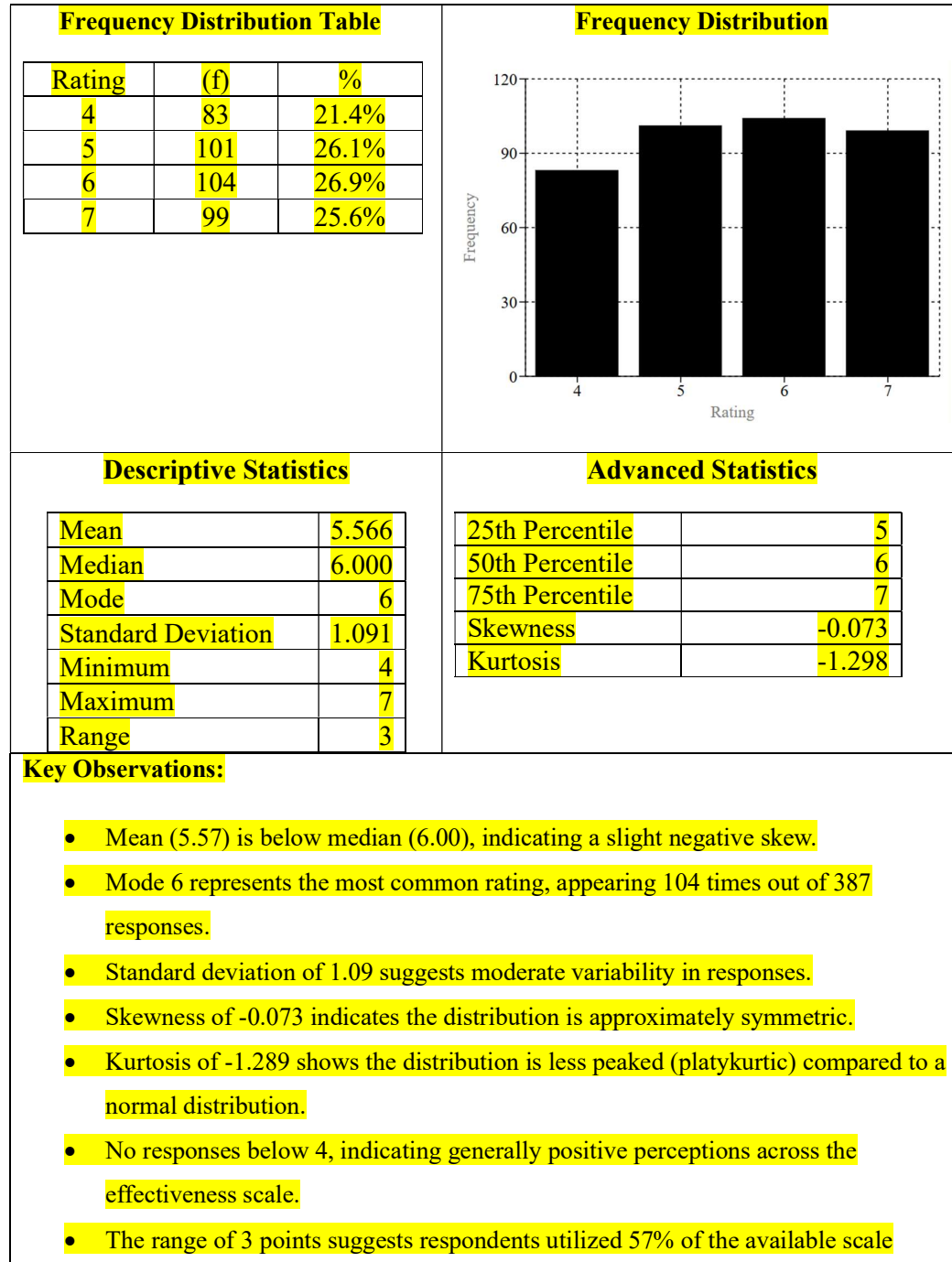


Table: 4.28: Q3.13. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management effectively manage risk?

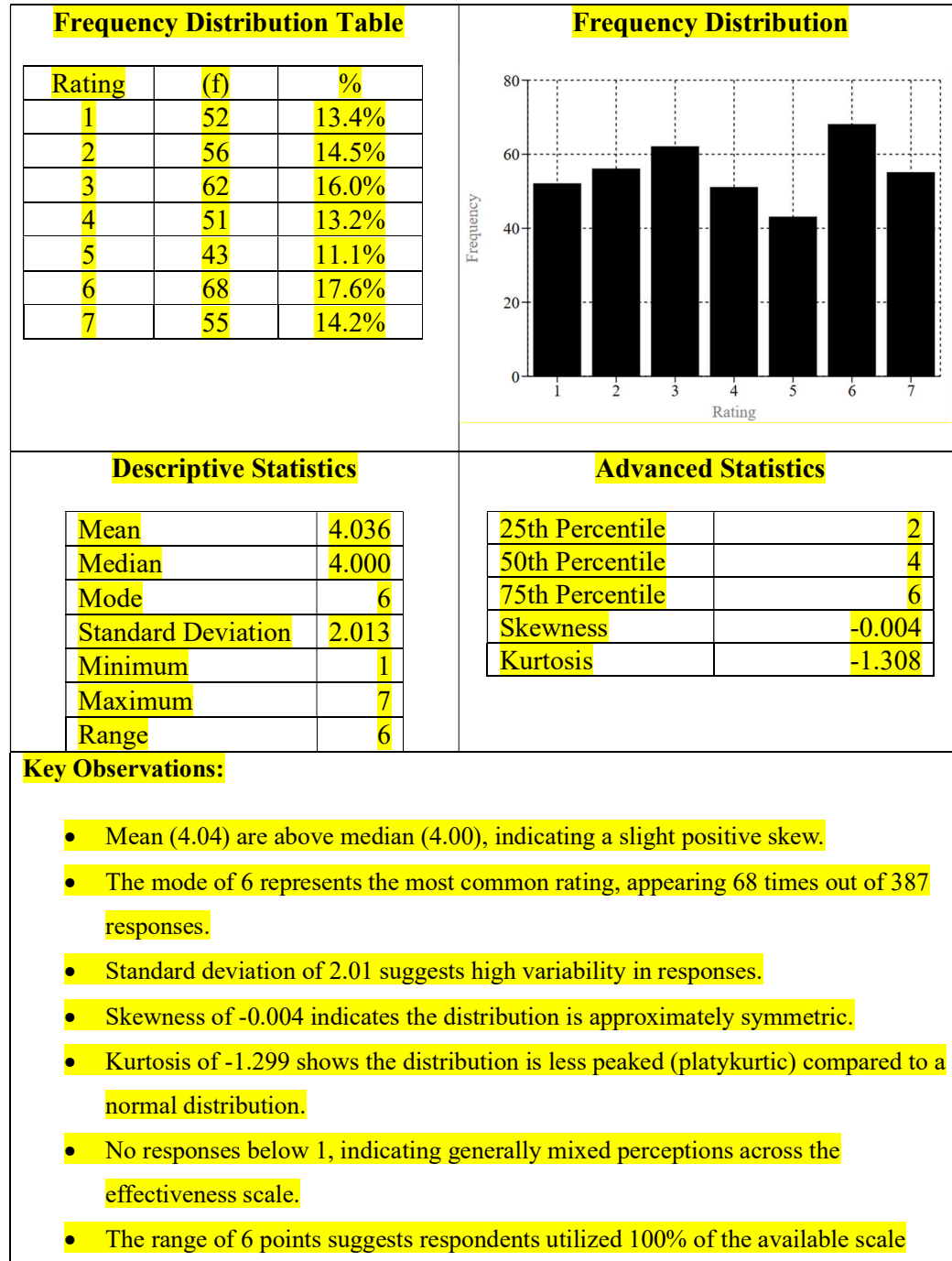


Table: 4.29: Q3.14. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are flexible and responsive to unexpected events?

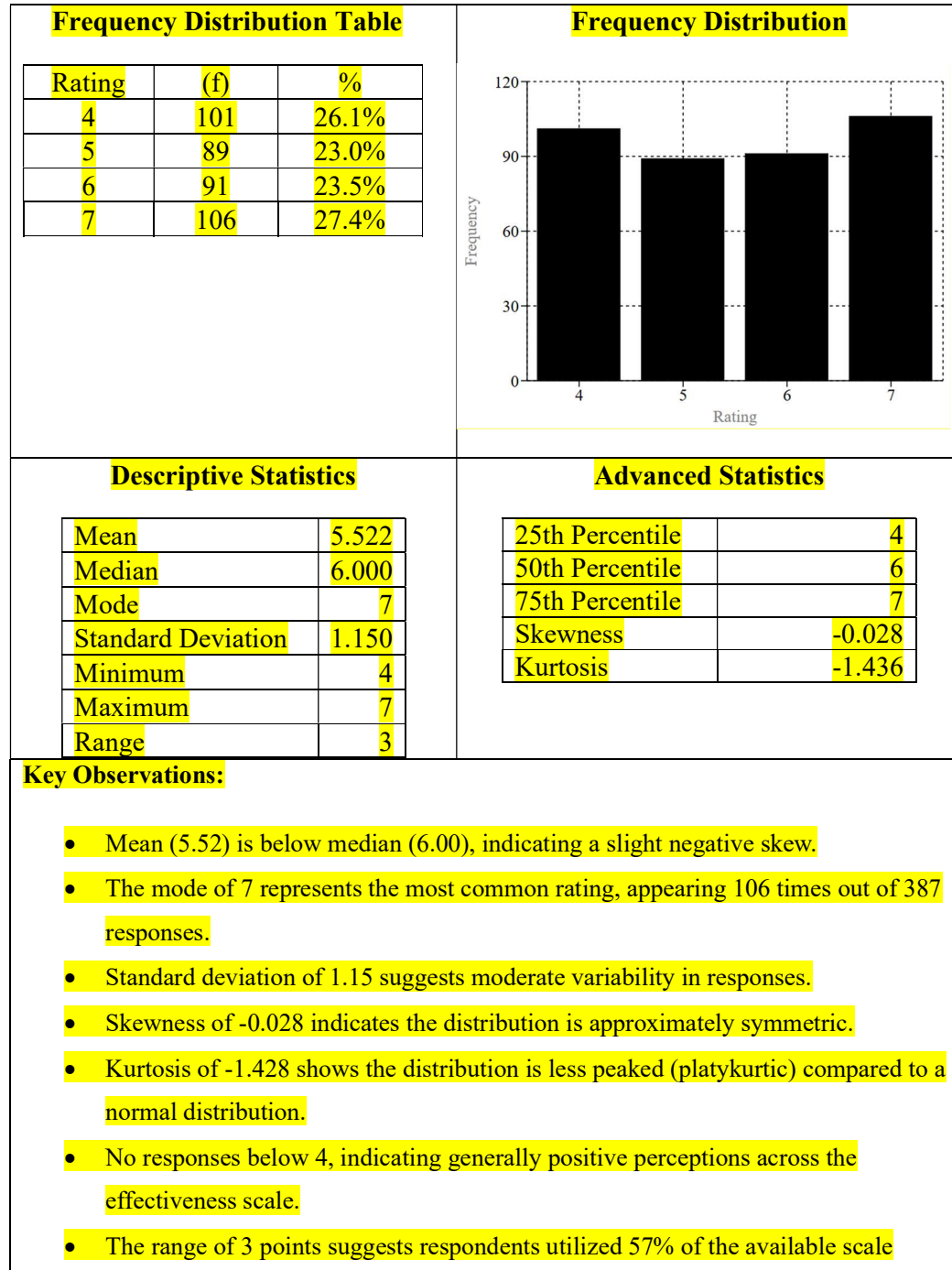


Table: 4.30: Q3.15. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are effective in managing remote and hybrid work arrangements?

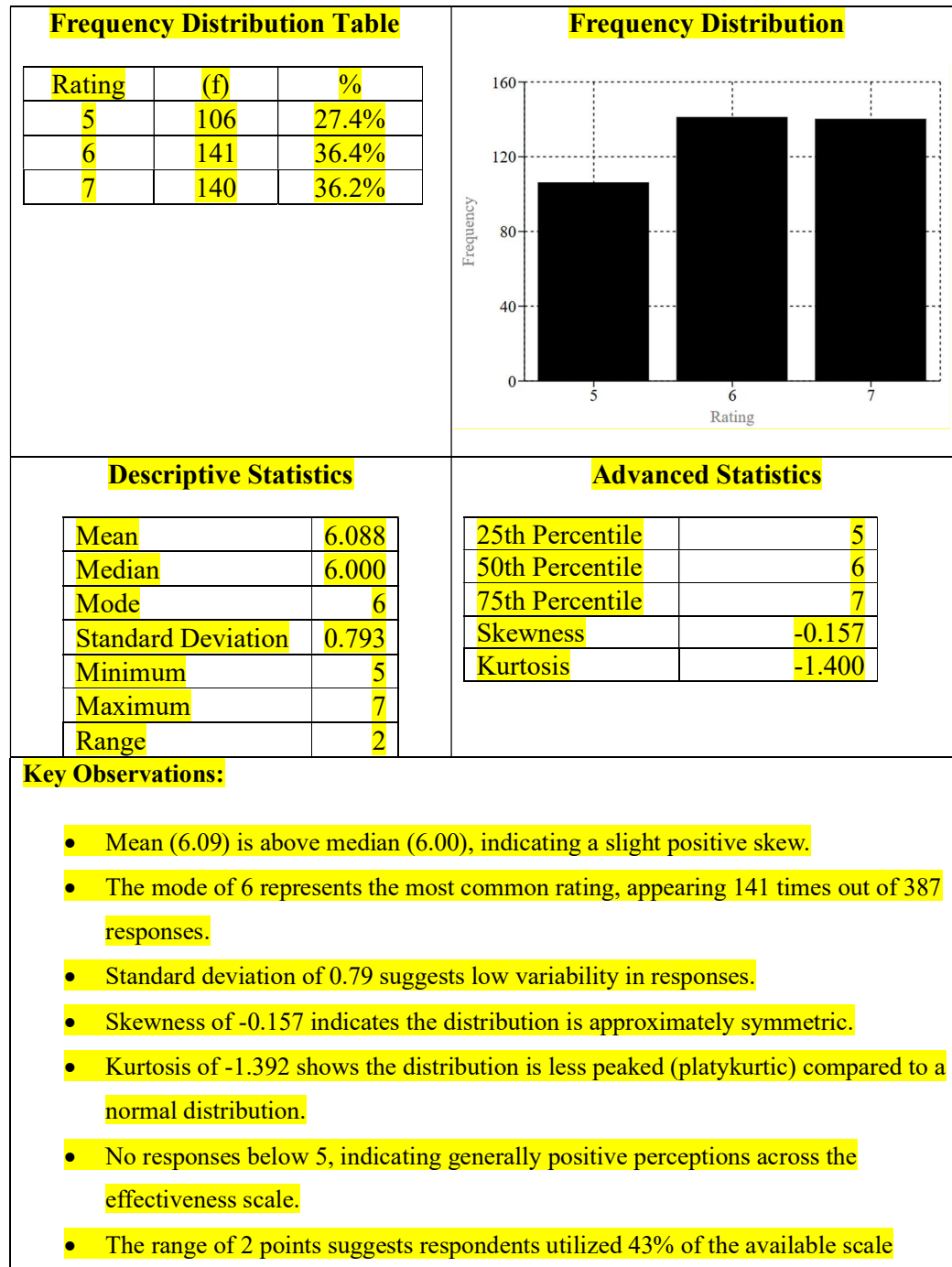


Table: 4.31: Q3.16. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management have applications in place for employee well-being and mental health?

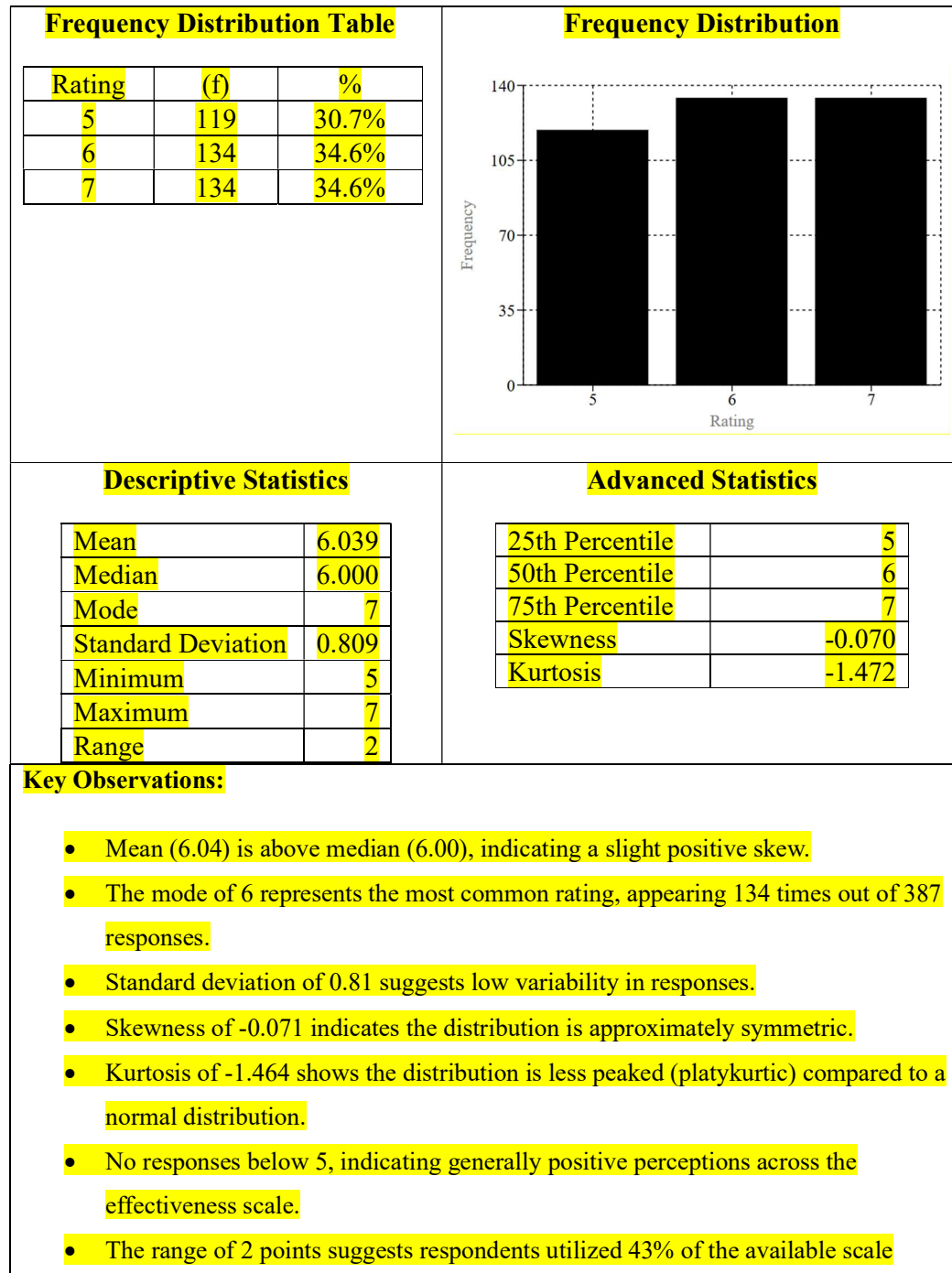


Table: 4.32: Q3.17. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management prioritize employee well-being and mental health?

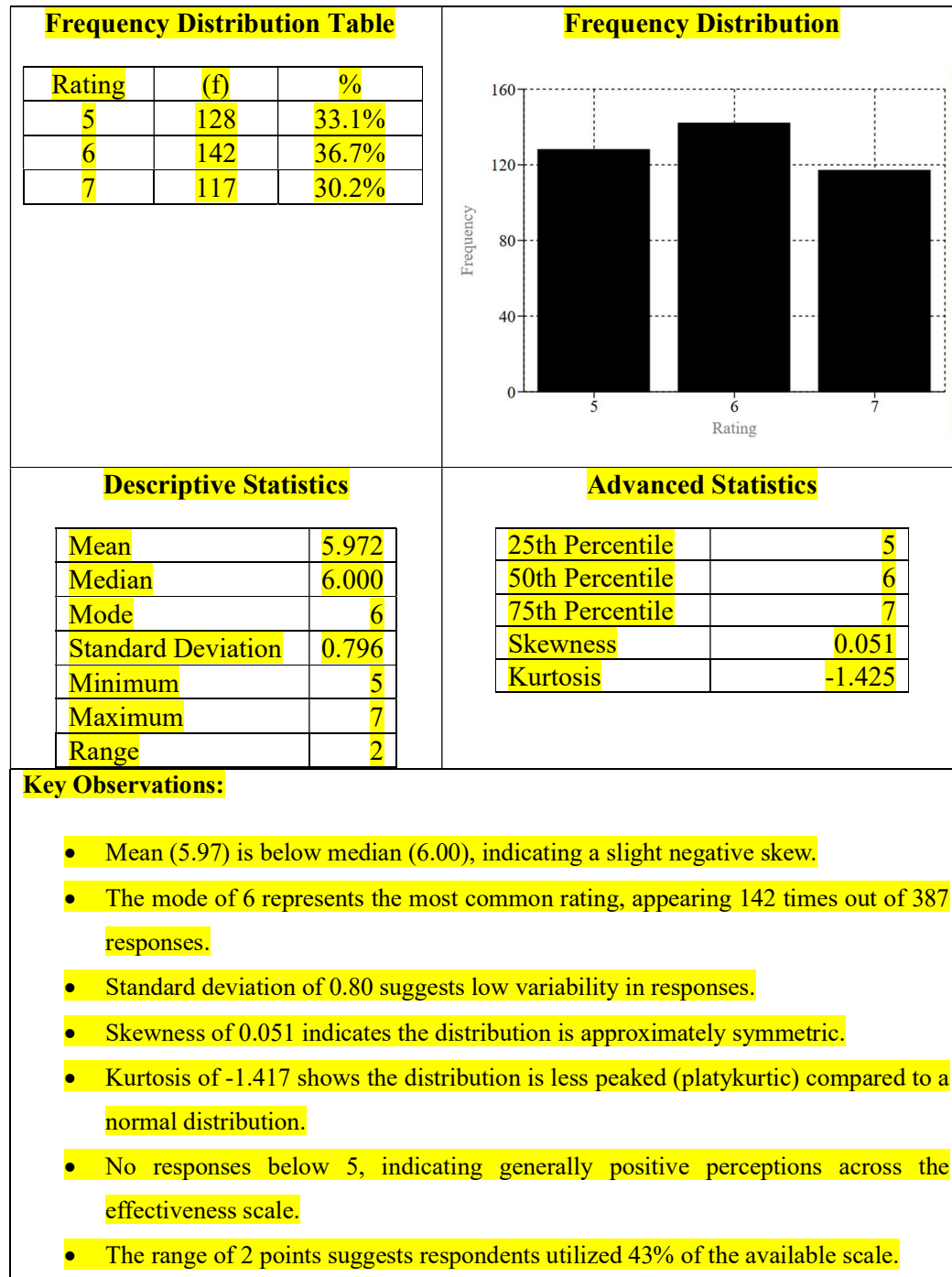


Table: 4.33: Q3.18. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management have technology easily accessible to promote diversity, equity, and inclusion?

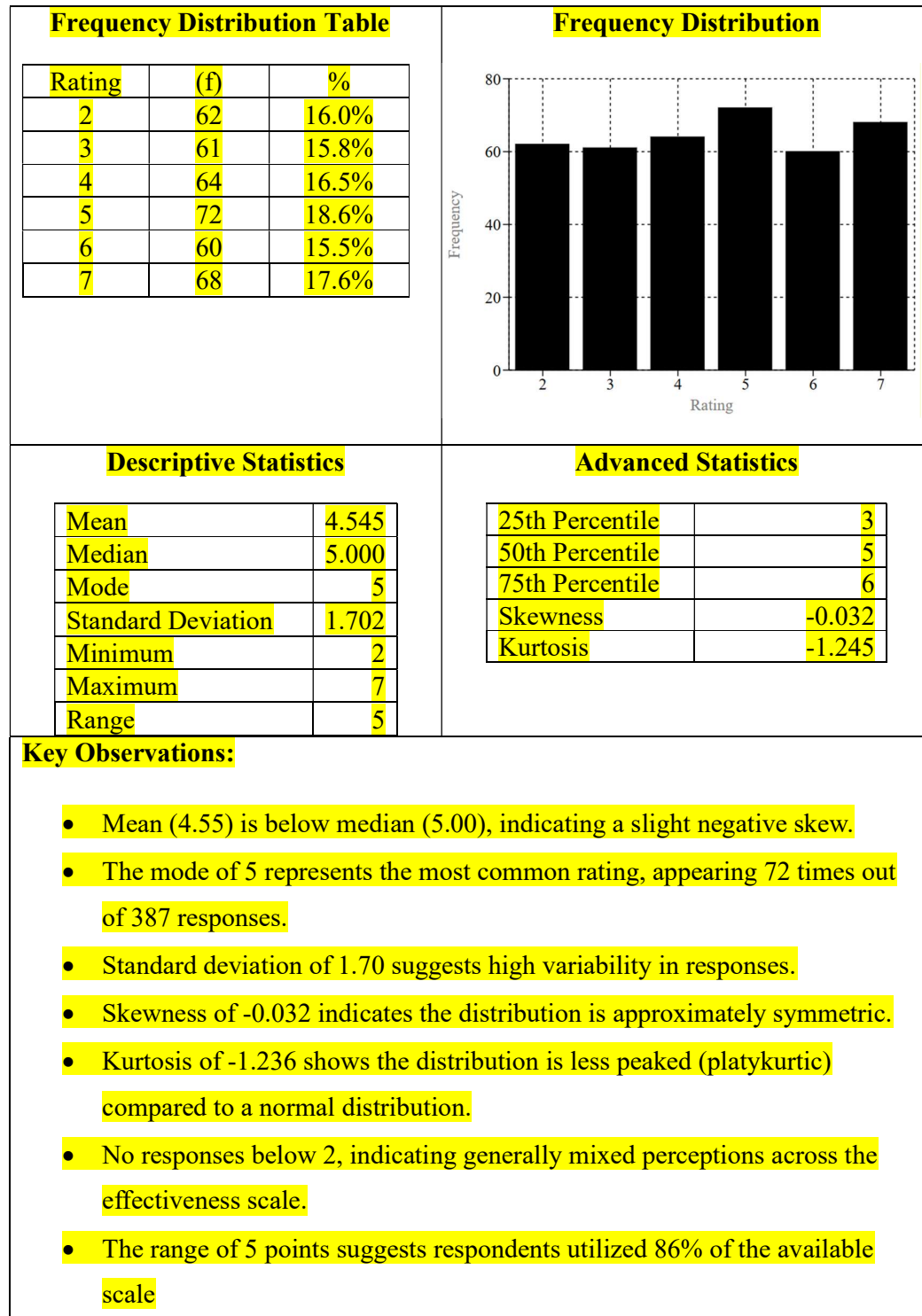


Table: 4.34: Q3.19. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management promote diversity, equity, and inclusion?

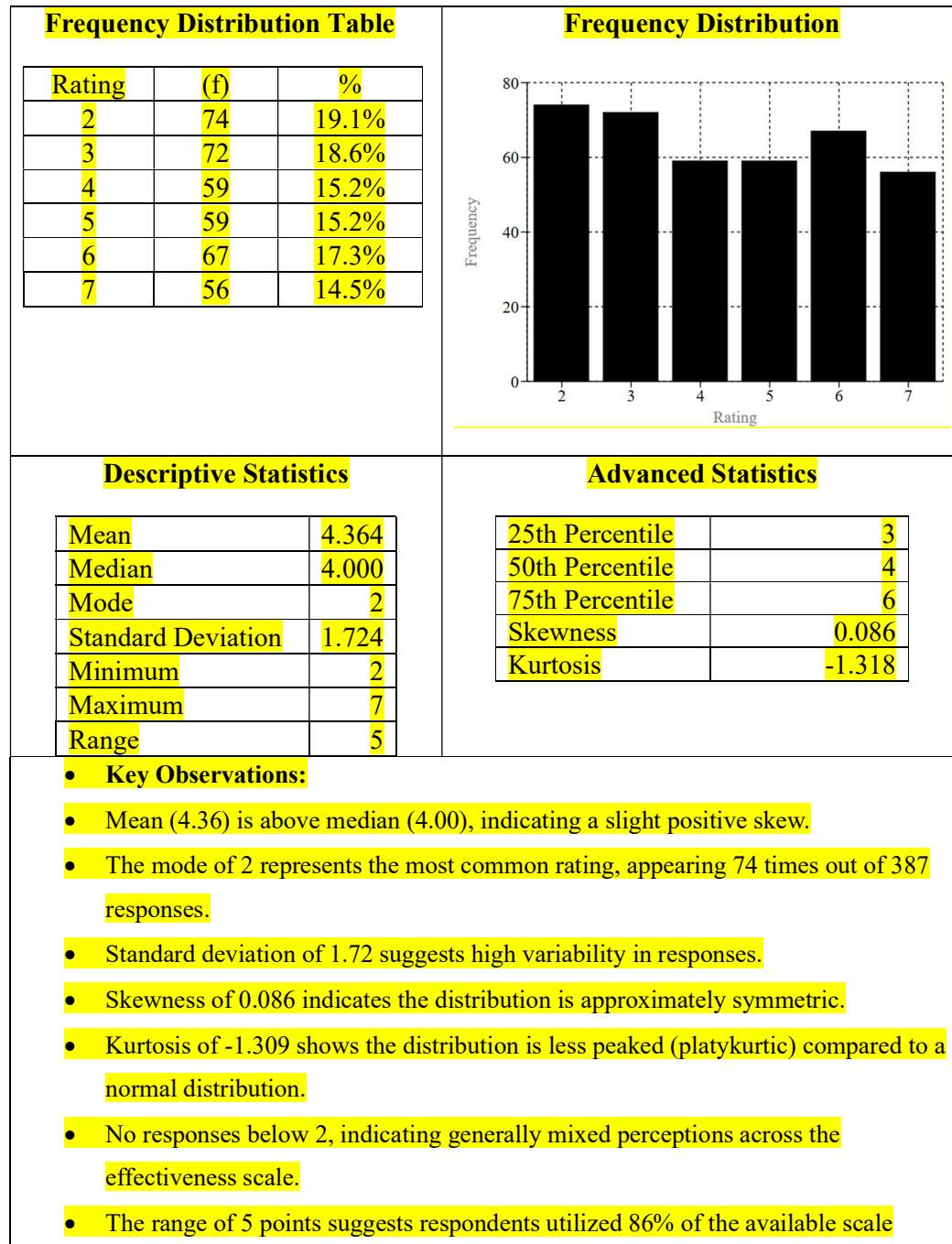


Table: 4.35: Q3.20. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management effectively use technology to enhance workplace experience?

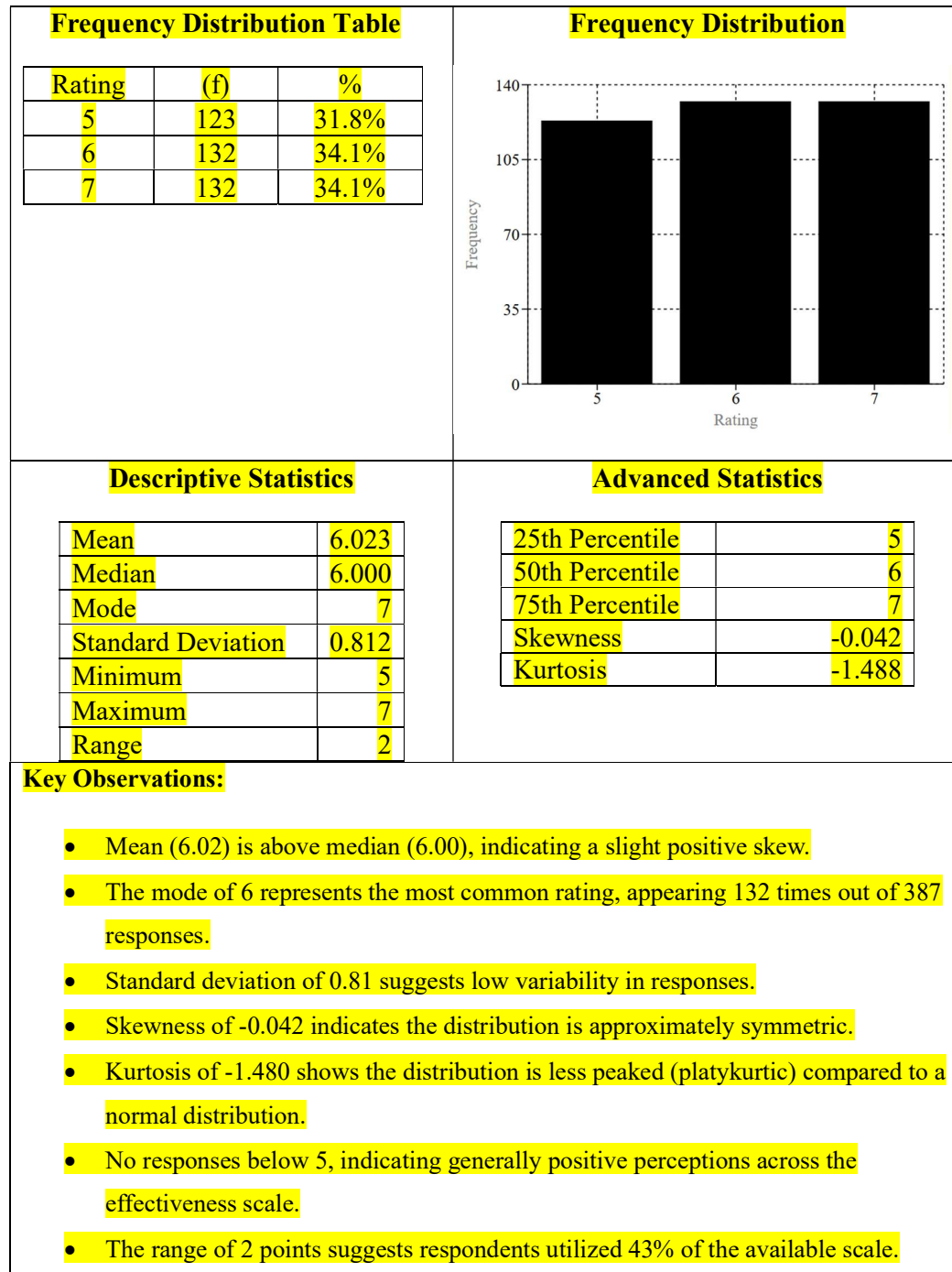


Table: 4.36: Q3.21. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management effectively balance the needs of different stakeholders, such as employees, shareholders and customers?

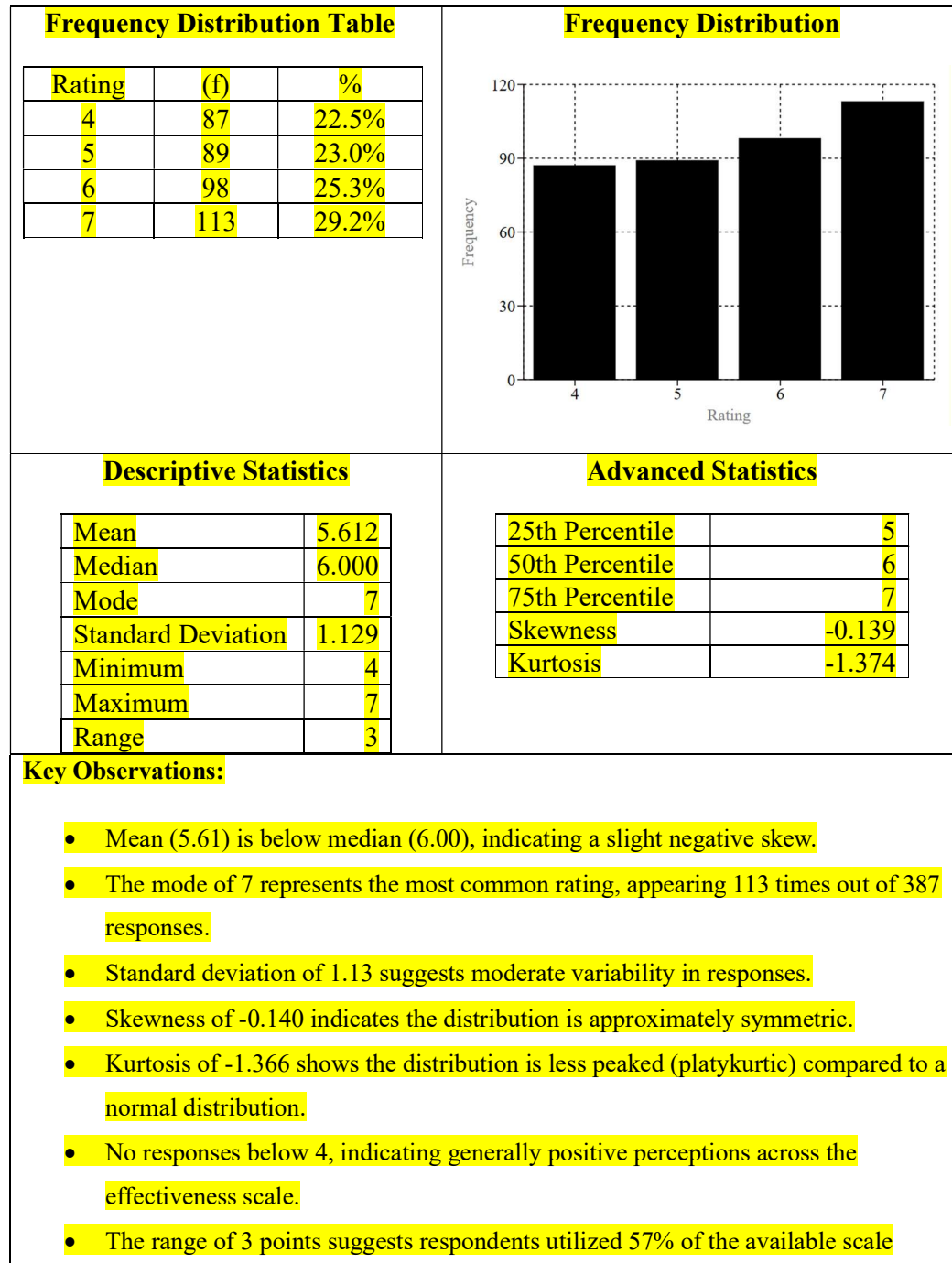


Table: 4.37: Q3.22. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are innovative and forward-thinking?

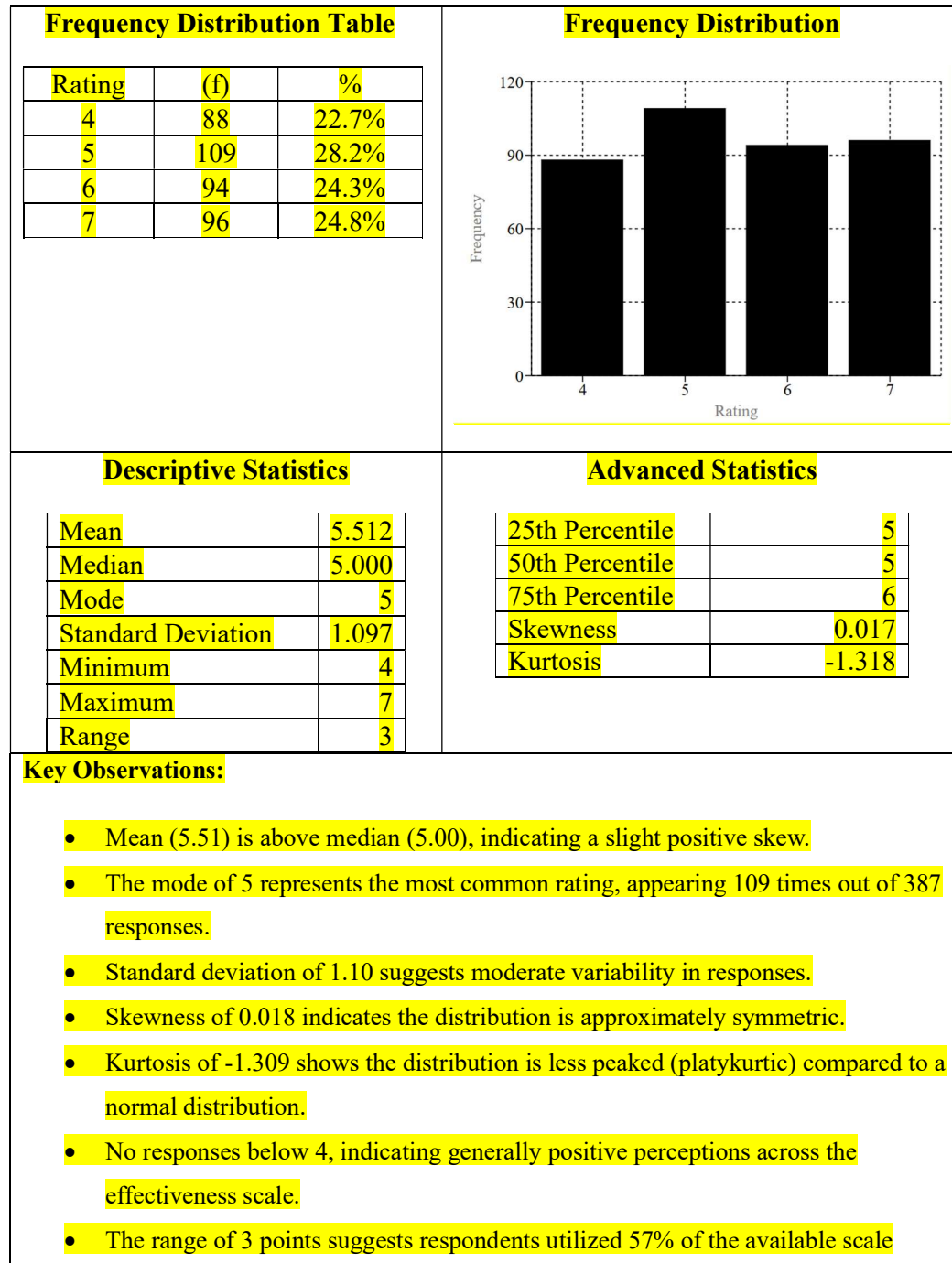


Table: 4.38: Q3.23. How relevant do you think the new business framework for Corporate Real Estate is to the current market trends and demands?

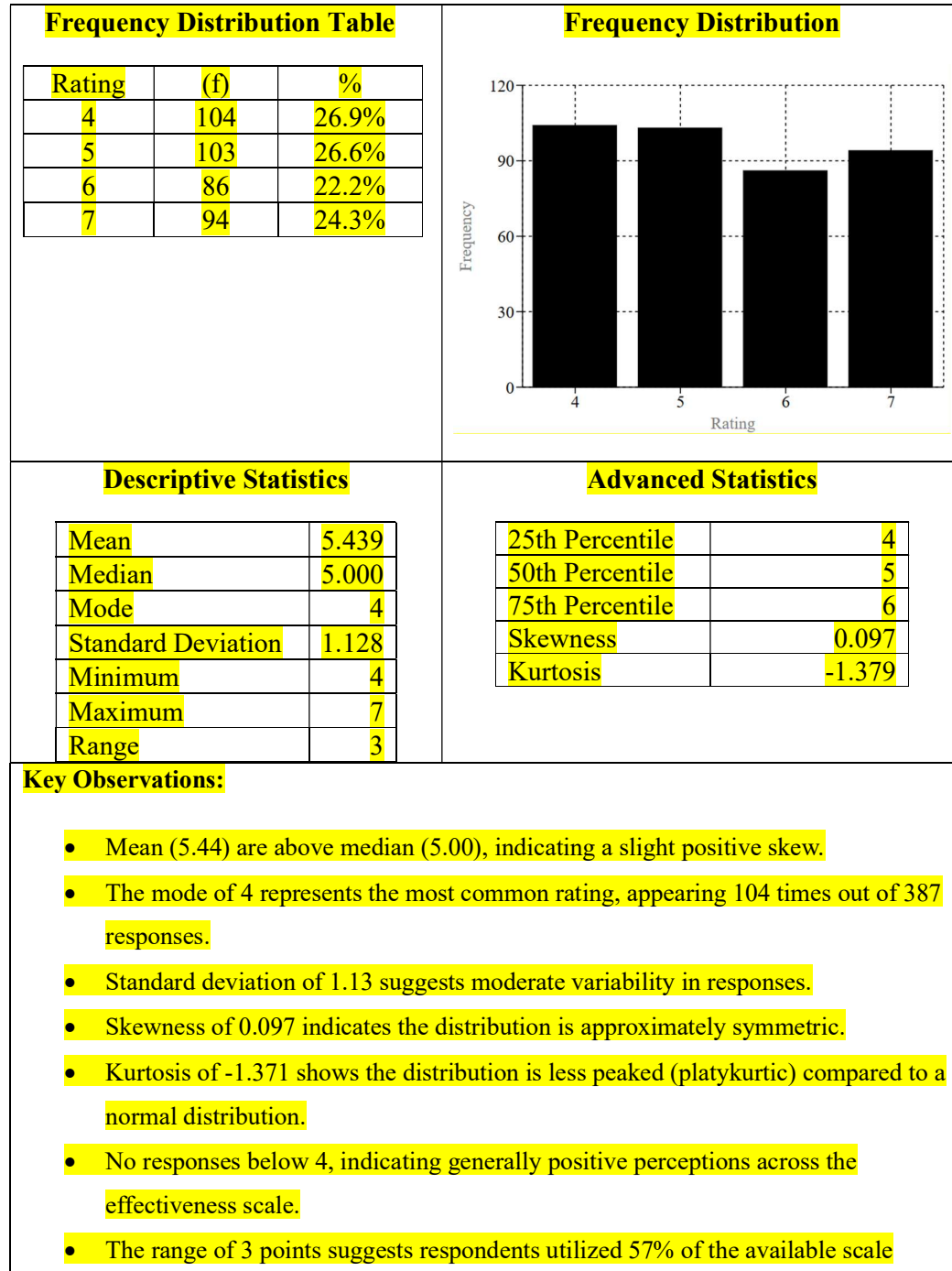


Table: 4.39: Q3.24. How likely are you to adopt the new business framework for Corporate Real Estate in your organization?

