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# Perceptions of library and information science professionals towards Internet of Things (IoT)

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## Abstract

In the present era, the Internet of Things (IoT) is considering a hot topic in all disciplines and spreading rapidly in different domains including library and information science sphere. Thus, the library and information science professionals are fascinating greatly towards the Internet of Things (IoT). This study aims to get perceptions of library and information science professional towards the Internet of Things (IoT). The results of the study revealed that most of library and information science professionals who participated in this survey belonged to academic libraries, working on librarian's designation, known (IoT) concept from online sources and from two years. "Not using this concept in their working places" found as the main reason to not aware of (IoT) concept. Further, results discovered that special training was required, Internet of Things (IoT) concept found useful, reason namely "able to integrate many things by one interface or device" noted as a main reason to use (IoT) concept and Internet of Things (IoT) concept will be sustained in library and information science domain in future. This study may be useful for getting insights of the library and information science professionals towards the Internet of Things (IoT) concept and for using it in the library and information science domain.

**Keywords-** Internet of Things, Library and information science professionals, Perceptions, Survey, IoT, Libraries, Library and information science domain, Wireless technologies.

## Introduction

Emergence of diverse kind of information technologies and communication techniques are being presented deeper impact on the education, services, learning pedagogies, communicating methods, access and usages of different kind of resources and on the other things connected with the academic, social, daily life works and other works in different disciplines including library and information science domain. Among the diverse information and communication technologies, the Internet emerged as the one of the prominent technology for communicating, sharing, accessing and disseminating the information, resources and other things very promptly in online mode throughout the world in different forms and formats with human support. As such, in today era, the Internet has become the most powerful tool for making everything accessible anywhere and anytime on online mode. Thus, library and information science professionals are using the internet as a reservoir for making library and information science courses, services, products, trainings, workshops etc. online in their respective libraries and information science schools, institutes, organizations, libraries and so on. Apart from that, the internet is making the daily life of people more easier by facilitating them with diverse kind of services and platforms online and with human interactions as well. Elkhodr et al. (2016) by conducting a survey pointed out that how the Internet of Things (IoT) helps to improve the quality of life of people. An advanced version of internet evolved as the internet of things (IoT) wherein different things may be connected and communicated automatically each other through the sensors, radio

frequency identification (RFID), strong networking and other ways as and when required or on time or in time or maybe in proactive manner, if one intentionally does. In the context of internet of things (IoT), the things may be anything like cell phones, iPods, mobile devices, resources, services, education, people, animal, any physical objects etc. Fleisch (2010) measured the concept of the Internet of Things (IoT) in an economic point of view and further described that how the Internet of Things (IoT) can add value in the services and other things. As such, the Internet of Things (IoT) may be used as a ubiquitous technology to perform multi-tasks in different disciplines including library and information science domain, therefore, library and information science professionals are attracting towards internet of things (IoT) phenomena and trying to become familiar with internet of things technology by different ways in order to use this technology into library and information science in an effective manner. On the other hand, getting perceptions of library and information science professionals is always helpful in connection with knowing insights towards any technology like the internet of things (IoT). Thus, an attempt is made to conduct a study focusing on the perceptions of library and information science professionals towards the Internet of Things (IoT).

### **Literature review**

Kumar and Patel (2014) described the evolution of the Internet of Things (IoT) concept and further raised the different issues related to security and privacy through a survey. Wang et al. (2015) conducted a survey focused on the evolutionary process of Internet of Things (IoT) concept and bridged the gap found in the evolution process of Internet of Things (IoT). Li et al. (2015) through a survey presented a definition, architecture, technology and applications of Internet of Things (IoT). This study further discussed the issues related to the challenges and remedies to implement the Internet of Things (IoT) technologies. Ibarra-Esquer et al. (2017) through a systematic literature review mapped the evolution of Internet of Things (IoT) using different databases and discovered that Internet of Things (IoT) concept, definitions and applications are being evolved in different domain in variant ways and data technologies are playing important roles in the Internet of Things (IoT) sphere. Bradley et al (2018) described the concept of the Internet of Things (IoT) and developed Internet of Things enabled library spaces and facilities in Newman Library at Virginia Tech using different types of wireless technology and platforms. Abbasy and Quesada (2017) through a survey predicated the factor which can influence the Internet of Things (IoT) technology in a higher education setting. Kim et al. (2017) made semantic network analysis of Internet of Things (IoT) technology from the period of 2015-2017 using web of science (WoS) database and also suggest provides areas of further studies in this environment. AlHogail (2018) through a survey investigated the factors influence to build the trust of the users in order to adopt the Internet of Things (IoT) technology. This study further proposed a three-dimensional trust model and validated this model on the basis of customer opinions and feedbacks for using Internet of Things (IoT) technology for different sectors. Wójcik (2016) described the Internet of Things (IoT) technology found very useful to implement in academic and public libraries in different areas such as library services and other activities. Xu (2014) stressed on to use the Internet of Things (IoT) technology and its applications in libraries because this technology is helped greatly to shape a library as an intelligent library. Gupta and Singh (2018) stated that the Internet of Things (IoT) provided great opportunities to improvise to the academic library services effectively. This study further identified areas in which the Internet of Things (IoT) may be applied in academic libraries. Pujara and Satyanarayana (2015) identified the possible areas in the library in which the Internet of Things (IoT) technology can be applied effectively. Altaf et al. (2019) through a survey compared the different trust models exist in the Internet of Things (IoT) environment and further proposed

a conceptual framework to develop an effective trust model in the smart Internet of Things sphere for variant purposes. Whitmore et al. (2015) through a survey highlighted the recent trends taking place in the Internet of Things sphere. This study further explored the areas in which research can be done in different domains in future in order to make the Internet of Things (IoT) technology sustainable. Sezer et al. (2017) through a survey described the background, types, technologies and future research areas of Internet of Things (IoT).

