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Value Operation: Linking Value in New Business Model Creation Process

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Completed Research Paper

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Abstract

Enterprise engineering is a discipline concerning designing and modeling an enterprise system. On creating a new business model, we can start from scratch ideation, or conduct innovation, manipulation, etc. of the current, existing business model. New Business Model Creation Process is a framework to conduct business model manipulation to create a new business. However, one of the seemingly important aspects of business is lost: Value. This research attempts to create a framework of Value Operation and link it into New Business Model Creation Process, using the concept of e3value. This paper will explain the literature review related to this work, the methodology, the demonstration of this framework, discussion of the result and the conclusion of this research.

Keywords: Value, Operation, Business Model Canvas, e3value

Introduction

In this increasingly fierce business competition, an enterprise must continuously strive to innovate their business. This leads to necessity of deep understanding of the nature of enterprise business as a system. Enterprise engineering is a discipline concerning designing and modeling an enterprise system using several theories. One of such theories is τ-theory (Dietz et al., 2013) that explains the representation of system in two ways; function that illustrates the set of services that a system is able to provide, and construction that explains the structure, composition, and environment of a system.

A function model, or a black-box model (Dietz, 2006) does not explicitly shows any information about construction. As a dominant yet vague sort of model, a function model can be differently interpreted, therefore it is tricky to (de)compose it. Business model is considered as such function model, because business model generally show the function of a business in perspective of an observer (customer, stakeholder, etc.) For example Business Model Canvas (BMC), one of the most popular business model representations, shows value proposition of a business, that can be perceived differently depends on the observer. On the contrary, (de)composition of construction model is possible; one example is using algebraic notation (Suga and Iijima, 2018), they perform mathematical operation in manipulating DEMO Construction Model (CM), one of the representation of enterprise construction model.

On creating a new business model, we can start from scratch ideation, or conduct innovation, manipulation, etc. of the current, existing business model. Business model manipulation has been mentioned in previous research (Baden-Fuller and Haefliger, 2013; Baden-Fuller and Morgan, 2010). Aversa et al. (2015) then proposed concept of modularity to manipulate a business model. However, they only provide the description of the concept and the example. Also, rigorously manipulating

business model directly is generally not possible, because of the nature of business model that is considered a function model.

To be able to rigorously manipulate business model, a workaround is necessary; transform it into construction model (Pratama and Iijima (2018a, 2018b). They utilized the notion of functional/constructional transformation (Mannaert, Verelst, & De Bruyn, 2016) and using the fact that rigorous manipulation of construction model is possible (Suga and Iijima, 2015), they proposed New Business Model Creation Process (Pratama and Iijima, 2019). Using this framework, we can gather several business models, generate construction models from them and create a pool of submodels, modify them to create a new construction model, and generate a new business model to create a new business in a certain industry.

Even though New Business Model Creation Process succeeded to produce a new business model from the existing models, one of the seemingly important aspects of business is lost: Value. Currently, there is no correspondence of value in DEMO concept; therefore in order to preserve value of initial business model, another enterprise modelling concept that has value concept is necessary to be used in parallel with the proposed framework. One of such concept is e3value (Gordijn, 2002). Gordijn, Osterwalder, and Pigneur (2005), and then Caetano et al. (2017) proposed the mapping between concepts of BMC and e3value. In e3value, value transmission between company and customer can be clearly illustrated. Using concept of modularity, manipulation of value can be conducted, called Value Operation. Given the facts mentioned, this paper aims to answer the following question: How can we conduct Value Operation in New Business Model Creation Process?

This research attempts to create a framework of Value Operation and link it into New Business Model Creation Process, using the concept of e3value and modular manipulation. This paper will explain the literature review related to this work, the methodology, the demonstration of this framework, discussion of the result and the conclusion of this research.

