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## **Enabling the Transfer of Information Technology Support Knowledge to Enterprise Customers Using Web-based Self-service Systems: Critical Success Factors from the Support Organisation Perspective**

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### **Abstract**

*This paper explores critical success factors (CSFs) in the transfer of after-sales information technology (IT) support knowledge from IT product and service firms that provide IT support services ("IT support organisations") to enterprise customers, when Web-based Self-service Systems (WSSs) are used. The research explores the topic from an IT support organisation perspective in an interpretive multi-stage study involving six large multinational IT support businesses. Key findings reported in the paper include six categories of CSFs, and twenty-seven CSFs distributed across the six categories. The findings suggest that researchers and practitioners consider planning and implementing WSSs for after-sales IT support provision within a complex network of IT support organisations, business partners and enterprise customers.*

### **Keywords**

Web-based Self-service Systems; Information technology support; Knowledge transfer

### **INTRODUCTION**

The availability of the World Wide Web for after-sales customer support provision has brought new opportunities for information technology (IT) vendors and service providers. In the business-to-business (B2B) IT services environment, after-sales IT support is increasingly outsourced by enterprise customers to large multinational IT product and service providers (*IT support organisations*) (Chandler & Tapper 2004, CIO 2004). In this environment, IT support organisations (together with business partners) respond to enterprise customer after-sales enquiries, problems and incidents regarding core IT products and services (Kapella 2003, Negash et al. 2003). A Web-based self-service system (WSS) can be helpful in this context. Such a system is a key type of network-based customer service system (NCSS) that has been defined as "a network-based computerised information system that delivers service to a customer either directly (e.g. via a browser, PDA, or cell phone) or indirectly (via a service representative or agent accessing the system)" (Piccoli et al. 2004, p. 424). A WSS may be integrated with a customer contact centre and a multi-channel service strategy to provide after-sales customer support (Negash et al. 2003). Highlighting the potential of WSSs for the IT services sector, the Gartner Group has forecast that by 2010, web-based self-service interactions in the IT services sector will grow by 65 per cent – an increase of 30 percent from 2005 – and will account for over 50 per cent of all customer service interactions (Kerr 2005).

Among other potential benefits, WSSs offer important knowledge-based advantages in the provision of after-sales customer support (Gebert et al. 2003, Tzokas & Saren 2004). First, WSSs electronically leverage knowledge management (KM) principles in order to capture, build and reuse support-oriented explicit knowledge from support agents and, increasingly, customers. Second, WSSs empower support agents with tacit knowledge and thus boost agent productivity while improving support at the customer end. Both knowledge-based advantages of WSSs centre on the process of *knowledge transfer* (CSI 2002).

This paper aims to identify the critical success factors (CSFs) that enable the successful transfer of after-sales IT support-oriented knowledge from IT support companies to enterprise customers when WSSs are used. This research focuses on operational IT support services relating to after-sales support provided for configuring and operating the core IT environment as well as key value enabling services such as the service (help) desk (Peppard 2003). The research explores the IT support organisation perspective of CSFs by conducting (1) a case study at a large multinational IT support organisation and (2) a cross-organisational focus group of senior managers from five multinational IT support organisations.

The paper continues with a brief theoretical background which frames the empirical research. It then outlines the research methodology and proceeds to discuss the findings, including a set of CSFs that are classified into six categories. A conclusion section reflects upon the theoretical and practical implications of the findings and offers directions for future research.

## THEORETICAL BACKGROUND

The researchers discovered early in the empirical phases of the study that an IT support organisation may consider and perceive diverse stakeholder needs in offering support by WSSs. Therefore this section begins by reviewing a stakeholder-oriented relational framework for Web-based enterprise customer service reported in (Cooper et al. 2005) that is useful to frame some of the key empirical results. Next, the section conceptualises knowledge transfer to enterprise customers when using WSSs in an after-sales enterprise IT support context, by reviewing the literature. Finally, the section provides a brief review of eight categories of potential success factors for the transfer of support-oriented knowledge from the IT support organisation to the customer, drawn from a consideration of extant literature.

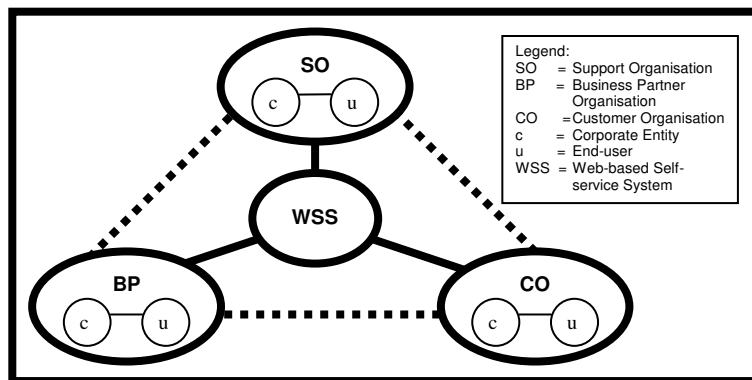


Figure 1: A Stakeholder-oriented Relational Framework for Web-based Enterprise Customer Service (Cooper et al. 2005)

### Stakeholder-oriented Relational Model of Web-based Enterprise Customer Service

Based on the initial case study of an IT support organisation (reported in detail in Cooper et al. 2005), a framework was developed depicting the relationships between key stakeholders involved in WSS use for managed IT support (Figure 1). This framework depicts three key organisational types which may be involved in IT support provision – support organisation, business partner organisation and customer organisation, and their interaction with one another directly and via a WSS. At each organisation there are also corporate entity representatives (e.g. managers) interacting with end-users. Concepts in this framework support existing marketing literature that suggests that research on customer services and their technological mediation should consider organisational, employee- and customer-based factors together (Zeithaml et al. 2000), particularly when customer service is provided across organisational boundaries (McCalla et al. 2004).

