# Abstract

Proposal for constructing method of IoT platform business

－Clarifying value using service function deployment－

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　　This research deal with IoT platform business in manufacturing companies. Manufacturers have a lot of existing facilities and devices. They have value creation potential since they can be incorporated into the IoT platform. This study proposes a design method for IoT platforms. In this research, IoT platforms are assumed to include hardware devices and software.

　　In the manufacturing industry, it becomes crucial to make a profit due to the progress of commoditization. To get out of this situation, we need to create additional value from data in manufactured devices. In recent years, information technologies such as IoT, AI, Big Data are advancing increasingly. Additionally, platforms utilizing information technology have been built. From the standpoint of the manufacturing industry, although using existing devices is effective, it is not easy to balance additional sensors and benefits. Also, deploying to multiple services instead of a single service, the provided value will be improved. However, increasing demand makes decision-making difficult.

　　The main objective of this paper is to support decision-making for constructing IoT platform business. It requires a design method and an effective model to build IoT platform business. This paper surveys existing platforms to make a model creating value from data. A design method is proposed by using the model. Finally, this paper evaluates the method to confirm that the proposal is achieved.

　　IoT platforms have many stakeholders and components. To identify them, examining the cases of existing IoT platform business. This paper proposes a model from these results. This model has stakeholders, components, and additional value layers. The layers have business, service, function, and technology layers. Using these layers can conduct creation value from data.

There have been many papers on designing IoT systems and designing platforms. However, there has been little research on designing IoT platform. This paper proposes a design method for IoT platforms. This method uses the model given above. It focuses on services and analyzes value creation. This paper calls the method "Service function deployment".

An experiment is conducted to evaluate the proposed method. It has a comparison of two methods. One method is "Service function deployment", the other is a class diagram. A class diagram is a famous method for structural design. Participants of the experiment are ten people. Eight people are designers. 2 people are evaluators. The designers use templates to design platforms and evaluate methods. The evaluators confirm completed templates and evaluate them from the management's point of view. "Analytic hierarchy process" is adopted as the evaluation method.

In the designer's perspective evaluation, a class diagram superior to "Service function deployment" in terms of almost all. Designers tend to prefer a class diagram for design. In the management perspective evaluation, "Service function deployment" is superior to a class diagram in terms of attractivity. Because "Service function deployment" enables clarification of value creation from data.

In conclusion, "Service function deployment" enables IoT platforms to create additional value. Although "Service function deployment" is adequate for decision making, a class diagram should also be used in another phase. In the designer's opinion, a class diagram is an effective way to get a bird's eye view of the entire design. In future research, a proposal that mixes the two methods is needed.