Literature Review

Business Model Manipulation

Research on Business Model (BM) has been extensively discussed over the last 15 years (Foss and Saebi, 2017). There are several business model frameworks, the most popular are Business Model Canvas (BMC) (Osterwalder and Pigneur, 2010) and Business Model Navigator (Gassmann, Frankenberger, and Csik, 2013). A recent survey (Massa, Tucci, and Afuah, 2017) suggested that business model research trends continued to increase in terms of publications. However, most of them focused on BM generation and/or innovation through the act of craftsmanship; not focusing on methodology of business model manipulation, although this concept has been mentioned (Baden-Fuller and Haefliger, 2013; Baden-Fuller and Morgan, 2010).

Aversa et al. (2015) introduce business model manipulation using concept of modularity of six operators (Baldwin and Clark, 2000) namely splitting, substituting, augmenting, inverting, excluding, and porting. Table 1 illustrates the modular operators in business modelling according to (Aversa et al., 2015).

Table 1. Modular Operators in Business Modeling (Aversa et al., 2015)

Operator	Definition
Splitting	Separating a business model element into two or more new model elements
Substituting	Replacing a business model element with another element performing the same task
Augmenting	Establishing a new business model element (or more elements in order to account for a new layer in a multisided business model) to increase the value of the business model and/or its elements
Inverting	Leveraging a specific part of a business model, to stand alone element or stand-alone business model
Excluding	Removing a component to narrow down the business model's function
Porting	Moving a business model component (or an entire model) from one domain to another

New Business Model Creation Process

BM Manipulation introduced by Aversa et al. (2015) only mentions the concept and the example; they did not introduce a framework or methodology of it. As BM is a function model, Pratama and Iijima (2018a) argued that rigorous manipulation of BM required a definition of its construction model. Therefore they proposed a New Business Model Creation Process (Pratama and Iijima, 2018b), a framework of BM Manipulation using Business Model Canvas as function model representation and DEMO Construction Model as construction model representative. Figure 1 illustrated the New Business Model Creation Process. Business Model Canvas illustrated as a black box, and DEMO Construction Model illustrated as a white box. The details of this framework can be seen in (Pratama and Iijima, 2019).

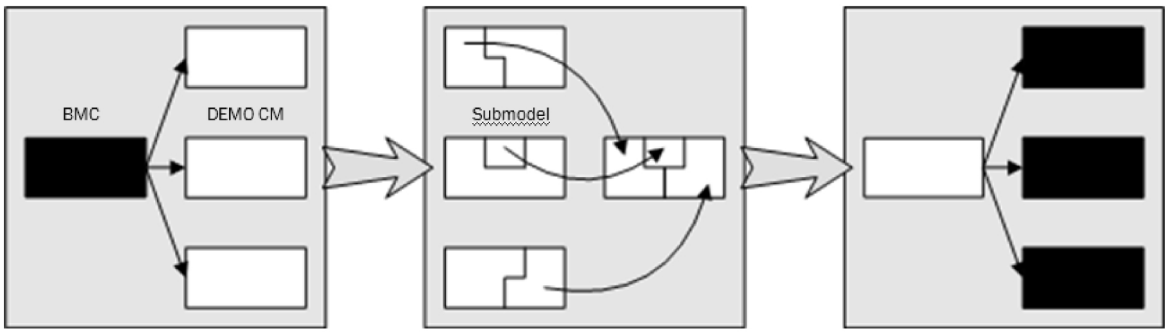

Figure 1. New Business Model Creation Process (Pratama and Iijima, 2018b)

This process consists of three phases:

Phase 1: Transformation from existing BMC to CM

In this phase, one or more existing BMC is transformed into an initial CM. One BMC may result in one or more CM. This is done by transforming BMC into DEMO-Oriented BMC (Pratama and Iijima, 2018a), then transforming it into DEMO CM.

Phase 2: New CM generation using split and merge operation

In this phase, some initial CMs form previous phase is split to create submodels, and those submodels are merged into a new CM. This can be done by using algebraic notation (Suga and Iijima, 2018).

Phase 3: Transformation from new CM to new BMC

In this phase, new CM from previous phase is transformed into a new BMC. One CM may result in one or more BMC. This can be done by transforming CM into Pre-BMC (Pratama and Iijima, 2018b) that serves as an intermediate process, then adding some additional information to generate a new BMC.

