**Learning at Third Level**

**Assignment 1**

Title: Internet of Things

Name: Jack Carroll

T Number: T00194823

Date: 5/10/2016

**Table of Contents**

1. Introduction p.3
2. Main Text

* Usefulness of Internet of Things (IOT) p.4
* Advantages of IOT on industries and sectors p.5
* Security and Privacy p.6

1. Conclusion p.7
2. Reference List p.8
3. Bibliography p.10

**Introduction**

In today’s world, Internet usage is rapidly increasing thanks to the increased presence of numerous sensors and software installed into technological products, i.e. smartphones. These items are constructed on a series of sensors which collects data to interpret it and to transfer data emerging from sensors to “machines on the ground” so the devices instantly connect to the “thing” (Household appliances, vehicles). This process is forming part of the revolutionary project that is known as the Internet of Things(IOT) (Burrus, 2014).

According to Kevin Ashton (British technology developer), the IOT is defined as a means of identifying different characteristics of the “real world” including temperature and lighting by various gadgets. It allows extra statistics to be created and “consumed” by mechanisms where contemporary life can be enhanced by machine to machine communication with different appliances (Ashton , 2009 cited in Duncan, 2014). IOT originated from the works of Mark Weiser (Xerox PARC member) as the company wanted to discover what would arise when countless items had inexpensive “computing power” inserted into these devices which became recognised as “ubiquitous computing” (McEwen & Cassimally, 2013, p. 23).

The IOT is becoming more important for millions of families as “76% of adults” are connected to the Internet through a vast range of broadband subscriptions from providers who reduce the prices for data constraints. Therefore, it will be easier for Wi-Fi connected households to use their online connections in order to communicate with the Internet-connected devices (tablets, smartphones) (McEwen & Cassimally, 2013, p. 15).

The author will focus on the advantages and disadvantages of the IOT since it is certain that the IOT will have a pivotal role in changing industries and sectors positively and negatively. As well as that, life will be made much easier by the presence of IOT since its functions will complete jobs for humans in homes worldwide. However, the security and privacy of the world’s population cannot be ruled out as it is possible that devices could gain access into the personal lives of individuals.

**Usefulness of Internet of Things in homes**

Deore et al emphasises the importance of IOT on 21st century homes by explaining how “Smart Homes” feature different layers which include Home Environment(HE) and Remote Environment(RE) (K.Deore, et al., 2015, p. 898). The RE is amounted to the users who are permitted to retrieve the system via the Internet on smartphone applications by means of Wi-Fi or 3G/4G. The HE contains Home Gateway(HG) and a “hardware interface module”. Deore et al indicates that the HG offers data conversion services for the suggested architecture. Therefore, these layers are significant in powering a smart home because the phones that have Wi-Fi embedded within them can operate the architecture to acquire and command the home appliances (K.Deore, et al., 2015, p. 898).

Duncan establishes the opportunities that will be taken from the IOT plan which will have an extraordinary impact on future houses (Duncan, 2014). The efficiency of “device-to-device communication” is clearly indicating how houses could possibly perform jobs for families. For example, when people walk into a certain room, the motion sensors will switch on the lights and when an individual gets up in the morning, the technology within the house and the embedded sensors can communicate between each other to open the blinds and to turn on the television. Thus, it can be concluded that the IOT concept in houses could make daily life more undemanding due to the capability of the smart gadgets to commune with each other especially to a core hub for usage when the devices are located everywhere (Duncan, 2014).

**Advantages and Disadvantages of IOT on Industries and Sectors**

N Tongay highlights the significance of “sensor data computing” (SDC) which has an impact on the “transport and health sectors” when data is used to transport statistics for these industries. Large information quantities must be managed as the details require updates and access for the dispatchment of services so the data is available effortlessly to move the information smoothly. Once the “real-time” data is demanded by industries and sectors, the distribution of material within the computer is hindered because of “Wireless Sensor Networks” not having the ability to command “real-time” execution. As a result, N Tongay reasons that the services must gain facts and figures from the computers so SDC succeeds in making the delivery of services more straightforward for industries worldwide to avoid postponements for global products (N Tongay, 2016).

Scott and Ketel clarifies the prospects that IOT can create towards the raw material industry and the construction business. For instance, IOT is inclined to develop transmissions between “devices” and the utilisation of acquired information. It is evident when factory apparatus relays with raw material stockpile as this improves the standard of life where objectives are conducted by various modern products and data is accumulated. Scott and Ketel continues to show the purpose of the IOT for assisting the construction industry as the concept has the capacity to rescue the lives of individuals. The sensors that are now incorporated with sensors alerts drivers of incoming dangers and orders the motorists to reduce speed through the “wireless internet in the car”. Thus, the IOT has a key role in accompanying the construction industry and car services due to the IOT’s central participation in saving lives and its position in the management of factories (Scott & Ketel, 2016).

**Security and Privacy**

Gupta and Sapna maintain the viewpoint that privacy is a particularly worrying situation in relation to the IOT because there is a threat that the data which is kept in cloud storage could be examined by anyone. In fact, this is due to the frequency of cyber-attacks that causes harm to the computers and IOT. The biggest trouble affecting IOT security according to the two authors here is the “Backdoor” process which creates an atrocious effect on IOT updates as “vendors” are responsible for this security attack. Thus, the authors here recommend that “privacy policies” should be designated for each network to prevent the information from being viewed which will ultimately result in the administration of privacy for the “IOT Applications” or infrastructure (Gupta & Shukla, 2016, p. 316).

