A Conceptual Framework on Information Co-Creation: Bridging the Gap between Organizations and Consumers

Hayati Yusof [*a], Azizah Ahmad[b], Lee Eng Keong[c]

aUniversiti Tunku Abdul Rahman, Perak, Malaysia
bUniversiti Utara Malaysia, Kedah, Malaysia
cUniversiti Tunku Abdul Rahman, Perak, Malaysia

Abstract

Information quality (IQ) plays a dual role. In the context of organizations, information has been used by employees within an organization for working purposes and achieving targets. On the other hand, customers are also information users. They rely on information to stay informed, make decisions, comply with rules and exercise their rights and obligations. Literatures pointed out that there is a wide gap between information quality created and shared between organizations and their customers in which the latter is seemed at a disadvantage. This is simply because customers are seen as external to the organizations and passive. They are just merely the end recipients of goods and services. The aim of this paper is to propose a conceptual study to bridge the gap in information co-creation between organizations and customers. The novelty of the framework is to create a "win-win" situation for both parties. By using Information Systems Success (ISS) model, a personalized customer experience can be created by taking into consideration their voices and rights in the information co-creation process. As a result, a meaningful journey produces satisfied and empowered customers that tend to be loyal to organizations. This serves to reward the organizations in their long-term churn management.

Keywords: Information quality, information co-creation, information systems success model, customer experience

1. INTRODUCTION

No company can ever escape the effects of poor data quality (DQ). Even though most effects are barely noticeable but the cumulative impacts are severe. Data are critical assets in today's digital age. It has been defined as "raw and unorganized facts that need to be processed while the processed, organized, structured or presented data in a useful context is called information" (www.diffen.com, n.d.). The speed of data creation, together with their forms, sources and origins are constantly challenging their quality. The early studies on data quality went back to the 1990s or may be earlier. Established names of data quality gurus such as Wang and Strong (1996), Redman (1998), Ballou and Pazer (1985) and English (1999), just to name a few, have consistently fought for data quality improvement ever since. Acknowledging data importance, the search is still continues in the digital era to find better ways of creating, maintaining and using data.

1.1 Impacts of poor data quality

Redman (1998, 2004) was best at pointing out the impacts of poor data quality. Some data are simply incorrect or poorly defined, do not fit for their purpose or can lead to misinterpretation by data users. He claimed that poor data quality was the root-cause of much national and international turmoil in the early year of 2000 in the USA.

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*Corresponding author. Tel.: +0-605-4688888; Fax: +0-605-4661313
E-mail: hayati@utar.edu.my

1.2 Examples of data quality disasters

- During the Bosnian war back in 1999, the United States inadvertently bombed the Chinese Embassy killing three Chinese reporters. This action stemmed from a data error for a military target involving the same street in Yugoslavia.
- The collapse of Enron and subsequently the fall of its auditor, Arthur Andersen were due to misleading financial reporting.
- Jesica Santillan was given donated organs with the wrong blood type by her surgeons. It caused her body to reject the new heart and lungs, and her system to shut down. It was estimated that as many as 100,000 people die every year from medical mistakes. In Jesica's case, the error was caused by the failure to communicate basic information (Kopp, 2003).
- The September 11, 2001 attacks on America might have been prevented had various intelligence agencies shared their data and heightened their security and awareness (Redman, 2004).

Poor data quality costs a typical company about 10-20 percent of its revenues. It angers customers, causing difficulties in decision making process, makes it harder to adopt new technologies and may ruin company image and reputation (Redman, 2004).

From a scholarly point of view, data quality issues have been studied many times from organizational perspectives, but very rare from the perspective of consumers (Moura e Sá & Martins, 2016). Among the scarce studies on data quality involving customers are water or utility issues (Moura e Sá & Martins, 2016), the provision of e-tax filing services (Saha, Nath, & Salehi-Sangari, 2012), access to digital information (Bouwhuis, 2006), just mentioning a few. How customers perceived data is important as it involved their rights and needs to information. Issues such as incorrect billings or invalid customer address, vague presentation of information and obsolete records should gain proper attentions of the commercial operators and the regulators as the customers are relying on these information to make decisions.

The aim of this paper is to propose a conceptual framework in bridging the gap in information co-creation involving both the organizations and the customers. This is seen as, by bridging the gap, good quality of data creation is helping the organizations to achieve their tangible goals/benefits, at the same time retaining satisfied and empowered customers on the intangible side as a 'check and balance' in their business ecosystem.

