ASSESSING CRITICAL SUCCESS FACTORS (CSFs) AND QUALITY OF SERVICE: AN EMPIRICAL STUDY BASED ON SINGAPORE COMPANIES

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ABSTRACT

Research in the U.S. has revealed that quality service has become a critical success factor (CSF) for Information Systems (IS) departments in U.S. organisations. This report examines whether quality service is critical to the IS departments in Singapore organisations. To achieve the purpose, the findings of previous research regarding CSFs in IS departments has been examined with a view to identifying a set of CSFs that include quality related CSFs. This is followed by a survey of Singapore firms' executives in charge of IS departments. The findings show that while there are some differences across the two studies, overall the ratings of this study and the U.S. study are closely correlated.

Keywords: CSF, Information Systems, IS Department, quality service

INTRODUCTION

Purpose of this Research

Improving the quality of service of an organisation is a key factor in gaining competitive advantage. As a service department within an organisation, the information systems (IS) department measures its success only by how well it provides user-friendly service and helps provide good products to its clients. By providing service IS departments can contribute to the total quality management of the organisation.

This study examines the use of CSFs of IS departments in Singapore firms. It investigates the perception of IS managers about the quality service as a CSF. CSFs has been used both as a decision aid to management and a learning device for the IS organisations.

About the author

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Definitions and Concepts

There are two important terms in this research: Quality service and critical success factor (CSF). The word 'quality' has been interpreted in many different ways, and there is no agreement on what actually constitutes quality. In the broadest sense, quality is anything that can be improved, which could guide management decisions. According to Imai (1989), quality is associated not only with products or services, but also with the way people work, the way machines are operated and the way systems and procedures are dealt with. It includes all aspects of human behaviour. He emphasized the word 'KAIZEN' meaning improvement, rather than quality or productivity. The implication of 'KAIZEN' in conjunction with other methods such as quality control, quality assurance and statistical quality control were first introduced and played a vital role in the Japanese industries. Most of these methods were introduced in manufacturing until the 1980s, when awareness of the importance of quality started to grow in service industries. Among the leading researchers in this field are Gronroos (1998), Ferguson and Zawacki (1993), and Parasuraman, Berry and Zeithaml (1991, in Brown, Gummesson, Edvardson & Gustavson 1991). For instance, Gronroos defined 'service quality' in a way which could guide management decision. For this, a model of service quality is proposed. Parasuraman et al. (1991), on the other hand, provided a 'gap analysis' model which is a systematic research program on service quality. The basis of both models serves as a foundation for understanding, measuring and improving service quality.

For both manufacturing and service firms, quality relates positively to long-term goals and financial performance, and according to Gronroos (1998), quality service is becoming a primary differentiating factor for most businesses today. Barclay (1993) examined the consistencies between treating quality as a strategic objective and the action/behaviour that lead to improved quality products and services. In his study, a multi-industry sample of service and manufacturing organisations was used. It was found that high quality was the most frequently suggested primary strategic objective of most firms. This high quality leads to increased profitability, market share, employee and customer satisfaction and competitiveness (Crosby 1978; Deming 1986; Juran 1988; in O'Hara & Frodey 1993).

From the above description, it is clear that quality means meeting requirements and when these requirements are fulfilled then quality service is produced. This productive quality is found in industries where tangible benefits are very high.

The second concept in this research is critical success factors (CSF). Like quality, the meaning of CSF has also been interpreted in different ways and used at different levels within organisations. The CSF approach was originated as a method of defining chief executive information needs. Since then, it has been found to be applicable to any organisation and to any management level within an organisation (Martin 1982). The technique has two main functions: First, to encourage the individual executives to focus on those issues which are the most important; and second, to help them think through their information needs in these area (Gunton 1993). The CSF technique has become a cornerstone and has attained a high degree of acceptance in IS planning methodologies. Among the leading researchers in this field are Rockart (1979), Martin (1982), Boynton and Zmud (1984), and Ward (1990). Most of these researchers related the CSF with an organisation's goals, planning and management objectives. For example, according to Rockart

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(1979) CSFs are the few key areas where 'things must go right' for the business to flourish. Shank, Boynton and Zmud (1984) identify corporate information needs. On the other hand Munro and Wheeler (1998) used it to determine the information requirements for management control. In the broadest sense, CSF is a management tool to help managers define their information needs and to link those with general business needs.

Another important concept in this research is the term Information Systems (IS). The IS denotes all IS or IT (information technology) departments or IS services groups within an organisation.