The framework in Figure 1 is presented here as it frames some of the later empirical findings that (1) highlight the need for IT support organisations to consider other stakeholder perspectives when WSSs are used for after-sales IT support, and (2) highlight the importance of knowledge flows in a managed enterprise support context.

### Knowledge Transfer in After-sales Enterprise IT Support Services using WSSs

For the reader to better appreciate the managed IT support context, we now review the transfer of IT support-oriented knowledge (both explicit and tacit) from the IT support organisation to a customer firm. Explicit knowledge is regarded as accessible and has been defined as knowledge that is made manifest through language, symbols, objects, and artefacts and is therefore more easily shared (Choo et al. 2000). Tacit knowledge is defined as knowledge that is personal, non-codified, contextualised and difficult to articulate or formalise (Nonaka & Takeuchi 1995). People may be alerted to their tacit knowledge by inquiry and other forms of dialogue (Neve 2003). In this study, the knowledge of interest is IT support-oriented knowledge, comprising break/fix solutions, best practices and resolutions.

The transfer of break/fix solutions, best practices and resolutions from an IT services organisation (frequently interacting with partners) to customer firms can significantly benefit the support organisation by improving support agent productivity and reducing future support costs (Chmaj 2004). Such transfer of tacit and explicit knowledge may also help the enterprise customer accept, over the longer term, the product or service being

supported. When an enterprise customer quickly gains support and adapts and assimilates new processes and skills, the customer firm will be more efficient, productive and loyal (Kay 2004). Extant research into customer support considers knowledge transfer, however, it primarily focuses on *intra*-organisational knowledge transfer (e.g. Bose & Sugumaran 2003) and rarely addresses the important *inter*-organisational transfer of knowledge from its original source in the support organisation to the enterprise customer.

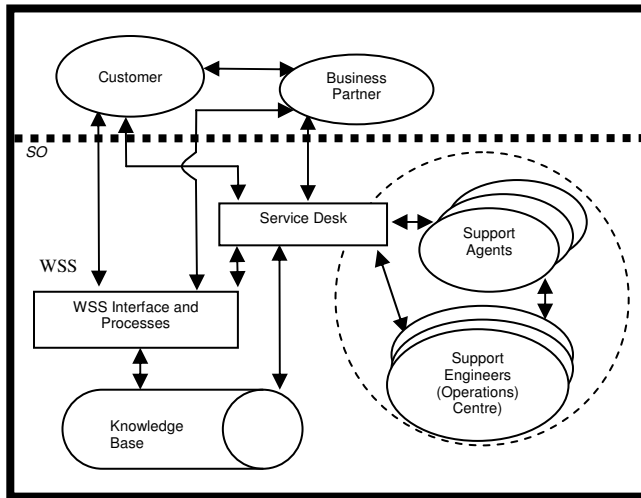


Figure 2: Knowledge transfer in enterprise after-sales IT support when WSSs are used

Adapted from theoretical descriptions (notably, CSI 2002, Kapella 2003) and findings from the case study (Cooper et al. 2005), in Figure 2 we have developed a high-level representation of the knowledge flows involved in inter-organisational knowledge transfer in the managed IT support and WSS context. Solution-oriented knowledge is transferred from the support organisation to the customer firm as follows. When the customer firm experiences IT incidents or problems, IT professionals may telephone Service Desk support agents or directly access the Web site seeking a solution. Web-based search requests for solutions from the knowledge base are immediately framed as a potential solution and submitted to a support agent. In the event that the customer professional does not find a solution as explicit knowledge, first tier support agents identify potentially successful solutions from (1) their tacit knowledge of the subject matter or (2) searching the solutions knowledge base, while escalating complex problems to experienced second and third tier support agents. Further downstream are tiers of support engineers - technology specialists who ultimately resolve the most difficult problems drawing upon their valuable tacit knowledge. New and evolving solutions are captured in the knowledge base as explicit knowledge and organised for reuse. Successive efforts by support agents to address related questions by customers are aimed at helping the customer firm to institutionalise support-oriented knowledge. It should be noted that sometimes IT support is provided by a business partner. In this case a customer firm's IT professional may have direct interaction with IT professionals at the partner firm. Business partners may also contribute to the WSS knowledge base via the WSS interface (for example, by contributing in user forums) or may locate solutions from the knowledge base in order to assist customers.

To further assist in analysing the factors involved in transferring after-sales solution-oriented IT support knowledge to enterprise customers when a WSS is used, Szulanski's four stage processual model of intra-organisational knowledge transfer (Szulanski 2003) has been adapted and enhanced, comprising four stages - initiation, implementation, ramp-up and integration.

