Towards Developing Measurement Indicator for Value

Satoshi Nishimura and Ken Fukuda

National Institute of Advanced Industrial Science and Technology (AIST), Tokyo, JAPAN
{satoshi.nishimura, ken.fukuda}@aist.go.jp

Abstract. Value is a key concept to model strategy of business. Company tends to evaluate new business from a viewpoint of fundamental value. However, other types of value, which includes subjective value, knowledge value and emotional value, can be useful to consider long-term business. We aim to develop measurement indicator for value to support decision making to select business strategy. This paper describes our motivation and first step to develop ontology of value type.

Keywords: Value, Service, Ontology.

1   Introduction

Service industry is a dominant industrial discipline among developed countries. And the structure of service activities are recognized to be complex because co-creation is an intrinsic part of the system. Vargo and Lusch proposed value co-creation to clarify the importance of the interaction among customers and employees for value creation [7]. Ueda et al. classified co-creation into three classes based on the network topology between "producer", "customer" and "environment" [12].

Quality of service activities should be measured to improve quality of service effects. Economical value, which is also called fundamental value or functional value, is chosen as a measurement indicator to decide business strategy in many cases. However, there are considerable other types of value which should be considered when the management of a company develop long-term business plan, such as expertise knowledge of employees and customers' loyalty and emotion toward products, employees or brands, etc. Toya defines Knowledge Value (KV) as the accumulated knowledge held by co-creators and Emotion Value (EV) as the affective value associated with customer and employee moods and perceptions in [8]. However, there are not enough discussion how to measure the amount of those non-economical values and which indicator is appropriate in a particular case.

On the other hand, the notion of "value" is used as various meanings in different fields [1, 9, 10]. The notion of XaaS (X as a service such as Mobility as a Service) and sharing economy are broadening the boundary between value creator and value receiver even further. Therefore, we should clarify the notion of value to understand systems that create values and to communicate with each other of different disciplines.

In this paper, we provide the first step towards developing measurement indicator for knowledge value. In section 2, we describe our motivation more precisely. Section 3 provides related work about the notion of value. We start to survey from value modeling and business ontology discipline. In section 4, we summarize this paper.

2 Motivation

Companies tend to evaluate the prospect of new business from economical viewpoints. This strategy is simple and good to choose beneficial business activities for the company. However, the strategy might be harmful from a sustainability point of view. Some jobs may help the company to increase employees' satisfaction, some jobs may help their customers to gain understanding and loyalty toward the company, some jobs may help the company to get customers information. And it can happen that all these jobs do not contribute to make money directly. An example is servitization of manufacturing, which tends to fail without proper non-economical KPIs (Key Performance Indicators) during the investment phase when profit is very low.

If the company's evaluation of businesses are based on non-economical values (such as KV and EV), the company is expected to select more various business strategies. And when the company decides the strategy, the measurement methods and indicators of value will be useful to assess the decision.

There is no standard notion of value yet [9]. This should prevent the managers of the company decide what value they should increase. Therefore, we will classify types of value in appropriate manner based on ontological engineering method. Then, we will investigate what measurement indicator is measurable and suitable for each type of value. For the first step, we start to survey the notion of value.

3 Related work

We picked up 4 related papers published in 12th International Workshop on Value Modeling and Business Ontology as follows.

The main focus of Hruby is formation of coalitions and activities in a coalition includes value exchange [3]. Coalitions can be dealt as a kind of context. Under coalitions context, people who want to exchange something valuable in the value exchange processes. To model the value exchange should be beneficial to clarify the value type and measure the amount of the value.

Proper et al. try to construct a modeling framework for design of value co-creation constellation [4]. They employ the notion of value co-creation [5] and construct the modeling framework to design the value co-creation in a particular service. The framework distinct potential value in production context and real value in the context of value creation in interaction and independent value creation context based on the research [6] investigated by Grönroos et al. Customers and providers of services take different roles in each context and create each value.

Andersson et al. focuses on value ascription [1]. The key notion of the paper is context which value ascription occurs. They mentioned subjectivity of value as same as

other research [2, 3, 4]. Additionally, in the paper, the context is changed with the value. And ascribing value to different value objects can be comparable in the same context. For the comparison, they introduce "value structure." However, the component of value structure is not discussed well, and they do not clarify whether the value includes only fundamental value or KV and EV.

da Silva Reis et al. proposes a notion to configure value networks based on subjective business value [2]. The focused question is how to realize sustainable economy. They also consider subjectivity of value to configure a value network. However, they just consider only assurance, privacy and trust as subjective value.

4 Preliminary result: ontology of value types

Toya [8] consider value including fundamental value (FV), KV and EV as we mentioned in the introduction. We follow this classification. To integrate current related work's notion, we start to create ontology using Hozo [11]. The part of ontology is shown in Fig. 1.

