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Determinants of New Service Performance in the Telecommunications Industry

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Abstract

While many telecommunications services have successfully benefited consumers, companies, and national economy, there have been more cases for telecommunications service failures. In this paper, based on the survey of 60 telecommunications service cases in Korea, determinants of telecommunications service performance are identified and managerial implications are derived. Understanding factors contributing to the performance would provide meaningful insights into how to improve the new telecommunications service development.

1. Introduction

South Korea has drawn great attention with its rapid growth in the telecommunications service industry, especially in the areas of mobile phone service, broadband Internet access service, and wireless Internet service. However, there are more cases for telecommunications service failures. The success has a seamy side to it. This phenomenon will continue to be an issue as new telecommunications services are continually introduced and market competition gets fiercer. Evolution from fixed to mobile, convergence of broadcasting and telecommunications service, globalization of market and competition, and M&As are important driving forces for this trend. In this respect, more and more service failures are expected. Therefore, it is very important to identify determining factors for service successes and failures.

In this paper, based on the survey of 60 telecommunications service cases in South Korea, factors contributing to the performance of telecommunications services are identified and managerial implications are derived. Understanding what are the determinants of the service performance and their relative importance would provide an important insight into how to improve the new telecommunications service development and launch processes.

2. Research Model

In their review of literature on new product performance, Montoya-Weiss and Calantone [1994] classified the factors related to the new product performance into 4 categories (new product strategy, development process, organization, and market environment) and related eighteen factors.

Strategic factors include product advantage, technological synergy, company resources, strategy, and marketing synergy. Eight factors in development process category are proficiency of technical activities, proficiency of marketing activities, protocol, top management support/skill, proficiency of predevelopment activities, speed to market, and financial/business analysis. Factors in organization

category contain internal/external relations and organizational factors such as organizational structure and climate. Three market environment factors include market potential, market competitiveness, and general operating environment

While some consistency exists among the results of previous research, the eighteen factors have shown different effects depending on the research context. Therefore, it is difficult to determine a global set of rules that can be used as a guideline by the managers in all industries [Karakaya & Kobu, 1994].

Using the four categories, significant factors derived in notable studies [e.g. Rothwell et al., 1974; Cooper, 1979; Cooper & Kleinschmidt, 1987; Maidique & Zirger, 1990; de Brentani; 1991], and preliminary interviews with telecommunications service experts, we conceptualized our research model as shown in Figure 1. Four categories are composed of 17 factors, which contains 77 variables. The numbers in the parentheses indicate the numbers of variables for each factor.

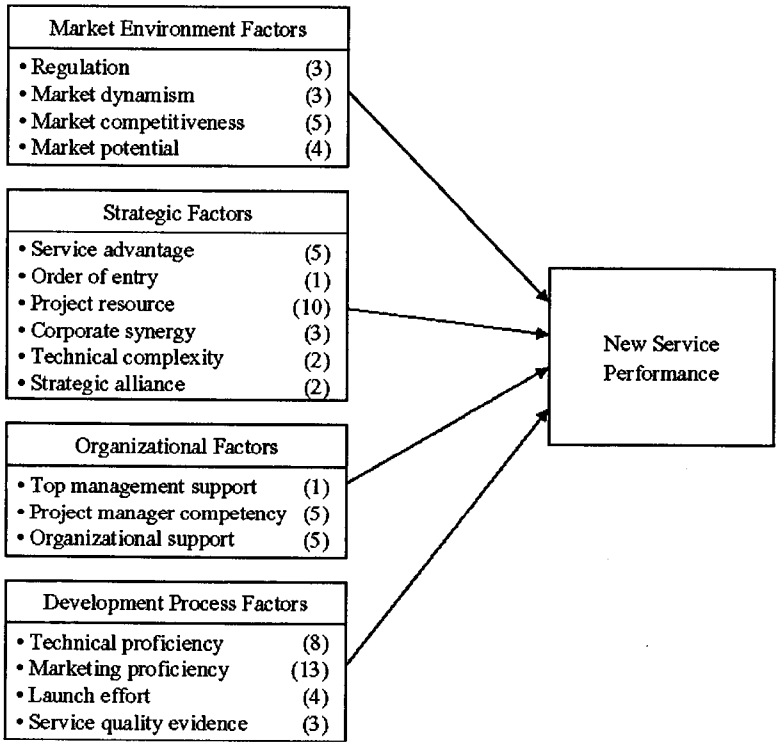

Figure 1. Research Model

3. Research Method

We performed a survey and interviews with industry experts. The data collection involved a survey of 10 Korean telecommunications firms. In the survey, each respondent was asked to select a successful or a failed service. The questionnaire consisted of 77 variables that made up the seventeen dimensions of the model. These variables were measured using 1-7 Likert scales. In addition, each respondent was asked to determine to what degree the service was successful or not via a 1-14 anchored Likert scale.

