

Visual Modeling for Value (Co-)Creation

Work in progress

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Abstract. Modeling value (co-)creation requires visual constructs to communicate among stakeholders. We introduce a set of visual constructs to design and describe the value (co-)creation process. The set has been built based on requirements and guidelines provided mostly by service dominant logic and software engineering communities. We present a basic example that illustrates the potential usability of our constructs. Finally, we discuss open questions and challenges to be addressed.

Keywords: Visual modeling, value (co-)creation, service innovation

1 Introduction

Modeling value (co-)creation requires sound (ontological) basis as well as clear (visual) constructs to represent core concepts. The former supports design and analysis, whereas the latter supports effective communication with all stakeholders.

On the one hand, regarding the understanding of value (co-)creation, some authors have already analyzed this process from different perspectives such as service innovation [2], marketing [3, 6] and management [4]. In this line, Ranjan and Read have identified concepts that are involved in value (co-)creation [13]. Likewise, Grönroos et al. as well as FitzPatrick et al. have identified important relationships that are established between stakeholders [3, 6].

On the other hand, regarding the definition of constructs, software engineering (SE) communities have also provided guidelines to develop new (software-supported) languages [10, 7]. One of the main ideas is to support the extrovert and introvert roles that are played by designers. In this way, languages must be simple enough to facilitate communication with stakeholders (extrovert), nonetheless, they should also support formality to perform analysis (introvert) [7].

In this paper we report work in progress that aims at developing a visual modeling toolkit to design and analyze value (co-)creation opportunities, which can later be developed into a software tool to help practitioners to systematically

design and create new services to match customer requirements. For instance, iSIM (integrated Service Innovation Method) defines a seven-step approach to design and commercialize new services [1], in which the second phase completely focuses on designing unique customer value propositions (CVPs). In this way, to achieve our goal, we have gathered requirements from different communities, which have been used to design a set of constructs for different aspects of value (co-)creation. We show how these constructs can be used to design value creation opportunities, which help us to finally discuss open questions and research challenges.

1.1 Related Work

There have been several efforts to model the value (co-)creation process. For instance, the *e³-value* ontology [5] and subsequent extensions such as the service encounter concept [16]. Briefly, *e³-value* focuses on designing the exchange of valuable objects among stakeholders, whereas service encounters are interaction spaces where not only *collaboration* among stakeholders takes place but also *value* is derived by each one during the integration of their resources.

In the same vein, the so-called Value Proposition Canvas (VPC) [9] has been also proposed to model the value (co-)creation process on top of the Business Model Ontology (BMO) [11]. Likewise, the field of customer experience has been also interested in this area since some authors argue that value (co-)creation is deeply related to ultimate customers' experience [15], which can be modeled using visual notations based on so-called human activity modeling (HAM) [15].

1.2 Requirements

Concepts and relationships. Out of different studies, we have distilled relevant concepts and their relationships [12, 13, 4, 2, 6, 3]. Ranjan and Read [13] as well as Frow et al. [4] have extensively analyzed value (co-)creation focusing on two dimensions: *Value in use* and *co-production*.

Value in use mostly refers to types of experiences that are influenced by *cognitive*, *emotive* and *behavioural/functional* aspects [12, 13], whereas co-production refers to stakeholders' levels of engagement [13, 4], which can be seen as *co-ordination*, *co-operation* and *collaboration* relationships established among stakeholders to actually (co-)create value [2, 6, 3].

In this way, we want to be able to capture both relationships (co-ordination, co-operation and collaboration) and aspects (cognitive, emotive and functional) by means of visual constructs that can be used during the design and analysis of value (co-)creation opportunities.

Modeling. To design our first set of visual constructs, we have mostly followed guidelines provided by [7] and [10]. Malavolta et al. encourage designers to create languages that must be able to support extrovert and introvert roles. The former helps users (e.g. service designers) to communicate ideas clearly among novice

and expert stakeholders, whereas the latter supports the analysis and automation of tasks [7].

