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**REPORT OF RESEARCH PAPER**

ON

**“Internet of Things”**

Submitted to

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In partial fulfillment of the requirements for the award of degree of

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## **ABSTRACT**

In this research paper current scenario of Internet of Things will be discussed. The challenges and the possible procedure and technological building blocks of the Internet of Things will be mentioned. Basic medium that will be consider to proceed further is RFID.the purpose of this research is to understand the feasibility of how routine work can be related with the Internet of things such as IoT in bus transportation system and how disasters can be prevented from IoT only. A methodology is also presented in the paper for building Internet of things. The paper will conclude with the problems we are facing in the present architecture of the internet of things with the proposed solution that can be implemented.

## INTRODUCTION

Internet of things refers to the internet of how the communication can be established among the systems. Internet Of things provides the interoperability which provides through the language of internet. . IoT is a communication technology that will converge all the things in this real world. The basic idea of internet of things to use various things like RFID(Radio Frequency Identification) which are able to communicate with one other and work together with their adjacent systems to attain common objective via unique addressing addresses. Basically physical objects are no longer disconnected with this virtual world. Everything is connected and controlled by remotely.

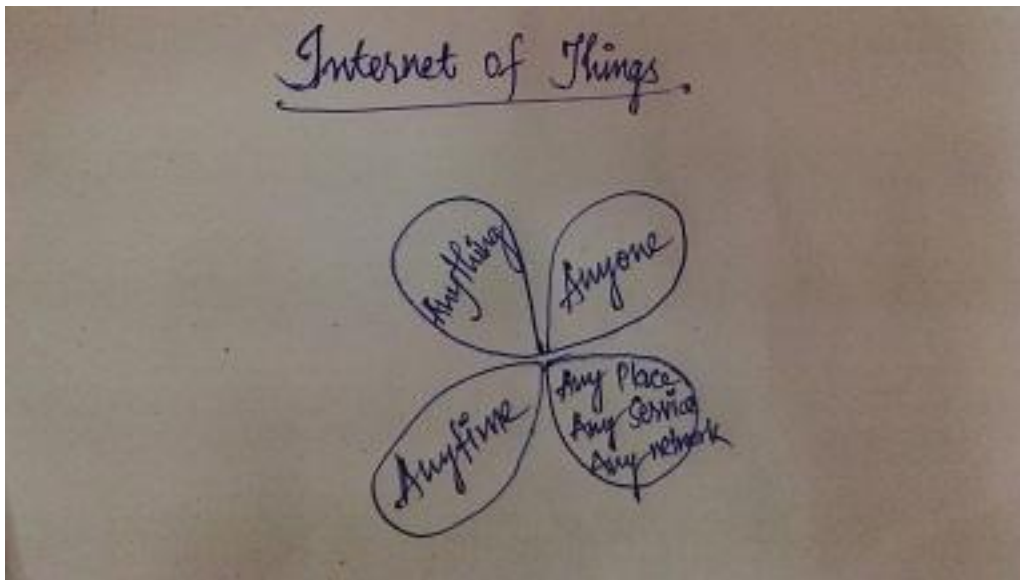


Fig 1: Connectivity in Internet of Things

As IoT refers to “connecting objects” so IoT methodology emphasize on structure of economic values that leads to sharing, collaboration, community and learning. The methodology described in this research paper is developing iteratively. Internet of things can be consider as a bottom-up approach as it has been initiated with a small concept and now take place as a crucial technology in the markets.

