

Queensland University of Technology

**“A Research Project on the Application of Blockchain Technology in Healthcare”**

**Project Plan- Research Project**

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# 1. Introduction

The assignment focuses on the study of blockchain technology used in healthcare industries. It would highlight the changes that the technology would provide to healthcare industries including the improvements of the health care systems, increasing the privacy, interoperability, and security of the medical data of the patients. The study focuses on the improvements in recording data electronically and their significant objectives. The study examines the usage of blockchain in the healthcare sector and its influence on the care services to the care users.

Along with its benefits of using blockchain technology, some major risks need to be detected earlier to overcome these risks safely. Blockchain technology plays a vital role in healthcare industries, as securing information is mostly required in these types of industries. The project aims the methods skillfully used by the organizations to provide the approach of using electronic records (Medium, 2018). This technology provides wide implications for the stakeholders in the healthcare industries. Health care industries include hospitals, pharmaceutical companies, and other health care institutions which are industry lowing the blockchain technologies. While using this technology these industries need to focus on the challenges and to provide a backup plan of defensive strategies to protect the information. Hence, the study will reflect the overall aspects of using blockchain technology in healthcare organizations.

## 1.1 Background

With an increase in technologies almost every industry including healthcare, introduces innovative technology to enhance their services. The major aspect of using blockchain technology in healthcare helps in reduction in the cost of the medicines. It is required for recording documents securely to solve the problem of wasting money and time (Forbes, 2019). Deploying the blockchain would highlight the occurrence of a change in the healthcare industries.

With the help of this technology, the patients are provided with benefits on their medicine by reducing the cost or even providing free medicines. The companies related to pharmaceuticals are beneficial in billing and accounting of different orders as well as helps them to provide information about their inventory stocks (Deloitte, 2019). A major benefit in terms of medical frauds can also be seen that are ameliorating the service effectiveness of healthcare organizations.

Although technology is providing help to millions of people and industries that does not mean it cannot provide risks to the organizations. It has become the most popularized technology in recent years. There can be a risk of documentary damages due to certain electrical faults or some external factors that would affect the privacy of these documents (Siyal *et al.* 2019). It has totally changed the methods of working in the healthcare organizations by providing security as well as privacy to those documents, which can be misused illegally.

Comparing the recent use of technologies, blockchain technology has become the most significant technology in healthcare industries. It helps the doctors as well as the whole organizations to provide data as well as information of a specific patient effectively with less consumption of time (Medium, 2018). The overall study focuses on the key benefits of using blockchain technology in healthcare organizations. According to the HIE surveys it was found that the blocking of the information has been popularized which is still ineffective in recent years. For curbing the problem of information, blocking there is an immediate need for a collaborative relationship to be maintained within these organizations along with powerful financial incentives and by increasing the transparency of the actions done by the staffs.

### 1.1.1 Medium of Propagation

* Exploitation of data share ability, security, and interoperability
* Hindrances occurring in multi-purpose authentication
* Need for monetary incentive to make it a mass reality
* Need to standardize universally
* Lack of knowledge among the staffs

## 1.2 Objectives and target deliverables

The project focuses on the major objectives of blockchain technology in healthcare organizations. It provides the importance of this technology as well as its changes in the pharmaceutical companies along with healthcare units. It provides a trustable base to the patients as well as to the staffs and doctors (Deloitte, 2019). In this section, the assignment would provide some targeted aspects, which are required for improving this technology.

The main objectives of this project are to provide ways of using blockchain technologies in

* It provides knowledge about the prototype used by blockchain technology
* To provide security to the documents by using blockchain technology
* To highlight the key requirements that needs to be improved in this technology
* Use of secondary data to capture all the information in the study
* To provide positive as well as negative aspects of using this technology

Hence, the overall project implies the use of blockchain technology to provide in-depth knowledge about the uses and its aims. The project aims in developing knowledge about these technologies among a huge mass of people (Siyal *et al*. 2019). Therefore, the assignment proves to be beneficial in providing proper information about the blockchain technology in healthcare industries.