The *initiation* stage comprises all events leading to a decision to transfer IT support-oriented knowledge. At the IT support organisation, knowledge is captured from support agents and customers into the knowledge base as explicit knowledge whenever there is a related change such as the release of a new product or in the course of performing support work (Kapella 2003). Issues affecting knowledge capture centre on difficulties in codification, motivating contributions, and enabling sufficient access. Front-line agents should be empowered with knowledge to troubleshoot customer problems and incidents during assisted support and must gain access to the tacit knowledge of higher tier agents by training or other mechanisms (Davenport & Klahr 1998). Customer organisation contacts access the WSS and search for potential resolutions from within the knowledge base or through community forums, e-mail or chat. Intelligent software identifies optimal potential resolutions in the knowledge-base. Difficult problems are escalated to higher tier agents who may perform root cause analysis resulting in workarounds that also update the knowledge base (Kapella 2003).

During the *implementation* stage, explicit and tacit knowledge flows between the support organisation and the customer contact (typically an IT professional) who must be motivated and able to understand, learn and assimilate received knowledge (Simonin 2004, Szulanski 2003). In assisted support (e.g. chat or e-mail), social

ties are established between the support agent and the customer contact and the transfer process is customised to the customer (Szulanski 2003). Power, cognitive capacity and relationship issues may constrain successful knowledge transfer (Szulanski 2003).

In the *ramp-up* stage, a customer company commences using the resolution, perhaps inefficiently at first, but gradually identifying and resolving unexpected problems (Szulanski 2003). Customers should spend some time applying explicit knowledge in order to acquire the tacit and contextual aspects (Simonin 2004). If transmitted knowledge is not well understood by customers, it is most likely to be replicated (Szulanski 2003), however well understood knowledge is typically adapted to the customer firm's context (Williams 2003). Even in a WSS environment, the support organisation must still have supporting processes in place for this stage (Pujari 2003).

In the *integration* stage, transferred knowledge becomes institutionalised at the customer site (Szulanski 2003). The customer company experiences similar issues as the support organisation in transferring resolutions and best practices within its support team and product/service end-users. According to Goodman and Dean (1982), institutionalisation is complete when old practices are replaced. Goodman and Dean argue that socialisation, commitment, reward allocation, diffusion, sensing and recalibration determine the level of integration.

We note at this point the existence of a knowledge-centred support (KCS) methodology developed recently by a consortium of the major multinational IT services firms (CSI 2002). KCS involves the capture, structure, delivery, measurement, maintenance and improvement of support-oriented knowledge, and is increasingly implemented by IT services firms. However importantly, while the KCS approach emphasises the importance of an evolutionary collaborative knowledge-based approach to IT support provision, it does not (1) focus on Web-based support or (2) clearly identify or organise the CSFs for transferring knowledge to the customer using enterprise IT support using WSSs. Thus we did not commence with KCS as the theoretical basis for this research and instead developed our own theoretical base (Figure 1, Figure 2, the descriptive staged model of knowledge transfer above, and the discussion in the next section) for empirical exploration, as will be explained in the later methodological section.

### **Categories of Enabling Factors for Successful After-sales Enterprise Support using WSSs**

Identifying stakeholder-based categories of enabling factors may be helpful for classifying CSFs and understanding support organisation perceptions of the needs of different types of stakeholders. We here identify and summarise eight categories of factors – relating to the key stakeholder groups identified in Figure 1 – that may underpin the provision of successful after-sales enterprise support by WSSs. We recognised that a broad categorisation could be useful for exploring potential CSFs relating to successful knowledge transfer. Due to paper size constraints, only a brief introduction to each category is provided here.

#### **Management for Strategic and Operational Benefits**

There are potential operational and strategic advantages and benefits for the vendor/provider organisation and its customers from using WSSs (Geib et al. 2006). At the operational level, such systems are expected to reduce support costs stemming from customer-provider interactions (e.g. telephone calls in call centres) and deliver a strong return on investment. Strategically, they provide an opportunity to develop customer relationships and secure customer loyalty.

#### **Organisational Readiness**

Organisational strategy, technical infrastructure and culture in the support organisation may be important elements in WSS success. Strategic measures include the establishment of a customer orientation (Rigby et al. 2003) and alignment of technology with this strategy. The technical infrastructure must be able to support internal knowledge workers (Drury & Farhoomand 1999) and large numbers of support transactions over the long term (Zeithaml et al. 2000). A culture that is customer-oriented, employee-empowered, open and knowledge-sharing may be important to facilitate knowledge flow from the support organisation to the customer (Sasser et al. 2003).

#### **Top Management Support**

Top management support is needed for many reasons, including, in particular, resourcing the WSS initiative (Drury & Farhoomand 1999, Mollstedt & Fredriksson 2004).

#### **Knowledge Management Capabilities and Processes**

Leveraging knowledge about products, services, customers and their support assists in eCRM (Geib et al. 2006). Strategic customer-oriented knowledge should also be shared with business partners (Warkentin et al. 2001). A knowledge management strategy that underpins Web-based customer support can help identify gaps, bottlenecks, barriers and deficiencies in business processes and lead to improved customer support.

## Content

Concise, performance-oriented, high quality content in a support organisation's knowledge base is essential to eCRM success (Gebert et al. 2003, Chmaj 2004).

### Customer Experience Management

Customer experiences must be managed by a support firm. The customer's experience of the WSS interface must be enjoyable and satisfying (Walker et al. 2002) and must provide service functionality (Cenfetelli et al. 2005). Numerous marketing experts have identified a range of customer-perceived service quality characteristics, including: usability; reliability, responsiveness, security and privacy; personalisation; findability; content; and relationship between customer and service provider (see Cooper et al. 2005, for a review).