## LITERATURE REVIEW

The crucial mechanism of the Internet of Things will be RFID systems made up of one or more entities and several RFID tags. RFID tag is a small memory chip that is connected to an antenna in a package.[3]

For internet of things the RFID system, sensor networks imparts some advantages:

1. RFID system is less expensive and small in size and also not dependant on battery life.
2. Wireless sensor networks are considered as a network which can cover wide range of area and the communication procedure so they need not require any reader.[4]

Applications of Internet of Things:

1. Hauling and logistics area: Buses, Cars are actually related with internet of things as they are attached with the sensors, actuators.also the roads have tags and sensors which sends information to the traffic sites.
2. Real-time data dispensation knowledge based on RFID and NFC which can perform supervision of every node of the supply chain like design buying raw material, construction, and transport.[1]
3. Mobile Ticketing: A panel that provides information about carrying services can be prepared with an NFC tag, a diagram indicator, and a numeric identifier. The consumer can retrieve that particular data from the web with the mobile phones.[3]
4. Monitoring environmental parameters: food items can be also preserving using persistent compute and sensor technology propose huge possible for civilizing the effectiveness of the food supply chain.[3]
5. Augmented maps: tourists uses maps for the proper guide they are also consider under internet of things as that also involve sensors that can be fetched onto the phone.

Current issues to be tackled of internet of things

1. Standards: There are numerous consistent efforts but they are not included in a complete support.
2. Dynamic: There are various ways to address entity but none for moving support in the IoT scenario, where measurability and compliance to heterogeneous technologies represent crucial problems
3. Naming Servers should be needed to map an orientation to a account of a exact object and the corresponding identifier, and vice versa.
- 4.Existing transport protocols is not able to succeed in the IoT scenarios according to their link setup and blocking control mechanisms may be in vain and also they need extreme buffering to be implemented in objects.[1]
5. Traffic classification and QoS maintainance: The IoT will make data interchange with patterns that are predictable to be considerably unusual from those experiential in the current Internet. Accordingly, it will also be required to describe new QoS necessities and hold schemes

6. Verification and Validation: Proper authentication should be provided to Internet of things but in current scenario is not available.[1]

7. Data Correctness and Integrity: Data should be properly correct and secure with passwords and should be trapped by the intruders. Therefore, the password lengths supported by IoT technology are too small to provide optimal levels of security.