### 1.2.1AIMS

* To identify the use of blockchain technology in the current situation
* To provide knowledge about the blockchain technology features and its importance
* Identification of the risks and the strategies to overcome it
* The use of a management approach in the study

### 1.2.2 Deliverables

* Taking permission from the assessor after selecting the topic of the project
* Submission of the online agreement after taking the supervisor’s permission on the university portal
* Rectifying the errors after receiving feedbacks from coordinators, assessors, and supervisors
* Planning an exclusive project by providing all the key factors
* Discussing the project topic with the supervisors as well as teammates and maintaining a regular log book
* Developing the exclusiveness of the project
* Choosing the best articles on blockchain technology in the healthcare industry (Medium, 2018)
* Reviewing and gathering of information
* Acquiring knowledge on cryptographic approach applying it in blockchain technology in the healthcare industry
* Providing knowledge about private and public key development
* Developing a professional presentation with a unique representation of graphics
* Submitting the final report

### 1.2.3 Stakeholders

|  |  |
| --- | --- |
| **Stakeholders**  | **Roles and responsibilities** |
| Student  | Gathering knowledge and implementing it in the project |
| Academic assessor | To provide feedbacks and guidelines on each of the assignments |
| Peers  | To provide guidance as well as clarifies the doubts  |
| Project coordinator  | Analyze the project report. |

**Table 1: Stakeholder plan**

(Source: Created by learner)

# 2. Project Methodology

This project is based on the application of blockchain technology in the healthcare industry for elevating the effectiveness of information management system associated with the healthcare industry. This is a research project and for developing this project following considerations will be adopted-

* Development research by considering previous research in this ground
* In this study, secondary data collection will be considered as the method of data collection
* Development of the final project report and presentation on this topic
* Sort-out effective resources in by reading different resources in this ground

# 3. Project management approach

Cryptography can be considered one of the basic building blocks associated with blockchain development. Development of an effective cryptographic coding can help to increase the security of digital communication process, which is the main functional unit, related to the information management associated with the healthcare service. In this project, an effective cryptographic coding will be developed and will be used for a database management system in healthcare industries. In this context, the public key and the hash key will be developed by considering the number of care users.



**Figure 1: Cryptographic process**

(Source: Medium, 2018)

Cryptographic application in the digital communication process can be considered one of the most secured processes of digital communication (Medium, 2018). In cryptography, both sender and receiver use a key for opening the encryption and decryption of a specific message. Due to this reason, without having the specific key the content of massage cannot be hacked. This makes the entire process of digital communication secured. For each particular private key, a particular public key is developed at the beginning of the cryptographic process. Hence, without this particular key, this message cannot be opened. Since the channel of distribution of messages associated with the healthcare industry is insecure, hence the application of cryptographic process can help to elevate the security level.

## 3.1 Results and outcome with scope

This research report will provide knowledge related to the application of the blockchain process in the information management system associated with healthcare services. In order to elevate the effectiveness of this report proper breakdown structure of this project will be provided in this report in such a manner by which project time can be optimized. This report also will delineate the procedure of development of public and private associated with the encryption and decryption process by considering the knowledge associated with this topic from the previous ground. This report also provides knowledge related to the considerations of different procedures at the time of developing hash, public and private key, which can help to realize the process by which the application of blockchain process can be made more effective in healthcare.

|  |  |
| --- | --- |
| In scope | Out of Scope |
| Must Have (70%)ü Researching the applicability of blockchain in healthcare information management procedureü Considering the application of cryptography in development of an effective blockchain processü Development of an effective secondary research-based study (Challenges and benefits)Should Have (30%)ü Development of some effective solutions related to the drawback of application blockchain process in healthcare. Could have (30%)ü Application of an effective comparison between different development techniques of blockchain architecture in this regardsü Feasible application of architectural knowledge associated with blockchain process | ü Development of practical knowledge in the ground of application of blockchain in healthcareü Inclusion of innovative approaches in this groundü Development knowledge related to the alternatives in place of blockchain technology.  |

**Table 2: Scope Priority**

(Source: Created by learner)