### **Methodology**

To conduct this study, an online questionnaire was developed for knowing the perceptions of the library and information science professionals on the different aspect of the Internet of Things (IoT) and library and information science domain. This online questionnaire was consist of the total 10 questions, wherein, eight questions of single choice and two questions of multiple-choice were included. To get perceptions of library and information professionals on the Internet of Things (IoT) in the library and information science, this questionnaire was sent to 250 library and information science professionals who were working in different libraries and LIS schools/ institutions on their personal/ official e-mail IDs through e-mail. In response to 250 questionnaires, 150 complete responses were received from respondents. These received responses were recorded and tabulated by using Microsoft Excel-2007 and analysed from different angles. This survey was conducted from 26 November 2018 to 30 May 2019.

### **Objectives of the Study**

The objectives of this study are enumerated as follows:

- To know about the awareness levels, frequencies and sources of the library and information science professionals towards knowing the Internet of Things (IoT) concept.
- To discover whether the Internet of Things (IoT) concept is useful and special skills required for library and information science professionals or not.
- To investigate the reasons to use the Internet of Things (IoT) technology in library and information science.
- To examine whether the Internet of Things (IoT) concept will be sustained in library and information science domain in future or not.

### **Analysis**

The following analysis made on the basis of responses received from the library and information science professionals after conducting this survey:-

#### **Working places of the library and information science professionals**

Figure (1) shows that the majority of library and information science professionals (60%) who participated in this survey are working in academic libraries. The (15%) library and

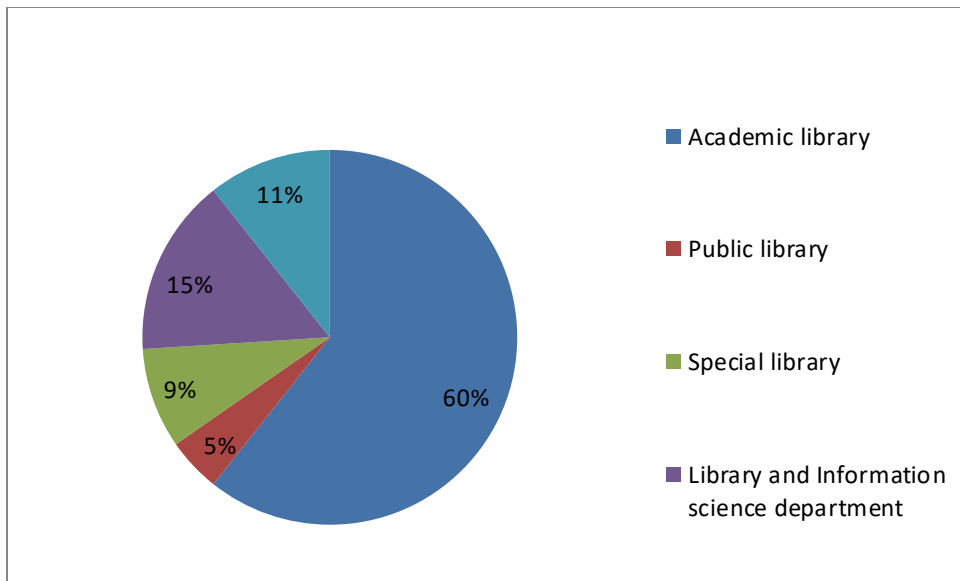


Figure 1- Working places of the library and information science professionals

information science professionals who were participated in this survey belong to the library and information science departments, (11%) associated with library and information science institutes/ organisations and slightly less in percentage (9%) LIS professionals belong to special libraries respectively. Whereas in minority, only (5%) library and information science professionals who participated in this survey belong to public libraries only. It discloses that every type of libraries, library and information science departments, institutes and organisations want to take participate in the survey.

#### **Designations of the library and information science professionals**

Figure (2) depicts the designations of the library and information science professionals who participated in this survey. At majority level, slight different was noted from the figure (2), between designations namely librarian (24%) and library and information science (LIS) teachers (23%) respectively, in terms of the number of library and information science professionals who participated in this survey. It is interesting to note that between two

