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# Supporting Knowledge Transfer in Web-Based Managed IT Support

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## Abstract

**Purpose:** To highlight the importance and complexities of the knowledge transfer process in the provision of effective managed after-sales IT support, when the Web is used for service delivery.

**Design/methodology/approach:** An interpretive case study of a multi-national Managed Service Provider (MSP) and a focus group of representatives from five comparable MSPs.

**Findings:** MSPs that use Web-based channels for the provision of after-sales IT support services need to address a range of important social and organisational issues in order to realise cost and efficiency-based benefits.

**Research limitations/implications:** The paper provides a four stage processual model of knowledge transfer in the provision of Web-based managed after-sales IT support services. The barriers and enablers of knowledge transfer at each stage are identified. The paper adopts a MSP perspective and suggests that further research from the customer perspective is required.

**Practical implications:** The paper highlights some important social and organisational enablers and barriers, which will guide MSPs when providing managed after-sales IT support using Web-based channels.

**Originality/value:** The paper provides the first staged model of inter-organisational knowledge transfer in a complex multi-organisational and multi-channel Web-based context.

**Keywords** – Knowledge Transfer, Web-based Self-Service, Customer Support, Information Technology Services.

## **1. Introduction**

Managed service providers (MSPs) of information technology (IT) services have experienced significant service growth in the past decade and are forecast to increase their market penetration (Hall, 2008). One popular service offered is after-sales IT support (“managed IT support”) where MSPs respond to non-IT enterprises’ after-sales IT-based enquiries, incidents and problems. Two key enablers for managed IT support are 1) self-service channels such as the Web, which provide convenient cost-effective service delivery, and 2) the application of knowledge management principles. In particular, effective inter-organisational knowledge transfer is important for successful managed IT support (Davenport & Klahr, 1998; CSI, 2002; Das, 2003) especially when the Web is used for support delivery. During the delivery of support in this context, key knowledge about customers, products, problems, incidents and resolutions, flows across the Web and supplementary channels through MSPs and business partners to customer enterprises (CSI, 2002).

New challenges faced by MSPs offering after-sales IT support via the Web are important to identify, as suggested by recent studies on self-service. Despite predictions that the Web would facilitate 58% of customer interactions in the IT service sector by 2010 (Kerr, 2005), a recent survey revealed that only 22 percent of end-users consistently used the Web as a service touch point (Colquhoun & Krajewski, 2008) while another suggested a need to improve customer experiences with self-service (Accenture, 2008). These and other studies suggest that the use of

Web-based self-service for managed IT support presents significant challenges for MSPs and deserves further research. Knowledge transfer, as an important enabler of successful managed IT support (CSI, 2002), provides a useful theoretical lens with which to explore these challenges. However published inter-organisational knowledge transfer models do not support complex multi-organisational knowledge transfer taking place over an extended period with the Web utilised as the central delivery channel.

This paper develops a temporal staged model for inter-organisational knowledge transfer in Web-based managed IT support in order to address this gap in the literature. The model is employed to help identify key enablers and barriers for successful knowledge transfer in each stage of the transfer process using interpretive research methods. The findings may guide MSPs by identifying key issues important to address during each stage of the knowledge transfer process, thus enabling more effective Web-based service provision. The paper focuses on operational after-sales IT support services relating to assembling and operating the core IT environment, and providing key value-adding services such as the Service Desk (Peppard, 2001).

The research also adopts a service provider perspective. Prior research on self-service technology adoption and success has assumed a traditional customer-oriented focus and primarily studied only the customer perspective of the processes and issues involved. Gummesson (2008) notes that non-customer stakeholder perspectives are also important for research. Clearly MSPs are in the best position to understand the technologies, knowledge and skills, and other resources deployed in IT support provision and the complex network of support offered.

By researching how knowledge can be successfully transferred to customer firms using Web-based self-service, this paper contributes to theory on inter-organisational knowledge transfer in an electronic business setting. Senior support managers and knowledge managers at MSPs will benefit from a greater understanding of how IT support knowledge is transferred successfully to customer firms when Web-based self-service is used, and the key enablers and barriers involved at each stage of a complex process that takes place over a long time period. As knowledge transfer is central to the provision of effective after-sales IT support services, such an

understanding could assist MSPs in their efforts to improve IT support. By focusing on the relevant key enablers and barriers for each stage of the process managers can better allocate scarce resources during each stage. Given the significant number of support transactions being moved to Web-based channels in the provision of managed IT services, the findings of this research will have increasingly important implications for both MSPs and their customers. The research also adds insights to current knowledge transfer theory in a business-to-business setting where the transfer process occurs over a long time period and Web-based services are employed. The research question explored in this study is:

*“How can MSPs transfer after-sales IT support-oriented knowledge to enterprise customers successfully when Web-based Self-service Systems are used?”*

The remainder of the paper is organised as follows: Section Two provides a theoretical background which reviews the use of Web-based self-service systems (WSSs) in managed IT support and overviews inter-organisational knowledge transfer in managed IT support. Section Three describes the design of the research project. Section Four describes a staged model of knowledge transfer in the managed IT support context when WSSs are used. Section Five identifies and discusses the key enablers and barriers involved in each stage. Section Six discusses key findings from the study in light of existing literature. Section 7 concludes by summarising key contributions, drawing conclusions, outlining limitations and offering final commentary.

## **2 Theoretical Background**

This section reviews the use of WSSs in managed IT support and provides an overview of inter-organisational Web-based managed IT support. Potential barriers and enablers for knowledge transfer are then reviewed.

### **2.1 Web-based Managed IT Support**

A Network-based Customer Service System (NCSS) 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 is a key type of NCSS that enables pre-sales, sales and after-sales self-service via a Web interface and is complemented by a customer contact centre and multi-channel service strategy (Negash *et al.*, 2003).

A WSS has several important advantages for service providers, consumers and customer firms. Notably, it may reduce the cost of support transactions by empowering support agents, consumers and enterprise customers to more easily capture, transfer and re-use support-oriented knowledge and information (Delic & Hoellmer, 2000; Negash et al., 2003). Such systems also offer qualitative advantages to enterprise customers by developing improved operational performance and greater consumer satisfaction, loyalty and retention (Schultze & Bhappu, 2005). Consumers can use a WSS to contribute knowledge and so co-produce services (Schultze & Bhappu, 2005).

