# Archival Analysis of Service Desk Research: New Perspectives on Design and Delivery

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## Abstract

*Our analysis of service desk studies shows the extent to which researchers have neglected important aspects of service desk design and delivery. The observations are made through an archival analysis of 58 peer reviewed publications in top tier outlets. Our analysis led to the development of a generic framework which identified three themes in service desk design – (1) user groups, (2) support models, and (3) technology types – and two themes in service desk delivery – (1) direction of delivery, and (2) executive support level. This paper makes a twofold contribution to service desk research. First, it provides an understanding of service desk functions and the challenges faced by organisations in delivering those functions. Second, it identifies established and emerging areas in the service desk field. This archival analysis is the first attempt to systematically analyse the service desk literature.*

## Keywords

Service desk, help desk, archival analysis, design, delivery

## INTRODUCTION

Help desk research is becoming a prevalent theme in the Information Systems (IS) discipline (Knapp 2013). A help desk facilitates and enhances a company's communications by being a single point of contact between organisations and their end users (González et al. 2005; Marcella and Middleton 1996). With the rapid expansion and growing complexity of information technology (IT), the communication required between the help desk and end users has increased (Jäntti 2012; Uebernickel and Brenner 2014). Companies are beginning to increase their focus on the importance of help desks and customer engagement and satisfaction (Elster 2014). In competitive markets, maintaining a higher operational uptime is essential for organisations to satisfy the needs of internal and external customers (Mackey 2011). Furthermore, according to a 2013 Help Desk Institute survey, the number of companies who send customer satisfaction surveys with every service request has increased by 40% since 2009 (Giva 2014). Recently, service desk providers are employing new user centric tools including: self-service, mobility, social-media based collaboration and advanced analytics capabilities (CA Technologies 2014). Yet, there is a dearth of help desk research in top tier outlets. To the best of our knowledge, this study is the first attempt to systematically analyse the help desk literature.

In contemporary management, help desks are not only considered as providers of technical support, but also as a strategic asset for setting future directions and remaining competitive in the marketplace (Bon et al. 2007; Leung and Lau 2007). Additional processes such as incident management, change management and knowledge management have been recently added to supplement the help desk's main function of providing technical support (Nuwangi et al. 2012; Nuwangi et al. 2014; Tang and Todo 2013). Consequently, help desks have evolved into service desks (Knapp 2013). Furthermore, the most critical issues faced by organisations in the service desk environment pertain to: (1) the structure of the service desk; and (2) how to improve user support (Green 2011; Leung and Lau 2007). Therefore, the objective of this paper is to examine service desk[1] research delineating the structure ('design') and process ('delivery') of service desks (Leung and Lau 2007; Marcella and Middleton 1996; Peslak 2005; Siau 2003). Thus, we seek to answer the following research question: "What are the emerging research trends apparent in service desk design and delivery literature?" With the aim of building cumulative knowledge, this paper informs researchers and practitioners about the current state and future directions of service desk research. For the novice service desk researcher, our analysis provides a summary of published research areas and identifies gaps

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[1] For the purpose of resolving ambiguity, the term "service desk" is utilised throughout the paper.

to be taken into consideration when developing their study focus. For established researchers, the archival analysis captures insights into the areas of research that have reached theoretical saturation.

## RESEARCH METHOD

Archival analyses are widely utilised in the IS discipline to identify research trends (Eden et al. 2012; Tushi et al. 2014). Our archival analysis is based on a thematic analysis of peer reviewed publications[2]. We used academic databases such as SpringerLink, EBSCOhost, Informit, ProQuest, IEEE Xplore and the ACM Digital Library. Furthermore, we reviewed the top tier journals in IS, as well as business and management journals. Due to the limited number of service desk-related publications in top tier outlets the search was expanded to include additional academic journals and conference proceedings.

Researchers have been exploring design and delivery in the service desk environment since 1990 (Kendall 2002). Consequently, our archival analysis examined literature published between 1990 and 2014. To retrieve the articles, a search was performed for articles containing the following terms in the title, abstract or keywords: help desk design, service desk design, IT support services, help desk delivery, service desk delivery and customer support services. The relevancy of the retrieved articles was determined, with the relevant articles classified deductively into the classification framework that is discussed below. To ensure the reliability of results any uncertainties that occurred in the classification of articles were resolved with a discussion amongst all co-authors.

