World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:4, No:6, 2010

The Service Failure and Recovery in the Information Technology Services

Jun Luo, Weiguo Zhang., Dabin Qin

Open Science Index, Economics and Management Engineering Vol:4, No:6, 2010 publications.waset.org/12733/pdf

***Abstract*—**It is important to retain customer satisfaction in information technology services. When a service failure occurs, companies need to take service recovery action to recover their customer satisfaction. Although companies cannot avoid all problems and complaints, they should try to make up. Therefore, service failure and service recovery have become an important and challenging issue for companies. In this paper, the literature and the problems in the information technology services were reviewed. An integrated model of profit driven for the service failure and service recovery was established in view of the benefit of customer and enterprise. Moreover, the interaction between service failure and service recovery strategy was studied, the result of which verified the matching principles of the service recovery strategy and the type of service failure. In addition, the relationship between the cost of service recovery and customer's cumulative value of service after recovery was analyzed with the model. The result attributes to managers in deciding on appropriate resource allocations for recovery strategies.

***Keywords*—**service failure, service recovery, information technology services

I. Introduction

AFTER 30 years reform, Chinese information technology industry has formed an industrial structure of competition and coordinate development of the information technology services. Along with China's entering into the WTO, the government will fundamentally reform the market access, national treatment, and transparency, etc. The restriction against foreign information technology operators will deregulate gradually. Hence, Chinese information technology service enterprises will face a more competitive situation. Thus it is necessary for the information technology service enterprises to provide knight service, increase the customers' satisfaction, and develop the customers' loyalty. The academic research on market information use [1, 2], market orientation [3], have highlighted the role of organizational information processes (e.g., information acquisition, dissemination, and use) in shaping businesses response to their market environment [4]. However, the marketing literature remains rather silent on the organization-wide learning about specific customers [5]. An understanding from this perspective would increase the firm's customer–related responsiveness, specifically in a service failure context.

Be attributable to the characteristics of the information technology service product is intangibleness, otherness, instantaneousness and subjectivity, which result in the operators cannot realize the "zero defect" service, and the service failure is inevitable and abounded [1]. In order to avoid the consequence of customers' complaints and turning away from the company and enterprises' profit decreasing, the service recovery becomes an important way for information technology operators to rebuild customers' satisfaction [6]. The service recovery is defined as an organizational adaptation of a recovery action after the service failure. Its purpose is to rebuild the customers' satisfaction and thus retain the customer.

Research on service recovery to date has focused on customer complaint behaviour and customers' recovery expectations and satisfaction thus typically adopting a consumer behaviour perspective. Some research results showed that the service recovery had remarkable impact on the customers' general service evaluation. The work presents a first step towards studying the design of complaint response processes [7]. They use a combination of two complementary methods: The mechanistic approach, based on established guidelines, and the organic approach based on creating a favourable internal environment. The customers attached more importance to the recovery service than the first service, while the dissatisfaction from the recovery will be more serious than the discontent from the first service [8, 9]. As in paper [10], Keaveney found that the service failure and the failed recovery were the major cause for the customer to switch their service provider. Therefore, the high quality service recovery is very important to increase customers' satisfaction and to retain the customers' loyalty [11]. But the service operator will cost much in the process of service recovery. Therefore, understanding the nature of service failures and their impact on customer responses and designing cost-effective recovery strategies have been recognized as important issues by both service researchers and practitioners.

Jun Luo is with the College of Economics and Business Administration, Chongqing University, Chongqing, 400030, China, (Tel: 0086-023-65112506; E-mail:ljchina8@163.com).

Weiguo Zhang is with the College of Economics and Business Administration, Chongqing University, Chongqing, 400030, China, (Tel: 0086-023-65112506; E-mail:wgzhang@cqu.edu.cn).

Dabin Qin is with the College of Economics and Business Administration, Chongqing University, Chongqing, 400030, China, (Tel: 0086-023-65112506; E-mail:qindabincqu@163.com).

Supported by the MOE project of humanities and social sciences at universities (08JA630093)

Open Science Index, Economics and Management Engineering Vol:4, No:6, 2010 publications.waset.org/12733/pdf

II. The Service Failure in the Information Technology Services Industry

Chinese information technology service enterprises have adopted series measures to increase the service quality, but because of the particularity of the information technology services, the service failure is inevitable. According to the characteristics of the information technology industry and relevant data analysis, the service failures of the information technology service enterprises are embodied in the following.