# 4. Task Breakdown Structure and Weekly Plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Start** | **End** | **Activities** | **Deliverables** |
| **Increment 1** |
| Week 1 |   | Selection of the topic of the project | Assessor’s permission in this regards |
| Week 2 |   | Supervisor Permission on the agreement of this project | Online agreement submission on university portal |
| Week 3 |   | Development procedure of oral presentations | Rectification of errors in the project by considering feedback from assessor, coordinators and supervisors |
| Week 4 | Week 4 | Development of the project plan by granting all factors associated with this project | Exclusive project planning |
|  **Increment 2** |
| Week 5 |   | Development of a group study period by considering the intervention of the supervisor | Preparation of report after discussion with teammates and supervisor and maintenance daily log book |
| Week 6 |   | Development of structure of the research project | Elevate exclusiveness of this research project |
| Week 7 |   | Consideration of secondary analysis  | Selection of effective articles on blockchain application in healthcare |
| Week 8 |   | Secondary analysis  | Information gathering a reviewing  |
| **Increment 3** |
| Week 9 |   | Review of the entire project by considering outcomes of the meetings and group study logbook.  | Knowledge development related to cryptographic approach and application of blockchain in healthcare  |
| Week 10 | Week 11 | Development further rectification | Especial knowledge related to public and private key development |
| Week 12 |   | Development of presentation | Development of professional presentation by considering an exclusive graphical representation  |
| Week 13 | Week 13 | Submission of the final report | Final submission of the report |

**Table 3: Project Breakdown Structure**

(Source: Created by learner)

# 5. Communication Plan

Communication planning can be considered as one of the pivotal factor associated with project management. This can help to elevate the effectiveness of project management by developing exclusive knowledge sharing environment by involving project management team members in effective interaction process associated with entire project management planning (Siyal *et al.* 2019). Application of effective communication planning always requires proper identification of each communication activity associated with the stakeholders and project management process. Communication plan also defines the result of each communication process, which can help to elevate the effectiveness of the project management process.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | purpose | Method | Occurrence | Participants | Result |
| Meeting  | To develop the approach associated with the entire project development process | Face-to-Face conversation | 2 Days in a week | Students and project supervisor | Development of the effective logbook by considering the findings of this meeting |
| Group study  | To increase knowledge of team members by creating a knowledge sharing environment  | Development of proper schedule for meeting | At least thrice in a week  | Students | This will elevate knowledge of each participant in this project which is necessary for increasing project effectiveness |
|

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Analysis and rectification of feedbacks |   |   |   |    |

   | To increase the knowledge and skill of team members | Via email | Twice in a week | Team members, project supervisors | This will provide a chance to rectify errors which will be beneficial for this project |
| Telephonic conversation | To consult different issues associated with this project |  A phone call to each member and by making a telephonic conference  | According to the necessity of the project | Student and supervisor | Sudden issues can be solved more effectively |
| Industry visit and telephonic conference with the health professional | To assess the present situation of the information management process in healthcare | Phone call | Every week | Student, supervisor | This can help to make elevate the knowledge related to the information management system, which is used in the healthcare industry presently. |
| Review Session | To analyze the feedback associated with the activities of team members | Face-to-Face | End of every two week | Students and Supervisor | This can help to rectify errors associated with the group performance |

**Table 4: Communication plan**

(Source: Created by learner)

# 6. Potential project risk and risk mitigation strategies

Development of project management planning by considering risk mitigation strategies can help to elevate the effectiveness of project management planning. This can help to realize the likelihood associated with each risk related to a specific project. An effective risk plan has been provided below which considers different risks associated with a project by which this project can be made more exclusive. This can help to take effective steps in order to develop required strategies to reduce the rate of risk in future.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ID | Risk | likelihood | Impact | Mitigation plan |
| 1. | Ineffective planning of the project | High | High | The planning needs to be discussed with assessor, coordinators and supervisors for rectifying the errors associated with the planning  |
| 2. | Improper collection of resources | High | High | Collection of resources by consulting with supervisor and by considering the background of the author |
| 3. | Improper scheduling and attendance of the participants in group tasks  | Medium | Medium | Consideration of the necessity of each operation associated with the project before selecting the timeline.  |
| 4. | Ineffective conversation among the stakeholders of the project | Medium | Low | Development of proper communication channel among the members of the project by considering available options |
| 5. | Lack of involvement of supervisor in the project | Low | High | Develop effective relationship with the supervisor and to maintain a regular connection with the supervisor  |

**Table 5: Risk management planning**

(Source: Created by learner)

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