LITERATURE REVIEW

In management and IS literature, the use of CSFs is seen as a tool for IS planning in an organisation. Although, there appears to be some debate about who is the original author of the CSFs, it was John Rockart (1979) who first applied CSFs in the field of IS to identify the information requirements by IS senior executives. According to Rockart (1982), CSFs are the key areas where 'things must go right' for the business to flourish. These critical factors are geared towards conducting interviews with top managers about their goals and perception of how information should be handled (Laudon & Laudon 2011; O'Brien & Marakas 2009). During each interview the IS executives added new CSFs or dropped old CSFs until a final set was determined. It was argued that CSFs are used as a guide for IS planning, strategic planning and implementation, information centre planning, IS project management and as a competitive analysis technique. Rockard's typical CSFs are a) service; b) communication; c) IS human resources; and d) repositioning the IS function.

With the dynamic changes in the IS and business environment, CSFs have changed. For instance, Martin (1982) added few valuable factors to Rockart's CSF approach, indicating that management control is also an area that must be considered. Munro (1983) on the other hand compared both Rockert's (1982) and Martin's (1982) CSFs and found the result to be complementary. Zahedi (1986) constructed a CSF hierarchy and configuration based on Rockart's data and tested the results against Martin's data set. He presented the use of IS reliability measure in management decisions, and discussed cases lacking quantifiable performance measures. The article suggests reliability as a measure of system success. Raghunathan et al. (1989) also related CSFs of IS managers to the performance of IS organisations. In their study they identified six criteria of Martin's (1982) study and all of them are related to the CSFs of IS managers.

In the early 90s, the importance of quality in the services was emphasised by many researchers (Ferguson & Zawacki 1993; Hutchins 1992; Perry 1992; Pollalis & Frieze 1993), who argued that traditional CSFs are obsolete and that a new set of CSFs has evolved. For instance, according to Hutchins (1992), to implement total quality one of the critical success factors is to link it to the mission statement. The mission statement provides a focus for total quality and leads directly to the identification of key issues or CSFs. In the same line of thought, Pollalis and Frieze (1993), argued that because of the current development in information technology, competitive advantage pressures and structural changes within organisations, an emerging set of CSFs has become essential for IS executives in the latter half of the decade. They argued that IS

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performance or success should be measured using CSFs that are different from the past. This is because the focus of attention in measuring IS performance has shifted from systems-oriented measures (e.g., input and output capabilities) to extra organisational ones (e.g., senior management involvement and planning). According to Ferguson and Zawacki (1993), to retain the substantial impact on the business and to continue to provide a valuable contribution to the business units of the company, IS must examine their own ability to provide quality services and to meet the IS needs of the company. To gain a better understanding of quality service IS managers must first understand the basic strategies organisations use to differentiate themselves from the competition. These strategies are service, technical, price and image.

Recently, Huotari and Wilson (2001) investigated a series of reports conducted in both academic and business institutions of the U.K. and Finland. They strongly believed that a CSF approach is appropriate to determine the information needs of an organisation and enable it to achieve a competitive advantage. Yet another study was conducted by Tibar (2002) across various industries, which indicated that the information needs of managers were related to competitors, customers, technology and quality management.

In the 21st century, as a service function within an organisation, the IS department can measure its success only by how well it serves its customers (i.e., the end-users), and strive to improve the quality of service that contributes to that success.

RESEARCH METHOD

This research is an extension of previous studies. It has used a combination of CSFs to understand the adoption of IS CSFs in Singapore. However, it does not fully adopt the framework of prior studies. This study also examines the demographics of IS departments and the firms, and then examines whether there is any co-relation between such demographics and CSFs. 'Demographics' will help assess whether firm characteristics have any influence on the choice of CSFs.

A multi-section questionnaire was mailed to the top 50 Singapore companies in March, 2005. The first section of the questionnaire focused on the demographics of IS departments. This included data about respondents' experience (in terms of years in IS-related functions), the size of organisation (i.e., number of employees), type of company (i.e., either manufacturing or services), and whether the company is decentralised. The second section of the questionnaire focused on 20 CSFs (see Table 1). These factors were drawn from prior studies. Respondents were asked to rank each of the 20 CSFs on a five-point Likert scale (e.g., 1 = Not important at all, 5 = Very important).

The research did not have any serious ethical implications for the respondents. Despite this, confidentiality has been maintained. All information received from the respondents has been coded, so that the identity of the respondents and the nature of their responses are not disclosed. The research reports only the overall findings rather than the responses of individuals.