## SERVICE DESK CLASSIFICATION FRAMEWORK

In an approach similar to the research of Gable (2010), the service desk classification framework was developed using an iterative analysis of the data, followed by deductive classification of the articles into the framework. Service desk design and delivery are two key paradigms in the service desk literature and thus were the focal point of this archival analysis. The classification framework comprised two high level categories, namely, the design category and delivery category. Service desk design focuses on evaluating the current service desk structures and practices (Tan et al. 2009). It also seeks to ensure that a new service meets both the current and future requirements of the organisation (McBride 2009). The design category can be further classified into three high level topics: the background of the user groups (Prensky 2001; Prensky 2009; Vodanovich et al. 2010), the nature of the support models (Kirchmeyer 2002; Lau 2005 ; Middleton 1999), and the technology types (McAfee 2006). Table 1 presents the definitions for each of the design sub-topics. It is acknowledged that the definitions of the service desk support models may overlap (e.g. distributed support models may also be considered to be virtual in some instances).

Table 1: Service Desk Design Classification Framework

| High Level Topic | Sub-Topic | Definition |
|---|---|---|
| User Groups* | Digital Native | Person who was born during /after the introduction of digital technologies. |
| | Digital Immigrant | Individual who was born prior to the introduction of digital technologies. |
| Support Models** | Local | A local service desk is located within the organisation and within the same geographical location. |
| | Central | A single point of contact to support the entire organisation. |
| | Virtual | Online support, where technicians can provide support remotely. |
| | Distributed | 24 hour/7 day a week service desk, where service desks are positioned strategically to ensure support can be provided at all hours. |
| Technology Types*** | Function IT | Facilitates stand-alone tasks (e.g. word processors, spreadsheets). |
| | Network IT | Facilitates interactions between stakeholders (e.g. email, platforms). |
| | Enterprise IT | Organisational-wide IT used for executing business processes (e.g. enterprise resource planning, supply chain management and customer relationship management systems). |

*Prensky (2009); Vodanovich et al. (2010); **Botha and Leonard (2012); Dubey and Hefley (2011); McNaughton et al. (2010); Osiatis (2011); *** McAfee (2006)

Alternatively, service desk delivery encompasses the tasks of communicating effectively and expediting the resolution of IT problems to meet customer expectations (Kadre 2011). It combines a blend of staff, processes, information and technology to increase productivity and optimise customer service (Joshi and Chebbiyyam 2011). The service desk delivery literature is further classified into two categories: the direction of delivery, and executive support level. The direction of delivery can be either internal or external (González et al. 2005; Heckman and Guskey 1998). The level of support can be classified as management, strategic or operational (Botha and Leonard 2012; Jantti and Kalliokoski 2010). Table 2 presents the definitions for each sub-topic.

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[2] MISQ, ISJ, ISR, JAIS, JMIS, EJIS, JSIS, JIT, DSS, CSCW, SIGCHI, ICIS, ECIS, PACIS, etc.

Table 2: Service Desk Delivery Classification Framework

| High Level Topic | Sub-Topic | Definition |
|---|---|---|
| Direction of Delivery* | Internal | Customer service representatives support the internal organisation. |
| | External | The service desk has been outsourced to an external organisation. |
| Executive Support Level** | Management | The service desk is designed to create value for the client (value creation). |
| | Strategic | The service desk is designed to sustain long-term advantages (value co-creation). |
| | Operation | The service desk is designed to support day-to-day operations. |
| *González et al. (2005); **Joshi and Chebbiyyam (2011) | | |

