Literature Review Final Version children tracking products using either RFID and GPS

**Honor Pledge**

On my honor, I have neither given nor received aid on this assignment

Literature Review Final Version

In order to deal with the challenge of children's security and provide ways that parents can use to track and keep their children safe, numerous technologies have been proposed and adopted. This paper aims to undertake a review of various scholarly articles and assess how Radio-frequency identification (RFID) and Global Positioning System (GPS) technologies have been utilized as well as their effectiveness.

The effectiveness of the RFID technology is acknowledged by the Organization for Economic Co-operation and Development (2008) which takes an in-depth look at it an seeks to help interest parties understand its operations and its effectiveness. In their article, they assert that its deployment in various areas is promising. The article shows how RFID is a convenient technology with many facets. They show how it enables the process of data collection from electronic tags that do not need contact and transmitters that are wireless and that enabling the tracking process. The article also shows the importance of understanding the strengths of RFID technologies as well as the limitations which bedevil its application so that the technology can be effectively used. The article shows how different types of RFID technologies can be used and how they differ depending on the context of implementation. It offers information about RFID elements such as its hardware and software components, standards, operation ranges, modes, security aspects of its information, and so forth. It shows the potential security challenges that are faced in the use of RFID technologies which interfere with its integrity, availability, and confidentiality. Some of the examples it offers include cloning, jamming, eavesdropping, denial of services, malware and so forth. This article is significant to my study because it shed pertinent information about the RFID technology making the process of assessing its effectiveness and operation a success

Numerous scholars have undertaken studies to determine the effectiveness of this technology. Anusha and Naidu (2016) in their study identified the challenges that parents with students face not knowing whether their children attend their college classes or not. They proposed the use of a tracking system that allows parents to track their children’s movement and whether they attended school at the proper time or not. This system relies on tracking children who get into the bus and their movement whether they go to college and home or they are alight at certain points. Their proposed system uses processor technologies with RFID, GPS, ARM and GSM (Global System for Mobile Communications). This paper is critical to the study because it shows the reliability of the various system as they are used to track the movement of the student helping in identifying the most effective.

Building upon this, Pang, Ding, Liu, and Fang (2018) in their study identified the importance of enabling parents to track their children since approximately 800,000 children in the US are reported missing annually. Their solution to the challenge was a child tracking system based on the RFID technology. These scholars designed a system of their own prompted by the cost and energy limitation that dogged the existing systems. In the study, the scholars proposed the use of RFID tags the children can have which works together with a tracking system that allows the users that have been deployed to aggregate the readings and track the children. This study is significant because it shows that the RFID technology can be successfully employed in the process of successfully and reliably tracking children.

Still, in support of the RFID technology and its effectiveness, Muli (2016) in his study identifies the challenges that are related to child security and the need for tracking them in order to keep tabs. The scholar proposed the use of Radio Frequency Identification (RFID) to resolve the challenge. The technology which is proposed to work hand in hand with a geotag frequently notifies the parent of the location of their children with a timestamp through an SMS system. Further, the identified system can help the parents identify the location of their children by querying their whereabouts. This article shed light on how an RFID system can be utilized to ensure the security of children through a tracking system

This is similar to Lina, Lub, Kwana, and Shenb (2010) who in their study propose a RFID system that can help parents track their children in an amusement park as well as crowded public venues. In this proposal, different parties have to come together to allows for the tracking. RIFD readers, the control center, visitors in a park, employees as well as storage nodes work together. The child information from their RFID tag is read by RFID readers which are posted throughout the park, the information is sent to the storage node where it's accessed by the employee and then communicated to the parent who is park visitor. This system also seeks to ensure information privacy (child’s identity) even as they track the child and relate it only to their guardian. This paper shows how the RFID technology can practically be used in tracking children in public place showing the technology’s effectiveness

On the contrary, Hedefine (2006) indicated that, even though technologies that track a person have experienced drastic growth and development, they come with challenges and threats to personal privacy. The article shows how the RFID technology can be used to identify the location of a person as well as continuously track them even without having the proper consent from the individual. The article seeks to determine how a person’s privacy can be ensured while still making use of the technology. It proposes that there should be an option where a person does not have to link their identity to the tag’s number in order to bring about a balance between the tracking desired especially for children and the privacy of individuals. This article is important for my study because it shows the challenges that come with the application of RFID technologies in tracking someone where they undermine their privacy and touch on certain legal control and ethical issues.

