Software Engineering Professional Case Study of Advantage Internet of Thing in Business Industry

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Abstract—The Internet of Thing is becoming an increasingly growing topic of conservation both in the workplace and outside of it. Internet of Thing sometimes referred to as the Internet of Object will change everything. IoT will represent the next evolution of the Internet, taking a huge leap in its ability to gather, analyze and distribute data that we can turn into information, knowledge and ultimately wisdom. However as business, government, standard bodies and academia work together to solve the challenges, IoT will continue to progress.

Index Terms—Internet of Thing, Advantage, issues, case study.

1 Introduction

THIS paper is intended to discuss how internet of thing (IoT) can give advantage in business industry. IoT is expected to spread rapidly over the coming years and this convergence will unleash a new dimension of services that improve the quality of life. IoT is a system of interrelated computing devices, mechanical and digital machines, object, animal or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. In line with this development, the majority of the government in Europe, in Asia and in the Americas consider now the Internet of Thing as an area of innovation and growth. Moreover, end-users in the private and business domain have nowadays acquired a significant competence in dealing with smart devices and network applications.

In 2003, there were approximately 6.3 billion people living on the planet and 500 million devices connected to the internet. Looking to the future, it predict there will be 25 billion devices connected to the internet. It is important to note that these estimates do not take into account rapid advances in internet or device technology. IoT impact every business. Mobile and the Internet of Thing will change the types of device that connect into a companys systems. These newly connected devices will produce new types of data. The Internet of Things will help a business gain efficiency, harness intelligence from a wide range of equipment, improve operation and increase customer satisfaction. IoT will also have a profound impact on peoples lives. It will improve public safety, transportation and healthcare with better information and faster communication of this information.

2 Case Study

As more devices become Internet-enabled, experts fear an embedded systems security worst-case scenario for enterprises, many of which are unaware of the risks or unable to mitigate them. However, this article will not only discuss its security but also its capacity and benefits.

Example for Internet of thing can be study were setup the temporary eye clinic and the operating room by using the tiny cabin provided to them at Syrian refugee camp in Duhok.

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This telemedicine kit features all the basic health care diagnostic devices connected remotely with the doctor. Based on the need of the doctors, this kit can be customized with the selected list of diagnostic devices. In this case study, the eye doctor need an ophthalmoscope and it is included in the kit. All the diagnostic devices transmit the data to the doctor in real time along with video conferring capabilities. This field kit can be easily operated by the field service technician with a little overview and training. This has helped to control the number of minor cases crowding the local hospital, freeing up more appointments for urgent and serious cases. In addition to the speed, the quality of healthcare is as equal to the personal visit. This is also more convenient for patients, which helps to avoid frequent and long distant travel for doctors visit.

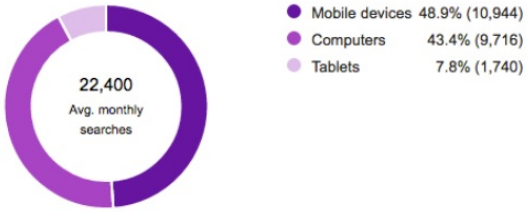

Fig. 1. Internet Influenced Real Estate Transactions
Source: Google AdWords

3 Benefit Of Internet of Thing

3.1 Communication

One of the IoT benefit were communication. IoT encourages the communication between devices, also famously known as Machine-to-Machine (M2M) communication. Because of this, the physical devices are able to stay connected and hence the total transparency is available with lesser inefficiencies and great quality. IoT communicate to people and systems such as state and health of equipment and data from sensors that can monitor a persons vital sign. For example in the health-care industry, IoT can help a hospital track the location of everything from wheelchair to cardiac defibrillators to surgeon. IoT also can be used in different industry such as transportation industry.

Fig. 1 shows 48.9 and 43.4% devices usages of Google search trend are dominated by mobile devices and computers.

3.2 Automation and Control

Due to physical objects getting connected and controlled digitally and centrally with wireless infrastructure, there is a large amount of automation and control in the workings. Without human intervention, the machines are able to communicate with each other leading to faster and timely output. In a connected world, a business will have visibility into a devices condition. In many cases, a business consumer will also be able to remotely control a device. For example, a business can remotely turn on or shut down a specific piece of equipment or adjust the temperature in a climate-controlled environment. Meanwhile, a consumer can use IoT to unlock their car or start the washing machine. Once a performance baselines has established, a process can send alerts for anomalies and possibly deliver an automated response.