## ANALYSIS AND DISCUSSION

Overall, 58 articles were reviewed (Appendix 1). The data suggests an increasing interest in service desk research since the 1990s, with recent years showing a decline in the number of published papers. However, we note that recent data may also be skewed due to the publication times typically associated with academic outlets. The results obtained from deductively classifying service desk publications into the aforementioned classification framework are presented in Figure 1. All the relevant articles that were retrieved from the journals and conference proceedings were able to be classified into the framework, with no additional categories being created inductively. However, a number of publications spanned both the design and delivery categories. An overview of the articles classified in each of the categories is presented in the subsequent
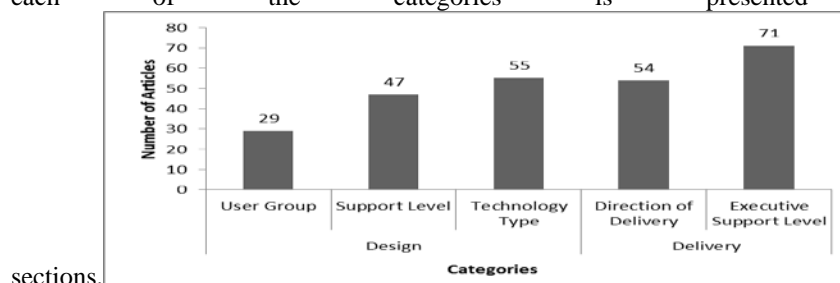


sections.

Figure 1: Approaches to service desk research

## Service Desk Design

Service desk design consists of the user groups, the support models and the types of technology for which users require support. Figure 2 illustrates the categorisation of articles into the sub-topics of service desk design. A discussion of these results for each sub-topic is presented in the subsequent sections.
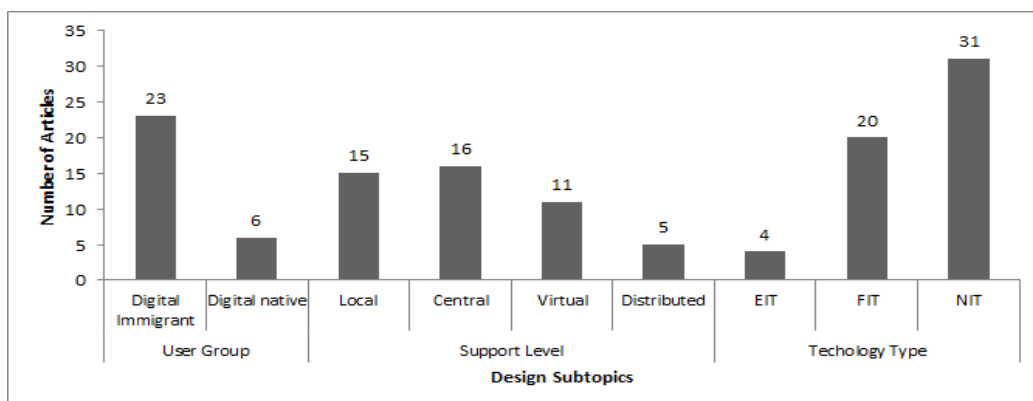


Figure 2: Design sub-topic analysis

## User Groups

The service desk user groups can be divided into digital natives and digital immigrants (Prensky 2009; Vodanovich et al. 2010). A digital native is a person who was born during or after the general introduction of digital technologies and who has grown up with digital technology from an early age (Palfrey et al. 2009; Palfrey and Gasser 2013). On the contrary, a digital immigrant is an individual who was born before the widespread adoption of digital technology and who was not exposed to technology at an early age (Palfrey et al. 2009; Prensky 2001).

Digital natives have little awareness of a world where information and communications technology was not a ubiquitous part of their day-to-day existence (McMahon and Pospisil 2005). When it comes to technology, digital

natives are "in need of immediate gratification" (Vodanovich et al. 2010). Therefore, they have different expectations of the support provided by service desk representatives. Consequently, more research needs to be performed into investigating how we design and implement service desks for digital natives. Digital immigrants, on the other hand, whilst having an appreciation for the increased efficiency and capacity offered by IT, remain more prone to experiencing confusion when interacting with it (McMahon and Pospisil 2005). The majority of service desk studies have focused on optimising the methods of delivering assistance to digital immigrants (Froehle 2006; González et al. 2005; Jantti 2013; Kim et al. 2012) (refer to Figure 2). This could be due to the prominence of digital immigrants in the workplace, with digital natives only starting to enter the workforce in more recent years. With societal shifts occurring, a new approach in service desk research will be required that contemplates both user groups.