Business Model Canvas

Business Model Canvas (BMC) (Osterwalder and Pigneur, 2010), is a strategic management tool for developing a new business model, or simply capture the existing one (Salgado et al., 2014). BMC was first introduced as a new design science approach of business model ontology (Osterwalder, 2004). BMC is popular in its way to pinpoint the essential elements on a business as leverage for innovation (Martikainen, Niemi, and Pekkanen, 2014). Figure 2 illustrates BMC and its building blocks description.

In the BMC, the building blocks are positioned according to their classification. The left side of the canvas represents the internal business of the company on how to create business values, whereas the right side represents the customer side of the business and how to deliver those values. The bottom side can also be classified as a financial aspect of the business.

<table>
<tr>
<td rowspan="2">Key Partners
The Key Partners Building Block defines the party, people or organizations that work together with the company to run the business model.</td>
<td>Key Activities
The Key Activities Building Block describes the activity of the company to run the business model.</td>
<td rowspan="2">Value Propositions
The Value Propositions Building Block describes the products or services that the company provides as a value for their Customer Segment.</td>
<td>Customer Relationships
The Customer Relationships Building Block describes relationship between the company and its Customer Segments.</td>
<td rowspan="2">Customer Segments
The Customer Segments Building Block defines the party, people or organizations that the company targets to deliver its value.</td>
</tr>
<tr>
<td>Key Resources
The Key Resources Building Block describes the assets or resources that the company possesses to run a business model.</td>
<td>Channels
The Channels Building Block describes the way of transmission and transfer of Value Proposition to reach its Customer Segments.</td>
</tr>
<tr>
<td colspan="3">Cost Structure
The Cost Structure describes the costs that the company has to cover to run the business model.</td>
<td colspan="2">Revenue Streams
The Revenue Streams Building Block describes the revenue that the company receives from its Customer Segment.</td>
</tr>
</table>

Figure 2. Business Model Canvas (Osterwalder & Pigneur, 2010)

e3value

e3value is a value model that shows the exchange of things with economic value between actors (Gordijn and Akkermans, 2003). Developed by Gordijn (2002) as an alternative to process or activity model, e3value shows the economically reciprocal of value (Caetano et al., 2017), that is, one providing a value object expects to receive a reciprocal value object in return. Table 2 lists the e3value concept description. In addition to the first 9 concepts of e3value (Gordijn and Akkermans, 2003), there is one more concept introduced to better express the flow of Value Object, called Value Transmission (Pombinho, Tribolet, and Aveiro, 2014). Because of this additional concept, there is an addition to e3value ontology that was developed by Caetano et al. (2017) as shown in Figure 3.

Table 2. e3value Concept Description (Gordjin and Akkemans, 2003; Pombinho, Tribolet, and Aveiro, 2014))

Concept	Definition
Actor	An economically independent entity capable of exchange Value Object
Value Object	An object (services, products, money) that is of value for one or more Actors
Value Port	An abstraction of how an Actor provide or request Value Object
Value Offering	A set of equally directed (outgoing and ingoing) Value Ports
Value Interface	A set of Value Ports with economic reciprocity consists of one or more Value Offerings
Value Exchange	The transmission of Value Objects from outgoing to ingoing Value Ports
Market Segment	A group of Actors that share common economic perspective
Composite Actor	A group of Actors with one common Value Interface
Value Activity	An activity performed by Actors to yield a profit or increase economic value of Value Object
Value Transmission	A flow of a Value Object from one Actor to another