3.3 Cost Saving

Many companies will adopt IoT to save money. Costs can be reduced through improved asset utilization, process efficiencies and productivity. Measurement provides actual performance data and equipment health, instead of just estimate. Business, particularly industrial companies, lose money when equipment fails. With new sensor information, IoT can help a company save money to minimizing equipment failure and allowing the business to perform planned maintenance. Sensors can also measuring items, such as driving behavior and speed, to reduce fuel expenses and wear and tear on consumables. New smart meters in homes and businesses can also provide data helps people understand energy consumption and opportunities for cost savings. IoT fundamentally proves to be very helpful to people in daily routines by making appliances communicate to each others in an effective manner thereby saving and conserving energy and cost. Allowing the data to be communicated and shared be-

tween devices and then translating in into our required way, it makes our systems efficient.

3.4 Efficient Process

Organizations can use real-time operational insights to make smarter business decision and reduce operating costs. They can use real-time data from sensors and actuators to monitor and improve process efficiency, reduce energy costs and minimize human intervention. The machine-to-machine interaction provides better efficiency, hence accurate results can be obtained fast. IoT connects devices like phones, automobiles, television, refrigeration, etc. to one ecosystem. The interconnected devices can then be synced to provide customer data to companies. Through integration of all the data business can gain valuable insight on consumers, trend and preference to provide personalized and improve service to their customers. This result in saving valuable time. Instead of repeating the same task every day, it enables people to do other creative jobs.

4 ISSUES AND CHALLENGE

4.1 A lack of standard and inter-operable technologies

Sometime the issue of where are your workloads today, and where should they be in the future needs an inter-operable technology. The reality is that you need to support workloads across all architectures on-premises, virtual infrastructure, and the cloud and those workloads must be easily migrated to and from different environments.

In the case of Malaysia, Fig. 2 shows smartphone usage and leads to inter-operable technologies amongst smartphones.

The sheer numbers and vendors, technologies and protocols used by each class of smart device inhibits interoperability. The lack of consensus on how to apply emerging standards and protocols to allow smart objects to connect and collaborates make it difficult for organizations to integrate application and devices that use different network technologies and operate on different networks.

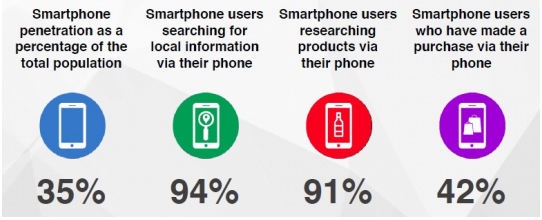

Fig. 2. Smartphone Usage in Malaysia
Source: Google Our Mobile Planet Report (January 2014)

4.2 Data and Information Management Issues

Routing, capturing, analyzing and using the insight generated by huge volumes of IoT data in timely and relevant ways is a huge challenge with traditional infrastructure. The sheer magnitude of the data collected will required sophisticated algorithm that can sift, analyzes and deliver value from data. As more devices enter the market, more data silos are form, creating a complex network of connection between isolated data sources. The lack of universal standards and protocols will make it even tougher for organization to eliminate data silos.

4.3 Privacy and Security Concern

Deriving value from IoT depends on the ability of organizations to collect, manage and mine data. Securing such as data from unauthorized used and attacks will be a key concern. Similarly, with many devices used for personnel activities, many users might be aware of the types of personally identifiable data being collected, raising serious privacy concerns. And because most devices involve minimal human interference, organizations need to be concerns about hacking and other criminal abuse. A far bigger potential for risk in the future is a security breach or a malfunctioning device that induces catastrophic failures in the IoT ecosystem.

4.4 The Demand for Embedded Software

To meet the growing demand for software and to keep up with rapidly changing business and consumer trends, developers are under pressure to write and reuse more code than ever,

to deliver newer and better features, and to do it all faster. Manufacturers in the appliance, automotive, consumer electronics, and medical device industries are rapidly expanding the use of embedded devices powered by software, making smarter products and adding new features and capabilities. Analysts expect numerous other industries to embrace the Internet of Things (IoT), and companies in these industries will require software for their smart, interconnected devices.

5 CONCLUSION

The unparalleled data generated by IoT devices has te potential to create benefits for product manufacturer, ultimately supporting companies and consumers. By mastering and honing their ability to create and manage IoT, industry leaders are establishing new thresholds of performance and delivering highly personalized customer experience, product and service, while achieving high efficiency levels. The acceleration of IoT from lofty concept to reality is predicated on the projected exponential growth of smart devices and the confluences of low-cost infrastructure, connectivity and data.

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