This paper is organized as the following: first, the introduction is given; then, the literature review will be presented. Next, the conceptual framework will be explained, followed by a discussion and conclusion.

2. LITERATURE REVIEW

2.1 Information systems (IS) success model

Information Systems Success model was introduced by DeLone and McLean in 1992 in searching for "the measure of IS success" in IS research. The first model introduced consisted of six interrelated dimensions of success. They are System Quality, Information Quality, System Use, User Satisfaction, Individual Impacts and Organizational Impacts [Fig. 1]. During 1992-1999, the IS Success model have been applied in 144 journal articles and 15 conference papers. In addition to citations, various researchers have direct or indirectly validated, challenged, critique or extended the actual model (DeLone & McLean, 2002).The model was updated later to include 'service quality' as the third dimension while 'individual impact' and 'organizational impact' were replaced by 'net benefits' as a result of changes in the role and management of IS [Fig. 2] (DeLone & McLean, 2003).

2.2 Systems quality

System quality describes measures of the information processing system (Pitt, Watson & Kavan, 1995). In addition, it measures aspects such as ease of use, functionality, reliability, flexibility, data quality, portability and integration (DeLone & McLean, 2003).
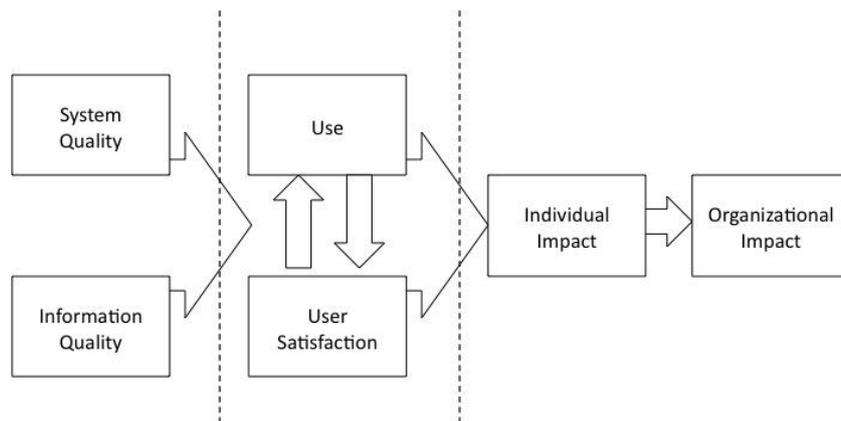
Fig. 1. Information systems success model
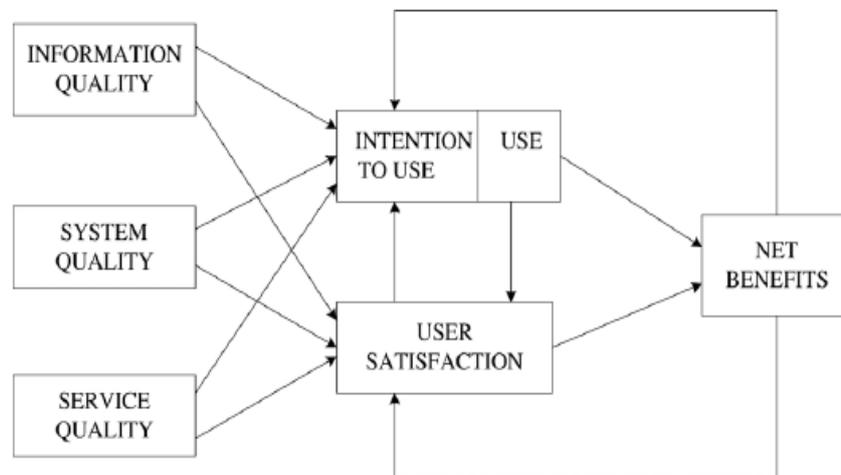(Source: DeLone & McLean, 1992)

Fig. 2. Updated information systems success model
(Source: DeLone & McLean, 2003)

2.3 Information quality

Information quality represents measures of information systems output such as accuracy, timeliness, currency, precision and reliability of information provided (Pitt, Watson & Kavan, 1995).In terms of Information System Success model, information quality may contribute in individual's decision-making performance, job effectiveness and quality of work produced (DeLone & McLean, 2003).