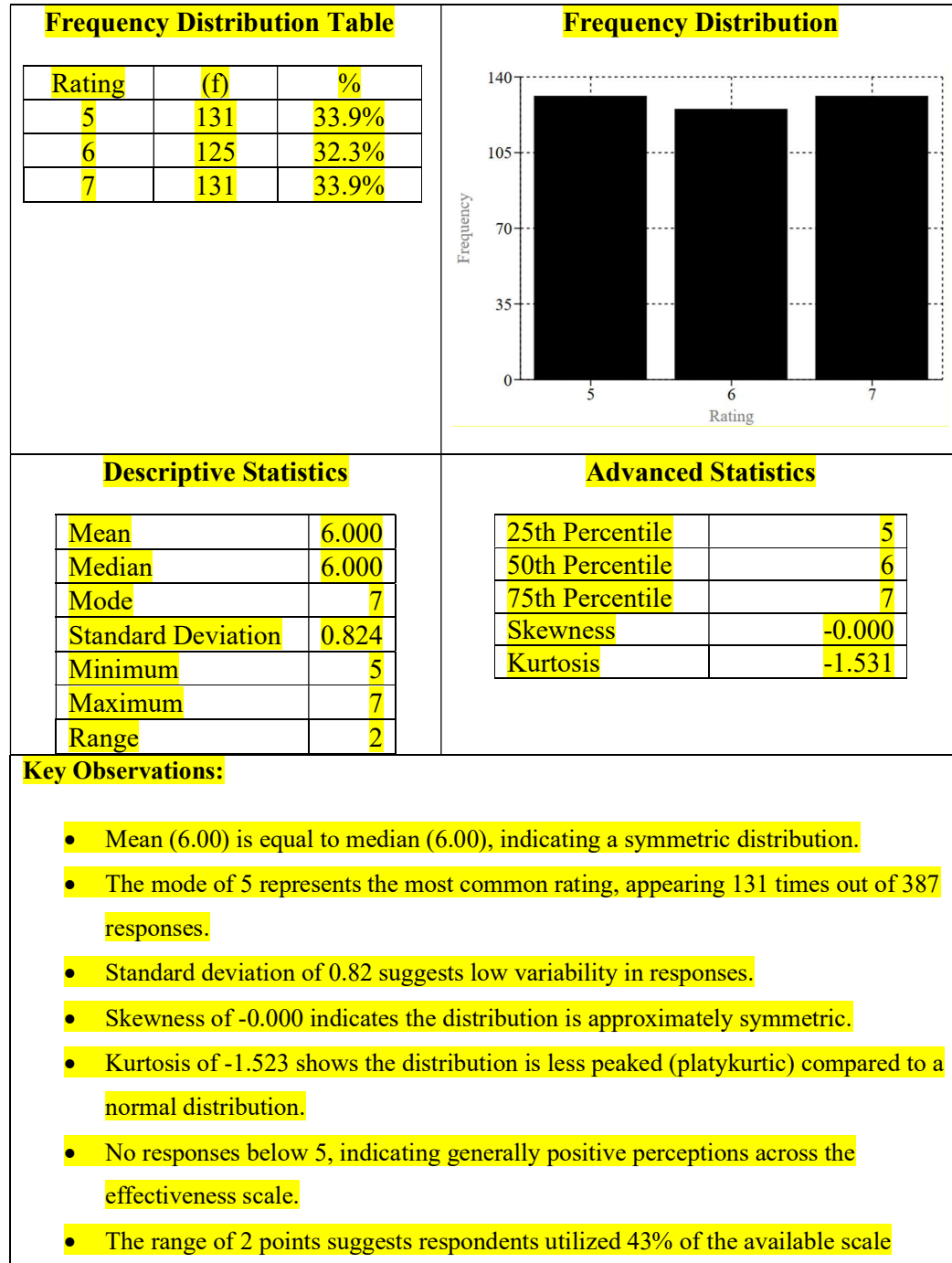


Table: 4.40: Q3.25. How likely are you to recommend the new business framework for Corporate Real Estate to other organizations in your industry?

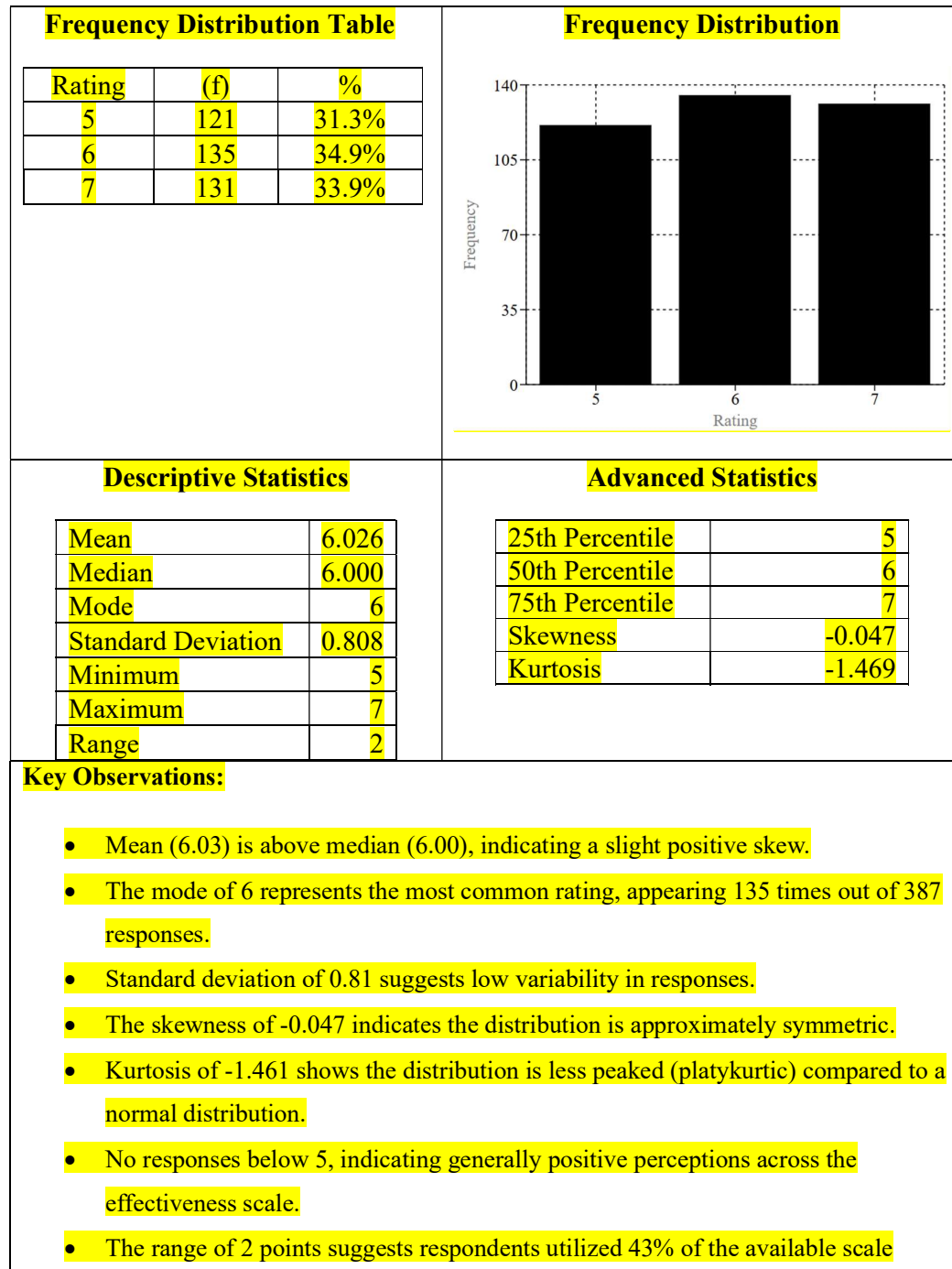


Table: 4.41: Q3.26. In your opinion, what are the most important factors to consider when developing a successful corporate real estate and space management strategy?

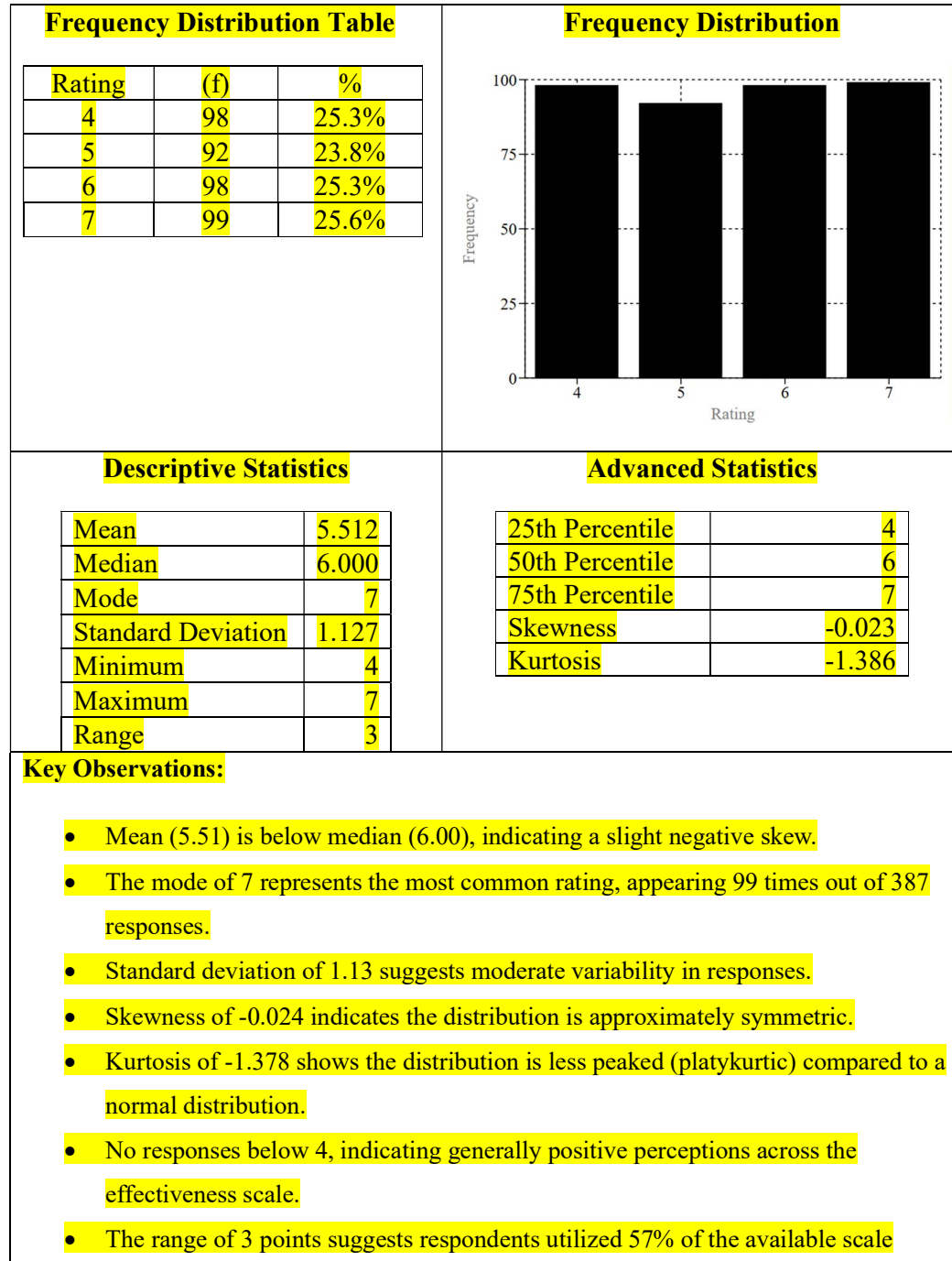


Table: 4.42: Q3.27. Is there anything else you would like to share about your experience with corporate real estate and space management framework?

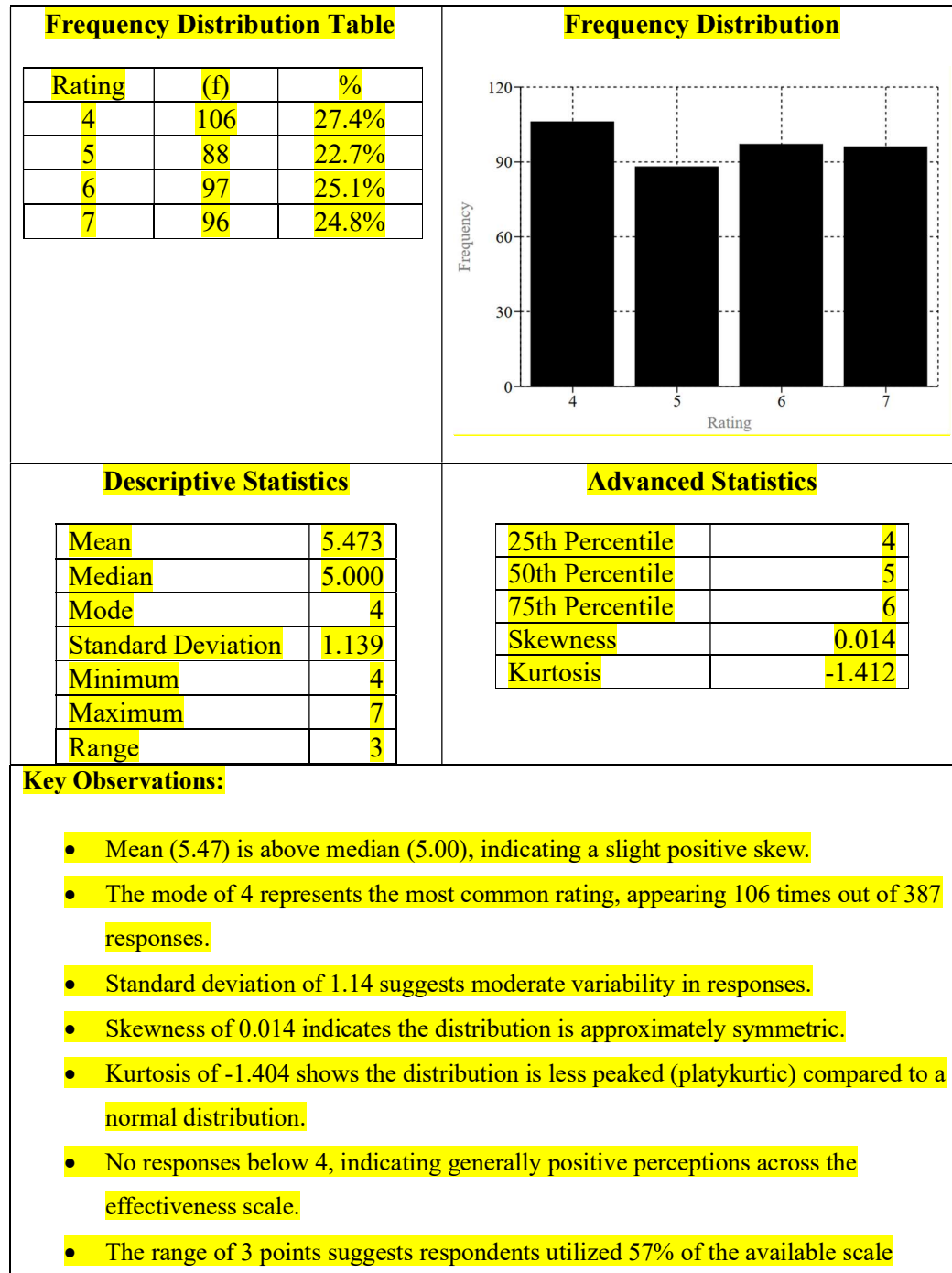


Table: 4.43: Q4.1. To what extent do you believe the new business framework for Corporate Real Estate will enhance overall business performance?

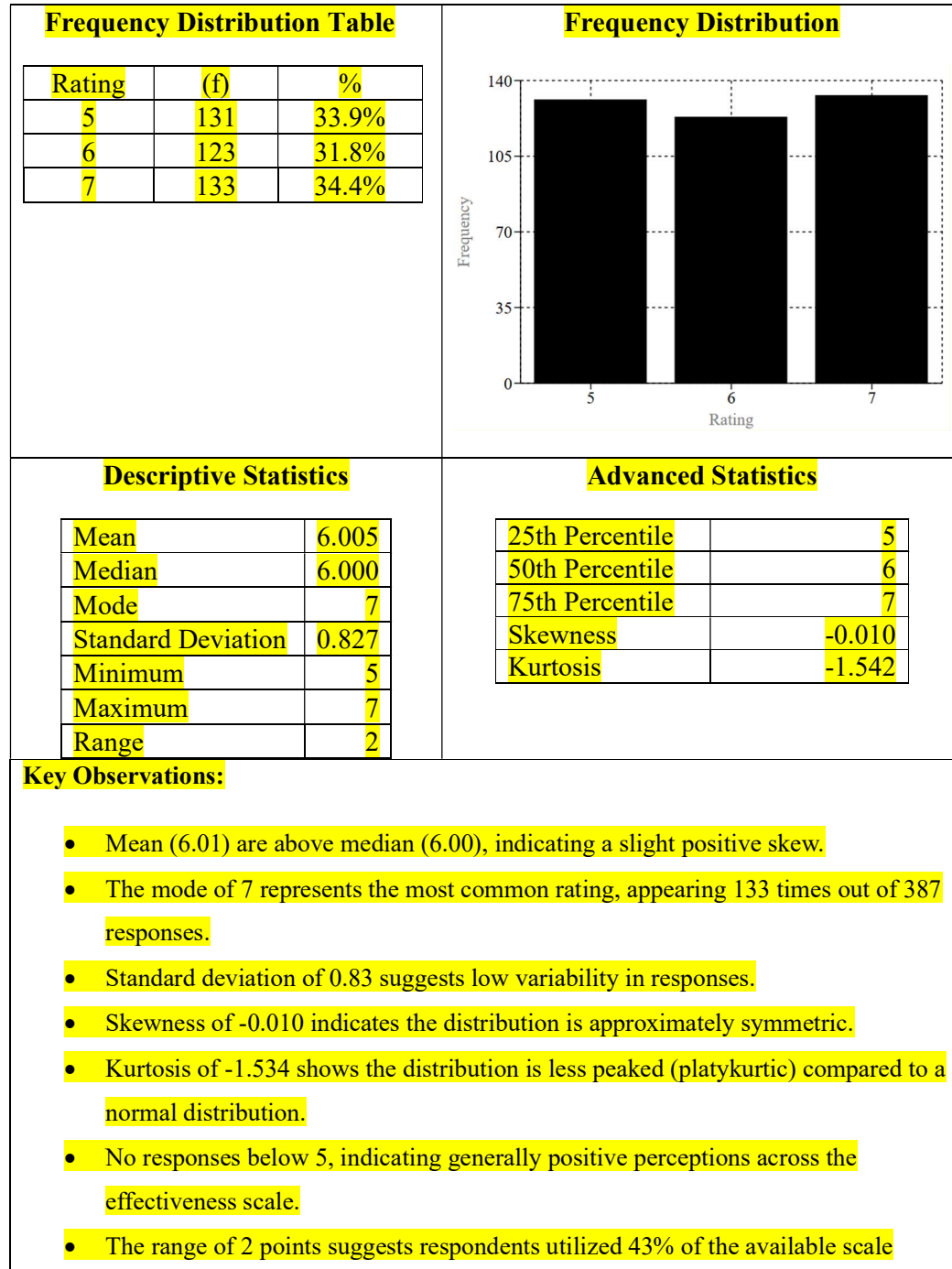


Table: 4.44: Q4.2. To what extent do you believe the new business framework for Corporate Real Estate will improve operational efficiency?

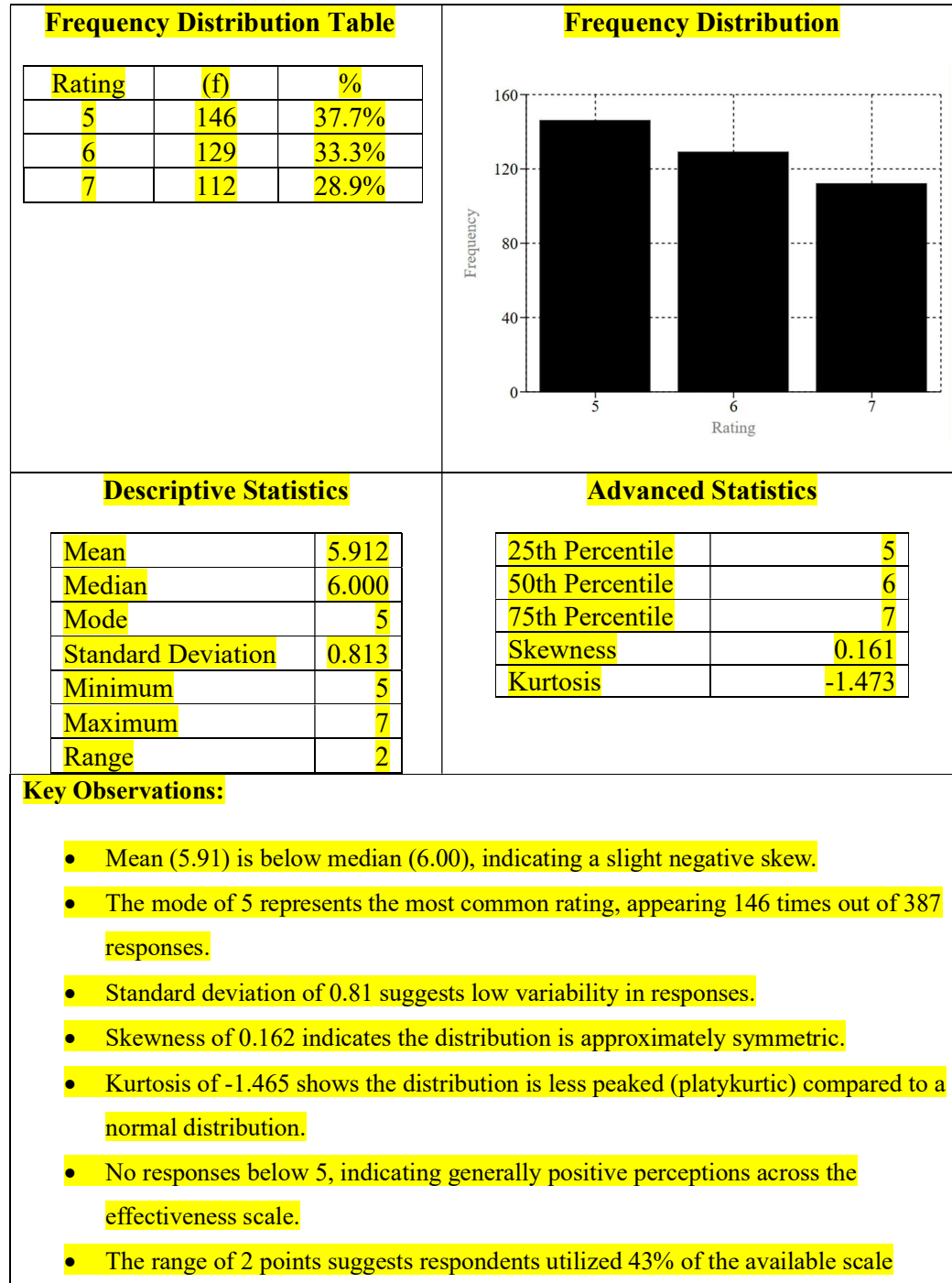


Table: 4.45: Q4.3. To what extent do you believe the new business framework for Corporate Real Estate will improve risk management?

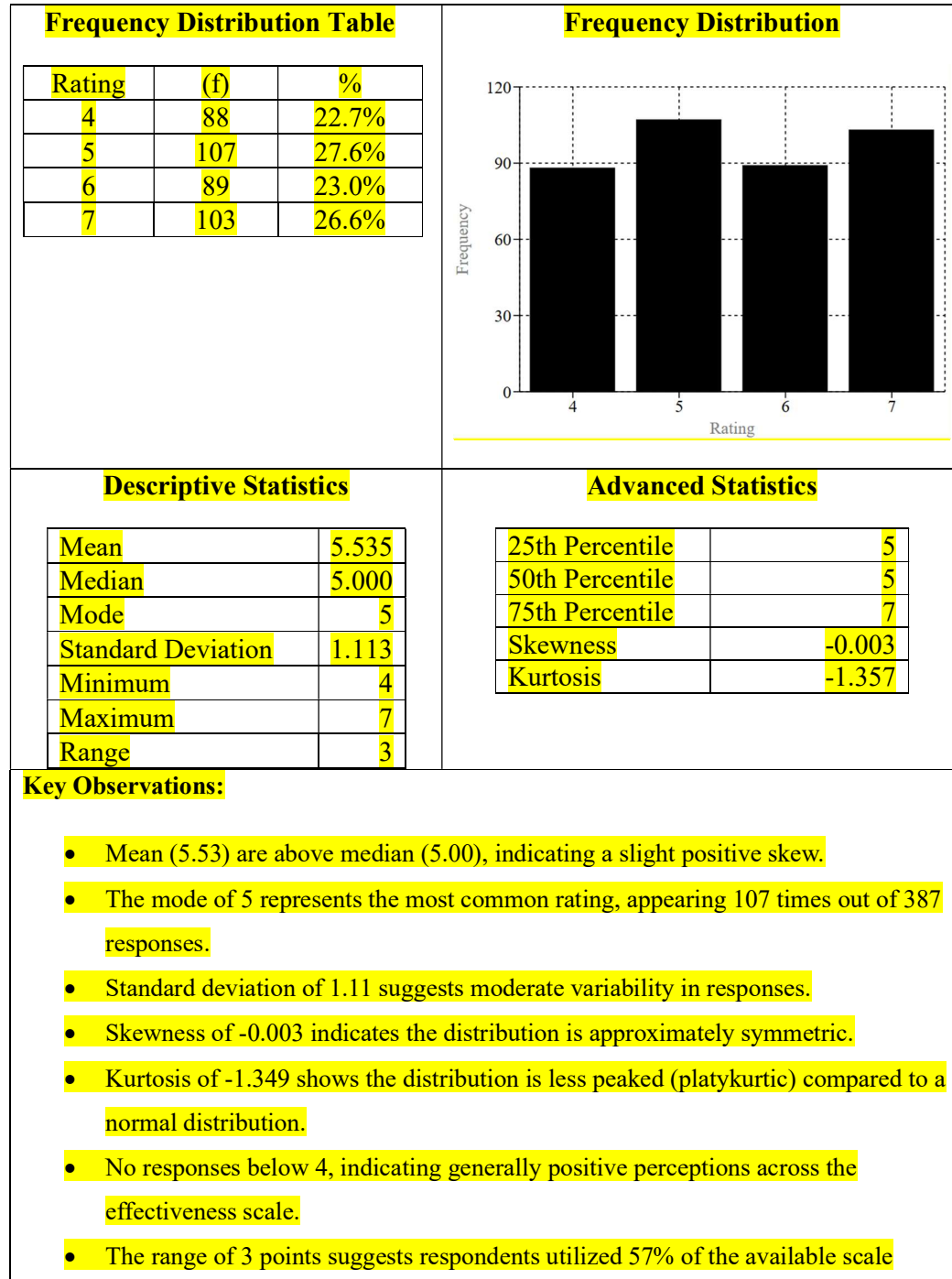


Table: 4.46: Q4.4. To what extent do you believe the new business framework for Corporate Real Estate will improve collaboration and communication among stakeholders?

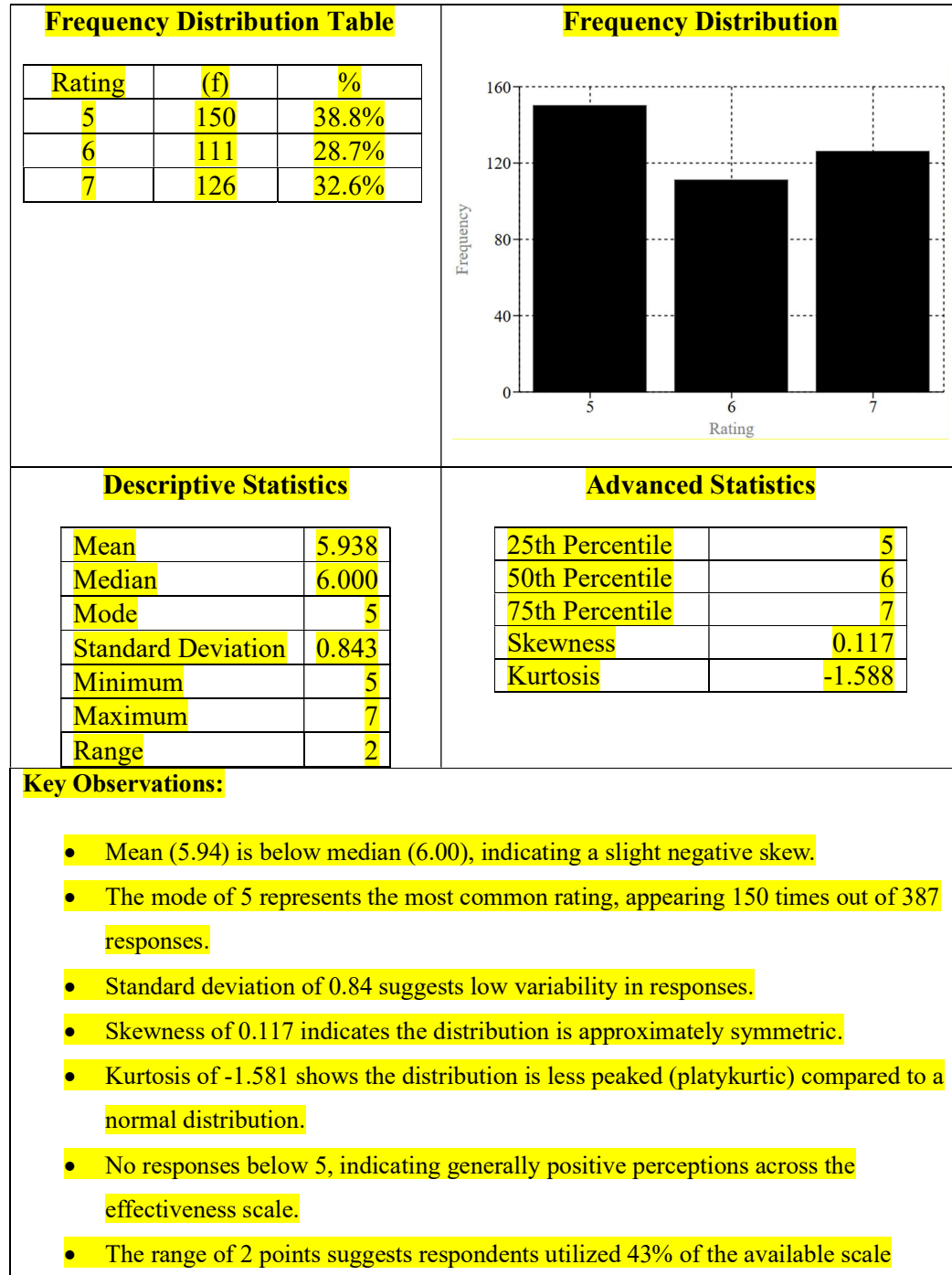


Table: 4.47: Q4.5. To what extent do you believe the new business framework for Corporate Real Estate will improve the use of technology in real estate operations?

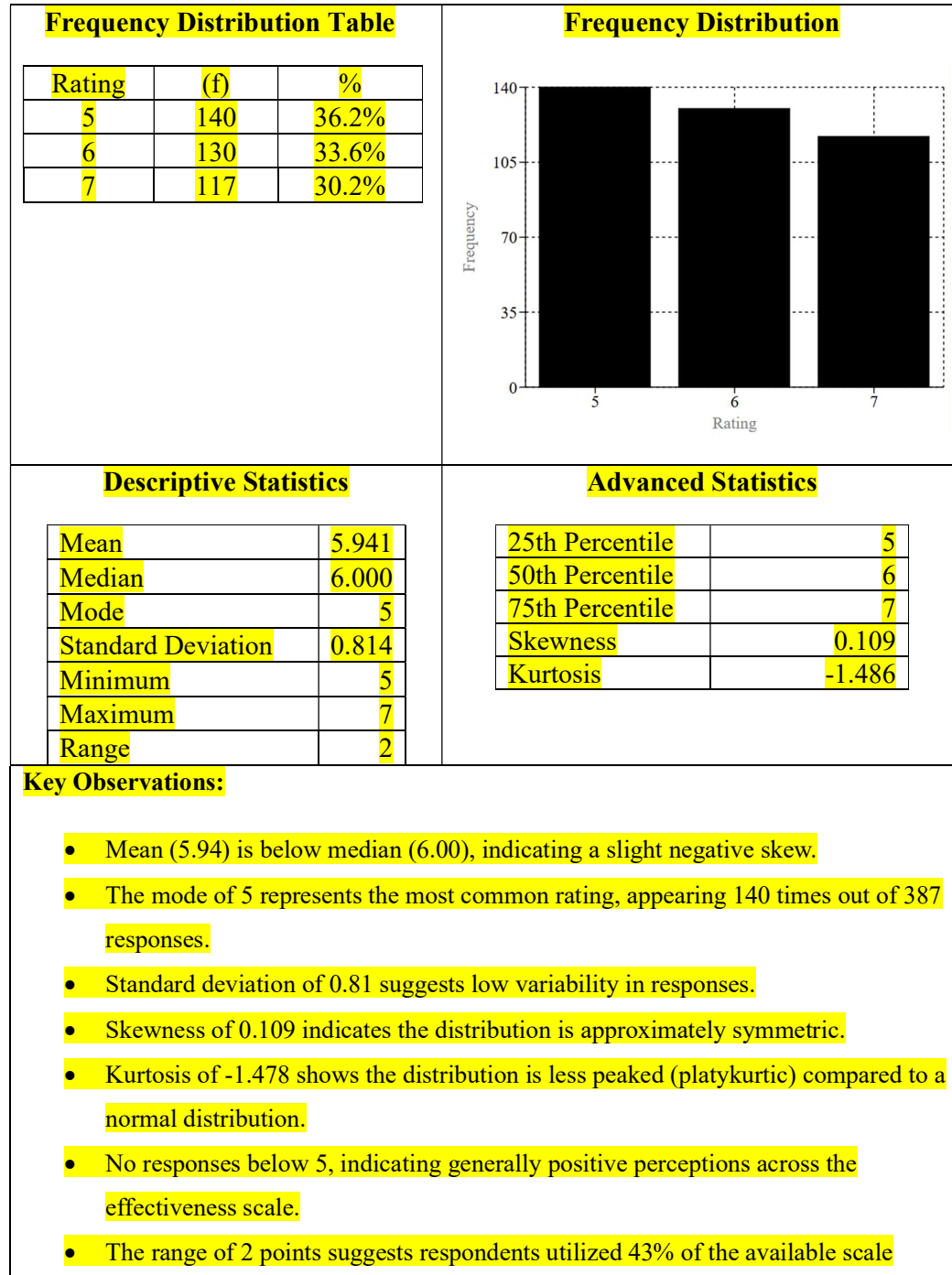


Table: 4.48: Q4.6. To what extent do you believe the new business framework for Corporate Real Estate will improve the alignment of real estate strategy with overall business strategy?

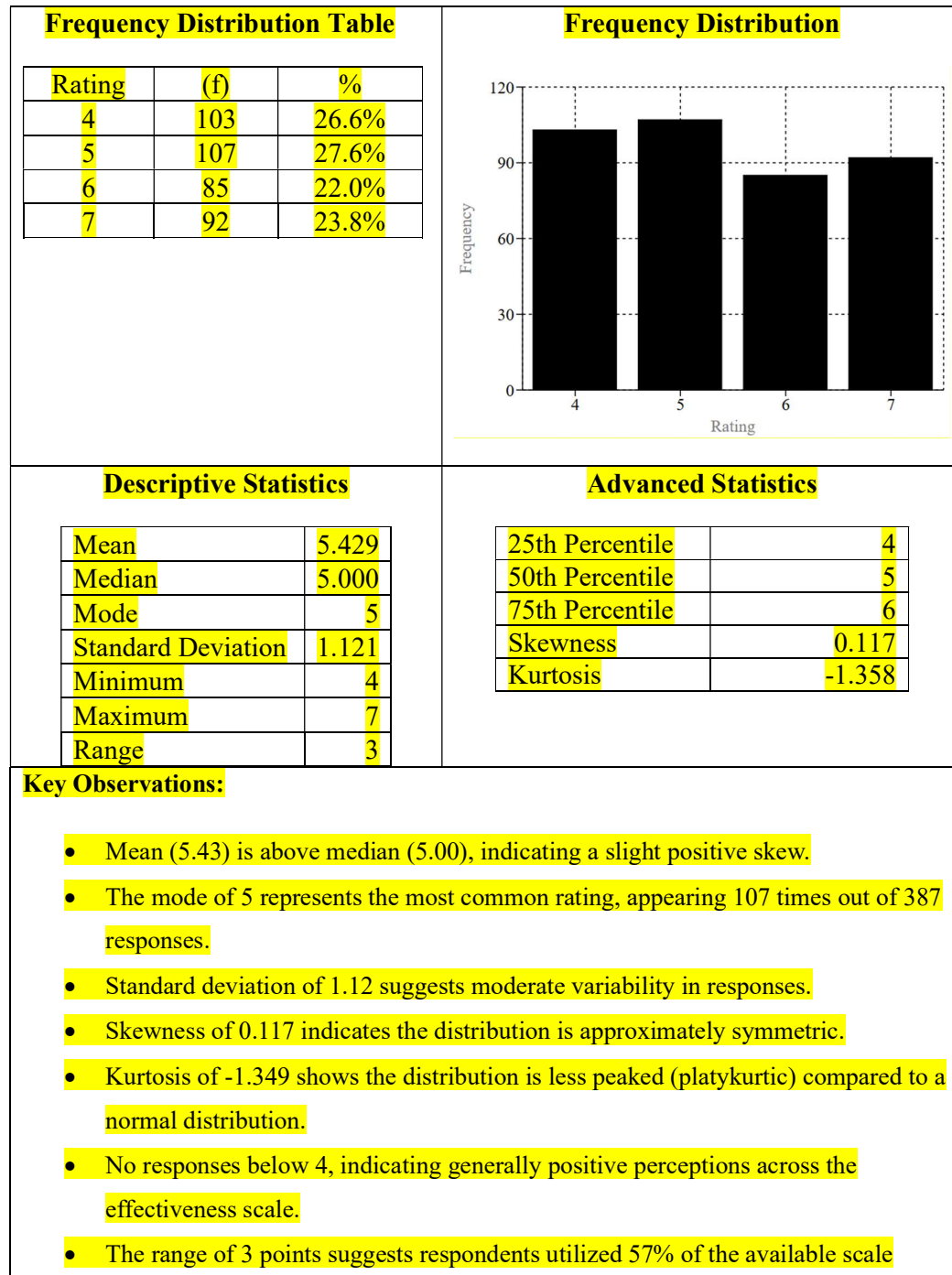


Table: 4.49: Q4.7. To what extent do you believe the new business framework for Corporate Real Estate will improve the use of data analytics in real estate decision-making?

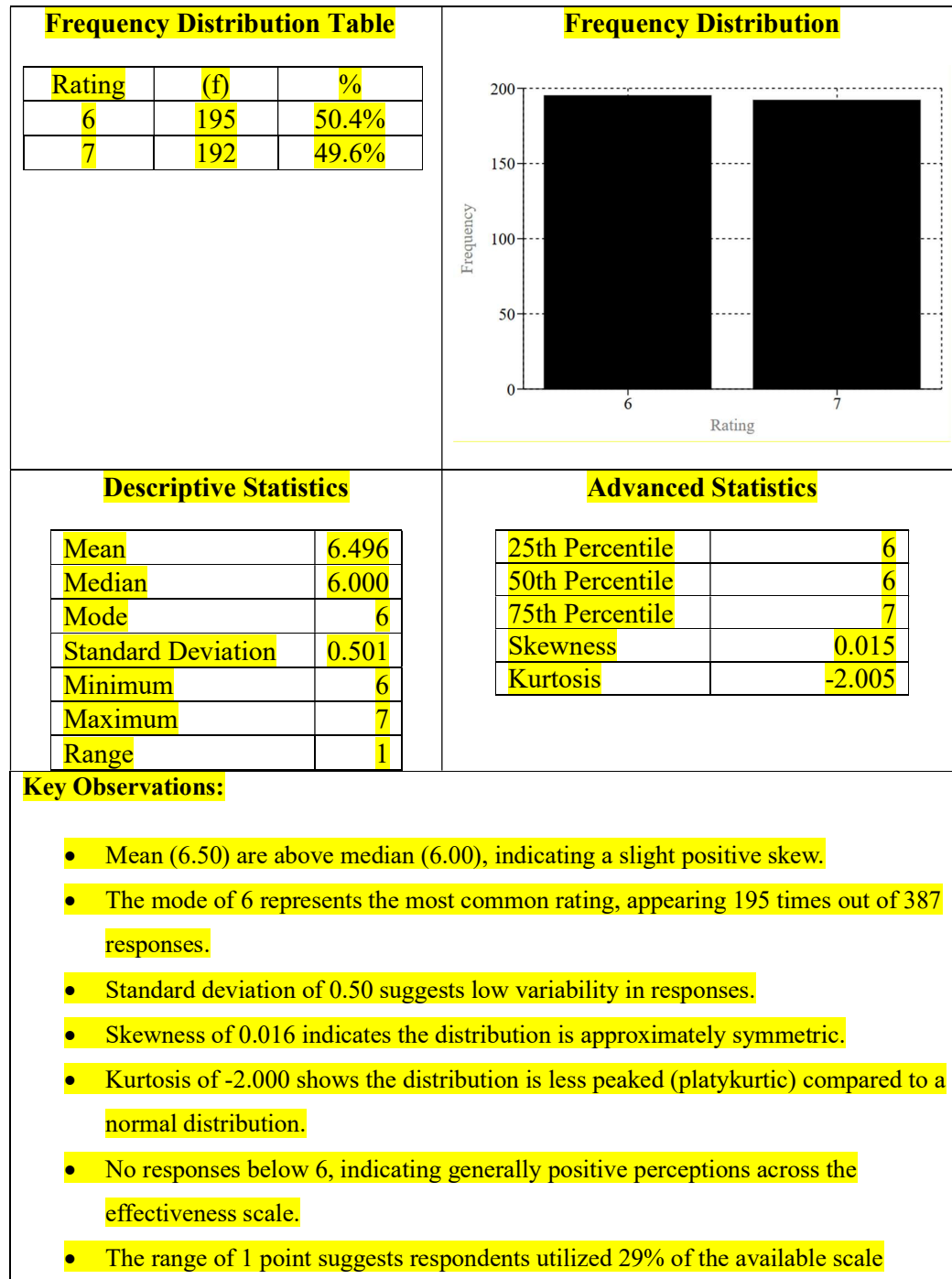


Table: 4.50: Q4.8. To what extent do you believe the new business framework for Corporate Real Estate will improve the ability to anticipate future real estate needs like hybrid working?

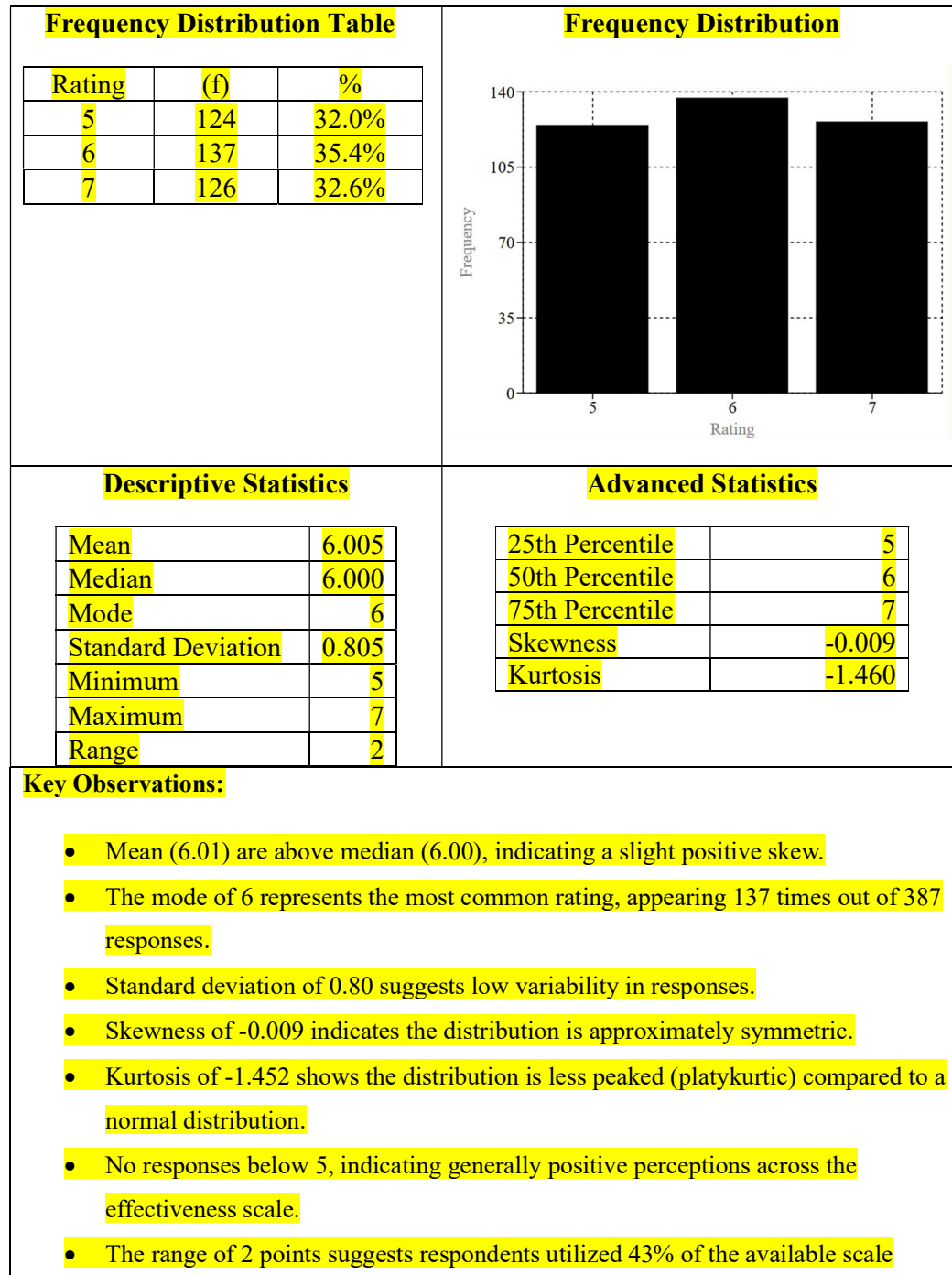


Table: 4.51: Q4.9. To what extent do you believe the new business framework for Corporate Real Estate would help you achieve your organization's strategic objectives?

