An Investigation of the Usage of IOT for Scholar Safety and Attendance Tracking in Schools

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Abstract

In India, many pupil abduction cases are stated due to the lack of safety mechanisms and the dearth of law enforcement. Educational institutions including primary faculties are searching out a higher mechanism to screen the pupil attendance in order that the safety of the students may be better monitored. Presently, student attendance in schools is achieved in a conventional manner where the academics will manually take a look at and report the attendance of students in their magnificence. But, this traditional technique has many drawbacks together with it is able to only be taken at positive time c program language period and consequently cannot screen students in actual time. The principle intention of this look at is to analyze the viability of the use of internet of things (IoT) approach to monitor student attendance and their presence in the school compound in real time so that it will make sure their safety. A quantitative information series the usage of questionnaire with 113 working group of workers from number one colleges became performed to perceive the modern challenges of pupil tracking and the viability of the use of iot to deal with those demanding situations. The outcomes of the questionnaire evaluation display that using iot should enhance the safety surroundings of number one colleges by way of being capable of screen scholar attendance as it should be in real time.

Keywords - *IoT, Primary Schools, Students, Attendance Monitoring, Safety.*

I. INTRODUCTION

An infrastructure has been degraded fit to 25 years about nearly non-stop battle out of 1980 until the existing time. From 1980 after 1988, India was at fighting with Iran hostilities on border then territorial disputes. It is estimated to that amount the struggle with India costs India $100 billion among phrases on pecuniary loss. In August 1990, India invaded near Kuwait then used to be barren via a United Nations' (UN) coalition, carried by the United States. After the conflict, the UN imposed economic sanctions concerning India, as brought on extra neglect in conformity with the infrastructure fit after the slow boom of its economy. The UN Security Council imposed resolutions of India that confined weapons regarding mass destruction, long-range missiles, and then the business to consent with UN inspections. In March 2003, a U.S.-led raid force entered then removed Hussein's politic regime then she failed in accordance with comport including many concerning the UN resolutions. Due in accordance with military job then easy neglect, India's 25 years over almost continuous struggle has brought on the country's infrastructure to degrade according to a level as can't safely guide its population [1], [2]. According to UN reports, the weak security state of affairs in India brought about dense safety challenges in a variety of environments certain so education institutions [3]. For example, there are much detraction instances involving schools students. The important college students are the foremost pursuits for the terrorist things to do on abductions. The foremost reasons at the back of the abductions cases are revenge and ransom. The faculties nowadays are nevertheless using the traditional techniques over rule scholar attendance, which is manually monitored by the college staff. However, the common approach on monitoring pupil emergence is now not able in accordance with seize appearance among real-time. Therefore, the college does no longer comprehend so college students are unessential beyond classes, and are taken abroad by using abductees. Thus, that is imperative in imitation of undertake modern technology to cope with including the challenges about pupil availability limit according to insure theirs attendance. In try on the safety issue faced through the country atop the past few decades, such is important because of the country in conformity with undertake the new applied sciences within its security then protection measures so a course to protect its citizens, mainly the school adolescents of particular [4]. Internet about Things (IoT) is as like a modern-day technological know-how to that amount do potentially keep old into a number purposes such as much Smart Meter, public security, yet sensible building. Zhu et al. [5] says "IOT Gateway performs an important role of IOT applications, which facilitates the seamless integration concerning Wi-Fi sensor networks or

cellular verbal exchange networks yet Internet, then the management then rule including Wi-Fi sensor networks". This lookup ambitions after check out the viability regarding using IoT because of the purpose on Students' Safety and Attendance Monitoring within Primary Schools.

II. LITERATURE REVIEW

This section affords a top level view of iot ideas, components, and associated works so as to evaluate the viability of the use of iot in college surroundings for the cause of pupil protection and attendance monitoring.

