# Study on Issues in Managing and Protecting Data of IOT

**Pooja Mehta[1] Nidhi Barot[2]**
[1,2]Assistant Professor
[1,2]Department of Computer Engineering
[1,2]SAL Institute of Technology and Engineering Research
Ahmadabad, India

*Abstract*— This paper discusses variety of issues for preserving and managing data produced by IoT. Every second large amount of data are added or updated in the IoT databases across the heterogeneous environment. While managing the data each phase of data processing for IoT data is exigent like storing data, querying, indexing, transaction management and failure handling. We also refer to the problem of data integration and protection as data requires to be fit in single layout and travel securely as they arrive in the pool from diversified sources in different structure. Finally, we confer a standardized pathway to manage and to defend data in consistent manner.

***Key words:*** IoT, Database Management

## I. INTRODUCTION

To clarify what the IoT refers to, numerous good surveys were presented recently. The basic idea of IoT is to connect all things in the world to the internet [3]. It is expected that things can be identified automatically, can communicate with each other, and can even make decisions by themselves. Haller et al. [1] have provided the following definition.

"A world where physical objects are seamlessly integrated into the information network, and where they, the physical objects, can become active participants in business processes. Services are available to interact with these 'smart objects' over the Internet, query their state and any information associated with them, taking into account security and privacy issues." Historically, the IoT referred mainly to Radio-frequency identification (RFID) tagged objects that used the Internet to communicate. Its origins lie in the manufacturing area, for example, the Auto-id project [4]. The Cambridge Auto-id laboratory produced a number of white articles, journals, and conference articles on the project

## II. INCREASING DATA VOLUME AND COMPLEX DATABASE MANAGEMENT

Volume and complexity of data are increasing as IoT devices are more. Main source of data complexity is variety of data received and produced by IoT applications like RFID, Addresses Identifiers, pictorial and digital data, Environmental i.e. GPS data, Sensor data, chronological data etc. All of these are to be gathered and formed in a universal database format is tricky job. Hence, it is required to use Web Data Management concepts and XML to integrate with traditional DBMS. Nature of data is complex, as a result the entire data modeling has to be done very cautiously. Effective data modeling will result into a healthier DBMS.

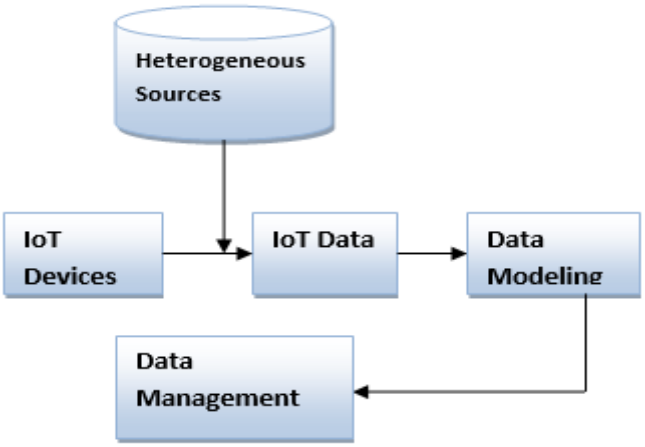


Fig. 1: flow of data management

Moreover, IoT itself is dynamic in nature thus the data mostly will be arriving and receiving from web. Data storage and manipulation environment needs to be improved as Web Evolution shown in the figure2. Web 1.0 was first arena in which user interaction with internet and application was quite little. Improved web 2.0 is examples of e-commerce and social sites websites where human web page interaction was through database and web apps. Evolutionary Web 3.0 has humans, devices, database servers and applications interactions [5,6]. This way convolution of data also has been rose which is great opportunities

for researchers now a days. Each data processing phase has come up with interesting challenges such as "How to form a query?", "How can we lessen the time of transactions?". "How can we secure a series of transactions?" ect.

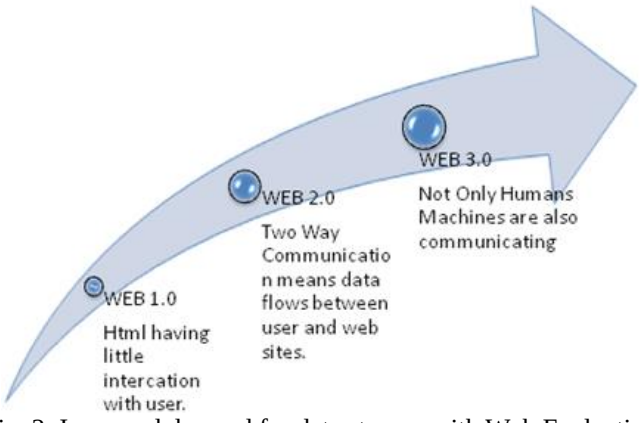


Fig. 2: Increased demand for data storage with Web Evaluation

## III. DATA PROTECTION

The IoT is probable to clutch a lot more personal Data than is held on the present Web. In addition, right to use to such information officially is borderless from the point of view of national boundaries. Many countries such as the UK have Data Protection laws. The UK Data Protection Act [7] requires all organizations which handle personal information to comply with a number of important principles regarding privacy and disclosure. Another is that suitable safeguards must in place to protect the data. There are eight principles altogether. Personal data in the IoT will be harder to protect because of its sheer quantity and the interconnectedness of systems. For the IoT to be a success, however, protection mechanisms and a legal framework that can work across national borders is essential. Some work has been carried out in developing data privacy taxonomy [8].

## IV. MAJOR DATABASE ISSUES IN IOT

In this section we set out all the database issues that can degrade the performance of the IoT.

### *A. Data Size and Range*

Data range and size contrast with the sources of data and the travelling of data differs. Certain IoT devices produce less data but density of data is more like sensor data. IoT applications must have provision to store and manage such data so that at the user level data complexity can't be seen.

### *B. Indexing*

It is a major challenge that find a target item across the world where identification of particular item is to be done by IPs. In such a case, indexing is to be modeled and applied in a smarter way. In general sort of DBMS indexing is difficult to provide but in case of IoT it is even harder to confer the indexing because of heterogeneous sources.

### *C. Query Languages*

Special query language is required to be developed or existing should be extended since the original SQL does not guarantee the optimum results.

### *D. Aggregation and Integration*

Data aggregation should be done on timely manner as inappropriate time aggregations can give rise to false causality [9, 10]. The problem revolves around the ability to select the optimal sampling period for
continuous data. Data integration again is a crucial challenge of IoT data because the type and size of data keep on changing with the IoT device and Architecture. Flexible schemas could become part of the solution and better integration.

### *E. Data Visualization*

Once data is processed or query been answered by the databases, next phase is to view the data as per user requirement. Likewise, the data may be in the graph, chart, and picture or in the form of text. Hence next generation of database management have the great challenge of providing visualization and dashboard facility.

## V. CONCLUSION

In this article we have discussed the IoT in the context of database challenges. We have considered the type of data that will be part of the IoT and have discussed areas of concern for data management. We conclude that some interesting database research results of recent years could prove useful in developing the technologies needed for data management in the IoT, but new approaches would need to be adapted to the particular requirements of the IoT. The major priority is finding suitable methods for storing, indexing, accessing, and enabling self-description of trillions of objects that will be part of the new IoT.

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