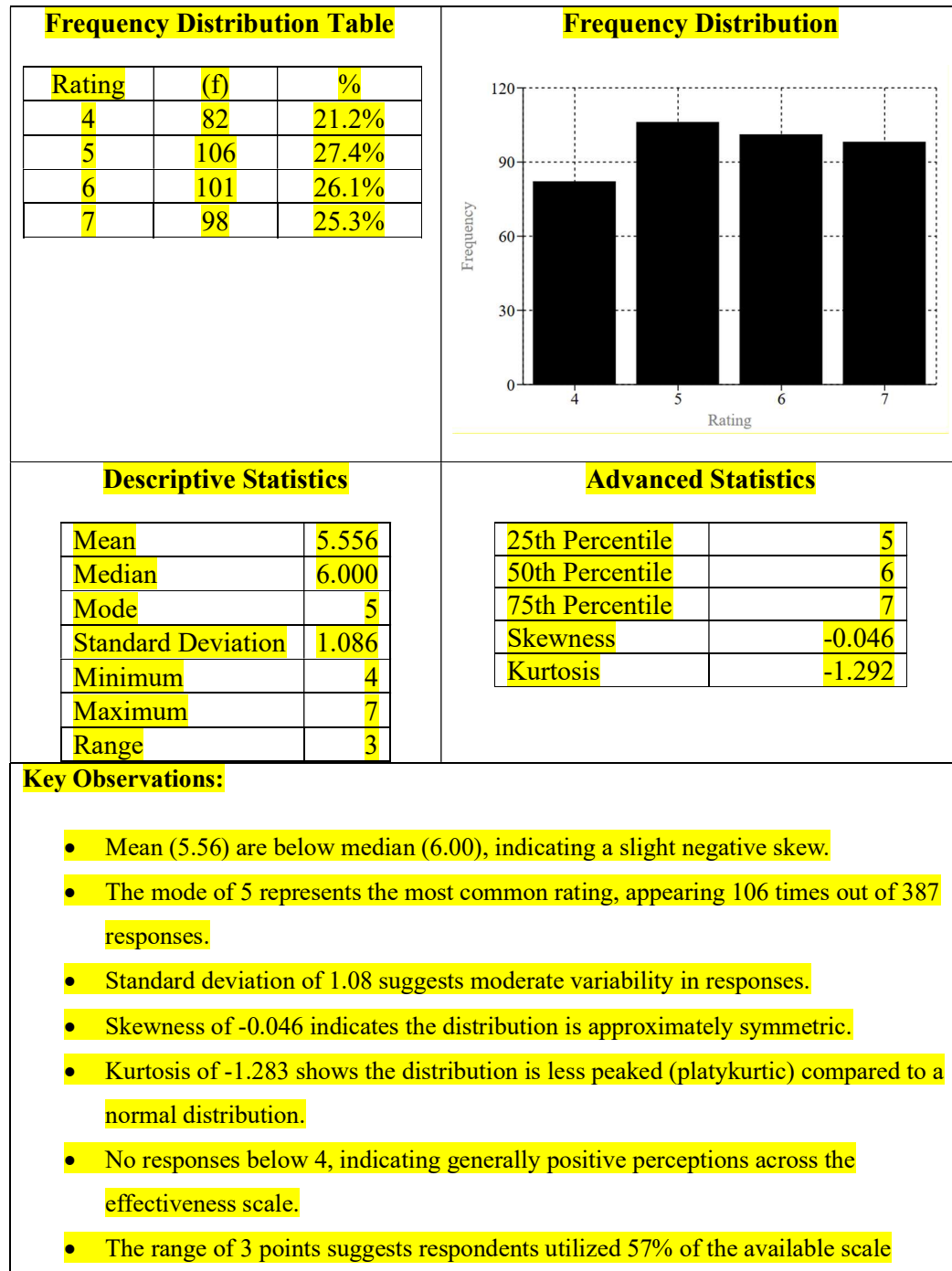


Table: 4.52: Q4.10. How easy or difficult do you think it would be to implement the new business framework for Corporate Real Estate in your organization?

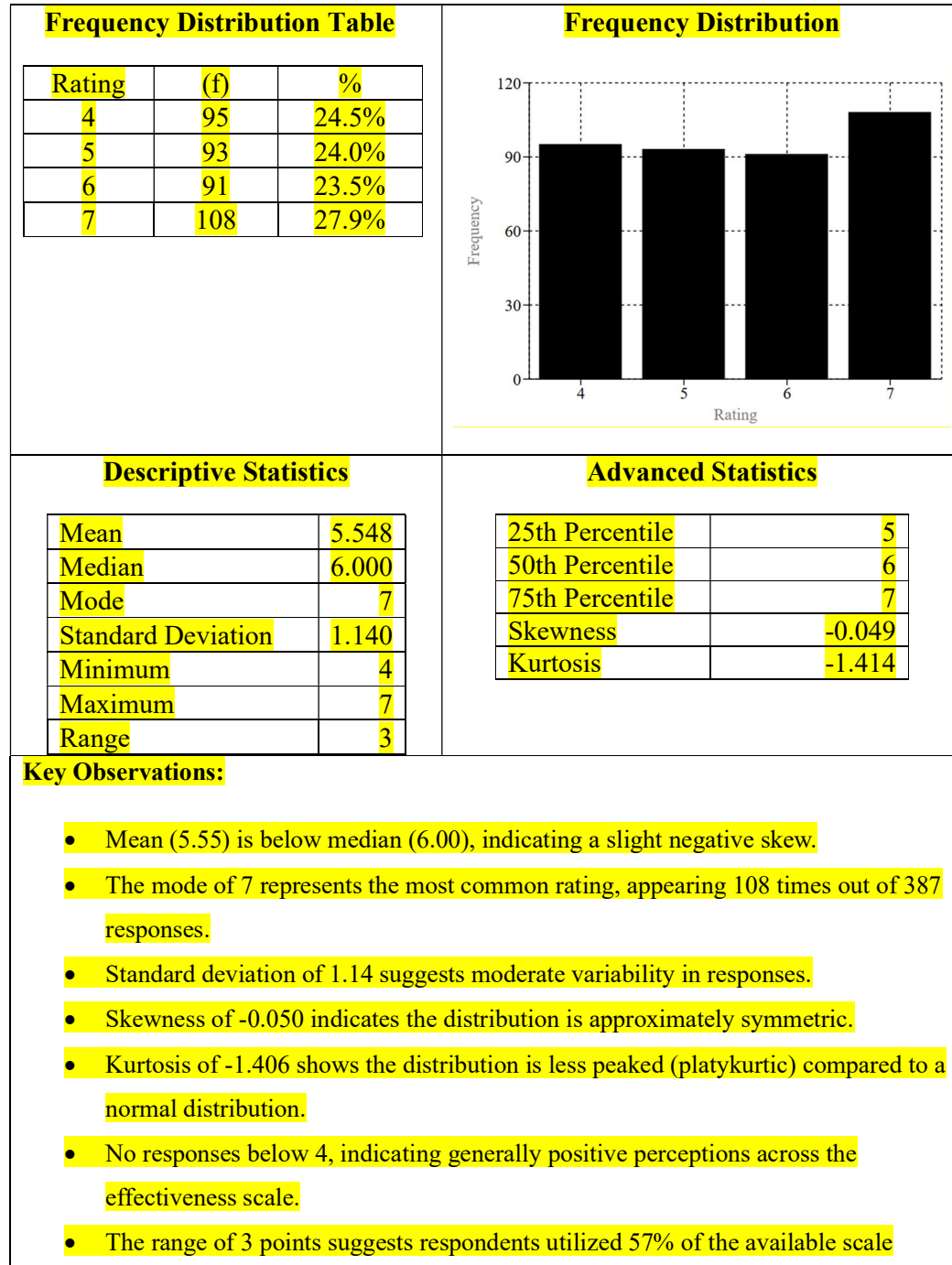


Table: 4.53: Q4.11. How confident are you in the ability of the new business framework for Corporate Real Estate to provide measurable benefits to your organization?

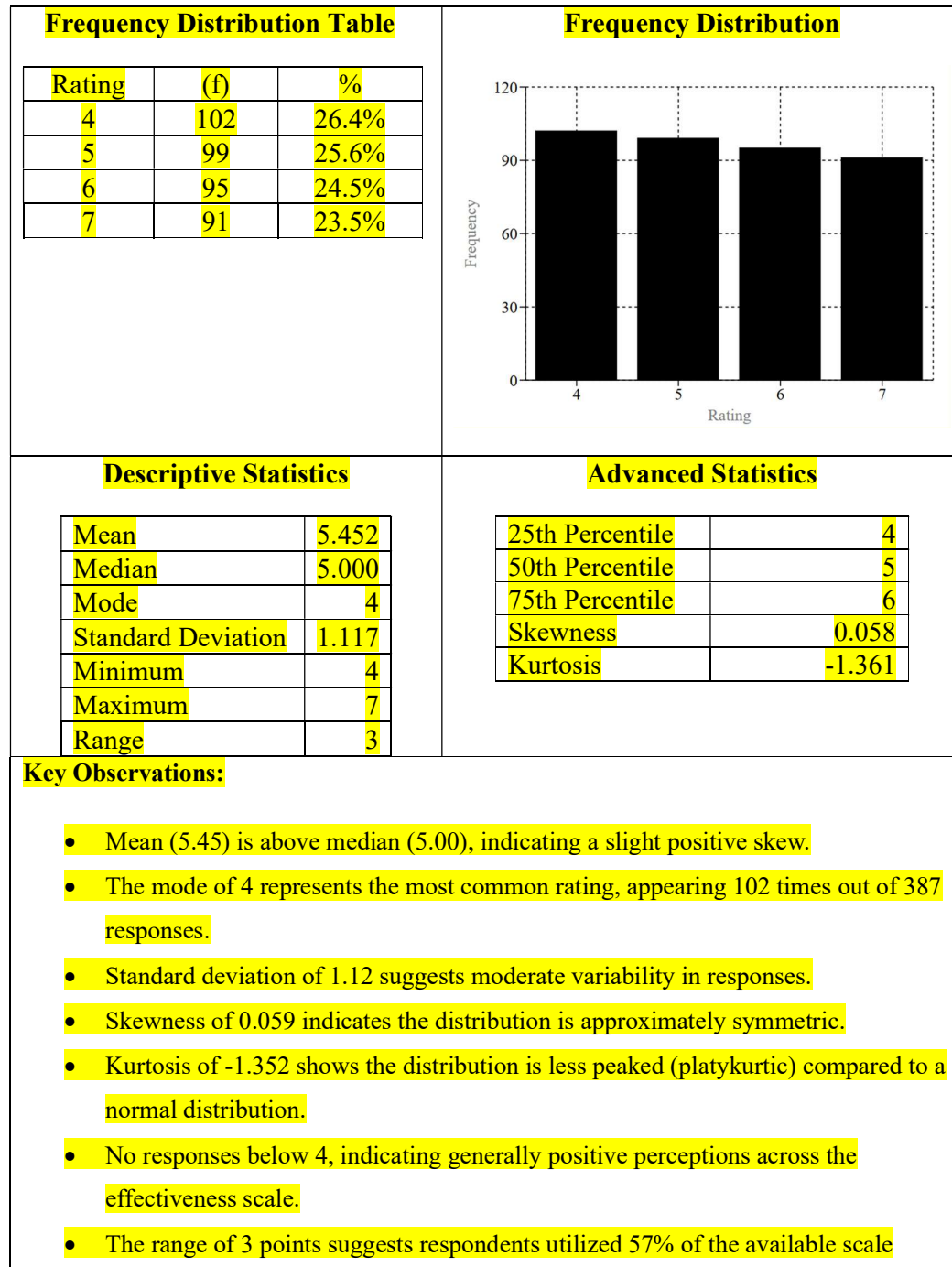


Table: 4.54: Q4.12. How will the new Corporate Real Estate business structure improve collaboration and communication in your organization?

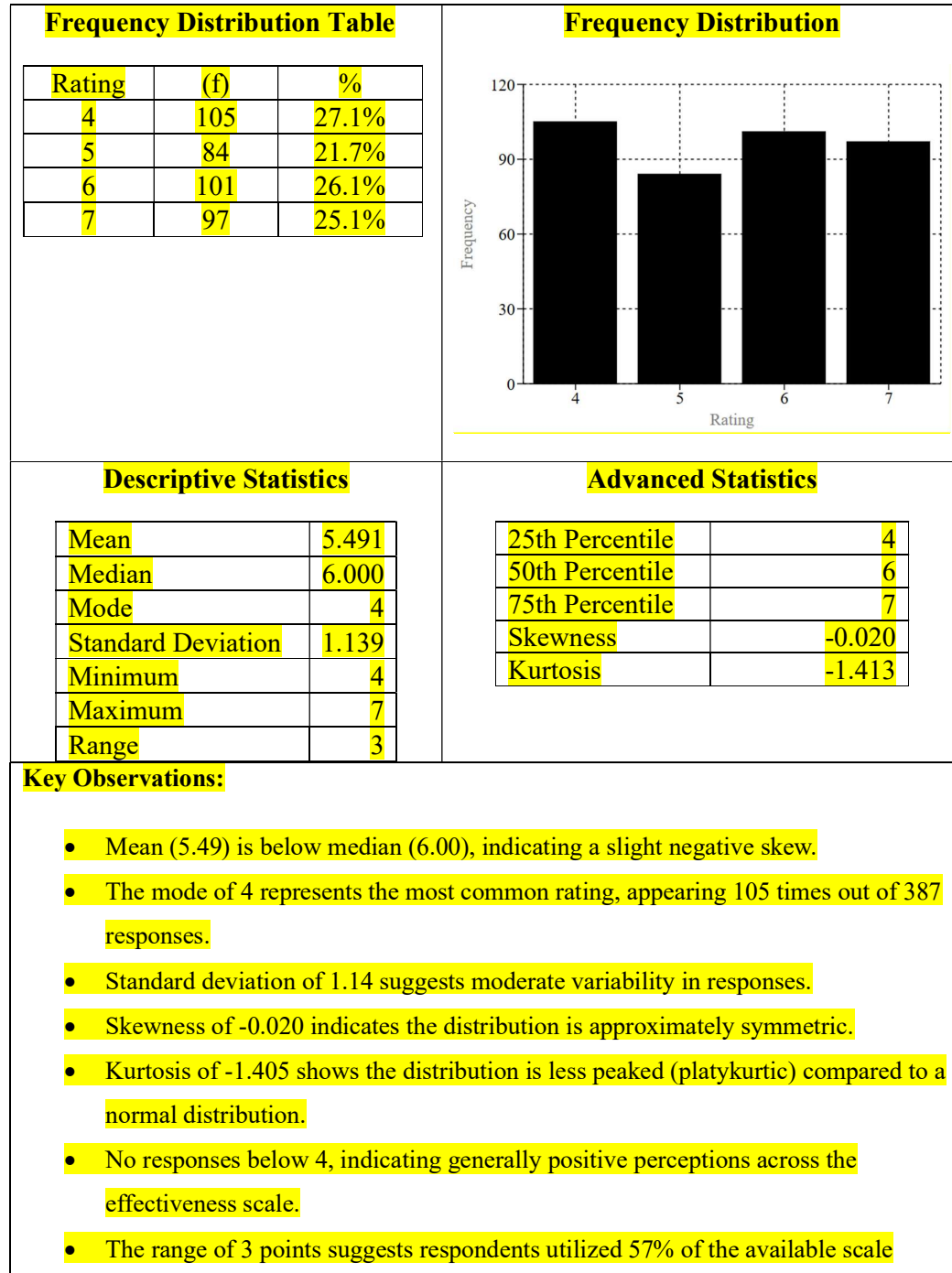


Table: 4.55: Q4.13. In your opinion, what are the most important factors to consider when implementing a corporate real estate framework?

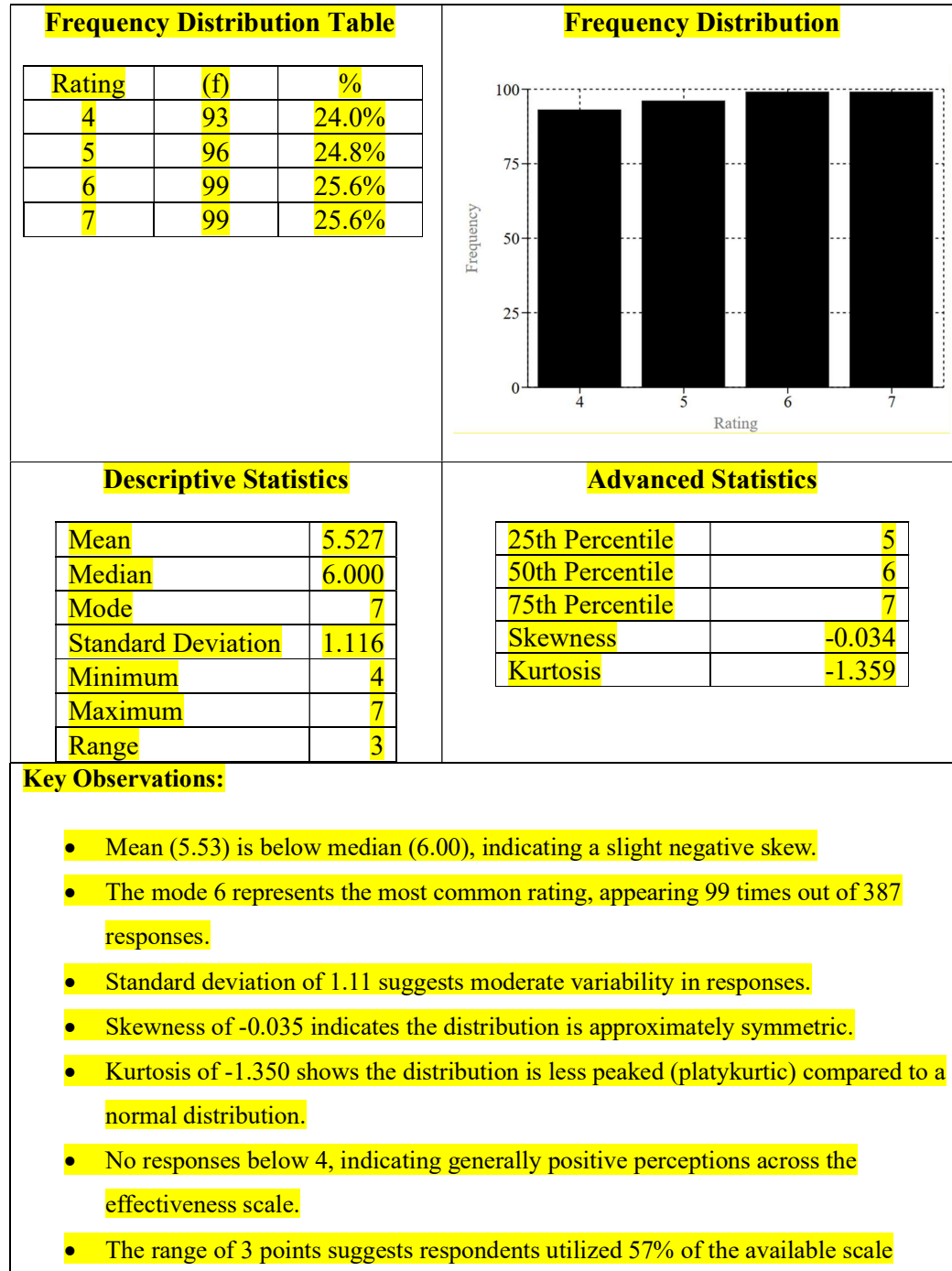


Table: 4.56: Q4.14. Would you like to contribute anything else about your experience that should be considered while developing the corporate real estate framework?

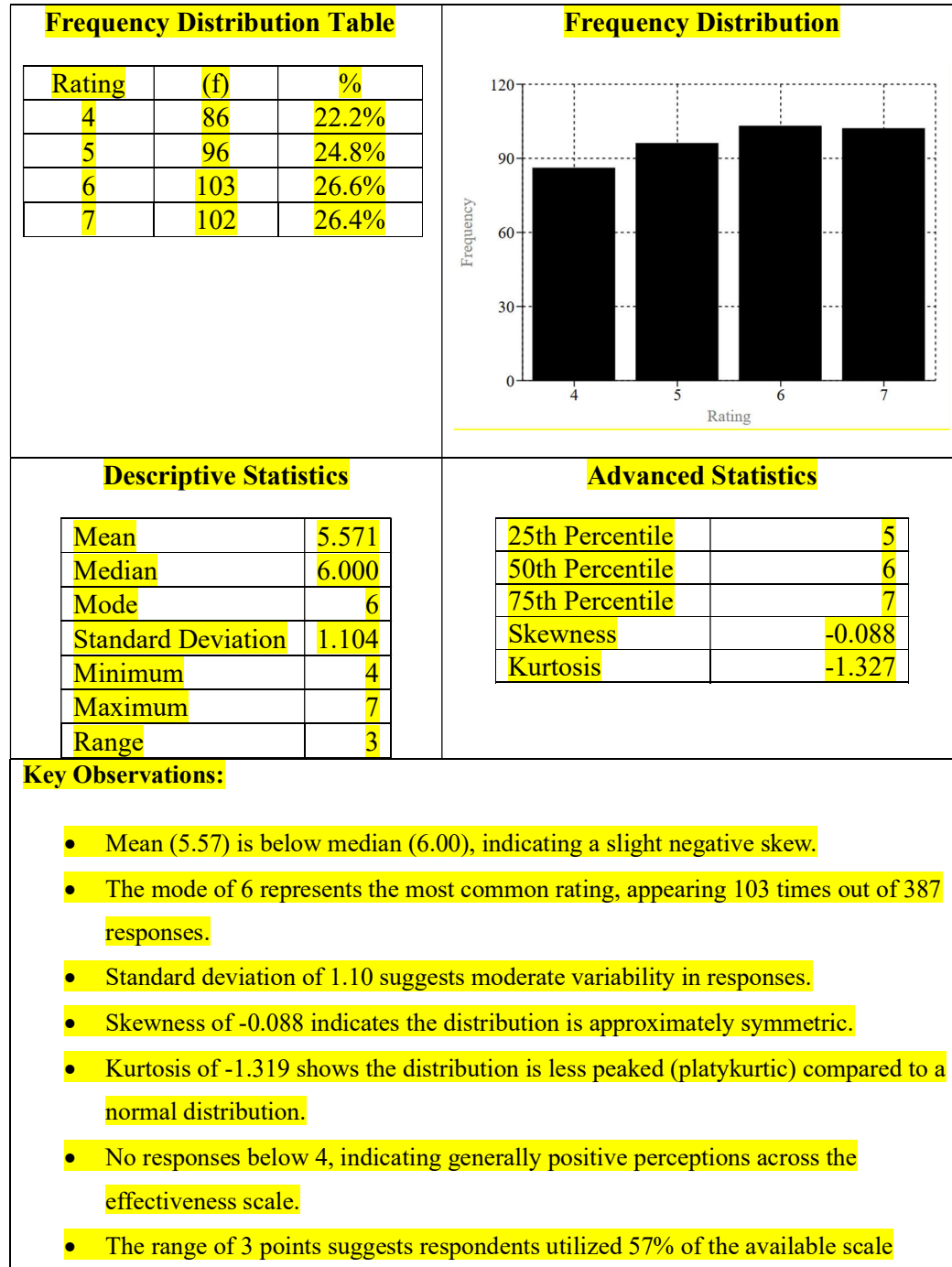


Table: 4.57: Q5.1. To what extent does your organization utilize technology to manage its real estate portfolio?

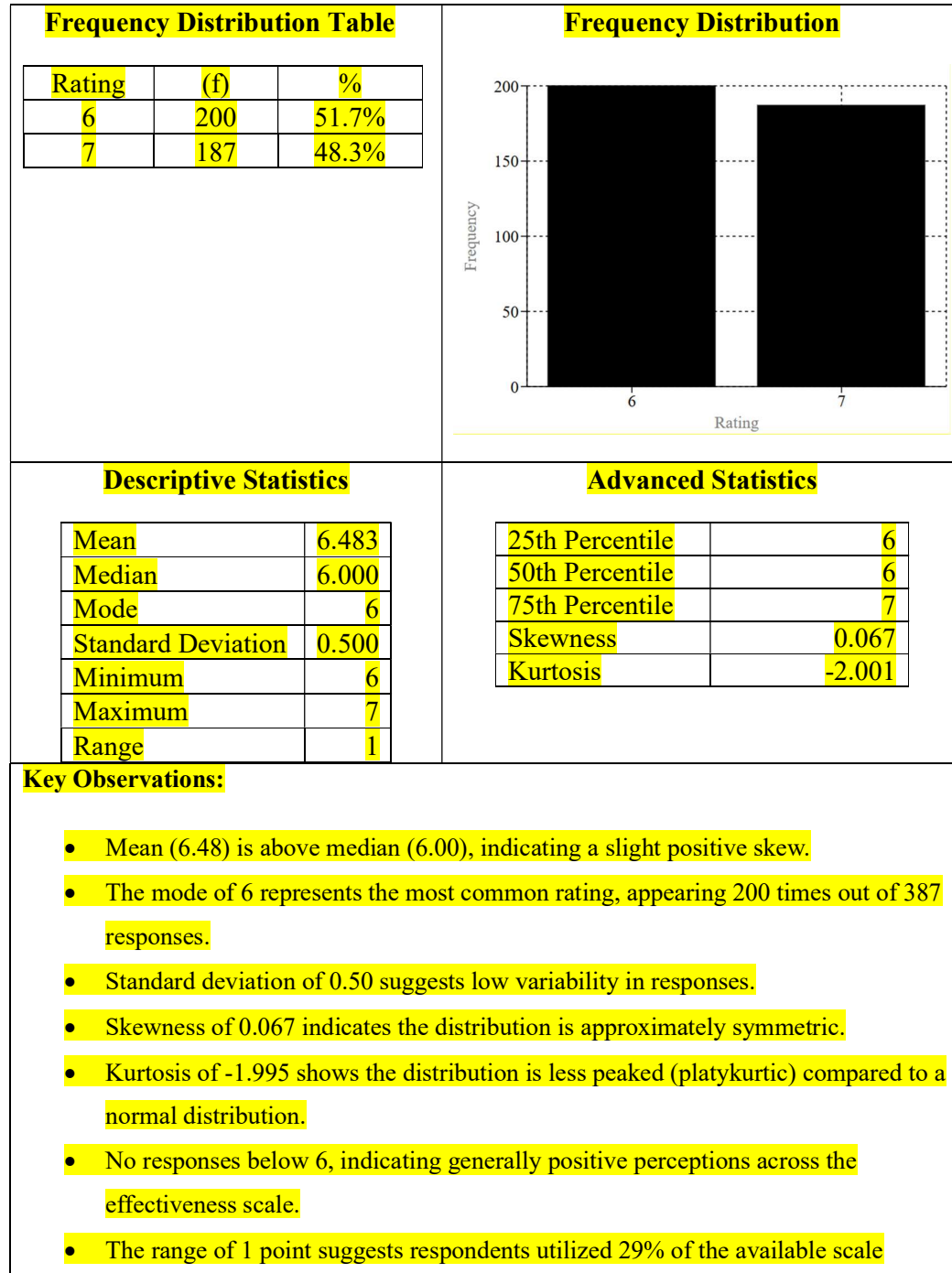


Table: 4.58: Q5.2. How satisfied are you with the current level of technology integration in your organization's real estate management

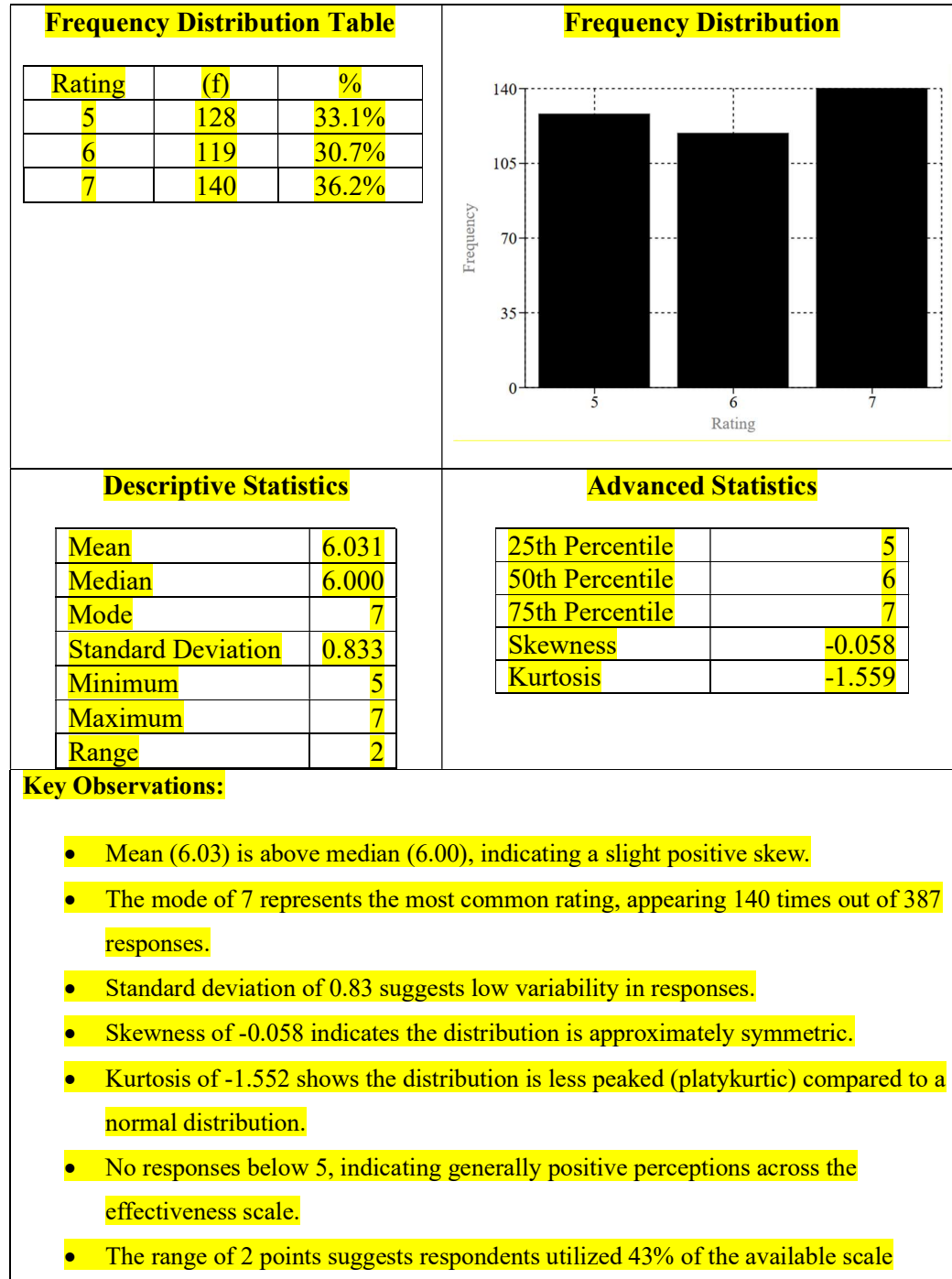


Table: 4.59: Q5.3. To what extent has technology improved your organization's real estate management efficiency and effectiveness?

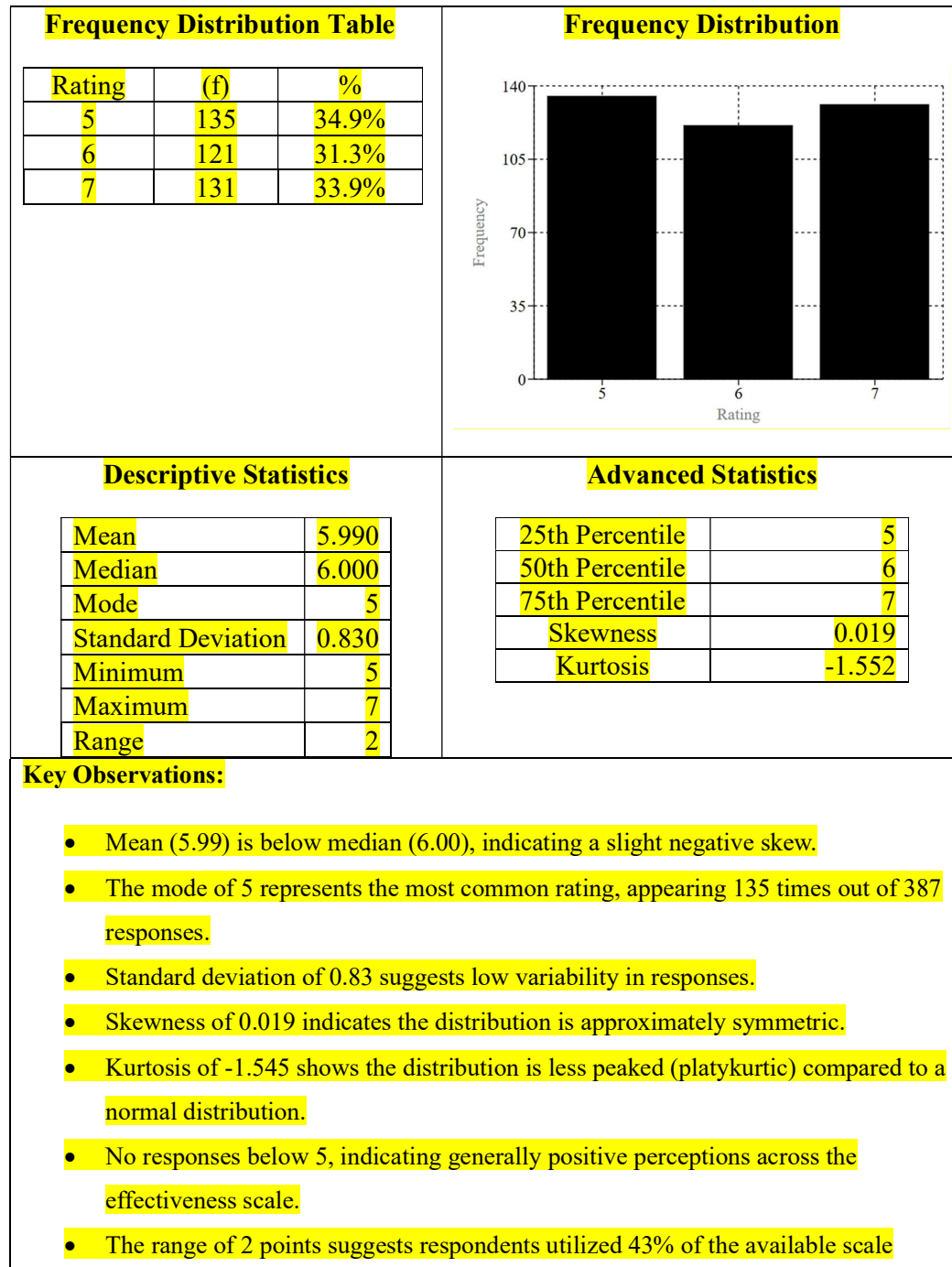


Table: 4.60: Q5.4. How frequently do you use technology for real estate analysis and forecasting?

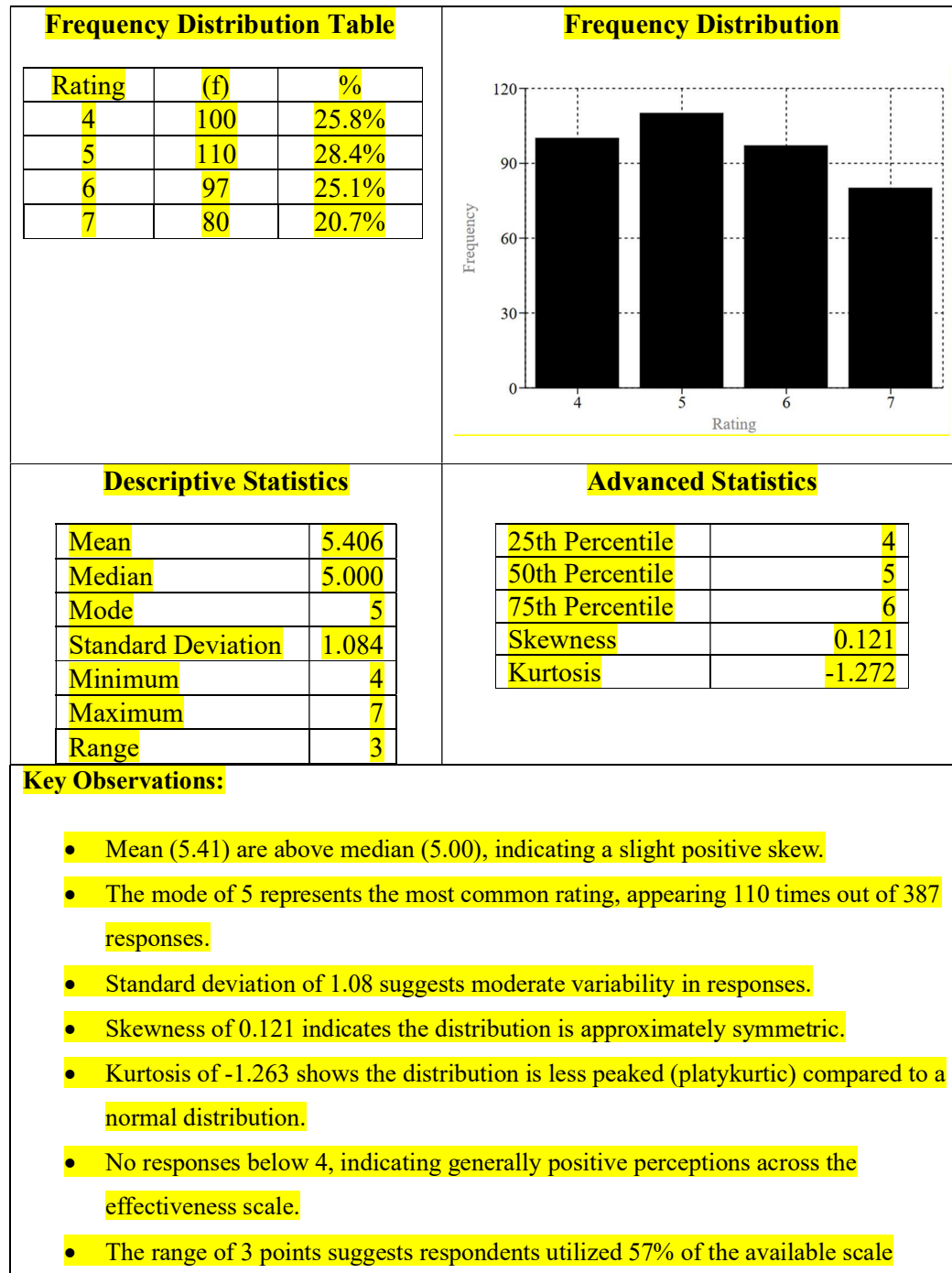


Table: 4.61: Q5.5. How important is it for your organization to use technology to manage its real estate portfolio?

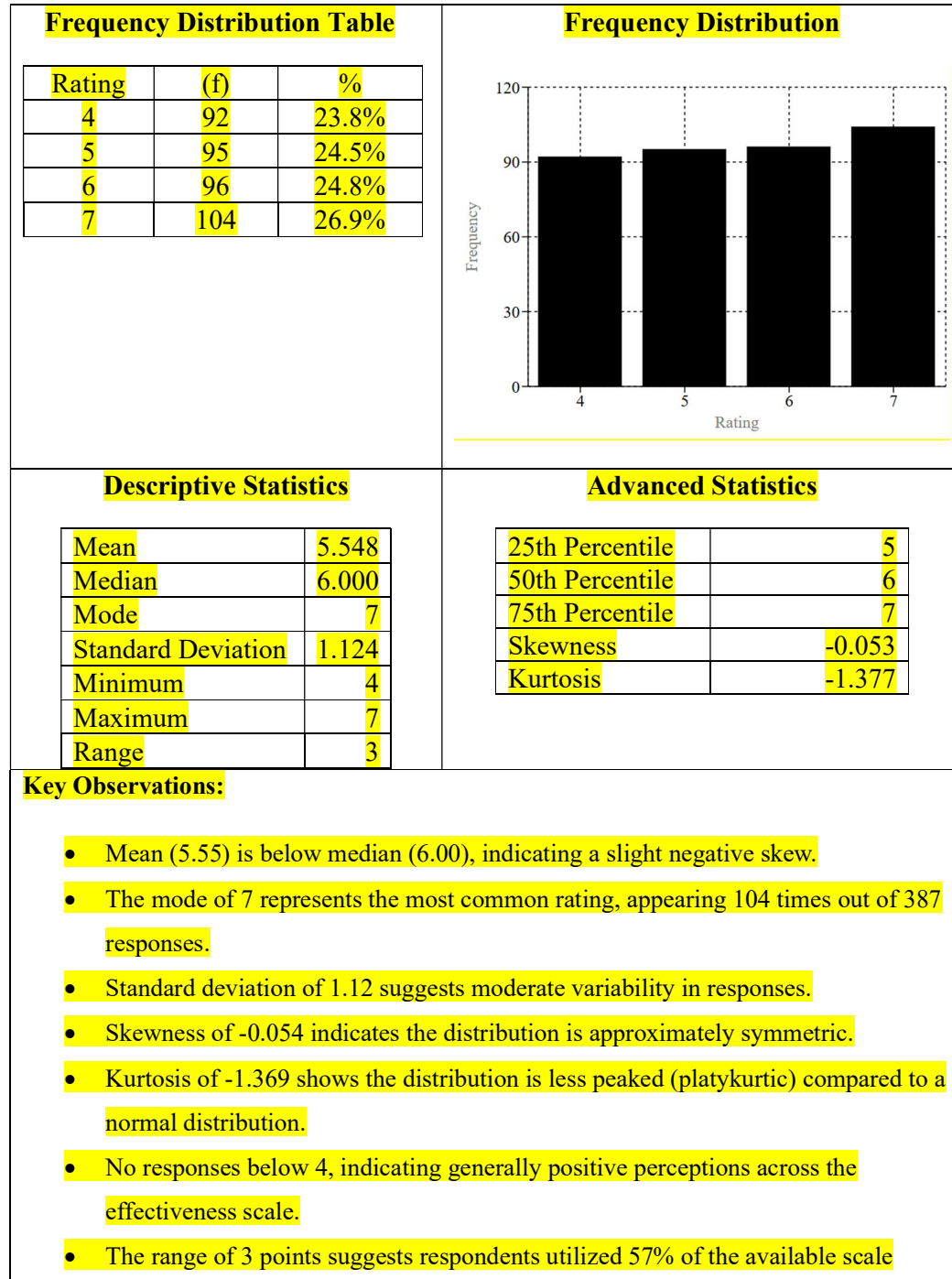


Table: 4.62: Q5.6. To what extent has technology enhanced your organization's ability to make informed real estate decisions?