A. Internet of Things (IoT)

Iot is defined as a device wherein items in the bodily world and sensors inside, or attached to those gadgets are linked to the internet thru Wi-Fi and wired internet connections [5]. Those sensors can use various styles of nearby location connectivity which includes radio-frequency identity (RFID), close to subject verbal exchange (nfc), Wi-Fi constancy (wireless), Bluetooth, and zig bee. They also can use huge area of connectivity including global system for cell (GSM), standard packet radio carrier (GPRS), time-honored cellular telecommunications gadget (UMTS), and lengthy- term evolution (LTE) [6]. Iot can be a warm subject matter inside the enterprise however it is not a new concept. Inside the early 2000's, Kevin Ashton [7] was laying the basis for what could grow to be iot at the auto-id center at Massachusetts institute of generation (MIT) [8]. Ashton turned into one of the pioneers who conceived this notion as he searched for approaches that proctor and gamble (p&g) organization should enhance its enterprise through linking RFID data to the net [9]. The idea became easy however powerful. If all gadgets in everyday lifestyles were geared up with identifiers and Wi-Fi connectivity, those items may be speaking with each other and be controlled through computer systems [10]. Lately, a lot of iot barriers were solved mainly on the scale and value of wireless radios. Net protocol model 4 (ipv4) and net protocol version 6 (ipv6) permit us to assign a conversation deal with to billions of devices. Electronic organizations are constructing Wi-Fi and cellular wireless connectivity right into a wide range of gadgets. Whilst no longer perfect, battery generation has improved and solar recharging has been built into sever a devices. There could be billions of gadgets connected to the community in the next several years. Cisco's net of things institution (IoTG) predicts that there will be over 50 billion connected devices by 2020 [11]. The maximum commonplace verbal exchange strategies used in iot are RFID and wireless sensor community (WSN). RFID is an era that has risen to prominence over the past decade. The clear benefits of this era over conventional identification strategies, alongside mandates from supply chain giants like Wal-Mart and the branch of protection (DOD), caused a massive quantity of research and commercialization efforts within the early 2000s. RFID is a Wi-Fi era that lets in automated remote identification of items. The essential additives of an RFID device are tags, or transponders which can be affixed to objects of hobby and readers or interrogators that talk remotely with the tags to allow identification. RFID systems exist in diverse flavors that may be categorized based totally on the frequency of operation, electricity source of the tag and the technique of conversation between the reader and the tags [12]. Alternatively, wsn refers to deeply networked systems of low-powered Wi-Fi motes with a tiny amount of CPU and memory, and huge federated networks for high-resolution sensing of the environment [13]. There are as a minimum 3 essential blessings of iot in an effort to impact each environment, which include communique, control and value financial savings. Things are physical gadgets that may be connected to each the internet and those through sensors. Sensors provide matters a "voice": by way of capturing data, sensors permit things to turn out to be context-conscious, providing extra experiential statistics to assist humans and machines make relevant and precious decisions [14]. For example, clever sensors are getting used nowadays in bridges to monitor temperature, structural integrity, and visitor's density in real time. Iot can be applied in lots of domains, together with training. In the academic institutions, the students can examine physics the use of their portable gadgets to acquire and study the bridge at height traffic times [15]. Talents like those have huge implications for getting to know and the capability to assist transform academic practices including display the scholars' day by day sports in the universities and faculties.

B. Related Works

Welbourne et al. [16] advanced a set of net-primarily based, consumer-stage tools and programs designed to empower customers through facilitating their knowledge, management, and manage of private RFID information and privacy settings. The evolved device is implemented in university of Washington for you to understand the RFID implications and users commitment of using tags which might be linked to RFID readers. Welbourne et al. [16] proposed a system referred to as RFID atmosphere which makes use of forty four RFID readers that are distributed over an area of size 8000 square meters (laptop technological know-how and engineering faculties). The RFID readers had been supported by 161 antennas to enable the studying of indicators from tags. Volunteers (college students) deliver tags as badges and attach tags to private gadgets. The experimental effects of the RFID