WSSs support informational, transactional, proactive and remote support services. At a basic level, informational support enables end-users to access a Web site and retrieve resolutions and other information and knowledge to assist with after-sales enquiries and incidents and problems. This includes “break-fix” support, ‘no touch’ self-help such as answers to Frequently Asked Questions (FAQ) and ‘low touch’ assisted support via online communities of practice (Negash et al., 2003). Transactional support is based on support transactions such as case tracking and the supply of software patches for downloading (Conneighton, 2004). Proactive support comprises preventive, detective and recovery maintenance such as Web-based monitoring for IT effectiveness, installing support software on end-user computers, and disseminating new solutions and best practices to customers (Addy, 2008; Conneighton, 2004; Coulibaly, 2008). Thus by being able to support a wide range of support services, WSSs are a powerful support services tool.

## **2.2 Knowledge Transfer in Web-Based Managed IT support**

According to Alavi and Leidner (1999), ‘explicit’ knowledge (information) can be internalised by an individual receiver as ‘tacit’ knowledge. The researchers argue that a process of reflection, enlightenment and learning is needed for explicit knowledge to become tacit in the human mind. This learning process is likely to happen when a

receiver has an interest in applying the explicit knowledge in context – such as the IT support context of this research.

After conducting a comprehensive literature review of IT services and Knowledge Management literature (e.g. CSI, 2002; OGC, 2002; Pentland, 1992; Selamat, 2006; Szulanski, 2001), we developed an initial non-staged conceptual model of inter-organisational knowledge transfer in the managed IT support context when WSSs are used, as depicted in Figure 1. Key types of knowledge considered important for effective managed IT support are the knowledge of customers, their IT products and infrastructure, and IT problems, incidents and resolutions. The model conceptualises the transfer of IT solutions to resolve customer firms' after-sales IT support needs by a complex transfer of tacit and explicit knowledge from an MSP (termed "support organisation" here to highlight the customer support role).

Take in Figure 1

The example shown is of an IT resolution developed by a support agent and later captured in explicit form in a knowledge base. When end-users at a customer firm experience IT incidents – or an IT services firm recognises a pattern of incidents at the customer firm and identifies a related problem – the knowledge transfer process is activated. An end-user at the customer firm may elect to telephone the MSP's Service Desk to access assisted support via support staff. Alternatively, he or she may directly access the MSP's WSS seeking a resolution. Where an end-user does not find a solution accessible as explicit knowledge, first tier Support Agents at the MSP identify potentially successful solutions from their tacit knowledge of the subject matter or by searching the solutions knowledge base. Complex problems are escalated to experienced second and third tier Support Agents. Downstream are several tiers of Support Engineers – technology specialists who ultimately resolve the most difficult problems by drawing on expert tacit knowledge. New and evolving solutions are captured in the knowledge base and organised for later reuse. Where IT support is provided by a business partner, the customer's IT professionals may communicate directly with that partner's IT professionals. Business partners can access the MSP's knowledge via the WSS or Service Desk.

## **2.3 Knowledge Transfer**

Szulanski's (1996) intra-organisational model for transfer of best practices is a temporal model which was considered suited to adaptation to the present inter-organisational managed IT support context due to its temporal nature, and the analogy between best practices and the project context of transferring and diffusing IT resolutions through a customer firm. The original model comprises four stages: initiation; implementation; ramp-up; and integration. The model considers the transfer of knowledge from a source to a receiver. The initiation stage consists of all events that lead to the decision to transfer knowledge from a source to a receiver. In the implementation stage, knowledge flows between the source and receiver who must be motivated to understand, learn and assimilate received knowledge. Social ties are established between the source and receiver and the transfer is customised to suit receiver needs. The ramp-up stage begins when the receiver commences using the received knowledge, typically inefficiently at first but gradually identifying and resolving unexpected problems that arise while using the new knowledge, ramping up towards a satisfactory level of performance. The integration stage begins after a receiver achieves satisfactory results with the transferred knowledge. The transferred knowledge is routinised and institutionalised in the organisation, whereby the new knowledge replaces old knowledge and practices.

### ***2.3.1 Barriers and Enablers for Knowledge Transfer***

There are many enablers and barriers for knowledge transfer reported in knowledge management literature. *Knowledge-based* variables include the tacitness and complexity of knowledge (Simonin, 1999). Tacit knowledge such as expertise in debugging software is notoriously difficult to transfer (Simonin, 1999) while complex knowledge such as complex codified IT resolutions is difficult to integrate with a receiver's tacit knowledge. Strong ties must exist between sharer and receiver if tacit knowledge is to be successfully transferred (Lane & Lubatkin, 1998; Szulanski, 2000). Knowledge which does not have a proven record of past usefulness is also more difficult to transfer, as without a record of past robustness and success it is more difficult to persuade potential recipients to engage in transfer (Szulanski, 2000).

*Receiver-based* variables include absorptive capacity, motivation and retentive capacity (Szulanski, 2000). Absorptive capacity concerns the characteristics of a

receiver and his/her ability to exploit external sources of knowledge (Szulanski, 1996; Cranefield & Yoong, 2005; Nieminen, 2005). Absorptive capacity in an inter-organisational context refers to a firm's ability to identify, assimilate and exploit knowledge from external organisations (Lane & Lubatkin, 1998; Cranefield & Yoong, 2005; Nieminen, 2005). According to Lane and Lubatkin (1998), strong relationships between partner organisations can partly close an absorptive gap. Such partners also require some overlap of knowledge bases (Simonin, 1999) while ongoing interaction between partners is also helpful (Simonin, 1999), as is partner interdependence (Steensma & Corley, 2000). Finally, a receiver may lack retentive capacity and abandon knowledge transfer (Zaltman *et al.*, 1973).

*Sharer-based* variables include motivation and reliability (Szulanski, 2000). Sharers may be motivated to share knowledge by altruistic feelings (Lichtenstein & Hunter, 2006). A sharer may be guided by a receiver's need to know, desire to know, ability to access knowledge and anticipated use (Lichtenstein & Hunter, 2006). A source may resist sharing knowledge out of fear of losing ownership, a position of privilege, superiority or power (Davenport & Prusak, 2000). The source may be deterred by inadequate rewards offered for sharing hard-earned knowledge advantages (Davenport & Prusak, 2000). An expert or other trustworthy source is more likely to influence the behaviour of a recipient (Szulanski, 1996).