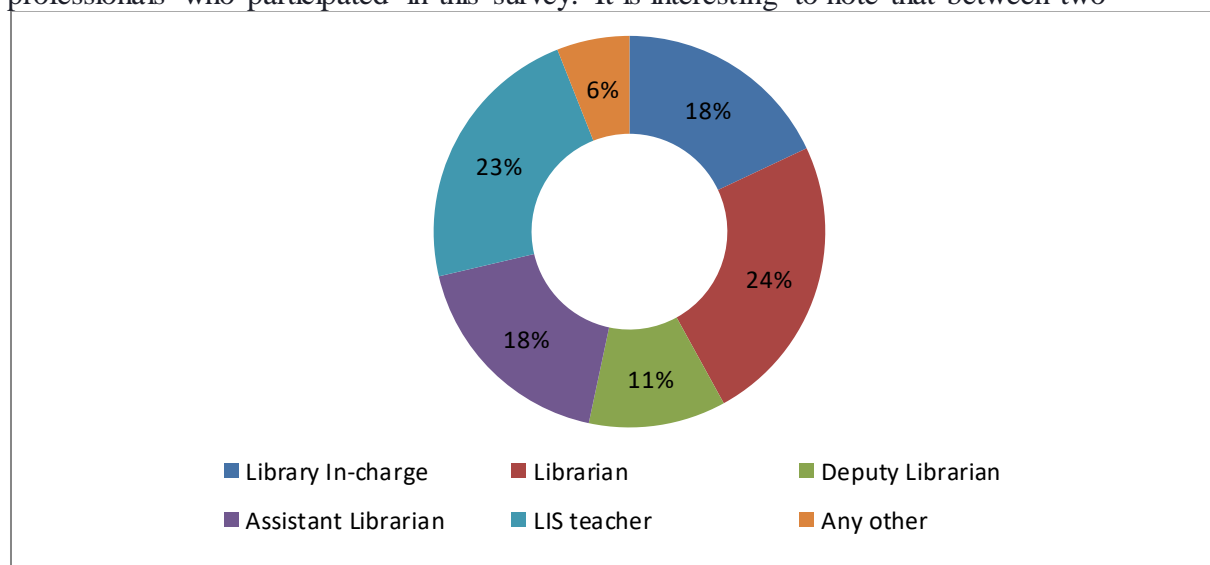


Figure 2- Designations of the library and information science professionals

designations viz. library in-charge and assistant librarian respectively in equal percentage (18%) library and information science professionals were participated in this survey. But, on the deputy librarian designation, only (11%) LIS professionals were participated in this survey. Whereas, library and information science professionals who did not cover in the designations shown in figure (2) were participated only in (6%) on the minority level. It shows that library and information science professionals who are working in different designations want to participate in such online survey.

### **Have you heard about the Internet of Things (IoT) concept**

When the question asked from respondents regarding "have they heard about the Internet of Things (IoT) concept", the responses received by the participants depicted in figure (3).

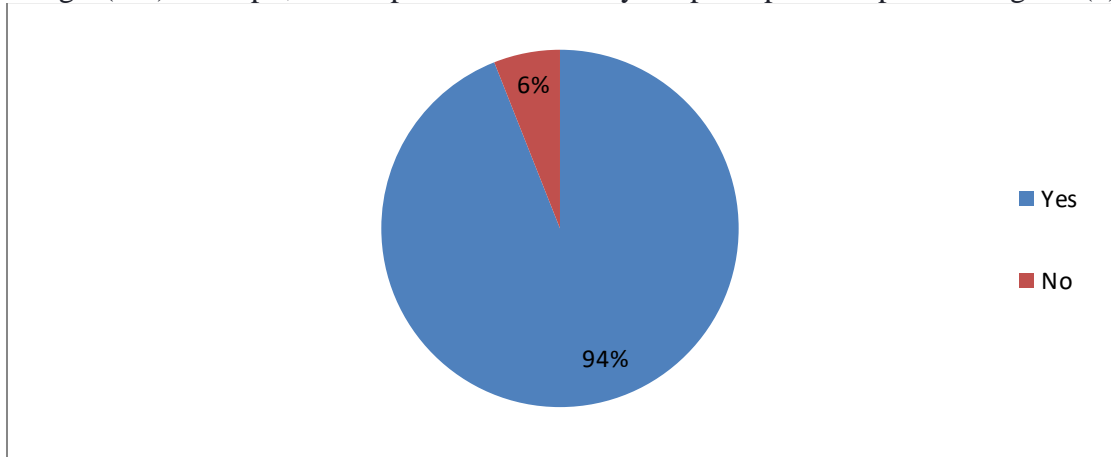


Figure 3- Heard about the Internet of Things (IoT) concept

It was found from the figure (3) that most of library and information science professionals (94%) were heard about the Internet of Things (IoT) concept. It shows that a large number of library and information science professionals are attracting towards the Internet of Things (IoT) concept. Du and Liu (2014) stated that Internet of Things (IoT) technology enable to make a smart library for the users, On the contrary, only (6%) library and information science professionals were not heard about the Internet of Things (IoT) concept.

### **Means to heard about the Internet of Things (IoT) concept**

Responses received regarding "how did you heard about Internet of Things (IoT) concept", presented in figure (4) which demonstrated that the majority of library of information science professionals (38%) stated that they heard about the Internet of Things (IoT) concept from online resources, followed by (32%) library and information science professions who heard (IoT) concept by browsing on internet. It may be happened because of both online

