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A Technique to Integrate Service Business Models with ArchiMate

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Abstract

With the penetration of digital transformation into enterprises, business model creation has become important issues for modern enterprises. Although business model canvas is well known, it isn't easy to use Business Model Canvas for novice service designers. In this paper, an integrated technique is proposed to develop the service oriented Business Model Canvas step by step by combining with Customer Journey Map and Service Blueprint. Moreover, we examine the applicability of the technique by designing an emergency call service.

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Keywords: Business Service Design; Business Model Canvas; Customer Journey Map; Service Blueprint; ArchiMate.

1. Introduction

The digital transformation is necessary to transform current enterprises into digital enterprises by creating digital business models according to the Ministry of Economy, Trade and Industry of Japanese Government. Although Business Model Canvas (BMC) is widely used to create business models, BMC is difficult to directly develop for

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novice service designers. For example, defining key activities of BMC is difficult without clarifying detailed usage scenario how to use services. However, BMC doesn't provide such means to describe detailed usage scenario.

In this paper, an integrated technique to design business services by combining BMC with Customer Journey Map and Service Blueprint is proposed to solve the obstacles of BMC on novice service designers.

The rest of the paper is organized as follows. Section 2 explains related work. The integrated business service design technique is proposed in section 3. Section 4 shows a case study of business service design using the proposed approach. The effectiveness, novelty and limitations are discussed in section 5. Finally, section 6 concludes the paper.

2. Related work

In this section, related research on Service Design, Business Model, and ArchiMate are explained. Then entities of Business Model Canvas, Customer Journey Map and Service Blueprint are compared.

2.1. Service Design

Spath and Fahnrich [1] define a service meta-model consisting of 9 entities, i.e., Customers, Goals, Inputs, Outputs, Process, Human/Information/Physical enablers, and Environment. Goals can be used to express goals of business, services, and customers. Since the organization of the provider and the owner can be defined as Human enablers, the business model can be expressed by the interaction process with the customer.

Shostack [2] proposed Service Blueprint as a method for designing services. The Service Blueprint designs services in the way of Inside-Out. Stickdorn et al. [3] describes a service design method using Service Blueprint.

Customer Journey Map [4] designs services from the customer's point of view so that the behavior patterns of customers are visualized in the way of Outside-In. Therefore, the customer behavior pattern is designed according to the viewpoint consisting of the customer's interests, customer behavior, contact points, and behavior stages.

2.2. Business Models and ArchiMate

Meertens et al. [5] proposed a mapping between Business Model Canvas (BMC) and ArchiMate by using business ontology. BMC [6] is widely used to design business models by 9 entities, i.e., Value proposition, Customer segment, Relationship, Channel, Key activities, Key resources, Key partners, Cost structure, and Revenue streams. The approach proposed by Meertens and others maps abstract to concrete models. Although the mapping is suitable for experienced designers, it is difficult to think abstractly for novice designers. Concrete thinking is easier for novices. Therefore, the reverse mapping direction of Meertens and others is necessary for novice designers.

ArchiMate [7] is an Enterprise Architecture (EA) modeling language standardized by The Open Group for TOGAF (TOG Architecture Framework) [8]. TOGAF is the most powerful EA framework [9]. As a result of comparing the business model notations, Yamamoto showed that ArchiMate has the highest expressive power on business modeling [10].

EA has also been used to model healthcare business services. For example, Sharaf et al. [11] discussed EA in the mobile healthcare cloud service domain. Yamamoto and Zhi [12] define business model patterns using ArchiMate. Yamamoto and others [13] also proposed a service design method based on Jobs Theory [14] and ArchiMate.

Zhou and others [15] proposed a visual innovation method based on ArchiMate. They also showed the effectiveness of the method by a controlled experiment that carried out to compare with the existing approaches, i.e., Business Model Canvas, Balanced Scorecard [16], and Jobs Theory. They didn't consider Customer Journey Map nor Service Blueprint.

2.3. Comparison of BMC, CJM and SBP

Table 1 shows the comparison of Business Model Canvas (BMC), Customer Journey Map (CJM) and Service Blueprint (SBP). As CJM designs services from the customer viewpoint, it lacks corresponding elements for Key activities, Key partners, and Key resources of BMC. As SBP designs services from service providers' viewpoint, it

lacks the corresponding element for Value proposition of BMC. Both CJM and SBP lack elements of cost and revenue elements. The table also implicitly imply a service design approach to combine CJM, SBP and BMC in this order.

The right most column in Table.1 named “ArchiMate element” shows a mapping these entities to visual elements of ArchiMate. Therefore, it is clear that ArchiMate can represent BMC, CJM and SBP.