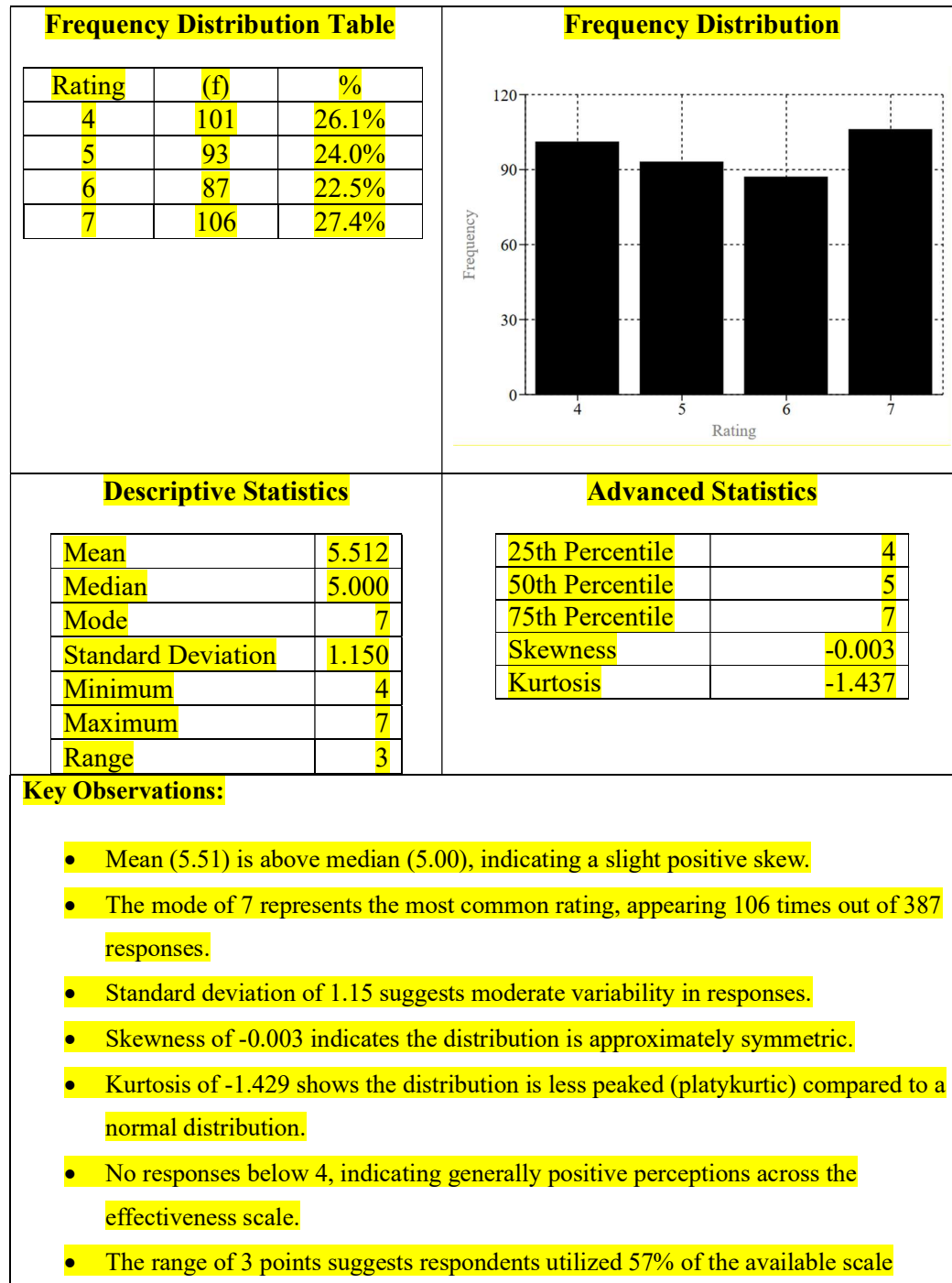


Table: 4.63: Q5.7. How satisfied are you with the current technology tools and platforms available for real estate management?

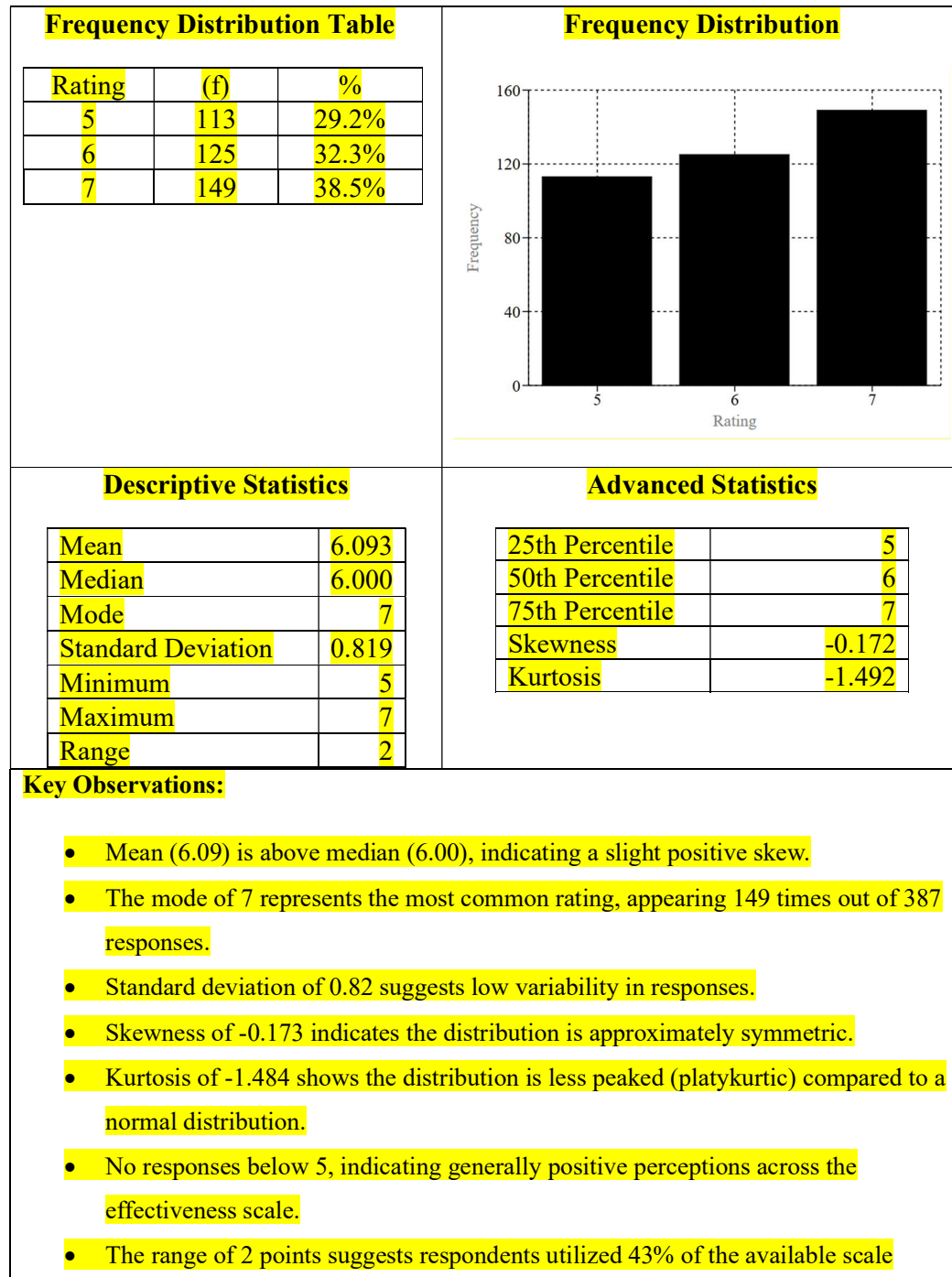


Table: 4.64: Q5.8. To what extent do you think technology has improved the efficiency of corporate real estate management?

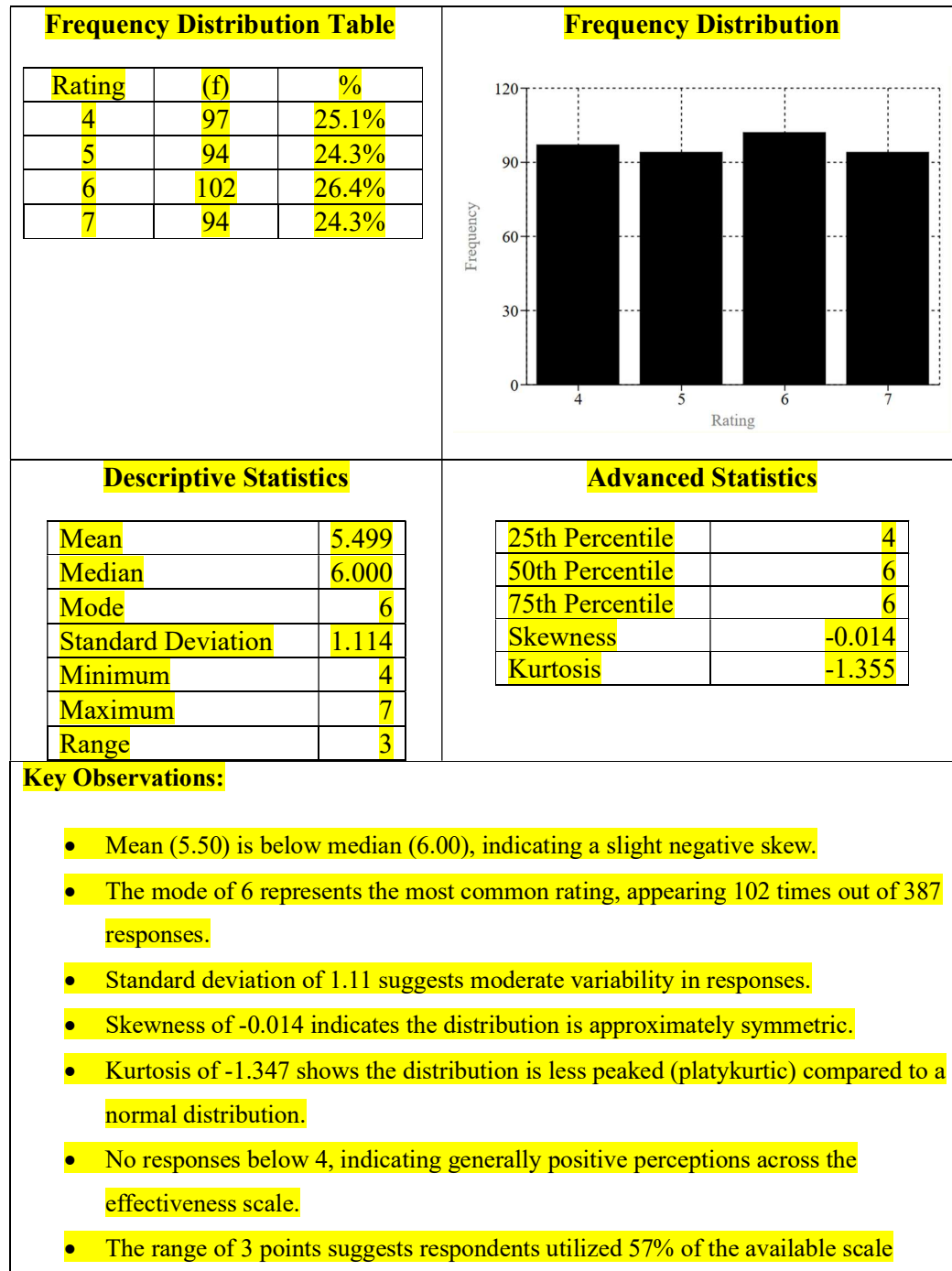


Table: 4.65: Q5.9. How often do you use technology in corporate real estate management?

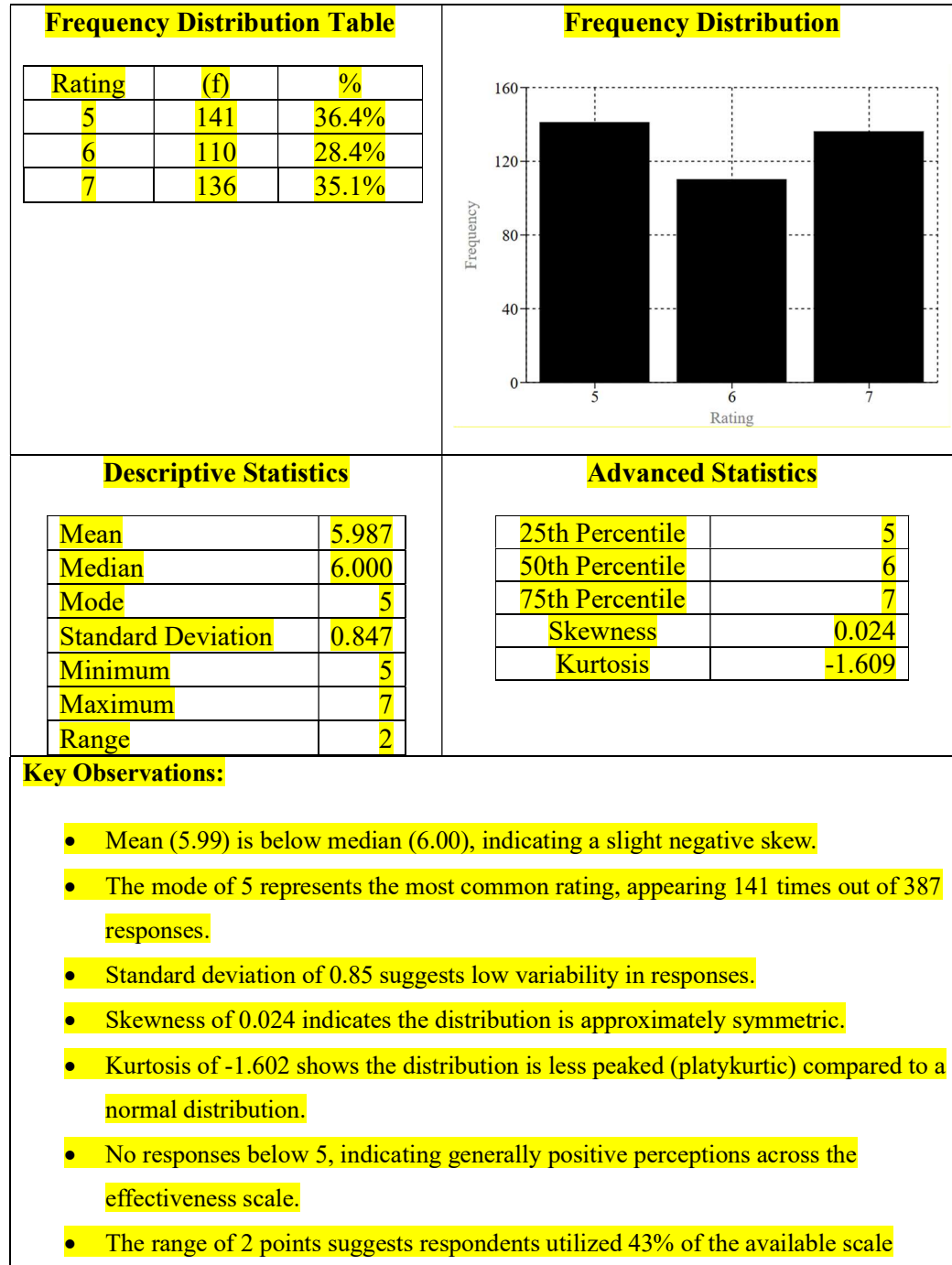


Table: 4.66: Q5.10. In your opinion, how important is technology in managing corporate real estate?

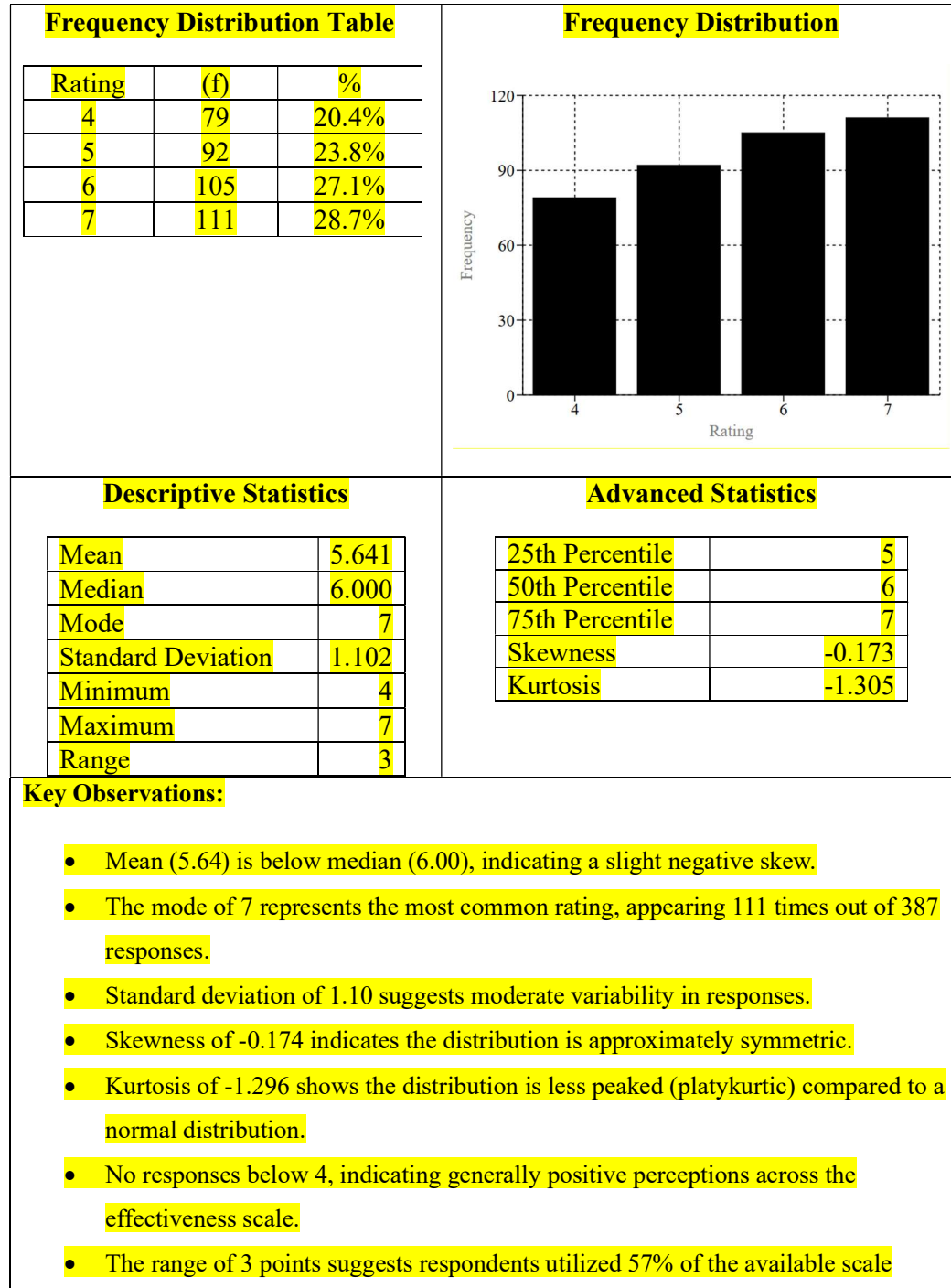


Table: 4.67: Q5.11. To what extent do you believe technology can improve the accuracy of corporate real estate data?

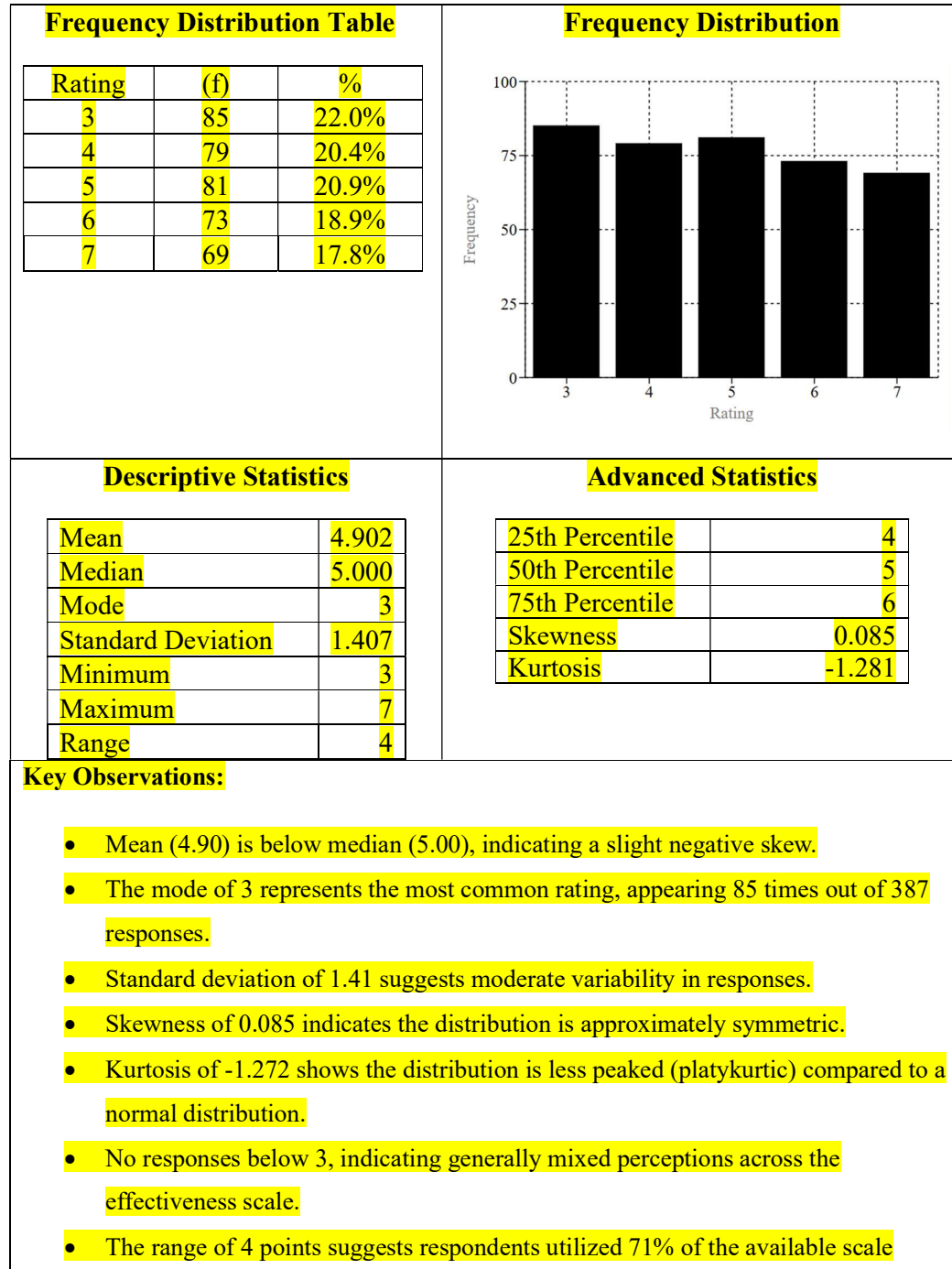


Table: 4.68: Q5.12. How would you rate the level of technological adoption in your organizations corporate real estate management practices?

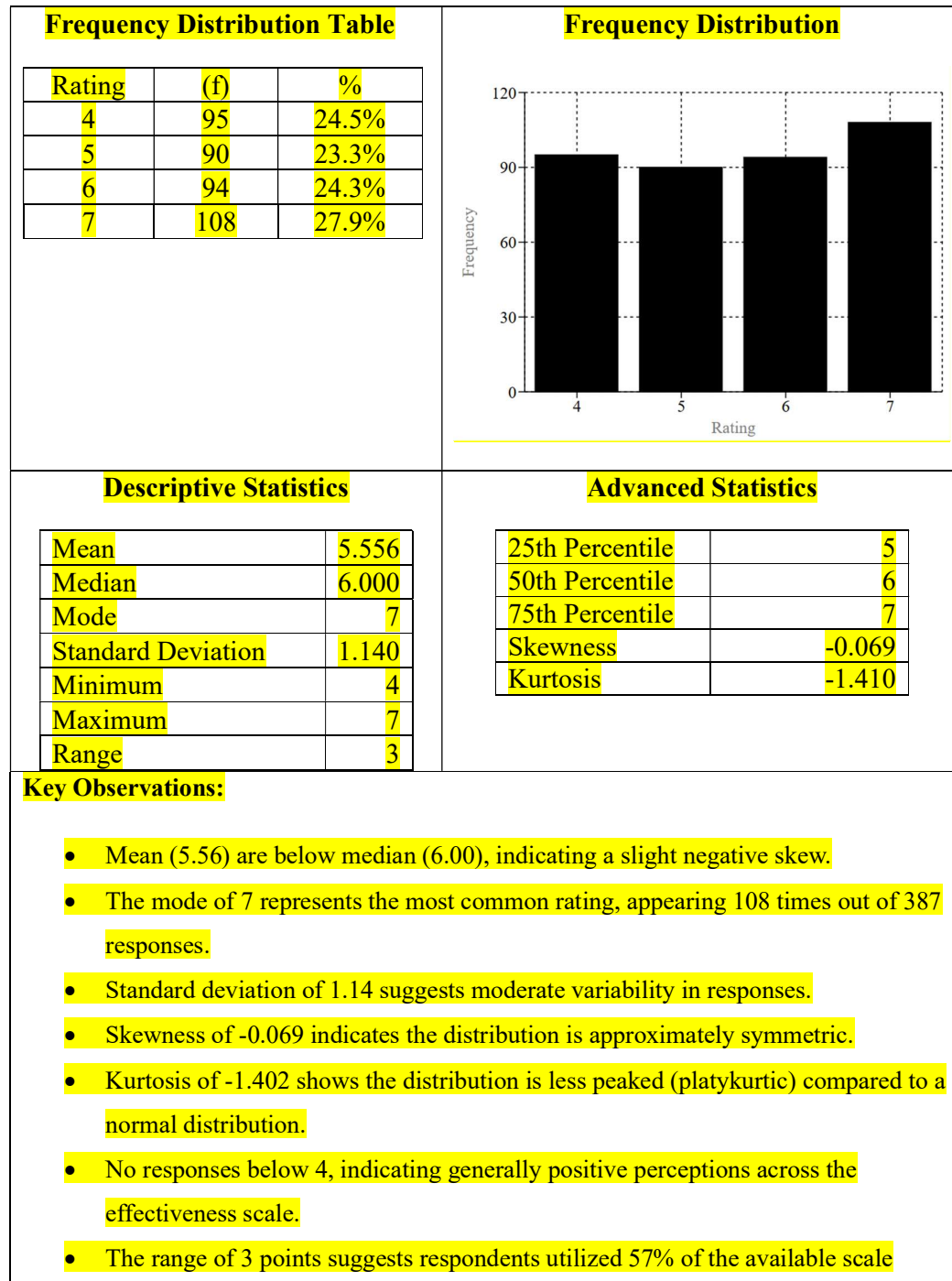


Table: 4.69: Q5.13. How often does your organization invest in new technologies to improve corporate real estate management?

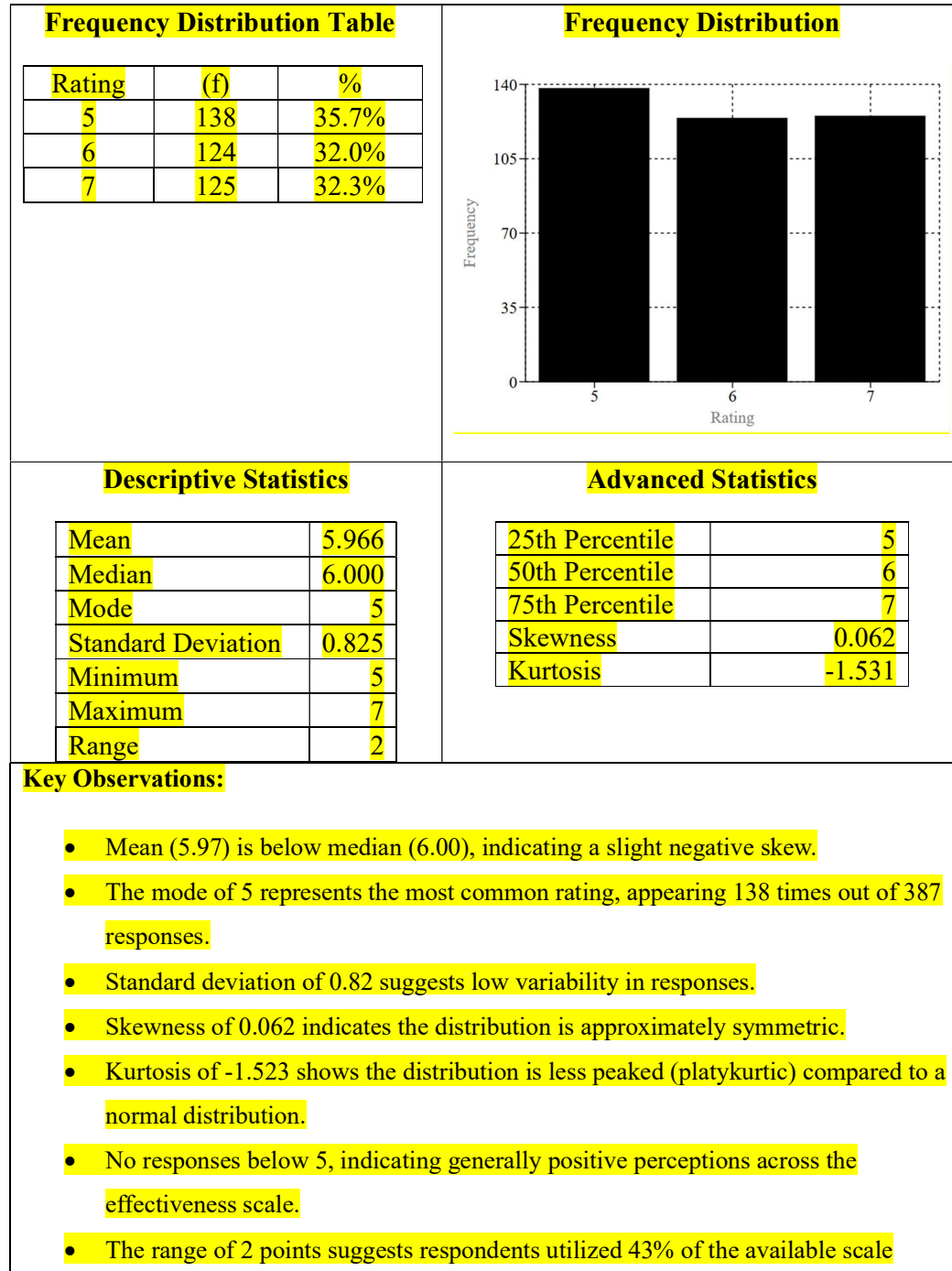


Table: 4.70: Q5.14. How satisfied are you with the level of technological support provided by your organization for corporate real estate management?

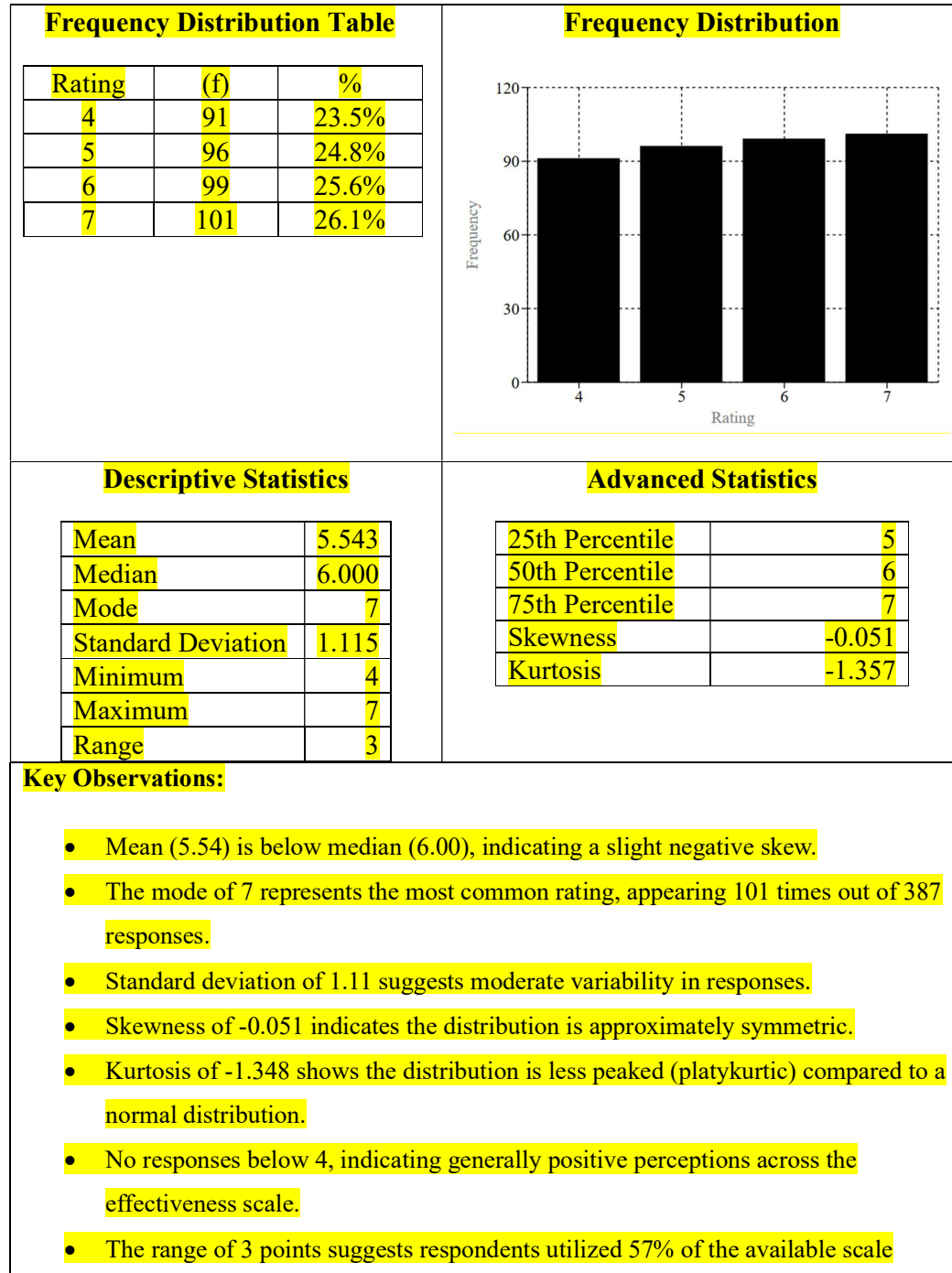


Table: 4.71: Q5.15. What, in your opinion, are the most essential factors to consider when implementing technology for the adoption and acceptance of corporate real estate?

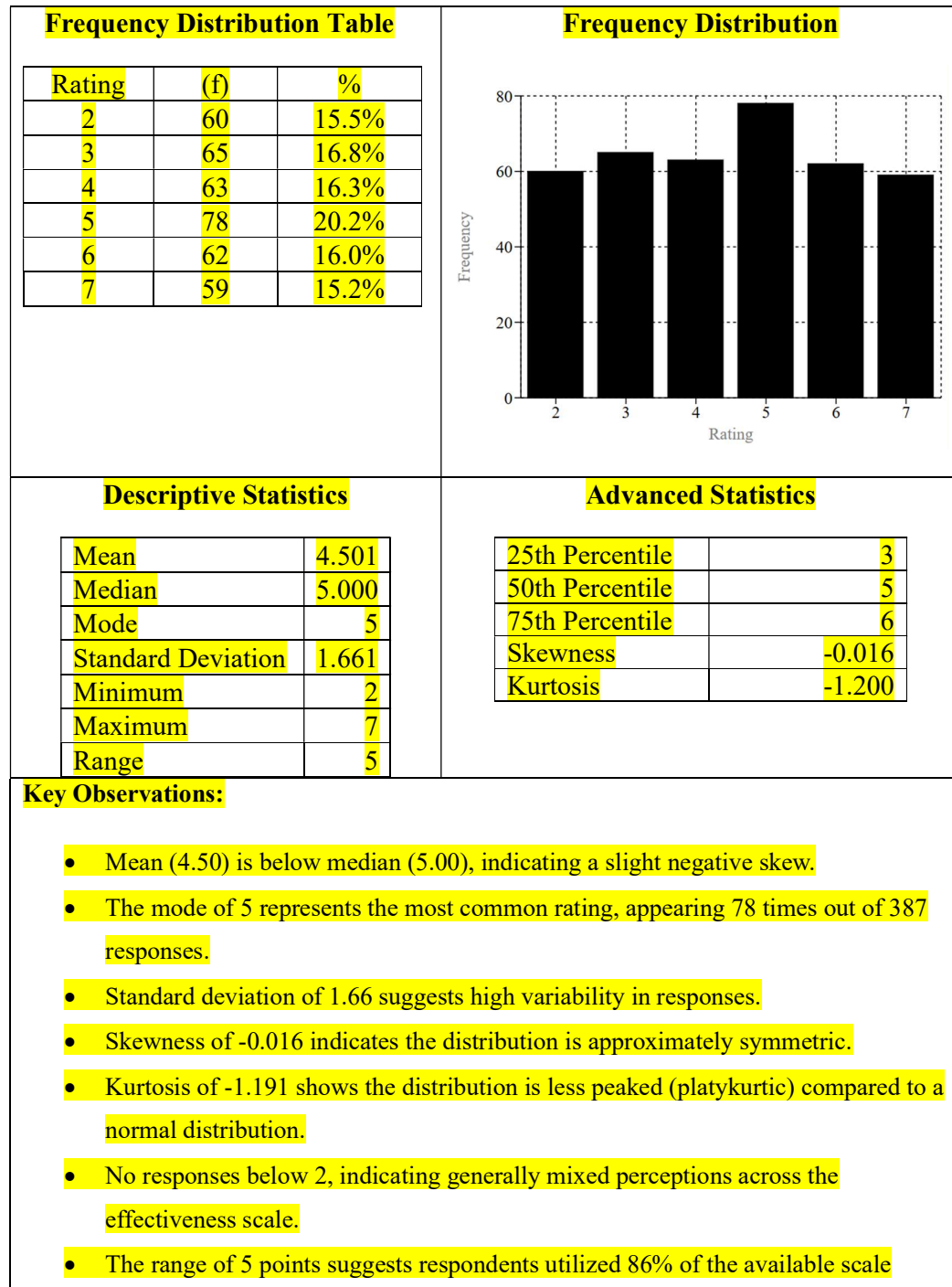
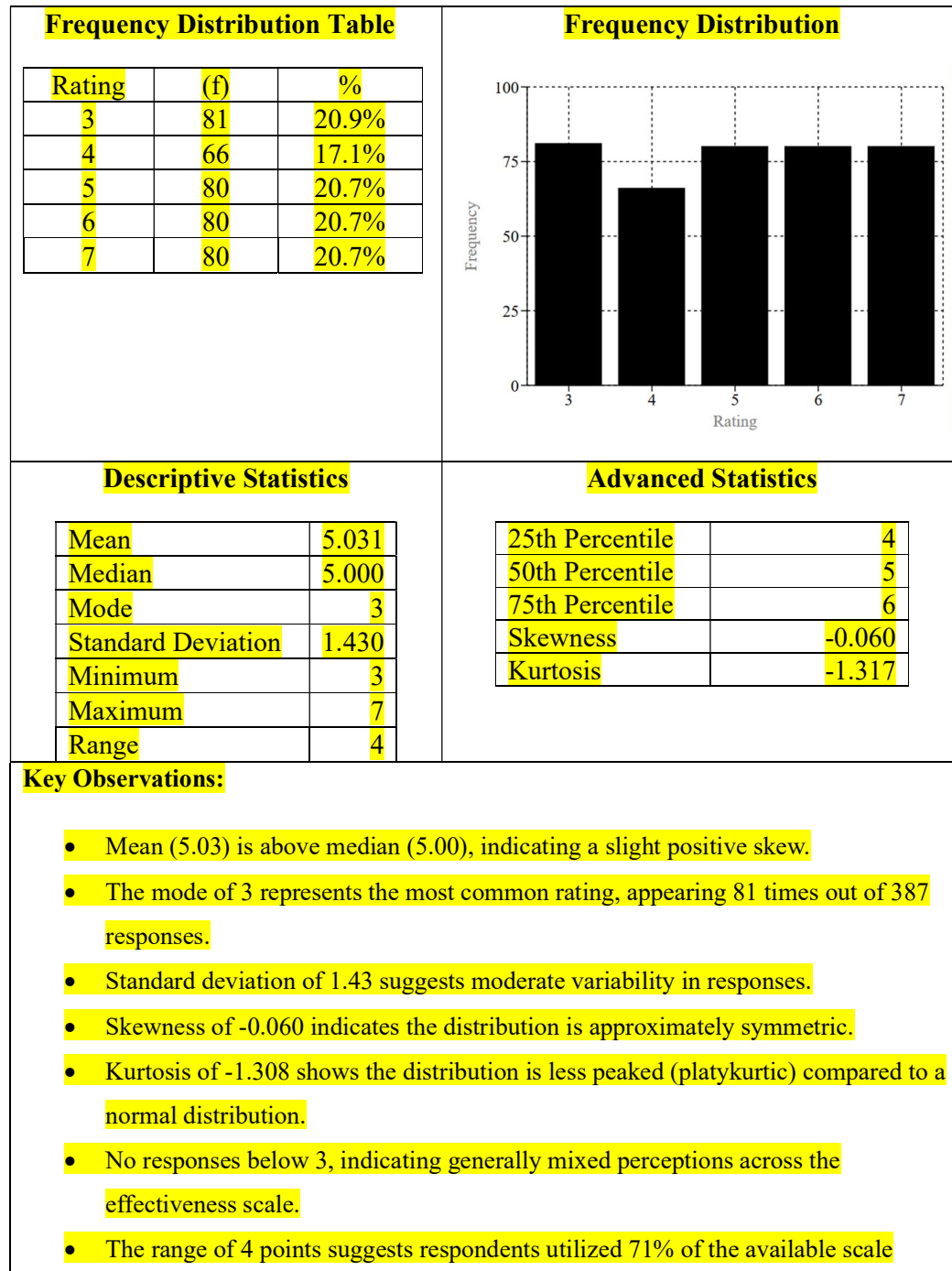


Table: 4.72: Q5.16. Would you like to add anything else about your experience that should be taken into account when introducing new technology to an organization?



4.4.3. Confirmatory Factor Analysis:

The multidimensional research data was examined using structural equation modelling (SEM). The analysis entailed doing a confirmatory factor analysis (CFA) on the variables (constructs) related to real estate using IBM SPSS version 24. The Cronbach alpha coefficient estimates for the whole component (one independent factor) related to the measurement construct of real estate was 0.856, indicating that the model is suitable for further statistical investigation. Fig. 4.13 illustrates the adequacy of the proposed theoretical framework by validating the factors, constructs, and variables by applying the chi-square test.

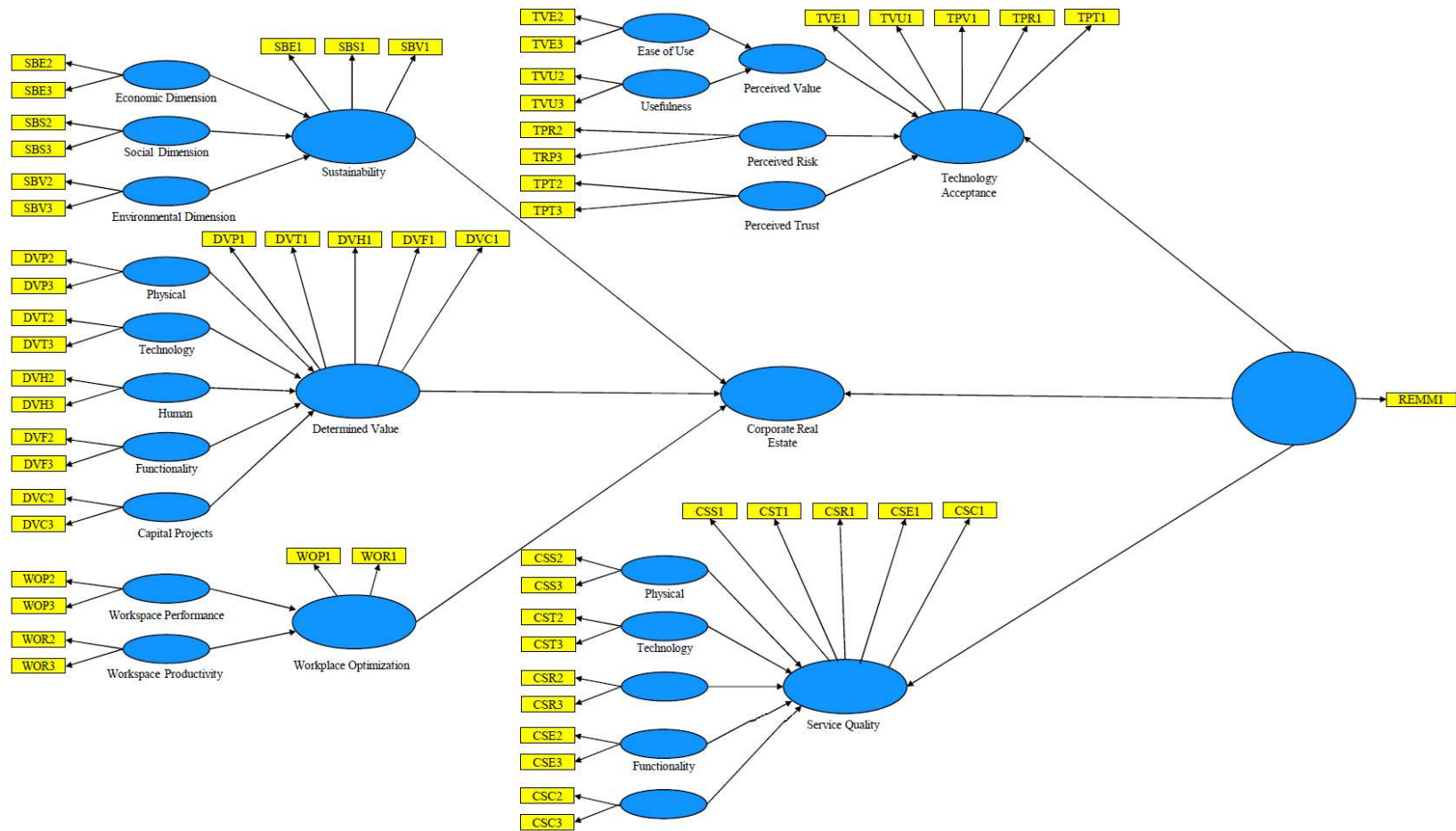


Fig. 4.13: Confirmatory Factor Analysis – Proposed Theoretical Model.

