A Service System Analysis on Relationship Activities and Customer Satisfaction

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Innovation and productivity in services has become a topic of interest to researchers due to the shift to service economics. This growth of services encourages us to study basic business system changes from product-based to service economies. In service economics, values are co-created by service receivers and service providers. In this paper, we studied service activities of value co-creation by focusing on service interactions and customer satisfactions. We found that service relationship activities have a key role to improve customer satisfactions.

Key Words: サービス、リレーションシップ、お客様満足度、価値の協創、サービス活動

1. Introduction

Innovation and productivity in services has become a topic of interest to researchers due to the shift to service economics [1] [2] [3]. This growth of services encourages us to study basic business system changes from product-based to service economies [4]. In service economics, values are co-created by service receivers and service providers [5] [6]. In this paper, we studied service activities of value co-creation by focusing on service interactions [7] [8] and customer satisfactions [9]. We found that service relationship activities have a key role to improve customer satisfactions.

In the following paper, first we look into service concepts including the history of service definitions including value co-creation concept, and types of service interactions. Based on the concepts, we built the hypotheses on customer satisfactions and service activities focusing on relationships and experience.

In Section 3, we conducted a survey to investigate the linkages of these elements. In Section 4, we discuss the results and future researches.

2. Basic concept in services

First we review service definitions for the base understanding of service itself.

2.1 Value co-creation in a service system

Many studies are done on this subject, especially in service marketing. Intangibility, Heterogeneity, Inseparability and Perishability, called as IHIP, were discussed as the common attributes of services. There were discussion how much these characteristics are commonly supported in service examples. The study by Zeithaml, Parasuraman, and Berry [10] identified marketing problems associated with each of the IHIP characteristics. Lovelock and Gummesson [11] argued that many services have characteristics that are the opposite of IHIP. To overcome this situation, Edwardsson, et al [12] proposed the value creation perspective as the key concept of services [5]. The value co-creation by service receivers and service
providers is the fundamental concept of services, which distinguishes services from other business activities. For value co-creation, the skill and knowledge are core competence of service providers. Adding to the knowledge, the service providers create and add values into the service system of the service receivers [13] thorough the service delivery. It requires the collaboration with service receivers and service providers. The understanding of the business environment and requirements of service receivers is necessary to meet the expectation of the service receivers. For getting the deep understandings and insights of the service system of service receivers, service interactions between service receivers and service providers need to be considered.

2.2 Service interactions
Service interactions are categorized into the following interaction types by Gutek, et al [8]:

1. Relationships
2. Pseudorelationships
3. Encounters

In a service relationship, a service receiver can identify a member of the service providers, and builds trust through longer term interactions. The service receiver and the service provider share knowledge though the service relationship. On the other hand, service encounters are relatively shorter term interactions, which provide discrete transactions, focusing on functions and uniformity, based on delivery process improvement. Gatek uses pseudorelationships for a hybrid type of interaction between a service receiver and provider organization, such as the company of service providers. In this paper, we do not look at the service interaction of provider organization and focus on service relationships and encounters.

As we discussed in Section 2.1, the experience of service providers, such as the skill and knowledge, is an important element to satisfy needs of the service receivers. Addition to the experience, service relationships are also necessary to deliver innovative service offerings by collaboration with service receivers and service providers. Through value co-creation, the service providers embed values into the service system of the service receivers. Service relationship activities are a key to understand customers' needs and expectations of the service delivery. Customers are not only looking for the result of the service delivery, but also knowledge during the service delivery, which are provided based on the experience of service providers. We developed the following hypotheses on customer satisfactions and service activities focusing on relationships and experience:

H1: The execution of service relationship activities correlates positively with the customer satisfaction of the delivered service solutions.
H2: The level of experience of service providers correlates positively with the customer satisfaction of the provided knowledge during the service delivery.

In the next section, we look into the approach to study these hypotheses.

3. Methods
The data for this study was collected from service practitioners, who participated in business and IT services. The questionnaire survey was administrated in 2008 [14] [15]. We had 207 respondents of the survey. The response rate was 20.3%. Of the received respondents, 202 (97.6%) respondents were valid data. We used four questionnaires about service activities on relationships and experience in Appendix for this study. The questionnaire was designed in accordance with a structured survey method [14]. Each question was in the form of a statement for which the respondents were asked to indicate the level of their agreement on a 5-point Likert scale (1: disagree strongly 2: disagree slightly, 3: neutral, 4: agree slightly, 5: agree strongly). We integrate customer satisfaction data based on service providers and service projects.