Table 1: List of critical success factors used in the questionnaire

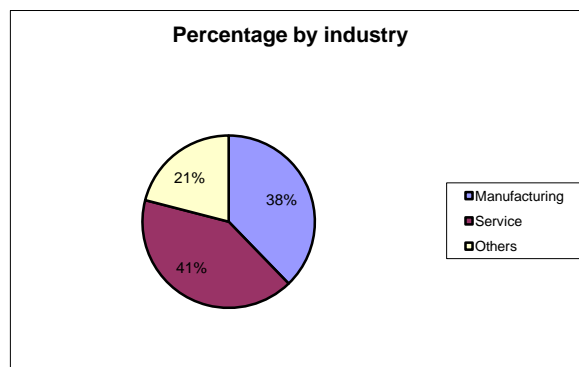| |
|---|
| Delivery of good quality IS services |
| Support from top management for IS activities |
| Communication between IS executives and users |
| Reliability of application systems |
| Security of Networking/data |
| Handling growth and change |
| Focus on intra-organizational linkages |
| Focus on extra-organizational linkages |
| Decentralization of MIS |
| How ISs are perceived by competitors |
| Focus on on-line service |
| Establish strong culture |
| High quality of MIS managers |
| Good customer service |
| Good Leadership |
| Advanced IS system |
| Quality of production |
| Successful knowledge implementation |
| Appropriate benchmarking process |
| Integration of business plan with IS Plan |

FINDINGS

Demographics of Respondents and Companies

Out of the 50 questionnaires distributed to the top 50 Singapore business firms, 24 were returned, representing a response rate of 48% (see Figure 1 below).

Figure 1: Response rates
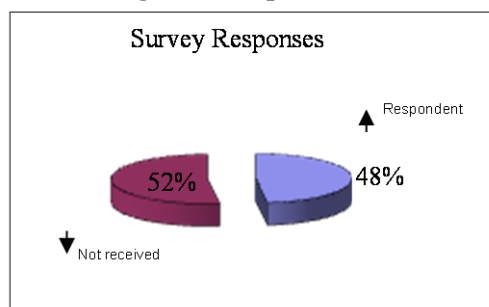
In this research only business firms were surveyed. As shown in Figure 2 below, most of the firms who responded were from service firms (41%), followed by manufacturing (38%). The rest of the categories (21%) were mainly from IT and engineering firms.

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Figure 2: Percentage of respondents by industry

Organisation Characteristics

Table 2 below shows that the respondent organisations had a range of characteristics.

Table 2: Organisation characteristics

| No. of employees		Respondents by industry	
<200	19	Manufacturing	9
>200	5	Service	10
		Others	5
Years of Experience		**Location of offices**	
1-10 years	19	Same city	6
11-20 years	5	More than one city	11
21-30 years	0	None	7

The size of each organisation was rated according to the number of employees in the organisation, rather than employees in the IS departments, as conducted in the previous study. This is because it was felt that quality of the service, which is one of the CSFs being examined here, is more a determinant of organisational size than IS department size. The assumption being that the size of the organisation influences the extent of the demand for quality services on IS department. Therefore, this variable focused on examining the perception of CSFs related to variance in firm size. It was found that 83% of the firms had less than 200 employees.

Executives' Years of Experience

Executives' experience was examined under three categories: 1-10 years experience; 11-20 years experience; and 21-30 years experience. As shown in Figure 3, most of the executives tended to have 1-10 years experience rating (79%); 21% of executives seemed to have 11-20 years experience and nil response for 21-30 years experience. Same categories were used in the previous research (Pollalis & Frieze 1993). In the USA, the IS executives seemed to have more experience and fell mainly under the category 21-30 years, whereas in Singapore, most IS executives had 1-10 years of IS experience. This is may be because

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IS departments in Singapore are in an early stage of implementing IS functions and in this fast paced society executives tend to be more mobile. Interestingly, 21% of executives who do have 11-20 years of experience are from service organisation.

**Figure 3: Number of executives' year of experience**
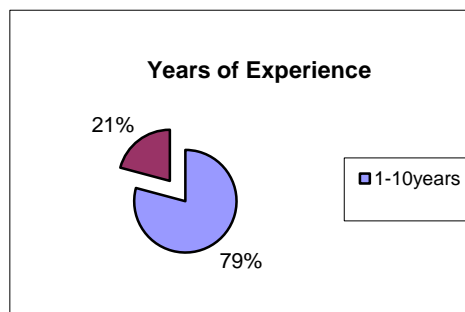
Office Location

There are three categories of office location identified. These were: offices in the same city, offices in more than one city, and single offices. This was done to understand the degree of decentralisation of the firms and its effects on the perception of IS executives.