In Fig. 4.13 of the research model, the primary real estate variables are the Real Estate Maturity Model (REMM), Corporate Real Estate (CRE), Determined Value (RDV), Sustainability (RSB), and Workspace Operations (RWO). These variables are the main factors in the study. Additionally, the Technology Acceptance Model (CTA) and Service Quality (CSQ) are also important real estate variables. The second-order constructs, which are dimensions or indicators related to the construct of determined value, include Physical (DVP), Technology (DVT), Human (DVH), Functionality (DVF), and Capital Projects (DVC). The notion of sustainability encompasses three dimensions: the economic dimension (SBE), the social dimension (SBS), and the environmental dimension (SBV). Workspace Performance (WOP) and Workspace Productivity (WOR) are concepts that are connected to the overall functioning of Workspace Operations. Technology Acceptance Model (TAM) includes Ease of Use (TVE), Usefulness (TVU), Perceived Value (TPV), Perceived Risk (TPR), and Perceived Trust (TPT). Service Quality involves Speed of Service (CSS), Tangibility (CST), Reliability (CSR), Satisfaction (CSE), and Control (CSC).

The CFA evaluates the research model based on two criteria: (1) the fitness of the model, which is assessed by a chi-square test that reports the chi-square value and the associated degree of freedom (df), and (2) the confirmation of the elements. The second objective is to assess the soundness and dependability of the research model, which is evaluated using the measurement model (outer modelling).

The fitness of the research model was evaluated initially on the first-order constructs and subsequently on the second-order constructs (dimensions) to determine the adequacy of the model, as presented in table 4.10 of the confirmatory factor analysis (CFA). The CFA examines the relationship between recognized elements and their underlying developments. The use of CFA (Confirmatory Factor Analysis) confirms that the sample research data obtained on an indicator scale is unidimensional.

Table 4.16 demonstrates that the first-order constructs - Corporate Real Estate (CRE), Determined Value (DM), Sustainability (RSB), Workspace Operations (RWO) in addition to the Technology Acceptance Model (CTA) and Service Quality (CSQ) display a substantial alignment with the sample data.

The Real Estate Maturity Model (REMM) construct yielded a chi-square estimate of 288.9 with 168 degrees of freedom, and this result is statistically significant at a p-value ($p\text{-value} < 0.001$) below the threshold of 0.05 confidence level. The Chi-square to the degree of freedom (Cmin/df) of the corporate real estate build was 4.389, which falls within the acceptable range of 1.000 to 5.000. The goodness to fit index (GFI) of the real estate management construct is 0.981 which falls below the recommended threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the real estate construct is 0.963, also falling below the intended threshold limit of 0.9. The root mean square error of approximation (RMSEA) for the real estate construct is 0.073, which falls below the threshold range of 0.05 to 0.1. Therefore, the study's test data demonstrates that the real estate Maturity Model (REMM) construct is a suitable fit in terms of its uni-dimensionality.

Table 4.73: Confirmatory factor analysis using goodness-of-fit test.

Constructs	Chi sq.	Degree of freedom	Cmin/df	P- value	Goodness of Fit Index (GFI)	Comparative Fit Index (CFI)	Root Mean square error of approximation (RMSEA)
Corporate Real Estate - Real Estate Maturity Model							
CRE	288.9	168	4.389	<0.001	0.981	0.963	0.073
DVP	78.73	23	2.867	<0.001	0.981	0.943	0.058
DVT	73.86	20	2.456	<0.001	0.932	0.921	0.056
DVH	186.8	132	3.832	<0.001	0.953	0.945	0.054
DVF	135.3	122	3.358	<0.001	0.962	0.933	0.063
DVC	183.9	135	3.692	<0.001	0.958	0.947	0.057
RDV (Determined Value)							
RDV	258.3	165	4.256	<0.001	0.964	0.923	0.064
SBE	68.93	17	4.632	<0.001	0.954	0.945	0.071

Constructs	Chi sq.	Degree of freedom	Cmin/df	P- value	Goodness of Fit Index (GFI)	Comparative Fit Index (CFI)	Root Mean square error of approximation (RMSEA)
SBS	167.7	145	4.322	<0.001	0.947	0.921	0.062
SBV	181.7	163	4.211	<0.001	0.951	0.907	0.066
RSB (Sustainability)							
RSB	183.6	153	4.338	<0.001	0.963	0.927	0.072
WOP	166.5	143	3.981	<0.001	0.955	0.905	0.079
WOR	253.6	129	4.173	<0.001	0.973	0.913	0.069
RWO (Workspace Optimization)							
RWO	267.7	175	4.285	<0.001	0.974	0.929	0.067
TPV	163.9	149	3.964	<0.001	0.962	0.918	0.062
TVE	186.8	132	3.832	<0.001	0.953	0.945	0.061
TVU	135.3	122	3.358	<0.001	0.962	0.933	0.063
TPR	136.9	138	3.765	<0.001	0.952	0.928	0.055
TPT	148.8	128	4.167	<0.001	0.977	0.939	0.059
CTA (Technology Acceptance)							
CTA	287.9	167	4.379	<0.001	0.981	0.963	0.073
CSS	185.8	130	3.812	<0.001	0.953	0.945	0.065
CST	69.91	18	3.622	<0.001	0.945	0.938	0.068
CSR	161.7	127	3.158	<0.001	0.952	0.948	0.067
CSE	149.6	115	3.794	<0.001	0.971	0.931	0.066
CSC	71.53	19	2.827	<0.001	0.951	0.948	0.059
CSQ (Service Quality)							
CSQ	257.3	165	4.252	<0.001	0.964	0.923	0.064

The Determined Value (RDV) construct yielded a chi-square estimate of 258.3 with 165 degrees of freedom, which is statistically significant at a p-value ($p\text{-value} < 0.001$) below the threshold of 0.05 confidence level. The exhibited value construct had a Chi-square to the degree of freedom (Cmin/df) of 4.256, which is within the threshold range of 1.000 to 5.000. The determined value construct has a goodness-to-fit index (GFI) of 0.964, which falls below the intended threshold limit of 0.9. Similarly, the demonstrated value construct has a comparative fit index (CFI) of 0.923, which also falls below the proposed threshold limit of 0.9. The presented value construct has a root mean square error of approximation (RMSEA) of 0.064, which falls below the threshold range of 0.05 to 0.1. Therefore, the one-dimensional nature of the value construct that was proven is confirmed by its strong relationship to the test data in the study.

The Sustainability (RSB) construct yielded a chi-square value of 183.59 with 153 degrees of freedom, indicating statistical significance at a p-value ($p\text{-value} < 0.001$) below the threshold of 0.05 confidence level. The sustainability construct had a Chi-square to the degree of freedom (Cmin/df) value of 4.338, which falls inside the threshold range of 1.000 to 5.000. The goodness-to-fit index (GFI) of the sustainability construct is 0.963, which falls below the recommended threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the sustainability construct is 0.927, again below the intended threshold limit of 0.9. The root mean square error of approximation (RMSEA) for the sustainability construct is 0.072, which falls below the threshold range of 0.05 to 0.1. Therefore, the study's test data confirms that the sustainability construct is unidimensional.

The Workspace Optimization (RWO) construct yielded a chi-square value of 267.7 with 175 degrees of freedom, indicating statistical significance at a p-value ($p\text{-value} < 0.001$) below the threshold of 0.05 confidence level. The workspace optimization construct had a Chi-square to the degree of freedom (Cmin/df) value of 4.285, which falls inside the threshold range of 1.000 to 5.000. The goodness-to-fit index (GFI) of the workspace optimization construct is 0.974, which falls below the recommended threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the workspace optimization construct is 0.929, also falling below the intended threshold limit of 0.9.

The workspace optimization construct has a root mean square error of approximation (RMSEA) of 0.066, which falls below the threshold range of 0.05 to 0.1. Therefore, the study's test data demonstrates that the workspace optimization construct is well-suited in terms of its uni-dimensionality.

The Technology Acceptance (CTA) construct yielded a chi-square value of 287.9 with 167 degrees of freedom, which is statistically significant at a p-value ($p\text{-value} < 0.001$) below the confidence threshold of 0.05. The technology accept construct had a Chi-square to the degree of freedom (Cmin/df) value of 4.379, which falls inside the threshold range of 1.000 to 5.000. The goodness-to-fit index (GFI) for the technology acceptance construct is 0.981, which falls below the intended level of 0.9. Similarly, the comparative fit index (CFI) for the technology accept construct is 0.963, also falling below the proposed threshold of 0.9. The technology accept construct has a root mean square error of approximation (RMSEA) of 0.073, which falls below the threshold range of 0.05 to 0.1. As a result, the test data of the study indicates that the technology acceptance construct is appropriate in terms of its a single dimension.

The Service Quality (CSQ) construct revealed a chi-square estimation of 257.3 with 165 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. Chi-square to the degree of freedom (Cmin/df) of the service quality construct was 4.252, which is below the threshold limit of 1.000 to 5.000. The service quality construct's goodness-to-fit index (GFI) is 0.964, which is below the proposed threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the service quality construct is 0.923, which is also below the proposed threshold limit of 0.9. The service quality construct's root mean square error of approximation (RMSEA) is 0.064, which is below the threshold limit of 0.1. Hence, the test data of the study demonstrates the single dimensionality of the service quality construct.

Table 4.10 demonstrates that the second-order constructs, which include physical value, financial value, human value, functionality value, and capital value, are related to the construct of determined value; the economic, social, and environmental dimensions are related to the construct of sustainability; and corporate productivity and performance

are related to the construct of workspace optimization. The constructs of technology acceptance, Ease of Use, Usefulness, Perceived Value, Perceived Risk, and Perceived Trust, as well as the Speed of Service, Tangibility, Reliability, Satisfaction, and control components of service quality, have a significant fit to the sample data.

4.4.4. Testing Second order constructs:

4.4.4.1. Testing Determined Value - Second-Order Constructs:

The physical value (DVP) construct revealed a chi-square estimation of 78.73 with 23 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The physical value construct's Chi-square to the degree of freedom (Cmin/df) was 2.867, which falls within the threshold range of 1.000 to 5.000. The physical value construct's goodness-to-fit index (GFI) is 0.981, which is below the proposed threshold limit of above 0.9. Similarly, the comparative fit index (CFI) of the physical value construct is 0.943, which is also below the proposed threshold limit of above 0.9. The physical value construct's root mean square error of approximation (RMSEA) is 0.058, which is below the threshold limit of 0.1. Thus, the physical value construct's single dimension is demonstrated in alignment with the study's test data.

The Technology value (DVT) construct disclosed a chi-square estimation of 73.86 with 20 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The technology value construct's Chi-square to the degree of freedom (Cmin/df) was 2.456, which is below the threshold limit of 1.000 to 5.000. The comparative fit index (CFI) of the technology value construct is 0.921, which is also below the prescribed threshold limit of 0.9. The goodness-to-fit index (GFI) of the technology value construct is 0.932. The technology value construct's root mean square error of approximation (RMSEA) is 0.056, which is below the threshold limit of 0.1. Thus, the technology value construct's one-dimensionality is illustrated in its fit with the study's test data.

The human value (DVH) construct revealed a chi-square estimation of 186.77 with 132 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is

below the threshold limit of 0.05 degree of confidence. The human value construct's Chi-square to the degree of freedom (Cmin/df) was 3.832, which falls within the threshold range of 1.000 to 5.000. The human value construct's goodness-to-fit index (GFI) is 0.953, which is below the proposed threshold limit of above 0.9. Similarly, the comparative fit index (CFI) of the human value construct is 0.945, which is also below the proposed threshold limit of above 0.9. 0.061 is the root mean square error of approximation (RMSEA) of the human value construct, which is below the threshold limit of 0.05 to 0.1. Therefore, the human value construct's one-dimensionality is demonstrated in relation to the study's test data.

The functionality value (DVF) construct revealed a chi-square estimation of 135.33 with 122 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The functionality value construct's Chi-square to the degree of freedom (Cmin/df) was 3.358, which falls within the threshold range of 1.000 to 5.000. The functionality value construct's goodness-to-fit index (GFI) is 0.962, which is below the proposed threshold limit of above 0.9. Similarly, the comparative fit index (CFI) of the functionality value construct is 0.933, which is also below the proposed threshold limit of above 0.9. 0.063 is the root mean square error of approximation (RMSEA) of the functionality value construct, which is below the threshold limit of 0.05 to 0.1. Therefore, the functionality value construct's one-dimensionality is evidenced in its fit with the study's test data.

A chi-square estimation of 183.88 with 135 degrees of freedom was discovered by the capital value (DVC) construct. This estimate is measurably significant at a p-value of less than 0.001, which is below the threshold limit of 0.05 degrees of confidence. The capital value construct's Chi-square to the degree of freedom (Cmin/df) was 3.692, which falls within the threshold range of 1.000 to 5.000. The capital value construct's comparative fit index (CFI) is 0.947, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.958. The capital value construct's root mean square error of approximation (RMSEA) is 0.057, which is below the threshold limit of 0.1. Therefore, the capital value construct's single dimension is demonstrated in relation to the study's test data.

4.4.4.2. Testing Sustainability - Second-Order Constructs:

The economic dimension (SBE) construct revealed a chi-square estimation of 68.93 with 17 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The economic dimension construct's Chi-square to the degree of freedom (Cmin/df) was 4.632, which falls within the threshold range of 1.000 to 5.000. The economic dimension construct's comparative fit index (CFI) is 0.945, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.954. The economic dimension construct's root mean square error of approximation (RMSEA) is 0.071, which is below the threshold limit of 0.1. Therefore, the economic dimension construct's one-dimensionality is demonstrated in relation to the study's test data.

The social dimension (SBS) construct revealed a chi-square estimation of 167.73 with 145 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The social dimension construct's Chi-square to the degree of freedom (Cmin/df) was 4.322, which falls within the threshold range of 1.000 to 5.000. The social dimension construct's goodness-to-fit index (GFI) is 0.947, which is below the proposed threshold limit of above 0.9. Similarly, the compare fit index (CFI) of the social dimension construct is 0.921, which is also below the proposed threshold limit of above 0.9. The social dimension construct's root mean square error of approximation (RMSEA) is 0.062, which is below the threshold limit of 0.1. Consequently, the social dimension construct's single dimensionality is demonstrated in relation to the study's test data at hand.

The environmental dimension (SBV) construct revealed a chi-square estimation of 181.72 with 163 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The environmental dimension construct's Chi-square to the degree of freedom (Cmin/df) was 4.211, which is below the threshold limit of 1.000 to 5.000. The comparative fit index (CFI) of the environmental dimension construct is 0.907, which is also below the prescribed threshold limit of above 0.9. Additionally, the goodness-to-fit index (GFI) of the environmental dimension construct is 0.951. The environmental dimension

construct's root mean square error of approximation (RMSEA) is 0.066, which is below the threshold limit of 0.1. Thus, the strategic focus construct's single dimensionality is illustrated in its fit with the study's test data.

4.4.4.3. Testing Workspace Optimization – Second-Order constructs:

The productivity construct (WOP) revealed a chi-square estimation of 166.54 with 143 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The productivity construct's Chi-square to the degree of freedom (Cmin/df) was 3.981, which falls within the threshold range of 1.000 to 5.000. The productivity construct's comparative fit index (CFI) is 0.905, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.955. 0.079 is the root mean square error of approximation (RMSEA) of the productivity construct, which is below the threshold limit of 0.05 to 0.1. Consequently, the productivity construct's one dimensionality is demonstrated in its correlation with the study's test data.

The performance (WOR) construct revealed a chi-square estimation of 253.57 with 129 degree of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The performance construct's Chi-square to the degree of freedom (Cmin/df) was 4.173, which falls within the threshold range of 1.000 to 5.000. The performance construct's comparative fit index (CFI) is 0.913, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.973. The performance construct's root mean square error of approximation (RMSEA) is 0.069, which is below the threshold limit of 0.1. As a result, the performance construct's single dimensionality is demonstrated in its fit with the study's test data.

4.4.4.4. Testing Technology Acceptance – Second-Order constructs:

The Perceived Value (TPV) construct revealed a chi-square estimation of 163.93 with 149 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The perceived value construct's Chi-square to the degree of freedom (Cmin/df) was 3.964, which falls within

the threshold range of 1.000 to 5.000. The perceived value construct's goodness-to-fit index (GFI) is 0.962, which is below the proposed threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the perceived value construct is 0.918, which is also below the proposed threshold limit of 0.9. 0.062 is the root mean square error of approximation (RMSEA) of the perceived value construct, which is below the threshold limit of 0.05 to 0.1. Hence, the perceived value construct's one-dimensionality is demonstrated in relation to the study's test data.

The Ease of Use (TVE) construct revealed a chi-square estimation of 186.77 with 132 degree of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The Chi-square to the degree of freedom (Cmin/df) of the ease-of-use construct was 3.832, which is below the threshold limit of 1.000 to 5.000. The ease-of-use construct's comparative fit index (CFI) is 0.945, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.953. The RMSEA of the simplicity of use construct is 0.061, which is below the threshold limit of 0.1 or 0.05. Finally, the simplicity of use construct's one-dimensionality is demonstrated in correspondence with the study's test data.

The Usefulness (TVU) construct identified a chi-square estimation of 135.33 with 122 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The usefulness construct's Chi-square to the degree of freedom (Cmin/df) was 3.358, which falls within the threshold range of 1.000 to 5.000. The usefulness construct's comparative fit index (CFI) is 0.933, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.962. The usefulness construct's root mean square error of approximation (RMSEA) is 0.063, which is greater than the threshold limit of 0.1. Therefore, the usefulness construct's uni-dimensionality is evidenced in its fit with the study's test data.

The Perceived Risk (TPR) construct revealed a chi-square estimation of 136.92 with 138 degree of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The perceived risk construct's Chi-square to the degree of freedom (Cmin/df) was 3.765, which is below the threshold limit of 1.000 to 5.000. The perceived risk construct's goodness-to-fit index (GFI) is

0.952, which is below the proposed threshold limit of 0.9. Similarly, the comparative fit index (CFI) of the perceived risk construct is 0.928, which is also below the proposed threshold limit of 0.9. The strategic cost construct's root mean square error of approximation (RMSEA) is 0.058, which is below the threshold limit of 0.1. Hence, the perceived risk construct's single dimensionality is demonstrated in relation to the study's test data.

The Perceived Trust (TPT) construct revealed a chi-square estimation of 148.84 with 128 degree of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The perceived trust construct's Chi-square to the degree of freedom (Cmin/df) was 4.167, which falls within the threshold range of 1.000 to 5.000. The perceived trust construct's goodness-to-fit index (GFI) is 0.977, which is below the proposed threshold limit of above 0.9. Similarly, the comparative fit index (CFI) of the perceived trust construct is 0.939, which is also below the proposed threshold limit of above 0.9. The estimated root mean square error of approximation (RMSEA) for the perceived trust construct is 0.059, which falls within the threshold range of 0.05 to 0.1. Therefore, the perceived trust construct's uni-dimensionality is demonstrated in relation to the study's test data.

4.4.4.5. Testing Service Quality - Second order constructs:

The Speed of Service (CSS) construct revealed a chi-square estimation of 185.77 with 130 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The Chi-square to the degree of freedom (Cmin/df) of the pace of service construct was 3.812, which is below the threshold limit of 1.000 to 5.000. The speed of service construct's goodness-to-fit index (GFI) is 0.953, which is below the proposed threshold limit of above 0.9. Similarly, the comparative fit index (CFI) of the speed of service construct is 0.945, which is also below the proposed threshold limit of above 0.9. The speed of service construct's root mean square error of approximation (RMSEA) is 0.065, which is below the threshold limit of 0.1. Consequently, the pace of service construct's dimension is found to be well-suited to the study's test data.

The Tangibility (CST) construct revealed a chi-square estimation of 69.91 with 18 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The tangibility construct's Chi-square to the degree of freedom (Cmin/df) was 3.622, which falls within the threshold range of 1.000 to 5.000. The tangibility construct's comparative fit index (CFI) is 0.938, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.945. 0.068 is the root mean square error of approximation (RMSEA) of the tangibility construct, which is below the threshold limit of 0.05 to 0.1. Therefore, the tangibility construct's one dimension is demonstrated in relation to the study's test data.

The Reliability (CSR) construct revealed a chi-square estimation of 161.7 with 127 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The reliability construct's Chi-square to the degree of freedom (Cmin/df) was 3.158, which falls within the threshold range of 1.000 to 5.000. The reliability construct's comparative fit index (CFI) is 0.948, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.952. The reliability construct's root mean square error of approximation (RMSEA) is 0.067, which is below the threshold line of 0.05 to 0.1. Therefore, the reliability construct's single dimension is evidenced in its fit with the study's test data.

The Satisfaction (CSE) construct disclosed a chi-square estimation of 149.55 with 115 degrees of freedom, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The Chi-square to the degree of freedom (Cmin/df) of the satisfaction construct was 3.794, which is below the threshold limit of 1.000 to 5.000. The satisfaction construct's comparative fit index (CFI) is 0.931, which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.971. The strategic cost construct's root mean square error of approximation (RMSEA) is 0.066, which is below the threshold limit of 0.1. Therefore, the satisfaction construct's one-dimensionality is demonstrated in relation to the study's test data.

A chi-square estimation of 71.53 with 19 degrees of freedom was obtained for the Control (CSC) construct, which is measurably significant at a p-value of < 0.001 , which is below the threshold limit of 0.05 degree of confidence. The Control construct's Chi-square to the degree of freedom (Cmin/df) was 2.827, which is below the threshold limit of 1.000 to 5.000. The control construct's comparative fit index (CFI) is 0.948,

which is also below the proposed threshold limit of 0.9, and its goodness-to-fit index (GFI) is 0.951. Control construct's root mean square error of approximation (RMSEA) is 0.059, which falls within the threshold range of 0.05 to 0.1. Consequently, the control construct's one-dimensionality is demonstrated in its fit with the study's test data.

4.4.5. Measurement Model

A component of the measurement model is the analysis of the validity and reliability of the items on the measuring instrument. The methodology involves evaluating the validity and reliability of the proposed study framework using the measurement model approach (outer model) and Smart PLS version 3.0. This is achieved through the utilization of the measurement model approach. In the Indian Corporate Real Estate department and workspace, this method is employed to assess the impact of corporate real estate on the proven value of the organization, determined value, sustainability, and workspace optimization. The technology acceptance model is employed to introduce new technologies for the modern world, and the staff's implementation and acceptance of their use, as well as the organization's productivity and performance. This approach results in satisfaction for both parties, and the service quality is measured in equal terms for both serving the stakeholders and our internal staff in their daily operations.

The study is grounded in first-order constructs as well as second-order constructs, which refer to the dimensions of things. In this study, the exogenous variable (independent variable) is corporate real estate (CRE), while the endogenous variables (dependent variables) include determined value, sustainability, and workspace optimization. These variables are part of the technology acceptance model, which also incorporates technology usage and delivery using service quality. The study focusses on the corporate real estate department and organizations. In second-order constructs, the exogenous variables (independent variables) consist of physical value, financial value, human value, functionality, and capital projects. These variables determine the value of the endogenous variable. Additionally, the exogenous variables include economic dimension, social dimension, and environmental dimension, which determine the sustainability of the endogenous variable. Lastly, the exogenous variables include productivity and performance of the organization, which determine the

workspace optimization of the endogenous variable. (4) The exogenous variables (independent variables) in the technology acceptance model version 3.0 are Ease of Use, Usefulness, Perceived Value, Perceived Risk, and Perceived Trust. These variables have explicitly provided data along with the speed of service, tangibility, reliability, satisfaction, and control, which form the adopted scale of endogenous variables for service quality. The variables. Table 4.11 displays the outcomes of the validity and reliability tests conducted on both the first-order constructs and the second-order constructs.

4.4.6. Reliability and Validity of Model Constructs testing:

Initially, the external model was evaluated using composite reliability to establish the internal consistency of the constructs. Additionally, the Average Variance Extracted (AVE) was examined to determine the convergent validity of the constructs, and Cronbach's α was used to measure the reliability of the indicators. Table 4.11 demonstrates that the composite reliability values for the first-order constructs, namely Corporate Real Estate (0.8437), Determined Value (0.8083), Corporate Sustainability (0.8048), Workspace Optimization (0.7747), Technology Acceptance (0.7988), and Service Quality (0.7928), exceed the minimum threshold of 0.7. The Average Value Extracted (AVE) values of the first-order constructs are as follows: Corporate Real Estate: 0.7834, determined value: 0.5611, sustainability: 0.5813, workspace optimizations: 0.6352, technology acceptance: 0.5744, and Service Quality: 0.5675. These values exceed the minimum threshold of 0.5, indicating that they are acceptable in terms of both AVE and Cronbach's α reliability and validity tests.

Table 4.74: Reliability and validity of model constructs.

Constructs/ Dimensions	AVE	Composite Reliability	Cronbach's Alpha (α)	R Square
Corporate Real Estate (CRE)	0.7834	0.8437	0.8562	0
Physical	0.8324	0.9085	0.799	0
Financial	0.7586	0.8627	0.7822	0
Human	0.6128	0.7547	0.7982	0
Functionality	0.8671	0.9288	0.8475	0
Capital Projects	0.8421	0.9143	0.8129	0

Constructs/ Dimensions	AVE	Composite Reliability	Cronbach's Alpha (α)	R Square
Determined Value (RDV)	0.5611	0.8083	0.7097	0.8307
Economic Dimension	0.8406	0.9134	0.8129	0
Social Dimension	0.7703	0.8702	0.7033	0
Environmental Dimension	0.8221	0.9023	0.7875	0
Sustainability (RSB)	0.5813	0.8048	0.7327	0.9393
Workspace Productivity	0.7000	0.8749	0.7905	0
Workspace Performance	0.7663	0.9076	0.8474	0
Workspace Optimization (RWO)	0.6352	0.7747	0.7408	0.2989
Ease of Use	0.9764	0.9987	0.8072	0
Usefulness	0.9045	0.9537	0.8031	0
Perceived Value	0.8326	0.9087	0.799	0
Perceived Trust	0.7607	0.8637	0.7949	0
Perceived Risk	0.8663	0.9284	0.8475	0
Technology Acceptance (CTA)	0.5744	0.7988	0.7294	0.8233
Speed of Service	0.8671	0.9288	0.8475	0
Tangibility	0.8421	0.9143	0.8129	0
Satisfaction	0.8663	0.9284	0.8475	0
Reliability	0.8406	0.9134	0.8129	0
Control	0.8482	0.9178	0.8244	0
Service Quality (CSQ)	0.5675	0.7928	0.7261	0.7073

The Cronbach α values of the first-order constructs, as displayed in table 4.17, are as follows: Corporate Real Estate: 0.8562, determined value: 0.7097, sustainability: 0.7327, workspace optimizations: 0.7408, technology acceptance: 0.7294, and Service Quality: 0.7261. These values exceed the minimum threshold of 0.7, indicating that the model is an excellent fit (Hair et al., 2017).

Table 4.17 displays the composite reliability values of the second-order constructs. The following dimensions and factors have scores that exceed the minimum threshold of 0.7: Physical (0.9085), Financial (0.8627), Human (0.7547), Functionality (0.9288), Capital Projects (0.9143), Economic Dimension (0.9134), Social Dimension (0.8702),

Environmental Dimension (0.9023), Workspace Productivity (0.8749), Workspace Performance (0.9076), Ease of Use (0.9987), Usefulness (0.9537), Perceived Value (0.9087), Perceived Trust (0.8637), Perceived Risk (0.9284), Speed of Service (0.9288), Tangibility (0.9143), Satisfaction (0.9284), Reliability (0.9134), and Control (0.9178).

The average values of the second-order constructs - The following dimensions and factors have values greater than the minimum prescribed limit of 0.5: Physical (0.8324), Financial (0.7586), Human (0.6128), Functionality (0.8671), Capital Projects (0.8421), Economic Dimension (0.8406), Social Dimension (0.7703), Environmental Dimension (0.8221), Workspace Productivity (0.7000), Workspace Performance (0.7663), Ease of Use (0.9764), Usefulness (0.9045), Perceived Value (0.8326), Perceived Trust (0.7607), Perceived Risk (0.8663), Speed of Service (0.8671), Tangibility (0.8421), Satisfaction (0.8663), Reliability (0.8406), and Control (0.8482).

The Cronbach α values of the second-order constructs are as follows: Physical: 0.799, Financial: 0.7822, Human: 0.7982, Functionality: 0.8475, Capital Projects: 0.8129, Economic Dimension: 0.8129, Social Dimension: 0.7033, Environmental Dimension: 0.7875, Workspace Productivity: 0.7905, Workspace Performance: 0.8474, Ease of Use: 0.8072, Usefulness: 0.8031, Perceived Value: 0.799, Perceived Trust: 0.7949, Perceived Risk: 0.8475, Speed of Service: 0.8475, Tangibility: 0.8129, Satisfaction: 0.8475, Reliability: 0.8129, and Control: 0.8244. These values exceed the minimum threshold of 0.7, indicating that the model is a perfect fit (Hair et al., 2017).

Table 4.75: Discriminant validity of first-order constructs.

Constructs	CRE	RDV	RSB	RWO	CTA	CSQ
CRE	0.9898					
RDV	0.8616	0.8468				
RSB	0.7935	0.7513	0.8539			
RWO	0.6742	0.5309	0.5193	0.8166		
CTA	0.4513	0.3929	0.3623	0.4690	0.8045	
CSQ	0.3748	0.2350	0.0536	0.3214	0.3608	0.9110

Corporate Real Estate (CRE), Determined Value (RDV), Sustainability (RSB), Workspace Optimization (RWO), Technology Acceptance (CTA) and Service Quality (CSQ)

Table 4.18 displays the extent to which the second-order scale constructs and the first-order constructs exhibit discriminant validity. The abbreviations used in table 4.18 are as follows: Physical (DVP), Financial (DVT), Human (DVH), Functionality (DVF), Capital Projects (DVC), Economic Dimension (SBE), Social Dimension (SBS), Environmental Dimension (SBV), Workspace Productivity (WOP), Workspace Performance (WOR), Ease of Use (TPV), Usefulness (TVE), Perceived Value (TVU), Perceived Trust (TPR), Perceived Risk (TPT), Speed of Service (CSS), Tangibility (CST), (CSR), Reliability (CSE), and Control (CSC).

4.4.7. Testing the Cross-Loadings of Model Constructs

4.4.7.1. Determined Value:

In the final stage of the measurement model, the cross-loadings between the components (constructs) or the loadings of items inside the construct are examined. The cross-loading of each construct was assessed in both horizontal and vertical directions. According to Nunnally's (1978) study, the loading of the item value inside the construct should be greater than the loadings of all other constructs in both horizontal and vertical directions. Furthermore, the item's loading within the construct should exceed the

minimum recommended threshold of 0.6, as stated by Nunnally (1978). Therefore, this unequivocally confirms that one structure is distinct from another. Table 4.14 displays the cross-loadings of the items that make up the determined value construct. The loadings of the items within the determined value construct are as follows: DVP1: 0.5944, DVT1: 0.7386, DVH1: 0.5554, DVF1: 0.7277, DVC1: 0.754. The loadings of the second-order constructs related to the demonstrated value construct are as follows: physical construct (DVP2: 0.9041, DVP3: 0.9205), technology construct (DVT2: 0.8811, DVT3: 0.8608), human construct (DVH2: 0.9034, DVH3: 0.64), functionality construct (DVF2: 0.9211, DVF3: 0.9411), and capital projects construct (DVC2: 0.9089, DVC3: 0.8915). The cross-loadings of the shown value construct exhibit larger values compared to the cross-loadings of the other constructs, both horizontally and vertically. Additionally, these loading values above the minimum threshold of 0.6 as stipulated by Nunnally (1978). Therefore, this unequivocally confirms that one structure is distinct from another.

Table 4.76: Determined Value Constructs – Cross Loading.

Constructs	Physical	Financial	Human	Functionality	Capital Projects	Determined Value (RDV)
DVP1	0.586	0.5287	0.4384	0.2403	0.2168	0.5944
DVP2	0.9041	0.6042	0.477	0.3218	0.2976	0.5865
DVP3	0.9205	0.5539	0.5678	0.3361	0.3868	0.6412
DVT1	0.697	0.5652	0.4687	0.3501	0.3717	0.7386
DVT2	0.6341	0.8811	0.4083	0.272	0.2734	0.5426
DVT3	0.463	0.8608	0.5508	0.3043	0.2877	0.5041
DVH1	0.4202	0.4625	0.6233	0.2295	0.2406	0.5554
DVH2	0.5035	0.5099	0.9034	0.3847	0.3935	0.6005

Constructs	Physical	Financial	Human	Functionality	Capital Projects	Determined Value (RDV)
DVH3	0.3957	0.3228	0.64	0.2467	0.2358	0.3352
DVF1	0.3399	0.3225	0.3421	0.6552	0.6628	0.7277
DVF2	0.3254	0.2724	0.3758	0.9211	0.7297	0.6006
DVF3	0.3455	0.338	0.3952	0.9411	0.7692	0.6917
DVC1	0.3408	0.2806	0.3593	0.7237	0.9263	0.7540
DVC2	0.3523	0.3117	0.408	0.7575	0.9089	0.6812
DVC3	0.3638	0.3428	0.4567	0.7913	0.8915	0.6084

4.4.7.2. Sustainability:

The final stage of the measurement model evaluates the cross-loadings between the factors (constructs) or the loadings of elements within the construct. The cross-loading of each construct was verified in both horizontal and vertical directions. In accordance with Nunnally's (1978) research, the loading of the item value within the construct should be greater than the loadings of all other constructs in both horizontal and vertical directions. Furthermore, the item's charge within the construct should exceed the minimum prescribed limit of 0.6 (Nunnally, 1978). Consequently, this serves as a comprehensive confirmation that one construct is distinct from another. The cross-loadings of the items of the sustainability construct are illustrated in Table 4.14. The loadings of the items within the sustainability value construct are SB1: 0.6717, SBS1: 0.6463, and SBV1: 0.7178. The loadings of the second-order constructs related to the demonstrated value construct are the economic dimension. Social dimension construct SBS2: 0.6732, SBS3: 0.6216, environmental dimension SBV2: 0.8274, SBV3: 0.7092, SBE2: 0.8962, SBE3: 0.2161, SBS3: 0.7092. The cross-loadings of the demonstrated

value construct are observed to be larger than the respective cross-loadings of all other constructs in both the horizontal and vertical directions. Additionally, these loading values exceed the minimum prescribed limit of 0.6 (Nunnally, 1978). Consequently, this serves as a comprehensive confirmation that one construct is distinct from another.

Table 4.77: Sustainability Constructs – Cross Loading.

Constructs	Economic Dimension	Social Dimension	Environmental Dimension	Sustainability (SB)
SBE1	0.9370	0.2457	0.3876	0.6717
SBE2	0.8962	0.2877	0.3794	0.5288
SBE3	0.2161	0.8964	0.558	0.7474
SBS1	0.2949	0.8586	0.7104	0.6463
SBS2	0.3879	0.6732	0.9331	0.8568
SBS3	0.3701	0.6216	0.8795	0.6473
SBV1	0.4262	0.4808	0.7972	0.7178
SBV2	0.4638	0.3623	0.8274	0.7183
SBV3	0.5014	0.2438	0.7092	0.7188

4.4.7.3. Workspace Optimization:

The final stage of the measurement model involves testing the cross-loadings across variables (constructs) or the loadings of items inside the construct. The cross-loading of each construct was assessed in both horizontal and vertical directions. According to Nunnally's (1978) study, the loading of the item value inside the construct should be greater than the loadings of all other constructs in both horizontal and vertical directions. Furthermore, the item's loading within the construct should exceed the minimum recommended threshold of 0.6, as stated by Nunnally (1978). Therefore, this unequivocally confirms that one structure is distinct from another. Table 4.14 displays the cross-loadings of the components pertaining to the workspace optimization

construct. The loadings of the elements inside the determined value construct are as follows: WOP1: 0.8805 and WOR1: 0.6873. The loadings of the second-order constructs associated to the demonstrated value construct are as follows: workspace performance WOP2: 0.8462, WOP3: 0.8113, and workspace productivity. The value of WOR2 is 0.2696 and the value of WOR3 is 0.8547. The cross-loadings of the exhibited value construct exhibit larger values compared to the cross-loadings of the other constructs, both horizontally and vertically. Furthermore, these loading values are above the minimum threshold of 0.6 as stipulated by Nunnally (1978). Therefore, this confirms unequivocally that one structure is distinct from another.

Table 4.78: Workspace Optimization Constructs – Cross Loading.

Constructs	Workspace Performance	Workspace Productivity	Workspace Utility (WU)
WOP1	0.4985	0.2988	0.8805
WOP2	0.8462	0.3253	0.5217
WOP3	0.8113	0.2333	0.3615
WOR1	0.8519	0.3829	0.6873
WOR2	0.3035	0.2696	0.7036
WOR3	0.3103	0.8547	0.3265

4.4.7.4. Technology Acceptance:

The final stage of the measurement model evaluates the cross-loadings between the factors (constructs) or the loadings of elements within the construct. The cross-loading of each construct was verified in both horizontal and vertical directions. In accordance with Nunnally's (1978) research, the loading of the item value within the construct should be greater than the loadings of all other constructs in both horizontal and vertical directions. Furthermore, the item's charge within the construct should exceed the minimum prescribed limit of 0.6 (Nunnally, 1978). Consequently, this serves as a

comprehensive confirmation that one construct is distinct from another. The cross-loadings of the items of the technology construct are illustrated in Table 4.14. The loadings of the items within the technology acceptance construct are TVE1: 0.7340, TVU1: 0.8879, TPV1: 0.4178, TPR1: 0.5201, and TPT1: 0.8568. The loadings of the second-order constructs related to the technology acceptance construct are simplicity of use. TVE2: 0.9128, TVE3: 0.9122, usefulness TVU2: 0.8218, TVU3: 0.6833, perceived risk TPR2: 0.7237, TPR3: 0.7913, and perceived trust: TPT2: 0.6615, TPT3: 0.6333. The cross-loadings of the demonstrated value construct are observed to be higher than the respective cross-loadings of all other constructs in both the horizontal and vertical directions. Additionally, these loading values exceed the minimum prescribed limit of 0.6 (Nunnally, 1978). Consequently, this serves as a comprehensive confirmation that one construct is distinct from another.

Table 4.79: Technology Acceptance Constructs – Cross Loading.

Constructs	Ease of Use	Usefulness	Perceived Value	Perceived Risk	Perceived Trust	Technology Acceptance (CTA)
TVE1	0.5864	0.5819	0.2411	0.3829	0.3873	0.734
TVE2	0.9128	0.7068	0.3227	0.6216	0.8795	0.6756
TVE3	0.9122	0.6869	0.3356	0.2988	0.8805	0.6733
TVU1	0.6964	0.9198	0.3515	0.6732	0.9331	0.8879
TVU2	0.6364	0.8218	0.2732	0.2333	0.3615	0.6113
TVU3	0.3410	0.6833	0.6574	0.5678	0.3361	0.6294
TPV1	0.3242	0.2928	0.9152	0.2467	0.2358	0.4178
TPR1	0.3461	0.3755	0.9461	0.3253	0.5217	0.5201
TPR2	0.3408	0.2806	0.3593	0.7237	0.9263	0.7540
TPR3	0.3638	0.3428	0.4567	0.7913	0.8915	0.6084

Constructs	Ease of Use	Usefulness	Perceived Value	Perceived Risk	Perceived Trust	Technology Acceptance (CTA)
TPT1	0.3879	0.6732	0.9331	0.6732	0.9331	0.8568
TPT2	0.3701	0.6216	0.8795	0.2333	0.6615	0.6473
TPT3	0.8962	0.2877	0.3794	0.2732	0.6333	0.5288

4.4.7.5. Service Quality:

The final stage of the measurement model involves testing the cross-loadings between the components (constructs) or the loadings of items within the construct. The cross-loading of each construct was assessed in both horizontal and vertical directions. According to the research conducted by Nunnally (1978), the loading of the item value inside the construct should be greater than the loadings of all other constructs in both horizontal and vertical directions. Furthermore, the item's loading within the construct should exceed the minimum recommended threshold of 0.6, as stated by Nunnally (1978). Therefore, this unequivocally confirms that one structure is distinct from another. Table 4.14 displays the cross-loadings of the items inside the service quality construct. The loadings of the items within the service quality construct pertain to the speed of service. CSS2 has a score of 0.6970, CSS3 has a score of 0.6341. Tangibility CST2 has a score of 0.6625, and CST3 has a score of 0.6338. Reliability CSR2 has a score of 0.7080, and CSR3 has a score of 0.7794. Satisfaction CSE2 has a score of 0.6732, and CSE3 has a score of 0.8333. Control CSC2 has a score of 0.7168, and CSC3 has a score of 0.8915. The cross-loadings of the exhibited value construct exhibit larger values compared to the cross-loadings of the other constructs, both horizontally and vertically. Furthermore, these loading levels are above the minimum threshold of 0.6, as stipulated by Nunnally (1978). Therefore, this unequivocally confirms that one structure is distinct from another.

Table 4.80: Service Quality Constructs – Cross Loading.

Constructs	Speed of Service	Tangibility	Reliability	Satisfaction	Control	Service Quality (CSQ)
CSS1	0.9205	0.5539	0.5678	0.3361	0.3868	0.6412
CSS2	0.6970	0.5652	0.4687	0.3501	0.3717	0.7386
CSS3	0.6341	0.8811	0.4083	0.2720	0.2734	0.5426
CST1	0.4630	0.8608	0.5508	0.3043	0.2877	0.6041
CST2	0.4202	0.6625	0.6233	0.2295	0.2406	0.5554
CST3	0.3455	0.6338	0.3952	0.9411	0.7692	0.6917
CSR1	0.3701	0.6216	0.8795	0.2333	0.3615	0.6473
CSR2	0.3523	0.3117	0.7080	0.7575	0.9089	0.6812
CSR3	0.8962	0.2877	0.7794	0.2732	0.2333	0.5288
CSE1	0.9122	0.6869	0.3356	0.2988	0.8805	0.6733
CSE2	0.6964	0.9198	0.3515	0.6732	0.9331	0.8879
CSE3	0.6364	0.8218	0.2732	0.8333	0.3615	0.6113
CSC1	0.3408	0.2806	0.3593	0.7237	0.9263	0.7540
CSC2	0.5860	0.5287	0.4384	0.2403	0.7168	0.5944
CSC3	0.3638	0.3428	0.4567	0.7913	0.8915	0.6084

4.4.8. Univariate Analysis

The one-sample t-test, also known as univariate analysis, is used to assess the normality of the data collected for each factor. Table 4.18 displays the average, standard deviation, skewness, and kurtosis calculated for each factor (construct) pertaining to corporate real

estate using IBM SPSS version 24. It indicates that the number of samples is drawn from a normal distribution.

Table 4.81: Univariate Analysis.

Constructs	Mean	Std. Deviation	Skewness	Kurtosis
Corporate Real Estate	3.87	0.93	0.523397	-1.308521
Physical	2.38	0.72	0.418564	-1.524933
Financial	3.43	0.63	-0.753784	-1.632783
Human	2.67	0.59	-0.564289	0.683925
Functionality	1.95	0.87	1.493277	-0.580552
Capital Project	1.77	0.65	0.578824	1.578432
Determined Value (RDV)	3.73	0.84	1.067394	-0.948263
Economic Dimension	2.74	0.64	2.027952	-1.684292
Social Dimension	1.84	0.67	1.428953	-0.539527
Environmental Dimension	1.92	0.74	1.639632	0.583286
Sustainability (RSB)	3.52	0.54	-0.502724	2.859331
Workspace Productivity	2.38	0.68	-0.692741	-1.593293
Workspace Performance	2.63	0.88	0.942053	1.649331
Workspace Optimization (RWO)	3.23	0.82	-0.838531	-1.289465
Ease of Use	2.17	0.62	1.834421	-0.939531
Usefulness	2.85	0.33	-0.338124	2.682465
Perceived Value	1.98	0.92	1.749434	-0.773297
Perceived Trust	2.98	0.95	1.56395	1.853644

Constructs	Mean	Std. Deviation	Skewness	Kurtosis
Perceived Risk	2.73	0.35	1.238743	0.647213
Technology Acceptance (CTA)	3.21	0.79	1.379013	-0.828263
Speed of Service	1.89	0.62	-0.720542	-1.345836
Tangibility	2.92	0.44	1.286453	0.438753
Satisfaction	2.14	0.52	-0.742964	-1.643297
Reliability	1.76	0.59	-0.648627	-0.489371
Control	2.12	0.39	2.084375	-1.217295
Service Quality (CSQ)	2.41	0.79	-0.827941	-1.293293

A review of the constructs reveals that the majority of them are perceived in a positive manner, with average scores above midway. The skewness values exhibit variation, indicating the presence of both left-skewed and right-skewed distributions, which reflects the range of responses. The kurtosis values indicate that the majority of distributions are less peaked than a normal distribution, while there are a few exceptions such as Sustainability (RSB), which has a distribution that is more peaked. This approach facilitates the identification of domains of proficiency (high means) and domains that may want further examination (low means or high variability).

4.4.9. Analysis of Constructs:

The mean value of 3.87 for Corporate Real Estate (CRE) reflects a positive perception of this sector. The standard deviation of 0.93 indicates a modest level of variability in the replies. A positive skewness of 0.523397 suggests that the data distribution is somewhat skewed to the right, meaning that there are more scores above the average and a longer tail on the right side. The kurtosis score of -1.308521 indicates a distribution that is flatter than a normal curve, suggesting a lower number of extreme values.

The high mean value of 3.73 for the Determined Value (RDV) implies a generally positive assessment. The standard deviation of 0.84 indicates a certain degree of variability in the responses. The skewness value of 1.067394 suggests a distribution that is skewed to the right, suggesting that there are a greater number of lower scores but a few really high scores. The kurtosis value of -0.948263 indicates that the distribution is less peaked and has fewer extreme values compared to a normal distribution.