4. Results
We studied two service teams. One is business and application services, and the other is IT infrastructure services. Pearson's rank correlation coefficient showed at Table 1, which is for business and application services. "Experience in a company" has a positive and strong correlation with "Technical certification" and a negative correlation with "Service relationship activities now". The negative correlation
with service relationship activities recently shows the change of environment factors, which are not addressed in this paper. Both of service relationship activities are correlated positively and strongly.

A factor analysis was conducted using Principal Factor Analysis (PFA) approach with Varimax rotation. Table 2 shows the results of the analysis. Two meaningful factors are computed. “Service Relationships” has a positive relation with both service relationship activities. “Experience” has a positive relation with “Experience in a company” and “Technical certification”. We use these factors for the analysis of the following customer satisfactions. Table 3 shows the result of regression analysis of delivered solution satisfaction as dependent variable. The model is significant at the p < 0.05 level (R² = 0.24). Coefficients of “Service Relationships” are positive and significant for satisfaction of delivered solutions (β= 0.46, p < 0.05). Table 4 shows the result of regression analysis of provided knowledge satisfaction as dependent variable. The model is significant at the p < 0.05 level (R² = 0.32). Coefficients of “Experience” are negative and significant for satisfaction of provided knowledge (β= 0.48, p < 0.05). Table 3 shows that the hypothesis H1 is supported. However, hypothesis H2 is not supported by Table 4. The result of Table 4 shows the opposite for the experience variable.

### Table 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Experience in a company</td>
<td>4.03</td>
<td>0.44</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Technical certification</td>
<td>3.07</td>
<td>0.62</td>
<td>.290**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Service relationship activities in the past</td>
<td>4.59</td>
<td>0.77</td>
<td>-.079</td>
<td>-.019</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Service relationship activities now</td>
<td>4.55</td>
<td>0.75</td>
<td>-.159*</td>
<td>-.003</td>
<td>.348**</td>
<td>1</td>
</tr>
</tbody>
</table>

N=150

*P < 0.05; **P < 0.01.

### Table 2

<table>
<thead>
<tr>
<th>Factors</th>
<th>Service Relationships</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service relationship activities now</td>
<td>.859</td>
<td>-.054</td>
</tr>
<tr>
<td>Service relationship activities in the past</td>
<td>.400</td>
<td>-.046</td>
</tr>
<tr>
<td>Experience in a company</td>
<td>-.145</td>
<td>.562</td>
</tr>
<tr>
<td>Technical certification</td>
<td>.026</td>
<td>.524</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Factor Analysis
Rotation Method: Varimax

### Table 3

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Relationships</td>
<td>.49*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>.24*</td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

β: standardized partial regression coefficient

*P < 0.05; **P < 0.01.
TABLE 4
RESULTS OF REGRESSION ANALYSIS: PROVIDED KNOWLEDGE SATISFACTION AS DEPENDENT VARIABLE
(BUSINESS AND APPLICATION SERVICES)

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>γ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>-0.48*</td>
<td>-0.40*</td>
</tr>
<tr>
<td>Service Relationships</td>
<td>0.41*</td>
<td>0.31</td>
</tr>
<tr>
<td>R2</td>
<td>0.32*</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

β: standardized partial regression coefficient; γ: correlation coefficient
*P < 0.05; **P < 0.01.

Pearson’s rank correlation coefficient showed at Table 5, which is for IT infrastructure services. “Experience in a company” has a negative correlation with “Service relationship activities in the past”. The negative correlation with service relationship activities shows the change of environment factors, which are not addressed in this paper. Both of service relationship activities are correlated positively and strongly.