### Electronic Business Readiness of Customers

Barua et al. (2004) suggest that customer firms must be capable of doing (and willing to do) electronic business with provider organisations. Such capability relies on IT resources, processes and readiness, where readiness is the ability of the firm to seamlessly exchange strategic and tactical information with customers and suppliers.

### Employee Experience Management

The support agents in the support organisation should have good experiences with the system. Employees play a key role in WSSs by contributing explicit knowledge to the knowledge base and validating that knowledge. In assisted WSSs, they play a role in ensuring the smooth transition between self-support and delivering support to the customer by alternative channels such as telephone. Support staff, however, may not wish to contribute their valuable tacit knowledge to a knowledge base due to a perception that this may damage their job security (Davenport & Khlar 1998, Gray 2001). Support agents should be appropriately qualified and receive technical and support training. Their satisfaction may be enhanced by providing opportunities for problem analysis and innovation (Heskett et al. 1997) while individual recognition and social relationships may prove useful in motivating knowledge sharing (Bock & Kim 2002).

## RESEARCH METHODOLOGY

This section outlines the research methodology and design of the study, in order to establish the CSFs that enable the effective transfer of support-oriented knowledge to enterprise customers when WSSs are used, taking a support organisation perspective. As the environment in which a WSS is planned, developed, implemented and used is a human activity system, we adopted an interpretive research approach (Walsham 1995) that accounts for the subjectivity and social construction of perceptions. The success or failure of a WSS is to a large extent dependent on the managers, developers, content providers and other users inside the support organisation. We thus sought to understand *the support organisation perspective* of the enabling factors for successful transfer of after-sales support-oriented knowledge to a customer firm using WSSs, in the IT services context.

Clarke noted that when conducting research in electronic business, there is often a paucity of theory (Clarke 2001). He suggests that studies in the field should therefore be the main focus and that *theory development* is needed. Similarly, we observed very little scholarly literature theorising directly about the support organisation's perspective of the key factors relevant to providing successful WSSs. We further noted that best-in-class companies in a variety of domains were successfully offering such services (according to their own criteria, and awards and reports given by key industry bodies) and we therefore elected to conduct an interpretive case study in one of these firms in the IT services domain in order to develop preliminary theory.

The CSF method (Rockart 1979) proposes that organisational strategy may best be based on 'identifying elements of the organisational environment that are critical to operation or exposed to significant threat' (Tillquist 2002, p. 78). Given the gap in the literature, and as we were considering large extended service provider enterprises (cf. Tillquist 2002) and determining success factors for them, we adapted the CSF research method of Rockart (1979) to conduct (1) an interpretive case study of WSS success in a best-in-class multinational business in the industry of interest (IT services) and (2) validate the findings across a range of similar best-in-class multinational IT services companies in order to explore external validity. As such, the study can be appreciated as a two-stage study.

In *Stage One* (reported in detail in Cooper et al. 2005), a preliminary literature review was conducted to develop background. An interpretive case study was then conducted at a large best-in-class multinational IT services organisation 'SERVIT' (a pseudonym) chosen for its progressive approach to IT support, award-winning support Web site, extended enterprise status, and mature, successful WSS strategy integrated with multi-channel, multi-vendor support. The choice of such a company also enabled issues of high service volume, complexity, dispersion and electronic business to surface. The Australian headquarters of SERVIT constituted the unit of

analysis. SERVIT assured the researchers that they successfully transferred support-oriented knowledge to customer firms, as supported by associated awards.

The case study, adapting the CSF method (Rockart 1979), was conducted in two phases. In the first phase, twelve key managerial informants from relevant business functions were interviewed for approximately one and a half hours each, with questions guided by the descriptive model of inter-organisational knowledge transfer reviewed earlier. The staged model was found valuable in eliciting a wide range of CSFs. Interviews were recorded, transcribed and inductively analysed by qualitative content analysis (Krippendorf 1980), thus identifying an initial set of CSFs. Other data sources, including documents, observations and SERVIT online support sites, were used to enhance the set of CSFs. In the second phase, a CSF focussing workshop (Rockart 1979) of three hours' duration was conducted with five of the original interviewees, and analysed by qualitative content analysis (Krippendorf 1980), to develop, among other findings, a revised set of 27 CSFs, a stakeholder-relational model of customer service with WSSs (figure 1), an initial categorisation scheme for the CSFs and insights into key management issues (Cooper et al. 2005).

In *Stage Two*, which has only recently been completed, a cross-organisational focus group was conducted to validate the above set of CSFs externally. Participants comprised six Australia-based senior managers from five large multinational IT service organisations with branches in Australia. A three hour session took place in which participants discussed the general applicability to their companies of the set of 27 CSFs, the stakeholder relational model (Figure 1), managerial issues and the initial categorisation scheme. The transcribed data was analysed using qualitative content analysis (Krippendorf 1980). Further feedback by e-mail enabled finalisation of findings for the study.

## FINDINGS AND DISCUSSION

This section provides and discusses a selection of findings as emerged from the final cross-organisational focus group (Stage Two). Details of the initial case study (Stage One) are available elsewhere (Cooper et al. 2005). We discuss now, in turn, the role of WSSs in transferring support-oriented knowledge to the customer, the CSFs, and a selection of key issues related to stakeholder perspectives of the CSFs.

### Importance of WSSs and the Transfer of Support-oriented Knowledge to the Customer

All six focus group participants reported current extensive utilisation in their companies of WSSs for providing enterprise customer IT support. WSSs were primarily employed to increase customer satisfaction and loyalty and for support organisation costs reduction. Participants noted that the knowledge transfer process was a key objective for WSSs. One participant mentioned that an estimated 95 per cent of product support issues at his company were now resolved by WSSs. Another participant mentioned how his company had been "growing support engineers each year" as underscoring the need to move customers to self-support using WSSs. New initiatives in WSSs were also being planned by several of the companies represented.