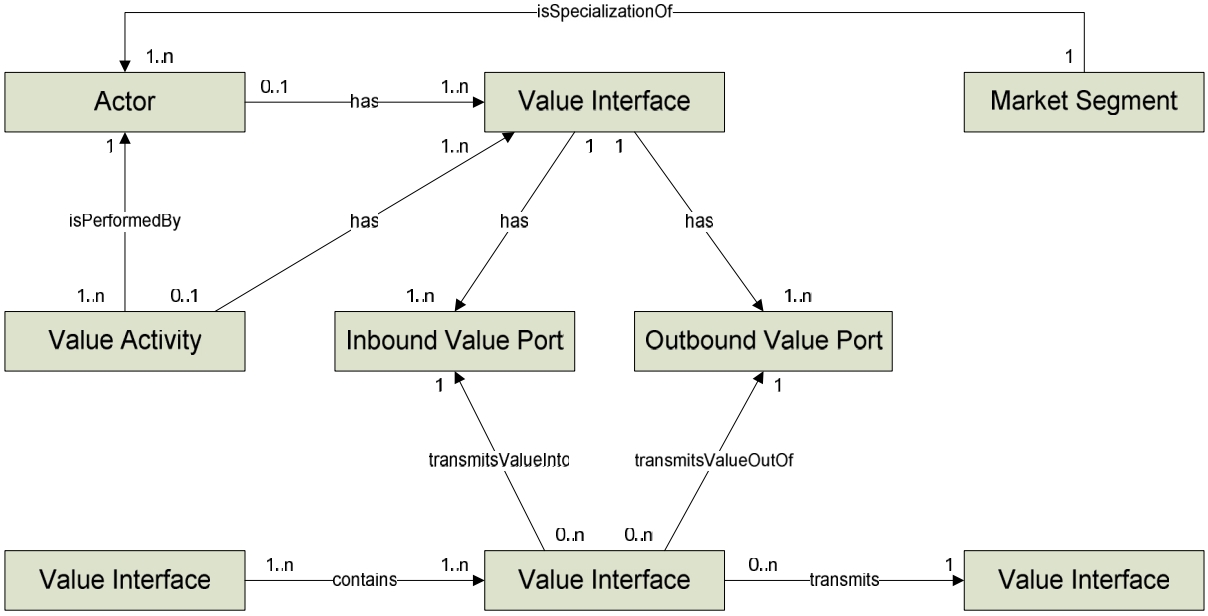

Figure 3. e3value Ontology Concept (Caetano et al., 2017))

Gordijn, Osterwalder, and Pigneur (2005), further refined by Caetano et al. (2017), conducted correspondence mapping between BMC and e3value. They found that Value Proposition in BMC corresponds to the Value Interface; in which Value Objects flow through the Value Ports in e3value. In other words, in Value Interface, there is Value Exchange between one or more Value Objects (Value Proposition components, i.e. services or products) via outgoing Value Transmission and the

other Value Objects (money) via ingoing Value Transmission, from the perspective of one Actor (company), as illustrated in Figure 4.

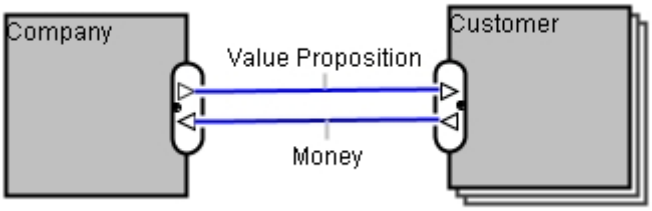

Figure 4. Value Interface of Value Proposition Components and Money in e3value

Methodology

In this section, we will explain our proposed methodology of Value Operation.

Value Operation as an extension of New Business Model Creation Process

As mentioned in Introduction section, in New Business Model Creation Process, the value of initial model is lost. To preserve the initial value and transform it into new value of new model, we propose a framework to generate a new Value Proposition of new BMC called Value Operation. Figure 5 illustrates this framework as an extension of New Business Model Creation Process. This paper will focus on the upper rectangle part of the framework. This process is done by transforming the existing Value Proposition of initial BMC into Value Interface, then apply manipulation operation to those Value Interfaces to create a new Value Interface, and then generate new Value Proposition from the new Value Interface. This new Value Proposition serve as additional information for the synthesis of new BMC proposed in (Pratama and Iijima, 2018b).

