Implementation of Security Systems in IoT Using Blockchain

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INTRODUCTION

The connection created between smart devices to gather information and data, and create sensible choices is what the Internet of Things (IoT) means. IoT deployment includes different devices that can be recognized in an unusual way using installed sensors linked through a network. These heterogeneous devices are known for their distinguished low energy, tiny memory size, and poor processing capability. For that, IoT tremendous improvements and marketing have revealed how much the system of IoT is vulnerable and requires improvement. (Gremban, 2019) Hence with Blockchain uniting with IoT, Blockchain will provide a safer setting for the vulnerable system of IoT. Blockchain technology can be considered the lost piece of the puzzle that allows equal agreement action with no need for verifying the performance. It solves all the expected problems from the system through a well-planned process, like its ability to improve, sudden breakdown, time stamping, history, privacy, faith, and authenticity. Yes, Blockchain has many advantages, and for that very reason, IoT is using Blockchain more and more, even though there is no way Blockchain can solve every problem in the digital economy, but its role is huge for sure. Blockchain technology affords a guaranteed and trusted measured contractual obligation for IoT users to transmit money or data or any kind of assets without any concern. (Gremban, 2018)

IoT devices will use the sharp-witted agreements to activate message interchanges. With that feature, there won't be any necessity for a centralized dominion. And also, by expanding this deal to include not only individuals but also programs and companies, you will get an entirely administered reliable digital base. Expand understanding of the emerging technologies is one of the major study results, it concerns in particular the Internet of things and Blockchain technologies. The other major reason is to learn how each one of these techniques is managed to provide growth and development to extra technology by succeeding present difficulties and make use of it to the utmost range (Minoli, 2020).

scalability challenges (Rejeb, Keogh & Treiblmaier, 2019). In the end, the most important thing is if the Blockchain technology would be able to stand and support IoT and if by combining with the device it could provide a better solution for the protection system and the scalability challenges.

This study major goal is to deal with the present protection system and the scalability challenges for the Internet of things by compounding with Blockchain technology. This study will also investigate the in-depth perception of the Internet of Things and Blockchain technologies as the first step for its major goal. (Mohanta, Jena, Ramasubbareddy, Daneshmand & Gandomi, 2020) Then it will classify the primary struggles and gaps in the current Internet of Things device by inspecting the printed works.

This study will investigate the significant function of Blockchain concerning defeating and solving the most significant problems as its next step. Moreover, this study gives a thorough analysis of IoT and Blockchain combination with the future and possible benefits for both, the construction, and the current faced problems when using these technologies (Minoli & Occhiogrosso, 2018). Finally, the researcher will suggest a better way to improve and answer the major problems of the combined IoT and Blockchain experience.

1. RESEARCH QUESTIONS

In this study, we will investigate and explore the ongoing problems of IoT and Blockchain, in addition to the possible benefits of their merged use. We will also focus on uncontrollable and disturbing applications in this sector in addition to a check to the accessible Blockchain platforms that approach and solve these hurdles. (Rozell, 2018)

- Research on the Blockchain technology which includes dissecting its features and challenges
- Indications and analyses of the methods of combining IoT devices and Blockchain technology
- Discussion of the subsisting Blockchain, lot platforms, and application
- Feedback and comparison of the performance of different Blockchain in an IoT device
- Abstract environment framework
- Reasons and goals for this work

2. CONCEPTUAL OR THEORETICAL FRAMEWORK

The main question for this research is how the combination of Blockchain technology would be a settlement to overcome subsisting security and forget the subsisting security and scalability challenges of the internet of things. (S A & Umamakeswari, 2018)

The IoT device market is still not controlled. Therefore, security is one of the great worries for it. The problems of this security include the failure to recognize compromised devices, seepage of data, the hackers' monitoring devices distantly. Based on Gemalto, a digital security firm, less than half of IoT business can reveal if any device has been infringed.

Blockchains publicized ledger technology could save against data manipulation. Moreover, if the information is taken part through smart contracts over a decentralized and cryptographically secure Blockchain network, the device can have increased independent functions. (Sequeira & Lopes, 2015)

Rather than requiring third parties to continually observe and notarize every micro translation between devices, the IoT system will be able to operate speedily. Blockchain could also be leveraged to fight hackers by closing compromised devices in an IoT device.

As mentioned, Blockchain is a new area of interest. While some firms have set up experimental programs to study Blockchain application. There are not years of data to study and use as proof points. Not only is trust in technology itself a possible point, but they're also must be a level of responsibility among firms that determine to pursue joint Blockchain ventures. (Viriyasitavat, Xu, Bi & Hoonsopon, 2019)

When start up a Blockchain program, many factors require to be into consideration through the implementation process. Often, it is not as tracking the location of the product. The case of the goods for example, the temperature of mortal food is also critical data to observe. Researchers require to think through how this data will be captured, communicated and planned.