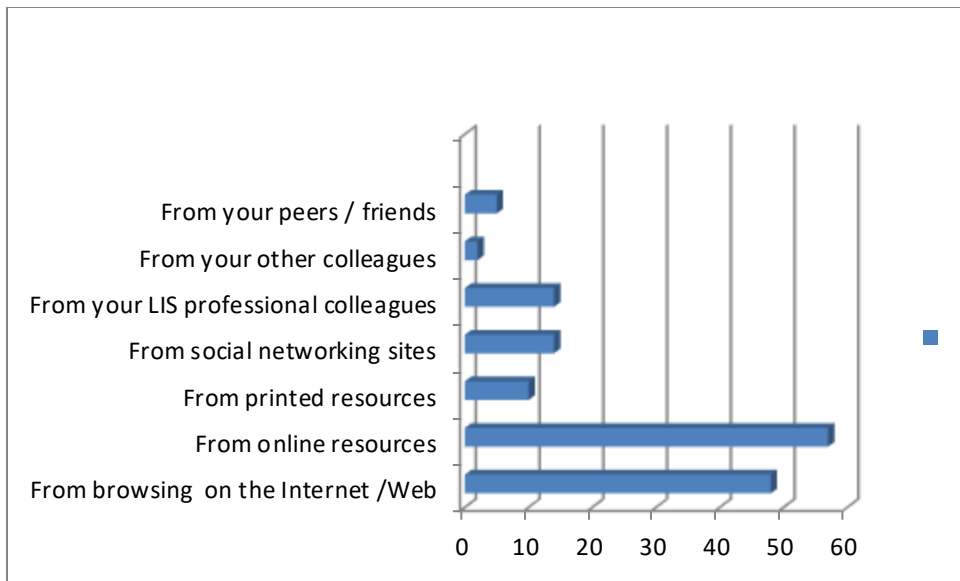


Figure 4- Means to heard about the Internet of Things (IoT) concept

resources and the Internet has become most demanded media to keep abreast from the latest concepts and update information on anywhere and anytime modes. Hoy (2016) urged to the librarians to get aware of emerging technologies in order to make smart libraries. Further, it is interesting to note that other five medium such as social networking sites, LIS professionals/colleagues, printed resources, peers/ friends and other colleagues were used by less than ten per cent library and information science professionals respectively. Among seven medium as mentioned in figure (4), "from your other colleagues" was used by library and information science professionals in minority only (1%).

### Duration of getting familiar with Internet of Things (IoT) concept

Duration of getting familiar with the Internet of Things (IoT) concept presents through figure (5). It was found from the above-mentioned figure that the maximum number of library and information science professionals (34%) were familiar with the Internet of Things (IoT)

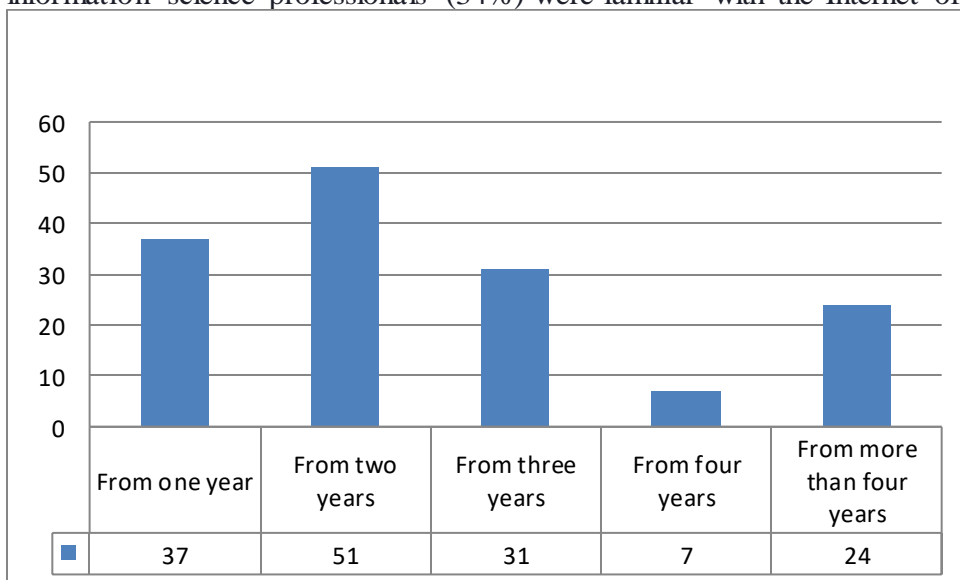


Figure 5- Duration to getting familiarity with Internet of Things (IoT) concept

concept, from two years, followed by (25%) library and information science professionals from one year and (21%) library and information science professionals from three years respectively. Massis 's (2015) study also urged to the librarians to actively get engaged in Internet of Things (IoT) technology because this technology provides great space to use its applications in the libraries in variant ways. On the contrary, less than twenty per cent library and information science professionals (16%) were familiar with the Internet of Things (IoT) concept from more than four years. But, contrary, from four years, only (5%) library and information science were found familiar with the Internet of Things (IoT) concept. It reveals that the library and information science professionals are getting familiar with the Internet of Things (IoT) concept.