Likewise, Moody encourages designers to follow nine principles during the design of new notations [10]. Moreover, we consider Moody’s principles as a good starting point since the main goal of the principles is to guide the design of “cognitively effective visual notations”, which will help us to produce notations that are not only easy to understand but also powerful enough to support the analysis of value (co-)creation.

2 Proposal

2.1 Constructs

Taking as an initial inspiration the scratch programming language and environment developed by Maloney et al. [8], we have designed a set of constructs. Scratch provides visual constructs to allow self-learning in users (mostly children and teenagers) that want to learn how to program computers. Scratch provides four types of visual constructs (command, function, trigger and control blocks) that capture the essence of programming, this makes Scratch very easy to learn and syntax-error free as connecting constructs is similar to connecting LEGO bricks.

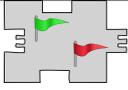
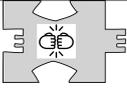
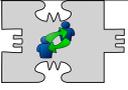
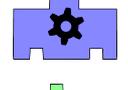
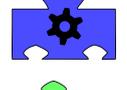
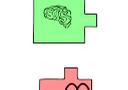
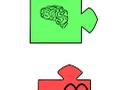
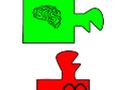
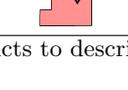
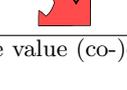
	Co-ordination	Co-operation	Collaboration
Encounter (Touch point)			
Functional			
Cognitive			
Emotive			

Table 1. Visual modeling constructs to describe value (co-)creation opportunities.

Table 1 presents the main constructs that may help us to understand and analyse value (co-)creation opportunities. We present co-operation, co-ordination and collaboration blocks (named encounters) that aim at capturing the dynamic customer-supplier relationships that take place during value (co-)creation. Likewise, we also present blocks for the functional, cognitive and emotive aspects that form part of the value in use experience. All blocks are used in combination with textual descriptions that clearly specify their role (See example in Section 2.2).

Our constructs resemble elements of a puzzle that must be assembled to create a “meaningful” structure. Furthermore, the shape of each construct also (visually) constraints the types of interactions in which such construct can participate. For example, to model a value (co-)creation opportunity that requires co-operation between customers and suppliers, the service designer can only combine blocks belonging to the co-operation category. In addition, constructs have different color intensity that helps to (visually) represent the shift from co-ordination, co-operation and collaboration, i.e. strong color intensity implies a strong relationship.

2.2 Example

To illustrate the use of our constructs, we use an example inspired by case studies in the tourism sector [12, 14]. To travel from one destination to another, a customer’s full journey may be composed of several encounters/touch points such as gathering information about a possible destination, making a final decision, booking tickets, traveling, staying at the desired place among others. In Figure 1, we illustrate booking tickets as an opportunity to co-create value that requires co-operation between suppliers and customers.

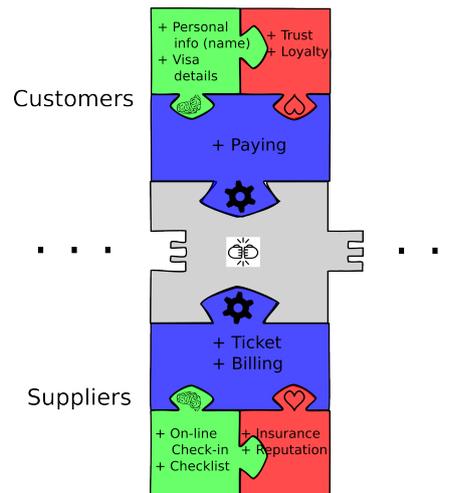


Fig. 1. Value co-creation as a co-operation between customers and suppliers.

On the one hand, customer must co-operate by providing not only the actual payment but also cognitive aspects such as personal information and emotive aspects such as trust (as they are taking a leap of faith by traveling with a given company). On the other hand, suppliers co-operate not only by providing a ticket but also by considering cognitive aspects such as checklists and emotive aspects such as reputation. The correct integration of all these aspects will be

the ultimate way in which value co-creation could happen. Furthermore, we also foresee models in which encounters will be linked to each other to fully represent a customer journey. For instance, as depicted in Figure 1, the co-operation encounter could be connected to other encounters by either the left side or the right side.

