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Evaluating Sociotechnical Factors Associated With Telecom Service Provisioning: A Case Study

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Abstract

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MS, Walden University, 2012

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Abstract

Provisioning Internet services remains an area of concern for Internet service providers. Despite investments to improve resources and technology, the understanding of sociotechnical factors that influence the service-provisioning life cycle remains limited. The purpose of this case study was to evaluate the influence of sociotechnical factors associated with telecom service provisioning and to explore the critical success and failure factors, specifically in the telecommunication industry of Kuwait. Guided by sociotechnical systems theory, this qualitative exploratory case study approach examined a purposeful sample of 19 participants comprising of managers, engineers, and technicians who had the knowledge and experience of the service-provisioning life cycle. Semistructured interviews, project logs, and a self-created follow-up questionnaire were the primary sources of data. Thematic analysis techniques assisted in coding the data and developing themes, which resulted in a set of critical success and failure factors that influence the service-provisioning life cycle. Cross-functional communication, risk management practices, infrastructure availability, and employee skill development were among the emergent factors that influenced the service implementation. Internet service providers may use the results from this study to improve the service-provisioning life cycle. Successful implementations will promote an environment of positive social change that will increase employee motivation, productivity, and employee morale.

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Dedication

This dissertation is dedicated to my family; it would not have been possible to complete this journey without their patience and support. I feel privileged that my parents believed in me and I am the first individual to complete a doctoral degree in my family. I acknowledge that my father, Mohammed Iqbal, my mother, Rehana Akhter, my sisters, Ayesha Iqbal and Amna Iqbal, and my brother, Faisal Iqbal, always pushed me by encouraging and supporting me to complete the program.

I also dedicate this doctoral study to the most important person in my life, my loving wife, Sadia Wajid. She motivated me when I was low and provided a comfortable environment in which I could study. She was always there with a smile and maintained a constant supply of snacks to keep me going. Her understanding and sacrifices pushed me to the finish line. Finally, a special dedication goes to my two-year-old son, Talal Fahad, whose hugs and smiles were my source of stress-relief and relaxation. Thank you all for making it happen.

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I would like to thank Dr. Anthony Lolas, for his integral role in providing me with invaluable expert advice and timely feedback. I am grateful that I benefitted from his knowledge and subject matter expertise in the area of my study. His reviews have helped me in identifying and filling the gaps in my study. I am thankful that I had the pleasure of learning from him.

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Chapter 1: Introduction to the Study

Information availability using high-speed and robust network infrastructures has become a business enabler for the e-commerce industry. Organizational leaders have acknowledged that the Internet and global connectivity has become one of the primary channels for business and retail transactions that are reliant on the infrastructure provided by service providers. Service providers play a significant role in providing organizations with a physical transport network infrastructure with access to content and services on the Internet or hosting content and services online. The demands of cloud computing, high-speed Internet access, and a reliable network infrastructure have burdened service providers to address the challenges of successfully provisioning services to the subscribers. Service-provisioning failures have led to customer dissatisfaction and loss of subscribers.

Managers must implement an effective strategy to overcome the challenges of service-provisioning failures. Decision makers must develop new strategies by identifying critical success factors and cultural attributes to improve performance and increase sustainability that contribute to the success of telecom service provisioning and organizational objectives. The focus of this study was to evaluate the sociotechnical factors that influence the service-provisioning cycle in an Internet service provider (ISP) organization.

Background of Study

Advances in technology and global connectivity have resulted in the proliferation of online business and the e-commerce industry. Growth has been substantial in the field

of online businesses and e-commerce that primarily focus on delivering products and services to consumers on a global scale (Vasvi, Nayak, & Seema, 2014). Many organizations are shifting from the traditional retail and distribution model to a more competitive online business based on e-commerce. Organizations in the e-commerce industry rely on global connectivity and high-speed Internet services to meet the requirements of growing economies (Poggi, Carrera, Gavaldà, Ayguadé, & Torres, 2014). The demand for online services and e-commerce globally has triggered the need for reliable and high-speed Internet services requiring an infrastructure that can address the challenges of transmitting and receiving voluminous data efficiently.

The Internet is a system of globally connected servers and computers that use Internet Protocol (IP) to serve millions of users worldwide. The Internet originated as a government-owned network called ARPANET that evolved into a public network of autonomous systems (Ma, Lui, & Misra, 2013). The autonomous systems, owned by public and private service providers, interconnect to deliver various types of contents and services to users. The interconnectedness of service providers serves as a mesh network that allows the transfer of information from content providers across multiple autonomous systems to reach subscribers (Yang & Rong, 2015). A typical ISP broadcasts content from local sources, provides transit network infrastructure to other providers, and extends network access to serve local subscribers.