**Support Models**

According to the Information Technology Infrastructure Library (ITIL) the support model is an aspect of service desk design which is classified into four different groups (refer to Table 1) (Botha and Leonard 2012; Dubey and Hefley 2011; McNaughton et al. 2010). The classification of support models using ITIL is appropriate as ITIL provides a practical approach for IT service delivery (ILX Group 2014). The distributed service desk model was very popular in the 1980s when IT was relatively simple and straightforward (Kirchmeyer 2002). However, when the complexity of IT increased the number of points of contact were reduced by merging them into a single location or a smaller number of locations forming a centralised service desk (Leung and Lau 2007). The virtual service desk became prominent when networking capabilities increased. In the virtual service desk structure, end users get the impression of a single, central service desk when in fact the service desk representatives may be using online technology in multiple locations (Morgado et al. 2010; Saeed and Abdinnour 2011). The virtual service desk model has also given rise to the 24/7 service desk colloquially referred to as the "follow the sun" model where transnational organisations may combine two or more of their geographically dispersed service desks to offer round-the-clock assistance (Jantti and Kalliokoski 2010; Leonard and Strydom 2011; McBride 2009). The summary of the results in Figure 2 above revealed that the majority of articles published during the selected period focused on the older local and centralised models. There is a dearth of studies addressing the newer and more significant virtual models that allow for more efficacious rendering of assistance to the future IT user (Foo et al. 2002; Stanciu and Neagu 2009).

**Technology Types**

According to McAfee (2006), there are three different types of IT: (1) function IT (FIT), (2) network IT (NIT), and (3) enterprise IT (EIT) (refer to Table 1). This particular technology classification was selected for the purposes of the present study because end users generally require assistance from the service desk in relation to one of these three types of technologies. Common FITs are applications that support stand-alone tasks, such as word processors and spreadsheets. NIT includes messaging services such as email clients (McBride 2009) and platforms that openly share information (Alarifi and Sedera 2013; El Sawy and Bowles 1997; Gião et al. 2010). EIT refers to the cases where structured interactions have been imposed among users, which can occur at either the data or process level such as enterprise resource planning, customer relationship management and supply chain management systems (Ramasubbu et al. 2008; Sedera and Dey 2013). The analysis of the literature (Figure 2 above) showed that researchers have focused predominately on users who require help with NITs, somewhat less on users seeking assistance with FITs and markedly less on users interacting with EITs. This preference for focusing on NITs suggests that users experience greater disorientation in the absence of structured interactions. Although NIT remains the system type with the most potential, this categorisation shows the extent to which current and future service desk practices will have to maintain a focus on unstructured network interactions. With EIT being complex technological artifacts and notoriously known for requiring support, it is concerning that the service desk support of EIT has been neglected in the literature.

**Service Desk Delivery**

Service desk delivery pertains to the direction of delivery and the level of executive support provided by the service desk. Figure 3 illustrates the categorisation of articles into the two sub-topics of service desk delivery. A discussion of these results is presented in the subsequent sections.

Figure 3. Delivery sub-topic analysis

## Direction of Delivery

The direction of service desk delivery can be either internal or external (Feinberg et al. 2000; González et al. 2005; Heckman and Guskey 1998). Our data shows that the focus of the internal service desk delivery literature pertains to: developing assistance for staff, reducing expenditure, increasing productivity, increasing efficiency in communication, synchronising, and replacing internal competition with cooperation (Botha et al. 2012; Gião et al. 2010; Saeed et al. 2011). Customer satisfaction is imperative in external service desk environments (Anton et al. 2004), with dissatisfied customers likely to abandon the organisation . Subsequently, the predominant themes of external service include assurance, response time, empathy and consistency (Hsieh et al. 2012; Srivardhana and Pawlowski 2007). Furthermore, barriers to external service desk delivery have also been examined such as language issues (González et al. 2005). As the analysis in Figure 3 illustrates, there is an even distribution of the studies on the internal and external directions of delivery. However, there are important issues pertaining to internal and external service desk delivery that are yet to be investigated such as time differences and cultural differences between end users and service desk representatives.

