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## FROM PRODUCT CENTRED DESIGN TO VALUE CENTRED DESIGN: UNDERSTANDING THE VALUE-SYSTEM

Randmaa, M.; Howard, T.J. & Otto, T.

**Abstract:** *Product design has focused on different parameters through history- design for usability, design for manufacturing, design for assembly etc. Today, as the products get bundled with service, it is important to interconnect product, service and business model design to create synergy effect and offer more value for the customer for less effort.*

*Value and understanding the value-system needs to be in the focus of business strategy. Value can be created, exchanged and perceived. It can be tangible (physical products, money) or intangible (information, experience, relationships, service). Creating value is usually a co-creation process, where customers, suppliers and manufacturers all have their part.*

*This paper describes a paradigm shift towards value-based thinking and proposes a new methodology for understanding and analysing the value system.*

*Key words: value centric design, value-system, co-creation, value network analysis, value activity cycle, value distribution.*

### 1. INTRODUCTION

Globalization and information technologies have made the economic landscape more transparent, customers smarter, more demanding and networked. However, not only the changes in the landscape of economics have influenced the customer behaviour. Michael Etgar has brought out major changes in social sphere [1]:

- social and cultural changes: more time is used for entertainment, sports and

education- social and psychological cost of free time increases,

- demographics: growth in the number of smaller families and single people- increased outsourcing of various home maintenance activities, growth in semi-prepared dishes,
- entry of women into the workforce: women's time spent on household activities decreases- growth of telemarketing and Internet based shopping,
- globalization: integration of economies- Western-like patterns increase,
- technology: the Internet- the cost for interaction between buyers and sellers decreases,
- recession: increase in the number of unemployed- market value of time for many consumers has decreased,
- cultural changes, New Age beliefs and behaviour- search of self-fulfilment e.g. bread baking; shopping combined with entertainment- purchasing has become less of a cost factor and more of a value-producing factor in itself,
- Increased efficiency of the consumer as a producer: increase in the general level of education in a market- more efficient consumption, consumers need less time for their in-house performance of various activities.
- Vargo, Lusch and Morgan also state that individuals become increasingly micro specialized- there is an increasing need for specialized services [Vargo, Lusch and Morgan 2006].

It is due to these dynamic changes that new retailing formats develop and consumers want to change their mix of value providers. Social and psychological cost of time changes. How consumers value different activities, products and services

changes dynamically depending on customers' context and life-style.

Also the wishes of industrial customers have changed- industrial customers value how well value propositions harmonize with their existing components, processes and strategies [2].

Expansion of collaborative technologies allows businesses to organize their value creation processes in new ways. Process-centric view of business changes for human-centric view of business, which means that people are seen as the active agents of business rather than processes. Verna Allee [3] is developing a new promising theory and methodology for understanding the value network within and outside a business.

There may be some major opportunities to apply co-creation models between different parties of economy (customers, suppliers, retailers, producers etc.), that would change how value is created, delivered and perceived [1]. It is our ambition to contribute to the shift towards value-based thinking by opening up some new perspectives for understanding the value system and noticing new product, service and business model design potentials.

## **2. THE THEORY OF VALUE-BASED THINKING**

This section establishes the context in which the new paradigm of value-centred design has arisen and introduces how to view a value system or network.

### **2.1. A paradigm shift from product centric design to value centric design**

Recent studies in marketing, engineering design and business development have found that it is not tangible goods that the customers want [4]. What customers value is what effect these products have on them. Two widely used examples of this idea are the drill and the bicycle. Customers buy holes (solution) instead of the drill (product). Similarly they do not buy a bicycle (product), but a mean for

transportation (self-service) or emotions that a bicycle creates (ownership). Function of the goods is to enable services [4] and to provide less identifiable experiences and emotions [5]

Ratio between created value and cost (not only monetary cost) needs to be high to be competitive on global markets. However, recent findings that people's choices in economic experiments often deviate substantially from those that would maximize their immediate material payoffs have generated substantial rethinking of the postulates of human decision-making. The most well-known example of this phenomenon is Linux (open-source software, developed by programmers voluntarily). It is therefore essential that in order to provide the best, most competitive offerings, a company must invest a sufficient amount of time in understanding what it is their customers, partners and suppliers value [2].

Companies create value by their offerings and customers judge the value of products and services. Nevertheless, no two people can have the same experience- each experience derives from the interaction between the staged event and the individual's prior state of mind and being. Therefore perceiving the value is individual and context dependent. Consumers expect new products to harmonize with their values and lifestyles, and industrial customers expect products to mesh with their existing components in a work-system or a production process.

Value for customers is created throughout the relationship with the company, partly in interactions between the customer and the supplier or service provider [2].

The authors have found in previous researches through literature, example cases and practice that seeing value from a multi-disciplinary viewpoint opens up some unexploited opportunities for the companies to create competitive advantages by overcome barriers within a value system, design integrated products and services, work more effectively, co-

create value with customers and achieve long-term relationships with customers.