To discuss what process is the source of value or what property of a thing contribute to value, an ontology is necessary to describe the processes of an interaction among agents. This discussion and the ontology help researchers and managers to clarify the difference among various notions of value which are provided by many researches. After that, we will be able to propose measurement indicators of each value.
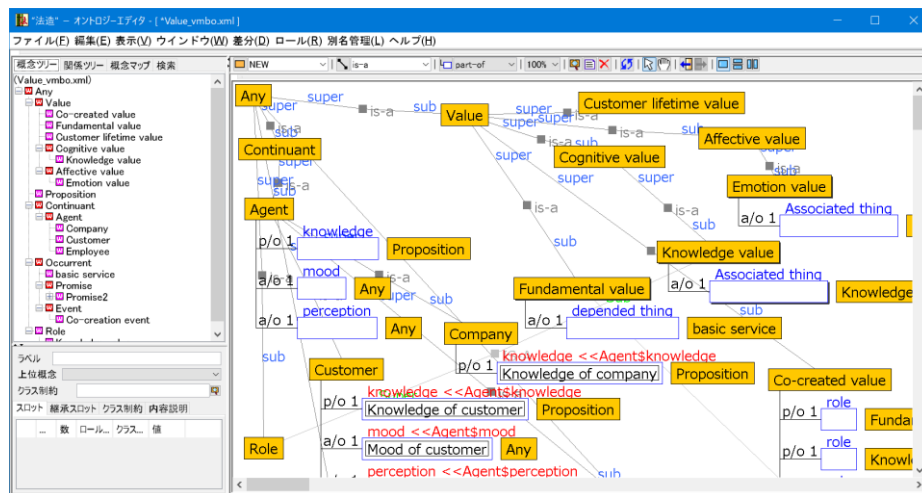

Fig. 1. Ontology of value types under construction

5 Summary

For the first step to development measurement indicators for value, we try to construct an ontology of value types. We start to survey about value in value modeling and

business ontology workshop. Concurrently, we start to construct the ontology based on the notion provided in [8]. We will integrate other contribution provided in related work.

Contributions for the community of value modeling and business ontologies will be (1) ontology of value types, and (2) how to measure each value for decision making by managers of companies.

Acknowledgement

References

1. Andersson, B., Johannesson, P.: Ascribing Value, 12th International Workshop on Value Modeling and Business Ontologies, 8 pages (2018)
2. da Silva Reis, J., de Alencar Silva, P., Bukhsh, F. A., de Castro, A. F.: Configuring Value Networks based on Subjective Business Value, 12th International Workshop on Value Modeling and Business Ontologies, 12 pages (2018)
3. Hruby, P.: Value Exchange and Formation of Coalitions, 12th International Workshop on Value Modeling and Business Ontologies, 6 pages (2018)
4. Proper, H. A., Bjekovic, M., Feltus, C., Razo-Zapata, I.: On the Development of a Modeling Framework for Value Co-creation, 12th International Workshop on Value Modeling and Business Ontologies, 10 pages (2018)
5. Lusch, R. F., Nambisan, S.: Service Innovation: A Service-Dominant Logic Perspective, MIS Quarterly, Vol. 39, No. 1, pp. 155-175 (2015)
6. Grönroos, C., Voima, P.: Critical Service Logic: Making Sense of Value Creation and Co-creation, Journal of the Academy of Marketing, Vol. 41, No. 2, pp. 133-150 (2013)
7. Vargo, S. L., Lusch, R. F.: Evolving to a New Dominant Logic for Marketing, Journal of Marketing, vol. 68, no. 1, pp. 1–17 (2004).
8. Toya, K.: A Model for Measuring Service Co-created Value, MBS Review, No. 11, pp. 29 – 38 (2015).
9. Anderson, B., Guarino, N., Johannesson, P., Livieri, B.: Towards an ontology of value ascription, 9th International Conference on Formal Ontology in Information Systems, Vol. 283, pp. 331 – 344 (2016).
10. Sales, T. P., Baião, F., Guizzardi, G., Paulo, J., Guarino, N., Mylopoulos, J.: The Common Ontology of Value and Risk, In: Trujillo J. et al. (eds) Conceptual Modeling. ER 2018. Lecture Notes in Computer Science, vol 11157. Springer, Cham, pp 121-135 (2018).
11. Kozaki, K., Kitamura, Y., Ikeda, M., Mizoguchi, R.: Hozo: An Environment for Building/Using Ontologies Based on a Fundamental Consideration of "Role" and "Relationship", In: Gómez-Pérez A., Benjamins V.R. (eds) Knowledge Engineering and Knowledge Management: Ontologies and the Semantic Web. EKAW 2002. Lecture Notes in Computer Science, vol 2473. Springer, Berlin, Heidelberg, pp. 213-218 (2002).
12. Kanji Ueda, Takeshi Takenaka, and Kousuke Fujita. Toward value co-creation in manufacturing and servicing. CIRP Journal of Manufacturing Science and Technology, 1(1):53–58, 2008.