## Executive Support Level

Service desks can be developed for operational, management and strategic purposes (Joshi and Chebbiyyam 2011). Operational service desks are predominantly designed with the objective of providing day-to-day technical support (Bartsch et al. 2010; Botha et al. 2012; Kim et al. 2012). The literature pertaining to operational service desks focuses on consolidation of the service desk functions, call logging tools and performance management (Botha and Leonard 2012; Kim et al. 2012; Marcella and Middleton 1996). The literature pertaining to management service desks encompasses the implementation of self-help knowledge management systems (Jantti 2013; Lau 2005 ; Leung and Lau 2005).

Strategic service desks determine the entire long-term direction of service desk delivery (Grönroos 2008). As evident in the analysis illustrated above in Figure 3, limited attention has been paid to strategic service desks. Marcella and Middleton (1996) highlighted that modern service desks need to focus on fixing the root cause of problems and become more proactive, customer oriented and strategy driven. The analysis of the service desk design literature (Figure 3 above) also showed the alarming extent to which researchers have neglected the investigation of management and strategic service desk practices in favour of activities that are operational in nature. This focus on the short-term operational outlook could be detrimental to the future development of service desk support and progression. Thus, it is imperative that researchers shift their attention to studying the current trends in service desk support at the management and strategic levels.

## CONCLUSIONS AND FUTURE WORK

The purpose of this study is to provide a summary of published research and to pinpoint the current trends in service desk literature in the IS discipline. This research-in-progress paper has identified the established and emerging areas in the service desk field and identifies gaps in the literature for future research to address. Our findings show that scholars are beginning to pay more attention to this interesting and imperative topic, yet a more rigorous effort is required to fully understand the challenges of service desk utilisation. Furthermore, the archival analysis demonstrated that research on service desk support for network IT is more prevalent in the literature in comparison to service desk support for enterprise IT. In addition, new service desk models such as distributed service desks have received little attention. This research opens up various opportunities for establishing cumulative knowledge in the discipline and will help researchers to identify potential areas on which to focus. The research will be extended in the future to examining the industry's use of service desk's challengers and enablers to ensure the applicability of these results.

Traditionally, organisations have utilised service desks to simply provide resolutions to technical issues. However, with (i) the recent advances in technology, (ii) the need for organisations to attain a competitive advantage, and (iii) the increase in the number of digital natives and the progressive decline of digital immigrants in the workforce, the service desk environment needs to be reconceptualised. Therefore, we believe there is a need for a new concept that takes into account the updated functions of today's service desk model. We propose the concept of the value-adding service desk (VAS Desk) to inspire a new focus on ensuring constant and ongoing improvements in the quality of products and services being offered through the service desk.

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APPENDIX 1 - Summary of service desk literature analysis