The Kuwait telecom sector has been open to competition since 1991, and Zajil Telecom is the first Internet and data service provider in the country. Following Zajil Telecom, three other providers, Qualitynet, Gulfnet, and Fast Telecommunication,

received licenses to provide Internet and data connectivity services in the State of Kuwait. Internet subscription is reaching a point of saturation, with an approximate Internet penetration of 86.9% users of the total population of Kuwait (Central Intelligence Agency, 2013), which creates competitive demand for a reliable and robust Internet and value-added services to target new subscribers as well as ensure a higher level of service quality to retain existing customers.

The convergence of various services deployed over a common network infrastructure has increased the business and service complexity. Telecom operators are adopting a new strategy of bundling various services to gain new subscribers from competitors and to retain existing subscribers (Srinuan, Srinuan, & Bohlin, 2014; Zaballos, 2013). Service providers' telecom infrastructure requires enhancement to support the delivery of various value-added services. Üner, Güven, and Cavusgil (2015) noted that service providers want to sell various services to gain a competitive edge and increase their subscriber base. The rush to move ahead of competition not only increases pressure on implementing new services but also burdens the resources and the system to provision, maintain, and support the services.

Internet services providers are primarily responsible for providing access to the Internet. However, despite being a publically available service, the governments or privately owned organizations are the primary owners of the infrastructure that is used for providing access to the Internet within a country (Schwartz & Preoteasa, 2015). Initially, access to the Internet was available using the copper infrastructure, primarily used for the telephone network, within the country (Haigh, Russell, & Dutton, 2015). However, the

copper-based internet access has many limitations such as lower access speeds and disruption of services because of the copper deterioration. Many countries have upgraded their infrastructure to fiber optics to cope with the requirements of higher bandwidth and faster Internet access (Tahon, et al., 2014).

Internet services providers are consistently challenged to maintain the high levels of infrastructure availability for the access to the Internet and other value-added services (Çetinkaya, Alenazi, Peck, Rohrer, & Sterbenz, 2015). Availability of services is affected by the reliability (probability of a system failure within a time duration) and resiliency (the ability of a system to maintain acceptable levels service availability during faults or other issues) of the network infrastructure (Çetinkaya, Alenazi, Peck, Rohrer, & Sterbenz, 2015; Moreno-Vozmediano, Montero, & Llorente, 2013). Service providers have to maintain a physical and logical layer of resiliency in their infrastructure to attain higher levels of availability. Maintaining higher levels of network availability warrants a continuous investment in enhancing and upgrading the network infrastructure, which has been a challenge for many service providers because of the high-cost implications.

Service providers are shifting from their core business model to incorporate value-added services to have a competitive edge. The core business of a service provider is to provide Internet or data services to its customers (Economides & Tåg, 2012). The overarching benefits of virtualization and cloud-based computing have resulted in a paradigm shift for service providers who are adopting a model of incorporating services based on virtualized information and communications technology (ICT) as part of their products and services (Jain & Paul, 2013). Service providers' ICT portfolios encompass

services such as virtual servers, cloud storage and backup, videoconferencing bridges, hosted IP telephony, virtual firewall and security, and other virtualization services for corporate and retail customers.

Investments in the field of IT have dramatically grown with the evolution of cloud computing and virtualization services. Subscribers who use cloud computing empowered by virtualization technologies can acquire storage, security, computational power, and business applications as services over the Internet from service providers (Zissis & Lekkas, 2012). Organizations have started using cloud architecture to host their e-commerce and business applications on the service provider's platform. Cloud computing has become a business enabler for organizations, as it directly contributes toward reducing the cost of infrastructure investments (Xu X. , 2012). Marston, Li, Bandyopadhyay, Zhang, and Ghalsasi (2011) contended that organizations could use cloud computing and virtualization services to decrease the investment in IT infrastructure, increase return on investment, enhance green computing capabilities, and maintain a sustainable environment. The high implementation rate of cloud-computing technologies has shifted the paradigm of traditional management practices by challenging decisions makers to manage geographically diverse resources efficiently (Ryan, 2013). To ensure customer satisfaction and retention, service providers should meet the demands of service availability, wider bandwidth spectrum, and reliability.

The growth and business demands for e-commerce and online services have triggered the need for a secure, reliable, and highly available network infrastructure. The dependency on the Internet and online services has necessitated stringent service-level

agreements (SLAs) between subscribers and the service providers (Cuomo et al., 2012). Organizations are shifting toward using the services provided by service providers to help them minimize IT investments. Service providers face constant challenges to maintain and enhance their infrastructure to retain a competitive edge in providing cloud, network, and managed services to customers.