8. Privacy: A lot of confidential information about a individual can be composed without the individual aware.[3]

## Methodology for building the Internet of things

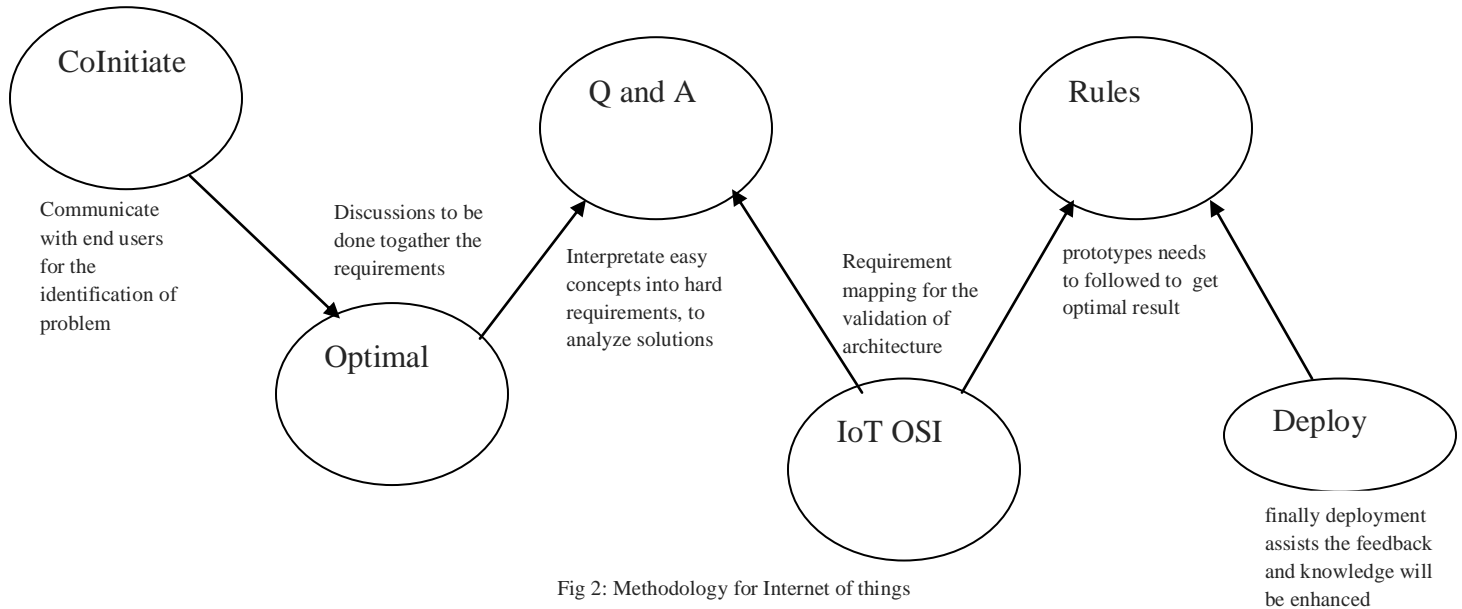


Fig 2: Methodology for Internet of things

CoInitiate: Initiation is the first step for any entity to be build

Purpose:

- Sessions should be conduct to initiate projects and to communicate with end users.
- Problems of users should be taken and analyze them.
- Most appropriate design should be formulated according to the user.
- Design should be as simpler without any complexity and sounds technically.
- Most practical cases should be considered to avoid the domain problem.

Real life implementation of coInitiatiate has been done as solution for smart cities.[5]





Fig 3: Smart Cities Initiation

Optimality: Ideal solution leads a positive impact to implement any proposed technology.

- For optimal solution brainstorming can be performed in which in a group from each member ideas have been taken and then ideal idea has chosen for implementation.
- Prompt and easy for programmers.
- Standardize technology.
- Basically meant for designer and developers.
- Stakeholders can conduct a meeting for the discussion

Real life implementation of optimality is IoT canvas which an application for the brainstorming sessions.

THINGS	END POINTS	MIDDLEWARE	AUTOMATION	USERS
Water barrel/pump	Water level sensor	Raspberry PI	waterBarrel>90% && solar panel	House owner (Head geek)
Weather station (Alecto WS-5000)	Valve control	XBee Gateway	>90%, valve=1&&washer	Family members
Solar panel(Solar log)	Allinet logger	Messaging Broker	=1 solar panel >90%	Community members from weather websites
Washing Machine (Beko)	Smart-Relay box		<appliance>Power	
Dryer			=1&&program=1	
Dishwasher				
	DATA MODEL	THIRD PARTY SERVICES	WIDGET	
	Valve control - int Weather station - complex Solar - complex Appliances - bool	Wunderground	Weather, water, solar - <b>Graphs</b>  Appliance control - <b>toggle status</b>	

Fig 4:Canvas Application

Q & A:

Purpose:

- Avoid the gap between creativity, idea and implementation.
- The idea is technical, economical, managerial feasible or not.
- What is the domain for implementation of the problem?

Real life implementation:

Some surveys has been conducted with user groups to formulate the best way of understand a project and choosing the most appropriate solutions for IOT OSI layers to support project development.