Table 1 also shows patterns to describe CJM and SBP by ArchiMate. Although CJM and SBP diagrams are detailed, the knowledge required to describe both diagrams can be restricted. These patterns help novice designers describe CJM and SBP.

Table 1. Comparison of BMC, CJM, and SBP.

BMC	CJM	SBP	ArchiMate element
Customer	Customer	Customer	Business actor
Relationship	Customer Stage/ activity	Customer actions	Business process
Chanel	Access point	Physical evidence	Business Interface
Value proposition	Customer thought		Value, Goal
Key activities		Frontstage/ Backstage actions	Business process
Key partner		Support process	Business actor
Key resources		Physical evidence	Device
Cost structure			Value
Revenue streams			Value

3. Business Service Design Method

This section describes the steps to design business services by collaborating CJM, SBP, and BMC. As CJM and SBP are based on concrete thinking, these diagrams are easily used by novice designers. After describing both diagrams, then BMC is developed by selecting elements from these diagrams.

3.1. Step1- Develop Customer Journey Map

The constituents of Customer Journey Map are customer thought, activity stages, customer activity, and access point. Activity stages consist of customer actions. Customer thoughts are goals and expectations of customer assigned to each activity stage. Access point is the media provided to customer for using services.

3.2. Step2- Develop Service Blueprint

By using above result, the constituents of Service Blueprint are described as follows.

Customer actions and physical evidence of SBP are described from customer activities and access points of CJM. Then frontstage actions of SBP are developed in aligning to customer actions. The backstage actions shall also be developed to respond for each frontstage action. Support stage processes are designed for supporting frontstage and backstage actions.

3.3. Step3 Develop Business Model Canvas

By using results of Step1 and Step2, Business Model Canvas is developed as follows.

Customer is the same as those of CJM.

Relationship is extracted from customer actions of SBP.

Channel is defined by access point of CJM and physical evidence of SBP.

Key activities are defined by extracting key activities of frontstage and backstage activities of SBP.

Value proposition are defined by integrating customer thoughts of CJM.

Key resources are defined by extracting physical evidence of SBP.

Cost structure are defined by summing up all the cost for frontstage /backstage actions, support processes and physical evidence.

Revenue streams are defined by service fees for customer actions.

4. Example

The proposed approach is applied to design an emergency service for the elderly. Section 4.1 explains the target service. Section 4.2 describes the Customer Journey Map, Service Blueprint and Business Model Canvas for the emergency service for the elderly.

4.1. Emergency service for the elderly

With the arrival of a super-aging society that is unprecedented in the world, the number of households living alone or only elderly people is increasing rapidly, and the number of people who are worried about medical care and long-term care is increasing rapidly.

In the emergency response service, by using a dedicated device equipped with GPS function, and emergency call function, it is possible to send an emergency signal to the emergency centre anytime (24 hours), anywhere (inside or outdoors) at the time of emergency. At the time of emergency, trained emergency responders rush to respond to requests from senior users.

4.2. Service design of the emergency service for the elderly

The Customer Journey Map and Service Blueprint for the above scenario is shown in Fig.1. In Fig.1, both models are described by ArchiMate.

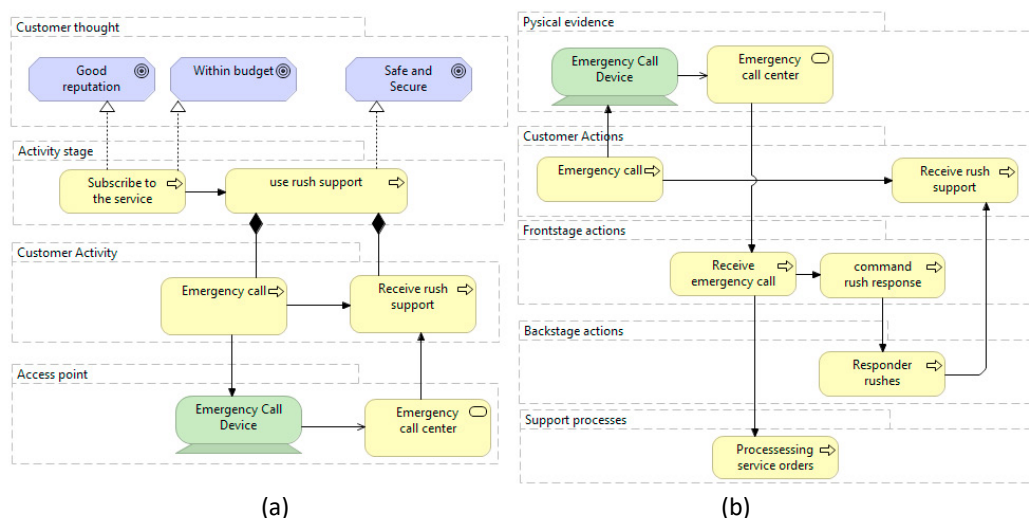


Fig. 1. (a) Customer Journey Map; (b) Service Blueprint.