The telecom service providers of Kuwait are struggling to meet the demands of providing services to multinational organizations and other subscribers to compete in the global market. Garg (2010) noted that service providers have failed to understand the balance of social and technical influences on adapting new technologies and services. It is important to understand the influence of the social and technical aspects while implementing new products and services in the service provider environment. The advent of new technologies and services leads to a challenge of implementation for service providers, the failure of which leads to an environment of customer dissatisfaction.

Dissatisfied subscribers are prone to switching from one service provider to another using a process called *churn*. The annual churn rate of European providers is 38%, which has cost service providers billions of dollars (Üner et al., 2015). Telecom operators are trying to reduce their rate of churn and retain their customers (Kisioglu & Topcu, 2011). Consequently, telecom operators are trying to increase their market share by adding new products and services to attract new customers as well as retain existing subscribers.

Service providers' efforts in competing with the market and launching new products have also increased the number of failures in service provisioning. Researchers

at Dimension Data (2015) indicated that 45% of failures are due to telecom equipment, and 55% are due to external factors, including human error (30%). Researchers have highlighted the negative impact of poor service provisioning on the customer and the long-term survival of the services provider (Jeng & Bailey, 2012; Morrisson & Huppertz, 2010; Murphy, Bilgihan, Kubickova, & Boseo, 2014; Roschk & Gelbrich, 2013). Service-provisioning failures negatively affect the service provider–client relationship.

The service-provisioning process includes scheduling resources, hardware installation, core network configuration, infrastructure setup, and implementation of the subscribed services. Many researchers have focused on the importance of quality in service delivery (Dao & Yang, 2014; Poku, Ansah, & Lamptey, 2014). However, the connection between the positive or negative influence of sociotechnical factors on telecom service provisioning remains unknown. Understanding how technological advances, human nature, organizational culture, subscribers' attitude, and external factors affect the service provisioning is important.

Understanding the influence of sociotechnical factors on telecom services provisioning is important to develop new guidelines and strategies for service providers to increase the rate of success during the service-provisioning cycle. Improvement in the service-provisioning process can increase the rate of customer retention and profitability for service providers. Successful implementations will promote an environment of increased employee motivation, productivity, employee morale, and positive social change where service failures lead to unpredictable consequences. Adapting and responding to a technological change in a rapidly growing environment of service

providers necessitates an approach that can improve the collaboration, interconnectedness, and streamlining of people, process, and technology.

Problem Statement

Service-provisioning failures affect subscribers negatively, which negatively influences the service provider–customer relationship and business retention. A report by Dimension Data (2015) indicated that 45% of failures are due to telecom equipment and 55% are due to external factors, including human error, which accounts for 30% of the issues. The general problem was that social and technological factors such as human errors, technology failures, environmental factors, or other issues affect the rate of failure in telecom service provisioning. Understanding the relationship between customer dissatisfaction and failures in service is important, as these threaten the long-term survival of telecom service providers (Ou & Sia, 2010). Service-provisioning failures have led to service cancellation and loss of business opportunities for service providers.

Various studies have been conducted identifying the influences of social, technical, and environmental factors on the Internet services in the western countries (Azam & Quaddus, 2013; Pearce & Rice, 2013; Shin & Jung, 2012). However, the Middle Eastern region is highly understudied, specifically Kuwait, where societies and cultures differs vastly from the western world (Gaither & Al-Kandari, 2014). The specific problem was that researchers and practitioners had not explicitly identified, using the sociotechnical lens, the influence of social, technical, and environmental factors on the success or failure of Internet services provider's service-provisioning life cycle in the telecom sector of Kuwait (Gelvanovska, Rogy, & Rossotto, 2014; Quach, Jebarajakirthy,

& Thaichon, 2016; Ragnedda & Muschert, 2013; Seawright, DeTienne, Bernhisel, & Larson, 2008). Researchers have focused on the importance of quality in service provisioning (Dao & Yang, 2014; Poku et al., 2014), but understanding the positive and negative effects of social and technical attributes of an organizational system associated with the service-provisioning life cycle is important. The focus of this case study was on evaluating the influence of sociotechnical attributes and exploring critical success and failure factors associated with service provisioning in a telecom organization in Kuwait.