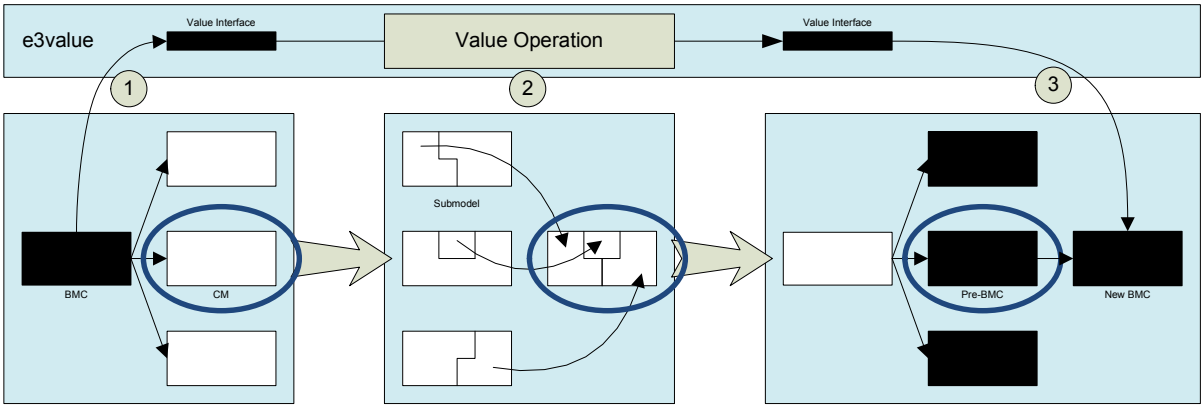

Figure 5. New Business Model Creation Process with Value Operations

Value Operation process is conducted after the new pre-BMC is created, therefore the initial BMCs and its Value Proposition are already given. Note that in Figure 5, there is a number that designates the steps used in this paper, as described below:

STEP 1 Transform Value Proposition of Existing BMC into Value Interface of e3Value

To generate the Value Proposition for new BMC, we transform the initial Value Propositions into Value Interface of e3value, with the Value Proposition components transformed into Value Object within Value Interface. First, we identify the Value Proposition Components that corresponds to Value Object; that is services or products. The identified components then treated as Value Objects of

outgoing Value Transmissions within Value Interface. After that, we draw the initial Value Interface of e3value for each initial BMC, correspond to Figure 4. Value Objects in ongoing Value Transmissions corresponds to services or products from Value Propositions, meanwhile Value Objects in ingoing Value Transmissions corresponds to money.

STEP 2 Value Interface Manipulation Operation

Using Modular Operators of Business Model Manipulation, we conduct operation on Value Interface to form a new Value Interface. We perform modular operation on Value Objects using appropriate modular operators. It depends on which Value Objects that is decided to be retained or removed in the new Value Interface by the stakeholders. The result then drawn to illustrate new Value Interface of e3value to be used in new BMC. The resulted Value Objects in previous steps are placed in their appropriate Value Transmissions.

STEP 3 Generate New Value Proposition

The last phase is the generation of new Value Proposition from the transformation of new Value Interface. The resulting Value Proposition then combined with Pre-BMC to form a new BMC.

Case Study: Telecommunication Industry in Indonesia

In this section, we introduce a simple case to demonstrate our proposed methodology. This paper uses Telecommunication Industry in Indonesia as a case study. The authors already conducted New Business Model Creation Process (Pratama and Iijima, 2019) for this case study, and using the resulted pre-BMC and its respective initial BMCs to demonstrate our proposed framework. The resulted pre-BMC used was named Portable Internet Device (Figure 6, called *S'* onwards), and the initial BMC is Mobile Internet Package (Figure 7, called *S1* onwards) and IoT Vending Machine Controller (Figure 8, called *S2* onwards).

<table>
<tr>
<td rowspan="2">Key Partners
Device Provider:
Device Providing</td>
<td>Key Activities
Service Activation</td>
<td rowspan="2">Value Propositions</td>
<td>Customer Relationships</td>
<td rowspan="2">Customer Segments
Internet User</td>
</tr>
<tr>
<td>Key Resources
Service Manager
Partner Manager</td>
<td>Channels</td>
</tr>
<tr>
<td colspan="2">Cost Structure
Device Payment</td>
<td colspan="3">Revenue Streams
Service Payment</td>
</tr>
</table>

