CHAPTER 1
INTRODUCTION

In this chapter, a brief explanation regarding projects background and other related component for detailing project proposed will be explain.

1.1 Background of Study

In this era of advanced technology, there is a technology that has been the talked of town since January 2009 that was invented by Satoshi Nakamoto. Bitcoin was invented using the concept of peer-to-peer electronic cash system that uses cryptography. Thus, create a new path for cybersecurity to protect their sensitive data by using the blockchain, which is the main concept behind most of the crypto currency available now.

Besides cryptocurrency, blockchain have also slowly making its way into other fields such as crowd funding, voting system, charity, networking and the internet of things, etc. There are many other fields where the technology of blockchain is implemented to further enhance its security and data management.

This project will be focus on more about how the blockchain technology can help to secure the digital asset by providing immutability, transparency, availability and validate the integrity of the digital asset. With blockchain, it allows data or information to be distributed but not copied throughout the network. Not only that, the data cannot be corrupted, because altering any information on the blockchain would mean override the entire network which will cost a huge amount of computing power. This is because, a block in a blockchain contained the hashes of the previous block and the block is distributed across all the nodes. Every time a new block is created, the nodes in the network will verify whether the block is valid before adding it into the blockchain.

1.2 Problem Statement

Conducting an examination is important in every learning institute such as school, universities, colleges, or even in working environment for recruitment purposes (RAMU, 2013). In schools and universities, to evaluate the student learning outcomes, they are tested with examination or projects based on their respective course (Alice, 2013). Each schools or universities have their own ways managing this examination process, whether using a manual method such as written test, oral or an online examination.

For the purpose of this project, the focus will be on the drafting process of an examination paper system. Before the examination paper are finalize and chosen to be use in the examination, the lecturer in charged need to create the examination paper and the answer scheme and then submit it to the vetter. If the vetter rejects the first draft, the lecturer need to create a new examination paper and answer scheme and resubmit it again. But if the vetter accepts the first draft, the examination paper will then be forwarded to the coordinator (Noorwahida, 2016). The figure 1.1 below shows the flowchart regarding the procedure for the preparation of final examination paper in Universiti Teknologi Mara (UiTM).

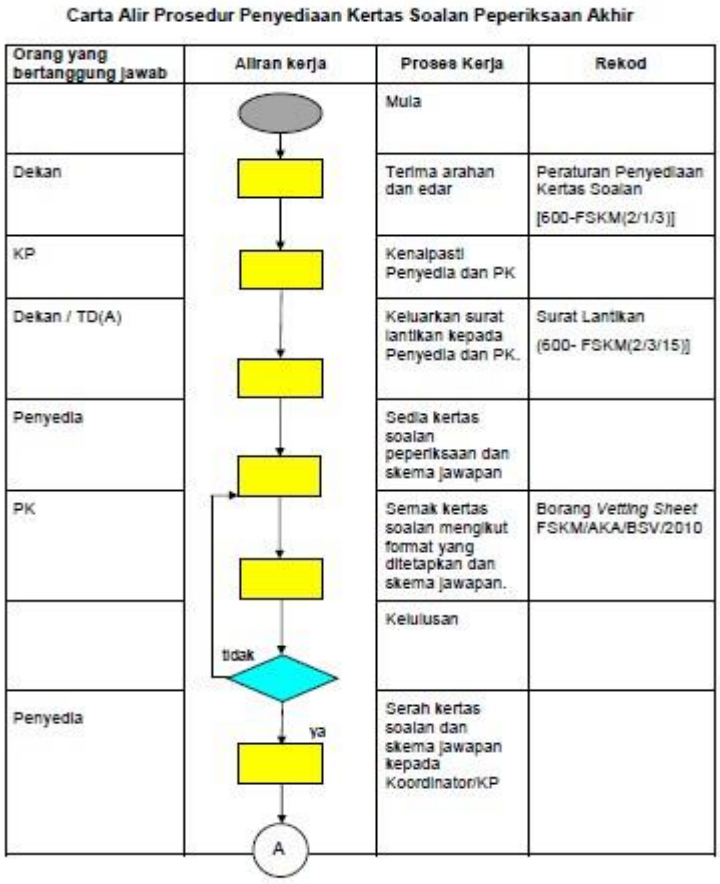

Figure 1.1 Final Examination Paper Procedure

The current trends of handling the draft of the examination paper physically or storing it digitally inside a thumb drive poses a lot of threat and weaknesses such as the paper might be misplaced or lost during the process, stolen and modify or leak by unauthorized person. If the unwanted incident did happen such as question paper leakage, the lecturer need to draft a new examination paper by following the procedure as mentioned previously which is time consuming. Not only that, the credibility, quality of exams and as well as reliability of the results might become questionable (Munir, 2014).

1.3 Project Objectives

The objectives of this project are as follow:

a) To design and develop secure exam question management system based on blockchain technology.
b) To evaluate the effectiveness of the system in term of security.

1.4 Scope of Project

The focus of this project is to secure the examination question paper that are in pdf format using the blockchain technology, which it will store any critical information about the file inside the blockchain. The system will use the Rinkeby (Ethereum Testnet) as a platform to deploy the smart contract, as it is an open-source and public (Dannen, 2017).

There are three targeted users in the system, which are lecturer, vetters and Hal Ehwal Akademik (HEA) staff for the purposes of uploading a file and sharing the files with other user to be view, download and print. The system will use an Ethereum Test Network instead of the main network as it is expensive to make a transaction and it will require a real ether for any transaction created by the user.

1.5 Significance of Project

The significance of this project is that it provides a more secure platform for the users to manage the exams paper and store it as the project use a distributed file system, which will guaranteed the availability of the service because there is no central database to host the file. Not only that, because it used the smart contract that were deployed to the Rinkeby (Ethereum Testnet) as a platform to store critical information about the files, therefore the probability for the data to be tampered is almost zero because all the nodes need to be compromised for it to happen. The sender and owner of the file can also be verify to avoid any impersonation or imitation from irresponsible personnel. Furthermore, the system prevent a spamming problem from happening, as any transaction made by the user will require a confirmation and ether.