The Sustainability (RSB) mean of 3.52 indicates a favourable assessment of Sustainability. The small standard deviation of 0.54 suggests that there is a high level of agreement among the respondents. The negative skewness value of -0.502724 indicates a left-skewed distribution, meaning that there are more replies above the average. The kurtosis value of 2.859331 indicates a leptokurtic distribution, which means that the data has a more pronounced peak, and heavier tails compared to a normal distribution, indicating the presence of more extreme values.

The Workspace Optimization (RWO) score of 3.23 reflects a generally favourable assessment. The standard deviation of 0.82 indicates a moderate level of variability in the replies. The negative skewness value of -0.838531 indicates that the distribution is skewed to the left, meaning that there are more frequently higher scores. The kurtosis value of -1.289465 suggests that the distribution is platykurtic, which means it is flatter and has fewer extreme values.

The mean value of the Technology Acceptance (CTA) is 3.21, indicating an overall good assessment. The response variability is moderate, as indicated by the standard deviation of 0.79. The positive skewness value of 1.379013 shows a pronounced right-skewed distribution, where the majority of replies are lower, but there are a notable number of very high scores. The kurtosis value of -0.828263 indicates that the distribution is flatter and has fewer outliers.

The mean Service Quality (CSQ) of 2.41 implies a less favourable impression of Service Quality. The presence of a standard deviation of 0.79 indicates that there is a certain degree of variability in the responses. The negative skewness of -0.827941 indicates that the distribution is skewed to the left, indicating that a larger number of

respondents provided higher ratings. The kurtosis value of -1.293293 suggests a distribution that is flatter than the normal distribution, implying that there are fewer extreme values.

4.4.10. ANOVA:

The analysis of variance (ANOVA) test is utilized to determine if there is a significant disparity in the means of selected segment variables (factors) by assessing the level of variability among group means of the dependent variable (factor) or selected segment factors tested by the levels of an independent variable (which affects the dependent variable chosen segment factors). This is done by reporting the F-statistic value and p-value for each selected variable.

Table 4.19 displays the ANOVA findings regarding the correlation between corporate real estate and the determined value, as well as the assessment of variances in the relationship between the dimensions of the determined value and the corporate real estate. These results are used to test the hypotheses for objective 1 of the research study.

4.4.10.1. Determined Value Relation:

Table 4.82: ANOVA on Determined Value and Corporate Real Estate Relation.

Constructs/ Dimensions	Mean	Std. Deviation	F- Valu e	P- value	Decision (1% sig.)	Path Analysis
Determined Value (RDV)	3.73	0.84	3.62	<0.001	H1: Accepted	CRE → RDV
Physical (DVP)	2.38	0.72	2.98	<0.001	H1a: Accepted	CRE → DVP
Technology (DVT)	3.43	0.63	4.33	<0.001	H2a: Accepted	CRE → DVT
Human (DVH)	2.67	0.59	4.86	<0.001	H3a: Accepted	CRE → DVH

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Functionality (DVF)	1.95	0.87	3.23	<0.001	H4a: Accepted	CRE → DVF
Capital Projects (DVC)	1.77	0.65	3.46	<0.001	H5a: Accepted	CRE → DVC

H1: Determined Value (RDV): Corporate Real Estate positively contributes to the determined value of the company.

The F-value of 3.62 in Table 4.19 indicates that the shown value in relation to the corporate real estate department is statistically significant, with a p-value of less than 0.001. This suggests that the company's corporate real estate department plays a role in enhancing the proven worth of the organization. Thus, the alternative hypothesis – “***H1: Corporate Real Estate positively contributes to the determined value of the company***” is accepted.

H1a: Physical (DVP): The organization’s physical value positively contributes to the building, construction, and in accordance with GREEN and LEED global workspace standard.

The F-value of 2.98 in Table 4.19 indicates that there is a statistically significant relationship between the physical workspace value and the corporate real estate department of the organization, with a p-value of less than 0.001. This suggests that the company's corporate real estate department plays a role in enhancing the overall value of the company's physical workspace. Thus, the alternative hypothesis ***H1a: “The organization’s physical value positively contributes to the building, construction, and in accordance with GREEN and LEED global workspace standard”*** is accepted.

H1b: Technology (DVT): The organization's technology standards positively contribute to the easy use, adoptability, and acceptability of new technology.

Table 4.19 indicates that the F-value for the technological value in relation to the corporate real estate department of the organization is 4.33, which is statistically significant with a p-value of less than 0.001. This suggests that the corporation's corporate real estate department plays a role in enhancing the technological value of the organization. Thus, the alternative hypothesis ***H1b: "The organization's technology standards positively contribute to the easy use, adoptability, and acceptability of new technology" is accepted.***

H1c: Human (DVH): The organization's human values, standards and culture positively contribute to employee satisfaction of the company.

The F-value of 4.86 in Table 4.19 indicates that there is a statistically significant relationship between the human value and the corporate real estate department of the organization, with a p-value of less than 0.001. This suggests that the organization's corporate real estate department has a role in enhancing employee satisfaction within the company. Thus, the alternative hypothesis ***H1c: The organization's human values, standards and culture positively contribute to employee satisfaction of the company" is accepted.***

H1d: Functionality (DVF): The organization's building functionality positively contributes to use of workspace usage of the company to provide productivity to employee and organization.

Table 4.19 indicates that the F-value for functionality, in relation to the corporate real estate department of the organization, is 5.68 and is statistically significant with a p-value of less than 0.001. This suggests that the corporate real estate department of the company plays a role in enhancing the efficiency and effectiveness of the company's workspace. Thus, the alternative hypothesis ***H1d: "The organization's building functionality positively contributes to use of workspace usage of the company to provide productivity to employee and organization" is accepted.***

H1e: Capital Planning (DVC): The organizations positively contribute to financial stability, growth and lower operating costs in a sustainable model.

The F-value of 3.46 in Table 4.19 indicates that there is a statistically significant relationship between capital planning and the corporate real estate department of the organization, with a p-value of less than 0.001. This suggests that the company's corporate real estate department plays a role in financing the company's capital projects. Thus, the alternative hypothesis *H1e: “The organizations positively contribute to financial stability, growth and lower operating costs in a sustainable model” is accepted.*

4.4.10.2. Sustainability Value Relation:

Table 4.83: ANOVA on Sustainability and Corporate Real Estate Relation.

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Sustainability (RSB)	3.52	0.54	6.71	<0.001	H2: Accepted	CRE → RSB
Economic Dimension (SBE)	2.74	0.64	3.92	<0.001	H2a: Accepted	CRE → SBE
Social Dimension (SBS)	1.77	0.73	2.09	0.313	H2b: Rejected	CRE → SBS
Environmental Dimension (SBV)	1.92	0.74	5.58	<0.001	H2c: Accepted	CRE → SBV

H2: Sustainability (RSB): Corporate Real Estate positively contributes to the overall sustainability of the company.

Table 4.20 shows that the F-value for the sustainability value with respect to corporate real estate department of the company is 6.71 is statistically significant with $p < 0.001$. This indicates that the corporate real estate department of the company contributes to the sustainability value of the company. Therefore, the alternative hypothesis – **H2:** *“Corporate Real Estate positively contributes to the overall sustainability of the company” is accepted.*

H2a: Economic (SBE): The organization 's standards and priorities positively relate to economic sustainability and compliance for the organization.

Table 4.20 shows that the F-value for the sustainability value with respect to corporate real estate department of the company is 6.71 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the sustainability value of the company. Therefore, the alternative hypothesis – **H2a:** *“The organization 's standards and priorities positively relate to economic sustainability and compliance for the organization” is accepted.*

H2b: Social (SBS): The organization's policies positively influence social sustainability and compliance within the organization.

Table 4.20 shows that the F-value for the sustainability value with respect to corporate real estate department of the company is 2.09 is statistically significant with $p = 0.313$. This indicates that the corporate real estate department of the company does not contribute to the sustainability value of the company. Therefore, the alternative hypothesis – **H2b:** *“The organization's policies positively influence social sustainability and compliance within the organization” is rejected.*

H2c: Environmental (SCV): The organization 's properties positively impact environmental sustainability and compliance for the organization and its staff.

Table 4.20 shows that the F-value for the sustainability value with respect to corporate real estate department of the company is 5.58 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the sustainability value of the company. Therefore, the alternative hypothesis – **H2c:**

“The organization 's properties positively impact environmental sustainability and compliance for the organization and its staff” is accepted.

4.4.10.3. Workspace Optimization Value Relation:

Table 4.84: ANOVA on Workspace Optimization & Corporate Real Estate Relation.

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Workspace Optimization (RWO)	3.23	0.82	6.43	<0.001	H3: Accepted	CRE → RWO
Workspace Productivity	1.37	0.64	2.05	0.299	H3a: Rejected	CRE → WOP
Workspace Performance	2.63	0.88	5.39	<0.001	H3b: Accepted	CRE → WOR

H3: Workspace Optimization (RWO): Corporate real estate department positively contributes to the workspace culture of the company.

Table 4.20 shows that the F-value for the workspace optimization with respect to corporate real estate department of the company is 6.43 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the workspace optimization values of the company. Therefore, the alternative hypothesis – **H3: “Corporate real estate department positively contributes to the workspace culture of the company” is accepted.**

H3a: Workspace Productivity (WOP): The productivity of the workspace has a positive effect on the organization's optimization in achieving the full potential of the technologies and services it offers.

Table 4.20 shows that the F-value for the workspace optimization with respect to corporate real estate department and related technology offering of the company is 2.05 is statistically not significant with $p=0.299$. This indicates that the corporate real estate department of the company does contribute to the workspace optimization related to productivity value in relationship with technology offering and acceptance of the company. Therefore, the alternative hypothesis – *H3a: “The productivity of the workspace has a positive effect on the organization's optimization in achieving the full potential of the technologies and services it offers” is rejected.*

H3b: Workspace Performance (WOR): The performance of the workspace has a favourable impact on the organization's ability to optimize the value of the technology and services it provides.

Table 4.20 shows that the F-value for the workspace optimization with respect to corporate real estate department and related technology offering of the company is 5.39 is statistically significant with $p<0.0001$. This indicates that the corporate real estate department of the company does contribute to the workspace optimization related to performance value in relationship with technology value and services offered by the company. Therefore, the alternative hypothesis – *H3b: “The performance of the workspace has a favourable impact on the organization's ability to optimize the value of the technology and services it provides” is accepted.*

4.4.10.4. Corporate Real Estate Value Relation:

Table 4.85: ANOVA on Corporate Real Estate construct Relation.

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Determined Value (RDV)	3.73	0.84	3.62	<0.001	H1: Accepted	CRE → RDV
Sustainability (RSB)	3.52	0.54	6.71	<0.001	H2: Accepted	CRE → RSB

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Workspace Optimization (RWO)	3.23	0.82	6.43	<0.001	H3: Accepted	CRE → RWO

H4: Corporate Real Estate (CRE): Corporate real estate core values, constructs, dimensions on determined value (RDV), Sustainability (RSB) and Workspace Optimization positively contributes towards adoption and acceptance with satisfaction and productivity of technology implementation.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and related dimensions for RDV: 3.62, RSB: 6.71 and RWO: 6.43 are statistically significant with $p < 0.0001$ for all three dimensions. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology value. Therefore, the alternative hypothesis – *H4: “Corporate real estate core values, constructs, dimensions on determined value (RDV), Sustainability (RSB) and Workspace Optimization positively contributes towards adoption and acceptance with satisfaction and productivity of technology implementation.” is accepted.*

4.4.10.5. Technology Acceptance Value Relation:

Table 4.86: ANOVA on Technology Acceptance and Corporate Real Estate Relation

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P-value	Decision (1% sig.)	Path Analysis & Result
Technology Acceptance (CTA)	1.84	0.67	4.84	<0.001	H5: Accepted	CRE → CTA

Perceived Value	2.65	0.49	3.88	<0.001	H5a: Accepted	CRE → TPV
Perceived Ease of Use	2.17	0.62	4.67	<0.001	H5b: Accepted	CRE → TVE
Perceived Usefulness	1.29	0.32	2.69	0.048	H5c: Accepted	CRE → TVU
Perceived Risk	1.55	0.38	2.63	0.241	H5d: Accepted	CRE → TPR
Perceived Trust	1.77	0.65	3.46	<0.001	H5e: Accepted	CRE → TPT

H5: Technology Acceptance (CTA): Corporate real estate positively contributes towards adoption and acceptance of emerging technology.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and related technology offering of the company is 4.84 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology value and services offered by the company. Therefore, the alternative hypothesis – **H5: “Corporate real estate positively contributes towards adoption and acceptance of emerging technology” is accepted.**

H5a: Perceived Value: CRE positively impacts the perceived value on adoption of current and emerging Technology.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and related technology offering of the company is 3.88 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology perceived value and services offered by the company. Therefore, the

alternative hypothesis – **H5: “Corporate real estate positively impacts the perceived value on adoption of current and emerging Technology” is accepted.**

H5a1: Perceived Ease of Use: CRE positively provides ease of use for current and future technology uses.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and ease of use of technology offering of the company is 4.67 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology perceived ease of use and all technologies offered by the company. Therefore, the alternative hypothesis – **H5a1: “CRE positively provides ease of use for current and future technology uses” is accepted.**

H5a2: Perceived usefulness: CRE positively impacts perceived usefulness in usage of current and emerging Technology.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and ease of use of technology offering of the company is 2.69 is statistically not significant where $p = 0.048$. This indicates that the corporate real estate department of the company does contribute to the technology usefulness in relationship with technology perceived in bringing out useful value for all technologies offered by the company. Therefore, the alternative hypothesis – **H5a2: “CRE positively impacts perceived usefulness in usage of current and emerging Technology” is rejected.**

H5b: Perceived Risk: CRE positively impacts on the perceived risk in adoption of emerging Technology.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and ease of use of technology offering of the company is 2.63 is statistically not significant where $p = 0.241$. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology risks in accepting and anticipating risks on usage as value for technologies offered by the company. Therefore, the alternative hypothesis – **H5a2:**

“CRE positively impacts on the perceived risk in adoption of emerging Technology” is rejected.

H5c: Perceived Trust: CRE positively impacts on the perceived trust in adoption of future Technology.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and ease of use of technology offering of the company is 3.46 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does contribute to the technology acceptance in relationship with technology trust in usage and forecast of all technologies offered by the company. Therefore, the alternative hypothesis – ***H5c: “CRE positively impacts on the perceived trust in adoption of future Technology” is accepted.***

4.4.10.6. Service Quality Value Relation:

Table 4.87: ANOVA on Service Quality and Corporate Real Estate Relation.

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Service Quality (CSQ)	1.72	0.69	2.07	<0.001	H6: Accepted	CRE → CSQ
Speed of Service	1.43	0.81	2.04	0.412	H6a: Rejected	CRE → CSS
Tangibility	2.83	0.83	5.68	<0.001	H6b: Accepted	CRE → CST
Reliability	1.29	0.32	2.69	0.048	H6c: Rejected	CRE → CSR
Satisfaction	2.13	0.52	6.73	<0.001	H6d: Accepted	CRE → CSE

Constructs/ Dimensions	Mean	Std. Deviation	F- Value	P- value	Decision (1% sig.)	Path Analysis
Control	2.66	0.74	5.33	<0.001	H6e: Accepted	CRE → CSC

H6: Service Quality: Corporate Real Estate Service Quality Positively Impacts the Adoption of Technology in creating a framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology adoption and acceptance of the company is 2.07 is statistically significant with $p < 0.0001$. This indicates that the corporate real estate department of the company does hugely contribute to service quality acceptance in relationship with technology adoption and framework creation. Therefore, the alternative hypothesis – H6: *Corporate Real Estate Service Quality Positively Impacts the Adoption of Technology in creating a framework.* is accepted.

H6a: Speed of Service: Corporate Real Estate Speed of Service positively impacts the Adoption of Technology in creating a framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology adoption and acceptance of the company is 2.04 is statistically not significant where $p = 0.412$. This indicates that the corporate real estate department of the company does not satisfyingly contribute to service quality in relationship with technology adoption and framework creation. Therefore, the alternative hypothesis – H6: *Corporate Real Estate Speed of Service positively impacts the Adoption of Technology in creating a framework* is rejected.

H6b: Tangibility: Corporate real estate tangibility of service positively impacts the adoption of technology in creating a framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology framework for the company is 5.68 is statistically significant where $p < 0.0001$. This indicates that the corporate real estate department of the company does satisfyingly significantly and contributes to service quality in relationship with framework creation. Therefore, the alternative hypothesis – H6b: “Corporate real estate tangibility of service positively impacts the adoption of technology in creating a framework” *is accepted*.

H6c: Reliability: Corporate real estate’s reliability in technology adoption positively impacts the creating a framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology adoption and acceptance of the company with reliability as its core component which is 2.69 is statistically not significant where $p = 0.048$. This indicates that the corporate real estate department of the company does not satisfyingly contribute to service quality in relationship with reliability of technology services and framework creation. Therefore, the alternative hypothesis – H6c: “Corporate real estate’s reliability in technology adoption positively impacts the creating a framework” *is rejected*.

H6d: Satisfaction: Corporate real estate’s satisfaction in technology services positively impacts the adoption of technology in creating a framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology framework for the company is 6.73 is statistically significant where $p < 0.0001$. This indicates that the corporate real estate department of the company contributes to service quality in relationship with satisfaction in technology and framework creation. Therefore, the alternative hypothesis – H6d: “Corporate real estate’s satisfaction in technology services positively impacts the adoption of technology in creating a framework” *is accepted*.

H6e: Control: Corporate Real Estate's Technological control variable positively impacts corporate real estate service quality in creating a technology maturity framework.

Table 4.20 shows that the F-value for the technology acceptance with respect to corporate real estate department and Service Quality plays a crucial role in creating a framework for technology maturity framework for the company is 5.33 is statistically significant where $p < 0.0001$. This indicates that the corporate real estate department of the company contributes to service quality in relationship with control in technology maturity framework creation. Therefore, the alternative hypothesis – H6e: “Corporate Real Estate's Technological control variable positively impacts corporate real estate service quality in creating a technology maturity framework.” *is accepted.*

4.4.11. Structural Model

The structural model entails evaluating the route coefficients of the proposed model. The methodology entails evaluating the suggested research model's conceptual structure by employing the bootstrapping technique (inner model) with the use of Smart PLS version .0. The technique is employed to evaluate the structure of the suggested conceptual model for assessing the impact of corporate real estate on the determined value of the organization, sustainability, and workplace optimization. This is done using the technology acceptance model and service quality usefulness in the real estate workspace.

The study is grounded in first-order constructs and second-order constructs, which refer to the dimensions of things. In this study, the exogenous variable (independent variable) is corporate real estate (CRE), while the endogenous variables (dependent variables) include determined value, sustainability, workplace optimization, technology acceptance variables, and service quality variables related to the use of real estate companies. In the second-order constructs, the exogenous variables (independent variables) consist of physical value, technology value, human value, functionality, and capital projects. These variables contribute to the adopted scale of the endogenous variable of demonstrated value. Additionally, the exogenous variables include economic dimension, social dimension, and environmental dimension, which

contribute to the adopted scale of the endogenous variable of sustainability. Furthermore, the exogenous variables encompass workspace productivity and workspace performance, which contribute to the adopted scale of the endogenous variable of workplace optimization. Moreover, the exogenous variables include ease of use, usefulness, perceived value, perceived risk, and perceived trust, which contribute to the adopted scale of the endogenous variables of technology acceptance model version 3. Lastly, the exogenous variables consist of speed of service, tangibility, reliability, satisfaction, and control. Fig. 4.14 displays the evaluations of the structural model for the primary and secondary components of corporate real estate, together with their standardized route coefficients.

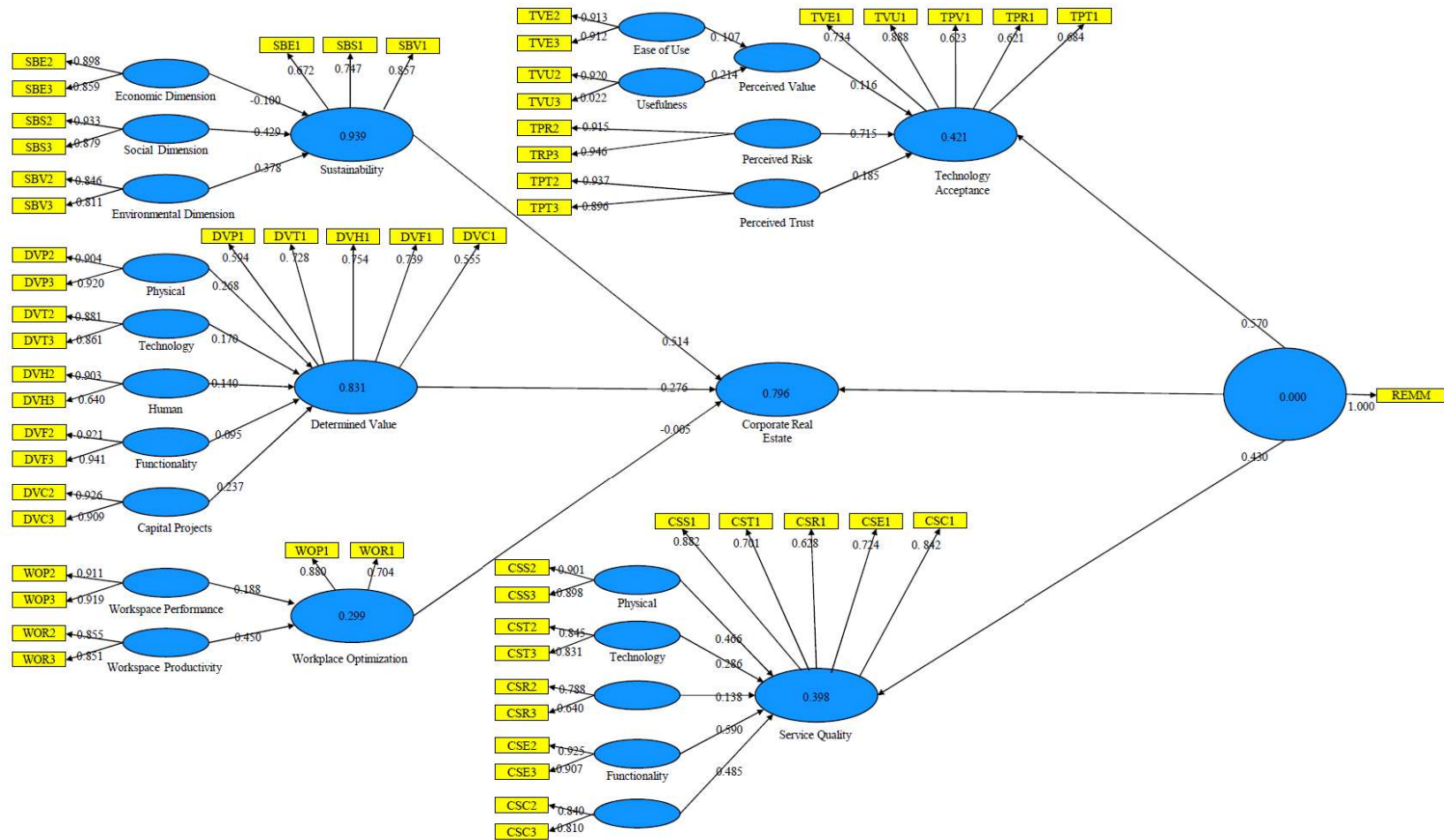


Fig. 4.14: Structural model of corporate real estate with standardized path coefficients

4.4.11.1. Hypotheses Structural Model Testing:

The structural model of the study was evaluated on two main criteria after meeting the criteria of the measurement model assessment: (1) The strength of the relationship between the independent and dependent variables in the regression is determined by the coefficient of determination (R^2), which should fall within the range of $R^2 > 0$ to $R^2 \leq 1$. (2) The statistical significance of the path coefficients (path analysis) is used to establish the accuracy of the structural model. The inner model was analysed by the bootstrapping technique, a non-parametric statistical method to obtain path coefficients to test the relationship between endogenous variables in the first-order constructs (determined value, sustainability and workplace optimization) along with technology acceptance variables and service quality variables and exogenous variables (corporate real estate) and then the relationship between the second-order constructs (determined value, sustainability and workplace) along with technology acceptance variables and service quality variables) and exogenous variables (physical value, technology value, human value, functionality, and capital projects; economic sustainability dimension, social sustainability dimension, environmental sustainability dimension; workspace productivity and workspace performance and include ease of use, usefulness, perceived value, perceived risk, and perceived trust; along with speed of service, tangibility, reliability, satisfaction, and control) (Vinzi et al., 2010). The accuracy of the structural model is substantiated by the observation that the R^2 values of the variables under investigation in the study are 0.939, 0.831, 0.299, 0.796, 0.421, and 0.398, which fall within the threshold limit of $R^2 > 0$ and $R^2 \leq 1$, as illustrated in Fig. 4.14. The model's variance inflation factor (VIF) was determined to be 1.316, indicating that there was no collinearity issue (threshold limit 1.196 to 1.799). Therefore, the model is predictively relevant.

Furthermore, as displayed in Table 4.31, the t-values are either greater than 1.96 ($p \leq 0.05$) or greater than 2.56 ($p \leq 0.001$). The t-value of 2.984 ($\beta = 2.764$, $p \leq 0.001$) provided evidence for the relationship between Determined Value (H1) and Corporate Real Estate. The t-value of 5.7022 ($\beta = 2.677$, $p \leq 0.001$) substantiated the relationship between Physical Value and Determined Value (H1a). The t-value of 4.0935 ($\beta = 1.699$, $p \leq 0.001$) substantiated the relationship between Technical Value and Determined

Value (H1b). The t-value of 4.1645 ($\beta = 0.1405$, $p \leq 0.001$) substantiated the relationship between Human Value and Determined Value (H1c). A t-value of 1.9609 ($\beta = 0.095$, $p \leq 0.05$) was obtained to substantiate the relationship between Functionality and Determined Value (H1d). The t-value of 2.3341 ($\beta = 0.2369$, $p \leq 0.05$) substantiated the relationship between Capital Projects and Determined Value (H1e).

Table: 4.88: Hypotheses testing of the structural model.

Path Analysis	Standardized Beta (β) or Original Sample (O)	Standard Error (STERR)	T Statistics (O/STERR)	Decision
Corporate Real Estate (CRE) -> Determined Value (RDV)	0.2764	0.0926	2.984	H1 Supported
Physical Value -> Determined Value (RDV)	0.2677	0.047	5.7022	H1a Supported
Technology Value -> Determined Value (RDV)	0.1699	0.0415	4.0935	H1b Supported
Human Value -> Determined Value (RDV)	0.1405	0.0337	4.1645	H1c Supported
Building Functionality -> Determined Value (RDV)	0.095	0.0492	1.9609	H1d Supported
Capital Market -> Determined Value (RDV)	0.2369	0.1015	2.3341	H1e Supported
Corporate Real Estate (CRE) -> Sustainability (RSB)	0.5137	0.0478	10.7453	H2 Supported

Path Analysis	Standardi zed Beta (β) or Original Sample (O)	Standar d Error (STERR)	T Statistic s (O/STERR)	Decision
Economic Dimension -> Sustainability (RSB)	-0.1004	0.0416	2.4114	H2a Supported
Social Dimension -> Sustainability (RSB)	0.4291	0.032	13.3986	H2b Supported
Environmental Dimension -> Sustainability (RSB)	0.3784	0.027	14.0043	H2c Supported
Corporate Real Estate (CRE) -> Workplace Optimization (RWO)	-0.0047	0.0728	2.0651	H3 Supported
Workplace Productivity -> Workplace Optimization (RWO)	0.4497	0.0487	9.2382	H3a Supported
Workplace Performance -> Workplace Optimization (RWO)	0.188	0.0805	2.3348	H3b Supported
Corporate Real Estate (CRE) -> Determined Value, Sustainability, Workplace Optimization	0.2842	0.098	2.997	H4 Supported
Corporate Real Estate (CRE) -> Technology Acceptance (CTA)	0.0308	0.0383	2.8053	H5 Supported
Perceived Value -> Technology Acceptance (CTA)	0.1852	0.0437	4.2374	H5a Supported
Ease of Use -> Technology Acceptance (CTA)	0.116	0.0436	2.6613	H5a1 Supported

Path Analysis	Standardi zed Beta (β) or Original Sample (O)	Standar d Error (STERR)	T Statistic s (O/STERR)	Decision
Usefulness -> Technology Acceptance (CTA)	0.7149	0.0406	17.5914	H5a2 Supported
Perceived Risk -> Technology Acceptance (CTA)	0.182	0.0339	2.2374	H5b Supported
Perceived Trust -> Technology Acceptance (CTA)	0.852	0.0412	12.2374	H5c Supported
Corporate Real Estate (CRE) -> Service Quality (CSQ)	0.3294	0.1072	3.2964	H6 Supported
Speed of Service -> Service Quality (CSQ)	0.2404	0.4327	4.2575	H6a Supported
Tangibility -> Service Quality (CSQ)	0.6136	0.3414	6.4843	H6b Supported
Reliability -> Service Quality (CSQ)	0.3841	0.198	2.1937	H6c Supported
Satisfaction -> Service Quality (CSQ)	0.4316	0.0536	2.5612	H6d Supported
Control -> Service Quality (CSQ)	0.5308	0.0283	2.7051	H6e Supported

A t-value of 10.7453 ($\beta = 0.5137$, $p \leq 0.001$) supported the hypothesis that there is a correlation between sustainability and real estate management (H2). A t-value of 2.4114 ($\beta = -0.1004$, $p \leq 0.05$) was obtained to corroborate the relationship between Economic

Dimension and Sustainability (H2a). A t-value of 13.3986 ($\beta = 0.4291$, $p \leq 0.001$) substantiated the relationship between Sustainability (H2b) and Social Dimension. A t-value of 14.0043 ($\beta = 0.3784$, $p \leq 0.001$) substantiated the relationship between Sustainability (H2c) and Environmental Dimension. The t-value of 2.0651 ($\beta = -0.4407$, $p \leq 0.05$) provided evidence for the relationship between Corporate Real Estate and Workplace Optimization (H3). The t-value of 9.2382 ($\beta = 0.4497$, $p \leq 0.001$) provided support for the relationship between Workspace Productivity and Workplace Optimization (H3a). A t-value of 2.3348 ($\beta = 0.4497$, $p \leq 0.001$) substantiated the relationship between Workspace Performance and Workplace Optimization (H3b). Therefore, the hypotheses were supported, which established the statistical significance of the structural model trajectories and the relevance of the hypotheses.

The association between Corporate Real Estate and Determined Value, as well as Sustainability and Workspace Optimization (H4), was substantiated by a t-value of 2.997 ($\beta = 0.2842$, $p \leq 0.001$). The link between Corporate Real Estate and Technology Acceptance (H5) was statistically significant, as indicated by a t-value of 2.8053 ($\beta = 0.0308$, $p \leq 0.001$). The t-value of 2.6613 ($\beta = 0.116$, $p \leq 0.001$) in Table 4.31 confirms the link between Perceived Value and Technology Acceptance (H5a). The association between Perceived Risk and Technology Acceptance (H5b) was confirmed by a t-value of 17.5914 ($\beta = 0.7149$, $p \leq 0.001$). The association between Perceived Trust and Technology Acceptance (H5c) was confirmed by a t-value of 4.2374 ($\beta = 0.1852$, $p \leq 0.001$).

The association between Corporate Real Estate and Service Quality (H6), was substantiated by a t-value of 3.2964 ($\beta = 0.3294$, $p \leq 0.001$) supported the hypothesis that there is a correlation between them. The link between Speed of Service and Service Quality (H6a) was statistically significant, as indicated by a t-value of 4.2575 ($\beta = 0.2404$, $p \leq 0.001$). The t-value of 6.4843 ($\beta = 0.6136$, $p \leq 0.001$) in Table 4.31 confirms the link between Tangibility and Service Quality (H6b).

The association between Reliability and Service Quality (H6c) was confirmed by a t-value of 2.1937 ($\beta = 0.3841$, $p \leq 0.001$). The association between Satisfaction and Service

Quality (H6d) was confirmed by a t-value of 2.5612 ($\beta = 0.4316$, $p \leq 0.001$) and the relation between Control and Service Quality (H6c) was confirmed by a t-value of 2.7051 ($\beta = 0.5308$, $p \leq 0.001$). Therefore, the importance of the hypotheses and the statistical significance of the routes in the structural model were confirmed by validating the hypotheses of the structural model.

By leveraging technical acceptability and service quality, the goal of the study was to demonstrate that corporate real estate plays a role in boosting value, sustainability, and workspace optimization in the real estate industry. This was accomplished through the utilization of such technology. With a chi-square value of 463.71, degrees of freedom (df) equal to 43, and a p-value that was less than 0.001, all of the indices suggested that the model fit was satisfactory. The structural model was found to have a satisfactory fit, as evidenced by the goodness-of-fit indices, which included the Goodness of Fit Index (GFI) of 0.977, the Comparative Fit Index (CFI) of 0.967, and the Root Mean Square Error of Approximation (RMSEA) of 0.069. In addition, the Cmin/df ratio of 4.11 was deemed satisfactory, which further supported the notion that the model was a reasonable fit for the data.

4.5. Results and Discussion Summary:

The thesis utilizes a combination of qualitative and quantitative methods to assess the added value of Corporate Real Estate (CRE). This is achieved through the analysis of interview data, bibliographic information, and respondent demographics. Additionally, statistical tests are conducted to examine the relationships between CRE, sustainability, workspace optimization, technology acceptance, and service quality.

A. Analysis using Qualitative methods:

The qualitative component will center on comprehending the function of CRE in generating value by means of in-depth interviews. The investigation will examine various commercial real estate (CRE) processes and their influence on enhancing value, specifically in relation to sustainability and optimizing workspace. In addition, an extensive literature assessment will be undertaken utilizing bibliometric techniques

such as citation, co-citation, and occurrence analysis to uncover important themes and trends in the subject.

B. Analysis using Quantitative methods:

Quantitative analysis refers to the systematic approach of studying and interpreting numerical data to make informed decisions or draw meaningful conclusions. The study will include a careful statistical analysis of survey data to examine the quantitative aspect. The determination of the sample size will be undertaken using GPower in order to provide sufficient statistical power. Demographic information, including gender, age, education, job classification, income, and organizational contribution, will be used to produce descriptive statistics. Statistical methods, such as confirmatory factor analysis, will be used to evaluate the dependability and accuracy of measurement models for concepts such as determined value, sustainability, workspace optimization, technology adoption, and service quality. An examination of the correlations between these factors and CRE value will involve the use of ANOVA and structural equation modelling.

CONCLUSION

CONCLUSION

5.1. Chapter Overview:

This chapter presents the findings of the research, as well as recommendations derived from the overall findings of the data analysis obtained after achieving the research objectives. Subsequently, the text discusses the potential integration of these findings with the practical, theoretical, and managerial implications uncovered by the study. Furthermore, the results and results of this research effort are disclosed.

5.2. Summary of Results and Suggestions:

The survey results indicate that the demand for Real Estate IT space by occupiers is undergoing a transformation over time, resulting in changes to the office structure in major Indian cities. This study examines the impact of office space management strategies on occupier satisfaction in the Indian Real Estate sector. It focuses on how real estate management contributes to enhancing value, sustainability, and workplace optimization. The study also explores the utility of Real Estate companies in India by applying the Technology Acceptance Model to assess the implementation of new technologies. The findings of this study will help improve service quality, employee satisfaction, and organizational productivity. Furthermore, it demonstrates the significant influence of sustainable practices in the real estate industry, which have resulted in a decrease in average space utilization and a positive impact on reducing maintenance expenses in the Indian real estate sector. As a result, India has become a sought-after global destination for real estate stakeholders and has successfully attracted occupiers of real estate projects in the Indian commercial real estate market.

5.3. Real Estate as we see as Determined Value:

The results of this study confirm the role of real estate in increasing the determined value of company property in the Indian real estate sector. It suggests that the impact of real estate on the company's value-add can be quantified either directly and simply (such as cost reductions) or indirectly and somewhat concealed (such as the influence of workplace design on staff productivity). Therefore, REM is crucial in Indian CRE firms (IT companies) as it showcases value by facilitating cost-effective management

of office space operations while simultaneously fostering a dynamic working atmosphere.

- A. The results of this study confirm that real estate plays a significant role in improving the value of the physical workspace. This is achieved by designing the physical workspace to align with the comfort level and work preferences of the property occupier. Such an approach enables companies to effectively manage the physical workspace by strategically allocating organizational resources (such as labor, capital, and real estate). Additionally, it creates a conducive environment where technology and individuals can interact to conduct business. Hence, effective management of the physical workplace is deemed a crucial aspect of real estate in order to ensure the smooth functioning of commercial activities.
- B. The findings indicate that real estate offers strategies for effectively managing the operational workspace of a company's property in order to increase its physical workspace value. This involves designing a workspace that is appropriately sized and tailored to the comfort and work requirements of the occupant in the Indian real estate sector. Nevertheless, the findings suggest that the participants in the survey expressed that the corporate premises were not conveniently reachable from their current location. This indicates that the Indian commercial real estate (CRE) sector should effectively coordinate the requirements of the occupants with the company's management for the selection of workplace locations. The choice of site has a direct influence on the creativity, productivity, health, and well-being of the occupants, as well as the smooth functioning of business operations (Riratanaphong, 2021). Additionally, it reflects the company's brand and identity, which is determined by the satisfaction with the workplace location and contributes to the overall value of the company's property (Haynes et al., 2017).
- C. The results of this study confirm that real estate plays a significant role in increasing the financial worth of a company's property by effectively managing property operations, such as workspace maintenance, while staying within the company's financial budget. The responsibility of the real estate manager is to choose a building that protects the company from unexpected financial burdens, such as rent increases or additional service charges, and requires minimal capital investment, allowing

more funds to be allocated towards the business. Hence, real estate is seen indispensable from a financial perspective in terms of reducing expenses and/or increasing revenue for a firm when assessing the financial implications of the decision to buy or lease a property, which requires ongoing evaluation.

- D. The findings indicate that real estate offers approaches to decrease property maintenance rental expenses and generate increased revenue, thereby aiding in the reduction of operational costs (specifically workspace maintenance) and offering a more favorable cost-benefit ratio for the company's operations. Nevertheless, the findings suggest that the participants in the survey expressed that the company's property lacks an ideal financial framework, specifically in terms of the balance between debt and equity for managing the property's operations. This suggests that the Indian commercial real estate (CRE) sector should consider the financial flexibility of acquiring freehold or leasehold properties. Additionally, it is important to assess the strategic implications of these procurement decisions on the company's property portfolio, as it can assist in decreasing the amount of fixed assets on the balance sheet. Furthermore, having financial flexibility allows for the ability to choose between buying, leasing, or engaging in sale and leaseback selections. This flexibility enables businesses to easily adjust to shifting business cycles and circumstances, particularly through the use of short leases or break clauses. While rental expenses can be a substantial and uncertain operating cost, it can also provide challenges in accurately predicting the financial worth of company-owned property (Roskams & Haynes, 2021).
- E. The results of this study confirm that real estate plays a significant role in improving the value of a company's property by creating a comfortable physical environment that enhances productivity in the workplace. Real estate is crucial for the human resource department since it provides guidance on the physical arrangement of workspaces and the design of corporate infrastructure, which directly affects employee productivity within business premises.
- F. The results suggest that the corporate real estate strategy has contributed to the human resource department by enhancing employee satisfaction and productivity. The real estate manager's strategies for spatial design of the workplace have created satisfying work experience in various settings, resulting in a happy and healthy

workplace that promotes efficient work. Therefore, REM plays a crucial role in the Indian CRE (Real Estate) sector since it represents the intrinsic worth of the company's property (Harris, 2015, Jayantha & Oladinrin, 2019).

- G. The results of this study affirm the role of real estate in enhancing building functionality, specifically in terms of the practical and physical utilization of the building (business property). REM offers techniques for incorporating flexible furniture to accommodate various applications and alter the physical work environment to suit the company's demands. This enhances the functional usage of the facility by optimizing its physical functioning. REM proposes strategies to enhance the practical utilization of the building by incorporating technology, such as automated property management. This technology integrates the property data generated by various company departments, facilitating seamless operations throughout the company's portfolio. Hence, effectively overseeing the operational aspects of the building contributes to the appreciation of the company's property worth by improving its physical and functional utilization (Voordt & Jensen, 2016).
- H. The results validate that the survey participants expressed that real estate plays a role in creating an energy-efficient workplace design that meets the needs of occupants and enhances the physical utilization of the building. IT companies should consider hiring a professional with expertise in designing real estate portfolio management strategies that align with the corporate strategies of non-property companies. This is because the corporate real estate (CRE) manager plays a crucial role in understanding the organization's core business and real estate requirements. Their responsibilities include maintaining the workplace portfolio and creating a digitally innovative workplace to contribute to the overall success of the business. Furthermore, the research findings validate that the real estate sector proposes techniques regarding property technology to effectively manage the operations that optimize the functional utilization of office spaces in Indian IT enterprises. Artificial intelligence (AI) is now essential in the operational tasks of the Indian CRE (Real Estate) to automate property management. This technology helps improve the real estate function of corporate office space, which is the largest expense. The main focus is on enhancing tenants or customer satisfaction in corporate settings (Karvigh et al., 2019).

- I. The results of this study confirm that real estate has a significant role in enhancing the company's position in the capital market by attracting an increase in the company's stock price. Hence, real estate holds great importance in the Indian commercial real estate sector for effective capital market management, company growth, and revenue generation. It plays a crucial role in enhancing the value of properties in the capital market, thereby contributing to the overall increase in shareholder wealth for the company's assets. The results suggest that the survey participants emphasized the importance of real estate in maximizing shareholder value, which can be accomplished through increases in revenue and/or profitability. REM has been found to attract financial investments and generate firm revenue, hence enhancing shareholder wealth. Hence, REM plays a crucial role in enhancing the financial value of the company in the Indian real estate sector. It achieves this by implementing effective strategies to maximize revenue through efficient management of the company's portfolio. Additionally, REM effectively communicates the real estate strategy to key stakeholders such as society, staff, customers, and owners, thereby contributing to the overall financial success of the company in the Indian real estate market.

5.4. Sustainability via Real Estate Management:

This study confirms that real estate management plays a significant role in promoting sustainability in the workplace of Indian IT companies. Specifically, it focuses on three key aspects of sustainability reporting: (1) ensuring cost-effective infrastructure that is economically sustainable, (2) supporting social compliance by developing real estate strategies that prioritize employee well-being, engagement, and motivation, and (3) meeting environmental building standards by creating a healthy workplace environment. Therefore, in the current 21st century period of Indian CRE (IT businesses), REM is regarded as crucial due to the increasing need for sustainability in managing real estate, technical, and infrastructural facilities in corporate operations. In addition, REM offers cost-efficient workspace solutions for managing company property operations, thereby reducing the carbon footprint in the Indian commercial real estate sector. This is crucial in ensuring uninterrupted office operations during and after times of crisis (Sharma, 2018).

- A. The user's text consists of a bullet point symbol. The results validate that the survey participants acknowledged the significance of real estate management in delivering economically viable infrastructure within Indian CRE (IT businesses). This suggests that the green infrastructure is effectively managed with little operational expenses. The interview results indicated that REM decisions focus on enhancing the physical workplace at Indian CRE (IT companies) by leveraging technology and financial resources. Hence, Rapid Eye Movement (REM) is regarded as crucial for optimizing workspace management and enhancing infrastructure at Indian Corporate Real Estate (CRE) in a resource-efficient manner. Furthermore, the results validate that the survey participants emphasized the significance of real estate management in decreasing infrastructural maintenance expenses for the purpose of economic sustainability reporting. Therefore, Rapid Eye Movement (REM) sleep is crucial for optimizing productivity and effectively utilizing the workspace and its resources, which have become indispensable as a result of globalization and technological progress in the global business arena. Furthermore, REM aids in managing the energy consumption of workplace facilities, namely in building maintenance, which is currently a crucial requirement for every organization.
- B. The results of this study affirm the role of real estate management in creating a socially conscious work environment in Indian CRE (IT businesses) that fosters gender equality and prioritizes enhancing the productivity of employees (occupiers) in the workplace. REM, or Resource and Energy Management, is crucial for Indian CRE (IT companies) as it enhances the efficiency of human resources and promotes social responsibility in the workplace. This, in turn, contributes to the social sustainability reporting of Indian CRE (IT companies) and fosters a positive and productive work environment. Nevertheless, the findings suggest that the participants of the survey expressed that the Indian CRE (IT businesses) lack workplace safety, which is the crucial element of social compliance that influences social sustainability in the workplace. Therefore, it is imperative for REM to prioritize worker safety in order to meet social compliance requirements and enhance occupier satisfaction in Indian CRE (IT businesses) facilities.

- C. The user's text consists of a bullet point. The results of this study affirm the role of real estate management in creating an environmentally conscious workplace at Indian CRE (IT businesses), which focuses on upholding building environmental standards to preserve the physical workspace. REM plays a crucial role in ensuring that the firm property is managed within the allocated budget, in accordance with the building regulations specified by Indian CRE (Park et al., 2020). The findings suggest that the survey participants reported that the Real Estate Management (REM) at the Indian CRE (IT companies) property is effectively fulfilling the building environmental standards for workplace sustainability. Additionally, the Indian CRE (IT companies) have implemented environmental initiatives to ensure proper waste management. REM, or Resource and Environmental Management, is highly valued in Indian CRE (IT businesses) due to its focus on meeting environmental compliance requirements and enhancing workplace safety through adherence to building environmental standards. REM establishes guidelines for water management, toxic waste management, and internal green management to ensure compliance with environmental regulations. This commitment to maintaining workplace facilities in accordance with building norms at Indian CRE (IT companies) contributes to environmental sustainability.