### Reasons to not familiar with Internet of Things (IoT) concept

Figure (6) shows the reasons regarding why the library and information science professionals yet not got familiar with the Internet of Things (IoT) concept. Through figure (6), a slight difference was noted in two reasons namely "not using this concept in your working place"

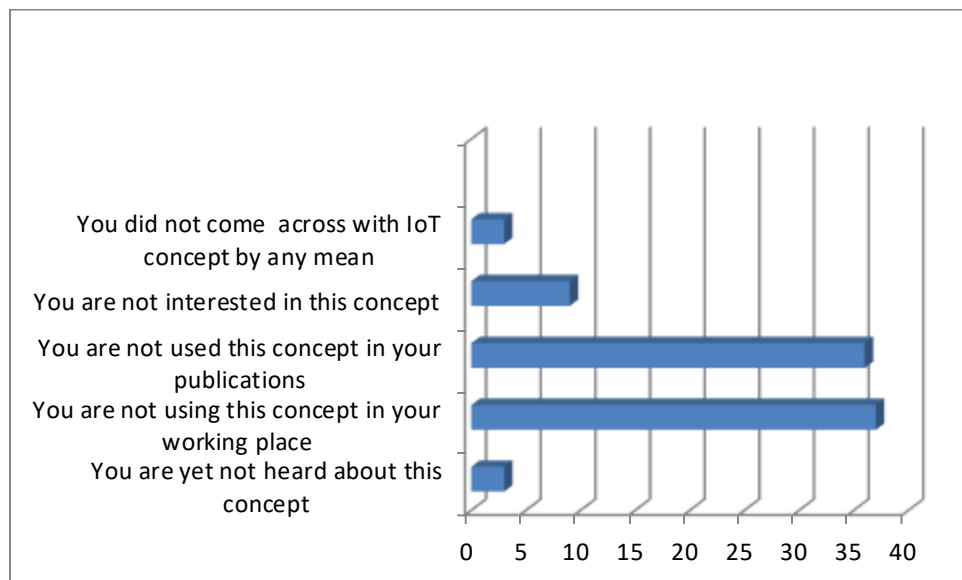


Figure 6- Reasons to not familiar with Internet of Things (IoT) concept

and "not used this concept in your publications" which opined by the majority of library and information science professionals (42%) and (41%) respectively and also discovered as the main reasons not to get familiar with the Internet of Things (IoT) concept. Pessoa et al. (2019) also pointed out the challenges of the Internet of Things (IoT) in detailed. On contrary, among rest of three reasons, one reason, "not interested in this concept" stated by only (10%) LIS professionals, but, two reasons such as "not heard about this concept" and "not come and across with IoT concept by any mean" opined by equal in percentage only (3%) library and information science professionals respectively found at minimum level.



### **Is special training for Internet of Things (IoT) required for LIS professionals**

When the question asked from respondents regarding "whether is special training required to the library and information science professionals to implement the Internet of Things (IoT) concept", the responses received from participants depicted in figure (7).

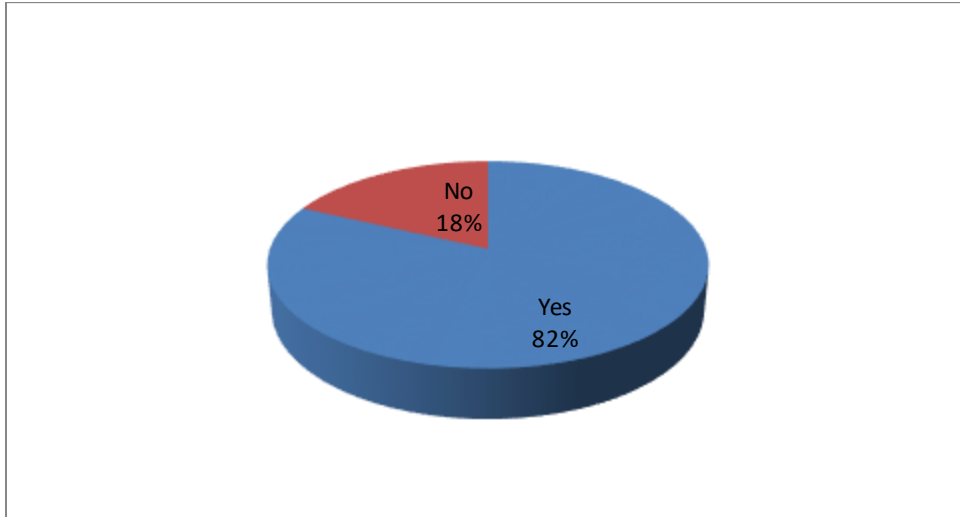


Figure 7- Special training required for Internet of Things (IoT) implementation

It was revealed from the figure(7) that large numbers of library and information science professionals (82%) said, yes, special training is required. Van Deursen and Mossberger (2018) discussed the Internet of Things (IoT) related skills issues in detailed. While, on the other hand, very fewer numbers of library and information science professionals (18%) stated that no, special training is not required to implement the Internet of Things (IoT) concept in library and information science sphere. It shows that the library and information science professionals are wanting to improve their skills especially for implementing the Internet of Things (IoT) technology into their respective libraries and other working places.