3 Open questions and challenges

As this work is the first step on trying to understand value (co-)creation concepts and relationships, more research is needed to capture the full complexity of this enterprise. To this aim, we will follow a design science approach, in which we will gradually iterate until reaching a notation that is ontologically and visually sound to allow clear communication with stakeholders as well as analysis of value (co-)creation opportunities.

Consequently, next steps will focus on answering questions about possible taxonomies for functional, cognitive and emotive aspects. In this way, it would be much easier to understand how they influence the value (co-)creation process.

Likewise, we must also try to answer questions regarding the role of coordination, co-operation and collaboration relationships during the design and analysis of unique value propositions. For instance, we think it would be possible to capture part of the business logic within our encounters, which can provide means to measure the impact of different designs.

Finally, the ultimate challenge is to use the resulting notation to support the design and evaluation of new services within companies in Luxembourg city.

References

1. Eng K. Chew. iSIM: An integrated design method for commercializing service innovation. *Information Systems Frontiers*, pages 1–22, 2015.
2. Bo Edvardsson and Bård Tronvoll. A new conceptualization of service innovation grounded in sâd logic and service systems. *International Journal of Quality and Service Sciences*, 5(1):19–31, 2013.
3. Mary FitzPatrick, Richard J. Varey, Christian Grönroos, and Janet Davey. Relationality in the service logic of value creation. *Journal of Services Marketing*, 29(6/7):463–471, 2015.
4. Pennie Frow, Suvi Nenonen, Adrian Payne, and Kaj Storbacka. Managing co-creation design: A strategic approach to innovation. *British Journal of Management*, 26(3):463–483, 2015.
5. Jaap Gordijn and J.M. Akkermans. Value-based requirements engineering: exploring innovative e-commerce ideas. *Requirements Engineering*, 8:114–134, 2003. 10.1007/s00766-003-0169-x.
6. Christian Grönroos and Päivi Voima. Critical service logic: making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, 41(2):133–150, 2013.
7. I. Malavolta, P. Lago, H. Muccini, P. Pelliccione, and A. Tang. What industry needs from architectural languages: A survey. *Software Engineering, IEEE Transactions on*, 39(6):869–891, June 2013.

8. John Maloney, Mitchel Resnick, Natalie Rusk, Brian Silverman, and Evelyn Eastmond. The scratch programming language and environment. *Trans. Comput. Educ.*, 10(4):16:1–16:15, November 2010.
9. Business model generation. Value proposition canvas. http://businessmodelgeneration.com/canvas/vpc?_ga=1.82481680.743556470.1449751425. [Online; accessed 10-December-2015].
10. D.L. Moody. The physics of notations: Toward a scientific basis for constructing visual notations in software engineering. *Software Engineering, IEEE Transactions on*, 35(6):756–779, Nov 2009.
11. Alexander Osterwalder. *The Business Model Ontology - a proposition in a design science approach*. PhD thesis, University of Lausanne, Ecole des Hautes Etudes Commerciales HEC, 2004.
12. Adrian F. Payne, Kaj Storbacka, and Pennie Frow. Managing the co-creation of value. *Journal of the Academy of Marketing Science*, 36(1):83–96, 2008.
13. Kumar Rakesh Ranjan and Stuart Read. Value co-creation: concept and measurement. *Journal of the Academy of Marketing Science*, pages 1–26, 2014.
14. Alex Rawson, Ewan Duncan, and Conor Jones. The truth about customer experience. *Harvard Business Review*, 91(9):90–98, 2013.
15. Jorge Teixeira, Lia Patrício, Nuno J. Nunes, Leonel Nãbrega, Raymond P. Fisk, and Larry Constantine. Customer experience modeling: from customer experience to service design. *Journal of Service Management*, 23(3):362–376, 2012.
16. Hans Weigand. Value encounters -modeling and analyzing co-creation of value. In Claude Godart, Norbert Gronau, Sushil Sharma, and G erome Canals, editors, *Software Services for e-Business and e-Society*, volume 305 of *IFIP Advances in Information and Communication Technology*, pages 51–64. Springer Berlin Heidelberg, 2009.