A factor analysis was conducted for this data, however data did not show meaningful factors. Table 6 shows the result of regression analysis of delivered solution satisfaction as dependent variable. The model is significant at the p < 0.05 level (R² = 0.21). Coefficients of “Service relationship activities in the past” are positive and significant for satisfaction of delivered solutions (β= 0.46, p < 0.05). Table 7 shows the result of regression analysis of provided knowledge satisfaction as dependent variable. The model is significant at the p < 0.05 level (R² = 0.18). Coefficients of “Service relationship activities in the past” are negative and significant for satisfaction of provided knowledge (β= 0.42, p < 0.05).

For IT infrastructure services, neither an expected experience factor nor a service relationship factor were identified. “Experience in a company” did not show the positive correlation with “technical certification”, but “service relationship activities in the past”. Both of variables of service relationships have a positive and strong correlation. We used these service relationship variables for the satisfaction analysis. Table 6 shows that the hypothesis H1 is supported when we treat “service relationship activities in the past” as service relationship variable. Hypothesis H2 is unknown since we could not identify an experience variable.

TABLE 5
MEANS, STANDARD DEVIATIONS, AND CORRELATIONS OF VARIABLES IN THE SURVEY
(IT INFRASTRUCTURE SERVICES)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Experience in a company</td>
<td>3.96</td>
<td>0.52</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Technical certification</td>
<td>2.9</td>
<td>0.66</td>
<td>.215</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Service relationship activities in the past</td>
<td>4.81</td>
<td>0.44</td>
<td>-.286*</td>
<td>.069</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Service relationship activities now</td>
<td>4.71</td>
<td>0.57</td>
<td>-.038</td>
<td>.338*</td>
<td>.395**</td>
<td>1</td>
</tr>
</tbody>
</table>

N=52
*P < 0.05; **P < 0.01.

TABLE 6
RESULTS OF REGRESSION ANALYSIS: DELIVERED SOLUTION SATISFACTION AS DEPENDENT VARIABLE
(IT INFRASTRUCTURE SERVICES)

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service relationship activities in the past</td>
<td>.40*</td>
</tr>
<tr>
<td>Service relationship activities now</td>
<td>0.06</td>
</tr>
<tr>
<td>R2</td>
<td>.18*</td>
</tr>
<tr>
<td>N</td>
<td>27</td>
</tr>
</tbody>
</table>

β: standardized partial regression coefficient
*P < 0.05; **P < 0.01.

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5. Discussion

From our analysis on survey data, the hypothesis of service relationship activities and customer satisfaction of the delivered solution was supported. Relationship service activities initiate service innovation discussion with service receivers and service providers. These discussions become the base platform of value co-creation. The delivered solution includes requirements of service receivers and values which are co-created by both of receivers and providers. However, a hypothesis of experience was not supported. For the case of business and application services, the experience variable was a negative correlation with provided knowledge satisfaction. The service relationship variable was a positive correlation with the provided knowledge satisfaction. Experience based service activities can be transactional as well as relational. In this survey, we asked only relational service activities, and assumed the other service activities as transactional. We need to study the relationship between transactional service activities and customer satisfaction in the future.

There was a different trend between business and application services and IT infrastructure services, especially for an experience variable. The expected knowledge by service receivers might be different between these service offerings. The skill development of service providers by these service types is different, and this might cause this result. We need to study the skill expected by service receivers by each service type.

In this study, we did not distinguish the role of service providers. It is national to assume that service relationship activities are important for the service providers at a front-stage [16]. The relationship among types of service interactions, roles of service providers, and customer satisfactions needs the further investigation.

Regarding PM competence, this study has the possibility to enhance scope management, quality management, communication management and human resource management from relationship activities of service providers and customer interactions viewpoints. By assessing these viewpoints, scope management and quality management will address customer expectation management, which will help to provide higher customer satisfaction services and the more value added differentiated services. In communication management, communication on relationship building will be included. For service providers, it is important to strengthen required communication skills on relationship building in human resource management. This was the initial study of service activities focusing on relationship and customer satisfactions. We would like to explore these areas in the future study.

APPENDIX

QUESTIONS IN THE SURVEYS

Please mark the number to indicate your status.
About your age.
About your technical certification.

Please mark the number to indicate your thoughts. (1: disagree strongly 2: disagree slightly, 3: neutral, 4: agree slightly, 5: agree strongly)

1. About service relationship activities, such as helping technical questions
   1. I provided service relationship activities in the past.
   2. I provide service relationship activities now.

REFERENCES