## 2.2. The value system

In Porter's value chain concept, the stream of values is one-way, company-centric and the market is separated from the value creating process (product is made ready and then offered on the market). However, this concept has proved not to be suitable in the context of intangible products (services, knowledge, financial products, and experiences). New approaches in science and economy show that the "value" can also be shared or co-created (open innovation, open source software, strategic alliances etc.) by combining different assets and resources into a value in the same process (value star) [6] or in interlinked activities (value network).

Value propositions are born by objects which can be products (physical goods), services, experiences, events, persons, places, properties, organizations, information or even ideas that describe

quantifiable benefits that individual organizations, making an offer promise to deliver. As a result, propositions may include many interlinked activities and actors that are able to create value in many other configurations other than a sequential pattern.

Success of a company depends on how efficiently it can convert one form of value into another within its network. In order to understand how any type of value is created, it is necessary to understand the value dynamics within the system.

The value creating process can be seen as a value star, where all activities done are participating in the process of value creation. By linking many value stars into one value system, value network is formed (Figure 1). Within a value network besides tangible goods and finance, also intangible values can be exchanged and shared (information, customer base, knowledge, relationships, experience etc.), without being converted into tangible values.

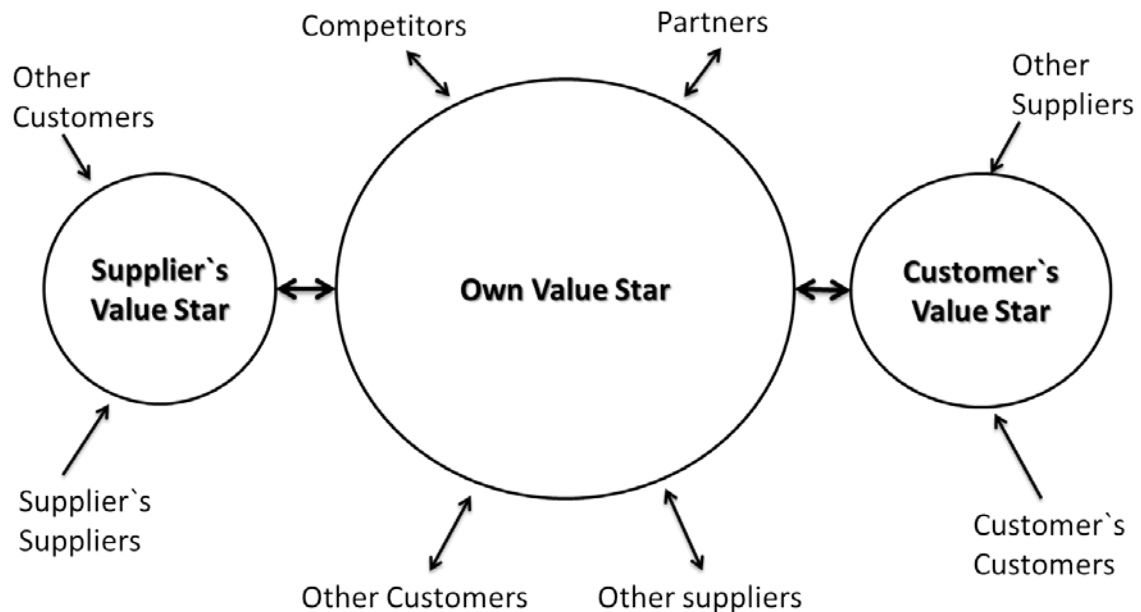


Fig. 1. Value stars connected into a value network

We see that understanding "value creation" in a wider, more interlinked context can unlock some potentially undiscovered market spaces for co-

created values and therefore be an essential step for re-configuring businesses for better fit in global knowledge economy where customers,

suppliers, partners, employees and relationships are seen as potential co-creators of value and experience. Our previous research affirms that value-based thinking often enables to have a better understanding of the problems within a value system and therefore assures discovering more effective solutions.

### 2.2.1 Value Network Analysis

Verna Allee has developed a Value Network Analysis approach in order to understand processes within and around business to be able to re-configure them for a better efficiency and long-term sustainability [3].

Allee defines Value Network as a set of roles and interactions that generate a specific business, economic, or social good. Therefore it can be said that Value Network is any group of people engaged in a purposeful activity. As long as people experience a sense of reciprocity and perceived value or accomplishment from the interactions, people will stay engaged.

Value Network Analysis shows roles, transactions and deliverables. It helps to form questions about optimizing the value flows in the Value Network. The prospect of her Value Network theory is greater agility of businesses from greater capacity to collaborate.

We take value-based thinking and Value Network Analysis as a starting-point for value-centred product, service and business design. We try to analyse different roles and activities (instead of roles, transactions and deliverables, as Allee does) in order to find new ways to distribute activities between different parties and therefore create more value for less cost within the value system.

## 3. VALUE-CENTERED DESIGN

This section proposes a new methodology for value-centred product, service and business model development.