A challenge that is highly difficult for software developers today in the management and security of the IOT is “software vulnerability” where Zhang reasons the inability of modern devices to “make use of current authentication or cryptographic methods” because of “resource” limits that are in action at present (Zhang, cited in Gupta & Shukla, 2016). Zhang argues that the data within the IOT including “real-time data” is fully “personal” as the amount of vulnerable “data readings” about the owners of these accessories and their intimate spaces should be respected as “private assets” due to the risk of a leakage that could expose the owner’s location and current wellbeing(Zhang, cited in Gupta & Shukla, 2016, p.317). Due to this warning, it is imperative that personal data should not be acquired by device companies without the permission and comprehension of consumers since there is an increased danger of attacks committed by hackers and attackers that could expose personal privacy and provoke damage when the data is not kept safely (Gupta & Shukla, 2016).

**Conclusion**

This assignment discovered the benefits of the IOT on neighbourhoods where families could experience easier lives due to the simple accessibility of the IOT to conduct tasks for. households. The report also examined the influence of the IOT on industries where the “sensor-data computing” is responsible for the simple delivery of services without difficulty when data is distributed to the industries and the IOT’s contribution to the safety of hundreds of lives in cars was highlighted as well due to the installation of sensors in the cars. In addition, the perils posed by cyber-attackers was stressed as the possibility of private information being revealed by invasions of privacy on IOT software are highly likely. The suggestion of protecting the sensitive data and accessing the private information safely with the user’s consent was indicated in this assignment because of the importance of security that needs to be addressed as soon as possible. It is unquestionable that the number of objects that will be connected to the Internet will rapidly increase to thirty billion by 2020 due to the global producers’ realisation that an unprecedented change is occurring in the evolution of the IOT (Clark Howard, 2013).

.

**Reference List**

# References

Burrus, D., 2014. *The Internet of Things is far Bigger than anyone Realises.* [Online]   
Available at: https://www.wired.com/insights/2014/11/the-internet-of-things-bigger/  
[Accessed 5 October 2016].

Clark Howard, B., 2013. *How the "Internet Of Things" May Change the World.* [Online]   
Available at: http://news.nationalgeographic.com/news/2013/08/130830-internet-of-things-technology-rfid-chips-smart/  
[Accessed 5 October 2016].

Duncan, G., 2014. *You can’t avoid the ‘Internet of things’ hype, so you might as well understand it.* [Online]   
Available at: http://www.digitaltrends.com/home/heck-internet-things-dont-yet/  
[Accessed 6 October 2016].

Gupta, K. & Shukla, S., 2016. *Internet of Things:Security Challenges for next generation networks.* Noida,India, IEEE,p315-318. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

K.Deore, R., R.Sonaware, V. & H.Satpute, P., 2015. *Internet of Thing Based Home Appliances Control.* Nashik,India, IEEE,p898-902. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

McEwen, A. & Cassimally, H., 2013. *Designing the Internet of Things (1).* 1st ed. [e-book]Chichester,Sussex,United Kingdom: Wiley. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 7 October 2016].

Minoli, D., 2013. *Building the Internet of Things with IPv6 and MIPv6 : The Evolving World of M2M Communications (1).* 1st ed.[e-book] Hooken,New Jersey: Wiley. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 7 October 2016].

N Tongay, K., 2016. *Sensor Data Computing as a service in Internet of Things.* Pune,India, IEEE,p1-4. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

Scott, D. & Ketel, M., 2016. *Internet of Things: A Useful Innovation or Security Nightmare?.* Baltimore,Maryland, IEEE,p1-6. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

**Bibliography**

# Bibliography

Burrus, D., 2014. *The Internet of Things is far Bigger than anyone Realises.* [Online]   
Available at: https://www.wired.com/insights/2014/11/the-internet-of-things-bigger/  
[Accessed 5 October 2016].

Clark Howard, B., 2013. *How the "Internet Of Things" May Change the World.* [Online]   
Available at: http://news.nationalgeographic.com/news/2013/08/130830-internet-of-things-technology-rfid-chips-smart/  
[Accessed 5 October 2016].

Duncan, G., 2014. *You can’t avoid the ‘Internet of things’ hype, so you might as well understand it.* [Online]   
Available at: http://www.digitaltrends.com/home/heck-internet-things-dont-yet/  
[Accessed 6 October 2016].

Gupta, K. & Shukla, S., 2016. *Internet of Things:Security Challenges for next generation networks.* Noida,India, IEEE,p315-318. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

K.Deore, R., R.Sonaware, V. & H.Satpute, P., 2015. *Internet of Thing Based Home Appliances Control.* Nashik,India, IEEE, p898-902. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

McEwen, A. & Cassimally, H., 2013. *Designing the Internet of Things (1).* 1st ed.[e-book] Chichester,Sussex,United Kingdom: Wiley. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 7 October 2016].

Minoli, D., 2013. *Building the Internet of Things with IPv6 and MIPv6 : The Evolving World of M2M Communications (1).* 1st ed.[e-book] Hooken,New Jersy: Wiley. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 7 October 2016].

N Tongay, K., 2016. *Sensor Data Computing as a service in Internet of Things.* Pune,India, IEEE,p1-4. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].

Scott, D. & Ketel, M., 2016. *Internet of Things: A Useful Innovation or Security Nightmare?.* Baltimore,Maryland, IEEE,p1-6. Available through: Institute of Tralee Library website <http://www.ittralee.ie/en/Library/> [Accessed 9 October 2016].