A. Operator's Hardware Failure

The hardware failure may come from the telecom service office or out of the office. The faultiness, trouble and improper design of the hardware in the service office may lead to the service failure. For instance, the incomplete identification code, operation introduction, working procedure, service item will result in the dispute; there is lacking in basic establishment for the customers to inquire about or print their bill. The service failure from outside office is mainly rooted in the technology. For example, the information technology base station cannot meet with the durative increasing call in a certain region; there is voice quality problem in some mountain areas; there is the marginal ramble in the administrative division boundary caused by the system and increase customers' mobile fees [12].

B. Service Attitude Failure

The service attitude failure is that the service staffs' attitudes – during the contact with customer in every key point – toward the customers fail to meet with the customers' expectation or go beyond the customers' tolerance [12]. It is often embodied by the non-standardization or irregularization.

C. Failure from the Service Provide Process

This type of failure is from the information technology service transfer process, which is mainly reflected in the inefficiency of the service, the overbearing clause in the agreement between the company and the customer, the illogical charge criterion or presumed rate change, lack of information technology to the customer, and not-doing his/her best to deal with the customers' complaints.

D. Lack of individualized service

When the customer requires the individualized service, some special demand cannot be satisfied. It mainly behaves as: (a) there's short of individualized service item for different consumption group and the customers' desired individualized service cannot be satisfied; (b) when the customers speak for rational requirement, they are refused or the problem cannot be solved effectively.

In addition, there is another two types of failure: (a) from the customers' not accurately expressing his expectation and (b) from the natural environment, such as the thunder, flood, etc. Confronted with these service failures brought with negative effects, the information technology service enterprise should implement the service recovery to increase the customers' satisfaction and to recover the image and reputation. In the following part, this thesis will analyze the interaction mechanism among the service failure, customers' perceived value, and the service recovery through an integrated model, and seek for the equilibrium between customers' perceived value and the service recovery cost to give a guidance to establish the service recovery strategy.

III. Integrated Conceptual Framework of the Service Failure and Recovery

Service failures and recovery strategies have been hot topics of keen attraction to service researchers [13] and practitioners [14]. The extant literature offers some useful insights along four broad themes: classification of service failures and recovery strategies, customer evaluation of service failure/recovery encounters, financial aspects of service recovery, and link between failure types and recovery strategies [11, 15]. However, significant research and modeling gaps remain. Based on the contributions of pervious research and focusing on the unanswered questions, develop an integrated conceptual framework of service failure and recovery strategies is developed, as shown in Figure 1.

The integrated conceptual framework incorporates from both the customer's and service corporation's perspectives. On the customer side, service failure should be divided into two components: failure type (i.e., outcome vs. process) and failure magnitude. When a failure occurs, the customer experiences a value loss, with the perceived value loss being moderated by the customer's sensitivity to each type of failure and perceived relative importance of the outcome and process dimensions. Depending on the type and magnitude of the corporation's service recovery effort, the customer experiences a value gain, with the perceived value gain also being moderated by the customer's sensitivity to each type of recovery and perceived importance of the two dimensions. The customer's overall mental accounting of perceived value of the service is collectively determined by his previously perceived value, perceived value loss from failure, and perceived value gain from the recovery.

On the service corporation's side, the recovery efforts have a dual objective. First, the firm aims to restore the customer's cumulative perceived value to a desired target level that is necessary for retaining the customer. Second, the firm attempts to minimize the overall recovery expenditure needed to realize the value recovery target. The overall recovery expenditure is the sum of the expenditures on outcome and process recoveries, which, in turn, depend on the corporations cost functions associated with the two types of recovery.