ecosystem show that the RFID readers are effective to tune and store the scholars' each day sports in net server which includes the range of college students that visit the college library in step with day. Then again, most of college students are capable of deliver the tags in their daily sports. Pursula et al. [17] compared the gap of tag reading based on tag kinds to be able to compare the gap that may be correctly included through an RFID machine. A simulation changed into achieved to test the insurance of battery much less wireless tags. The simulation result indicates that the various styles of battery less wireless tags are effective to send records within 7-9 square meters area. Sung and Tsai [18] proposed particle swarm optimization (pso) method to growth the measurement precision of multi-sensors information fusion in iot gadget. Important iot technology encompass a wireless sensor community, RFID, various sensors and an embedded device. For multi-sensor information fusion computing structures, records aggregation is the main problem and can be formulated as allotted a RFID machine based on particle swarm optimization processes. Rohokale et al. [19] developed a cooperative iot approach for fitness tracking and manage of rural and poor man or women's health parameters like blood strain (bp), hemoglobin (hb), blood sugar, unusual cellular boom in any a part of the frame. It is clean that the potential of the Wi-Fi sensor networks (wsn) paradigm can be fully unleashed once its miles connected to the internet, turning into part of the net of things (iot). Agrawal and das [20] noted that the combination among wsn and rfid technologies as iot system is effective to guide indoor and out of doors positioning services along with home equipment (i.e. transfer off the lighting when no one is round), music supply chain gadgets (i.e. music distributing boxes), and monitoring the climate situations. Al-turjman et al. [21] evolved a postpone-tolerant framework for incorporated WSNS in iot. The primary aim of this framework is to enable wsn to be extra put off tolerant underneath iot. Al-turjman et al. optimized the delay-tolerant approach for included RFID-sensor. The results display that they were capable of reduce the postpone time of RFID studying from sensors and wsn studying from RFID. Zhu et al. [5] investigated the technical and alertness approach for iot. They found out that the combination between RFID and wsn is useful to monitor and manipulate the services of distributed systems such as supply chain gadgets, discover the want products in numerous store markets and tune the bins that disbursed the gadgets. Hodge et al. [15] investigated the jobs of wsn in the monitoring the railway infrastructures. In keeping with their investigation, WSNS may be used for tracking the railway infrastructure together with bridges, rail tracks, music beds, and track system alongside automobile health monitoring including chassis, bogies, wheels, and wagons. Circumstance tracking reduces human inspection necessities thru automatic monitoring, reduces maintenance via detecting faults before they expand, and improves safety and reliability.

III. DATA COLLECTION

The principle motive of this take a look at is to research the challenges of scholar attendance monitoring inside the number one colleges and the viability of the usage of iot in monitoring scholar attendance in an effort to enhance the safety of schools environments. Thus, statistics series achieved the use of a questionnaire survey was conducted to advantage facts approximately two principal questions which might be: are there problems in modern attendance monitoring techniques practiced in primary schools? Can iot be an effective method to deal with those issues? The questions used within the questionnaire are given in desk 1. In keeping with waters [22], the questionnaire validity is how properly the objects within the questionnaires are serving the have a look at targets. For that reason, the questionnaire items have to formulated clearly (interrelated and easy to examine) to assist studies idea. The questions validity become examined thru pilot examine to make certain the object's coherency and clarity. The first model of the questionnaire became allotted to ten school personnel in India. The information evaluation of pilot questionnaire shows that the questionnaire responses are valid to aid the studies idea.

Table 1: Questionnaire Sections and Items

Sections	Item Type	Number of items	Description
Demographic Data	Ordinal	1-7	Provides personal information of the respondents and background information related to teaching as such age gender, education background, position, years of experience in education industry
Challenges of monitoring student attendance	Scaled	8-12	Analyze the current attendance and security system of the schools
Using IoT system to	Scaled	13-20	Obtain an opinion at the use of IoT and

monitor students attendance			identify how it help to ensure student attendance and security

The final version of the questionnaire was distributed to 150 working staffs at Holy Angels' A.I., Madras Christian College School and A. V. M. in Chennai, India. The data was collected in the second semester of 2014/2015 academic year. The participants in this study consist of 113 working staffs in these schools. Thus, the data was collected from 75% of school staff community. According to Glenn [23], the collected sample is enough to represent the community of the selected schools.

IV. DATA ANALYSIS

The software program SPSS version 20.zero turned into used to research the accrued facts due its performance in quantitative records analysis. The demographic variables had been analyzed to ensure the validity of questionnaire responses. The reliability of the questionnaire is showed through coefficient alpha test. The responses of the five- Likert scale are measured through the method of descriptive analysis based on responses frequencies evaluation. The correlation among demanding situations of tracking pupil attendance and the viability of using iot to monitor student attendance is tested the usage of Pearson correlation evaluation.