Figure 6. Pre-BMC of Portable Internet Device

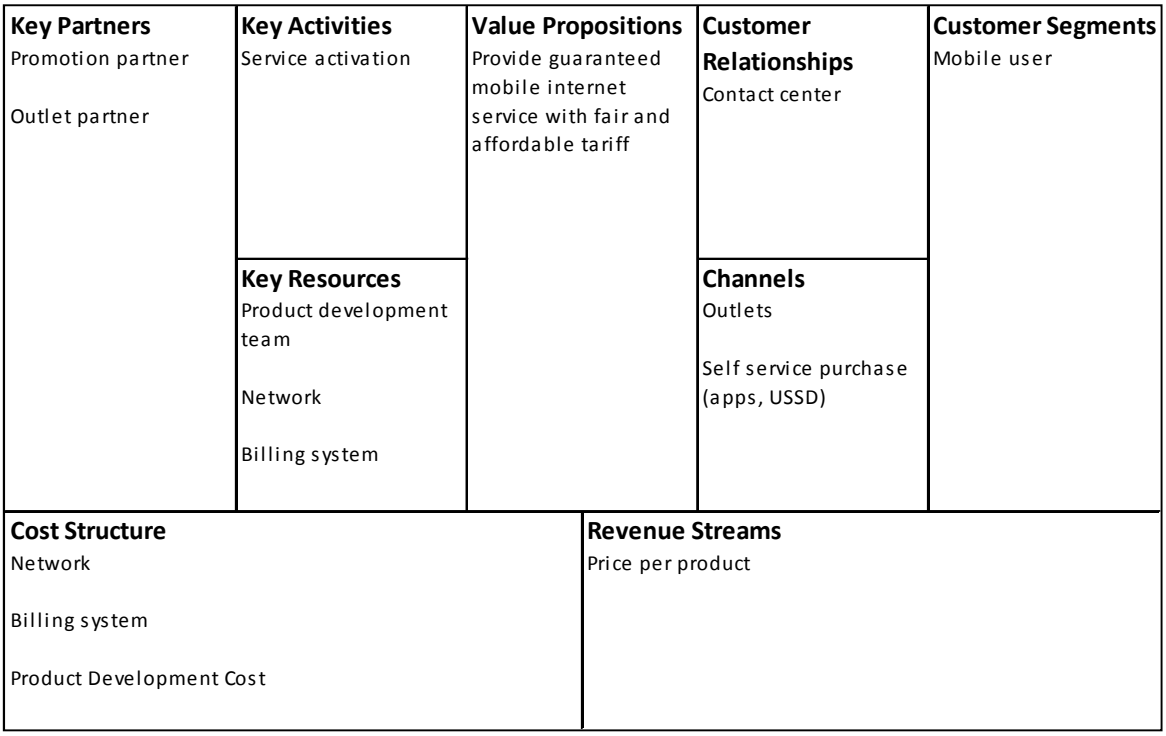

Figure 7. BMC of Mobile Internet Package

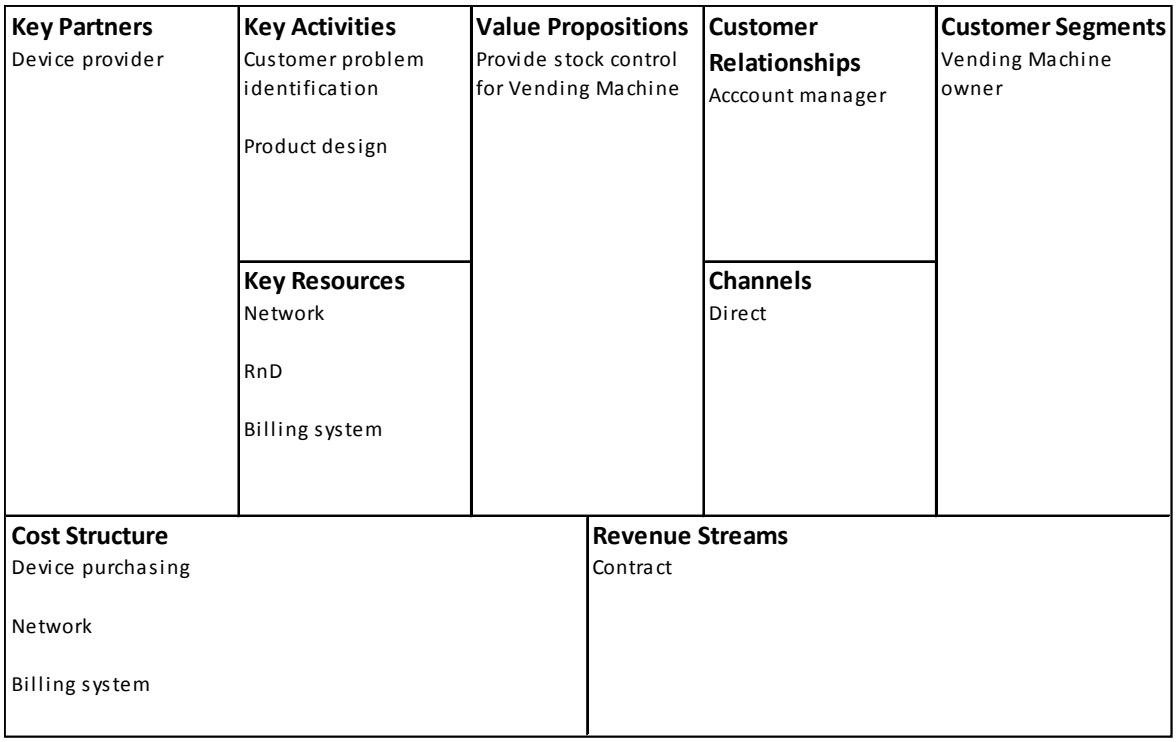

Figure 8. BMC of IoT Vending Machine Controller

We can see that the initial Value Proposition components are:

S1: Provide guaranteed mobile internet service with fair and affordable tariff
S2: Provide stock control device for Vending Machine.

Transform Value Proposition Components of Existing BMC into Value Object of e3Value

In this subsection we transform the Value Proposition of Mobile Internet Package and IoT Vending Machine Controller respectively, resulting in Value Interface. First, we identify the services or products mentioned in each Value Proposition. In *S1*, service of *mobile internet* is identified, meanwhile in *S2*, service of *stock control* and product of *device* are identified. Based on the result, we draw the initial Value Interface for each initial BMC. Figure 9 illustrates the resulting Value Interface.