The Business Model Canvas for the above scenario in 4.1 is shown in Fig.2.

Key Partner	Key Activity	Value Proposition	Customer Relationship	Customer Segment
Fire department Emergency hospital, Smart device developer	Emergency response service, Rush correspondence	"Safety and security" for senior citizen	Emergency response activities	senior citizen
	Key Resource		Channel	
	Data center, Control operator, Emergency responder		Home Security Device, Service receptionist	
Cost Structure			Value Stream	
Reporting device development / operation / maintenance costs, Data center expenses, Training and response costs for emergency responders			Service usage fee	

Fig. 2. Business Model Canvas.

5. Discussion

This section discusses on novelty, effectiveness, and limitations of the paper.

5.1. Novelty

This paper has integrated CJM, SBP and BMC to make it easier design business services for novice service designers. So far, business model notations are compared, service design models have not been compared with business models. The claim of the paper is that CJM and SBP are able to use for developing BMC. Moreover, the paper proposed the specific steps to integrate CJM and SBP with BMC.

The mapping direction proposed by the paper is opposite to those of Meertens et al. For novice designers, it is easier to design from detail models.

5.2. Effectiveness

In this paper, the proposed technique has been successfully applied to design an emergency call service. This showed the effectiveness of the proposed technique. The designed service models of CJM and SBP have represented in ArchiMate as shown in Fig.1.

In practice, student authors of the paper as novice service designer found the difficulty of BMC in the course of developing BMC for a regional service, especially in defining Key activities and partners. The cause of the issue is that user scenario is unclear in BMC. Without details of user scenario, the corresponding service activities are impossible to clearly define. CJM and SBP are useful to make user scenario clear. After eliciting usage scenario, it is easy to find Key activities by selecting primary activities to respond user actions even for novice designers.

5.3. Applicability of ArchiMate

As it is known that BMC can be represented in ArchiMate, BMC in Fig.2 is able to visualize by ArchiMate. Fig.3 shows a business service pattern in ArchiMate consists of entities in Table.1. The pattern shows an integrated model of CJM, SBP and BMC. Moreover, Fig 3 shows a visualization of inter-relationship among entities of Table 1.

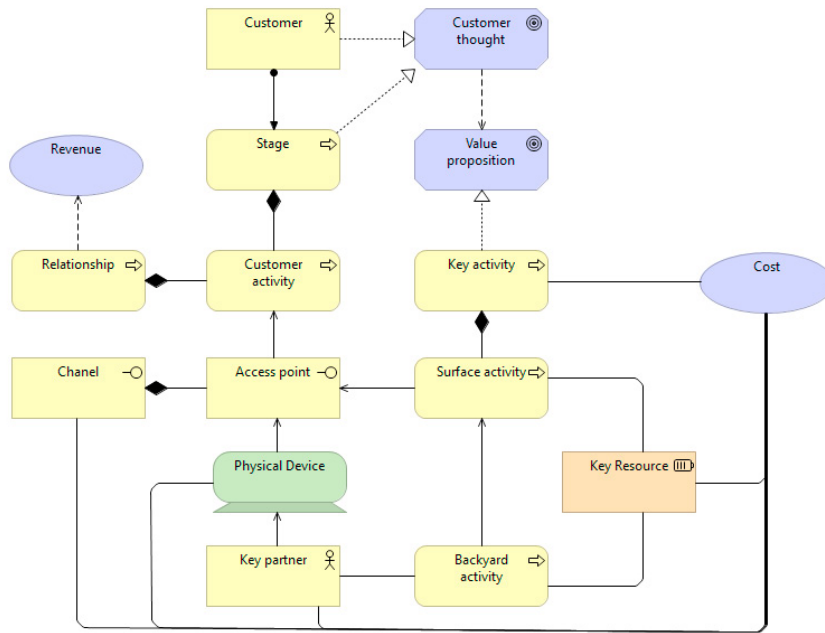


Fig. 3. Business Service Design pattern in ArchiMate.

5.4. Limitations

This paper only showed an application of the proposed technique for an emergency call service for the elderly. More case studies are necessary to show the quantitative effectiveness of the technique. Authors are now examining the proposed technique to a regional Mobility as a Service application in Japan.

6. Summary

This paper proposed a business service design technique by integrating Customer Journey Map, Service Blueprint, and Business Model Canvas. Moreover, a case study for applying the integrated technique to an emergency call service has explained with ArchiMate. The business service design pattern in ArchiMate has also proposed.

Future work includes more case studies on MaaS applications based on the proposed technique.

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