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Application to the Development of the Internet of Things (IoT) Business Models -A Simple Approach for Business Models

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Abstract

The research proposes a simple design approach for models of business and continue to design the theories of the models of business in the style of research, that enables the corporate businesses to generate new values of business, while making the utilization of IT. The analyses of the value of business that is generated by IT, and making the designs of the models of business, that continuously provide the value of business, would be a certain possibility. The application of the proposed method of research into the Internet of Things (IoT), that uses the technology of sensing as well as Global Positioning System (GPS), was assessed for the productivity. In the environment of fast changes, it is quite difficult to make designs of models of business in a sequential development process. The designs of the models of business necessitate an innovative approach to value-leading, that is for identifying the processes in IT, for creating services and products that are more valuable than the cost of the resources. This is done by continuous assessment, and garner knowledge in a short span of time, about the models of business, that are perfect matches to the scenarios of business, and move very close to the target of business. The research proposed a simple design approach for models of businesses, that generate value through the methods of design of the model of business, using approaches that are based on IT. The proposed research would be applied to the design of the models of business of Internet of Things (IoT), and assessed for productivity.

Keywords : models, Internet of Things (IoT), Global Positioning System (GPS), value-leading, and productivity

Introduction

The research introduces the process of generation of models of business towards a methodology of the development of models of business. A canvas of the model of business is used as a technique of the generation of models of business. A canvas of the model of business comprises of proposal of value, four areas of customer, funds as well as infrastructure. This procedure makes it difficult to envisage or make a concrete assessment.

The research also introduces another simple design approach, that could be similar to a 'fail-fast' approach, where the target is to minimize loss by highlighting the value for customers, making the development of products in repeated and short cycles, and create minimum viable products as well as garner feedback from customers, through a feedback loop. It is however not feasible to be used as a methodology of design for a model of business.

Objectives of Study

The study proposes the development of design of a 'fail-fast' approach methodology for models of business, with the following targets in mind :

a) A fail-fast approach for models of business that is based on values
b) A system that could transform IT into business value, that could be transformed from IT under an unreliable environment.

Methodology

The study proposes different ways of utilizing the 'fail-fast' approach for development of models of business.

a) The models of business with the framework of 'fail-fast' approach :

In this case, the models of business target for the generation of new values, using IT, and attain the target of business, that is set by a corporate business. By using the process of modularity, the models of business are classified into architectures of business as well as architectures of systems, that assist in grabbing the necessities in maximum entirety.

b) The ‘fail-fast’ procedure for models of business :

The models of business in the quick changing scenario of business, pose challenges in basic design. There is considerable problem in forecasting a model of business, and the value that it could possibly provide, because of a number of unknown elements. The most unavoidable circumstances are the repetition of the experiments and workouts. The design of the model of business makes the advance towards the ‘fail-fast’ concept of the repetition of experiments and workouts, in a very short span of time, and makes the design of a hypothetic model of business, that is nearer to the target of the business, and makes a refined advancement to the model of business. This advancement leads us to propose the ‘fail-fast’ procedure for the models of business with the base as ‘fail-fast’ start-up. The fail-fast method of design comprises of a design method that is two-layered with the starting design of the model of business that raises the hypothetic model of business and the detailed design of the model of business, that makes the refinement of the hypothetic model of business, in stages, for the actual setting up. These stages are performed by the repetition of the value of extraction of business, using the aimed IT generating hypothesis that generates the value of the business, as well as the assessment. The process of the design lowers the expenditure of design, since it permits the design of a model of business with flexibility that attains the target of the business.

c) System model canvas and extended business model canvas :

The study proposes two forecasting models for the architecture and the system of the business respectively. The system model canvas permits an association with the target of the system. The target of the system could be set into the structures of the value target of the system, cost target of the system, as well as profit target of the system, and each target is associated to the structures of the system model canvas. The extended business model canvas not only makes an extension of the business model canvas, but also identifies the concerns of the architecture of the business, along with the associations of the targets of the business. The target of the business could be set on the profit target, cost target, as well as the value target of the business, and each target is associated with the extended business model canvas.

d) Initial value analysis and the conversion of the value of IT :

The initial value analysis of the starting of the design of the model of business, is the procedure that transforms the IT into value. It is managed by drawing out the aimed IT of a model of business, and identifying the value of the business and the value of the system for the usage of the IT. This initial value analysis permits to scrutinize the IT that a model of business utilizes as input for design, and the value of the business that is generated by the usage of the IT.