### Critical Success Factors for Knowledge Transfer to Customer Firm Via WSSs

Emerging from the study is a set of 27 CSFs grouped in six categories (Appendix). Due to paper size constraints, we do not discuss each of the 27 CSFs in detail, however definitions are available in Cooper et al. (2006).

A key outcome of Stage Two of this research project is the set of six categories. Focus group participants had argued that the original case-specific twenty-seven CSFs (Cooper et al. 2005) were too many to easily manage in business, and suggested that consolidation of the CSFs would be advantageous. In the initial case study and the focus group there was some discussion and revision of the eight categories. Finally, emerging from the focus group discussions and feedback, six categories were identified, with all considered critical to all three stakeholder organisations: support organisation, business partner organisation and customer firm. As such, these six categories can be considered high level CSFs with the underlying 27 CSFs being seen as providing a finer level of granularity. A short descriptor for each category is shown in the Appendix together with the associated non-orthogonal categorisation of the original twenty-seven CSFs within these categories. It should be noted that there was also discussion by participants about how the 27 CSFs should be subdivided into levels within each of these categories/ high level CSFs. Findings concerning this subdivision are extensive, and due to paper size limitations will be the subject of a future publication.

### Perceived Stakeholder-based Perspectives of Critical Success Factors

Participants raised the stakeholder perspective as the most important perspective for successful knowledge transfer. While only the support organisation's perceptions of other stakeholder needs were obtained in this study, as a preliminary theoretical contribution, Figure 1 can be used to illustrate how CSFs may have a relational aspect, enable knowledge transfer, and be relevant to multiple stakeholder types. Participants confirmed that the

stakeholder relational model (Figure 1), developed from the CSF research at SERVIT, facilitates an understanding of the different stakeholders, their possible perspectives and relationships. The fact that all stakeholder views should be considered when planning, implementing and managing WSSs supports similar findings for electronic business settings by Kandampully (2003), Mollstedt and Fredriksson (2004), and Singh and Byrne (2005).

Interesting discussions revolved around the potential for different stakeholder perspectives, thus providing further understandings. Specifically:

- While a support organisation may find knowledge transfer highly desirable, it was questioned whether the customer end-user would feel the same way:

*“I think the provider [support organisation] is interested in transferring knowledge so they don’t have a problem any more and they can manage their costs and help the customers. [However, the customer firm’s end-user is thinking] I am interested, not in receiving knowledge, I am interested in my problem being fixed.... Don’t give me all this stuff. Tell me what the problem is so I can fix it... I don’t want the transferring of any knowledge.”*

This is an important point deserving further research. If an end-user at the customer firm does not wish to learn from a provided IT resolution, how can the support organisation ensure such learning?

- It was also observed that end-users at the customer side fulfilled particular roles and therefore had different needs. While some end-users may simply wish to resume IT operations using a supplied resolution, there were some personnel, such as Data Base Administrators, who were highly interested in learning about a solution and gaining more general support knowledge which could be useful at a future time.
- Participants questioned whether different stakeholders might interpret the CSFs differently. For example, it was mentioned that regular end-users of the WSS interface would prefer an intuitive interface whereas novice users required easy-to-use interfaces. In the initial case study at SERVIT, it had been mentioned that cost-effectiveness to a support organisation when a WSS was used was not the same as cost-effectiveness from the perspective of a customer firm.
- The interesting matter of whether relationships are possible – or even enabled – by WSSs, was raised. A two way relationship was posited:

*“Although it is a piece of software, it is the front end of a company. For instance, if I feel I have a positive relationship with my Netbank [internet banking] Web site, because I trust it, then that is part of the relationship. The trust side of it - and knowing that there is a bank behind it - is part of the relationship. It is just that it is the front end [Web interface and system] that is the connection.”*

However, others saw Web-based relationships as perhaps one way only:

*“I am thinking of my relationship with Google. I use Google at least ten times a day. I know who they are, but they don’t know who I am. So, is that a relationship?”*

- It was also suggested that stakeholder relationships can be more complex than Figure 1 allows. It emerged that while all companies represented at the focus group collaborated with business partners to provide enterprise support, and provided extranet web access to these partners, such relationships were complex:

*“We can have the relationship either with both the customer and the business partner or we can have it directly with the customer, or the customer could just have it with the business partner, and then the business partner could have it with us. I mean there are just so many different combinations there that the relationship can actually take.”*

- A further insight offered by participants highlighted greater complexity of relationships developing in the IT services context as stakeholder organisations increase in size, as there may be relationships developed at the individual, departmental and corporate levels. This finding is significant, as while it has been acknowledged in a large body of literature that developing relationships with partners is important (for example, Vlachopoulou & Manthou, 2003) there is very little extant literature concerning partner-unit-based relationships.
- Finally, in a B2B environment, while for particular stakeholder organisations there will be a different emphasis on – or responsibility for – each CSF within the six categories of CSFs, such factors will be a concern for all stakeholder organisations. For example, while it is the responsibility of the support organisation to have an adequate “IT Infrastructure capability” to enable its customers and business partners to participate in WSSs, the success of the WSS will also be affected by whether or not the customer



organisation has an adequate IT infrastructure capability at their end. Of course, the support organisation will have very little control over whether the customer organisation and business partner organisation do in fact address these factors. Supporting the need for all stakeholder organisations to address the six categories of CSFs, Kurnia and Johnston (2001) recently noted the importance of an entire industry being capable of trading across the Internet for company adoption of an inter-organisational system. Thus, if corporate customers or business partners in a managed IT support situation do not address their CSFs for successful use of WSSs for knowledge transfer, the WSS may be at risk of failing. Whether or not their CSFs are the same as the support organisation's perceptions of them as revealed in this study, deserves exploration in future research.