To make a new better system than the current protection system and scalability challenges of the Internet of things by combining Blockchain technology is the central purpose of this study paper. This study will also investigate the in-depth perception of the Internet of Things and Blockchain technologies as the first step for its major goal. Then it will classify the primary struggles and gaps in the current Internet of Things device by inspecting the printed works.

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While we are on the same topic, two revolutionary abstracts with a high effect were introduced by the researchers. First is Bitcoin which is considered to be a virtual digital currency. Bitcoin keeps in existence and value without any backup from any official authority or financial subsistence. In fact, it still exists and working safely thanks to the decentralized P2P network of actors, they are the ones who form an auditable and provable system for the coin. The second and most popular one, that is more recognized and famous than this digital currency is Blockchain technology. It uses an encrypted method to protect data and private information for the users. The Hawk compiler hoard encrypted activities; it's liable for translating the general code designed by programmers into a basic cryptographic. With that it enables users to keep their data privacy in transactions. (S A & Umamakeswari, 2018) In addition to encryption, the Enigma project, divides information into symbols and undefined pieces and then shares in a process that allows no bugs ever to have access to the data in the shared network. It also uses a decentralized series transmission process hash-table (DHT) that is available through the Blockchain to hoard information source.

Nonetheless, people seek to conserve their information security, even when using special Blockchain. For example, the Quorum represents a private-permissioned Blockchain which depends on Ethereum that utilizes cryptography, in order to restrict the permeability of touchy information and division, and thus, it could build information security and evolve it. In addition to that, Multichain combines client approvals to restrict permeability and to present powers over which exchanges are permitted and recognize the clients who can exploit the information. Likewise, Rockchain] is founded on Ethereum and obeys an information- centric strategy, where general measures can be completed in the special information, the aggregate conclusion can be received safeguarding information security. This strategy suggests a shared document framework that permits clients to oversee information security through savvy contracts in Ethereum. Also, Hyperledger Fabric presents a conveyed and adaptable record zeroed in on big market conditions. Hyperledger Fabric presents a self- control assistance tool and an entree control record through private channels where clients can control and limit the admittance to their mutual data in the business to contribute Blockchain network private data control. Because of this technique, public names allow

individuals in the network to know each other, without knowing the partaken data. (Rejeb, Keogh & Treiblmaier, 2019)

3. MATERIALS & METHODOLOGY

This segment explains the methods in detail, methodologies, the reason for this venture's present-day problems of the IoT domain, and an explanation on how to comprehend these issues utilizing Blockchain technology. Not only that but it will also offer help for scientists and researchers to study if the integration of Blockchain and IOTs will be successful for users or it's unbeneficial.

1. We are designed to look through articles and studies on websites such as Digital Libraries IEEE, ACM, Springer, and science directly while utilizing the keywords "Blockchain and IOT", and then we discover various yields.
2. We will focus on those studies we found and examined in the next step as they matched with our pursuit space and we will also arrange them as per their Primary and Secondary nature. Moreover, we will recognize various studies by looking and searching deeply on Google Scholar.
3. To summarize our materials and methodologies approach, we will cover and observe different studies that are related to our searched keywords. And after the abstract and conclusion review, we will eliminate the unessential papers.
4. Various issues will be recognized and dealt with after a thorough examination of the chosen studies. At that point, they will perform as the figures and base for mild knowledge. In addition, they will describe diagrams displaying problems which have been tended to by Blockchain.
5. Through our investigation, we will post only the new studies that were published after 2016. We also attempted to emphasize those papers having high effect operator or references, so the majority shared studies picks were made based on quality Publishers like IEEE, ACM and Springer.