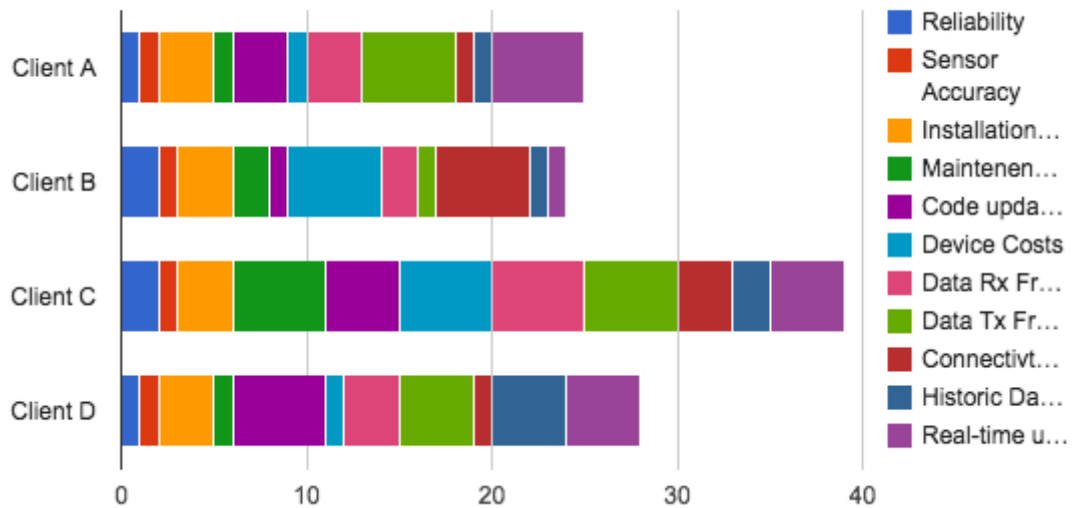


Fig 5: Results of survey with end users

IOT OSI:

Purpose:

- Simply the algorithm “internet as Operating System”.
- Makes easy to compromise with the scale of “internet of things”.
- Define scope areas for domain specific.