2.4 Service quality

Service quality is the most researched area in the Services Marketing (Fisk *et. al*, 1993). Parasuraman, Zeithaml and Berry (1985) conducted an extensive series of focus group interviews involving SERVQUAL. From the interviews, they concluded that service quality is determined by the difference between what the customer feels should be offered and what is actually provided. These researchers claimed that there are five dimensions assessed by customers when evaluating service quality, regardless of service type.

The dimensions are:
- **Tangibles** are referring to physical facilities, equipment and appearance of personnel.
- **Reliability** is the ability to perform the promised services dependably and accurately.
- **Responsiveness** is referring to the personnel's willingness to help customers and provide prompt service.
- **Assurance** is involving the knowledge and courtesy of employees and their ability to inspire trust and confidence.
- **Empathy** is about caring, individual attention given by the service providers (Pitt,Watson & Kavan, 1995).

Parasuraman, Berry and Zeithaml (1991) claimed that SERVQUAL's items measure the core criteria of service quality and they transcended specific functions, companies and industries. Moreover, context-specific questions may be used to supplement the measurement of the core criteria. Pitt, Watson and Kavan (1995) positively supported the use of SERVQUAL in assessing the success of Information Systems. In general, researchers agreed that SERVQUAL is a good predictor of overall service quality (Fisk *et. al.*, 1993).

Moreover, Johnston and Kong (2011) defined service quality from two perspectives: operational service quality and customer perceived quality. Operational service quality is referring to the operation's assessment of how well the service was delivered to its specification. In contrast, customer perceived quality is the judgement of the customers on the quality of the service, their experience and the perceived benefits that they obtained. Some examples of service quality attributes are reliability, empathy and responsiveness (Johnston and Kong, 2011). The service quality dimension has been added to DeLone and McLean's Information System Success model as the role of IS changes and becomes important over time [Fig. 2].

2.5   System use or use

System use or use is voluntary. Frequency of use, time of use, number of accesses, usage pattern and dependency may reflect system use or use in the Information Systems Success model by DeLone and McLean (2003).

2.6   Quality Function Deployment (QFD) and voice of the customer

QFD is defined as "a systematic way of ensuring that the development of product features, characteristics and specifications, as well as the selection and development of process equipment, methods and controls, are driven by the demands of the customer or marketplace" (Hauser, 1993). The QFD method was originally developed in Japan by Dr. Yoji Akao at the Tokyo Institute of Technology in the late 1960s. Initially it was referred to as the "Quality Tables" and later changed to QFD (Adiano & Roth, 1994). QFD uses four "houses" (House of Quality, HOQ) to capture the customer needs and translate them into the voice of the engineers. There are four aspects in the application of the voice of the customers (VOC). These are: identifying customer needs, hierarchical structuring of the needs, prioritising the needs and determining customer perceptions of performance (Hauser, 1993).

- **Customer needs**

Customer needs can be looked at from several perspectives such as basic needs (what a customer assumes a product will do), articulated needs (what the customer informs he or she wants the product to do) and exciting needs (the needs, that if they are fulfilled, would delight and surprise the customer).The QFD team first has to identify the customer needs, which are description of the benefits that the customers want the product or service to have (Hauser, 1993).

- **Hierarchical structuring of the needs**

The QFD team then structure the needs into a hierarchy such as primary, secondary and tertiary needs. Each step of the next lower need [eg: secondary needs] will be the detailed elaborations of the prior need [eg: primary needs] (Hauser, 1993).

- **Prioritizing the needs**

Prioritizing helps the QFD team to balance between the cost of fulfilling a customer need and the benefits gain by the customer. It helps companies to fulfil certain needs over the others while juggling with their cost-benefit issues (Hauser, 1993).

- **Customer perceptions of performance**

Through surveys, customer's perceptions of how well the company's product and competitive products fulfil customer needs will be obtained as this is useful in improving the product (Hauser, 1993).