Decentralisation may cause additional demands on the services of IS departments, such as the need for extensive networks. Such demands may affect the perception of the IS executives about CSFs. It was found that 46% of the firms were decentralised, because they had offices in more than one city. 25% had more than one office in the same city and the rest (29%) had a single office (see Figure 4 below). Office location was not identified as a demographic variable in the previous study (Pollalis & Freize 1993).

Figure 4: Different location of offices
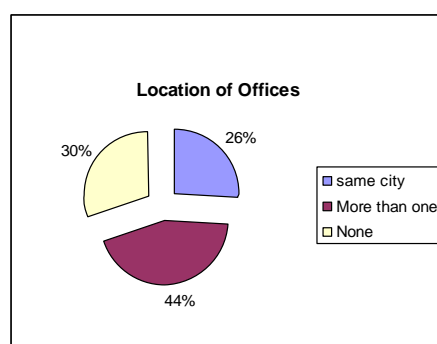
Analysing Critical Success Factors (CSFs)

The responses of CSFs have been analysed according to their frequency for the 'most important' rank. The frequency for the 'most important' rank was highest for CSFs' 'good customer service' and 'delivery of good quality service', followed by 'good leadership', 'quality of production' and 'handling growth and change'. This shows organisations not only give

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importance to good customer service but also to quality of service and production. To improve the quality of service and production good leadership is necessary for the total quality improvement of the organisation. Another important factor which was rated by IS executives was 'handling growth and change'. This shows that many organisations are using IT as a strategic resource to pursue competitive business. Organisations do check from time to time whether their quality of service and production is compatible to their industries.

Next important critical factors rated by IS executives were 'Support from top management for IS activities', followed by 'Reliability of application systems', 'Security of Networking/data' and 'Focus on online service". This shows the advancement in Information Technology where organisations are doing business online to compete in the global market. With this IS executives are more and more concern about security and privacy of internal data and reliability of procuring new application systems. Furthermore to enhance the effective way of running the business top management support for IS activity is also given importance.

Correlation Between Demographics and CSFs

First, looking at the service versus manufacturing firms, it was found that service related functions (for instance, delivery of good quality service and other IS services) were rated higher in service organisations. This may be because manufacturing firms' value tangible benefits, such as production and growth, more than service firms. Likewise, 'reliability of application systems' and 'handling growth and change' were given more importance in manufacturing firms.

No exact comparison could be drawn with the previous research (Pollalis & Frieze 1993), as they mainly compared public and private organisations. However, they observed that for CSFs, 'communications between IS executives and IS users' manufacturing firms were favoured more than service firms. In this study, it was favoured more by the service firms.

Second, the year of experience that the executives had in IS-related functions also affected the results. The result shows that years of experience of IS executives fall under either one to 10 years or 11 to 20 years, and nil response for over 20 years. Those who have worked the longest number of year (11 to 20 years) rated '*Integration of business plan with IS plan*' and '*reliability of application systems*' higher than executives with less experience (i.e., one to 10 years). Also, it was noted in the study that executives with less experience also rated '*integration of business plan with IS*', 'focus *on extra organizational linkage*', and '*successful knowledge implementation*' as less important than those who had been longer in IS. This could be because more experience executives tend to have a better and broader picture of where things are going in IS than junior executives. They seem to appreciate the overall importance of IS from a reliability viewpoint.

The third demographic variable with interesting results was the size of the organisation (i.e., number of employees). The analysis indicated that IS executives of larger organisations saw the need for integrating MIS within the organisation and that decentralisation of MIS was more significant than for smaller organisations. In both large and smaller organisation, the delivery of good quality service was given equal importance. The results can be further analysed by looking

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at how IS executives perceived the size of their organisations. With larger firms, IS executives are more concerned about the impact of IS on organizational strategy, structure and performance. This was less influential in smaller firms. Comparing the above analysis with previous research, it was found that in both Singapore and U.S. larger firms tend to take an interest in decentralisation and competitive advantages.

SUMMARY AND CONCLUSIONS

In the previous literature the CSFs were used to understand important features associated with activities ranging from identifying information needs to information systems planning and design techniques. Traditionally, the use of CSFs is based on structured and semi structured interviews with senior management executives. Such literature also indicated the increasing importance of quality service as a CSF.

This survey was conducted on IS departments in Singapore organisations, to see if quality service is regarded as an important CSF, as in the U.S. The results showed that executives in charge of IS departments considered that a 'focus on online service" to be as equally important to "delivery of good quality service". This could be because quality and online service lead to increased profitability, customer satisfaction and overall competitiveness. Overall it was found Singapore respondents seem to be more reliability and security conscious than U.S. executives. This may be due to rapid growth and change for Singapore firms than for the U.S. firms at the current time. Both Singapore and U.S. large firms tend to take an interest in decentralisation and competitive advantage. This indicates that large firms have a different strategic orientation compared to small firms.