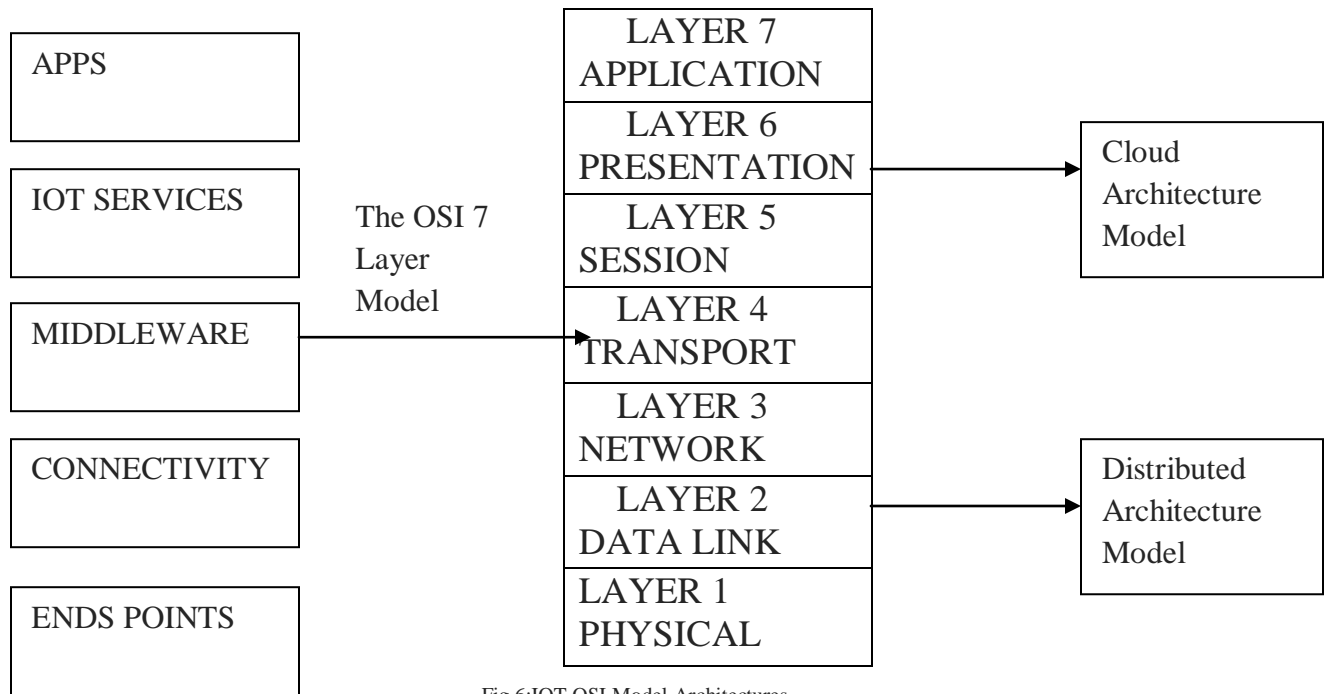


Fig 6:IOT OSI Model Architectures

The real life implementation of IOT OSI is IoT canvas mapping:

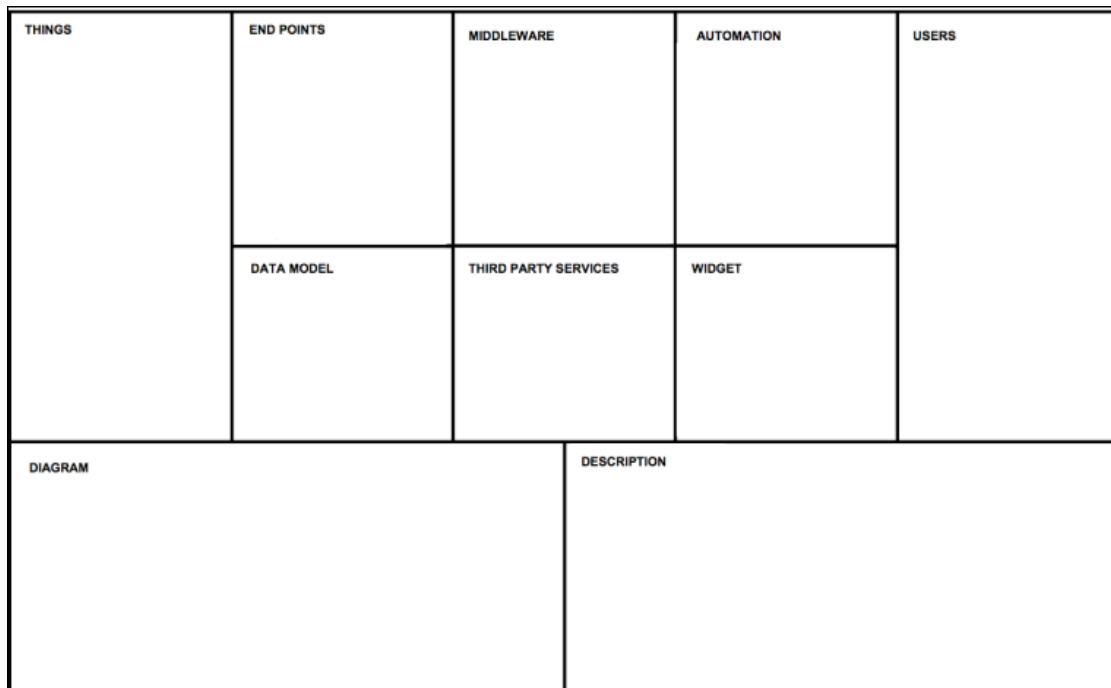


Fig 7:IOT canvas mapping

Rules:

Certain constraints have to be applied so as to maximize the utilization of IOT.

Purpose:

- Uses keywords and identifiers to build IOT products fast.
- Divides the components of Internet of Things