## CONCLUSION

A consideration of WSSs is an important emerging focus for the after-sales support of customer firms, as part of doing electronic business. This paper has presented key findings from a pioneering attempt to understand such systems from the organisational perspective, in terms of the CSFs involved. The research study has focused on the managed enterprise IT support context and has focused on the factors enabling the successful transfer of solution-oriented knowledge from the support organisation to external enterprise customers, from the perspective of the support organisation. In total, six large multinational IT support organisations were used to underpin this research project and its findings.

This paper has made several significant contributions:

- The importance of WSSs to the six organisations, as a means of increasing customer satisfaction and loyalty, and for support organisation costs reduction, has been established;
- A set of six categories of CSFs for successful transfer of support-oriented knowledge from an IT support organisation to a customer firm has been developed. Further, it has emerged that these six categories / high level CSFs might be viewed as encompassing an underlying 27 CSFs (see Appendix). A feature of this scheme is that the categories and underlying CSFs may not only apply to the support organisation but also (based on the support organisation perspective elicited in this study) to the other key stakeholder firms – that is, customer enterprises and business partners. This possibility needs to be explored in future research.
- A number of significant understandings of the support organisation's perceptions of stakeholder perspectives in this area have been identified.

The study also contributes to theory by adding fresh understandings and insights in this important area, and developing several new theoretical frameworks which can guide future research in this area, including a stakeholder-oriented relational framework (see Figure 1), a model of knowledge transfer in web-based enterprise after-sales IT support (see Figure 2) and an adapted/enhanced descriptive four stage processual model of intra-organisational knowledge transfer (see "Theoretical Background" in this paper). The paper has also contributed to practice by providing practical sets of CSFs to employ in planning, implementing and managing WSSs in IT support environments.

Limitations of this research include first, that the SERVIT case study participants (Stage One) and cross-organisational focus group participants (Stage Two) provided perceptions from the support organisation perspective only. Clearly, it would be valuable to conduct future research which investigates the issues from the customer and business partner perspectives – both corporate and end-user. Second, this research has adopted an interpretive approach, and while a level of generalisation was obtained through the focus group reported in this paper, there is a need to further explore the theories and guidelines developed, seeking greater generalisability. Third, the research has been conducted in a large, multinational managed IT services environment. Attempts to generalise the findings to other size and sector environments may raise new issues.

From the findings reported in this paper, two key themes have emerged. First, the CSFs for transferring after-sales IT support oriented knowledge to enterprise customers must be considered within a complex network of stakeholders and their individual needs. Second, in such a complex environment, there are numerous factors which must be addressed and this important reality requires acknowledgement and recognition from companies. Companies may appreciate the six categories of CSFs but there is much more to be done at the detailed level for success to be realised.

## REFERENCES

- Barua, A., Konana, P., Whinston, A.B. & Yin, F. (2004) An Empirical Investigation of Net-enabled Business Value, *MIS Quarterly*, December, 28(4), 585-625.