This study identified the important CSFs of IS departments in Singapore. It also explained, to a limited extent, the reasons behind the importance given to the more important CSFs. The study has helped create an understanding of what sort of CSFs are essential for the survival and growth of IS departments in Singapore business organisations. The CSFs have been used both as a decision aid to management and a learning device for IS executives, in order to focus on the few key areas in which things must go right for the business to flourish. The study also confirms that the IS departments give considerable importance to quality and on-line service.

LIMITATIONS OF THIS STUDY AND FUTURE RESEARCH

The study has some limitations. It is limited in the sense that the current research follows the previous research done in the U.S. For instance, some CSFs were obtained from Pollalis and Frieze (1993), which were the CSFs seen appropriate for the U.S. situation. The Singapore situation may require different CSFs. For example, Singapore firms may be generally smaller than U.S. firms or their activities may differ from those of U.S. firms, which may require the use of a different set of CSFs. Although the effect of each variable on CSF selection was not evident from the literature review, the effect of such variables on the choice of CSFs has been investigated in this research. The study looks at the overall status of quality service as a CSF of IS departments in Singapore organisations. The statistics provided in the study were based on

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the responses received from those in charge of IS departments. Input from users could be equally useful. Moreover, the data gathered here should be treated as approximations of perceptions rather than the exact CSFs that are used by the responding firms.

Follow-up research is needed to extend this study's findings to a broader base. In particular, more knowledge could be gained by investigating the types of quality service provided by IS departments and the effect on the organisation's strategy. Another important area to investigate is the relationship between the CSFs of IS departments and the CSFs of the whole organisation. Research is also needed to understand the views of the users of IS services to confirm whether IS executives have identified the appropriate CSFs for the survival and development of their departments and organisations.

REFERENCES

Brown, SW, Gummesson, E, Edvardson, B & Gustavson, B 1991, *Service quality: Multidisciplinary and multinational perspectives*, Lexington Books, Lexington, Mass.

Ferguson, JM & Zawacki, RA 1993, 'Service quality: A critical success factor for IS organisations', *Information strategy: The executive's journal*, vol. 9, no. 2, pp. 24-30.

Gronross, C 1988, 'New competition in the service economy: The five roles of service', *International Journal of Operations and Production Management*, vol. 8, no. 3, pp. 9-19.

Huotari, ML & Wilson, TD 2001, 'Determining organizational needs: The critical success factors approach', *Information Research*, vol. 6, no. 3.

Hutchins, D 1992, *Achieve total quality*, Director Books, Cambridge.

Imai, M. 1989, *KAISEN: The key to Japan's competitive success,* McGraw Hill, New York.

Laudon, KC & Laudon, JP 2011, *Management information systems: Managing the digital firm*, Pearson Education Inc., Upper Saddle River, New Jersey.

Martin, EW 1982, 'Critical success factors of chief MIS/DP executives', *MIS Quarterly*. vol. 6, no. 2, pp. 1-9.

O'Brien, JA & Marakas, GM 2009, *Management information systems*, McGraw-Hill/Irwin, New York.

O'Hara, J & Frodey, CA 1993, A service quality model for manufacturing, *Management Decision.* vol. 31, no. 8, pp. 47-51.

Pollalis, YA & Frieze, I.H 1993, 'A new look at critical success factors in IT', *Information Strategy: The Executive's Journal*, vol. 10, no. 1, pp. 24-34.

Porter, LJ Parker, AJ 1993, 'Total quality management: The critical success factors'. *Total Quality Management*, vol. 4, no. 1.

Raghunathan, TS, Gupta, YP & Sundararaghavan, PS 1989, 'Assessing the impact of IS executives critical success factors on the performance of IS organisations', *Information and Management*, vol. 7, no. 3, pp. 157-168.

Rockart, JF 1982, 'The changing role of the Information Systems executive: A critical success factors perspective', *Sloan Management Review*, vol. 24, no. 1, pp. 3-11.

Tibar, A 2002, 'Critical success factors and information needs in Estonian industry', *Information Research*, vol. 7, no. 4, Available at http://informationr.net/ir/7-4/paper138.html

Zahedi, F 1986, 'Reliability of information systems based on the critical success factors: Formulation', *MIS Quarterly*, vol. 11, no. 2; pp. 187-203.