*Context-based* variables include the organisational context and relationship issues. Factors that differentiate organisational contexts are their formal strategies, structures and systems, sources of coordination and expertise, and organisational culture (Szulanski, 1996; Davenport & Prusak, 2000; Gold *et al.*, 2001). Rewards, recognition, and cultures of trust, openness and honesty may motivate knowledge sharing (Gold *et al.*, 2001).

### ***2.3.2 Descriptive Staged Model for Knowledge Transfer in Web-based After-sales Managed IT Support***

A descriptive staged model of inter-organisational knowledge transfer for managed IT support when WSSs are used (Figure 2) was developed by synthesising Szulanski's (1996) model with other relevant literature pertaining to managed IT support, WSSs

and knowledge transfer, as presented earlier. This descriptive model was used as a lens to explore empirical data gathered during the research study as explained later.

Take in Figure 2

The next section reviews the research design employed for the research project, focusing on the steps that led to the development of a temporally staged model of inter-organisational knowledge transfer. Further details of the project can be found in Cooper (2007).

### **3 Research Design**

The research project employed an interpretive epistemology to allow investigation of a human activity system (Walsham, 1993). In *Stage One*, a literature review and synthesis resulted in a preliminary high level model of inter-organisational knowledge transfer in the managed IT support context (Figure 1) and a preliminary descriptive staged model of inter-organisational knowledge transfer (Figure 2).

In *Stage Two*, an interpretive case study was conducted at a large best-in-class multinational MSP ‘ServIT’ (a pseudonym). ServIT provides remote managed IT support to enterprise customers globally and was selected for this study because of its progressive approach to IT support, award-winning customer support Web site, extended enterprise status, and mature, successful WSS strategy integrated with multi-channel, multi-vendor support. The unit of analysis was the Australian headquarters for ServIT. The case study adapted the Critical Success Factor (CSF) method of Rockart (1979), focusing on identifying the factors critical for transferring after-sales IT support-oriented knowledge to customer firms via WSSs. The CSF method of 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 preliminary descriptive staged model of inter-organisational knowledge transfer (Figure 2) 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. Among other findings, the preliminary staged model of inter-organisational knowledge transfer was enhanced.

In *Stage Three*, a cross-organisational focus group was conducted to confirm findings from Stage Two. Focus groups can be effective for electronic business theory validation (Lichtenstein & Swatman, 2003). Participants comprised six Australia-based senior managers from five large multinational MSPs with branches in Australia. A three hour session took place in which participants discussed findings from Stage Two. Further feedback collected by electronic mail confirmed the outcomes of the research including the four stage knowledge transfer model, a set of CSFs (Cooper, 2007) and a set of key challenges for knowledge transfer.

All data from the interviews and focus groups were recorded, transcribed and inductively analysed by qualitative content analysis (Krippendorf, 1980). The coding process involved identifying important themes and categorising statements that revealed the factors critical for the successful transfer of after-sales IT support-oriented knowledge to enterprise customers when WSSs are used. Statements describing the after-sales IT support processes in their organisations were also identified and coded. The coded factors were compared by the two researchers and merged in consultation. The factors were then reviewed in light of understandings gained from the earlier literature review (including figures 1 and 2) and used to enhance the set of CSFs and the preliminary model of inter-organisational knowledge transfer.

Several steps were taken to assure research quality. To reduce bias and achieve investigator triangulation (Denzin, 1984), all data were analysed by two researchers working independently using a qualitative content analysis approach (Krippendorf, 1980). Trustworthiness was achieved (Denzin & Lincoln, 2005) by assuring credibility, dependability, confirmability and transferability through techniques such as prolonged participant engagement, cross-checking of multiple recordings of data collection activities, peer debriefing and triangulation via multiple sources and cross-validation (Yin, 2003). Dependability was established by documenting all procedures and problems in the research project, thereby providing an audit trail. Confirmability was obtained by careful recording of all research steps so that constructions,

assertions and facts can be tracked to their original sources. Transferability was obtained to a limited extent by the cross-organisational focus group that provided further judgments regarding the transferability of the findings to other organisational settings.

#### **4 Knowledge Transfer in Managed IT Support: a Staged Model**

This section briefly describes a four-stage model of inter-organisational knowledge transfer in the managed IT support context depicted in Figures 3 - 6. The model was developed by building on understandings in managed IT support provision and knowledge transfer from literature, and the findings from the case study at ServIT. In the figures, the case study at ServIT is used to illustrate and underscore key points. “Premia” is a pseudonym for a Service Desk tool used to track customer cases and underpinned by a solutions knowledge base. “ShareIT” is a pseudonym representing a Customer Relationship Management (CRM) tool that captures knowledge pertaining to individual customers, including knowledge pertaining to after-sales IT support.

Take in Figure 3

Take in Figure 4

Take in Figure 5

Take in Figure 6

##### **4.1 Initiation (Figure 3)**

Knowledge is initially captured from support agents, business partners and customers into the knowledge base whenever there is a change such as a new product release or in the normal course of support work. Knowledge is first captured from customers during the sales process, as this is used to enable the personalisation of subsequent service interactions. In providing after-sales IT support, details of *cases* are captured by support agents (or business partners) from IT professionals or other end-users at the customer firm. At ServIT, a case captures all the information and knowledge about a problem scenario including details of the affected product or system and the

symptoms exhibited, knowledge about how the support agent went about resolving the problem and, at the end of the case, a description of the solution which was finally able to resolve the problem. Lower-tiered support agents are coached formally and informally with access to higher-tiered support staff.

Where IT support personnel indicate that they have access to IT solution-oriented knowledge which has not been captured in the knowledge base but which could be of use to other support staff or customers, they are expected to share it by capturing it in the Premia knowledge base. For example:

“If we believe that we are going to see repeat calls raised by customers on a specific problem... say we have released a new update to a piece of software that goes out and is distributed to all customers, and so the first customer who installs it sees a problem... it will save us a great deal of calls if we can just put the workaround in the knowledge base and customers can [eventually] see that.” (Support Agent, ServIT)

Once captured, this knowledge can be accessed by front-line support agents as needed, empowering them during WSS-assisted support. Once knowledge has been initially captured in the Premia knowledge base, it is reviewed and organised for re-use by customers via the WSS knowledge base according to a set of internal standards:

“We have even got separate teams that take the case, review it technically, and format it before it is made available to customers on the WSS.” (Support Agent, ServIT)

Cases in the knowledge base evolve as follows. If, in re-using an IT solution, a support agent notes potential improvements to that solution, case notes and the IT solution are updated by the agent. Support staff (and business partners) can also contribute to the WSS knowledge base directly via online fora.