The other technology that can be applied in the process of tracking Children is GPS. However, in comparison to RFID, GPS has not received as much attention as the later. The studies conducted mostly show that GPS is preferred in tracking vehicles while RFID is the preferred technology in tracking children. Bajaj and Gupta (2012) in their article identified how vehicle tracking can be done with the use of GPS services. In this article, they show how car owners can make use of tracking services that are made possible through the use of GPS services and which enable them to know the particular location of their property and safeguard them from various security threats. This article is important to my study because it shows how the GPS security system can be used to effectively track and identify the particular location of something. Relating to my study it shows the effectiveness of GPS technology it is tracking and its possible applicability in tracking children, helping parents know their whereabouts, relieving anxiety and ensuring their safety

The two technologies can however be used together for better tracking of children. As scholars Fathima, Nivedha, Sangavi, Selvalakshmi andChitra (2016) illustrate. In their study, they highlight the critical necessity of tracking children among Indian parents since a child is reported missing every eight minutes. The scholars then propose the merging of RFID and GPS technologies in order to keep track of children. The two technologies are proposed to work hand in hand to identify when the child gets into the bus and where they exit. This information is then sent to their respective authority or guardian via SMS which enables them to keep tabs on them. While on one hand, the RFID lets the people know the areas the vehicle has passed, GPS provides a real-time location. This article is important to my study because it shows how the two technologies can work together in pursuit of the most reliable child tracking system.

In line with this, Sankaranarayanan and Hamilton (2014) identify how the RFID technology has been widely looked at in the public transport arena where it is used to track passengers as they board and alight. They highlight how both GPS and RFID technology have been employed in the process of bus tracking and reporting their expected arrival times. The scholar shows how these technologies can be used to track the movement of buses in order to let their users know exactly when they will arrive. This article is important for my study because it highlights a case study of how the technologies have been used and their reliability helping to make a decision of their effectiveness and how they can be successfully implemented in the process of tracking children.

This view also receives support from Shyam, Kumar, Shashi, and Kumar (2015) in their article which seeks to show how tracking systems can be used to help parents know the whereabouts of their children enhancing their security. They allude to the rise in kidnapping, accidents and the ways parents are driven to worry since they do not know the locations of their children. The scholars propose a tracking system that is SMS based that will enable parents to know where their children are in real-time. Based on their proposal the scholars opted for a system that combined both RFID and GPS with the former being part of the module kit located in a child’s bag giving parents the GPS coordinates of their children. The child’s location is sent to the parents via an SMS without requiring internet services. The scholars concluded that RFID technology is practical when it comes to tracking children. This article and the information it provide is pertinent to my study since it shows the effectiveness and reliability of RFID technologies when they are employed in tracking children and helping parents ensure the safety of their children. It also identifies the strength that comes with the application of RFID to communicate to the parents since it does not need internet connectivity.

In conclusion, this review shows that different scholars have looked at how RFID and GPS tracking systems can be used to determine the location of a child and help a parent in ensuring the security of their children. A majority of the scholars support the use of RFID technology and its effectiveness in the tracking process. The use of GPS technologies has been relegated more to tracking vehicle movement and not necessary for the child. There are however scholars who are convinced that two technologies can be combined and used to improve the tracking process in general. Therefore, as this study embarks on looking at children tracking using either the RFID or GPS technologies, determining the most effective and making the necessary recommendations, insight gathered from previous studies will be used to inform the approach as well as the methodology applied.

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