### **Usefulness of the Internet of Things (IoT) concept in LIS domain**

While the question asked regarding "will the Internet of Things (IoT) concept be useful to the library and information science professionals", the responses received from respondents

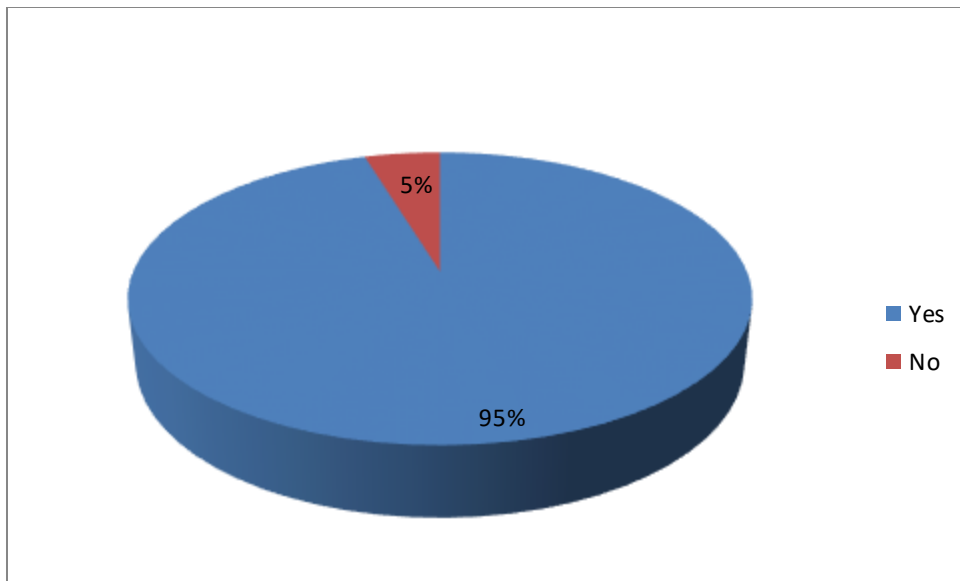


Figure 8- Usefulness of the Internet of Things (IoT) in LIS domain

presented through figure (8) which demonstrated that most of the library and information science professionals (95%) were agreed and stated yes, Internet of Things (IoT) concept will be useful for the library and information science professionals. Hoy (2015) discussed the usefulness of Internet of Things (IoT) in libraries in details including some examples of Internet of Things (IoT) enabled services. While, very few library and information science professionals only (5%) said that no, Internet of Things (IoT) concept will not be useful to the library and information science professionals. It reveals that library and information science professionals are attracting towards Internet of Things (IoT) concept.

### Reasons to use Internet of Things (IoT) in library and information science domain

Figure (9) depicts the reasons for which library and information science professionals want to use the Internet of Things (IoT) concept in their respective working places. It was found from

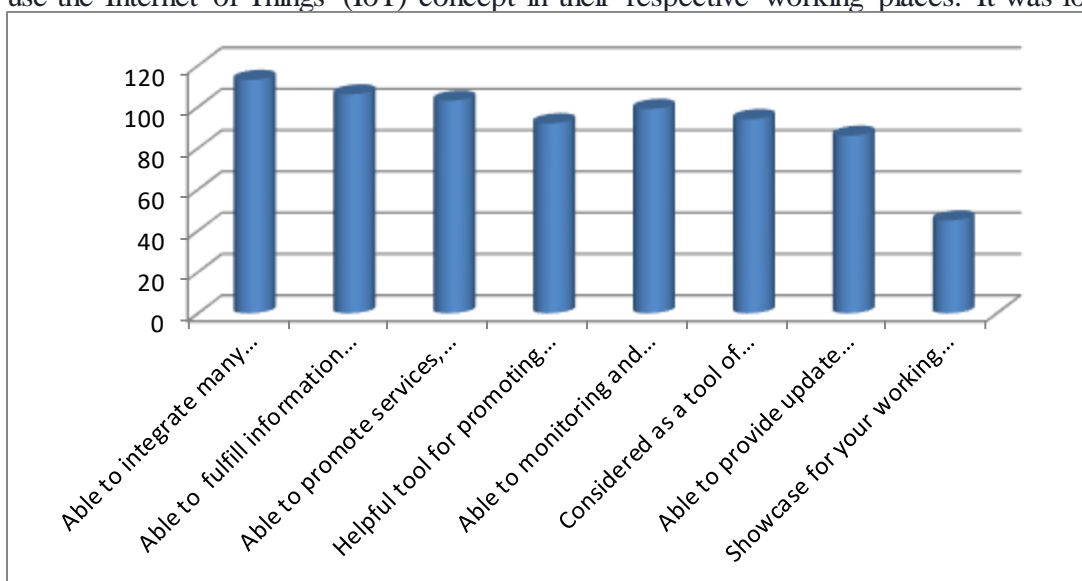


Figure 9- Reasons to use Internet of Things (IoT) in LIS domain

figure (9) that majority of library and information science professionals (75%) want to use IoT concept due to "able to integrate many things by one interface or device" reason, followed by "able to fulfil information needs of the users" reason by (71%) library and information science professionals. Qin (2018) in his study also emphasized that the Internet of Things (IoT) technology had great potentials to use in library services and for the other activities as well. Further, a slight difference was noted among six reasons as mentioned in the figure (9) which opined by more than fifty per cent but less than seventy per cent library and information science professionals. It shows that most of the library and information science professionals want to use the Internet of Things (IoT) concept extensively in the library and information science domain. In contrast to seven reasons as given in figure (9), only one reason such as "showcase for your working place" opined by only (30%) library and information science which was found in minority level.