As a method of conversion of a model of business that uses IT into a value of business, the idea of Needs Seeds matrix, is utilized, that is a method of Needs Seeds transformation for extracting ideas for the development of new products. The conversion method of Needs Seeds transforms the seeds of the technical characteristics of the product into the advantages and the operations for transforming to the value of the customers, and pulls out the present-day needs of the customers in a recurrent way. For the transformation of the seeds to needs in the Needs Seeds transformation model, the IT is set as seeds, and the value of business is set as needs. In this way, the study makes the application of the Needs Seeds transformation model, as a value transformation model from IT to the value of the 'fail-fast' procedure of design for models of business. The matrix of Needs Seeds proves to be the base for the Needs Seeds transformation method. So the 'fail-fast' procedure of design of a model of business, is known as one of the IT value matrices. The IT value matrix could examine the operations from the IT that has been pulled up, the value of the system of pull-up from the examination of the organization of the functions, and the value of the business from the examination of the organization for the value of the system.

The transformation process of the value of IT causes the transformation of IT into value, by the recurrence of the transformation process, that is achieved by the extension of the value matrix of IT. In order to stop the process of transformation, an assessment is made of the level of performance towards the targets of the systems and the targets of the business.

The design of a hypothetic model of business is essential for the generation as well as the providing of the value of the business and the value of the system, that are pulled in the value matrix of IT, during the transformation process of the value of IT. The value of the system pulled in the

value matrix of IT, enables the designing of the architecture of the system, using the system model canvas. The value of the business pulled in the value matrix of IT, enables the designing of the architecture of the business, using the extended business model canvas.

Finding and Analyses

a) An application framework :

The study proposed a method for the designing of a model of business using the Internet of Things (IoT). It is necessary to make the application of the design process of the initial model of business, to the models of business in general, and make the design of a hypothetic model of business of the Internet of Things (IoT), for the post-sales services of the business. The business aspires to generate a new model of business, taking advantage of the Internet of Things (IoT), in post-sales services, for making delivery of the value for customers. The participants of the post-sales services expect to derive from the new model of business, the advantages of IT, that include sensing, data analyzing technique, network of mobiles and Global Positioning System (GPS). The post-sales services strive to acquire the vision of the business, and that requires the diligent execution of the following steps :

i) The design of an architecture of business, that could consistently generate and deliver the pulled up value of business

ii) The design of an architecture of system, that could consistently generate and deliver the pulled up value of system

iii) The necessary modification of the target of the business and the target of the system, that could be achieved by the model of the business from the vision of the business

iv) Make an assessment of the architecture of the business and the architecture of the system on the designed hypothetic model of the business

v) Pull out the participants of the IT, and also pull out the value of the system as well as the business, that could be generated by the IT

b) A design of a model of business :

i) The Method

In order to utilize IT in the design of the model of business, utilizing the matrix of the IT value, a brainstorming session of the participants was conducted, for the extraction of the initial views. This provided the opportunity for open discussions among participants for sharing views and making innovative suggestions. In our study, the design team of business comprised of five participants and two facilitators.

ii) The Modification of the Targets of Business and System in the Framework of the Vision of Business

The target of the business could be determined by examining the target within the framework of the vision of the business. The vision of the business is initially finalized as a strategic target of business. The target of the business is further modified in sub-targets, like Target Cost for improving the service profit ratio, Target Profit for improving the sales of service, and Target Value of Business for augmenting the quality of service for the customers. In accordance with the modifications of the target of business, the target of the system was also modified to make the delivery environment of the service. The system target was divided into three sub-targets, as Target System Cost for operation within the charge of the usage of the system, Target System Value for utilization of data by more sophisticated machinery, and Target System Profit for augmenting the charge for the usage of the system.

iii) Value Examination of System and Business Availing of IT

The matrix of IT value helped examine the value of the system and business, that utilizes IT, that is extracted on the business of the Internet of Things (IoT).

The participants of IT are listed on the matrix of IT value. There is further pulling of smart devices, networks of mobiles, Global Positioning System (GPS), cloud and sensing that enable the utilization of the data by more sophisticated machinery. With reference to the listed participants of IT, the study extracted the functions of each IT participant, and the same were listed on the matrix of IT value. The operation includes the garnering of the data of sensing from the networks of mobiles and the Internet of Things (IoT) as well as the collection of data of the business from remote locations. The result of the examination of the generated value of the system, by the functions that are pulled up, with reference to the target value of the system, is listed on the value of the matrix of IT. Two values of the system are pulled up for the attaining of the target value of the system of the utilization of the data by more sophisticated machinery. The result of the examination of the generated value of the business, by the functions that are pulled

up with reference to the target value of the business is listed on the value of the matrix of IT. Two values of the system are pulled up, for attaining the target value of the business for augmentation of the quality of the service for the customers. After designing a hypothetical model of business, the degree of contribution of the pulled up values of business is evaluated. The degree of contribution is the impact of the contribution to the target value of the business, and is normally assessed in three phases, as 'below expectation', 'meets expectation', and 'above expectation'.

