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A Study on Internet of Things: Challenges and Standards

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Abstract:

The Internet of Things represents the communication between the devices using the embedded software and sensors. To collect the data and exchanging the data with the devices is possible through Internet of Things only. The Internet of Things system allows the users to achieve automation and integration with in the system. This paper describes the challenges and standards and enhancing the every aspect of data collection smartly.

Keywords:

IoT, Standard, Applications

1. Introduction

The most important features of IoT include artificial intelligence, connectivity, sensors, active engagement, and small device use. A brief review of these features is given below: AI – IoT essentially makes virtually anything "smart", meaning it enhances every aspect of life with the power of data collection, artificial intelligence algorithms, and networks. This can mean something as simple as enhancing your refrigerator and cabinets to detect when milk and your favorite cereal run low, and to then place an order with your preferred grocer. Connectivity – New enabling technologies for networking, and specifically IoT networking, mean networks are no longer exclusively tied to major providers. Networks can exist on a much smaller and cheaper scale while still being practical. IoT creates these small networks between its system devices. Sensors – IoT loses its distinction without sensors. They act as defining instruments which transform IoT from a standard passive network of devices into an active system capable of real-world integration. Active Engagement – Much of today's interaction with connected technology happens through passive engagement. IoT introduces a new paradigm for active content, product, or service engagement. Small Devices – Devices, as predicted, have become smaller, cheaper, and more powerful over time. IoT exploits purpose-built small devices to deliver its precision, scalability, and versatility.

The advantages of IoT span across every area of lifestyle and business. Here is a list of some of the advantages that IoT has to offer: Improved Customer Engagement – Current analytics suffer from blind-spots and significant flaws in accuracy; and as noted, engagement remains passive. IoT completely transforms this to achieve richer and more effective engagement with audiences. Technology Optimization – The same technologies and data which improve the customer experience also improve device use, and aid in more potent improvements to technology. IoT unlocks a world of critical functional and field data.

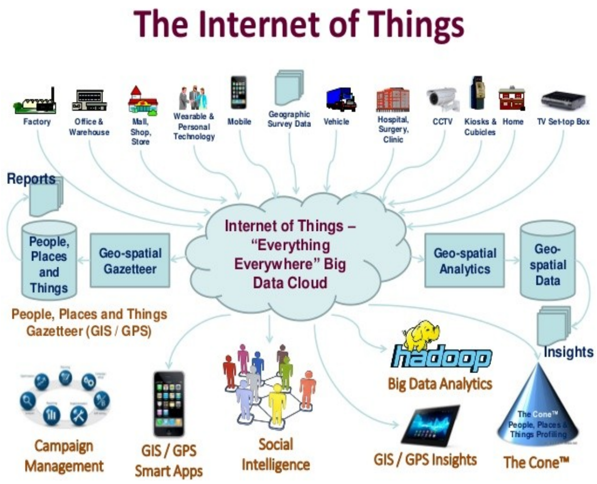

Figure 1: The Internet of Things architecture

IoT software addresses its key areas of networking and action through platforms, embedded systems, partner systems, and middleware. These individual and master applications are responsible for data collection, device integration, real-time analytics, and application and process extension within the IoT network. They exploit integration with critical business systems (e.g., ordering systems, robotics, scheduling, and more) in the execution of related tasks.

Data Collection This software manages sensing, measurements, light data filtering, light data security, and aggregation of data. It uses certain protocols to aid sensors in connecting with real-time, machine-to-machine networks. Then it collects data from multiple devices and distributes it in accordance with settings. It also works in reverse by distributing data over devices. The system eventually transmits all collected data to a central server.

Device Integration Software supporting integration binds (dependent relationships) all system devices to create the body of the IoT system. It ensures the necessary cooperation and stable networking between devices.

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These applications are the defining software technology of the IoT network because without them, it is not an IoT system. They manage the various applications, protocols, and limitations of each device to allow communication.

Real-Time Analytics These applications take data or input from various devices and convert it into viable actions or clear patterns for human analysis. They analyze information based on various settings and designs in order to perform automation-related tasks or provide the data required by industry. Application and Process Extension These applications extend the reach of existing systems and software to allow a wider, more effective system. They integrate predefined devices for specific purposes such as allowing certain mobile devices or engineering instruments access. It supports improved productivity and more accurate data collection.