6. PROJECT PLAN

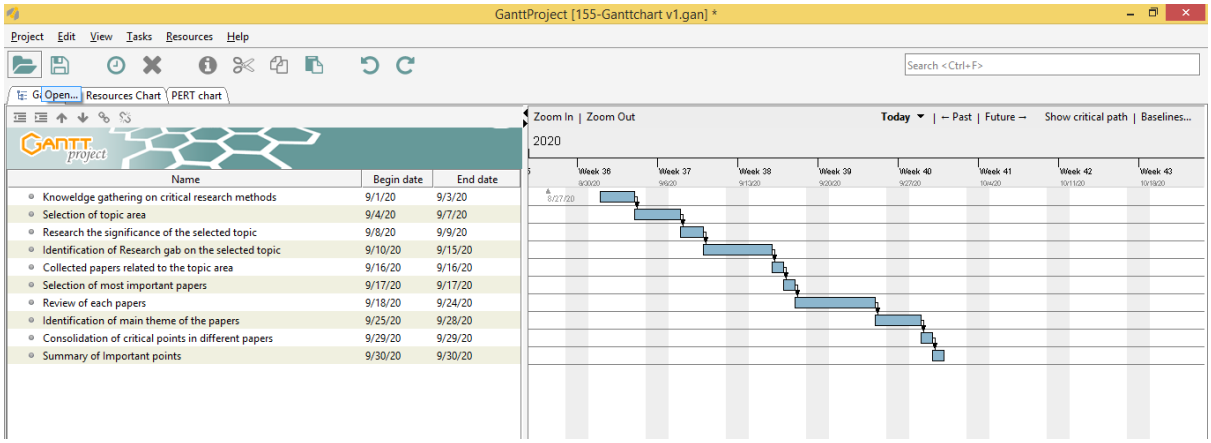
A. Deliverables

- Annotated Bibliography
- Journal Papers
- Report
- Seminar

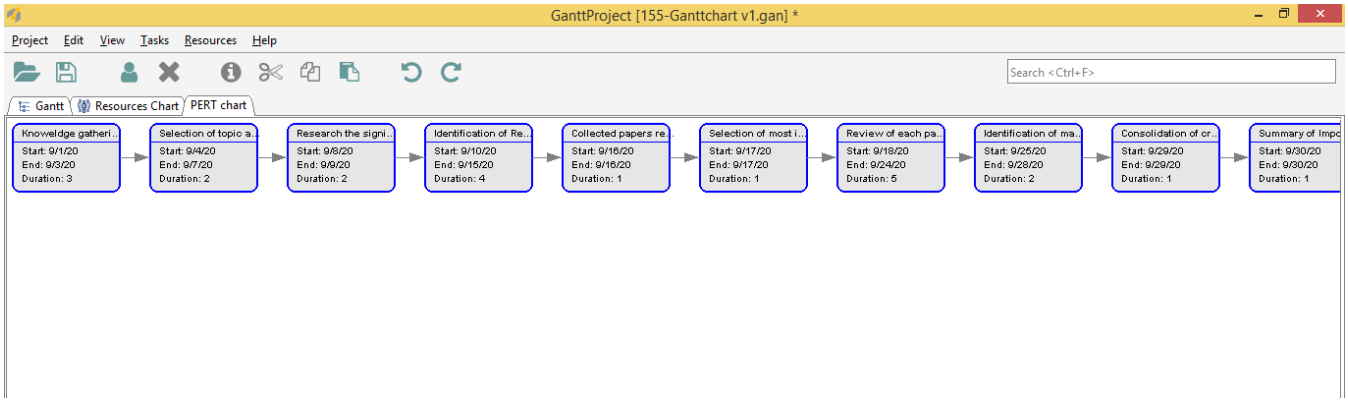
B. WBS

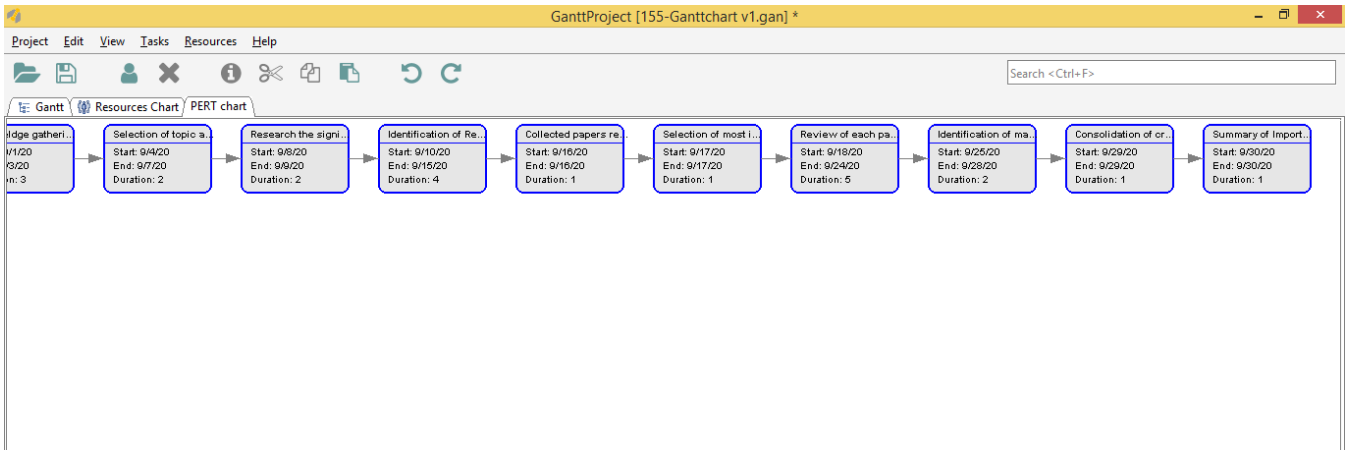
Week	Task
1	Obtained some knowledge about the research, e.g. how to read papers, how to evaluate papers
2	Selection of topic area
3	Research the significance of the selected topic
4	Identification of Research gab on the selected topic
5	Collected papers related to the topic area
6	Selection of most important papers
7	Review of each papers
8	Identification of main theme of the papers
9	Consolidation of critical points in different papers
10	Summary of Important points
11	Documentation

C. Gantt chart



D. PERT Chart





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