An end-user at the customer firm accesses the WSS and searches for potential resolutions from the WSS knowledge base or by accessing online fora, electronic mail or chat. If a search is performed, intelligent case-based reasoning (CBR) software identifies and displays optimal potential resolutions from the WSS knowledge base. Here intuitive navigation and effective key word searches are important. If a solution is not found, a customer end-user may choose to abandon the transfer process or re-initiate the transfer, either by refining the search criteria via the WSS, or by

submitting the incident to the Service Desk by telephone. To assist customers directly (e.g. by telephone or chat), ServIT support staff can search for knowledge in the Premia knowledge base or WSS knowledge base. Management at ServIT emphasises the importance of re-using existing knowledge rather than the re-solving of problems. If a solution is not found, the support agent begins trouble-shooting the incident and, if necessary, escalates the problem to higher-tiered support staff. Root cause analysis results in new workarounds that are posted to the Premia knowledge base. Business partners may also search the WSS knowledge base for solutions to assist customers. However business partners and customers do not have access to the ShareIt or Premia knowledge bases primarily for quality control reasons. Initiation is completed once a potential solution has been identified for transfer.

#### **4.2 Implementation (Figure 4)**

During the implementation stage, knowledge flows between ServIT, business partners and the end-user at the customer organisation. Knowledge may flow directly from a WSS to an end-user, such as in the downloading explicit knowledge in the form of a White Paper, patch or trouble-shooting document. Knowledge may also flow through ServIT support staff or a business partner – for example, via an online chat session with a customer end-user.

From a technical perspective, ServIT must consider the format of the knowledge and the type of channel used to transfer it. In this study, a commonly cited example of such a consideration was the need to present the knowledge in a format to cater for customers connected by a range of internet connection speeds:

“The accessibility that customers have is important. See, our company sometimes might think that everybody has high speed access but in reality it’s still around 50 odd per cent... People think everybody has got it but they don’t.”

(Customer Technology Division Manager, ServIT)

Where a human is the source of knowledge, social ties with a potential receiver are established and maintained. It was found in this study that even in a multi-channel support context where technology-mediated interaction is the primary point of contact, relationships remain paramount. For example:

“There are two parts to a relationship and if it is person to machine, you’ve still got to give them the experience that they are being treated as a valued customer.” (Customer Service Process Manager, ServIT)

At the end of the implementation stage, the knowledge has been transferred to an end-user at the customer firm.

### **4.3 Ramp-up (Figure 5)**

During the ramp-up stage, an end-user at the customer firm begins using the transferred knowledge, perhaps inefficiently at first, but gradually identifying and resolving unexpected problems by a phase of knowledge application or practicing. This may be completely independent, or may involve requesting additional assistance. If additional assistance is requested from ServIT, it is seen as an opportunity to obtain feedback from the end-user. Such feedback is subsequently consolidated in the Premia and WSS knowledge bases to improve the knowledge for future transfers.

During ramp-up, issues surrounding personalisation of the knowledge were found to be important. For example, the presentation of the knowledge needed to be customised so that the WSS could cater to different levels of customer expertise. Customer confidence in using the WSS and applying the knowledge was also critical, and it was important that end-users have the ability to back-out of and operation.

“The content of the knowledge may be the same, the presentation may need to differ widely, depending on the audience... how [do] you present it to the end-user in such a way that they will experience this ramp-up positively?” (Customer Process Manger, ServIT)

The feedback process highlights several possible outcomes from the ramp-up stage. First, the end-user may abandon knowledge transfer if difficulty is experienced applying the knowledge or if it is applied but does not provide a satisfactory resolution. Alternatively, the end-user may decide to re-initiate the knowledge transfer (via the WSS or alternative channels such as the Service Desk). Re-initiation necessitates the alignment of other support channels with the WSS and the need for ServIT to capture knowledge relevant to the end-user’s initial attempts to resolve the problem, so they do not become frustrated by having to explain or repeat these attempts with support agents:

“There has to be boundaries that say ‘this is not in the rules, this is not in the knowledge set, we are going to have to do a manual intervention’ and it has got to be the customer not getting there through frustration but being guided to that point...” (Customer Process Manager, ServIT)

The desired outcome of ramp-up is that the end-user applies the knowledge and finds that it meets their requirement. The end-user then progresses to the integration stage.

#### **4.4 Integration (Figure 6)**

During the integration stage, the transferred knowledge becomes assimilated at the customer organisation. Prior knowledge and practices are replaced with new knowledge and practices. Management at ServIT found that the level of integration required by customers is dependent on the type of knowledge transferred, the type of customer and their objectives:

“Success for integration will be based on our understanding of the type of end-user and on the type of knowledge... Some knowledge will be used once off, whereas in more complex environments where there are more likely to be repeat problems may need to be integrated.” (Customer Process Manager, ServIT)

This insight is consistent with the observations of support agents at ServIT, who noted that the transferred knowledge related to “break-fix” support is typically not integrated into customer firms (although support agents wished it was to reduce repeat enquiries). Instead, customers require the location of the knowledge in the WSS to remain stable so that in the event of a recurring issue, it is easy to re-locate the relevant knowledge via the web site. On the other hand, knowledge related to best practices was integrated by customer organisations but ServIT currently has difficulty measuring the success of such integration. The need to feedback information regarding the knowledge integrated by the customer organisation was seen as critical, as this enables ServIT to improve future support provision. For example:

“It is very important for the customer to realise that they need to be capturing information. We are always educating our customers [about] change management. A lot of them perhaps don’t do that now [but] we know that it is sort of a task that does ensure better maintenance of a system when you can track what has happened.”  
(Support Agent, ServIT)

## 5 Enablers and Barriers for Knowledge Transfer in Managed IT Support

The key barriers and enablers at each stage of knowledge transfer are summarised in Table 1 and described below.