### 3.1 Value activity-cycle

In order to understand value seen from a customer's point of view (value in customer context), it is vital to get insight into the activities of the customer needed to possess the value, which is where the customer values are perceived [7]. This can be seen as the frame for the total customer experience, as it brings in a time dimension of the value. Vandermerwe [8] has developed a graphical information model to get insight into the Customer-Activity Cycle (CAC). The CAC focuses on the activities that the customers go through to get the benefits of the offered products and services. It consists of three stages containing activities in relation to the utilization of the company's offerings: *pre* – before use; *during* – in use; *post* – after use. The activities are placed on a cycle, to illustrate how they are affecting the customer, the central stakeholder in the middle. [8], [9], [10].

We have developed CAC further, resulting in the Value Activity Cycle [2], as a tool to conceptualise value systems, focusing on the supplying network around the customer and the possibility to reconfigure this and to support the customer continuously in the activity cycle. Creating Value Activity Cycles and also un-bundling the company's activities needed to configure and offer value propositions. within a value creating network makes possible to see some interlinks and opportunities between the customer and the companies.

What is interesting to explore within this cycle, besides the supplying network, are the inherent and the maybe unused recourses of the customer as these are adding value to the total value system [6]. Vandermerwe's focuses on how the company can *add value*, by looking at the *critical points* which are representing value gaps, that hold opportunities for the company to fill. What are also important to elaborate from this customer cycle are

the *recourses of the customer* which can add value on the same level as the company.

Donald Normann [6] and his work with emotional design, describes that long-lasting emotional feelings (memories) take time to develop, and they come by sustained interactions, which are important to see as a process of co-creation between customer and company [11]. The value creating activities are not only a process within the company; co-creation experiences are a new paradigm of value creation.

### 3.2 Value distribution analysing matrix

In order to make potential interlinks within a system more clear, it is beneficial to analyse actors' activities within activity cycles in 4 perspectives-

- Why the actors are acting like that? (their needs and wants),
- Can they act differently? (their potentials, resources),
- Why don't/can't they act differently? (their barriers, restrictions) and
- How do different activity distribution strategies impact the value system?

For doing this, we propose value Analyzing matrix from activity perspective (Table 2). This matrix shall be filled in for every activity within the value system [2]. When the company has discovered all these 4 perspectives for all the activities and actors within a system, it is more likely able to see the big picture about the situations the customers, itself and other actors within a system are in. It is now possible to see potential interlinks for value co-creation, sharing, transaction

<b>4) Product transportation</b>	Customer	Furniture shop	Transport company
Needs, wants	Wants transportation service to be precise, in time. Service provider should to be polite, have clean shoes. Service needs to be at low price and fast.	Service can enhance customer experience and therefore potentially form long-term customer relationship/ base.	Wants more customers and higher prices. Wants to save money by optimising transportation routes.
Potentials, resources	Has a car, could transport the product himself. Man power/resources through friends to carry and drive.	We can start our own transportation service business.	We can start working only for furniture shop, if we make a contract for long enough period and good enough fixed prices.
Barriers, restrictions	Does not have a car or the car are too small to contain and thereby transport the product.	This business is not as profitable as our core business- selling goods.	Sometimes we can not deliver goods fast enough, because we try to optimise our routes, or the addresses given by furniture shop are not valid.
Impact	Customer feels that the product is expensive- there are added costs.	It is good to have long-time relationship with a customer, do statistics.	More work
<b>5) Product assembly</b>	Customer	Furniture shop	Assembly company
Needs, wants	Wants product to be assembled correctly and not damage apartment when carried inside.	In order to reduce storage ground, products must be stored before assembled.	Wants to assemble the furniture at the manufacturing factory- it is easier like that, no need to carry tools.
Potentials, resources	Could find some time to assemble the product. Would like to improve home environment by himself. Has friends, who can help if needed.	Could assemble the products at shop right after purchase. Could start our own assembly service business.	Could start working only for furniture shop, if we make a contract for long enough period and good enough fixed prices.
Barriers, restrictions	It is difficult to assemble products by himself because instructions are complicated, assembling requires special tools.	This business is not as profitable as our core business- selling goods.	-
Impact	Customer feels that the product is more expensive- there are added costs.	It is good to have long-time relationships with customers, can do statistic	More work

Table 1. Value analyzing matrix from activity perspective

and find ways to overcome barriers within a system.

It is possible to see the need and purpose of product, service or business model development and also foresee some risks that are in the value system [2].

#### 4. CONCLUSION

Changes in economic, social and technological landscape have created a need for seeing value creation from a more interlinked, multi-disciplinary viewpoint. Understanding the value-system opens up some unexploited opportunities for the companies to create competitive advantages by overcoming barriers within a value system, designing integrated products and services, working more effectively, co-creating value with customers and achieving long-term relationships with customers.

Proposed Value Activity-cycle approach combined with Value distribution analysing matrix is a tool for detecting un-used potentials within a value-system. Recent research through literature and case analysis [2] shows that this methodology can be very prospective for designing value-centred products, services and business models.

In order to validate the methodology and prove its practicality, further work will be done by applying it on existing and developing businesses.

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