Purpose of the Study

The purpose of this case study was to identify sociotechnical factors that influence the service-provisioning life cycle, specifically in a Kuwait-based ISP. The study involved investigating and exploring the problem through interviews with staff and management teams to illuminate the internal and external factors that directly affect the service-provisioning life cycle. Service providers need to maintain the ICT infrastructure in a cost-effective and sustainable manner that requires incorporating various industry best practices and IT governance frameworks, as well as aligning the services with the organizational strategy. The focus of the study involved exploring key factors that can assist in decreasing the rate of service-provisioning failures and reducing service cancelations. The study increased the knowledge and understanding of the internal and external factors that influence the success rate of provisioning customer circuits and increase the client retention ratio.

An important aspect of the study was to examine sociotechnical components that influence the service-provisioning life cycle. The implementation of new products and

services in an ICT environment necessitates the identification and management of negative behavior within the organizational culture (Dodaro, 2011). In this study, I identified existing and new technological implementations added to the services portfolio along with the associated processes that govern the service-provisioning systems. Sociotechnical systems theory (STS) served as the conceptual framework to explore the following characteristics:

- Technological evaluation.
- Wholeness and interdependencies of the organizational systems supporting the service-provisioning function.
- Organizational alignment and environmental inputs and outputs.
- Cross-functional communication.
- Risk assessment and decision-making.
- Customer satisfaction and retention.

I conducted a qualitative exploratory case study to evaluate the perceptions of people, the effectiveness of the processes, and the adequacy of technological implementations in a service provider environment. The focus of the research was to identify factors that positively or negatively influence the service-provisioning life cycle.

Research Questions

The central research questions were as follows:

CRQ1. How do managers ensure successful deployment of subscriber services in the telecom sector in Kuwait?

CRQ2. How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment?

The sub-research questions were as follows:

SRQ1. What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment?

SRQ2. What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service-provisioning errors?

SRQ3. What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services?

Conceptual Framework

The service-provisioning life cycle of an ISP comprises social and technical factors that interdepend on the implementation of products and services for the subscribers. I chose sociotechnical systems theory (STS) as the conceptual framework of this qualitative study because it provides the fundamental principles of understanding how social and technical factors interact in provisioning of services in a complex organizational system. Klein (2014) contended that STS resides on the fundamentals that an interrelationship exists between people and technology. The STS imperatives helped in the identification of critical success and failure factors that require a holistic approach to understanding the social, technological, and environmental elements of a service-provisioning system. Figure 1 is a graphical depiction of social, technical, and environmental factors involved in a service-provisioning life cycle. During the 1950s, social scientists and psychologists developed the foundation of sociotechnical systems

theory, a term coined by researchers at the Tavistock Institute of Human Relations, to influence the quality of technical change and working environment. The sociotechnical systems theory has evolved into a rich body of theory and practice used in organizations worldwide. A sociotechnical system's perspective gave insights into organizational systems that helped develop an understanding of various external and internal influences on the provisioning system.

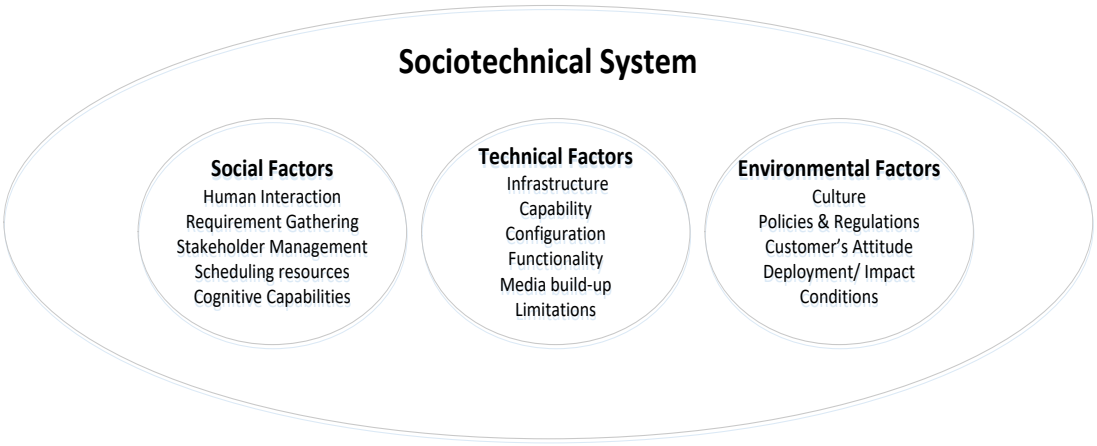

Figure 1. Graphical depiction of social, technical, and environmental factors involved in the service-provisioning life cycle.