In total, data were obtained for 78 telecommunications services. The final sample for the analysis numbered 40 successes and 20 failures from 10 firms after excluding 18 cases which were not adequate

for analysis.

4. Results

Three statistical analyses were conducted. First, exploratory factor analysis for 77 independent variables was performed to validate the factors in our model. Second, correlation analysis and t-test were utilized to examine the factors contributing to the service performance. Finally, a supplementary analysis is provided to understand the effect of speed to market, which was not included in the factor analysis solution.

(1) Factor analysis

Factor analysis was performed to obtain underlying dimensions of the 77 independent variables and to compare them with the dimensions of the model. Using principal components analysis with Varimax rotations, a series of analyses were repeated eliminating variables with loadings of less than 0.5 in successive runs. After 4 iterations, a robust and interpretable solution was obtained with 12 factors composed of 61 variables. The result is shown in Table 1.

Table 1. Factor Analysis Results

Category	Model		Factor solution	
	Factor	No. of var.	Factor	No. of var.
Market environment	Regulation	3	Regulation	3
	Market dynamism	3	Market dynamism	2
	Market competitiveness	5	Market competitiveness	5
	Market potential	4	Market potential & service advantage	9
Strategy	Service advantage	5		
	Order of entry	1	-	-
	Project resource	10	Project resource	9
	Corporate synergy	3	-	-
	Technical complexity	2	Technical complexity	4
	Strategic alliance	2	Strategic alliance	2
Organization	Top management support	1	Top management support	1
	Project manager competency	5	-	-
	Organizational support	5	Organizational support	5
Development process	Technical proficiency	8	Technical proficiency	6
	Marketing proficiency	13	Marketing proficiency	12
	Launch effort	4	Launch effort	3
	Service quality evidence	3	-	-

The analysis revealed that market potential and service superiority has the same underlying dimension. Furthermore, four factors in the model (order of entry, corporate synergy, project manager competency, and service quality evidence) were not found to be important by the analysis.

(2) Factors contributing to the service performance

Next, correlation analysis and t-test were performed to examine the factors contributing to the service performance. The correlation coefficient measures the degree of correlation between the scaled success/failure rating and each descriptor variable, and t-test tests for the difference of the means of each descriptor variable for successful services versus failures. The results are summarized in Table 2.

Table 2. Summary of Correlation Analysis and t-test

Category	Factor	No. of variables	Mean CC[a]	Max CC[a]	No. Sig. at[b]		Relative importance[c]
					0.05 level	0.01 level	
Market environment	Regulation	3	0.260	0.293	3 (1)	0 (0)	L
	Market dynamism	2	0.111	0.204	0 (0)	0 (0)	NS
	Market competitiveness	5	0.218	0.350	4 (3)	1 (0)	L
	Potential & advantage[d]	9	0.466	0.628	9 (9)	9 (6)	H
Strategy	Project resource	9	0.284	0.419	8 (2)	5 (1)	M
	Technical complexity	4	0.047	0.080	0 (0)	0 (0)	NS
	Strategic alliance	2	0.106	0.168	0 (0)	0 (0)	NS
Organization	Top mgt. support	1	0.222	0.222	1 (0)	0 (0)	L
	Organizational support	5	0.338	0.412	5 (5)	2 (1)	M
Development process	Technical proficiency	6	0.322	0.422	5 (5)	5 (2)	M
	Marketing proficiency	12	0.313	0.517	10 (7)	8 (2)	M
	Launch effort	3	0.491	0.595	3 (3)	3 (3)	H

[a] CC stands for correlation coefficient.

[b] "No. Sig. at" means "Number of significant variables at", and the numbers in the parentheses show the results of t-test.

[C] H: High, M: Middle, L: Low, NS: Non-significant

[d] Market potential & service advantage

(3) Effect of speed to market

Telecommunications industry has been characterized as network industries [Shy, 2001]. It has been claimed that in the market with network externalities, a firm that gets ahead by chance tends to increase its market share, cornering the market over time [e.g. Arthur, 1989; Shapiro & Varian, 1999]. The extreme outcome has been translated as "winner-take-all" [Arthur, 1996; Shapiro & Varian, 1999]. This winner-take-all hypothesis became popular among many managers and entrepreneurs, who have tried to build large installed bases ahead of competition. Therefore, great emphasis has been placed on speed to market by high-tech industry practitioners [e.g. McGrath, 2001]. In this section, considering the strategic importance of being the first to market, we provide additional analysis

of the impact of the factor on the performance[1].

First, the relationship between speed to market and performance was analyzed. The correlation coefficient was insignificantly low (0.013). In the interviews with the industry experts following the survey, we got some insights on this unexpected result, which were commonly related with most of the companies studied in this research.

"The pressure to be the first to market leaves little room for a systematic approach to service development."