| References | Service Desk Design | | | | | | | | | Service Desk Delivery | | | | |
| | User Group | | Support Model | | | | Technology Type | | | Direction of Delivery | | Executive Support Level | | |
| | Digital Immigrant | Digital Native | Local | Centralised | Virtual | Distributed | EIT | FIT | NIT | Internal | External | Mgmt | Operation | Strategic |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abraham et al. (1991) | | | | | | | | | | | | | X | |
| Bridge and Dearden (1992) | | | | | | | | | | | | | X | |
| Peters (1993) | | | | | | | | X | | | | X | X | |
| Marcella and Middleton (1996) | X | | | | | | | | | X | X | | | X |
| Smith (1996) | | | X | | | | | | | X | X | | X | |
| El Sawy and Bowles (1997) | X | | | X | | | | | | X | | X | | X |
| Puuronen and Savolainen (1997) | X | | | | | | | X | | X | X | | X | |
| Heckman and Guskey (1998) | | | | | | | | | | X | X | X | X | |
| Warren and Adman (1999) | X | | | | | | | X | | X | X | | X | X |
| Foo et al. (2000) | | | | X | | | | | | | | | X | |
| Lee et al. (2001) | X | | X | X | | | | X | | X | X | | X | |
| Govindarajulu (2002) | | | | X | | | | | | X | | | X | |
| Steehouder (2002) | | | | | | | | | | X | X | X | | X |
| Halverson et al. (2004) | | | | | | | | | | X | | X | | |
| Schauer and Thompson (2004) | X | | X | X | | | | X | | X | | X | X | |
| Srensen and Al-Taitoon (2004) | X | | | | | X | | | | X | X | X | X | |
| Deng (2005) | | | | X | | | | X | | X | X | | | |
| Evans and Jones (2005) | | | | X | | | | | | X | | | X | |
| González et al. (2005) | X | | X | X | | | | | | X | | X | X | X |
| Lau (2005 ) | | | | | | | | X | | X | | X | X | |
| Leung and Lau (2005) | | | | | | | | | | | X | | X | |
| Leung et al. (2005) | | | | | | | | | | | X | | X | |
| Pair and Boyle (2005) | | | | | | | | | | X | | | X | |
| Gray (2006) | X | | X | | | X | | X | | X | X | | X | |
| Froehle (2006) | X | | X | X | | | | | | X | | X | X | |
| Leung and Lau (2006) | | | | | | | | | | X | | X | | |
| Mawson-Lee (2006) | X | | X | X | | | | X | | X | X | | X | X |
| Leung and Lau (2007) | | | | | | | | | | X | X | | X | |
| Santhanam et al. (2007) | X | | X | X | | | | X | | X | | | X | |
| Steehouder (2007) | X | | | | X | | | X | | | X | | X | |
| Van Velsen et al. (2007) | | X | | | | | | | | X | X | | X | |
| Carr et al. (2008) | | | | | | | | | | | | X | | |
| Ramasubbu et al. (2008) | | | | | | | X | | | | | X | | |
| Sakolnakorn and Meesad (2008) | X | | | | X | | X | X | X | X | X | | X | |
| McBride (2009) | X | | X | X | | X | X | X | X | X | X | X | X | |
| Tan et al. (2009) | | | | | | | | | | | | X | | |
| Bartsch et al. (2010) | | | | | | | | | | | | | X | |
| Gião et al. (2010) | | | X | X | X | | | | | X | X | X | X | |
| Jantti and Kalliokoski (2010) | | | X | | | X | | | | X | X | X | X | |
| Morgado et al. (2010) | | | | | X | | | | | | X | | X | |
| Shang and Lin (2010) | | | | | | | | X | | X | | X | | |
| Wong (2010) | | | | | | | | | | X | | | X | |
| Green (2011) | | | | | | | | | | | | X | | |
| Joshi and Chebbiyyam (2011) | X | X | X | | | | | | | X | | X | X | X |
| Joshi et al. (2011) | | | | | X | | | | | X | | | X | |
| Leonard and Strydom (2011) | X | | | | X | X | | X | | | | X | X | |
| Li et al. (2011) | X | X | | | | | | X | | X | | X | X | |
| Saeed and Abdinnour (2011) | X | X | | | X | | | X | | | X | | X | |
| Samarakoon and Pulasinghe (2011) | | | | | X | | | | | X | | X | X | |
| Botha and Leonard (2012) | | | X | | X | | | X | | X | | X | X | X |
| Kim et al. (2012) | X | X | X | X | | | | | | X | X | | X | |
| Kumar and Telang (2012) | | | X | X | | | | X | | | | X | X | |
| Siti-Nabiha et al. (2012) | | | | | | | | | | | X | X | X | X |
| Bozdogan et al. (2013) | | | | | | | | | | | | X | | |
| Jantti (2013) | X | X | | | X | | | X | | X | | X | X | X |
| Sedera and Dey (2013) | | | | | | | | | | X | | | X | X |
| Tang and Todo (2013) | X | | X | X | | | X | | | | X | | X | |
| Trusson et al. (2013) | X | | | | | | | X | | X | X | | X | |
| **Count: 58** | **23** | **6** | **15** | **16** | **11** | **5** | **4** | **20** | **31** | **30** | **24** | **19** | **44** | **8** |

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