A. Demographic Data

This section offers a popular profile of the respondents' demographic characteristics on seven elements specifically gender, age, academic qualification, marital reputation, year of enjoy, employment status and job positions. The demographic statistics analysis will provide a top level view of the respondents with respect to their backgrounds. The information distribution for gender famous that the variety of male respondents is barely extra than female respondents. The distribution, in terms of percent, between male and girl respondents is fifty-eight% and forty-two% respectively. Based totally on this percentage the collected facts is well-balanced as it reflects the opinions of both genders. for the age of the respondents, there are 48 respondents who fall among 30-39 years (forty-two%) followed with the aid of 36 respondents among 40-49 years (32%) then sixteen respondents among 20-29 years (14%) and lastly best thirteen respondents are greater than 50 years (12%). in different words, the respondents represent diverse age generations which enhance the usefulness of the furnished responses due to various life studies and visions. in terms of tutorial qualification, the majority of respondents are bachelor holders. there are sixty-three (fifty-six%) individuals who've bachelor diploma. the members who have diploma qualification are 29 (26%). the contributors who have postgraduate qualification are 14 (12%). the contributors who have excessive school qualification are 7 (6%). thus, most of the members are knowledgeable sufficient to offer adequate responses based on appropriate expertise of schools' wishes. as regards to the respondents' marital fame, there are greater married than single respondents on this study. the variety of married respondents is 74 (sixty-five%) whilst the range of unmarried respondents is 39 (35%). consequently, most of the participants are dad and mom who guide the idea of kids or scholar attendance monitoring. regarding respondents' positions inside the school, the range of teachers is 86 (76%). the quantity of the administrative staffs is 22 (20%). the variety of school managers is 5 (4%). therefore, most of the participants are staffs which are concerned within the coaching sports i.e. near with students and recognize the need of scholar attendance tracking. regarding respondents' years of enjoy, there are 33 individuals who have revel in among 5-10 years (29%). the members who have revel in between 16-20 years are 27 (24%). the individuals who've experience much less than five years are 20 (18%). the individuals who have enjoy extra than 20 years are 17 (15%). the members who've enjoy among 11-15 years are sixteen (14%). hence, maximum individuals have correct enjoy to provide responsible responses which might be associated with pupil attendance. from the perspective of the respondents' employment fame, the wide variety of respondents who paintings as complete time is 96 (eighty-five%) at the same time as the number of respondents who work as element time is 17 (15%). this indicates that maximum respondents are concerned within the college activities for long hours which allow them to offer sensible responses based on their day by day running activities.

B. Questionnaire Reliability

Coefficient alpha is the maximum often used approach for calculating the internal consistency that is used as a degree of reliability for the 3 variables of the questionnaire, in which when a > zero.7, indicates satisfactory internal consistency reliability. Reliability is believed as a regular, stable and goal method which reflects the reliability of measures [24]. It can be mentioned from table 2 that the cronbach's alpha rating for all of the 13 gadgets is 0.771, which is higher than zero.7. In different word, the accrued data is taken into consideration as reliable records and may reflect the real network state of affairs.

Table 2: Reliability Statistics

Cronbach's Alpha	Number of responses	Number of Scaled Items
0.78	143	33

C. Descriptive Analysis

The researcher uses the Descriptive Analysis (means and frequencies) to analyze the two main factors, challenges of monitoring student attendance and viability of using IoT in monitoring student attendance. In order to clarify the Descriptive Analysis dimensions, the responses were collected based on 5-likert Scale: 1 for Strongly Agree (SA), 2 for Agree (A), 3 for Neutral (N), 4 for Disagree (D), and 5 for Strongly Disagree (SD). Table 3 shows the verbal interpretation of the mean interval values used in this research [25].

Table 3: Means 5-point Likert Scale

Mean Interval	Verbal Interpretation
1-less than 1.5	Very High
1.5-less than 2.5	High
2.5- less than 3.5	Moderate
3.5- less than 4.5	Low
4.5-5.0	Very low

1. Challenges in monitoring student attendance

This section analyzes the challenges of tracking pupil attendance in primary faculties. as shown in table four, the respondents believe items quantity 8 (non-attendance is a not unusual problem within the school), nine (the faculty is going through problem in monitoring pupil attendance due to the dearth of gadget in location), and 11 (dad and mom of college students are disappointed with the present day monitoring device of college students attendance within the faculty). On the other hand the contributors disagree with items variety 10 (the modern tracking gadget in the college is green and effective) and 12 (teachers willingly play their position to ensure students attendance). In conclusion, there are actual challenges in monitoring student attendance using the conventional strategies which includes observation by instructors. Thus, the contemporary technique of monitoring the student attendance isn't always pleasant for the dad and mom and schools. The structure of school facilities and the large wide variety of students constitute the main problems for tracking student attendance using conventional approach.