2. Literature Review

Gartner's Hype cycle : Garter's Information Technology Hype Cycle [13] is a way to represent emergence, adoption, maturity and impact on applications of specific technologies (2) In the adjacent graph, X- axis denotes expectations and Y- axis denotes time factors (3) Internet of Things has been identified as one of the emerging technologies in Internet of Things as noted in Gartner's IT Hype Cycle (4) It has been forecasted that IoT will takes around 5-10 years for market adoption as of the 2012. See the picture for data.

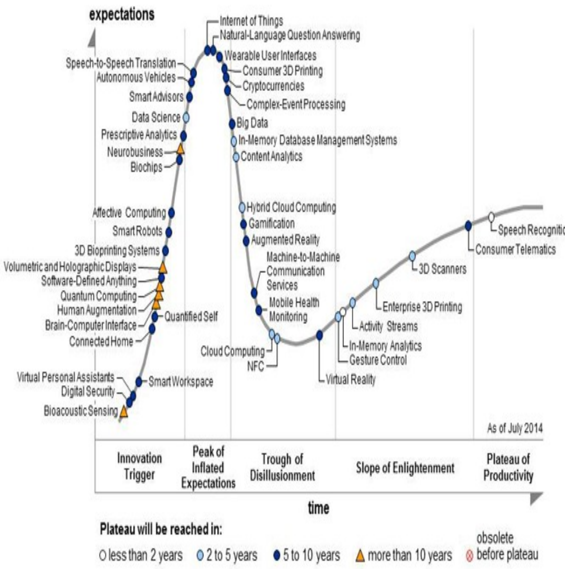

Figure 2: Gartner's Hype cycle

Architecture: One of the main problems with the IoT is that it is so vast and such a broad concept that there is no proposed, uniform architecture. In order for the idea of IoT to work, it must consist of an assortment of sensor, network, communications and computing technologies, amongst others [14].

Figure 3: Model Architecture of IoT

3. Proposed Work

Thingworx is a platform for the rapid development and deployment of smart, connected devices. Its set of integrated IoT development tools support connectivity, analysis, production, and other aspects of IoT development. It offers Vuforia for implementing augmented reality development, and Kepware for industrial connectivity. KEPServerEX provides a single point for data distribution, and facilitates interoperability when partnered with a ThingWorx agent.

Components Thingworx offers several key tools for building applications. These tools include the Composer, the Mashup Builder, storage, a search engine, collaboration, and connectivity. The Composer provides a modeling environment for design testing. The Mashup Builder delivers easy dashboard building through common components (or widgets); for example, buttons, lists, wikis, gauges, and etc. Thingworx uses a search engine known as SQUEAL, meaning Search, Query, and Analysis. Users employ SQUEAL in analyzing and filtering data, and searching records.

Interface The ThingWorx platform uses certain terms you must familiarize yourself with. In the main screen's top menu, you search for entities or create them. "Entity" refers to something created in ThingWorx. You can also import/export files and perform various operations on them. In the left menu, you find entity groups, which are used to produce models and visualize data; and manage storage, collaboration, security, and the system.

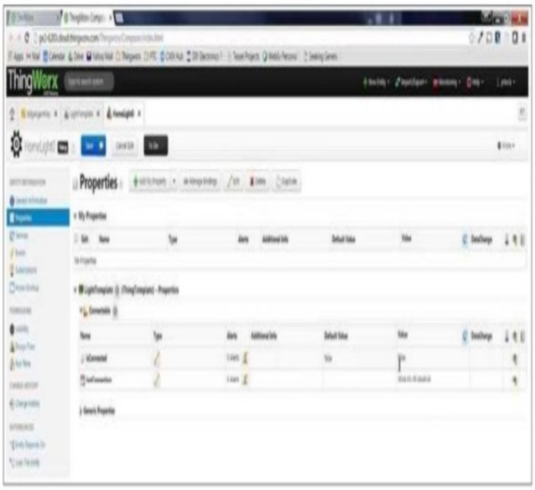

Figure 4: Thing Worx

When you select the Modeling category in the menu, you begin the process by creating an entity. The entity can be any physical device or software element, and it produces an event on changes to its property values; for example, a sensor detects a temperature change. You can set events to trigger

Actions through a subscription which makes decisions based on device changes. Data Shapes consist of one or more fields. They describe the data structure of custom events, infotables, streams, and datatables. Data shapes are considered entities.
Thing Templates and Thing Shapes allow developers to avoid repeating device property definitions in large IoT systems. Developers create Thing Templates to allow new devices to inherit properties. They use Thing Shapes to define Templates, properties, or execute services.