Stage	Barriers	Enablers
<b>Initiation</b>	<ul style="list-style-type: none"> <li>- Complexity of codification</li> <li>- Inadequate Support Agent motivation</li> <li>- Support Agent fear for job security</li> <li>- Motivating customer adoption of self-service</li> <li>- Lack of customer trust in knowledge and its source</li> </ul>	<ul style="list-style-type: none"> <li>- Integration of knowledge processes within employee workflow</li> <li>- Rewards and recognition</li> <li>- Marketing WSS to increase customer adoption</li> <li>- Systems to demonstrate knowledge robustness</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>- Ensuring positive relationship in electronic context</li> <li>- Customisation of knowledge</li> </ul>	<ul style="list-style-type: none"> <li>- Supplement online relationships with traditional relationships</li> <li>- Education and training</li> </ul>
<b>Ramp-up</b>	<ul style="list-style-type: none"> <li>- Identifying when end-users require additional assistance</li> <li>- Providing additional support increases support costs</li> </ul>	<ul style="list-style-type: none"> <li>- Technology to identify individual customers</li> <li>- Provision of additional support to address CRM objectives</li> </ul>
<b>Integration</b>	<ul style="list-style-type: none"> <li>- Understanding how transferred knowledge is integrated</li> <li>- Lack of emphasis on integration by customers</li> </ul>	<ul style="list-style-type: none"> <li>- Publication of success stories</li> </ul>

**Table 1** Barriers and Enablers for Knowledge Transfer in Managed IT Support Using WSSs

### 5.1 Initiation Stage

First, companies find it difficult to capture the complex tacit knowledge of IT support experts. It can also be difficult to motivate employees to share their knowledge with other employees or capture the solutions knowledge base. Service Desk managers at ServIT had set minimum targets for the number of knowledge base contributions support agents must make per year but explicit incentives for motivating knowledge sharing are only partly successful. One key reason is that if support agents fear sharing knowledge due to possible loss of status or other privileges - even employment - then this fear would over-ride rewards and recognition:

“There were some publicised problems around letting some people go and ServIT then having to rehire them as it was clear they had much tacit knowledge. The other side to this is the need to ensure that employees do contribute to the overall knowledge base but don’t lose their jobs as a result.” (Consulting Services Division Manager)

Among receiver-based barriers, a lack of customer awareness of the WSS was identified. The use of regular marketing strategies is used as an enabler to stimulate the use of the Web channel by end-users seeking support knowledge.

There are also motivational issues for end-users at customer firms in regards to adopting WSSs for after-sales IT support provision. Participants argued that customers will usually take “the path of least resistance” and thus if it is easier to pick-up the telephone than to use the WSS, they will do so. It was suggested that the cost structure of support contracts with customer firms should reflect the MSP’s desire to shift towards the provision of IT support services using the WSS as opposed to using more expensive channels.

Another challenge for end-users is knowledge trust: end-users who visit online support fora for assistance do not know which users they can trust to provide good solutions to their concerns. Merit-based incentive schemes are useful to enable development of user reputations that can be used by other users as reputation guides. For example, at ServIT and several of the organisations represented at the cross-organisational focus group, points are allocated to users who provide responses graded as valuable by those who pose the questions. Rewards and reputation-based systems help establish the robustness of solutions but are not wholly effective as solutions may fail in practice.

## **5.2 Implementation Stage**

Establishing a positive relationship between a knowledge source and a receiver of knowledge is important. For example, in the enterprise-customer context it was argued that:

“Your relationship with the [knowledge] recipient is absolutely key and fundamental to the success... without that relationship all that you have got in your collaborative tool is a whole lot of documents.” (IT Project Consultant, ServIT).

However relationships between end-users at a customer firm and support agents at the MSP are often virtual. Targeted strategies can help develop and maintain positive relationships. Allocation of client managers to customers may be useful so that the

traditional or “face-to-face relationship” is still nurtured. The need to customise support knowledge (that is, IT resolutions) to suit the requirements of customers can also be challenging. Strategies to better understand customer requirements may help to address this issue. Education and training on the benefits and use of WSSs may increase their adoption and enhance relationships between MSP personnel and customer personnel.

### **5.3 Ramp-up Stage**

It is difficult for an MSP to know when a customer end-user requires additional support unless the end-user alerts the provider. This is partly because many support services are requested anonymously. Anonymous use makes it difficult for service providers to achieve relational objectives, as capturing knowledge about individual customer firm end-users is problematic. Ensuring that end-users provide identity-based feedback on the usefulness of support knowledge is a related challenge. ServIT acknowledges the importance of these issues:

“Do we need customer relationship one-on-one experience tracking within self-support? Can you get a return on investment for that? I suspect it might be hard to prove... but my gut tells me that if you don't start at least thinking of these tactical implementation functions then you may be disappointed.” (Customer Process Manager, ServIT)

Thus there is seemingly a trade-off between transactional cost-effectiveness and objectives for CRM.

### **5.4 Integration Stage**

The institutionalisation of knowledge at the customer firm may not always be a high priority for customers, depending in part on the type of knowledge transferred. Rather, it is the capacity to re-initiate a knowledge transfer which might be considered important. Such a capacity means that when an end-user at a customer firm experiences the same issue again, he or she can move quickly to a familiar part of the system and immediately obtain the solution. In other words the stability of the location of the knowledge accessed via the WSS and the ability to set bookmarks are important. However, from the MSP's perspective, they would like to encourage customers to institutionalise knowledge in an effort to ensure more effective use of their products and services. This suggests a need for MSPs to educate customer firms

about the benefits of institutionalising IT solutions, such as reduced support costs. It also suggests a new receiver-based factor: receiver understanding of benefits of institutionalised knowledge.

With respect to feedback, in the interest of providing more effective support in the future, it is always useful to learn how customers have used and/or integrated received solutions. While some data is collected, the difficulty resides in encouraging customers to complete surveys and in how the organisation is able to interpret this data:

“One of the things that we tried to enforce is, if it does resolve your problem and you click the ‘yes’ button, then it allows us to do some kind of analysis. But just because you have re-used it might not be a good thing...Why is it being re-used? Is it because the instructions weren’t clear? Do we have to make it simpler?”  
(Service Desk Manager, ServIT).