- Bock, G. W. & Kim, Y. G. (2002) Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing, *Information Resources Management Journal*, 15(2), 14-22.
- Bose, R., and Sugumaran, V. (2003) Application of Knowledge Management Technology in Customer Relationship Management, *Knowledge and Process Management*, 10(1), 3-17.
- Cenfetelli, R.T., Benbasat, I. & Al-Natour, S. (2005) "Information Technology Mediated Customer Service: A Functional Perspective", in Avison, D.E. & Galletta, D.F. (Eds), *Proceedings of the International Conference on Information Systems, ICIS 2005*, December 11-14, 2005, Las Vegas, NV, USA. Association for Information Systems 2005.
- Chandler, D. & Tapper, D. (2004) *Driving Services Efficiency With Siemen's Business Services SieQuence Solution*, White Paper, No. 4248, IDC.
- Chmaj, J. (2004) *Optimizing Knowledge Resources to Drive Customer Value*, TMCNet.  
URL <http://www.tmcnet.com/cis/0804/crmside.htm>, accessed November 7, 2006.
- Choo, C. W., Detlor, B. & Turnbull, D. (2000) *Web Work: Information Seeking and Knowledge Work on the World Wide Web*, Kluwer Academic Publishers, Dordrecht.
- CIO (2004) State of the CIO 2004: The Survey, *CIO Magazine*, October 2004.  
URL <http://www.cio.com/archive/100104/survey.html>, accessed November 7, 2006.
- Clarke, R. (2001) "If e-Business is Different, Then So is Research in e-Business", Invited plenary paper for the 2001 IFIP TC8 Working Conference on E-Commerce/E-Business.  
URL <http://www.anu.edu.au/people/Roger.Clarke/EC/EBR0106.html>, accessed November 7, 2006.
- Cooper, V.A., Lichtenstein, S., and Smith, R. (2005) "Emerging Issues in After-sales Enterprise Information Technology Support Using Web-based Self-service Systems", *Proceedings of the 16<sup>th</sup> Australasian Conference of Information Systems*, 29 November-2 December, Sydney, Australia.
- Cooper, V.A., Lichtenstein, S., and Smith, R. (2006) "Knowledge Transfer in Enterprise Information Technology Support using Web-based Self-service Systems", *International Journal of Technology Marketing*, Vol. 1, No. 2, pp. 145-170.
- CSI (2002) "Getting Started with KCS", Consortium for Service Innovation.  
URL <http://www.thinkhdi.com/files/pdfs/GettingStartedKCS.pdf>, accessed November 7, 2006.
- Davenport, T.H. & Klahr, P. (1998) Managing Customer Support Knowledge, *California Management Review* 40(3), 195-208.
- Drury, D.H. & Farhoomand, A. (1999) Knowledge worker constraints in the productive use of information technology, *ACM SIGCPR Computer Personnel*, 4(1), Spring, pp. 21-42, ACM Press.
- Geib, M., Kolb, L. & Brenner, W. (2006) Collaborative Customer Management in Financial Services Alliances, in Fjermestad, J. and Romano, N.C. (eds), *Electronic Customer Relationship Management*, AMIS.
- Gebert, H., Geib, M., Kolbe, L. & Brenner, W. (2003) Knowledge-enabled customer relationship management: integrating customer relationship management and knowledge management concepts, *Journal of Knowledge Management*, 7(5), 107-123.
- Goodman, P.S. and Dean, J.W. (1982) Creating Long Term Organisational Change, in P.S. Goodman and Associates (eds.), *Change in Organisations*, Jossey-Bass, San Fansisco, CA, 226-279.
- Gray, P.H. (2001) The impact of knowledge repositories on power and control in the workplace, *Information Technology & People*, Dec, 14(4), 368-384.
- Heskett, J.L., Sasser, W.E. & Schlesinger, L.A. (1997) *Service Profit Chain: How Leading Companies Link Profit and Growth to Loyalty, Satisfaction, and Value*, Free Press.
- Kandampully, J. (2003) B2B Relationships and networks in the internet age, *Management Decision*, 41(5), pp. 443-451.
- Kapella, V. A. (2003) Framework for incident and problem management, White Paper, *International Network Services*.  
URL [http://www.ins.com/downloads/whitepapers/ins\\_white\\_paper\\_incident\\_management\\_0403.pdf](http://www.ins.com/downloads/whitepapers/ins_white_paper_incident_management_0403.pdf), accessed November 7, 2006.
- Kay, D. (2004) On Customer Support, *Portals Magazine*, May 4.  
URL <http://www.portalsmag.com/articles/default.asp?ArticleID=5594>, Accessed November 7, 2006.

- Kerr, B. (2005) The benefits of web-based self-service, Axios Systems.  
URL <http://www.toolselector.com/modules.php?op=modload&name=News&file=article&sid=2092>,  
accessed November 7, 2006.
- Krippendorff, K. (1980) *Content Analysis: An Introduction to its Methodology*, Sage Publications, Beverly Hills, CA.
- Kurnia, S. & Johnston, R. (2002) A Review of Approaches to EC-enabled IOS Adoption Studies, in *Proceedings of 35<sup>th</sup> Annual Hawaii Conference on System Sciences (HICSS'02)*, IEEE Society Press.
- McCalla, R., Ezingard, J-N. & Money, K. (2004) Behavioural Approach to CRM Systems Evaluation, *Electronic Journal of Information Systems Evaluation*, 6(2). URL <http://www.ejise.com/volume6-issue2/issue2-art16-mccalla.pdf>, accessed November 7, 2006.
- Mollstedt, U. & Fredriksson, O. (2004) Information systems failure and adoption of internet-based after-sales service in a business-to-business context, Paper presented at *12th International Colloquium in Relationship Marketing*, Hamilton, New Zealand.
- Negash, S, Ryan, T. & Igbaria, M. (2003) Quality and Effectiveness in Web-based Customer Support Systems, *Information and Management, September*, 40(8), 757-768.
- Neve, T.O. (2003) Right Questions to Capture Knowledge, *Electronic Journal of Knowledge Management*, 1(1), 47-54. URL <http://www.ejkm.com/volume-1/volume1-issue1/issue1-art6-neve.pdf>, accessed November 7, 2006.
- Nonaka, I. & Takeuchi, H. (1995) *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, New York: Oxford University Press.
- Peppard, J. (2003) Managing IT as a Portfolio of Services, *European Management Journal*, 21(4), 467-483.
- Piccoli, G., Brohman, M.K., Watson, R.T. & Parasuraman, A. (2004) Net-based customer service systems: Evolution and revolution in Web site functionalities, *Decision Sciences*, 35(3), 423-455.
- Pujari, D. (2003) Self-service with a Smile? Self-service technology encounters among Canadian business-to-business, *International Journal of Service Industry Management*, 15(2), 200-219.
- Rigby, D.K., Reichheld, F., and Dawson, C. (2003) Winning customer loyalty is the key to a winning CRM strategy, *Ivey Business Journal*, March/April, 1-5.
- Rockart, J.F. (1979) Chief Executives Design Their Own Data Needs, *Harvard Business Review*, March-April, 81-93.
- Sasser, W.E., Mahoney, M. & Heskett, J.L. (2003) How your Employees and Customers Drive a New Value Profit Chain, *Working Knowledge*, March 31, Harvard Business School, US.
- Simonin, B.L. (2004) An Empirical Investigation of the Process of Knowledge Transfer in International Strategic Alliances, *Journal of International Business Studies*, 35(5), 407-427.
- Singh, M. & Byrne, J. (2005) Performance Evaluation of e-Business in Australia, *Electronic Journal of Information System Evaluation*, 8(1), 71-80.
- Szulanski, G. (2003) *Sticky Knowledge: Barriers to Knowing in the Firm*, INSEAD, Singapore.
- Tillquist, J. (2002) Strategic Connectivity in Extended Enterprise Networks, *Journal of Electronic Commerce Research*, 3(2), 77-85.
- Tzokas, N. & Saren, M. (2004) Competitive advantage, knowledge and relationship marketing: where, what and how? *Journal of Business & Industrial Marketing*, 19(2), 124-135.
- Vlachopoulou, M. & Manthou, V. (2003) Partnership alliances in virtual markets, *International Journal of Physical Distribution & Logistics Management*, 33(3), 254-267.
- Walker, R.H., Craig-Lees, M., Hecker, R., Francis, H (2002) Technology-enabled service delivery: Investigation of Reasons Affecting Customer Adoption and Rejection, *International Journal of Service Industry Management*, 13 (1), 91-106.
- Walsham, G. (1995) The Emergence of Interpretivism in IS Research, *Information Systems Research*, 6(4), pp 376-394.
- Warkentin, M., Bapna, R. & Sugumaran, V. (2001). E-knowledge networks for inter-organizational collaborative e-business, *Logistics Information Management*, 14 (1/2), 149-163.