3. CONCEPTUAL FRAMEWORK

3.1 Value co-creation and the Peak-End rule

Consumer behaviour has fundamentally changed, causing one of the game-changing market disruptions. Customers, in the digital era, expect to engage companies wherever and whenever they choose, and have a hand in creating products and services that meet their needs alongside the company, a phenomenon known as customer co-creation of value (Heller Baird & Gonzales-Wertz, 2011). They are no longer a "mere passive recipient of goods and services" as demonstrated in Porter's (1998) value chain (Troisi, Carrubbo, Maione & Torre, 2017). Moreover, top performers or market leaders take the opportunity to learn from customers in order to collaboratively create superior 'moments of truth'. One way to do this is via social media engagement with customers. 'Moments of truth' are those situations when customer expectations are high which overlap with the strengths or promises of the service providers (van Hagen & Bron, 2014).

Values to customers can be divided into four categories. They are emotional values, social values, functional values and perceived sacrifice. Emotional values are utility produced by the affective states that a product or service generates; social values are the social utility obtained from the product or service; functional values are utility derived from perceived quality and expected performance of the product or service and lastly, perceived sacrifice is the loss derived from the product or service due to increase in its short-term and long-term costs (Wang, Po Lo, Chi & Yang, 2004; Eskafi, Hossein Hosseini & Mohammadzadeh Yazd,2013; Mostafa, 2015). Troisi *et. al.* (2017) defined value as "something to offer to all actors involved in the process of its creation".

Next, the 'peak-end rule' is a psychological phenomenon demonstrated by psychologist Kahneman, Fredrickson, Schreiber and Redelmeier (1993). The peak-end rule suggested that experiences should be evaluated during a period of time involving two memories: during the *peak* experience and *at the end* of that experience. The peak experience is where customers or users experience the strongest emotions, which can be positive or negative. The experience at the end is also important to assess the overall experience in its entirety (Kahneman, 2013; van Hagen & Bron, 2014). This is to emphasize that it is not necessary to fulfil on all aspect of the service provision/ experience to produce an outstanding value or a satisfied customer.

3.2 Customer rights and empowered customers

As consumers face a myriad of products and services daily, latest and current technology, mass-marketing tactics, salesmanship strategies and sharp advertising, they need to be equipped with consumerism knowledge and skills. This is to empower consumers to make informed choices, be savvy and resilient towards the challenging environment (Sabri, 2014).

To ensure consumer protection, the consumers, business operators and the government agencies need to carry out their particular responsibilities. In the Malaysian context, consumer protection is carried out in a number of ways such as the implementation of national policies on consumer protection, enforcement of existing legislations, formulations of new legislations and amendments to out-dated laws, the conduct of education programs in schools, clubs and seminars and partnership with consumer organisation as well as having good redress mechanisms in place. A good strategy to protect consumers usually involves increasing transparency and awareness of goods and services, promoting marketplace competition, averting fraud, educating consumers and eradicating unfair practices (Ardic, Ibrahim & Mylenko, 2011;Sabri, 2014).

3.3 Personalized customer journey: Customer experience or customer episode

Customer experience provides a new way of competition; it affects customer satisfaction, delivers customer loyalty, influences expectations, supports the brands, instils confidence and creates emotional bonds with the customers. Johnston and Kong (2011) conducted a study on designing a customer experience in order to achieve a triple bottom line. A triple bottom line means it is good for the customers, the organisation's employees and the organisation's bottom line. van Hagen and Bron (2014) provided an example of a customer experience or episode in the railway journey. In addition, Mostafa (2015) explored how to engage university students as active co-learning producers using social media.

A customer experience is different from a service. A service, or the 'moment of truth', is co-created or co-produced along with the customers. While value is created from the sale of the service for the organizations in which the customers make payments [Value-in-exchange] (Lusch, Vargo & O'Brien, 2007). From the customer's perspective, value is created in the service received; their experience of it. The customer's experience, therefore, is their personal interpretation of the service process and their interaction and involvement with it during their journey (episode). Similarly, a customer who flows through a series of touch points and how those touch points make the customer feels, makes his or her experience. It is personal and exists only in the customer's mind. Hence, there are no two same experiences. It results in customer's subjective feelings and associated physiological states.

3.4 Designing customer experience

Several attempts were found in designing and assessing customer experience such as creating customer clues, developing customer journey mapping, providing service transaction analysis and/or customer experience analysis by the organizations. When employees understand the experience their customers have to go through, it improves the delivery of services and reduces mistakes done by the employees. This resulted in reduced number of complaint, improved staff working satisfaction and created emotional bonds with the customers.