Understanding how knowledge is integrated becomes even more difficult when the knowledge moves away from break-fix scenarios and towards the higher level or “value-add” services. For example, the case organisation (ServIT) reported that the publication of “White Papers” to share success stories in using the organisation’s products and services (including support services) was a strategy employed to encourage customers to provide feedback.

Thus overall, the integration stage of knowledge transfer was not well understood in part due to difficulties in measuring integration and very few effective enablers were identified.

## **6 Discussion**

The enablers and barriers to knowledge transfer in Web-based managed IT support, identified in this paper, support a range of factors identified by other researchers in non-Web-based knowledge transfer while contributing fresh understanding through several new findings. By adopting a staged approach, the study has highlighted at which particular stage of the knowledge transfer process that these knowledge, sharer, receiver and context-based enablers and barriers are most relevant. However, existing literature does not address the stages of knowledge transfer and therefore in this section we focus the discussion more broadly on the identified knowledge-based,

receiver-based, sharer-based and context-based enablers and barriers and their main practical and theoretical implications.

Knowledge-based factors were found to act as barriers to knowledge transfer as found by (Kwan & Cheung 2006; Simonin 1999; Szulanski 2000) and complex knowledge such as an IT resolution can be difficult for a receiver to understand (Szulanski 1996, 2000). A key knowledge-based enabler emerging from this study is the importance of customisation of knowledge to the needs of customer organisations, as highlighted in the implementation stage of knowledge transfer where end-users better understood and accepted customised solutions. Attention to this issue may have a positive impact on customer satisfaction.

Limited support for the role of receiver-based factors in inter-organisational knowledge transfer (e.g. Lane & Lubatkin 1998) was provided by the study findings, perhaps because the study focused on investigating the provider perspective rather than the customer perspective. There were three key findings in this category. First, customer firm end-users may not be interested in institutionalising transferred IT solutions. Cranefield and Yoong (2005) highlight the need for a fit between the knowledge received and a receiving organisation's objectives. If a customer firm does not prioritise the institutionalisation of IT solutions throughout the firm, its employees will not make the effort to learn the solutions transferred from the service provider and will simply apply them to resolve the initial problem. Nieminen (2005) noted that for knowledge transfer to occur, a receiving organisation must be capable of absorbing shared knowledge. It is possible that such capability may be missing from some customer firms that are receiving IT solutions. Indeed the motivation and capability (or lack thereof) for knowledge integration will differ from customer to customer. For example, in a study investigating the transfer of knowledge in post system implementation, Santhanam et al. (2007, p. 171) identified that, "although users turned to IT professionals to obtain knowledge related to conceptual understanding and procedures to use the system, they most often turned to other users to obtain knowledge that allowed them to adapt the system to their work". Further research is required to understand issues surrounding knowledge integration in a Web-based context from both the MSP and customer perspectives, as such issues may

have implications for customer firm satisfaction and be a potential strategic differentiator.

Second, due to the anonymous nature of the Web it is difficult for the MSP to determine whether end-users at customer firms need additional support during the ramp-up stage. Further, inadequate end-user feedback regarding solutions and services, particularly during the later stages of knowledge transfer, led to limited opportunity to improve solutions for future knowledge transfer as MSPs were often unaware of the extent to which customers have integrated the transferred knowledge. The role of receiver feedback for future knowledge transfer success between a sharer and receiver was identified by Lichtenstein and Hunter (2006) in an intra-organisational context. There may be a role for such feedback in inter-organisational knowledge transfer success. Solutions previously proposed by other researchers are potentially valuable to improve opportunities for feedback such as ongoing interaction between partners (Simonin 1999) and partner interdependence (Steensma & Corley 2000; Kwan & Cheung 2006). A third receiver-based barrier identified was the lack of customer end-user motivation to use the WSS to initiate a knowledge transfer and such technological adoption issues are a fresh finding for knowledge transfer theory.

Sharer-based factors identified by the study included motivational issues as previously found by Szulanski (2000) and Kwan and Cheung (2006). As suggested by classic KM literature, support agents may fear loss of power from sharing knowledge with other employees in the firm (Davenport & Prusak 2000). This was evident in this study during the initiation stage where support agents are required to capture their knowledge into the knowledge base. Organisational context factors were the main category of factors that could impact sharer motivation as discussed below.

Context-based factors were found influential in knowledge transfer as also found by other researchers (Szulanski 1996; Gold et al. 2001; Kwan & Cheung 2006). Cultural enablers such as rewards and recognition, and systems developing trust in others' knowledge, were identified as supporting the importance of a knowledge sharing culture (Gold et al. 2001). Although notably, where sharers are concerned about job security and job loss, such mechanisms are unlikely to be effective. This is consistent with the argument of Huber (2001) which identifies knowledge sharing is seen as a

voluntary activity and thus explicit rewards and sanctions are not necessarily effective and should be used with caution. The findings of this study suggest that in circumstances where knowledge workers are concerned about job loss, managers need to ensure that knowledge capture activities form part of the normal workflow and reassure employees that participating in activities will not result in job loss, but rather, enable them to focus on value-adding activities.

In the context of managed Web-based IT support, trust is required inter-organisationally. The need for trust in virtual contexts has also been proposed by other researchers such as Panteli and Sockalingam (2005) and Bunduchi (2005). There is therefore a need to investigate the generation of user trust in the knowledge of others, in Web-based settings. Relationships can help develop such trust and it has been found that positive relationships facilitate the transfer of tacit knowledge (Lane & Lubatkin 1998; Szulanski 2000; Nieminen 2005).

The internet's evolving communication tools can be exploited to better develop inter-firm relationships (Sigala 2007). However, it was found in this study that MSPs seemingly make trade-offs between the transactional cost effectiveness provided by WSSs and their long-term objectives to develop relationships with their customers – or what Bunduchi (2005) terms “transaction costs and goodwill trust”. The tendency to favour cost-effectiveness is probably not surprising in a WSS context as ultimately cost savings are a major driver of self-service strategies, however, the results of this study indicate that MSPs are not certain of the return on investment (ROI) of using WSS for “break-fix” support or “value-added” services (such as the provision of White Papers on best practices). MSPs should thus remain mindful of the long term implications of these issues when making such trade-offs and further research is needed in this area.