"If our competitors introduce a new service, we should respond to it as soon as possible. Even though our service is a me-too service with little differentiation, fast response is regarded as better than to be a late mover with a well-positioned service"

Based on the understanding of the common industry practice, we hypothesized that the quality of the development process has a moderating effect on the relationship between speed to market and performance, that is, only when the quality of the activities in the process is satisfactory, speed to market has a positive effect on the performance. Subgroup analysis [Sharma et al., 1981] was used to test the hypothesis.

The sample was split into three subgroups on the basis of the three development process factors (marketing proficiency, technical proficiency, and launch effort). Subgroup 1 (low quality subgroup) consisted of 20 services in the bottom third on the mean value of the three factor scores. Subgroup 2 (middle quality group) and subgroup 3 (high quality subgroup) included the middle third and the bottom third services respectively[2].

Next, we performed regression analysis for each subgroup to investigate the relationship between speed to market and performance. The results are shown in Table 3.

Table 3. Subgroup Analysis Results

	Subgroup 1 (Low quality)	Subgroup 2 (Middle)	Subgroup 3 (High)
β	0.196	-0.398	0.768
t-value	0.422	-1.448	2.607
p-value	0.678	0.165	0.018
R^2	0.010	0.104	0.274

The results support our hypothesis. Speed to market has no significant impact on performance in subgroup 1 and subgroup 2. However, in subgroup 3, where the activities in the development process were well executed, speed to market has a strong explaining power for the performance with a high R^2 of 0.274. Therefore, it is concluded that the relationship between speed to market and performance is moderated by the quality of the activities in the development process.

Chasm theory [Moore, 1991; 1995] provides some fruitful insights on the result above. It says that

"whenever truly innovative high-tech products are first brought to market, they will initially enjoy a warm welcome in an early market made up of technology enthusiast and visionaries but then will fall into a chasm... If the products can successfully cross this chasm, they will gain acceptance within a mainstream market dominated by pragmatists and conservatives" [Moore, 1995, pp. 19-20].

There exists a main difference between the visionaries (early adopters) and the pragmatists (early

[1] This factor was excluded out of the factor solution (Table 1), so was not analyzed in the previous analyses.

[2] We alternatively split the sample into three subgroups based on the medians of the factor scores. Subgroup 1 consisted of 13 services having three factor values greater than the medians of the corresponding factor scores. Subgroup 2 (low quality subgroup) included 14 services having three factor values less than the medians. Subgroup 3 (middle quality subgroup) was composed of the remaining 33 cases. The result was similar with the one reported here.

majority) [Moore, 1995]. If a new product has an 80% solution, a visionary says, "Great, let's build the other 20% together" A pragmatist, on the other hand, says, "I will buy this thing when it's done but not before." She wants a 100% solution to her problem. In this regard, a first-to-market service with an 80% solution from focusing on the speed and sacrificing the quality is likely to fail to cross the chasm. On the contrary, if the service was resulted from a well-executed development process, it has a high possibility to get into a mainstream market and to be a success.

5. Managerial Implications

(1) Implement a systematic, market-driven service development process.

The results show that development process-related factors are most important for the performance. Due to the rapid technical change and fierce competition, most telecommunications firms have emphasized time-to-market based on technology-driven service concepts. However, our analysis implies that advanced technology does not guarantee any success (refer to "technical complexity" factor). Instead, marketing proficiency and enough launch effort are critical.

The importance of market-orientation is also supported by the high impact of market analysis ("market potential & service advantage" factor). In addition, the great pressure to be the first-to-market may cause the poor technical performance of the service. Therefore, there should be less emphasis on time-to-market and more on implementing a systematic development process, which should keep an appropriate balance of marketing and technical activities.

(2) Use portfolio management for resource allocation.

To put into enough resources for service development ("project resource" factor), it is important to have a company-wide resource allocation and prioritization mechanism. Portfolio management provides a good tool for this purpose. Through periodic reviews of the portfolio of all new service projects, new projects are evaluated, selected, and prioritized; existing projects may be accelerated or de-prioritized; and the resources are allocated and reallocated [Cooper, 2001]. In this process, the resource problem could be well addressed.

(3) Improve performance evaluation system to encourage cooperation between teams.

New service development involves many functional departments directly or indirectly. As our analysis shows, the cooperation is important ("organizational support" factor). However, we found, through the interviews with the industry experts, that there is a common barrier to the cooperation. They did not want to provide enough support for other project teams in need mainly because their support was not rewarded at all. In this regard, the performance evaluation system should be changed to incorporate the support activities into the employee's official job performance.

5. Conclusion

According to Griffin [1997], only one out of seven new product ideas is successful. However, successful new product development is critical to the success of a firm (For example, the ROI from a successful new product is 12 times as much as that from an ordinary product [Cooper, 1995].). In this study, we examined factors contributing to telecommunications service performance, and derived several implications from the analysis. Considering little cumulative research on telecommunications service sector and the importance of the industry, we expect this study to be a starting point of new research efforts.

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