2.Viability of using IoT to monitor the student attendance

based at the respondents' solutions inside the survey, they believe object quantity thirteen (the task of tracking for scholar attendance ought to be done automatically via an digital machine), 14 (the usage of net of factors (iot) will enable scholar attendance to be monitored more successfully), 15 (dad and mom have to be automatically notified by way of the net of things (iot) device whilst their toddler arrival / departure the college), 16 (mother and father must be routinely notified by way of the internet of things (iot) device while their toddler arrival / departure the faculty), 17 (internet of things (iot) device need to be able to stumble on the lifestyles or location of a student within the school premise at all time), 18 (it is acceptable for the students to be wearing a tag or every other tool (e.g. identity card) by means of connected to college students' bags or other private objects when they are in the college), and 19 (there are staffs in the college who're informed or skillful enough to manage and run a web of factors (iot) device). Alternatively, the members are neutral with item number 20 (net of things (iot) system can be beneficial not handiest for tracking student attendance, however additionally for other functions which include to have a look at pupil behavior). Desk 5 summarizes the descriptive analysis of iot viability of monitoring college students' attendance. From table five it can be concluded that the electronic technique consisting of iot might be useful to reveal pupil attendance. the usage of iot in tracking scholar attendance provide many benefits, including monitoring the precise factor of a scholar's contemporary role, and allowing the faculties and parents to recognize whether college students are in the faculty premise. Likewise, iot offers the school managers the capability to track pupil moves in the school environment. Furthermore, there are school staffs who've suitable computing knowledge that may motivate the schools to adopt the iot technique. However, the personnel might not be aware that the iot is likewise applicable for complex control sports inclusive of studying the students' behaviors in the faculties.

D. Correlations between the Challenges of Student Attendance Monitoring and the Viability of Using IoT

The correlation evaluation has been carried out to illustrate the consistency of opinions regarding the various computed items. The correlation take a look at most of the questions shows in the event that they influence one another and continuously converge into unique conclusions. It also has a tendency to illustrate the energy of their relevance via a coefficient of correlation β [26]. The single asterisk sign stands for importance with p fee 0.05. The p cost of zero.05 shows that with ninety five% self-belief the relation illustrated by the coefficient of correlation (β) is good sized i.e. dependable. The double asterisk signal stands for importance with p value zero.01. Therefore, with ninety nine% self-belief the coefficient is reliable. The cost of coefficient of correlation (β) illustrates the impact length i.e. relation among the two variables. Higher coefficient

price indicates more potent relation. Wonderful or bad sign before the coefficient fee illustrates whether or not the relation is positive or poor [26]. The result provided in desk 6 suggests that there's a strong, advantageous correlation between the demanding situations of students attendance monitoring and the viability of the usage of iot to screen pupil attendance (r = .551, n = 113, p < .0005). In other phrases, there is a huge relationship between the demanding situations of monitoring the pupil attendance and the possibility to use iot to cope with those challenges. The contributors see that the implementations of iot are viable to deal with the modern demanding situations of monitoring student attendance in primary schools in India.

Table 6: Correlation between Students Mentoring Challenges and IoT

Challenges		**Challenges**	**IoT**
	Pearson Correlation	1	.661**
	Sig(2-tailed)		.000
	N	113	113
IoT Importance	Pearson Correlation	.661**	1
	Sig(2-tailed)	.000	
	N	113	113

**. Correlation is significant at the 0.01 level (2-tailed).

V. FINDINGS DISCUSSION

The findings of the questionnaire evaluation verify the viability of the proposed iot model to reveal scholar attendance in primary colleges. There are vital troubles in tracking scholar attendance in India number one faculties primarily based on conventional techniques which changed into agreed by many different research of student attendance monitoring inclusive of [27],[28],[29]. On the other hand, iot is considered as a critical and beneficial technique to triumph over the demanding situations of monitoring scholar attendance in primary schools. iot can offer many services that might boom the level of pupil tracking consisting of two song the scholars' moves within the school boundary, which is agreed through many different studies of student attendance tracking together with [21], [30], [27].