Additionally, there are a few crucial factors to look into in order for the customers to be ready to take an active role as co-producers. They are role clarity, ability and motivation. The customers must be aware of what is expected of him/her in co-creating value together with the service provider. Ability refers to the customers' capability to engage in value co-creation with the service providers while motivation is the driving force that causes the customers to be willingly engaged in a value co-creation process (Lengnick-Hall, 1996; Wang, Hsieh & Yen, 2011; Mostafa, 2015).

3.5 Tangible net benefits

Information Systems Success may have impacted individuals, work groups, inter-organizations, industries, customers and societies (DeLone & McLean, 2003). All the impacts are classified as 'net benefits'. It could be a positive as well as negative end result. In this conceptual framework, however, tangible net benefits are referring to 'tangible' or measurable items such as profit or loss, revenues and/or sales figures produced. Here, tangible net benefits do not include values such as customer loyalty or dissatisfied customers.

3.6 Customer satisfaction and customer loyalty (*the intangible benefits*)

Satisfaction is the "consumer's fulfilment response. It is a judgement that a product or a service feature, or the product or service itself, provided a pleasurable level of consumption-related fulfilment, including levels of under- or over-fulfilment" (Oliver, 2015; Mostafa, 2015). Customer satisfaction is the ultimate intangible benefit considered valuable in an organization's churn management program. Next, customer satisfaction has a positive effect on customer loyalty (Gronholdt, Martensen & Kristensen, 2000). Loyal customers serve as 'part-time employees' as they provide strong word-of mouth, create business referrals, provide references and serve on advisory boards (Reichheld & Sasser, 1990; Bowen & Chen, 2001). Additionally, by just retaining five percent more of its customers, an organization's profits can increase by 25 percent up to 125 percent (Reichheld & Sasser, 1990).

3.7   Churn management

Customer churn which refers to the propensity of customers to cease doing business with a company in a given period of time, has become one of the prime challenges faced by companies worldwide (Xie, Li, Ngai & Ying, 2009).). This is because the cost of acquiring a new customer is seven times more expensive than the annual cost of retaining an existing one (Jahanzeb & Jabeen, 2007). Customer churn can be internal or external in nature; voluntary and involuntary. It can also be initiated by the customers themselves due to unfulfilled customer expectation or by the competitors through better service quality, pricing strategies or network coverage [telecommunication industry](Jahanzeb & Jabeen, 2007).

4.   DISCUSSION

When organizations create, use and maintain data or information, often they are examined from the internal point of view. The external view or the customer point of view is often neglected. Customers are treated as separated from the purpose of organizations. This created a big gap between information created and used inside the organizations and the ones supplied to the customers or the public. Meanwhile the customers also are information user, they rely on information to assess their bills, water usage, under or over-consumption of goods and services, new tariffs imposed and so on.

Internally, this study proposed the use of Information Systems Success model to measure the quality of system, information and services provided to the customers. From the external view, organizations can adopt the House of Quality to turn the voice of the customers into the voice of the engineers in order to produce better products and services. To bridge the gap, the concept of value co-creation from Service-Dominant Logic (Vargo & Lusch, 2006) in Services Marketing is applied in this study. Customers are no longer seen as passive; they should be motivated to become active and empowered co-creators along with the service providers. To do so, customers should be equipped with consumerism knowledge, skills and motivations. This is where regulatory bodies, consumer clubs and associations as well as educational institutions play their roles in society.

A personalized customer experience is aimed at creating a fulfilling 'moment of truth'. The 'peak-end rule' suggested that a good or bad experience will be formed during two of the most important *moments* in the customer journey - during the *peak* experience and *at the end*. By focusing on these two experiences in product creation or service delivery, organizations will be able to achieve better positions or even lead the marketplace (Heller Baird & Gonzalez-Wertz, 2011). As a result, positive tangible net benefits and a better churn management program could be realized by the organizations. At the other end, customers are satisfied with products consumed, information and services received [Fig. 3]. This contributes positively to the societal development.