iv) A Simple Design of the Architecture of the System

The system model canvas enables the design of the architecture of a system that could generate and deliver the value of the system needed for the operation of the business. We need to select the user of the machinery of the business, who should be preferably from the side of the manufacturer of the machinery required for business, and should also be a user of the system that provides the value of the system. Next it is necessary to develop the location indicating system. Thereafter, it is necessary to select the provider of a network, for providing the environment of the transmission of data for garnering the data of the condition and the location of the machinery of the business. For the structure of the cost, the data for the operation and development cost of the systems of information is pulled up, along with the cost for the transmission of data. These three components of the system model canvas helps make an optimum design of the architecture of the system.

v) A Simple Design of the Architecture of the Business

The extended business model canvas enables the design of the architecture of business that could generate and provide the value of the business, based on the location, abnormal function and safety. A corporate or individual user is selected to whom the value of the business of the safety is provided. In order to enable the customer segment to enjoy the value of the business, an Internet Service Provider, a provider of e-mail, as well as the monitoring center as a business channel, were made the necessary values of the provision of business. For the benefit of the segment of the customers, a monitoring service was pulled up, and provision was made for notifying the customers through any channel of business about any malfunctioning or abnormal incident. Regarding the structure of the

cost, the charge of the monitoring service was collected from the segment of the customers of business, and the profit realized. These identified components of the extended business model canvas help make an optimum design of the architecture of the business.

vi) The Assessment of a Model of Business

The architecture of system and the architecture of business are assessed with feasibility, sustainability and value, that are utilized in the design of the business and in the design of the system. The feasibility and the sustainability are assessed from the design of the system model canvas and the extended business model canvas. The assessment of the value of business is based on the degree of contribution to the target of the value of the business, whereas the assessment of the value of the system is based on the target of the value of the system.

vii) The Improvement of a Model of Business

The assessment of the model of business helped to examine the scope of the improvement in the model of business, for meeting the target of the business. The participants could face difficulty regarding sustainability and feasibility in the execution of the operations. In such cases, there could be a scope of the re-designing of the architecture of the business, by making a detailed review of the extended business management canvas.

Discussion

The proposed method has been scrutinized from the angle of corporate management as well as the designer of the model of the business. The factor of assessment of the corporate management comprises the nature of the delivery of the model of business to the target of business. The proposed methodology makes the assessment of the value with the target graph, that is the degree of delivery of the target, to the designed model of the business. So this makes it feasible to the corporate management to making precise decisions in the implementations of the model of business.

A few designers of the models of business, while utilizing IT, would resort to experimenting. The study, however, permits the generation of IT, that could prove to be advantageous, in the model of business, and could logically examine and bring about the values of the system and the business. It would enable the designing of a model of business that has an augmented viability, depending on the value.

Limitation and Future Scope of Research

In the assessment of the proposed methodology, it was observed that the process of value-conversion of IT and the value matrix of IT, the factors that were pulled up, included, networks of mobiles, Global Positioning Systems (GPS), as well as data analysis, as used in the business of the Internet of Things (IoT). The examinations of the operations of these technologies identify the outline of the system model canvas and the pulled up value of the system and the business, for the operation of certain functions in a methodical fashion. The proposed method of the study could evenly transform the IT into the value of the business and the system.

The study indicates the uninterrupted augmentation of the initial design of the model of business, with reference to the values of the business and the system that are pulled up during the process of the transformation of the value of IT. The proposed study could also design any model of business for any operation, by the architecture of the business and the system. So it is observed that the proposed method is the most useful in the event of the initial model of business, being unable to house the diverse features of the business in the fast changing of the environment of business.

It was mentioned that the business model canvas delivered the forecasting method of the model of business and the fail-safe method delivered the procedure of the development of the business. The delivery of the method of design of the model of business, could create the value of the utilization of IT, that could not be delivered. However, the proposed method could deliver an uninterrupted way of designing a hypothetical business in a progressive fashion, with the transformation process of the value of IT and the matrix of the IT value. As such, the proposed study delivers the technology of the design of the model of business, necessary in the fast changing scenario of the business.

Conclusion

The study has proposed a fail-fast approach to the designs of the models of business that generated the recently developed value, taking advantage of IT, that plays a significant part in the management of corporate affairs. This proposed approach to design, permits the design of the models of business, by way of reiteration of the design, that is value-leading in nature, in searching assessment, learning, manner, and its generation in phases. The proposed approach to the design of the model of business in the environment of the Internet of Things (IoT), is successful in the design of post-sales services of business, and the assessment of its efficiency.

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