### **Sustainability of the Internet of Things (IoT) concept in the LIS domain in future**

Responses received from respondents regarding "will Internet of Things (IoT) concept be sustained in library and information science domain in future", presented in figure (10) which demonstrated that most of the library and information science professionals (94%) were agreed and stated that, yes, Internet of Things (IoT) will be sustained in library and information science domain in future. It shows that the Internet of Things (IoT) will be sustained in library and information science area in future. Beier et al (2018) through an online survey discovered the sustainability dimensions benefit from the Internet of Things in

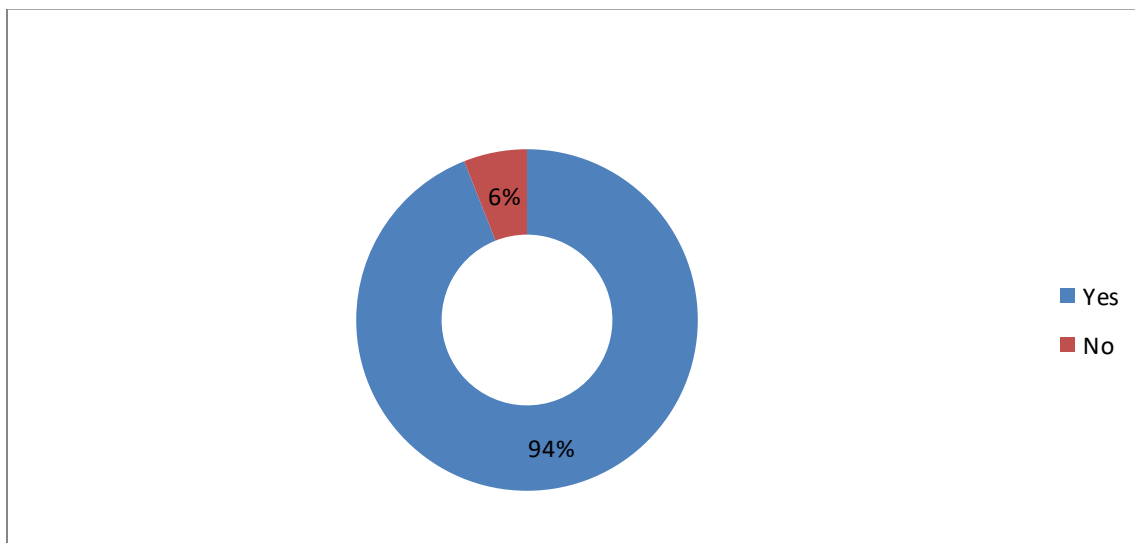


Figure 10- Sustainability of the Internet of Things (IoT) in LIS domain in future

industrial domain. On contrary, very few library and information science professionals who participated in this survey were disagreed and said that no, Internet of Things (IoT) will be sustained in library and information science domain in future.

### **Findings**

The following findings were discovered from this study:-

- It was found that the majority of library and information science professionals who participated in this survey belong to academic libraries.

- Large numbers of library and information science professionals who participated in this survey are working on librarian designation.
- Majority of library and information science professionals who participated in this survey had heard about the Internet of Things (IoT) concept.
- Most of the library and information science professionals used online resources to know about the Internet of Things (IoT) concept.
- A large number of library and information science professionals were familiar with the Internet of Things (IoT) concept from two years.
- The reason "you are not using this concept in your working place" was discovered as the main reason not to get familiar with the Internet of Things (IoT) concept.
- Most of library and information science professionals need to undergo for special training for implementing the Internet of Things (IoT) concept in library and information science domain.
- Large numbers of library and information science professionals opined that the Internet of Things (IoT) concept will be useful for library and information science professionals.
- "Able to integrate many things by one interface or device" discovered as the main reason to use the Internet of Things (IoT) concept in the library and information science domain.
- Majority of library and information science professionals stated that the Internet of Things (IoT) concept will be sustained in library and information science domain in future.

### **Suggestions**

The following suggestions were made on the basis of findings discovered from this study:-

- It is suggested that every library and information science professionals whether they are working in types libraries, library and information science institutes/ organisations and on different designations should participate in cutting edge technologies related survey like the Internet of Things (IoT) and library and information science.
- It is suggested to the all library and information science professionals should get aware towards the latest emerging concepts like the Internet of Things (IoT) in connection to use them in library and information science domain effectively.
- It is suggested to all library and information science professionals that they should use the most effective medium to know about latest concepts that are evolving at a worldwide level.
- It is suggested that every library and information science professionals must get familiar with cutting edge technologies and innovations as soon as possible.
- It is suggested that every library and information science professionals should get familiar with the Internet of Things (IoT) concept.
- It is suggested that every library and information science professionals should undergo for specialized training for getting full knowledge about the Internet of Things (IoT) concept in real sense.
- It is suggested that the library and information science professionals should use the Internet of Things (IoT) concept effectively.
- It is suggested that the library and information science professionals should look for more possible areas in which they can be used the Internet of Things (IoT) concept in the real situation.
- It is suggested that every library and information science professionals should look for possibilities regarding how they can make the Internet of Things (IoT) concept sustainable in library and information science domain in future.