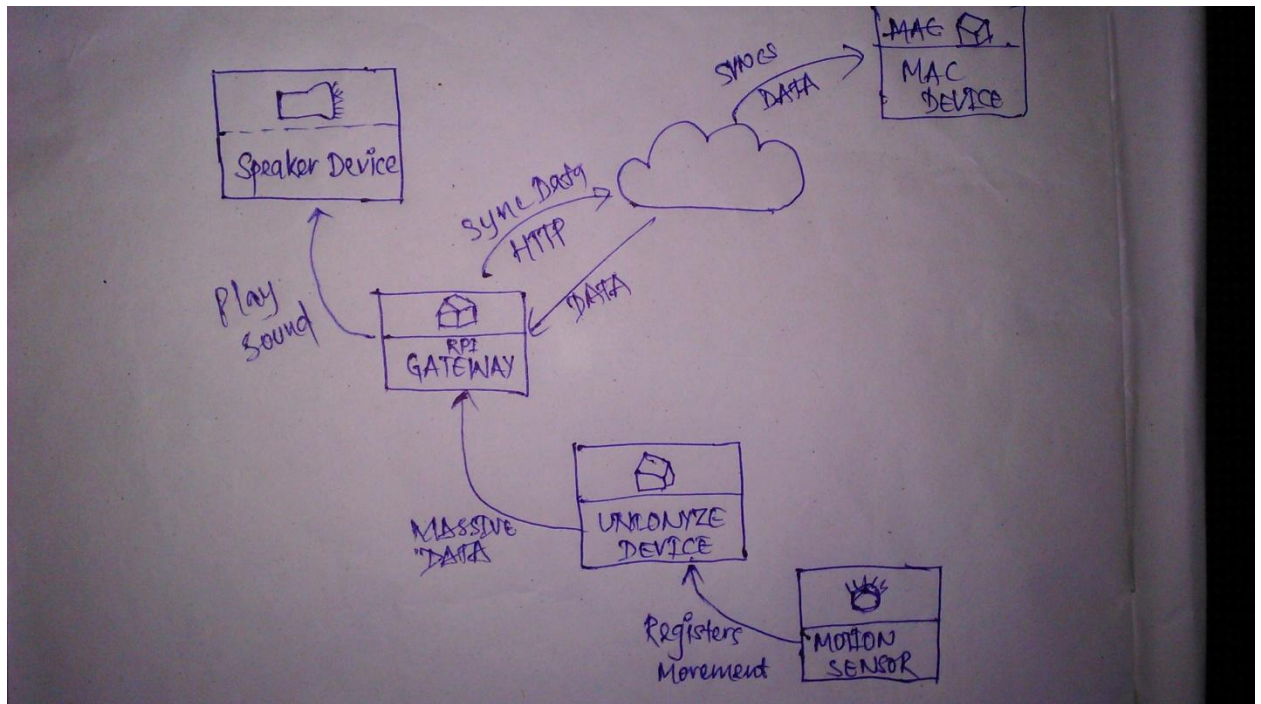


Fig 8: Diagram for Canvas Mapping

## **Problem Definition**

One main problem with the present IoT architectures is that it is intended for comparatively small scale IoT platform circular networks. Strongly deploy entities can't work together strongly across these platform to implement isolated jobs or processes that involve simulations, realization, and performance.

### **Three Tiers of a global network**

Basically Three IDA is subcategorized into three tiers: universal intelligence, provincial intelligence, and local intelligence. Existing efforts has to be tackled for the Internet of Things issues at the different tiers.

Some questions that need to be tackled for the appropriate execution of IOT:

1. Are all the architecture tiers function easily with different data lines access technology, with the minimal barriers and supply consumption?
2. What are the methods through which we can allocate devices equivalent to multiple services with priorities to practical and existing services without interrupting the others?
3. How can we handle isolation in a considerable IoT, collected by different procedure that belong to several organization and individuals?
4. Do we are able to create optimal methods for procedure to unexpectedly join over IoT architectures, so that run-time IoT services could be initiated and maintained whenever required?

## Proposed solution

Our way could be that we can establish more intellectual in the structural design in the form of cloud computing and services and software based services and distinct with networking.