Development ThingWorx actually requires very little programming. Users connect devices, establish a data source, establish device behaviors, and build an interface without any coding. It also offers scalability appropriate for both hobbyist projects and industrial applications.

4. Conclusion

IoT has been steadily bringing an ocean of innovative changes in our day by day lives, which thusly serves to making our life less difficult and more agreeable, however different advances and applications. There is multitudinous convenience of IoT applications into every one of the spaces including therapeutic, fabricating, mechanical, transportation, training, administration, mining, territory and so on. In spite of the fact that IoT has bottomless benefits, there are a few imperfections in the IoT administration and usage level.

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5. References

[1] Lianos, M. and Douglas, M. (2000) Dangerization and the End of Deviance: The Institutional Environment. British Journal of Criminology, 40, 261-278. http://sci-hub.bz/http://dx.doi.org/10.1093/bjc/40.2.261

[2] Ferguson, T. (2002) Have Your Objects Call My Object. Harvard Business Review, June, 1-7.

[3] Nunberg, G. (2012) The Advent of the Internet: 12th April, Courses.

[4] Kosmatos, E.A., Tselikas, N.D. and Boucouvalas, A.C. (2011) Integrating RFIDs and Smart Ob-jects into a Unified Internet of Things Architecture. Advances in Internet of Things: Scientific Research, 1, 5-12. http://sci-hub.bz/http://dx.doi.org/10.4236/ait.2011.11002

[5] Aggarwal, R. and Lal Das, M. (2012) RFID Security in the Context of "Internet of Things". First International Conference on Security of Internet of Things, Kerala, 17-19 August 2012, 51-56. http://sci-hub.bz/http://dx.doi.org/10.1145/2490428.2490435

[6] Biddlecombe, E. (2009) UN Predicts "Internet of Things". Retrieved July 6.

[7] Butler, D. (2020) Computing: Everything, Everywhere. Nature, 440, 402-405. http://sci-hub.bz/http://dx.doi.org/10.1038/440402a

[8] Dodson, S. (2008) The Net Shapes up to Get Physical. Guardian.

[9] Gershenfeld, N., Krikorian, R. and Cohen, D. (2004) The Internet of Things. Scientific American, 291, 76-81. http://sci-hub.bz/http://dx.doi.org/10.1038/scientificamerican1004-76

[10] Lombreglia, R. (2010) The Internet of Things, Boston Globe. Retrieved October.

[11] Reinhardt, A. (2004) A Machine-to-Machine Internet of Things.

[12] Graham, M. and Haarstad, H. (2011) Transparency and Development: Ethical Consumption through Web 2.0 and the Internet of Things. Research Article, 7.

[13] Jayavardhana, G., Rajkumar, B., Marusic, S. and Palaniswami, M. (2013) Internet of Things: A Vision, Architectural Elements, and Future Directions. Future Generation.

[14] Gigli, M. and Koo, S. (2011) Internet of Things, Services and Applications Categorization. Advances in Internet of Things, 1, 27-31. http://sci-hub.bz/http://dx.doi.org/10.4236/ait.2011.12004

[15] (2005) ITU Internet Reports, International Telecommunication Union. The Internet of Things: 7th Edition. www.itu.int/internetofthings/on

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue-17
December 2017

[16] Want, R. (2006) An Introduction to RFID Technology. IEEE Pervasive Compu-ting, 5, 25-33.

[17] Li, B.A. and Yu, J.J. (2011) Research and Application on the Smart Home Based on Component Technologies and Internet of Things. Procedia Engineering, 15, 2087-2092. http://sci-hub.bz/http://dx.doi.org/10.1016/j.proeng.2011.08.390

[18] Razzak, F. (2012) Spamming the Internet of Things: A Possibility and its probable Solution. Procedia Computer Science, 10, 658-665. http://sci-hub.bz/http://dx.doi.org/10.1016/j.procs.2012.06.084

[19] Shao, W. and Li, L. (2009) Analysis of the Development Route of IoT in China. Perking: China Science and Technology Information, 24, 330-331.

[20] Sun, C. (2012) Application of RFID Technology for Logistics on Internet of Things.

[21] Moeinfar, D., Shamsi, H. and Nafar, F. (2012) Design and Implementation of a Low-Power Active RFID for Container Tracking @ 2.4 GHz Frequency: Scientific Research.

[22] Bicknell, IPv6 Internet Broken, Verizon Route Prefix Length Policy, 2009.