Williams, C. (2003) Combining Adaptation and Replication: Knowledge Transfer among International Telecom Firms, *Academy of Management Meeting*, August, Seattle, WA.

Zeithaml, V.A., Parasuraman, A. & Malhotra, A. (2000) A Conceptual Framework for Understanding e-Service Quality: Implications for Future Research and Managerial Practice, *Working Paper Series*, Marketing Science Institute, Report No. 00-115.

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**APPENDIX:** Critical Success Factors for Transfer of IT Support-oriented Knowledge to Enterprise Customers Using Web-based Self-service Systems

<p><b>Organisational Commitment and Readiness</b></p> <p><i>“The organisation must manage the policies, processes and cultural issues which will affect its ability and willingness to embrace Web-based Self-service”</i></p>	<p><b>IT Infrastructure Capability</b></p> <p><i>“The organisation must have an adequate IT infrastructure in place, to enable it to participate in Web-based Self-service”</i></p>	<p><b>Knowledge Management Capabilities &amp; Processes</b></p> <p><i>“The organisation must practice the principles of knowledge management and implement associated knowledge management processes, to maximise the benefits received from the WSS strategy”</i></p>	<p><b>Content</b></p> <p><i>“The WSS must contain useful, accurate and up-to-date content in order to resolve the user’s support issue or knowledge requirement”</i></p>	<p><b>Experience Management</b></p> <p><i>“The WSS should manage the stakeholder’s experience, both at the corporate and end-user level. The stakeholder experience will directly affect satisfaction levels and therefore ongoing use of the WSS”</i></p>	<p><b>Management for Strategic &amp; Operational Benefits</b></p> <p><i>“The WSS strategy must assist the organisation in attaining its strategic and operational objectives”</i></p>
<p>CSF-8 Security, Privacy and Assurance CSF-16 Employee Focus CSF-17 Culture CSF-18 Marketing and Awareness of Web-based Self-service CSF-24 Alignment and Integration CSF-27 Top Management Support</p>	<p>CSF-6 Access, Connectivity and Performance CSF-7 Effective Information Architecture and Search Engine CSF-8 Security, Privacy and Assurance</p>	<p>CSF-19 Knowledge Creation, Capture and Reuse CSF-20 Knowledge Validation CSF-21 Knowledge Storage and Retrieval</p>	<p>CSF-3 Critical Mass: Knowledge: Content and Knowledge Contributors CSF-4 Usefulness: Provision of Knowledge which Meets User Requirements CSF-13 Customer Focus: Understand the Customer and their Requirements CSF-22 Presentation of Knowledge</p>	<p>CSF-2 Additional Value and Cross-selling CSF-4 Usefulness: Provision of Knowledge which Meets User Requirements CSF-5 Ability to Provide Efficiency CSF-7 Effective Information Architecture and Search Engine CSF-8 Security, Privacy and Assurance CSF-9 Ease of use/Usefulness CSF-10 Early Positive Experience CSF-11 Ongoing Positive Experience CSF-12 Confidence in Solution CSF-13 Customer Focus: Understand the Customer and their Requirements CSF-14 Positive Relationship CSF-15 Provision Additional Support: Education &amp; Training CSF-16 Employee Focus CSF-22 Presentation of Knowledge CSF-23 Measurement and Feedback of WSS Strategy CSF-24 Alignment and Integration CSF-25 Web-based Self-Service Over-ride and Recovery CSF-26 Ease of Re-initiation</p>	<p>CSF-1 Cost Effectiveness CSF-2 Additional Value and Cross-Selling CSF-4 Usefulness: Provision of Knowledge which Meets User Requirements CSF-5 Ability to Provide Efficiency CSF-13 Customer Focus: Understand the Customer and their Requirements CSF-14 Positive Relationship CSF-16 Employee Focus CSF-23 Measurement and Feedback of WSS Strategy CSF-24 Alignment and Integration</p>