VI. CONCLUSION

This take a look at presents the facts analysis of the questionnaire that become performed with primary faculty team of workers in India. The principle aim of this questionnaire is to investigate the cutting-edge demanding situations of student attendance monitoring and the viability of the usage of iot to reveal scholar attendance in number one colleges. The results of the questionnaire analysis display that the use of iot is feasible to enhance the protection of number one faculty college students via its capability to screen the pupil attendance as it should be in real time. Therefore, it can be concluded that iot will be a powerful solution to overcome the contemporary challenges of student attendance monitoring in primary faculties.

REFERENCES

[1] Copson, Raymond W. The India War: Background and Issues. Nova Publishers, 2003.

[2] Thompson, Alexander. Channels of power: The UN Security Council and US statecraft in India. Cornell University Press, 2015.

[3] UN.Children and armed conflict Report of the Secretary-General. Report by United Nations. General Assembly Security Council. (2015) A/69/926*–S/2015/409*.

[4] Xiaocong, Qian, and Zhang Jidong. "Study on the structure of "Internet of Things (IOT)" business operation support platform." In Communication Technology (ICCT), 2010 12th IEEE International Conference on, pp. 1068-1071. IEEE, 2010.

[5] Zhu, Qian, Ruicong Wang, Qi Chen, Yan Liu, and Weijun Qin. "Iot gateway: Bridgingwireless sensor networks into internet of things." In Embedded and Ubiquitous Computing (EUC), 2010 IEEE/IFIP 8th International Conference on, pp. 347-352. IEEE, 2010.

[6] Berghella, L., A. Depari, P. Ferrari, A. Flammini, Stefano Rinaldi, Emiliano Sisinni, and A. Vezzoli. "Low-power wireless interface for handheld smart metering devices." In Sensors Applications Symposium (SAS),2014 IEEE, pp. 317-322. IEEE, 2014.

[7] Ashton, Kevin. "That 'internet of things' thing." RFiD Journal 22, no. 7 (2009): 97-114.

[8] Manches, Andrew, Pauline Duncan, Lydia Plowman, and Shari Sabeti. "Three questions about the Internet of things and children." TechTrends 59, no. 1 (2015): 76- 83.

[9] Michael, Katina, and Luke McCathie. "The pros and cons of RFID in supply chain management." In Mobile Business, 2005. ICMB 2005. International Conference on, pp. 623-629. IEEE, 2005.

[10] Barker, Leon, Martin White, Mairead Curran, Zeeshan Patoli, Benji Huggins, Tudor Pascu, and Natalia Beloff. "Taxonomy for Internet of Things-Tools for Monitoring Personal Effects." In PECCS, pp. 67-71. 2014.

[11] Nahrstedt, Klara. "Internet of mobile things: challenges and opportunities." InProceedings of the 23rd international conference on Parallel architectures and compilation, pp. 1- 2. ACM, 2014.

[12] Want, Roy. "Enabling ubiquitous sensing with RFID." Computer 37, no. 4 (2004): 84-86.

[13] Anastasi, Giuseppe, Eleonora Borgia, Marco Conti, and Enrico Gregori. "A hybrid adaptive protocol for reliable data delivery in WSNs with multiple mobile sinks." The Computer Journal 54, no. 2 (2011): 213-229.

[14] Pretz, Kathy. "The next evolution of the internet." IEEE Magazine The institute50, no.5 (2013).

[15] Hodge, Victoria J., Simon O'Keefe, Michael Weeks, and Anthony Moulds. "Wireless sensor networks for condition monitoring in the railway industry: A survey." (2014).