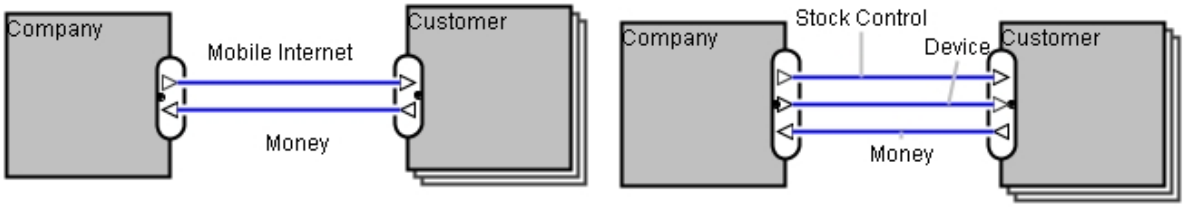

Figure 9. Value Interface of *S1* and *S2* respectively

Value Interface Manipulation Operation

In this subsection we perform Modular Operation on Value Interface of *S1* and *S2* to form a new Value Interface. This can be done by rigorously manipulating each of the Value Transmission available in the Value Interface, or manually perform manipulation of Value Interface using modular operators.

The Pre-BMC result (Pratama and Iijima, 2019) of *S'* is about a business of Portable Internet Device. A customer can purchase a portable device (similar to mobile wifi) with the same SIM card number to those of customer's so that another device can connect to Internet using mobile connection without subscribing to a new SIM card. Therefore we retain *mobile internet* Value Object and use operator **porting** to add *device* Value Object while **excluding** *stock control* Value Object. The resulting Value Interface of *S'* is illustrated in Figure 10.

