**INFORMATION SYSTEMS SECURITY**

**ASSIGNMENT 6**

RESEARCH PAPER REVIEW 2

**Topic:** Gamified service exchange platform on blockchain for IoT business agility

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In the past few years, IoT is being largely used by people in various fields. Despite of having numerous benefits, IoT also has a few drawbacks which are challenging to overcome. One of those challenges include IoT solution providers being unable to easily adjust and modify their solutions according to the market dynamics.

Previously, efforts have been made by other researchers to improve business agility by customizing and tying up the hardware and software from commonly shared and accessible resources owned by other solution providers. Author has briefly described work that has been done by fellow researchers. All such efforts have been mostly made by using centralized cloud services which allows IoT vendor to export and import data from 3rd party to exchange data among diverse networks. Few flexible architectures have also been proposed to allow distributed applications to be deployed on IoT networks. In few cases, solution providers are able to exchange data over cloud servers. Other than that, decentralized architecture has also been brought into attention i.e. to allow peer to peer exchange of data on blockchains, but its main focus is to work on the growing concerns of trust and privacy.

All previous works, either centralized or decentralized architecture, have mainly focused on connectivity and exchange process without being concerned about the effect it will have on the business goals. Decisions about sharing data and providing services need to be made in such a way that they align with the business plan and market dynamics. To address this issue and bridge the gap between business and technology layers, author has proposed a concept of decentralized gamified Service Exchange Platform (SEP) based on blockchain.

Gamification techniques are widely being used to help people and organizations to achieve their goals and in return, it gives a boost to user engagement with IoT devices. Author has proposed the idea of taking advantage of the gamification technique and applying it at application layer. This will provide solution provider a platform to request and offer services in an independent peer to peer form. Since intelligence is being added more in devices these days, it might be used to make decision-bias in response to an action where it increase the advantages for the business of solution provider. Author’s motivation to lay down the concept is to allow autonomous automatic peer-to-peer service exchange, and relate decision-making process directly to the business goals.

Moving on, author gave an overview of the Service Exchange Platform (SEP). Author explained that the core purpose of SEP is to create trust among entities, to agree on common rules and exchange services without the need of a 3rd party. In addition to that, it allows to implement gamification approach between the entities. Moreover, author has stated the assumptions that have been made. One is, that the entities have a strong communication network between them and all entities are generalized IoT service provider. Furthermore, entity stack layers are linked to blockchain oracles, which helps in invoking contacts to exchange services, transfer tokens and make decisions about whether to use internal or external resources based on parameters received from the business layer. Whereas, business layer forwards the price, rewards and service duration to oracle. As the facilitator of peer-to-peer exchange of service and value, blockchain technology is used. The proposed SEP architecture is not dependent on the blockchain framework and can easily be implemented on any blockchain which supports smart contracts.

Author has then described the services and requests in detail. Few of them are that all entities have the option to request and offer services which are initiated by IoT stack. Moreover, each service can have datasets and functionalities offered by IoT stack. Offering a service is a 2 stage process. The details of these stages is mentioned in the paper by author. In addition to that, author as described the requesting of service as the cheapest way of calling IoT stack requirement by doing comparison of cost of available SOs and cost of using internal resources. For further explanation, author has added a figure and some mathematical explanation. In conclusion, author states that if the cost of addressing an SR externally by a SO is lower than the cost of using internal resources, then the SEP smart contracts are used to form a contract automatically and begin delivery of service online or offline.

In a nutshell, the concept of platform based on blockchain to exchange services using gamification has been proposed. If implemented in future, it can be beneficial to both the SO and SR. Via price management and retention of customers, this could increase financial benefits for SO entities. Moreover, it could also support SR entities by collecting credit for the reuse of a service and enhancing business agility.