5.5. Workplace Optimization via Real Estate Management:

- A. The results of this study confirm that real estate plays a significant role in improving workplace efficiency, with a particular focus on the contribution of real estate management (REM) to enhancing corporate productivity and performance in Indian corporate real estate (CRE) of IT businesses. REM, or Rapid Eye Movement sleep, is crucial for enhancing workplace utility in Indian CRE (IT businesses). It has a significant role in increasing company performance (effectiveness) and occupiers' productivity (experience), which are critical factors in enhancing workplace usefulness.
- B. The results validate that the survey participants acknowledged the impact of real estate on enhancing corporate productivity in Indian CRE (IT businesses) by affirming that the company's property contributes to both individual occupier

and organizational productivity through an effective work environment. The interview results revealed that REM offers workplace solutions that have a significant impact on the productivity and creativity of employees in Indian CRE (IT businesses). REM, or Real Estate Management, is crucial because it enhances workplace efficiency by improving the usability of the workplace and offering services that save time, reduce costs, and streamline the work of employees. This ultimately leads to increased productivity and a better overall experience for employees within Indian CRE (IT companies).

- C. The study's findings validate the role of REM in enhancing employee productivity, hence leading to increased company productivity. The interview results indicated that REM enhances staff productivity by creating a well-designed workspace that meets the occupant's needs, leading to customer satisfaction in Indian CRE (IT businesses). REM, or Real Estate Management, plays a crucial role in enhancing employee productivity at Indian IT companies. REM involves the management of workspace strategies that are directly connected to the human capital, or employees, of the company. This has a significant impact on the personal satisfaction and well-being of the occupants of the company's real estate property. The study's findings validate the role of REM (rapid eye movement) in enhancing the quality of work and increasing productivity in Indian CRE (IT businesses). This is directly related to the quality of the physical work environment that supports knowledge workers. The survey participants asserted that the Real Estate Management (REM) of Indian IT organizations enhances organizational productivity by recruiting knowledgeable and trained employees instead of manual or semi-skilled workers. The interview results indicated that REM at Indian CRE (IT businesses) fosters functional flexibility, which involves the ability to perform a variety of business operations and multitask. This approach encourages job rotation and worker training to enhance productivity in the physical work environment. Thus, REM (Resource-based Employee Management) is seen as crucial in Indian CRE (IT businesses) due to its role in enhancing functional flexibility and ultimately improving the organization's competitive advantage (Haynes et al., 2017).

- D. Nevertheless, the findings suggest that the participants in the survey reported that the Indian CRE (IT companies) lack alignment in their work processes and have a complicated work environment. This factor is strongly connected to the usability of the workplace for the organization and the productivity of its employees. Therefore, the REM (Real Estate Management) department at Indian CRE (IT companies) should prioritize streamlining the work process to minimize the use of organizational resources. This will not only enhance employee connectivity but also enable them to efficiently complete assigned tasks, thereby boosting both individual occupier and organizational productivity.
- E. The results validate the survey respondents' assertion that real estate plays a crucial role in enhancing the corporate performance of Indian CRE (IT businesses) by demonstrating that company property helps to corporate performance through the effective and efficient utilization of property. The interviews indicate that REM at Indian CRE (IT businesses) is focused on enhancing the company's performance (effectiveness), hence contributing to workplace utility. This suggests that the Real Estate Management (REM) division at Indian CRE (IT businesses) assists in procuring properties at the most economical price and selling properties that are considered excess assets. REM is highly valued in Indian CRE (IT companies) due to its ability to deliver a streamlined and efficient corporate real estate service. This ensures that the company's property portfolio is optimized for its core business, minimizing capital investment.
- F. The study's findings validate the role of REM (rapid eye movement) sleep in enhancing the financial performance and overall corporate performance of Indian CRE (IT businesses). Furthermore, the interview findings indicate that REM at Indian CRE (IT businesses) encompasses the management of finances related to real estate matters and enhances the company's asset value. REM is crucial since it offers options to help the organization achieve its financial goals through cost reductions or ways to minimize capital at Indian CRE (IT companies). Additionally, the organization REM plays a role in optimizing

property utilization, resulting in cost savings on operational expenses for Indian CRE (IT companies).

- G. The study's findings validate the role of REM (rapid eye movement) in enhancing corporate performance by fostering learning, growth, and innovation in Indian CRE (IT businesses). The interview results indicated that REM at Indian CRE (IT businesses) is involved in designing working environments and providing suggestions for enhancements to enhance customer usability. This approach produces synergistic advantages by strategically positioning people according to their job tasks. In addition, the interview findings stated that REM offers real estate solutions that facilitate revenue-generating potential (innovations) for Indian CRE (IT businesses). Therefore, Rapid Eye Movement (REM) is crucial in Indian Corporate Real Estate (CRE) at IT firms, since it enhances the company's inventive performance by evaluating the learning and growth aspects of non-property companies' utilization of real estate workspaces.
- H. The study's findings validate the role of REM in enhancing operational business performance, which in turn leads to improved corporate performance. This improvement is achieved by optimizing internal business processes to meet or surpass client expectations and generate profits through efficient and effective property utilization. The interview results highlighted that REM at Indian CRE (IT businesses) facilitates business operations to generate operational cost reductions, with the goal of satisfying clients and stakeholders of the workplace. Thus, REM plays a crucial role in converting business requirements into operational strategies for real estate at Indian CRE (IT businesses). Its objective is to capture the production of corporate value through internal business processes, which are designed to meet or surpass customer expectations.

5.6. Implications of the Study:

5.6.1. Theoretical Implications:

- A. This study contributes to the existing body of literature on the influence of real estate management in the Indian IT industry. It presents empirical evidence on the effects of technology-enabled real estate management practices, specifically

focusing on sustainable aspects. These practices have the potential to decrease the need for physical workspace.

- B. The text consists of a bullet point. This study enhances the theoretical foundation of the natural resource-based view (NRBV) of the enterprise proposed by (Hart, 1995). According to (Anthony, 2019), a company's strategy, namely its workplace management plan, relies heavily on effectively allocating organizational resources to improve sustainable performance. Organizations employ a strategic strategy to effectively manage their resources (such as labor, capital, and real estate) in order to support their operations (Haynes et al., 2017). This study supports the findings of (Joy & Haynes, 2011) that demonstrate a strong and meaningful connection between real estate management and enhanced facilities performance in companies, achieved via the use of effective workspace management practices. Therefore, it is imperative for firms to establish workspace management indicators in order to effectively tackle workplace management challenges.
- C. This research makes several contributions to the current body of literature. This study focuses on analyzing the impact of NAW (New Ways of Working) on workspace utilization, specifically addressing the influence of sustainability factors on workspace management. The study aims to develop a comprehensive model that integrates all these variables. Therefore, this research fulfills the request made by (Jayantha & Oladinrin, 2019) for a study that expands our understanding of the impact of sustainability on the utilization of workspace in non-real estate enterprises in the commercial real estate (CRE) sector. Furthermore, this study offers a comprehensive overview of technology-driven techniques in real estate management, supported by empirical evidence from Indian IT businesses. No study conducted in India has examined the impact of sustainability on the relationship between corporate real estate (CRE) and reduction in workspace usage at Indian IT companies. This study focuses on management system standards rather than technical standards, which assist companies in optimizing their use of organizational resources. As there are no concrete findings from India about the connection between sustainability and workspace management strategy (CRE strategy), this research offers

preliminary evidence of the importance of implementing such a strategy to enhance a company's sustainability performance.

- D. This research contributes to the existing theoretical knowledge by providing a comprehensive understanding of how the changing needs of corporate occupiers around the world affect patterns of workspace usage, organizational structure, and office building architecture. This study addresses the lack of understanding regarding the connection between workspace management (CRE) and the behavioral intention of occupants in a developing country. It aims to determine the demonstrated value, competitive advantage, sustainability, and workplace utility of non-real estate companies (CRE corporations). Global corporations have recognized that employees no longer require physical office space to carry out their work. Instead, there is a growing demand to establish a pleasant work environment that enables employees to work from coffee shops or designated spaces for gamification, while being connected through wireless technologies.
- E. This study is the initial empirical inquiry conducted using the person-environment (P-E) theory applied to workplace design in the Indian context. Based on a thorough examination of previous research, it has been found that no study has been undertaken in India about workplace management using the P-E theory. This study aims to fill the gap in knowledge regarding the connection between workplace design layout, sustainability, and the behavioral intention of employees to use workspace in a developing country. The utilization of person-environment (P-E) theory in corporate real estate (CRE) offers a comprehensive approach to CRE practices that may be employed by organizations in the early stages of developing workspaces that align with occupiers' sustainability requirements.
- F. This study empirically examines the social dimension of the SERVQUAL theoretical framework proposed by (Parasuraman et al., 1988) in the context of real estate management decisions. Specifically, it investigates how the service quality of real estate facilities at the workplace impacts the productivity of human capital, which refers to the occupants of the company. (Koleoso et al., 2017) asserted that the service quality of corporate buildings can be evaluated using the FM-SERVQUAL model, which is based on the theoretical framework

of SERVQUAL proposed by (Parasuraman et al., 1988). The FM-SERVQUAL model was employed to empirically assess the facility management service quality and its effect on occupier satisfaction.

- G. This study aims to enhance our understanding of how the workplace is evolving in Indian corporate real estate (CRE) by applying the Technology Acceptance Model (TAM) to the field of real estate management. The study's findings determined that effective technology management in real estate necessitates innovative workplace design and facilities tailored to the requirements of both occupants and the firm.
- H. This study aims to enhance the application of the value-added BSC (balanced scorecard) theory and evaluate its practical consequences on client satisfaction in CRE (commercial real estate). The Balanced Scorecard (BSC) was developed by (Kaplan & Norton, 1996) as a means to assess an organization's strategic performance by incorporating both financial and non-financial objectives. According to this definition, this study determined that effectively managing financial capital in real estate management involves controlling the expenses of maintaining the workplace within the allocated budget and evaluating the financial benefits brought about by proper real estate management on the company's wealth.

5.6.2. Practical Implications:

- A. The study will assist policymakers in effectively designing office structures that can incorporate office space management strategies rooted in sustainability practices. This will enable Indian Corporate Real Estate to maintain competitiveness by reducing occupancy costs and becoming an appealing destination for occupiers globally. IT businesses in India are incorporating green workplace norms and using improved workspace management methods to enhance their sustainability performance.
- B. This study examines the advantages of incorporating real estate management into non-real estate companies, specifically Indian Corporate Real Estate. By doing so, it aims to address problems such as inefficient use of workspace, high maintenance and technology costs associated with real estate portfolios, and

excessive expenses related to infrastructure and facilities management. Additionally, the integration of technology requirements with employee needs is expected to create a conducive environment for knowledge workers, enhancing their comfort and productivity in accordance with workplace trends (Kaur et al., 2022).

- C. The user's text consists of a bullet point symbol. The primary stakeholders for IT companies are their staff and their welfare. It is crucial to ensure that the workspace design in Indian IT companies is in line with the brand, utilize technology to improve employee engagement and satisfaction, and enable a global workforce to facilitate knowledge work. Therefore, it is crucial for Indian IT companies to provide a workplace environment through real estate management that is appealing and capable of attracting and hiring top people in order to become a leading force in the IT industry (Greene & Myerson, 2011).
- D. The user's text consists of a bullet point symbol. This study offers valuable insights into the application of the real estate management function in the CRE business to tackle difficulties connected to portfolio management, diverse employee needs, and the enhancement of workspace usability through energy-efficient policies. This study can serve as a reference for practitioners to create more efficient workspace designs. The study's social ramifications can be broadened as it can provide guidance to other companies on effective workspace design activities. These initiatives can help overcome various challenges in managing real estate workplaces and ultimately improve workplace efficiency and employee satisfaction. The study can serve as a source of inspiration for the development of user-centric and innovative workstation designs in practical applications.
- E. This study has significant practical implications for managers in the field of workspace management in the global commercial real estate (CRE) industry. It highlights the importance of developing workplace designs that meet the needs of employees and achieve sustainability in the real estate management (REM) function of CRE. These implications are particularly relevant for operation managers, real estate managers, facility managers, and practitioners in the workspace management domain. The study's social implications can be

broadened as it has the potential to provide guidance to other companies in assessing their current utilization of workspace and assessing the effectiveness of their workspace management policies using the theoretical framework of value-added balanced (BSC) benchmarking criteria (Kaur & Solomon, 2022a).

- F. Further practical consequences involve actively communicating with employees to address their needs in workplace management. The most exemplary workplaces prioritize the well-being of their employees and involve them in all aspects of their work (Sanderson & Read, 2020; Zhao et al., 2019).
- G. The research will offer valuable insights to leading IT companies, helping them understand the increasing importance of workplace benchmarking. This benchmark will be based on the quality of services, corporate sustainability achievements, workspace facility design, and adherence to current trends in sustainable workspace usage. The goal is to enhance occupier comfort.

This study examined the influence of workplace design on occupier satisfaction and found that top corporations are evaluated in the premium and medium categories (Grade A and Non-Grade A) based on the level of services provided in the workplace. Organizations employ a strategic approach to ensure that their real estate management strategies, also known as integrated workplace management, are rooted in sustainability dimensions. These strategies aim to enhance business operations, boost business performance, and increase occupier satisfaction. This is particularly important in the IT industry, as it helps organizations retain knowledge workers (Harris, 2015).

5.7. Recommendation from the Study:

Practical insights emerge from this study's findings, applicable to medium and large real estate organizations. The framework serves as a cornerstone for Integrated Workspace Management Systems (IWMS) and Real Estate Maturity Models (REMM). It adapts to technological advances like Internet of Things (IoT), mobile, cyber, cloud, and blockchain. The model's stability relates to Technology Acceptance, incorporating future variables and service quality offerings. This foundation enhances organizational practices, leveraging research outcomes for industry-wide improvements

5.7.1. Model Stability:

Technology Acceptance Model 3 (TAM 3) offers insights into tech adoption across sectors, including Corporate Real Estate. Key constructs like perceived usefulness and ease of use need validation to ensure model stability. External factors such as organizational support and user training also play a role. Regular updates with fresh data and user feedback boost predictive accuracy. Combining TAM 3 with models like Unified Theory of Acceptance and Use of Technology (UTAUT) can deepen our grasp of CRE technology adoption patterns. This integrated approach yields a more nuanced understanding of how and why new technologies gain traction in the corporate real estate landscape

5.7.2. Service Quality in Framework:

Tangibles, reliability, responsiveness, assurance, satisfaction and empathy form the SERVQUAL model's core for evaluating CRE service quality. Firms should prioritize ongoing employee training and customer feedback systems to excel. Adopting service industry best practices and conducting regular audits against benchmarks ensures high standards. Technology integration streamlines processes and enhances customer interactions, boosting overall service quality. By focusing on these areas, CRE companies can maintain a competitive edge and foster client satisfaction in an ever-evolving market landscape.

5.7.3. Real Estate Metrics in Framework:

Navigating the real estate maze requires understanding key variables. Location, property type, market conditions, and regulations dictate the landscape of commercial real estate (CRE). To fine-tune these factors, firms must dive into detailed market research. Data analytics transforms numbers into insights, guiding informed decision-making. Staying attuned to regulatory shifts is essential for success. Embracing sustainability practices can elevate real estate investments. Energy-efficient buildings and green certifications boost asset value significantly. Collaborating with stakeholders, like government agencies and industry associations—offers valuable

insights. Their support can light the path through the intricate world of real estate variables.

5.7.4. Sustainability in Framework:

Environmental, Social, and Governance (ESG) principles are shaping the future of real estate. Embracing ESG criteria means prioritizing energy efficiency, waste reduction, water conservation, and sustainable materials. Developers are going green, earning certifications like LEED and BREEAM to showcase their commitment to Mother Earth. Social elements spotlight affordable housing, community involvement, and the well-being of occupants. Governance zeroes in on transparency, ethical practices, and steadfast regulatory compliance. By adopting ESG principles, businesses boost their market appeal, draw in eco-conscious investors, and pave the way for lasting sustainability greatly aids to the current framework created.

5.7.5. Workspace Optimization:

Data-driven strategies revolutionize workspace efficiency. Facility managers leverage IWMS and IoT technologies to monitor occupancy in real-time. Smart space planning and flexible designs boost productivity while cutting costs. These innovations enhance employee satisfaction and optimize resource allocation. By embracing these tools, companies transform their workplaces into dynamic, efficient environments. The result: streamlined operations and a more engaged workforce. Facility management's role has evolved, becoming central to organizational success. Through careful optimization, businesses unlock hidden potential in their physical spaces.

5.7.6. Property, Estate and Portfolio Management Framework:

Savvy real estate investors know portfolio management is crucial. They allocate assets strategically, monitor performance rigorously, and mitigate risks. Diversification shields against market fluctuations. Boosting rental income and trimming costs drive profits. Advanced analytics reveal market trends, guiding smart investments. With these tactics, property managers optimize returns and sidestep pitfalls. Real estate success demands a keen eye on market dynamics and a data-driven approach. Ultimately, informed decisions and efficient operations maximize portfolio value.

5.7.7. Technology Advancements in Framework Adoption:

From virtual tours to blockchain transactions, technology reshapes real estate. AI-driven algorithms now personalize property searches and automate customer service. Smart buildings harness IoT for real-time efficiency monitoring. Big data informs investment strategies and pricing decisions. These advancements streamline processes, enhance transparency, and improve buyer experiences. Virtual and augmented reality save time and money by offering immersive property previews. Blockchain's smart contracts reduce fraud risks. As the industry embraces these innovations, real estate becomes more accessible and responsive. The digital transformation continues, promising a dynamic future for buyers, sellers, and investors alike.

5.7.8. Practical Applications in Other Industries:

From healthcare to hospitality, CRE models drive efficiency and customer satisfaction. TAM 3 aids EHR adoption, while SERVQUAL measures service quality in hotels. Retailers and manufacturers use location analysis for site selection. These versatile tools, originally developed for real estate, now enhance decision-making across industries. CRE methodologies adapt seamlessly, boosting performance in varied business landscapes. The Government of India (GoI) can use this framework for their future city and state development. Their broad applicability demonstrates the power of cross-sector innovation, offering a fresh perspective on longstanding challenges.

5.7.9. Additional Suggestions: Corporations consider real estate portfolio management, also known as workspace management, important due to changing economic conditions, technological advancements, and globalization. This management practice has an impact on the financial statements and influences the company's investment decisions in workspace stock. The results of this management are reported in the company's annual reports. Additionally, the expenses related to overseeing commercial real estate assets are only surpassed by employee compensation in the Indian IT sector. Hence, efficient management of real estate within a business can result in significant cost reductions. Moreover, it is imperative for the executives in non-real estate companies, specifically those in Indian real estate organizations (CRE

corporations), to see the potential of utilizing real estate as a strategic tool to enhance the company's shareholder value (Kaur et al., 2022b).

- A. This study examines the involvement of sustainability, contemporary patterns, and methodologies employed by Indian real estate firms in creating a cutting-edge workplace design. The aim is to enhance the quality of corporate buildings in response to the evolving needs of occupants and management, with the assistance of a CRE manager. The role of a corporate real estate manager in managing workplace design or redesign change in non-real estate companies in the Indian office space is currently a popular topic. The role of a CRE manager is crucial as it focuses on improving the quality of corporate buildings by aligning the demands of occupiers with management, making their role indispensable. This study investigated the influence of Rapid Eye Movement (REM) on modifying workplace design in Indian CRE (IT businesses) and its effect on worker productivity. Additionally, it explored how these changes contribute to corporate social responsibility by reducing the carbon footprint.
- B. According to the 2020 report by the International Facility Management Association (IFMA) on workspace planning benchmarking, only a small number of Indian organizations in the IT industry are utilizing workplace facilities metrics to develop workspace management strategies. Multiple studies suggest that evaluating the sustainability of workplace facilities using green workplace standards enhances employee happiness and ultimately increases an organization's long-term profitability (Abankwa et al., 2021); (Allen & Macomber, 2020) and (Greene & Myerson, 2011). Consequently, evaluating the effectiveness of workplace design in non-real estate firms is seen as a significant method for effectively managing real estate portfolios that can enhance the organization's primary operations (Kaur & Solomon, 2021).
- C. A growing trend in the Indian corporate real estate (CRE) sector is the establishment of dedicated real estate departments within IT businesses. Despite not being recognized as a formal business, corporate Real Estate (CRE) in India has experienced significant growth in job opportunities over the past two decades, thanks to the globalization of service sector operations (Abatecola & Cafferata,

2014). Approximately 7% of the global workforce is engaged in capital projects and infrastructure, making corporate real estate a significant sector in the global economy. The annual expenditure on workspace management-related operations in real estate capital projects amounts to \$10 trillion, as reported by Deloitte in 2020. Based on the JLL report from 2019, Indian firms are experiencing a loss of USD 18 million as a result of inefficient utilization of workspace and the application of outdated benchmarks that prioritize cost reduction over improving the experience of occupants. Indian IT companies should prioritize identifying the role of workspace usability-based benchmarking measures instead of operational cost reduction benchmarks to meet the evolving needs of occupiers. Additionally, conducting a thorough study on changes in working patterns in the Indian workspace can aid in estimating future space requirements with greater precision and accuracy in the Indian workspace segment.

- D. The results demonstrate the evolving characteristics of the workplace in Indian IT businesses, as they incorporate technological advancements based on the Technology Acceptance Model (TAM) in the real estate sector. Nevertheless, the Indian CRE sector continues to face concerns regarding the standard of information. Despite the groundwork for AI in the Indian commercial real estate (CRE) office space being laid before the COVID-19 outbreak, its implementation is still in its early stages. Only a handful of Indian real estate organizations are utilizing technology to automate real estate activities (Kaur & Solomon, 2021). However, the current worldwide healthcare crisis caused by the deadly virus has made it imperative to address the labor needs in the Indian CRE. Data analysis is playing a crucial role in understanding the impact of COVID-19 worldwide. Organizations are leveraging data from the board and artificial intelligence (AI) in this episode to enhance routine operations (Treleaven et al., 2021). The division possesses a substantial amount of information, but there is a significant scarcity of 'useful and easily understandable information in the Indian Commercial Real Estate (CRE) industry, which is a fundamental requirement for Artificial Intelligence (AI) (Warren, 2018). Efficient property management in the world of automation necessitates the availability of property information online. This enables various property management activities to continue smoothly even during challenging

periods, ensuring minimal disruption to office space operations (Kaur & Solomon, 2021). To promote the adoption of PropTech (Property Technology) in India, the corporate real estate industry should prioritize the establishment of consistent and transparent standards. This will facilitate the integration of smarter technologies, leading to increased transparency of data and the development of more intelligent properties. It is important to note that these technologies should be tailored to the specific needs of end-users in the Indian corporate real estate sector, particularly IT companies.

A powerful framework designed for the Corporate Real Estate sector awaits medium and large organizations. By embracing this blueprint, they unlock a treasure trove of benefits. Strategy creation, meticulous planning, and value stream development become second nature in real estate. Melding the TAM 3 and SERVQUAL models offers a stronghold for tech adoption and superior service quality. With a spotlight on ESG principles and workspace optimization, sustainability flourishes, and efficiency soars. This framework serves as a strategic compass, guiding organizations through the intricate real estate landscape. Optimize assets and pave the way for lasting success with this invaluable roadmap. Corporate real estate firms can boost efficiency and sustainability through targeted enhancements. Key strategies include stabilizing TAM 3 models, elevating service standards, and fine-tuning property variables. Integrating ESG principles and optimizing workspace management further drive progress. These practices not only satisfy customers but also yield insights applicable across industries. By embracing this holistic approach, CRE companies position themselves for long-term success in an evolving market landscape.

5.8. Limitation of the Study:

Constraints shaped this study's outcomes. Key limitations include model selection, sampling methods, and timing of expert input. The research focused solely on agreed objectives, potentially narrowing its scope. Alternative approaches might yield different results. Validation centred on predefined goals, possibly overlooking other factors. These weaknesses, built up and refined over time, may have influenced findings. While improvements were made where possible, inherent dependencies

remain. The study's conclusions should be considered in light of these restrictions, acknowledging the potential for varied outcomes under different circumstances.

5.8.1. TAM 3 Model Limitations:

TAM 3's narrow focus on perceived usefulness and ease of use limits its scope in technology adoption analysis. It overlooks crucial external factors like cost, organizational culture, and structural imperatives. Designed for individual-level study, TAM 3 falters in organizational settings. Its struggle to quantify behaviour reliably hampers predictive accuracy. A potential TAM 4 could address these shortcomings by incorporating cost, culture, and structural elements such as branding and reach. This expansion would significantly alter the research landscape, transforming current limitations into future opportunities. Such revisions could pave the way for more comprehensive and accurate technology adoption studies across various contexts.

5.8.2. Gaps in Service Quality Model:

Customer expectations and service reality often diverge. SERVQUAL attempts to bridge this chasm through five distinct gaps. The knowledge gap reveals management's misunderstanding of customer needs. Policy gaps arise when quality standards miss the mark. Delivery gaps emerge as service falls short of specifications. Communication gaps occur when promises outpace performance. Perception gaps highlight the divide between anticipated and received service. Yet SERVQUAL's static approach struggles to capture the fluid nature of customer desires and service execution. This model, while useful, may not completely grasp the ever-shifting landscape of consumer expectations and service delivery realities.

5.8.3. Challenges in Implementing Technology Models:

Poor understanding of technology needs plagues real estate firms. Without clear goals, companies hastily adopt solutions, often with subpar results. This problem cascades, leading to insufficient resources for implementation. Inadequate planning follows, compounded by security risks and high costs. The rapid pace of tech evolution exacerbates these issues, making adaptation difficult. While our study covers extensive real estate variables, new technologies could introduce unforeseen factors. This

limitation reflects the industry's dynamic nature, where innovation constantly reshapes the landscape of available data and analytical approaches.

5.8.4. Other Models Used in Real Estate:

Real estate professionals can leverage diverse models beyond TAM 3 and SERVQUAL. The Unified Theory of Acceptance and Use of Technology synthesizes multiple frameworks, offering a holistic view of tech adoption. For project evaluation, the Real Estate Development Model assesses feasibility and profitability. Financial viability finds scrutiny in the Real Estate Financial Model, encompassing development, acquisition, cash flow, and sensitivity analyses. Each approach provides unique insights, adaptable to specific real estate needs. These alternatives complement or supplant traditional models, enriching decision-making processes in the property sector.

5.8.4.1. Unified Theory of Acceptance and Use of Technology (UTAUT):

Unified Theory of Acceptance and Use of Technology (UTAUT) offers a holistic view of tech adoption, surpassing TAM 3's scope. It weaves together performance expectations, perceived effort, social pressures, and supportive environments. This comprehensive approach illuminates how real estate professionals embrace innovations. UTAUT's multifaceted lens reveals subtle nuances in technology acceptance, providing richer insights than its predecessors.

5.8.4.2. Real Estate Development Model (REDM):

Market dynamics drive real estate development, shaping each project's journey. Developers navigate a complex process: analysing trends, choosing prime locations, and crunching numbers. They balance design aspirations with practical constraints, oversee construction, and craft compelling marketing strategies. This holistic approach minimizes risks while maximizing returns. Cash flow projections, detailed cost breakdowns, and sensitivity analyses form the backbone of decision-making. By aligning market needs with financial objectives, developers transform visions into profitable realities.

5.8.4.3. Real Estate Financial Model (REFM):

Investors and developers rely on the Real Estate Financial Model to gauge investment viability. This comprehensive tool integrates development, acquisition, cash flow, and sensitivity analysis sub-models. It generates detailed projections for revenue, expenses, and net operating income. The model's sensitivity analysis feature proves crucial, enabling stakeholders to assess how fluctuations in rental rates or occupancy levels affect a project's financial performance. By providing a holistic view of potential outcomes, this model empowers decision-makers to navigate the complex landscape of real estate investments with greater confidence and precision. Property valuation hinges on various factors. The Hedonic Pricing Model dissects these elements, guiding real estate decisions. Meanwhile, investors turn to the Discounted Cash Flow model to assess potential returns. This tool projects and discounts future cash flows, yielding a net present value. Real Options Analysis completes the toolkit, illuminating strategic pathways in uncertain markets. It helps stakeholders identify hidden values and seize overlooked opportunities. Together, these methods empower industry players to navigate the complex real estate landscape, transforming risks into rewards and shaping investment strategies for optimal outcomes.

5.8.4.4. Growing Variables in Real Estate, Technology and Sustainability:

In the ever-evolving real estate landscape, several factors are gaining traction. Technological strides and sustainability are at the heart of these changes. Key variables like location, property type, market conditions, and regulations shape this dynamic sector. Emerging technologies—think virtual reality (VR), augmented reality (AR), artificial intelligence (AI), blockchain, and the Internet of Things (IoT)—are revolutionizing how we engage with real estate. Workspace optimization is all about maximizing space and elevating productivity. This means smart facility and property management. Sustainability is equally vital, focusing on energy efficiency, waste reduction, water conservation, and eco-friendly materials. Together, these forces are crafting a brighter future in real estate.

5.8.4.5: Impact on Small Companies:

Small businesses often find themselves running a marathon in a sprinting world. Facing a whirlwind of technological change, they grapple with rising costs and tight budgets. With limited resources and technical know-how, adopting new tools can feel like an uphill climb. Their infrastructure may lack the backbone needed for seamless integration. Compounding these challenges are the maze-like regulatory demands that can stifle growth. Meanwhile, the competitive real estate market can feel less like a chance and more like a challenge. In this fast-paced arena, small companies need agility and innovation to thrive.

5.8.4.6. Policy and Regulatory Limitations in India:

Navigating India's real estate landscape requires mastery of intricate laws. RERA, Transfer of Property Act, and others aim for transparency and fairness. Yet these regulations often burden companies, especially smaller ones, with costly compliance. The ever-shifting legal terrain further complicates matters, making long-term strategies a challenge. Balancing accountability with business needs remains an ongoing struggle in this dynamic sector. As rules evolve, firms must adapt swiftly to stay competitive and compliant in India's complex property market.

A. Policy and Regulatory: Transparency, fairness, and accountability drive India's real estate regulations. Yet these laws often hinder small firms and newcomers. Stringent requirements can stifle innovation and growth. Complex approval processes delay projects and increase costs. Land acquisition faces hurdles due to fragmented ownership and unclear titles. Environmental clearances add time and expense. Zoning restrictions limit development options in prime areas. Foreign investment caps constrain capital inflows. Tax policies discourage long-term holdings. Building codes vary across states, complicating multi-city projects. Rent control laws deter residential investments. While well-intentioned, these regulations create barriers that shape India's real estate landscape.

B. Real Estate (Regulation and Development) Act, 2016 (RERA): RERA is one of the most significant laws governing the real estate sector in India. It was enacted to

protect the interests of homebuyers and promote transparency in real estate transactions. Under RERA, all real estate projects must be registered with the regulatory authority, and developers are required to provide detailed information about the project, including project status, layout plan, and completion schedule. However, RERA has its limitations:

- ***Exclusion of Pre-RERA Projects:*** Projects that were completed or started before the enactment of RERA are not covered under the Act, leaving many homebuyers without protection.
- ***Threshold for Registration:*** Real estate projects with a land area of less than 500 square meters or fewer than eight apartments are exempt from mandatory registration, potentially excluding many small projects from regulatory oversight.

C. Transfer of Property Act, 1882: The Transfer of Property Act orchestrates property transactions in India, from sales to leases. It lays a legal foundation for property dealings, yet it has its drawbacks:

- ***Complexity and Ambiguity:*** The Act's provisions can twist like a labyrinth, causing legal wrangles and delays.
- ***Outdated Provisions:*** Certain sections of the Act feel like relics, failing to match today's vibrant real estate landscape.

D. Indian Stamp Act, 1899: Property transactions in India face a costly hurdle: stamp duty. This fee, mandated by the Indian Stamp Act, varies by state and document type. High rates can deter small companies and individual buyers from entering the real estate market. The inconsistent pricing across states further complicates matters, sowing confusion among potential purchasers. While the Act aims to regulate document fees, its implementation often creates barriers. Buyers must carefully consider these additional costs when planning property acquisitions. The current system's limitations highlight the need for a more unified and affordable approach to stamp duty across India.

E. Registration Act, 1908: The Registration Act calls for crucial document registration, including property records. This ensures these documents carry legal weight and enforceability. However, challenges loom large:

- **Cumbersome Registration Process:** Navigating registration can feel like running a marathon; it's slow and tiresome, often stalling property deals.
- **Lack of Digitalization:** Many areas still cling to paper trails, hampering efficiency and piling on paperwork.

F. Real Estate Investment Trusts (REITs) Regulations, 2014: REITs are your gateway to investing in income-producing properties. Governed by the SEBI (REITs) Regulations, 2014, they shine in India's investment landscape. However, they come with a couple of clouds:

- **Limited Awareness:** Many investors remain in the dark about REITs, which dims participation.
- **Regulatory Hurdles:** Navigating the regulatory maze can trip up even the best REITs.

G. Policy and Regulatory Challenges: India's regulatory landscape can feel like a labyrinth for small real estate firms.

- **Compliance Costs:** For smaller players, the price of compliance can break the bank.
- **Bureaucratic Delays:** Red tape can tangle timelines, stalling projects when speed is key.
- **Frequent Policy Changes:** Constantly shifting regulations lead to uncertainty and muddled planning waters.

In this ever-evolving environment, small companies must navigate wisely to thrive, and these are seen as limitations to the research. The Corporate Real Estate framework, adaptable for mid-sized and large firms, offers a strategic roadmap for success. It merges TAM 3 and SERVQUAL models, boosting tech adoption and service quality. ESG principles and workspace optimization enhance sustainability and efficiency. This approach helps organizations develop strategies, plan effectively, and create real estate

value streams. It guides firms through market complexities, asset optimization, and long-term growth. The framework's comprehensive recommendations improve model stability, service quality, and real estate variables. By integrating these practices, CRE firms can boost efficiency, customer satisfaction, and sustainability. The insights gained prove valuable across industries, showcasing the framework's wide-ranging applicability and potential impact.

5.9. Future Scope of Study:

This section identifies crucial avenues for future investigation, shedding light on the limitations of the current study and providing a roadmap for subsequent researchers to expand upon the discoveries made. For instance, the current study's restrictive scope, which focused solely on a specific demographic, leaves room for exploration of the phenomenon in diverse populations. Future researchers could build upon these findings by designing studies that encompass a broader racial, ethnic, or socioeconomic spectrum. Another potential area for exploration is the longitudinal impact of the studied phenomenon, which remains unaddressed in the current research. By conducting follow-up studies, researchers can delve deeper into the long-term consequences of the phenomenon, providing a more comprehensive understanding of its effects. Furthermore, the current study's reliance on self-reported data raises questions about the potential biases and limitations of this methodology. Future research could employ more objective measurement tools, such as observational studies or biometric data, to validate and strengthen the findings. By acknowledging these gaps and suggesting avenues for future exploration, this section provides a foundation for subsequent research to advance our understanding of the phenomenon.

5.9.1. Future Real Estate Variables:

Emerging trends reshape real estate's future. AI, VR, and blockchain revolutionize property management and transactions. Economic fluctuations and urbanization alter market dynamics. Green building practices gain momentum, promoting sustainability. New regulations like RERA impact the industry landscape. These factors present both challenges and opportunities. Technology enhances efficiency but requires adaptation. Market shifts demand agile strategies. Sustainability practices offer long-term benefits

but may increase short-term costs. Regulatory changes aim to improve transparency yet add complexity. To thrive, stakeholders must navigate this evolving terrain. Understanding these interconnected trends is crucial for success in tomorrow's real estate market.

5.9.2. Future Sustainability Mandate Study:

Future study on the incorporation of Environmental, Social, and Governance (ESG) concepts in real estate is highly promising. Possible subjects include:

- **Green Building Certifications:** Evaluating how environmental performance, tenant happiness, and property values are affected by certifications such as LEED and BREEAM.
- **Climate Resilience:** Researching methods such as energy efficiency, flood prevention, and the integration of renewable energy sources to increase the resilience of real estate assets to climate change.
- **Social Impact:** Examining how real estate may support community involvement, affordable housing, and social fairness.
- **Governance Practices:** Examining how well governance structures guarantee openness, moral behavior, and adherence to laws in real estate activities.

5.9.3. Future of Workplace Optimization:

Facility and Usage-Related Workplace Optimization. The following topics can be the focus of future workplace optimization research:

- **Hybrid Work Models:** Analyzing how office space usage, worker productivity, and company culture are affected by hybrid work arrangements.
- **Smart Buildings:** Researching how to optimize building management, energy use, and space use through the use of IoT and smart technology.
- **Employee Well-Being:** Examining the connection between indoor environmental quality, workplace design, and worker health and wellbeing.
- **Cost Efficiency:** Examining methods for cutting operating expenses by using effective facility management, resource allocation, and space planning techniques.

5.9.4. Continuation on TAM 3 Model and Service Quality:

The Technology Acceptance Model 3 (TAM 3) and Service Quality (SERVQUAL) models shine bright, illuminating the path to understanding technology adoption and service excellence in real estate. As we gaze into the future, ripe with possibilities, researchers can dive into several intriguing avenues:

- **Model Extensions:** Innovating and testing new facets of TAM 3, considering elements like organizational culture, external pressures, and cutting-edge technology.
- **Service Quality in Digital Platforms:** Delving into SERVQUAL's magic to assess the quality of digital real estate platforms. Think online property listings, virtual tours, and customer support that delights!
- **User Experience:** Unpacking how user experience design sways technology adoption and service quality in real estate applications. A seamless experience is a powerful force!
- **Comparative Studies:** Undertaking comparative studies to measure the pulse of TAM 3 and SERVQUAL across diverse real estate realms, from residential havens to commercial hubs and industrial landscapes.

With these focal points, the future of real estate research is as promising as a sunny day in the market. The Corporate Real Estate sector's new framework offers a strategic edge for medium and large organizations. It melds TAM 3 and SERVQUAL models, boosting tech adoption and service quality. ESG principles and workspace optimization drive sustainability and efficiency. This roadmap guides firms through market complexities, asset optimization, and long-term success. By embracing these practices, CRE companies can enhance model stability, service quality, and real estate variables. The framework's comprehensive approach improves efficiency, customer satisfaction, and sustainability. It also provides valuable insights applicable beyond the real estate industry, paving the way for innovation across sectors.

5.10. Conclusion:

The effective utilization of workspace and the organization portfolio has become essential due to globalization and technological improvements in the global corporate landscape (Miller, 2014). The performance of the CRE is evaluated based on the expenses associated with operating and maintaining the workspace, such as the total cost of occupancy or the average use of each workstation. This requires effective management of limited resources. The significant growth of corporate real estate portfolios in India over the past twenty years has primarily been driven by two key factors: the adoption of technology and the globalization of real estate activities. This has resulted in an increase in the availability of flexible workspaces in India (CBRE Research, 2019). Recent ESG trends have led to a closer integration of CRE management with core business transformation. Occupiers' demands for tangible transformation are compelling firms to swiftly address concerns related to workspace utilization like never before. The emphasis on holding firms accountable for sustainability necessitates a re-evaluation of corporate real estate (CRE) management. The study has determined that the implementation of real estate management methods had a direct impact on demonstrable value, competitive advantage, sustainability, and workplace utility in the Indian commercial real estate sector, specifically among IT businesses. The results indicate that real estate management has had a positive influence on the existing practices of demonstrated value, competitive advantage, sustainability, and workplace utility in the Indian commercial real estate sector. The findings validate the statement. This study presents evidence of the impact of real estate management on the value, competitive advantage, sustainability, and utility of company property in the Indian commercial real estate sector, specifically in IT companies. It establishes a causal relationship model that demonstrates the importance of real estate value management in Indian CRE (IT companies). This study addresses the research gap identified by Jayantha & Oladinrin (2019) regarding the advantages of real estate management for non-real estate enterprises in the context of a developing country, specifically India. This evidence can be utilized and expanded upon to gain a more comprehensive comprehension of the impact of corporate real estate (CRE) on enhancing workspace management practices at non-real estate organizations.

Conducting interviews with property management professionals from various IT organizations in the Indian CRE (IT industry) allowed for the examination of the necessity of the real estate management value model. This study offered the ability to examine this occurrence in a uniform setting. Companies that consider real estate management as a fundamental aspect of their business and possess a substantial portfolio are more knowledgeable about property-related risks. Consequently, they establish dedicated real estate management departments to oversee their company's property portfolio (which consists of real estate assets owned by non-real estate companies). This strategic move allows them to mitigate weaknesses and capitalize on opportunities in the Indian commercial real estate sector, particularly in the IT industry (Kaur et al., 2022). However, all participants have acknowledged that real estate management is a growingly crucial domain for enhancing organizational efficiency. The interviews indicated that real estate is the second highest expenditure in any firm, following salaries. Hence, proficient management of real estate within a corporation might result in substantial cost reductions.

Hence the below 3 objective along with the hypothesis generated are positive and can be considered in creating a framework of Real Estate Maturity Model.

1. To ***examine*** the current *business frameworks* in Corporate Real Estate and Space Management – **Accepted.**
2. To ***determine*** the *value of a new business framework* for Corporate Real Estate. – **Accepted.**
3. To ***check the use*** of *technology* in Corporate Real Estate. – **Accepted.**

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APPENDICES

APPENDIX I

QUESTIONNAIRE

Survey to build a Sustainable Real Estate Maturity Model

The Real Estate Maturity Model (REMM) framework is a tool used to evaluate the maturity level of a real estate organization in various areas such as strategy, operations, technology, and customer focus. The REMM framework provides a roadmap for organizations to assess their current status, identify areas for improvement, and define specific actions that can help them achieve higher levels of maturity. The framework is designed to help real estate organizations develop a holistic approach to managing their operations, assets, and customers, and to enable them to better respond to market dynamics, competitive pressures, and regulatory changes. By using the REMM framework, real estate organizations can enhance their performance, reduce risks, increase customer satisfaction, and achieve sustainable growth over time.

Dear Participants, as a research scholar from the Mittal School of Business at Lovely Professional University, I have chosen you to participate in this study by completing the following questionnaire.

The #NextNormal has become a mantra, #Hybridworking has been a tried-and-true and successful activity in 2020 and 2022, and as employees return to the office, the Corporate Real Estate Facility management teams are exerting a tremendous amount of effort to accomplish this. This survey seeks to identify "Value" in the changes that have been occurring in the Corporate Real Estate Space. Do we continue to thrive with newer methods of working, enhanced models, and how they have shaped us, or do we continue to rely on the old model that is still effective? As technology plays a crucial role in employee satisfaction and organization productivity, my brief survey is divided into three sections to help me analyze the data on a global scale and publish it as research content based on the Technology Acceptance Model 3.0 (TAM 3.0) and SERVQual models.

D1. Determined Value

D2. Sustainability

D3. Workspace Optimization

D4. Technology Acceptance

D5. Service Quality

The survey can only be completed by employees of organizations, making you an ideal candidate to share your thoughts. There is no personal data stored at any time, including correspondence. The collected demographic information would only be used to demonstrate global usage and would not be tied to any particular participant. It would be ideal if you could complete the survey in a single sitting and that all inquiries were objective. All survey inquiries are required for a comprehensive analysis.

The survey is completely voluntary and would assist me in comprehending the global market gap.

Thank you for participating and providing your insightful feedback. Please feel free to share the original link with Corporate Real Estate Staff if you believe it will enhance their understanding of the research being conducted.

Name

Email ID

Organization you work for?

Total Years of experience?

Gender

Age

Highest level of education?

What is your current occupation?

What is your income category fall under?

- 3.1. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are effective in *maximizing operational efficiency*?
- 3.2. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are effective in reducing costs*?
- 3.3. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *in creating a positive workplace culture*?
- 3.4. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *in enhancing employee productivity*?
- 3.5. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *in attracting and retaining talent*?
- 3.6. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *in promoting collaboration and innovation*?
- 3.7. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are adaptable to changing business needs*?
- 3.8. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are aligned with company values and mission*?
- 3.9. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *prioritize sustainability and environmental responsibility*?
- 3.10. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are compliant with relevant regulations and standards*?

- 3.11. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *take into account the needs and preferences of different generations of employees?*
- 3.12. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management are *transparent and accountable?*
- 3.13. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *effectively manage risk?*
- 3.14. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are flexible and responsive to unexpected events?*
- 3.15. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are effective in managing remote and hybrid work arrangements?*
- 3.16. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management have applications in place for *employee well-being and mental health?*
- 3.17. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *prioritize employee well-being and mental health?*
- 3.18. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management have technology *easily accessible* to promote diversity, equity, and inclusion?
- 3.19. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *promote diversity, equity, and inclusion?*

3.20. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *effectively use technology to enhance workplace experience?*

3.21. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *effectively balance the needs of different stakeholders, such as employees, shareholders and customers?*

3.22. To what extent do you believe that current business frameworks in Corporate Real Estate and Space Management *are innovative and forward-thinking?*

3.23. How relevant do you think the new business framework for Corporate Real Estate is to the current market trends and demands?

3.24. How likely are you to adopt the new business framework for Corporate Real Estate in your organization?

3.25. How likely are you to recommend the new business framework for Corporate Real Estate to other organizations in your industry?

3.26. In your opinion, what are the most important factors to consider when developing a successful corporate real estate and space management strategy?

3.27. Is there anything else you would like to share about your experience with corporate real estate and space management framework?

4.1. To what extent do you believe the new business framework for Corporate Real Estate will *enhance overall business performance?*

4.2. To what extent do you believe the new business framework for Corporate Real Estate will *improve operational efficiency*?

4.3. To what extent do you believe the new business framework for Corporate Real Estate will *improve risk management*?

4.4. To what extent do you believe the new business framework for Corporate Real Estate will *improve collaboration and communication among stakeholders*?

4.5. To what extent do you believe the new business framework for Corporate Real Estate will *improve the use of technology in real estate operations*?

4.6. To what extent do you believe the new business framework for Corporate Real Estate will *improve the alignment of real estate strategy with overall business strategy*?