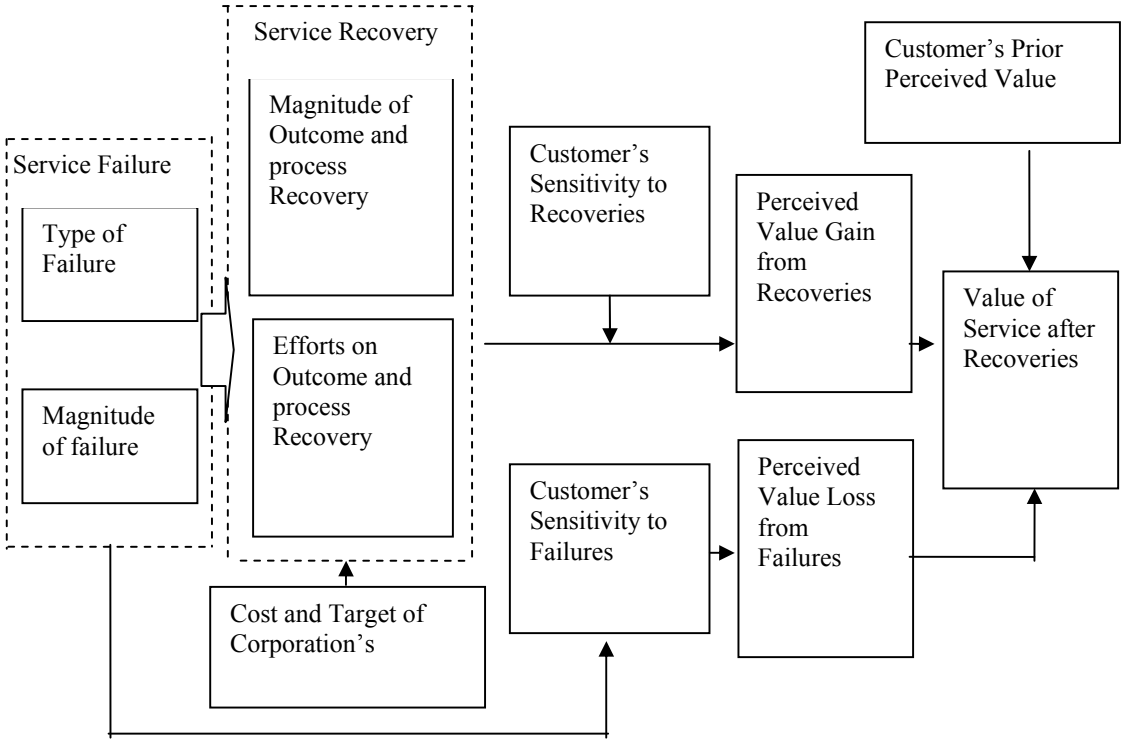


Fig.1 The integrated conceptual framework of the service failure and recovery

It is proposed that the type and magnitude of service recovery do not depend solely on the severity of the failure and the principle of matching mental accounting. Instead, in the integrated model conceptualizes a customer value-driven approach. That is, to determine the optimal recovery strategy, the service corporation first needs to decide on a target for its value recovery efforts (i.e. how much value the corporation expects the customer to perceive after recovery). This target value should be based on the customer's current and potential profitability as well as other criteria that might influence the customer's importance to the corporation. The value recovery target and the corporation's cost functions for outcome and process recovery jointly determine the type and magnitude of the optimal recovery strategy. In the following part, this paper develops mathematical representations of the various components of the framework and analyzes the relationship of service failures and recoveries.

IV. The Mathematical Model of the Service Failure and Recovery

A. Customer's prior perceived valve and service failure

It is denoted that a customer's prior perceived value of the service as PV. When PV>0 the customer has a net positive image of the corporation based on experiences before the current failure. When PV<0, the customer has already experienced some value loss from the corporation and has a net negative image. After the happening of the service failure, the customer will firstly divide the failure into two categories according to the type of the lost resources: outcome failure and process failure. The outcome failure is involved with the loss of the economic resources of the customer, while the process failure is relating to the loss of the social resources. The magnitudes of the outcome and process failures are denoted as F_1, F_2 respectively. So assumed that the magnitudes of both types of failure are continuous and that $F_1 \leq 0$ and $F_2 \leq 0$.

B. Customer Sensitivity

A set of parameters were represented as: β_1 for sensitivity to loss from outcome failure, β_2 for sensitivity to loss from process failure, ρ_1 for sensitivity to gain from outcome recovery strategy, and ρ_2 for sensitivity to gain from process recovery strategy. All the parameters are assumed to be positive. In our model accommodates situations wherein customers take higher-than-normal expect, that is $\beta_1<\rho_1$ and $\beta_2<\rho_2$ .This phenomenon is true, for instance, for some consumers who voluntarily take risks on new innovations and derive satisfaction from the process of trial or retrial, irrespective of their own failure (and recovery) or that of the service corporation [16].