5.   CONCLUSION

The effect of poor data quality is very severe to organizations. Incorrect or poor data was the root-cause of many national and international disasters such as the loss of human lives and reputations, the collapse of big corporations and the angers of customers. Literatures on data quality or information quality pointed out that there is a loophole between organization-customers information needs or information sharing. This framework is proposed to bridge the gap between information produced and used within organizations and the information received and used by customers or the public so that positive impacts of data quality could be realized. This study might be useful for service providers such as the telecommunication industries to improve customer clues, customize products and service delivery and create a better bond with their co-creators. This study opens up an opportunity to turn the framework into a practical work for future researchers in order to suggest a better method or tool to close the gap in organization-customer information sharing.
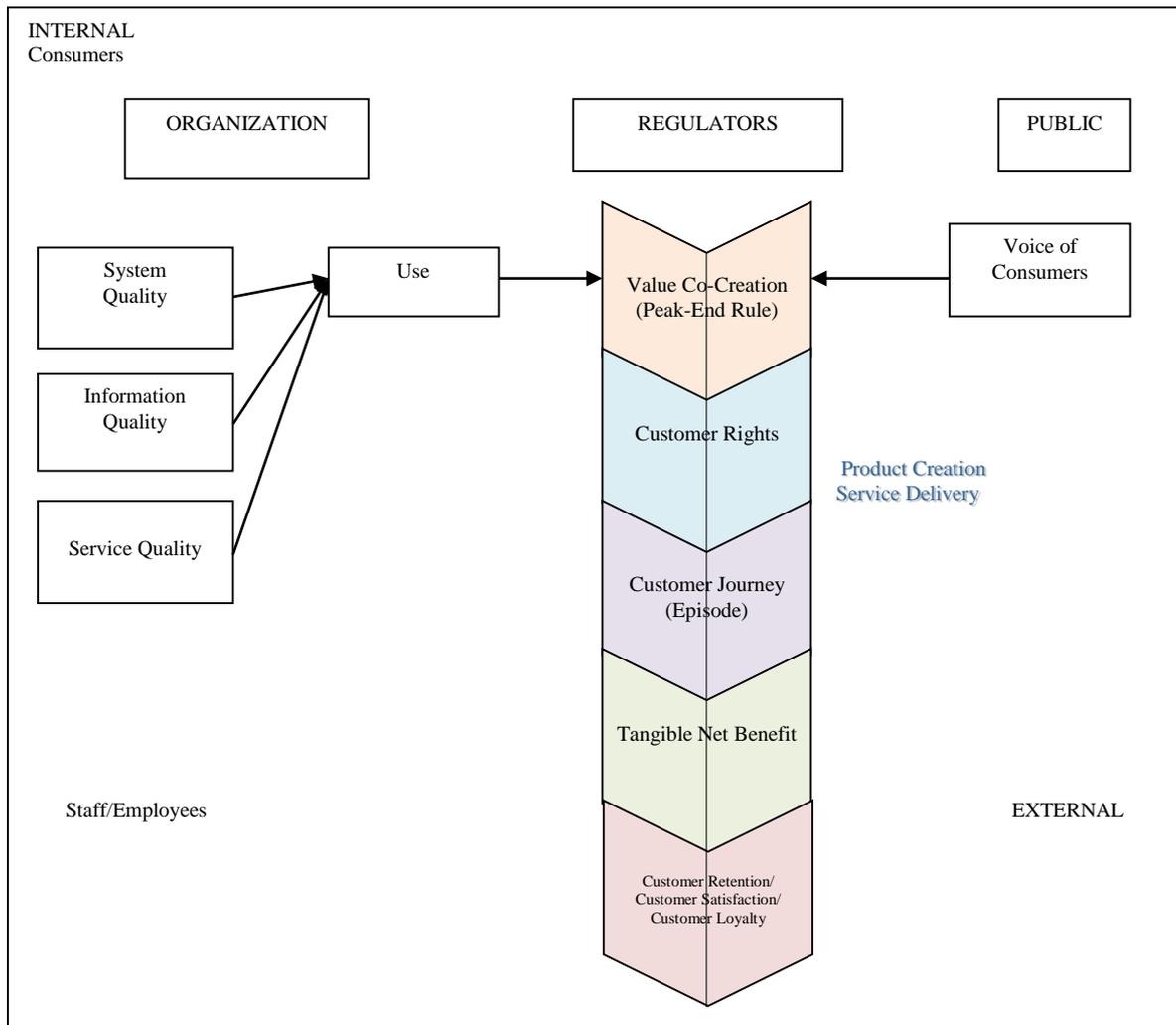
Fig. 3. Organization-Customer Information Co-Creation: A Conceptual Framework

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