## **7 Conclusion**

This paper has provided a staged temporal model of inter-organisational knowledge transfer from an MSP to a customer firm in after-sales managed IT support, when a WSS is used (Figures 3 - 6). Some of the key barriers and enablers to knowledge transfer in the after-sales managed IT support context were identified (Table 1) during

each stage. These understandings may be useful to help MSPs better manage their IT support services, including in the allocation of valuable resources at the time at which they are most needed. The enablers and barriers confirm many known knowledge-based, receiver-based, sharer-based and context-based factors in successful knowledge transfer and contribute fresh understandings by highlighting the distinctive ways in which they apply in a Web-based managed after-sales IT support services setting.

This findings suggest that strong ties are required in a managed after-sales IT support context. Further, it is critical to successful knowledge transfer that the WSS is effectively integrated with traditional support channels such as the phone-based Service Desk. This is reflected in Figures 3-6, which highlight that WSSs exist within a complex multi-channel, multi-tiered customer support system. The integration of technologies for complex inter-organisational knowledge transfer is a new finding for knowledge transfer success which warrants further investigation.

In conclusion, this paper highlights the need for MSPs to pay greater attention to the many social and organisational issues which can significantly limit the success of knowledge transfer in Web-based managed IT support.

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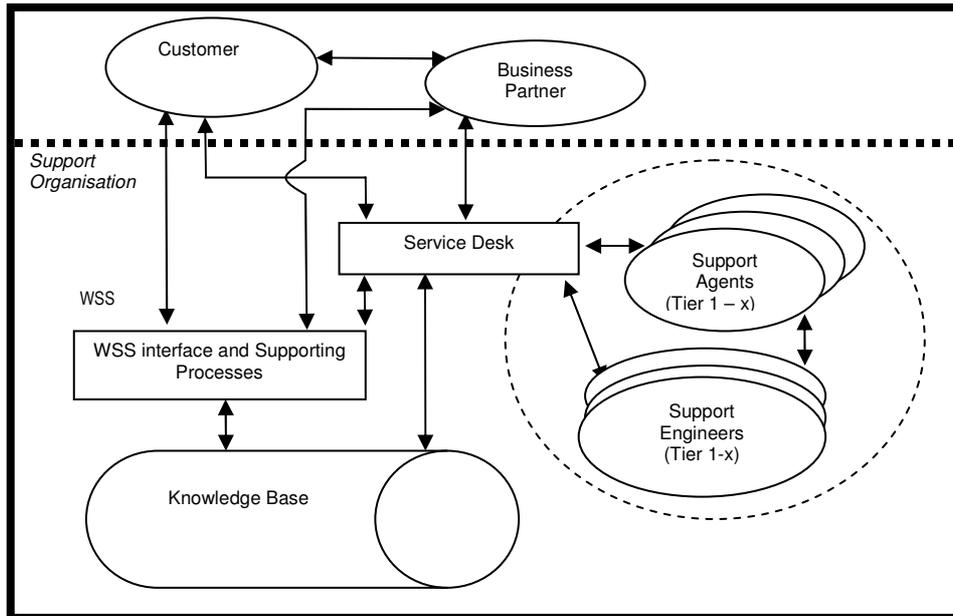
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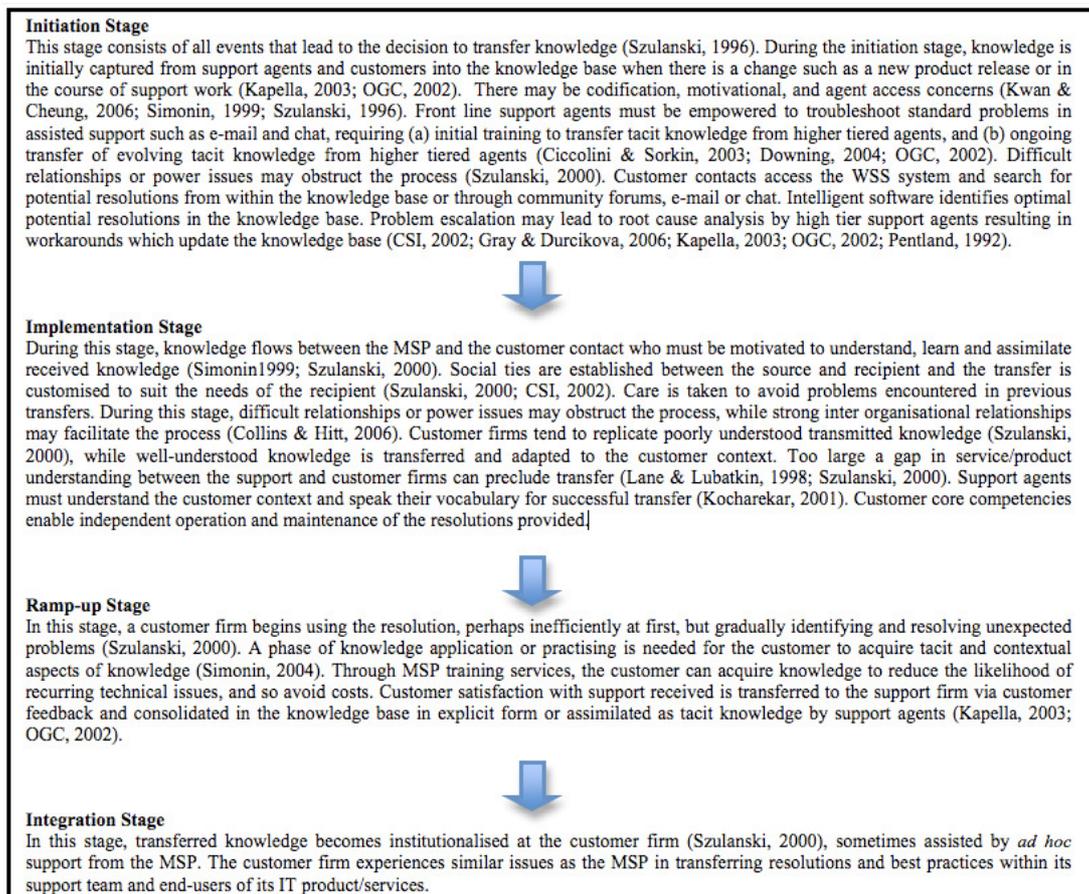
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**Figure 1: Knowledge transfer in Web-based after-sales IT support**



