CHAPTER 5
CONCLUSION, LIMITATION AND RECOMMENDATION

Secure Exam Management System or SEQM was developed to fulfill the need of user that wanted to securely share their files without storing it in any centralized database. In the previous four chapters, the methodology of the system, development and testing phase have been discussed in details. With that, in this chapter, it will conclude the report of this project and discussed about the limitation of the project and the recommendation for any enhancement that could be made for future works.

5.1 Conclusion

SEQM was successfully developed and had met the aim and objectives of the project by providing a decentralized web application for file sharing using InterPlanetary File System (IPFS) and Ethereum blockchain. The objective of this project is to design and developed SEQM based on blockchain technology and test it performance and security. While the aim of this project is to satisfy the needs of user to upload the files to the IPFS, store the hash generated by the IPFS inside the Ethereum blockchain and share the hash and transaction receipt with other user.

Through the development of this project, all the objectives have been achieved. This can be confirmed in the previous chapter where the testing for uploading file, viewing the file, sharing and receiving the file hash. For the testing of the blockchain part of the system, any transaction made by the user including deploying, storing the file hash and sharing the file was done by the Rinkeby Testnet where the result can be seen at https://etherscan.io/. By providing either the smart contract address, transaction hash or the user metamask address, it will show the receipt and all the transaction made by the address respectively.

From this project, the developer has gained a whole new knowledge about the development of decentralized application, InterPlanetary File System (IPFS) and the Ethereum blockchain technology where it is a lot more than just a crypto currency.

Developing a decentralized application based on blockchain technology, without a doubt has shown that there is a lot of enhancement that can be implement in the current technology for storing data securely.

5.2 Limitation of the Project

The limitation of this project is that it require user to have a Metamask account for login and connecting to the web, which is quite, inconvenience. The web application also does not support any user registration and login to the system, which result in lecturer, vetters and HEA stuff need to have Metamask account to use the system. . The file that was uploaded to the IPFS is not entirely secure unless the users encrypted it beforehand. The user also need to know the recipient address in order to send the file hash and transaction hash.

5.3 Recommendation

Throughout the development of the SEQM, all the basic functions needed by the user have been accomplished to achieve the main objective of this project. This has opened a lot of room for enhancement that could be made to make the system a lot more secure such as by including an encryption function during the process of uploading the file to IPFS. This is to prevent any irresponsible personnel from viewing the file. Even though the directory of the file has been hashed by IPFS, it is still possible for irresponsible personnel to guess the hash of the file. Therefore, this could be the suggestion for the future of work to provide an encryption function to the system.

The used of only Metamask to access the web application is quite cumbersome and inconvenience as the user need to know the recipient's Metamask account address to send the file hash and the transaction hash. Therefore, for the suggestion of future of work is to provide a registration and login function to enable user to use their username or email to represent them and accessing the web application. Actually, the

SEQM has tried to implement this function using the truffle box boilerplate code for authentication but it encounters a runtime error when the other functions were added.