## Conclusion

This study provides perceptions of the library and information professionals towards the Internet of Things (IoT). The results of this study depicted that most of library and information science professionals were aware of Internet of Things (IoT) concept, IoT concept found useful for the library and information science professionals and want to use Internet of Things (IoT) technology in library and information science domain but they need to undergo a special training programme for knowing different insights of IoT technology. It shows that the library and information science professionals are attracting towards the Internet of Things (IoT) technology but they do not have proper skill to handle this technology effectively. Therefore, it is suggested that the library and information science professionals should undergo in the specialized training programmes on Internet of Things (IoT). The library and information science professionals should also think very seriously with regard to how they can make optimum use of the Internet of Things (IoT) technology for making existing services, resources, courses and so on more valuable and to start new services which can able fulfil the demands of the users in integrated and proactive mode in present and future perspectives. Yan et al. (2014) conducted a survey on trust management of Internet of Things (IoT) and proposed the mechanism that makes the Internet of Things (IoT) phenomena trustworthy. Thus, it is also suggested to the library and information science professionals that they should think towards making the Internet of Things (IoT) technology as a trustworthy technology in library and information science domain.

## References

1. Abbasy, M. B., & Quesada, E. V. (2017). Predictable influence of IoT (Internet of Things) in the higher education. *International Journal of Information and Education Technology*, 7(12), 914-920.
2. AlHogail, A. (2018). Improving IoT technology adoption through improving consumer trust. *Technologies*, 6(3), 1-17.
3. Altaf, A., Abbas, H., Iqbal, F., & Derhab, A. (2019). Trust models of internet of smart things: A survey, open issues, and future directions. *Journal of Network and Computer Applications*, 137, 93-111.
4. Beier, G., Niehoff, S., & Xue, B. (2018). More Sustainability in Industry through Industrial Internet of Things?. *Applied Sciences*, 8(2), 1-12.
5. Bradley, J., Tomlin, P., & Mathews, B. (2018). . Building Intelligent Infrastructures: Steps toward Designing IoT-Enabled Library Facilities. *Library Technology Reports*, 54(1), 23-27.
6. Du, L., & Liu, T. (2014). Study on the development of smart library under Internet of Things. In *Applied mechanics and materials* (Vol. 529, pp. 716-720). Trans Tech Publications.
7. Elkhodr, M., Shahrestani, S., & Cheung, H. (2016). Internet of Things applications: current and future development. In *Innovative Research and Applications in Next-Generation High Performance Computing* (pp. 397-427). IGI Global.
8. Fleisch, E. (2010). What is the internet of things? An economic perspective. *Economics, Management, and Financial Markets*, 5(2), 125-157.
9. Gupta, J., & Singh, R. (2018, February). Internet of Things (IoT) And Academic Libraries A User Friendly Facilitator For Patrons. In *2018 5th International*

*Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLIS)* (pp. 71-74). IEEE.

10. Hoy, M. B. (2015). The “Internet of Things”: What it is and what it means for libraries. *Medical reference services quarterly*, 34(3), 353-358.
11. Hoy, M. B. (2016). Smart buildings: an introduction to the library of the future. *Medical reference services quarterly*, 35(3), 326-331.
12. Ibarra-Esquer, J., González-Navarro, F., Flores-Rios, B., Burtseva, L., & Astorga-Vargas, M. (2017). Tracking the evolution of the internet of things concept across different application domains. *Sensors*, 17(6), 1- 24.
13. Kim, J. H., Yoo, M., Lee, K. N., & Seo, H. (2017). The innovation of the internet: a semantic network analysis of the Internet of Things. *Asian Journal of Technology Innovation*, 25(1), 129-139.
14. Kumar, J. S., & Patel, D. R. (2014). A survey on internet of things: Security and privacy issues. *International Journal of Computer Applications*, 90(11) 20- 26.
15. Li, S., Da Xu, L., & Zhao, S. (2015). The internet of things: a survey. *Information Systems Frontiers*, 17(2), 243-259.
16. Pessoa, C. R. M., Batista, C. L., & Marques, M. E. (2019). Internet of Things and Internet of All Things. In *Handbook of Research on Expanding Business Opportunities With Information Systems and Analytics* (pp. 186-203). IGI Global.
17. Pujar, S. M., & Satyanarayana, K. V. (2015). Internet of Things and libraries. *Annals of Library and Information Studies*, 62(3), 186-190.
18. Qin, J. (2018). The Research of the Library Services Based on Internet of Things. In *4th International Symposium on Social Science (ISSS 2018)*. Atlantis Press, 412-420.
19. Sezer, O. B., Dogdu, E., & Ozbayoglu, A. M. (2017). Context-aware computing, learning, and big data in internet of things: a survey. *IEEE Internet of Things Journal*, 5(1), 1-27.
20. Van Deursen, A. J., & Mossberger, K. (2018). Any Thing for Anyone? A New Digital Divide in Internet-of-Things Skills. *Policy & internet*, 10(2), 122-140.
21. Wang et al. (2015) conducted a survey focused on evolutionary process of Internet of Things (IoT) concept and bridged the gap found in evolution process of Internet of Things (IoT).
22. Whitmore, A., Agarwal, A., & Da Xu, L. (2015). The Internet of Things—A survey of topics and trends. *Information Systems Frontiers*, 17(2), 261-274.
23. Wójcik, M. (2016). Internet of Things—potential for libraries. *Library Hi Tech*, 34(2), 404-420.
24. Xu, L. (2014). The Internet of Things technology application and the intelligent library. In *Applied Mechanics and Materials*(Vol. 571, pp. 1180-1183). Trans Tech Publications.
25. Yan, Z., Zhang, P., & Vasilakos, A. V. (2014). A survey on trust management for Internet of Things. *Journal of network and computer applications*, 42 (1), 120-134.