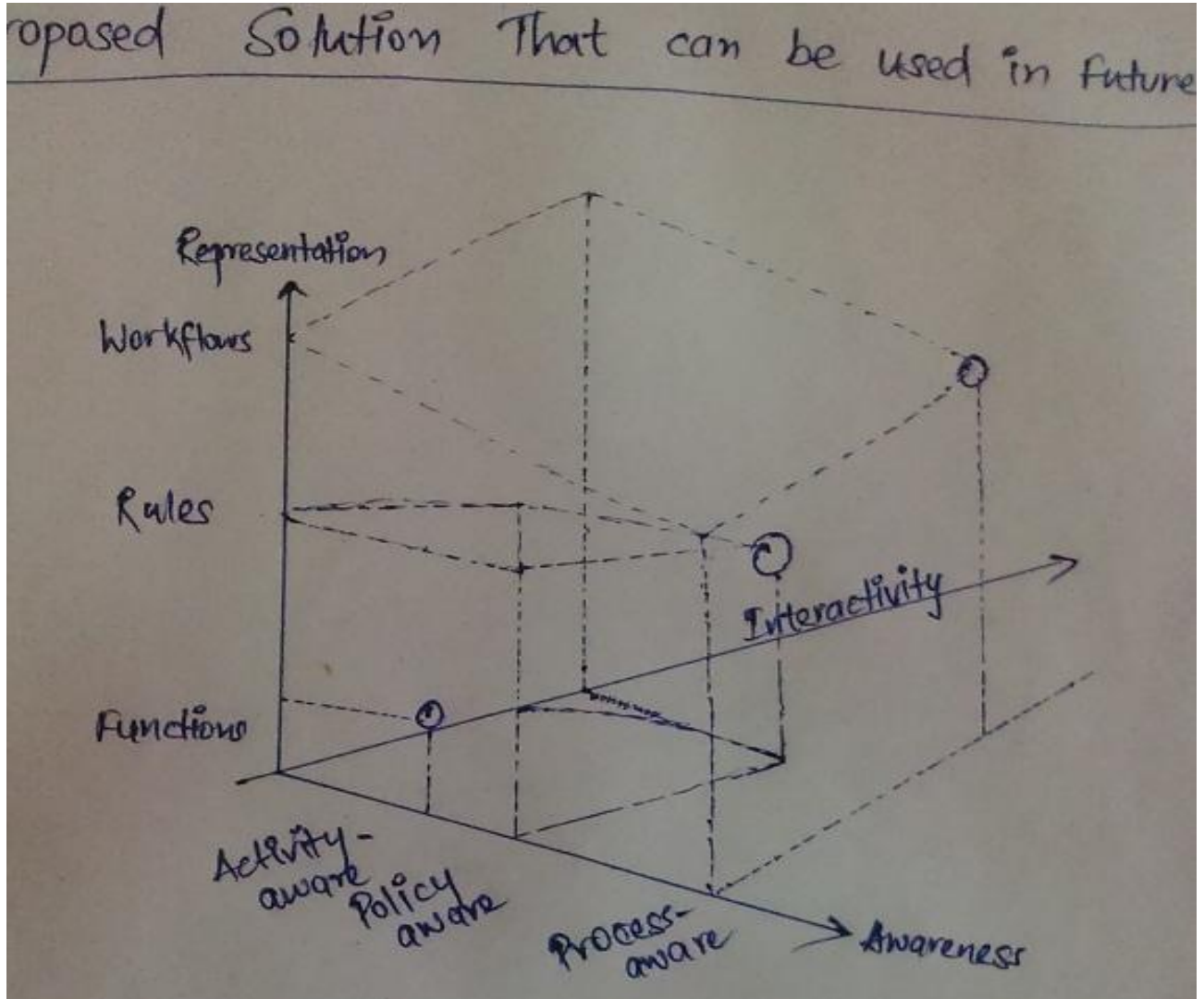


Fig 9: Proposed Architecture for IOT

Another approach could be the use of Domain Name System as basically Internet of Things is used to keep track of the address of the website. Also this architecture will able to adapt the URL's of the device.

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