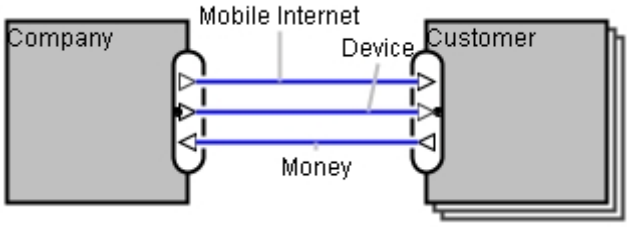

Figure 10. Value Interface of *S'*

Generate New Value Proposition Components

From the resulting value interface of *S'*, we can generate the Value Proposition of *S'*. The Value Proposition is the combination of *Mobile Internet* service and *Device* product. We can write it as follows:

"Provide Mobile Internet service with a Device"

Then by putting this result into Pre-BMC, and adding some additional information (in accordance with Pratama and Iijima, 2019), we obtained new BMC of Portable Internet Device, as shown in Figure 11.

<table>
<tr><td rowspan="2">Key Partners
Device Provider:
Device Providing</td><td>Key Activities
Service Activation</td><td rowspan="2">Value Propositions
Provide Mobile Internet service with a Device</td><td>Customer Relationships
Account Manager

Service Center</td><td rowspan="2">Customer Segments
Internet User</td></tr>
<tr><td>Key Resources
Service Manager
Partner Manager</td><td>Channels
Outlet</td></tr>
<tr><td colspan="2">Cost Structure
Device Payment</td><td colspan="3">Revenue Streams
Service Payment</td></tr>
</table>

Figure 11. BMC of Portable Internet Device

Discussion

This paper demonstrated Value Operation process of New Business Model Creation Process using e3value and modular operation, answering our research question. We also provide a simple case of Telecommunication Industry in Indonesia. We conduct transformation of Value Proposition in initial BMCs into Value Transmissions of e3value to clearly illustrate the value exchange. Then we conduct modular operation in one of the Value Transmission, in this paper we conduct porting and excluding. Then we generate new Value Proposition from the new Value Transmission, and then integrate it into new BMC created from New Business Model Creation Process.

Some advantages can be provided by using this proposed methodology. First, the value proposition of initial business model can be preserved in manipulation process. One of the main concerns of New Business Model Creation Process is that the value aspect is lost in transformation process, because in DEMO Construction Model, concept of value is not included. Using Value Operation as an extension can keep the initial value proposition in manipulation process. Therefore this work adds improvement on the framework. Second, using e3value to illustrate value transmission helps in clearly visualize the value exchange to make manipulation easier. By using modular operation on value transmissions we can create a new value transmission, which then becomes new value proposition. Third, this methodology can also be used as a part of Value Engineering, especially in improving the function of the product/services. Improving the function, in sense of business model, can be achieved by manipulating the value model.

Despite the potential advantage, this study is not without limitations. This paper only demonstrates manipulation of Value Transmission manually, although transformation between Value Proposition and Value Transmission can be done automatically. Rigorous manipulation of Value Transmission seems possible, by creating pool of Value Transmissions from several business models. However determining appropriate Value Transmission still needs decision making from the stakeholders. Using this methodology as part of Value Engineering is only a proposition; future research can be conducted to demonstrate this.

Conclusion

This paper produced a Value Operation as an extension of New Business Model Creation Process framework, as a method to synthesize a new business model, using Telecommunication Industry in Indonesia as a case study. We present Value Operation as a framework to manipulate the value proposition of the existing business models to create a new value proposition for the new business model. This satisfies our research question.

We borrowed the case of Telecommunication Industry in Indonesia and captured pre-BMC and its initial BMCs. We transform the initial Value Propositions from initial BMCs into Value Transmission of e3value. We conduct modular operation to create a new Value Transmission. We transform it into new Value Proposition as a value proposition of new BMC created from the borrowed case. By using this methodology, we expect that we can gather several business models, generate construction models from them and create a pool of submodels, modify them to create a new construction model, and generate a new business model to create a new business while keeping the value aspect of the model.

Acknowledgements

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