TOAST: A Trustable Online Job Application System with Blockchain Technology

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Abstract — **The trustability of digital data is always one of the main problems during the digitization process. Whatever in e-payment, data storage and digital signature, it is difficult to avoid data modified by unauthorized users. Taking the benefit of a large peer-to-peer network and cryptography algorithm, it can avoid the public ledger data being an unauthorized modification by a part of users. The blockchain technology is the main technology behind the protection in the cryptocurrency. Some of the blockchain platforms provides not only the public ledger services but also a programmable blockchain platform. (Buterin, 2014) The blockchain technology and distributed network will protect the state of contract and the data stored on the contract. Based on those technologies, we propose a secure and simplified way for creation and maintenance of the digital certificate while this system can be automized for job application.**

Keywords — *Blockchain, DApp, Cryptography, Smart Contract, Digital Signature*

I. INTRODUCTION

TOAST full name is A Trustable Online Job Application System with Blockchain Technology. It is a job application system based on the trustable data protected by blockchain technology. The digital certificate in TOAST can be traceable, linkable but cannot be modified. Based on those the property of the digital certificate, we can automize the conditional checking in a secure way. So that it can optimize the process for a job application and increase efficiency.

II. DESIGN/METHODOLOGY/IMPLEMENTATION

Besides developing a tool to create the digital certificate, there are 4 new techniques to enhance user experience and security which include no password authentication handshake, hybrid digital certificate protection conditional checking on smart contract and extendable structure design. Those techniques can increase the security level on the certificate, user convenience and the applicability based on TOAST.

A. No Password Authentication Handshake

A new two-sided authentication handshake by using the digital signature and checked with the data on Blockchain. Both client and server will be challenged to show the ownership of account private key. With this authentication handshake, there is no password required to access the server resources.

B. Hybrid Digital Certificate Protection

A combination of using the digital image to protect the information digital certificate while the image file is protected by the file hash value stored on Blockchain. Also, using the computer vision to ensure the image is related to the certificate(object detection and optical character recognition function powered by Google Cloud Vision).

C. Conditional Checking on Smart Contract

To ensure the conditional checking cannot be modified by the unauthored user, the full conditional checking for the conditional offer is done within the smart contract. Therefore, the conditional also protected by Blockchain technology.

D. Extendable Structure Design

The extendable structure design allows other application to cooperate with TOAST. Even the job application service itself is an off-chain service. With the data protected by blockchain technology, the use of TOAST is not limited only for job application. It can also be used for competition application, the college application or tracing the workflow.

III. EVALAUATION AND RESULTS

The result of building the TOAST system is a success. TOAST allows the user to add the pre-requirement on the certificate and offer so that it can work like a sub-smart contract inside the TOAST smart contract. Also, the user accesses the external service such as the job application server can be without any password and security level is not decreased. Now, TOAST can support one-click apply job function. Finally, it is a tool that can simplify the job application procedure.

Based on the rough interview, we can confirm this product can help the user reduce the problems caused by the physical certificate. However, there are currently some large free hiring platforms in Hong Kong. They have similar functions like quick apply but it is a centralized service and not all the company support that kind of function. Also, they own a large user-base and job position so that it is difficult to attract user without the security reason. Therefore, the next steps are to increase the user knowledge on Blockchain and increase their security awareness on their data.

IV. CONCLUSION

TOAST has been developed although there are still have some functional problem can be improved. The cost of using TOAST to protect our data is not very high. It already is a reasonable and acceptable fee. Also, extendable design let TOAST can support not only the job application process. What people need to do is only join the blockchain and get the benefit from a decentralized platform. One click applies for the job, programmable digital certificate and no password login. Those are the benefit of getting from the blockchain. Those are the benefit provided by TOAST services.

REFERENCES

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