4.7. To what extent do you believe the new business framework for Corporate Real Estate will *improve the use of data analytics in real estate decision-making*?

4.8. To what extent do you believe the new business framework for Corporate Real Estate will *improve the ability to anticipate future real estate needs like hybrid working*?

4.9. To what extent do you believe the new business framework for Corporate Real Estate would help you *achieve your organization's strategic objectives*?

4.10. How easy or difficult do you think it would be to *implement the new business framework* for Corporate Real Estate in your organization?

4.11. How confident are you in the ability of the new business framework for Corporate Real Estate to provide *measurable benefits to your organization*?

4.12. How will the new Corporate Real Estate business structure *improve collaboration and communication* in your organization?

4.13. In your opinion, what are the most important factors to consider when implementing corporate real estate framework?

4.14. Would you like to contribute anything else about your experience that should be considered while developing the corporate real estate framework?

5.1. To what extent does your organization *utilize technology to manage its real estate portfolio*?

5.2. How satisfied are you with the *current level of technology integration* in your organization's real estate management

5.3. To what extent has technology *improved* your organization's real estate management *efficiency and effectiveness*?

5.4. How frequently do you use technology for real estate *analysis and forecasting*?

5.5. How important is it for your organization to use technology *to manage its real estate portfolio*?

5.6. To what extent has technology enhanced your organization's *ability to make informed real estate decisions*?

5.7. How satisfied are you with the *current technology tools and platforms* available for real estate management?

- 5.8. To what extent do you think technology has *improved the efficiency of corporate real estate management*?
- 5.9. How often do you *use technology* in corporate real estate management?
- 5.10. In your opinion, how *important is technology in managing* corporate real estate?
- 5.11. To what extent do you believe technology can *improve the accuracy* of corporate real estate data?
- 5.12. How would you rate the level of technological *adoption in your organization's* corporate real estate management practices?
- 5.13. How often does your organization *invest in new technologies* to *improve* corporate real estate management?
- 5.14. How satisfied are you with the level of *technological support provided* by your organization for corporate real estate management?

APPENDIX II

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Secondary Sources:

BiggerPockets: <https://www.biggerpockets.com/blog> - Aims to educate people on all aspects of real estate and investing through free resources and tips. It serves as a social network for the real estate investing community, providing one of the best online educational resources for investors. Frequency: 2-5/D.

CNBC: <https://www.cnbc.com/real-estate/> - Provides readers with the latest news and headlines on the housing industry, mortgages, commercial and residential real estate, REITs, and more. Frequency: 10/D.

Commercial Property Executive: <https://www.cpexecutive.com/> - A leading resource for executives and companies involved in owning, investing in, developing, leasing, and managing commercial real estate. It includes reports on finance, sustainability, technology, property management, education, and legal and regulatory issues. Frequency: 4/W

Forbes | Real Estate: <https://www.forbes.com/real-estate/> - A premier source for reliable real estate news and analysis. It features breaking news, top headlines, and insightful articles for real estate investors on market trends and investment strategies. Frequency: 4/D.

Fundrise: <https://fundrise.com/education> - Offers insightful how-to articles and advice for both new and seasoned real estate investors. It also includes a helpful investing glossary for understanding real estate investment and crowdfunding terms. Frequency: 1/W.

Housing Wire: <https://www.housingwire.com/real-estate/> - A premier independent source for news, commentary, and analysis on the mortgage, real estate, and housing economy. It provides insights into the latest trends in interest rates, finance, and regulation. Frequency: 8-10/D.

Inman: <https://www.inman.com/topic/blogging/> - A leading independent provider of real estate news. The blog offers daily updates on news and technology advice, catering to real estate leaders, tech professionals, and consumers. It helps realtors and brokers stay ahead of trends with multiple daily posts. Frequency: 29/D.

Realty Times: <https://realtytimes.com/> - A trusted source for real estate news, offering advice for buyers, sellers, agents, and mortgage professionals. It also features articles on women in real estate and specific housing market outlooks. Frequency: 8-10/D.

RealWealth: <https://realwealthshow.com/> - A comprehensive directory of free educational content for investors, aiming to help people achieve financial freedom. It features daily podcasts (REN), weekly podcasts (RWS), and weekly long-form blog posts on real estate investing. Frequency: Daily podcasts with transcripts and weekly webinars.

Reddit – HomeOwners & Investors: <https://www.reddit.com/r/RealEstate/> - Focuses on real estate investing, landlording, financing, and more. It benefits from a high frequency of daily posts and helpful Q&A from readers. Frequency: 30/D.

Redfin Real-Time: <https://www.redfin.com/blog/> - Real-Time, is a comprehensive resource for owning, buying, and selling homes. It aims to revolutionize real estate in favour of the consumer, covering topics from Wall Street to Main Street. Frequency: 4/W.

The Commercial Journals: <https://www.bizjournals.com/news/commercial-real-estate> -Offer up-to-date news on commercial real estate from 43 cities across the U.S., helping readers stay current on important developments. Frequency: 3/W.

Trulia: <https://www.trulia.com/blog/> - Lists real estate and rental properties, offering in-depth school and neighbourhood information. It aims to simplify the process of buying, selling, or renting a home. Frequency: 1-2/W.

Zillow Porchlight: <https://www.zillow.com/blog/> - Serves as a consumer-centric real estate and rental marketplace, offering data, inspiration, and knowledge. It connects consumers with top local real estate professionals and provides quality information on buying renting, financing, and remodelling. Frequency: 4/Q.

Thesis Library:

Academia.edu: https://www.academia.edu/38233996/Real_estate_thesis - Researchers from all around the world upload and share their academic work on the for-profit website Academia.edu

Global Real estate Research: <https://www.researchprospect.com/real-estate-dissertation-topics/> - Land, buildings, properties, air rights, and subsurface rights are all involved in real estate transactions. Real estate is frequently discussed in university courses pertaining to business since it is acknowledged as a vital economic driver.

ScholarWorks @ Georgia State University: https://scholarworks.gsu.edu/real_estate_diss/ - Members of Georgia State University are featured in ScholarWorks for their research and scholarship. The archive is managed by the University Library to gather, arrange, share, and conserve the digital intellectual work produced by its staff, faculty, and students.

Shodhganga @ INFLIBNET: <https://shodhganga.inflibnet.ac.in/> - Research students can upload their Ph.D. theses on Shodhganga, which makes them publicly available to the academic community.

TU Delft: <https://repository.tudelft.nl/> - Academic outputs and digital resources from the fields of research and education can be found in the TU Delft repository. It provides a forum for a range of scholarly outputs from TU Delft while upholding Open Access ideals and encouraging cooperation, openness, and accessibility in scholarly research.

UK Assignment Geek: <https://uk.assignmentgeek.com/blog/real-estate-dissertation-topics/> - Students find it difficult to do research in the ever-changing real estate sector. For inspiration, more than 150 real estate research subjects have been assembled.

Indian Website References:

Abad Builders: <https://www.abadbuilders.com/blog/> - Known for creating top-notch homes and commercial spaces in Kochi.

Address Maker: <https://addressmaker.in/blog/> - Leading builders in Bangalore with projects consisting of world-class amenities.

Affordable Property Market: <https://affordablepropertymarket.com/category/> - Helps you fulfil your dream of living by assisting you with all aspects of property.

Ahad Builders: <https://www.ahadbuilders.com/blog/> - Building houses and helping build homes for over years.

Ashwin Sheth Group: <https://www.ashwinshethgroup.com/blog/> - A well-known name in the realty industry with an identity rooted in unique designs infused with contemporary thinking.

Assetmonk: <https://assetmonk.io/real-estate-investment-blog/> - An online real estate marketplace providing flexible investment opportunities in India.

Banyan Tree: <https://banyantree.in/blogs/> - Provides insights about the Pune villa project, property investment, and tips on landscaping plots.

Blox Blogs: <https://blox.xyz/blogs/> - Provides information about luxurious properties, real estates, and more in and around Mumbai.

Brigade Group: <https://www.brigadegroup.com/blog/> - Leading real estate developer in India with a focus on commercial and residential projects.

Chennai Dream Homes®: <https://www.chennaidreamhomes.com/real-estate> - Leading real estate agency and property consulting firm for flats for sale in Chennai.

Economic Times: Real Estate Blog <https://realty.economictimes.indiatimes.com/> - ETRealty is envisioned to be a destination for the real estate sector for in-depth news, views, analysis, data, and global trends.

EIPL Infra: <https://e-infra.in/blog/> - Provides the latest information on real estate in Hyderabad.

Farhan Rasheed: <https://www.farhanrasheed.com/> - A top blogger in India who blogs on Real Estate, Money, Startup, etc.

FirstBHK.com: <https://firstbhk.com/> - Find residential real estate upcoming/ongoing/new projects and properties in various cities.

Godrej Properties: <https://www.godrejproperties.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Goel Ganga Story: <https://goelganga.in/blog/> - Leading real estate developer providing exceptional value to clients.

Gopalan Enterprises: <https://www.gopalanenterprises.com/blog.html> - One of the most trusted real estate companies in Bengaluru.

Gupta & Sen: <https://www.guptasen.com/blog/> - Renowned real estate consultants and property agents for high-end luxury apartments, flats, condos, and bungalows in Mumbai.

Haware Intelligientia: <https://www.hawareintelligientia.com/> - Offers the best-automated property in Mumbai with an automated parking tower, smart kitchen, etc.

Hi-Life Builders: <https://hilifebuilders.in/blog/> - Offers quality residential & commercial properties in Thrissur, Kerala.

Hiranandani Group: <https://www.hiranandani.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

HomeInspeKtor: <https://www.homeinspektor.com/blog/> - Trusted adviser of home buyers and sellers providing comprehensive home inspection services.

Homes: <https://www.homes.in/blogs> - India's Favourite Real Estate & PropTech Portal providing intelligent edge to homebuyers.

House of Hiranandani: <https://www.houseofhiranandani.com/vlogs/blog/> - A leading business conglomerate developing iconic destination projects in India.

Hub and Oak: <https://www.hubandoak.com/blog/> - Publishes articles to help you keep up with the Indian Real Estate sector.

India Property Dekho: <https://www.indiapropertydekho.com/blogs> - Leading online platform simplifying and enhancing your property search experience in India.

Isha Homes: <https://ishahomes.com/blog/> - Specializes in strategically located, environmentally sustainable, technologically superior residential offerings.

Jagaha: <https://www.jagaha.com/blog/> - Mumbai's first dedicated commercial real estate platform.

Jain Oncor: Real Estate Blog <https://www.jainoncor.com/blog/> - A two-decade-old Real Estate consultancy firm offering residential, corporate, and commercial estate services.

JLL India: <https://www.jll.co.in/en/newsroom> - Coverage of commercial real estate news, trends, expert opinions, research, and more.

JP Infra: <https://www.jpinfra.com/blog/> - Offers various reasons to invest in property in Mumbai and innovative ways to transform your house into a home.

Kalpataru Group: <https://www.kalpataru.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Kohinoor Group: Real Estate and Property Blog <https://www.kohinoorpune.com/blog> - Excellence in construction quality and on-time delivery of their projects.

Larisa Realtech: <https://www.larisarealtech.com/category/blogs/> - Deals in Affordable Housing Gurgaon, Luxury Residential Projects, and Commercial Projects in Gurgaon.

Lodha Group: <https://www.lodhagroup.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Magicbricks: <https://content.magicbricks.com/> - Facilitates all real estate needs of buyers, sellers, agents, and almost everyone who wants to deal in Real Estate.

Mahindra Lifespace Developers: <https://www.mahindralifespaces.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Myron Homes: Real Estate Marketing Company <https://www.myronhomes.in/blog/> - Offers property buyers an exclusive selection of villas and residential plots.

Navi Mumbai Houses: <https://navimumbaihouses.com/blog/> - Features articles about real estate prices, property trends, renting residential, commercial properties, and construction projects.

NoBroker: Real Estate Blog <https://www.nobroker.in/blog/> - A new home rental platform that makes it easier to find your new home without paying any brokerage.

Oberoi Realty: <https://www.oberoirealty.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Pacifica Companies: https://pacificacompanies.co.in/pacifica_blog/ - A multi-talented real estate property development company in India.

Param Homes: Real Estate Consultant India <https://www.paramhomes.com/blog/> - Dedicated real estate experts team helping you buy your dream home Deals in commercial and residential property searches.

Prestige Group: <https://www.prestigeconstructions.com/blog/> - Leading real estate developer in India with a focus on commercial and residential projects.

Property Gully: <https://propertygully.com/blog/> - Aims to revolutionize the real estate experience by providing a comprehensive, user-centric platform.

PropertyHome: <https://propertyhome.in/> - Meets your property needs and delivers the most suited solution to your requirements.

PuneriProperty.com: <https://www.puneriproperty.com/> - Offers a variety of properties for sale, rent, and purchase in Pune.

Puravankara Limited: <https://www.puravankara.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Raheja Developers: <https://www.raheja.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Ravi Karandekar's Pune Real Estate Market Blog: <https://ravikarandeeekarsblog.blogspot.com/> - A real estate salesman helping property buyers to buy a property in Pune real estate market.

Real Estate India: <https://www.realestateindia.com/blog/> - Circulates relevant and trustworthy property information in India.

Real Estate India: <https://www.realestateindia.com/blog/> - Serves the needs of the real estate industry and designed to meet the needs of buyers, sellers, and brokers of Indian properties.

Real Estate Today Blr: <https://realestatetodayblr.com/> - A platform for real estate resources shown in the way of articles.

Realty Beat: <https://realtybeat.werealtors.co/> - Focuses on news, knowledge, opinion, and insights in real estate.

Realty Fact: <https://realtyfact.com/> - A globally read magazine that publishes, distributes, and syndicates real estate and property market news, rates, reports, investment trends, and industry data.

Realty NXT: <https://realtynxt.com/> - India's first media-tech platform providing views, news, analysis, and insights on Real Estate and PropTech.

Realty Redefined: <https://www.realtyredefined.com/blog/> - Brings innovation & technology to the real estate sector.

RK Mumbai Realtors: <https://rkmumbairealtors.com/blog/> - Deals in purchase, sale, rent, and lease of commercial and residential properties.

Runal Developers: <https://runal.com/blog/> - Real estate company aiming to form an illustrious skyline in the coming years.

Salarpuria Sattva: <https://www.sattvagroup.in/blog/> - Leading real estate developer in India with a focus on commercial and residential projects.

Shapoorji Pallonji Real Estate: <https://www.shapoorjirealestate.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

Sizzle Properties: <https://www.sizzleproperties.com/blog/> - A market leader in plotted developments in East Bangalore.

Skandhanshi: <https://skandhanshi.com/blog/> - Features property buying guides, Real Estate Tips, Reviews, News, Information & much more.

SmartOwner: <https://www.smartowner.com/blog/> - India's largest marketplace for investors offering high-value opportunities.

SMC Realty: <https://www.smcrealty.com/blog/> - Provides top guidance on real estate, legal issues, property tax for property buyers and sellers.

SMR Holdings: <https://www.smrholdings.in/blog.php> - Provides the best information on Real Estate news, projects, etc.

SNN Builders: <https://www.snnbuilders.com/blog/> - Leading real estate developer in Bangalore with a focus on quality and innovation.

Sobha Limited: <https://www.sobha.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

South Delhi Floors: <http://www.southdelhifloors.com/blog/> - South Delhi-based real estate consultants showcasing marvellous properties to esteemed clients.

SPR Highliving: <https://www.sprhighliving.com/blog/> - Offers luxury apartments for sale in Chennai.

Tata Housing: <https://www.tatahousing.com/blog/> - Leading real estate developer in India with a focus on quality and innovation.

The Property Times: Real Estate News & Views Portal <https://thepropertytimes.in/> - Presents real estate news, information, advice, research, opinion, and commentary for industry professionals and consumers alike.

TopPropMart: <https://www.toppropmart.com/blogs> - Technology-driven real estate consulting and services company serving customers across India.

Torbit Consulting: <https://www.torbitconsulting.com/insights/blog> - Real estate advisory with industry experts sharing advice on investment or property transactions in India.

Tricity - Real Estate News & Development: <https://www.ghardirectory.com/news> - Operates in the field of real estate business, building villas for rent.

True Assets Consultancy: <https://www.trueassetsconsultancy.com/> - A top real estate consultancy turning your real estate dreams into reality.

Unimark Group: <https://www.unimarkgroup.com/blog/> - Leading real estate development group based in Kolkata creating premium landmark spaces.

Valmark: <https://valmark.in/blog/> - Leading Residential & Commercial Real Estate Developer in Bengaluru.

Vastu Krupa Estate: <https://vastukrupaestate.in/blog/> - Professional Real Estate Consultant in Mumbai offering quality properties and services.

Vishwadharani Developers: <https://vishwadharinidevelopers.com/> - A flourishing Real Estate Company in Hyderabad backed by decades of Real Estate Experience.

APPENDIX III

ABBREVIATIONS

These acronyms are commonly used in several sectors of the Real Estate industry, including Corporate Real Estate, Commercial Real Estate, Facilities Management and Real Estate Technology. Their usefulness encompasses a wide range of aspects, such as Property and Space Management, Investment Analysis, Sustainability, and Technological Integrations. These terms are crucial in discussions related to Real Estate, Property Management, Space Optimization, Estate Management, Technology Adoption, and Service Delivery, among others.

Acronym	Abbreviation
AEC	Architecture, Engineering, and Construction
AI	Artificial Intelligence
AR	Augmented Reality
AVM	Automated Valuation Model
BA	Bibliometric Analysis
BA	Building Automation
BIM	Building Information Modeling
BMS	Building Management System
BPO	Business Process Outsourcing
CAFM	Computer-aided Facility Management
CAM	Common Area Maintenance
CapEx	Capital Expenditure
CBD	Central Business District

Acronym	Abbreviation
CM	Compliance Measure
CMMS	Computerized Maintenance Management System
CMS	Construction Management Software
CoRE	Commercial Real Estate
CRE	Corporate Real Estate
CREM	Corporate Real Estate Management
CRM	Customer Relationship Management
DaaS	Desktop as a Service
DCF	Discounted Cash Flow
DLT	Distributed Ledger Technology
DM	Data Management
DMS	Document Management System
EAM	Enterprise Asset Management
EM	Estates Management
ERP	Enterprise Resource Planning
FM	Facilities Management
GIS	Geographic Information System
HOA	Homeowners Association
HCI	Human Computer Interaction
HVAC	Heating, Ventilation, and Air Conditioning
HyW	Hybrid Working
IaaS	Infrastructure as a Service

Acronym	Abbreviation
IFMA	International Facility Management Association
IoT	Internet of Things
IoTaaS	Internet of Things as a Service
IRR	Internal Rate of Return
IT	Information Technology
ITeS	Information Technology-enabled Services
I&V	Innovations and Ventures
IWMS	Integrated Workplace Management System
KM	Knowledge Management
KPI	Key Performance Indicator
LAd	Lease Administration
LEED	Leadership in Energy and Environmental Design
LMS	Lease Management System
ML	Machine Learning
MLS	Multiple Listing Service
MSA	Metropolitan Statistical Area
NFC	Near-Field Communication
NN	New Norm
NNN	Triple Net Lease
NOI	Net Operating Income
NPV	Net Present Value
OpEx	Operating Expense

Acronym	Abbreviation
PaaS	Platform as a Service
PMS	Property Management Software
PP	Portfolio Planning
PrM	Property Management
QR	Quick Response
RE	Real Estate
REMM	
REI	Real Estate Maturity Model
REIT	Real Estate Investment Trust
RERA	Real Estate Regulatory Authority
RES	Real Estate sector
RET	Real Estate Technologies (RET
RF	Regulatory Framework
RFCM	Regulatory Framework and Compliance Measures
ROI	Return on Investment
RPA	Robotic Process Automation
SaaS	Software as a Service
SCaaS	Security Cameras as a Service
SM&TC	Science Mapping and Thematic Clustering
SME	Subject Matter Experts
SO	Space Optimization
SP	Strategic Planning

Acronym	Abbreviation
TAb	Technology Adoption
TAc	Technology Acceptance
TAM	Technology Acceptance Model
TR	Technology Ready
VIF	Variance Inflation Factor
VR	Virtual Reality
WFH	Work from Home
WM	Workspace Management
WoW	Ways of Working

APPENDIX IV

LIST OF PARTICIPATING ORGANIZATION STAFFS

Staff members from real estate companies who participated in this research study are listed below. The following data is a summary of the company's name, followed by the BSE code to identify the company, the location of the company's headquarters, the leadership or management of the company, the date or location of the company's founding, and a brief description of the company. I am grateful to all those who contributed to my research endeavours.

1. Akme Star Housing Finance Ltd. (533165): Headquartered in Mumbai, led by Mohammed Aslam Malik as MD, founded in 1998. Manages Housing finance company that provides home loans and property loans.
2. Anant Raj Ltd. (515055): Headquartered in Delhi, led by Ashok Sarin as Chairman, founded in 1969. Manages Real estate development focused on residential and commercial projects.
3. Ansal Properties & Infrastructure Ltd. (515145): Headquartered in Delhi, led by Sushil Ansal as Chairman, founded in 1983. Manages Residential townships, commercial complexes, hotels, malls and SEZs.
4. Arcadis NV (Netherlands): Led by Peter Oosterveer as CEO, AMS: ARCAD, headquartered in Amsterdam, founded in 1888. Design, engineering, and management consulting company active in the real estate sector.
5. Arihant Superstructures Ltd. (506194): Affordable and mid-income housing projects in Mumbai and Navi Mumbai. Managers led by Akshay Patel as MD, founded in 1991.
6. Ashiana Housing Ltd. (523716): Develops residential projects focused on senior living and children-friendly homes. Headquartered in New Delhi, led by Vishal Gupta as MD, founded in 1979, Manages Real Estate development.
7. Bombay Dyeing & Manufacturing Company Ltd. (500020): Headquartered in Mumbai, led by Nusli Wadia as Chairman, founded in 1879. Manages Textile manufacturer, also has real estate development arm.

8. Brigade Enterprises Ltd. (532929): Headquartered in Bengaluru, led by M.R. Jaishankar as Chairman & MD, founded in 1986. Develops residential, commercial and hospitality projects.
9. Capgemini SE (France): Led by Aiman Ezzat as CEO, EPA: CAP, headquartered in Paris, founded in 1967. Global IT consulting company with real estate services division.
10. CBRE Group Inc. (USA): Led by Bob Sulentic as President & CEO, NYSE: CBRE, headquartered in Dallas, founded in 1906. Global real estate services and investment firm.
11. Century Plyboards (India) Ltd. (532548): Headquartered in Kolkata, led by Sajjan Bhajanka as Chairman, founded in 1986. Manages Plywood/laminates maker, has presence in real estate/housing sector too.
12. Citigroup Inc. (USA): Led by Jane Fraser as CEO, NYSE: C, headquarters in New York City, founded in 1812. Multinational investment bank and financial services corporation with commercial real estate lending.
13. Cognizant (USA): Led by Brian Humphries as CEO, NASDAQ: CTSH, headquartered in Teaneck, NJ, founded in 1994. IT services provide real estate technology solutions.
14. Crest Ventures Ltd. (511413): Diversified into real estate after starting as a finance company. Does residential projects. Headquartered in Mumbai, led by Vijay Choraria as Chairman & MD, founded in 1986.
15. D.B. Realty Ltd. (532718): Headquartered in Mumbai, led by Vinod Goenka as Chairman & MD, founded in 1976. Manages Real estate development focused on residential and commercial projects in Mumbai and suburbs.
16. Delta Corp Ltd. (532848): Headquartered in Mumbai, led by Jaydev Mody as Chairman, founded in 1990. Owns and operates casinos and online gaming. Also develop residential/commercial projects.
17. Dilip Buildcon Ltd. (540047): Headquartered in Bhopal, led by Dilip Suryavanshi as Chairman & MD, founded in 1988. Builds Road construction EPC company, also active in residential and commercial development.
18. DLF Ltd. (532868): Headquartered in Gurugram, led by Rajiv Singh as Chairman, founded in 1963. Primary business is residential and commercial real estate development, also involved in rental business.

19. Ganesh Housing Corporation Ltd. (532840): Affordable housing projects in Mumbai, Thane and Pune markets. Headquartered in Mumbai, led by Shekhar Somani as Chairman & MD, founded in 1990.
20. Gayatri Projects Ltd. (532767): Headquartered in Hyderabad, led by T.V. Sandeep Kumar Reddy as MD, founded in 1994. Infrastructure and construction companies have residential/commercial projects too.
21. Godrej Consumer Products Ltd. (532424): FMCG company, part of the group with real estate development arm. Headquarters in Mumbai, led by Nisaba Godrej as Executive Chairperson, founded in 2001.
22. Godrej Properties Ltd. (533150): Headquartered in Mumbai, led by Pirojsha Godrej as Executive Chairman, founded in 1985. Residential, commercial and township development arm of Godrej Group.
23. Gokaldas Exports Ltd. (532676): Headquartered in Bangalore, led by Sivaramakrishnan Ganapathi as MD, founded in 1979. Textile/garment exporter has diversified into real estate development.
24. Gujarat Ambuja Exports Ltd. (524594): Agro-processing company, also has real estate and infrastructure verticals. Headquartered in Ahmedabad, led by Manish Gupta as Chairman & MD, founded in 1992.
25. HDFC Bank Ltd. (India): Led by Sashidhar Jagdishan as MD & CEO, BSE: 500180, Headquartered in Mumbai, founded in 1994. Banking services provide home loans and real estate project financing.
26. Hiranandani Developers Ltd. (532366): Develops large mixed-use integrated townships across India. Headquartered in Mumbai, led by Niranjan Hiranandani as Chairman & MD, founded in 1976.
27. Housing Development & Infrastructure Ltd. (532720): Headquartered in Mumbai, led by Rakesh Kumar Wadhawan as Chairman, founded in 1970. Township, residential and commercial projects. Also, into slum rehabilitation.
28. HSBC Holdings plc (UK): Led by John Flint as Group Chief Executive, LON: HSBA, headquarters in London, founded in 1865. Global banking and financial services firm with real estate financing operations.
29. Hubtown Ltd. (532172): Headquartered in Mumbai, led by Hemant Shah as Executive Chairman, founded in 1989. Residential and commercial projects primarily in and around Mumbai region.

30. IBM (USA): Led by Arvind Krishna as Chairman & CEO, NYSE: IBM, headquartered in Armonk, New York, founded in 1911. Multinational technology and consulting corporation with real estate services division.
31. ICICI Bank Ltd. (India): Led by Sandeep Bakhshi as MD & CEO, BSE: 532174, Headquartered in Mumbai, founded in 1994. Commercial bank with mortgage and real estate financing products.
32. Indiabulls Real Estate Ltd. (532832): Headquartered in Gurugram, led by Sameer Gehlaut as Chairman, founded in 2006. Builds Residential and commercial projects, part of Indiabulls Group.
33. Infosys Ltd. (India): Led by Salil Parekh as CEO & MD, BSE: 500209, Headquartered in Bengaluru, founded in 1981. IT services company with real estate technology solutions.
34. ITD Cementation India Ltd. (531153): Construction and EPC company, also undertakes real estate development. Headquarters in Mumbai, led by Jayanta Basu as MD, founded in 1978.
35. J.K. Cement Ltd. (532644): Cement manufacturer with a real estate/infrastructure development subsidiary. Headquartered in Kanpur, led by Shree Bhagwan Sahay as Chairman, founded in 1975.
36. Jaiprakash Associates Ltd. (532532): Diversified into real estate after civil engineering/construction projects. Headquartered in Noida, led by Manoj Gaur as Executive Chairman & CEO, founded in 1958.
37. JLL (USA): Led by Christian Ulbrich as President & CEO, NYSE: JLL, headquartered in Chicago, founded in 1783. Professional services firm specializing in real estate and investment management.
38. JMC Projects (India) Ltd. (522263): Construction and EPC player, has residential/commercial development vertical. Headquarters in Mumbai, led by Shailendra Tripathi as CEO & MD, founded in 1986.
39. Kalpataru Power Transmission Ltd. (522287): EPC player focused on power transmission and real estate. Headquartered in Mumbai, led by Mofatraj Munot as Executive Chairman, founded in 1981.
40. Kamdhenu Ltd. (532741): Headquartered in Gurgaon, led by Satish Kumar Agarwal as Chairman & MD, founded in 1994. Steel TMT bars maker, has forayed into affordable housing projects.

41. Karda Constructions Ltd. (533292): Headquartered in Mumbai, led by Naresh Karda as Chairman, founded in 1999. Manages Real estate construction and development company based in Mumbai.
42. Kaushalya Infrastructure Development Corporation Ltd. (532925): Infrastructure, construction and real estate development company. Headquartered in Nagpur, led by Ramesh Dongre as Chairman, founded in 1992.
43. Kolte-Patil Developers Ltd. (532924): Headquartered in Pune, led by Rajesh Patil as Chairman & MD, founded in 1991. Manages Residential and commercial projects in Pune and Western India markets. Also, into society re-development.
44. Kridhan Infra Ltd. (532977): EPC contractor active in roads/highways and real estate segments. Headquartered in Mumbai, led by Anil Shah as Chairman & MD, founded in 2003.
45. Life Insurance Corporation of India (LIC) (India): Led by M.R. Kumar as Chairman, not listed, headquartered in Mumbai, founded in 1956. State-owned insurance group with real estate investments and financing.
46. Mahindra Lifespace Developers Ltd. (532313): Headquartered in Mumbai, led by Arun Nanda as Chairman, founded in 1994. Manages Residential projects and integrated cities/industrial clusters, part of Mahindra Group. Also has affordable housing and renovation businesses.
47. Man Infraconstruction Ltd. (533556): Construction, real estate development and EPC services provider. Headquartered in Mumbai, led by Naresh B. Patel as Chairman & MD, founded in 1983.
48. Mangalam Cement Ltd. (532977): Cement manufacturer with real estate development as subsidiary business. Headquarters in Kochi, led by Vidya Mukundan as MD, founded in 1973.
49. Mazagon Dock Shipbuilders Ltd. (542134): Headquartered in Mumbai, led by Sanjeev Bhasin as CMD, founded in 1934. Manages Shipbuilding company has a presence in construction and real estate too.
50. Mirah Developers & Realtors Ltd. (532678): Headquartered in Mumbai, led by Rameshchandra Hiran as Chairman & MD, founded in 1997. Manages Real estate development focused on Mumbai and Western regions.
51. MRO-TEK Realty Ltd. (532726): Headquartered in Kolkata, led by Aniruddha Basu as Chairman & MD, founded in 1983. Manages Real estate and infrastructure development firm based in Kolkata.

52. Mumbai Makies Housing Realtors Ltd. (523186): Develops affordable housing projects in Mumbai. Headquartered in Mumbai, led by Pradeep Adlakha as Chairman, founded in 1995.
53. NBCC (India) Ltd. (534309): Headquartered in New Delhi, led by P. Prabhakar Rao as Chairman & MD, founded in 1960. Manages Project management consultancy, real estate development focused on govt/institutional projects. Also, into EPC contracting.
54. NCL Industries Ltd. (506808): Diversified firm with interests in real estate and construction. Headquartered in Hyderabad, led by K Ravi as Chairman & MD, founded in
55. NHPC Ltd. (533098): Headquartered in Faridabad, led by A.K. Singh as Chairman & MD, founded in 1975. Facilitates Hydroelectric power generator, has small real estate development portfolio.
56. Nila Infrastructures Ltd. (530377): Construction and infrastructure firm with real estate development arm. Headquartered in Ahmedabad, led by Manoj Vadodaria as Chairman & MD, founded in 1990.
57. Nitco Ltd. (532639): Headquartered in Mumbai, led by Vivek Talwar as Chairman & MD, founded in 1958. Tiles and bathroom products maker with real estate development projects.
58. Oberoi Realty Ltd. (533273): Focuses on premium residential projects, also has hospitality projects. Headquartered in Mumbai, led by Vikas Oberoi as Chairman & MD, founded in 1998. Focuses on premium residential projects, also has hospitality projects.
59. Omaxe Ltd. (532880): Develops residential, commercial, hi-tech townships and has other verticals. Also has construction, hospitality and healthcare verticals. Headquartered in New Delhi, led by Rohtas Goel as Chairman & MD, founded in 1987.
60. Parsvnath Developers Ltd. (532780): Headquartered in Delhi, led by Pradeep Jain as Chairman, founded in 1990. Pan-India residential, commercial, IT parks and SEZs development.
61. Peninsula Land Ltd. (503031): Headquartered in Mumbai, led by Nandan Piramal as Chairman, founded in 1870. Residential, commercial and logistics/industrial real estate developments in Mumbai.

62. Pennar Industries Ltd. (513228): Diversified engineering company with real estate/urban infrastructure projects. Headquartered in Hyderabad, led by Aditya Rao as Vice Chairman & MD, founded in 1964.
63. Phoenix Mills Ltd. (503100): Develops and operates retail malls, residential and commercial projects. Also has a hospitality business. Headquartered in Mumbai, led by Atul Ruia as Chairman, founded in 1905.
64. Pioneer Embroideries Ltd. (531720): Embroidery products exporter with real estate development business. Headquartered in Mumbai, led by Raj Kumar Sekhani as Chairman, founded in 1971.
65. Poddar Developers Ltd. (519551): Headquartered in Mumbai, led by Dipak Kumar Poddar as Chairman, founded in 1979. Real estate development focused on residential and commercial projects.
66. Prestige Estates Projects Ltd. (533274): Focus on residential, commercial, retail and hospitality projects. Headquartered in Bengaluru, led by Irfan Razack as Chairman & MD, founded in 1986. Focus on residential, commercial, retail and hospitality projects.
67. PSP Projects Ltd. (542905): Construction and real estate development firm based in Gujarat. Headquartered in Ahmedabad, led by Prahudas Vaishnav as Chairman, founded in 2008.
68. Puravankara Ltd. (532891): Develops premium residential and commercial properties. Headquartered in Bengaluru, led by Ravi Puravankara as Chairman, founded in 1975. Develop premium residential and commercial properties.
69. Quess Corp Ltd. (539978): Headquartered in Bengaluru, led by Ajit Isaac as Chairman & Founder, founded in 2007. Staffing/HR services firm, has subsidiary for construction and real estate projects.
70. Radhe Developers (India) Ltd. (531936): Headquartered in Mumbai, led by Gurvinder Singh as Chairman, founded in 1995. Real estate development company focused on Mumbai.
71. Raheja Developers Ltd. (512368): Develops residential and commercial projects in Mumbai region. Headquartered in Mumbai, led by Navin Raheja as Chairman, founded in 1983.
72. Sahara One Media and Entertainment Ltd. (532832): Headquartered in Lucknow, led by Subrata Roy Sahara as Chairman, founded in 2000. Media and entertainment firm under Sahara Group with real estate arm.

73. Sanathnagar Enterprises Ltd. (526163): Diversified business with interests in real estate, construction and manufacturing. Headquartered in Hyderabad, led by T. Narsinga Rao as Chairman & MD, founded in 1947.
74. Saraswati Commercial (India) Ltd. (532524): Financial services company with real estate development subsidiary. Headquartered in Howrah, led by Rana Sen as Chairman & MD, founded in 1983.
75. Satra Properties (India) Ltd. (508996): Headquartered in Mumbai, led by Praful Satra as Chairman & MD, founded in 1983. Real estate development focused on residential and commercial projects.
76. Schneider Electric Infrastructure Ltd. (534658): Headquartered in Hyderabad, led by Emmanuel Lespingal as MD, founded in 2011. Provides electrical products/solutions, has real estate development business.
77. Shobha Developers Ltd. (532718): Develops residential and commercial projects across South India. Headquartered in Bengaluru, led by Jyotsna Curtcliffe as MD, founded in 1995.
78. Shree Precoated Steels Ltd. (532930): Headquartered in Mumbai, led by Amish Thakkar as Chairman & MD, founded in 1988. Steel product manufacturer with real estate development subsidiary.
79. Shriram Properties Ltd. (542551): Headquartered in Bengaluru, led by M. Murali as Chairman & MD, founded in 2000. Manages Residential and commercial real estate.
80. Simplex Realty Ltd. (517300): Headquartered in Mumbai, led by Nandan Piramal as Chairman, founded in 1987. Manages Real estate arm of Simplex group, develops residential and commercial projects.
81. Sital Leasing and Finance Ltd. (534440): Headquartered in New Delhi, led by Surendra Mohan Aggarwal as Chairman, founded in 1983. Manages NBFC firm with interests in real estate development and investments.
82. Sobha Ltd. (532784): Headquartered in Bengaluru, led by Ravi Menon as Chairman, founded in 1995. Develops residential and contractual projects, also has manufacturing units for interiors.
83. Sowbhagya Media Ltd. (511763): Headquartered in Hyderabad, led by M.V. Narayana Rao as Chairman & MD, founded in 1994. Manages Media and entertainment company, has real estate development vertical.

84. Spaceage Products Ltd. (531246): Headquartered in Delhi, led by Renu Raheja as Chairperson, founded in 1987. Manufactures aluminum products, diversified into real estate development.
85. SPL Industries Ltd. (537671): Engaged in textiles/yarn manufacturing and real estate/township projects. Headquartered in Mumbai, led by Vijay Garg as Chairman & MD, founded in 1994.
86. Sree Sakthi Paper Mills Ltd. (531825): Headquartered in Coimbatore, led by Dr. R. Kanthimathinathan as Chairman, founded in 1977. Paper and paperboard maker, has presence in real estate sector too.
87. Standard Chartered PLC (UK): Led by Bill Winters as Group Chief Executive, LON: STAN, headquarters in London, founded in 1853. British multinational banking and financial services company with real estate financing services.
88. STL Global Ltd. (532034): Headquartered in Kolkata, led by Brij Bhushan Agarwal as Chairman & MD, founded in 1995. Manages Textile company having subsidiary for real estate development projects.
89. Sunteck Realty Ltd. (512179): Headquartered in Mumbai, led by Kamal Khetan as Chairman & MD, founded in 1972. Luxury residential projects also have commercial and township developments. Manages Luxury residential projects, also has commercial and township developments.
90. Suraj Ltd. (513605): Diversified business with interests in real estate, construction and engineering. Headquarters in Ahmedabad, led by Neeraj Chothani as MD, founded in 1991.
91. Swaraj Automotives Ltd. (520063): Auto components maker, diversified into real estate development. Headquartered in Chandigarh, led by M.M. Singh as Chairman, founded in 1982.
92. Tata Steel Ltd. (500470): Headquartered in Mumbai, led by N. Chandrasekaran as Chairman, founded in 1907. Steel maker with subsidiary focusing on real estate/urban infrastructure projects.
93. TCS (India): Led by Rajesh Gopinathan as CEO & MD, BSE: 532540, Headquartered in Mumbai, founded in 1968. IT services and a consulting company with real estate solutions.
94. TD Power Systems Ltd. (533553): Headquartered in Delhi, led by Mohib Khericha as Chairman, founded in 1999. Manufacturer of AC generators/motors with real estate development arm.

95. The Phoenix Mills Ltd. (503100): Develops and operates retail malls, residential and commercial projects. Also has a hospitality business. Headquartered in Mumbai, led by Atul Ruia as Chairman, founded in 1905.
96. Tinna Rubber and Infrastructure Ltd. (531199): Headquartered in Delhi, led by Bhupinder Kumar Sekhri as Chairman & MD, founded in 1987. Makes rubber products, also into real estate and infrastructure.
97. Triveni Engineering & Industries Ltd. (532356): Diversified engineering conglomerates with real estate vertical. Headquartered in Noida, led by Dhruv M. Sawhney as Chairman & MD, founded in 1944.
98. Tulip Telecom Ltd. (532691): Headquartered in New Delhi, led by H.S. Bedi as Chairman & MD, founded in 1998. Manages Telecom products & services firm having real estate development subsidiary.
99. Unitech Ltd. (507878): Headquartered in Gurugram, led by Yudhvir Singh Malik as Chairman, founded in 1972. Manages Residential and commercial development. Also, it has interests in amusement parks, hotels and IT parks.
100. Unity Infraprojects Ltd. (531335): Construction & engineering company active in real estate projects too. Headquartered in Mumbai, led by Kishore Gopal Avarsekar as Chairman, founded in 1997.
101. Urja Global Ltd. (526899): Engaged in polymer compound manufacturing and real estate/construction. Headquartered in Mumbai, led by Shailesh Bajaj as Chairman & MD, founded in 1994.
102. Vascon Engineers Ltd. (532702): Construction & engineering firm with residential/commercial projects. Headquartered in Pune, led by R. Vasudevan as Chairman, founded in 1986.
103. Vijay Shanti Builders Ltd. (531109): Headquartered in Delhi, led by Raj Kumar Raina as Chairman & MD, founded in 2004. Manages Real estate development focused on NCR and other North Indian markets.
104. Vipul Ltd. (503893): Develops residential, commercial and affordable housing projects in NCR region. Headquarters in Gurugram, led by Punit Beriwal as MD, founded in 1990.
105. Wipro Ltd. (507685): Led by Thierry Delaporte as CEO & MD, Head office in Bengaluru, founded in 1945. IT consulting firm with real estate technology practice.
106. Zuari Global Ltd. (500461): Headquartered in Goa, led by Saroj K. Poddar as Chairman, founded in 1967. A diversified conglomerate with major interests in

fertilizers, engineering products and services. Diversified firm with interests in fertilizers, engineering and real estate

APPENDIX V

COMPARISION OF LARGE AND MEDIUM ORGANIZATION FROM NSE & BSE

	Large	Medium
Tier 1	1. DLF Ltd (Delhi) 2. Godrej Properties (Mumbai) 3. Infosys (Bengaluru) 4. Tata Consultancy Services (TCS) (Mumbai) 5. Wipro (Bengaluru) 6. Reliance Industries (Mumbai) 7. HDFC Bank (Mumbai) 8. ICICI Bank (Mumbai) 9. Bharti Airtel (Delhi) 10. Adani Group (Ahmedabad)	1. Brigade Enterprises (Bengaluru) 2. Sobha Ltd (Bengaluru) 3. Puravankara (Bengaluru) 4. Oberoi Realty (Mumbai) 5. Phoenix Mills Ltd (Mumbai) 6. Prestige Estates Projects (Bengaluru) 7. Indiabulls Real Estate (Mumbai) 8. Ajmera Realty (Mumbai) 9. Capacit'e Infraprojects Ltd (Mumbai) 10. Anant Raj Ltd (Delhi)
Tier 2	1. Prestige Estates Projects (Mysuru) 2. Phoenix Mills Ltd (Pune) 3. Infosys (Mysuru) 4. Tech Mahindra (Chandigarh)	1. Signature Global (Gurgaon) 2. Anant Raj Ltd (Gurgaon) 3. Sobha Ltd (Coimbatore) 4. Brigade Enterprises (Mysuru)

	5. Mindtree (Bhubaneswar) 6. Wipro (Coimbatore) 7. Cognizant (Coimbatore) 8. TCS (Goa) 9. HCL Technologies (Madurai) 10. L&T Technology Services (Vadodara)	5. Puravankara (Coimbatore) 6. Ajmera Realty (Pune) 7. Capacit'e Infraprojects Ltd (Pune) 8. Nirlon Ltd (Pune) 9. Parsvnath Developers Ltd (Gurgaon) 10. HDIL (Pune)
Tier 3	1. Oberoi Realty (Mangalore) 2. Sobha Ltd (Mangalore) 3. Infosys (Mangalore) 4. Tech Mahindra (Bhubaneswar) 5. Wipro (Bhubaneswar) 6. TCS (Goa) 7. HCL Technologies (Madurai) 8. L&T Technology Services (Vadodara) 9. Capgemini (Gandhinagar) 10. QuEST Global (Bhubaneswar)	1. Ajmera Realty (Jalandhar) 2. Capacit'e Infraprojects Ltd (Jalandhar) 3. Nirlon Ltd (Udaipur) 4. Parsvnath Developers Ltd (Udaipur) 5. HDIL (Mangalore) 6. Anant Raj Ltd (Jalandhar) 7. Signature Global (Jalandhar) 8. Sobha Ltd (Udaipur) 9. Brigade Enterprises (Mangalore) 10. Puravankara (Mangalore)

APPENDIX VI
LIST OF PUBLICATIONS

S. No	Publication Details
1	Kaliprasad, Sathyanarayana, Veer P. Gangwar and Raj Kumar Singh. "Adoption of new-age technology for quality client service through smart real estate management." International Journal of Information Systems and Change Management Vol. 14.No. 2 (2024): pp: 176-197, https://doi.org/10.1504/IJISCM.2024.140620 .
2	Kaliprasad, Sathyanarayana, Veer P. Gangwar and Raj Kumar Singh. "Mapping the Service Quality Landscape in Property Business: Science Mapping and Thematic Clustering." International Journal of Process Management and Benchmarking Vol. 18, No.4, (2024): pp: 417 – 432, http://dx.doi.org/10.1504/IJPMB.2023.10059415 .

APPENDIX VII

LIST OF CONFERENCES

S. No	Conference Details
1	Kaliprasad, Sathyanarayana, Veer P. Gangwar and Raj Kumar Singh. "Mapping the Service Quality Landscape in Property Business: Science Mapping and Thematic Clustering." International Journal of Process Management and Benchmarking Volume: 18., Issue: 4 (2024): pp: 417 - 432. https://doi.org/10.1063/5.0154464
2	Kaliprasad, Sathyanarayana, Bose, Siddhartha, Gangadharan, K. Jithin, Nagpal, Rakhi, Veer P. Gangwar, Singh, Pritpal (2023). "Utilizing Artificial Intelligence to Successfully Communicate and Equip Real Estate Construction Workers with Ergonomic Footwear for Their Health". In: Khosla, A., Kolhe, M. (eds) Renewable Energy Optimization, Planning and Control. Studies in Infrastructure and Control. Springer, Singapore. https://doi.org/10.1007/978-981-19-8963-6_36