**Figure 2. Descriptive Staged Model for Knowledge Transfer in Web-based After-sales Managed IT Support**

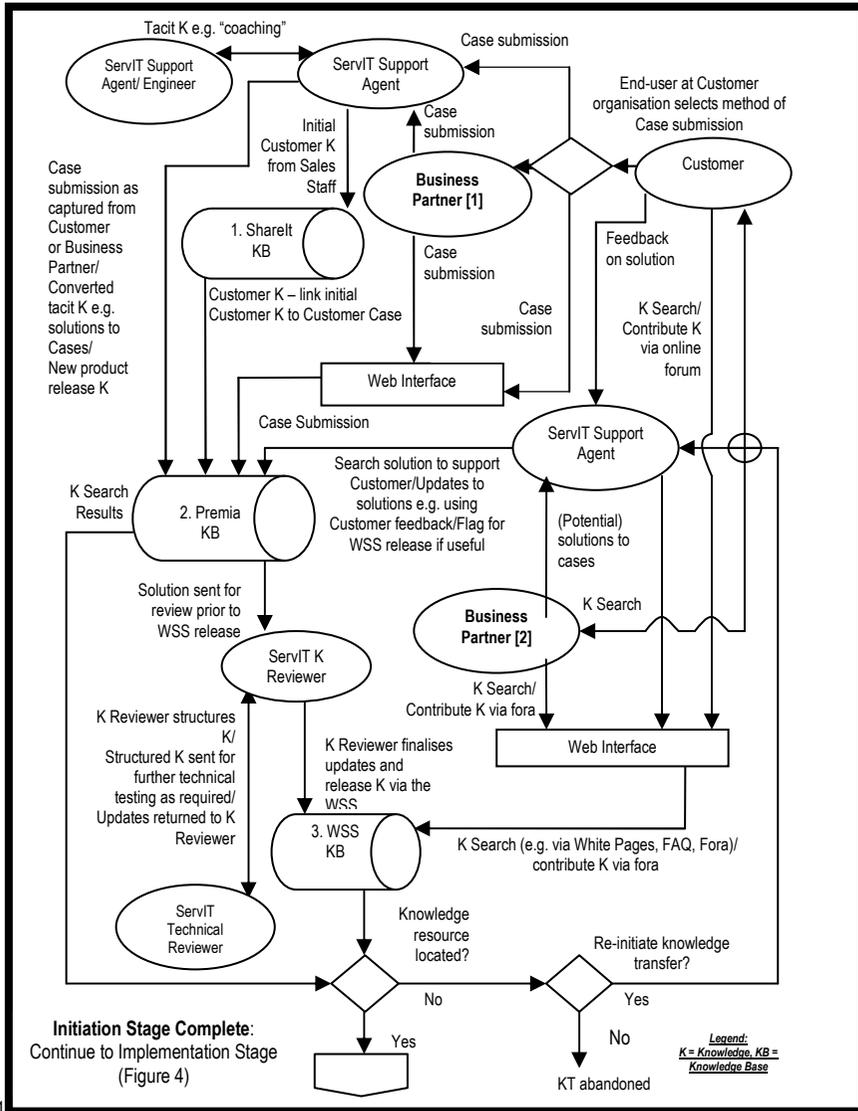


Figure 3. Initiation Stage of Knowledge Transfer

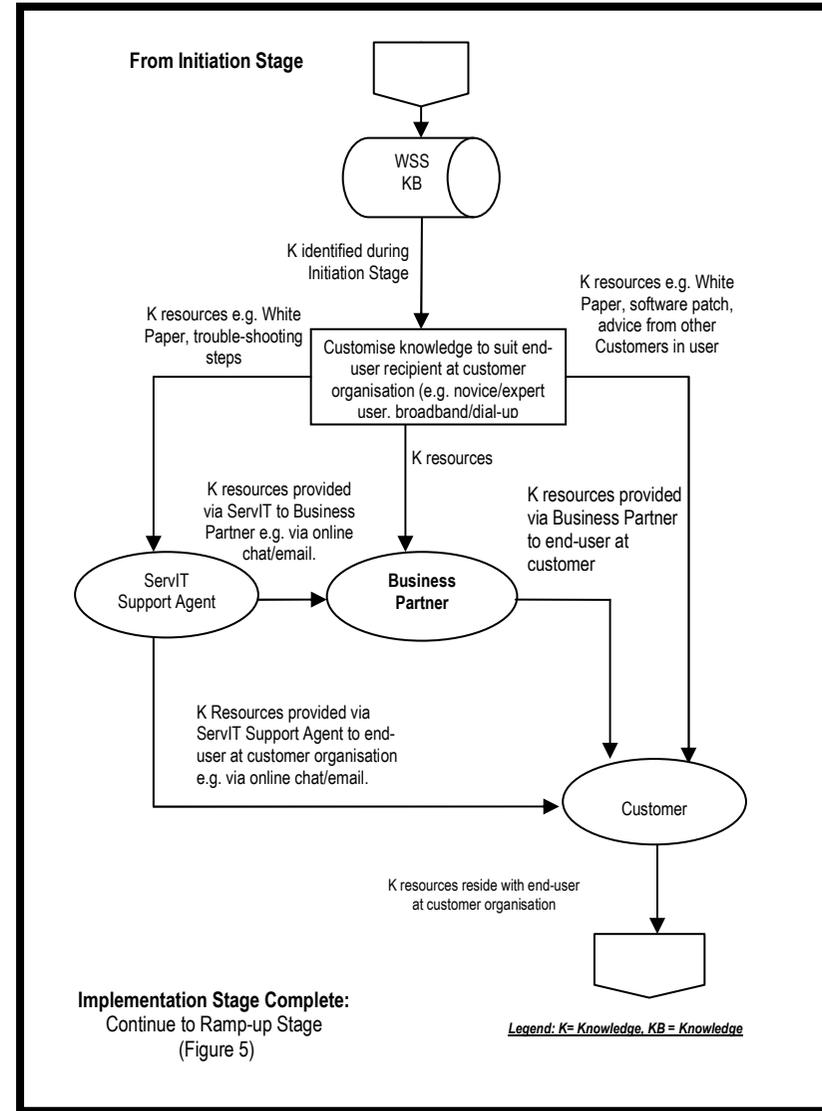


Figure 4. Implementation Stage of Knowledge Transfer