C. Corporation cost and recovery strategy

The corporation's cost structure for recovery strategies determines the efficiency of converting resource inputs into recovery performance. The model includes separate cost functions for the two types of recovery and depicts the outcome recovery magnitude C1(E1) as a function of outcome recovery expenditure E1, and the process recovery magnitude C2(E2) as a function of the process recovery expenditure E2 Although other resources, such as a more customer-oriented organizational culture, could indirectly enhance recovery

Open Science Index, Economics and Management Engineering Vol:4, No:6, 2010 publications.waset.org/12733/pdf

Open Science Index, Economics and Management Engineering Vol:4, No:6, 2010 publications.waset.org/12733/pdf

efficiency, our model's focus is on monetary recovery investment, which has a direct impact on the managerial objective of recovery-cost control.

Assumed that $C_1(E_1)$ and $C_2(E_2)$ are nonlinear convex functions with the following properties. Both outcome and process recovery efforts and expenditures are positively related the recovery magnitudes. That is $C'_1(E_1)>0$ and $C'_2(E_2)>0$, however, when recovery efforts and expenditures increases, its marginal unit contribution to recovery magnitude diminishes, that is $C''_1(E_1)<0$ and $C''_2(E_2)<0$.

One of corporation's goals is to restore the customer's overall perceived value of the service to a certain target level, L, which represents the cumulative value the corporation desires the customer to have after experiencing the service recovery.

The purpose of corporation's recovery strategies is that minimizes recovery cost and restores customer cumulative value to a certain target level, Therefore, the objective function can be written as follows:

$$\text{Minimize } E = E_1 + E_2 \tag{1}$$

Subject to:

$$PV + \beta_1 F_1 + \beta_2 F_2 + \rho_1 C_1(E_1) + \rho_2 C_2(E_2) = L \tag{2}$$

Where:

$$\beta_1 > 0, \beta_2 > 0, \rho_1 > 0, \rho_2 > 0,$$
$$F_1 \le 0, F_2 \le 0, E_1 \ge 0, E_2 \ge 0$$
$$C_1'(E_1) > 0, C''(E_1) < 0, C_2'(E_2) > 0, C_2''(E_2) < 0$$

In equation (2), $\beta_1 F_o$ refers to the customer perceived value loss from outcome failure and $\beta_2 F_p$ refers to the value loss from process failure. And $\rho_1 C_1(E_1)$ refers to the perceived value gain from outcome recovery and $\rho_2 C_2(E_2)$ refers to the value gain from process recovery. The cumulative perceived value after recovery, L, is composed of the elements on the left side of equation (2) , prior perceived value, perceived value loss, and perceived value gain. From the decision making perspective, this cumulative perceived value after recovery is set to be the service corporation's recovery target for the failure situation. It is noted that the modeling effort is the first attempt to formally integrate recovery cost control and customer value perception of the recovery in a single conceptual framework.

The general model proposed in this paper can serve as a basis for future model extensions. All parameters are assumed to be independent of one another.

To solve for the optimal solution to the objective function, the equations (1) and (2) combined into a new equation using the Lagrange multiplier approach:

$$\Pi(E_1, E_2, \lambda) = E_1 + E_2 + \lambda(PV + \beta_1 F_1 + \beta_2 F_2 + \rho_1 C_1(E_1) + \rho_2 C_2(E_2) - L) \tag{3}$$

As is customary in optimization models, the first-order conditions for the Π (E_1, E_2, λ) function are zero for the optimal solution. The first-order conditions for the Π (E_1, E_2, λ) function are:

$$\partial\Pi / \partial E_1 = 1 + \lambda \rho_1 C_1'(E_1) \tag{4}$$

$$\partial\Pi / \partial E_2 = 1 + \lambda \rho_2 C_2'(E_2) \tag{5}$$

$$\partial\Pi / \partial\lambda = E_1 + E_2 + PV - \beta_1 F_o - \beta_2 F_p + \rho_1 C_1(E_1) + \rho_2 C_2(E_2) - L \tag{6}$$

Given: $\partial\Pi / \partial E_1 = 0$, get that:

$$\lambda = -\frac{1}{\rho_1 C_1'(E_1)}$$

Then

$$\rho_1 C_1'(E_1) = \rho_2 C_2'(E_2) \tag{7}$$

The optimal solutions for expenditures on outcome recovery E^*_1 and process recovery expenditure E^*_2, can be obtained by simultaneously solving equations (6) and (7). The optimal solutions can be converted to managerial decision choices concerning outcome versus process according to the following general guideline. When $E^*_1 < E^*_2$, the recovery strategy emphasizing process recovery is preferred; when $E^*_1 > E^*_2$, the recovery strategy emphasizing outcome recovery is preferred; and when $E^*_1 = E^*_2$, a mixed strategy involving both types of recovery is preferred. Thus, the solutions provide insights for designing the most appropriate recovery strategy.