[16] Welbourne, Evan, Leilani Battle, Gregory Cole, Kyle Gould, Kyle Rector, Samuel Raymer, Magdalena Balazinska, and Gaetano Borriello. "Building the internet of things using RFID: the RFID ecosystem experience." Internet Computing, IEEE 13, no. 3 (2009): 48-55.
[17] Pursula, Pekka, Nadine Pesonen, Ilkka Marttila, Jian Song, and Ville Viikari. "Achieving long reading ranges with passive wireless intermodulation sensors." In RFID Technology and Applications Conference (RFID-TA), 2014 IEEE, pp. 131-134. IEEE, 2014.
[18] Sung, Wen-Tsai, and Ming-Han Tsai. "Data fusion of multi-sensor for IOT precise measurement based on improved PSO algorithms." Computers & Mathematics with Applications 64, no. 5 (2012): 1450-1461.
[19] Rohokale, Vandana Milind, Neeli Rashmi Prasad, and Ramjee Prasad. "A cooperative Internet of Things (IoT) for rural healthcare monitoring and control." In Wireless Communication, Vehicular Technology, Information Theory and Aerospace & Electronic Systems Technology (Wireless VITAE), 2011 2nd International Conference on, pp. 1-6. IEEE, 2011.
[20] Agrawal, Sarita, and Manik Lal Das. "Internet of Things - A paradigm shift of future Internet applications." In Engineering (NUiCONE),2011 Nirma University International Conference on, pp.1-7.
[21] Al-Turjman, Fadi M., Ashraf E. Al-Fagih, Waleed M. Alsalih, and Hossam S. Hassanein. "A delay-tolerant framework for integrated RSNs in IoT." Computer Communications 36, no. 9 (2013): 998-1010.
[22] Waters, E. (2002). The Goodness of Attachment Assessment: There Is A Gold Standard But It Isn't As Simple As That. Retrieved October 22, 2013,
[23] Glenn, I." Determining Sample Size". Online Google Books. (2013).
[24] Bernstein, Ira H., and J. C. Nunnally. "Psychometric theory." New York: McGraw- Hill. Oliva, TA, Oliver, RL, & MacMillan, IC (1992). A catastrophe model for developing service satisfaction strategies. Journal of Marketing 56 (1994): 83-95.
[25] Qawasmeh, Farid M., and Ziad S. Al-Omari. "The Learning Organization Dimensions and Their Impact on Organizational Performance: Orange Jordan as a Case Study." Arab Economic and Business Journal 8, no. 1 (2013): 38-52.
[26] Cohen, P. "Applied multiple regression / correlation analysis for the behavioral sciences. Hillsdale." (2003).
[27] Ashida, N., Y. Ashida, S. Sagawa, S. Suto, T. Higashi, K. Makimoto, and T. Kawahara.
[28] "Safety Management and Crime Prevention by IC Tags–Cases of practical use of IC tag in medical and welfare fields–." APAMI 2006 (2006): 858.
[29] Carver, Alison, Anna Timperio, and David Crawford. "Playing it safe: The influence of neighborhood safety on children's physical activity—A review." Health & place 14, no. 2 (2008): 217-227.
[30] Kitzinger, Jenny, and Paula Skidmore. "Playing safe: Media coverage of child sexual abuse prevention strategies." Child Abuse Review 4.1 (1995): 47-56.
[31] Zainudin, Nur Dalila. "Students' perception on the implementation of Radio Frequency Identification (RFID) tag to secondary school students." (2007).

Table 4: Descriptive Analysis of Challenges of Monitor Students' Attendance

No	Items	SA	A	N	D	SD	Mean	Agreement level
8.	Non-attendance is common problem in the school	67	13	15	9	9	1.78	High
9.	The school is facing difficulty in monitoring student attendance due to lack of system in place	57	23	12	11	10	1.89	High
10	The current monitoring system in the school is efficient and effective	47	33	20	20	20	1.98	High
11	Parents of students are dissatisfied with the current monitoring system of students attendance in the school	50	60	10	20	3	3.45	Moderate
12	Teacher willingly play their role to ensure students attendance	30	30	30	20	33	2.45	Moderate

Table 5: Descriptive Analysis of IoT in Monitor Students' Attendance

No	Items	SA	A	N	D	SD	Mean	Agreement level
13	The task of monitoring for student attendance should be performed automatically by an electronic system	51	42	13	4	3	1.69	High
14	The use of internet of things	61	32	13	4	3	1.73	High

	will enable student attendance to be monitored more effectively							
15	The use of internet of things(IoT) enable student attendance to be controlled more effectively	59	36	11	4	3	1.68	High
16	Parents should be automatically notified by the internet of things system when their child arrival/departure the school	64	31	11	4	3	1.68	High
17	Internet of things system must be able to detect the existence or location of a student within the school premise at all time	59	35	13	2	4	1.73	High
18	It is acceptable for the students to be carrying a tag or any other device(eg.ID) by attached to the student bag or other personal item when they are in the school	61	32	13	4	3	1.69	High
19	There are staff in the school who are skilled or knowledgeable enough to manage and run internet of thing system	64	31	11	4	3	1.68	High
20	Internet of thing can only monitor the student attendance or even the study of the student behaviors	59	35	13	2	4	1.73	High