V. Conclusion

In this paper, the service failure and service recovery in the information technology services industry were studied. The service failures include the hardware failure of operators, the failure of service process, and the failure of service staff, etc. These failures would bring the consumers with the loss of the service process and the loss of the service result. Based on this, an integrated model is constructed for the service failure and the service recovery considering the consumers' benefit and the recovery cost of the service enterprises simultaneously. In addition, the relationship between the type of the service failure and the service recovery strategy are analyzed, and further validated the matching principles of the service recovery strategy and the type of the service failure. The equilibrium of the service recovery cost and the customer's cumulative value of service after recovery can be achieved with the model, which was practical for the information technology enterprises to make appropriate recovery strategy.

References

[1] Mitchell, V. W. 1993. Handling Consumer Complaint Information: How and Why?. Management Decision 31(3): 21-28.

[2] Moorman, Christine. 1995. Organizational Market Information Processes: Cultural Antecedents and New Product Outcomes. Journal of Marketing Research 32(3): 318-336.

[3] Kohli, A. K. and Bernard J. Jaworski. 1990. Market Orientation: The Construct, Research Propositions. Journal of Marketing 54(2): 1-18.
[4] Johnston, Robert and Sandy Mehra. 2002. Best practice complaint management. Academy of Management Executive 16(4): 145-154.
[5] Campbell, A. J. 2003. Creating customer knowledge competence: managing customer relationship management programs strategically. Industrial Marketing Management 32: 375-383.
[6] Smith, Amy K. and Ruth N. Bolton. 2002. The Effect of Customers' Emotional Responses to Service Failures on Their Recovery Effort Evaluations and Satisfaction Judgments. Academy of Marketing Science 30(1): 5-23.
[7] Homburg, Christian and Andreas Fürst. 2005. How Organizational Complaint Handling Drives Customer Loyalty: An Analysis of the Mechanistic and the Organic Approach. Journal of Marketing 69(3): 95-114.
[8] Berry, L. L., A. Parasuraman and V. A. Zeithaml. 1990. Achieving Service Quality: Balancing Perceptions and Expectations. New York: The Free Press.
[9] Bitner, Mary Jo. 1990. Evaluating Service Encounter: The Effects of Physical Surroundings and Employee Responses. Journal of Marketing 54(April): 69-82.
[10] Keaveney, Susan M. 1995. Customer Switching Behavior in Service Industries: An Exploratory Study. Journal of Marketing 59(April): 71-82.
[11] Smith, A., R. Bolton and J. Wagner. 1999. A Model of Customer Satisfaction with Service Encounters Involving Failure and Recovery. Journal of Marketing Research 36(3): 356-372.
[12] LI Xin, YU Bo. 2004. The Characteristics of Service Quality Evaluation and Tactics of Service Recovery. Management Sciences in China 17(3): 73-76.
[13] Kau, Ah-Keng and Elizabeth W.-Y. Loh. 2006. The effects of service recovery on consumer satisfaction: a comparison between complainants and non-complainants. Journal of Services Marketing 20(2): 101-111.
[14] Brady, Michael K. and J. Joseph Cronin Jr. 2001. Some New Thoughts on Conceptualizing Perceived Service Quality: A Hierarchical Approach. Journal of Marketing 65(July): 34-49.
[15] Gronröos, C. 1990. Relationship approach to marketing in service contexts: the marketing and organizational behavior interface. Journal of Business Research 20(1): 3-11.
[16] Novak, T. P., D. L. Hoffman and Y. F. Yung. 2000. Measuring the Customer Experience in Online Environments: A Structural Modeling Approach. Management Science 19(1): 22-42.

Open Science Index, Economics and Management Engineering Vol:4, No:6, 2010 publications.waset.org/12733/pdf