In a sociotechnical system, an organization has two main areas: technological components and a social system. Human resources and technical subsystems co-optimize to accomplish the objectives successfully (Maguire, 2014). In the context of sociotechnical systems, a provisioning life cycle involves: (a) technological components, including network equipment, wire or wireless medium of communication, and associated hardware and (b) social elements composed of human resources, organizational culture, user attitude, and end. The technical and social systems correlate to transform work task inputs into products or services as outputs. Studying individuals'

attitudes and perceptions of cultural archetypes in adopting technologies is important (Parthasarathy, 2013). Therefore, conducting a sociotechnical analysis to identify the critical factors that influence the success or failure of service provisioning is also important.

Sociotechnical systems theory provides the foundation of comprehending technology-enabled organizational systems from the social and technical perspectives. The sociotechnical systems theory influences organization-wide technical implementations that support existing and new product or services and processes involved in the service-provisioning life cycle. I used the sociotechnical systems theory to evaluate the influence of technological implementations and user awareness, human behavior and resistance, organizational cultural and external influence, technological readiness and organizational objectives, and subscribers' attitude and acceptance.

Nature of the Study

I used a qualitative research methodology and employed a case study research design to explore the people, processes, and cultural and technological aspects of service provisioning in a telecom service provider environment. A qualitative approach was applicable to this study, as it was flexible, descriptive, and unconstrained (Yin, 2014). A qualitative methodology provided the framework of analyzing multiple sources of data, which supported the aspect of triangulation. Furthermore, exploring in depth the ways sociotechnical factors influence the success or failure of telecom service provisioning was important.

The complexity of understanding numerous sociotechnical variables associated with services provisioning led to my decision to use a qualitative rather than a quantitative mode of inquiry. A case study is the most suitable approach, as there are multiple variables of interest rather than specific data points (Yin, 2014). This study involved social elements, technical elements, and processes; hence, exploring the experiences and perspectives of people as they have witnessed the phenomenon was important. Yin (2014) posited that an exploratory case study is a preferred approach when investigating a phenomenon that influences a process. The study included a purposeful sampling strategy to recruit participants within the organization based on their experience and connection with the phenomenon. Participants were recruited from the following areas within the service provider organization: service-provisioning team, field engineering team, field technicians, backbone configuration team, network engineering team, order processing team, network operations center, quality assurance, and sales. The data collected using the interviews and organizational documents underwent analysis using thematic analysis.

Definitions

Autonomous system (AS): Hawkinson and Bates (1996) defined an autonomous system (AS) as "a set of routers under a single technical administration, using an interior gateway protocol and common metrics to route packets within the AS, and using an exterior gateway protocol to route packets to other ASes" (p. 3).

Churn: Churn refers to the likelihood of a subscriber shifting from one service provider to another (Gábor Benedek, 2014).

Cloud computing: Mell and Grace defined cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (p. 2).

Critical success factors: Boynton and Zmud (1984) defined critical success factors as "those few things that must go well to ensure success for a manager or an organization, and, therefore, they represent those managerial or enterprise areas, that must be given special and continual attention to bring about high performance" (Boynton & Zmud, 1984, p. 17).

Information communication and technologies (ICT): The umbrella term ICT "includes any communication device or application, encompassing radio, television, mobile phones, computers and network hardware and software, and satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning" (Kleine & Unwin, 2009, p. 1045).

Organizational alignment: Defined as "the fit between the business and IT strategic domains—intellectual alignment, the fit between business and IT infrastructures and processes—operational alignment or fit that transcends domains such that strategy is aligned with infrastructure—cross-domain alignment" (Gerow, Grover, Thatcher, & Roth, 2014, p. 1172).

Resiliency: The ability of a system to maintain acceptable levels service availability during faults or other technical failures (Moreno-Vozmediano, Montero, & Llorente, 2013).

Service-level Agreement (SLA): Aljoumah, Al-Mousawi, Ahmad, Al-Shammari, and Al-Jaddy (2015) defined an SLA as "an agreement that contains an explanation of the agreed service, parameters of the level of service, the guarantees regarding the quality of service, and arrangements for all cases of violations" (p. 9).

Sociotechnical: A sociotechnical approach involves recognizing the interrelation of human resources and technical subsystems, co-optimized to accomplish the objectives successfully (Maguire, 2014).

Sociotechnical systems theory (STS): West, Hirst, Richter, and Shipton (2004) noted, "Socio-technical systems theory provides a powerful framework for examining the effects of task design upon work group innovation" (p. 275).

Assumptions

Several assumptions surround the study. The first assumption was that my ability to discern the social and cultural influence on service provisioning depended on the honesty of the participants. The second assumption was that individual participants would be associated with the service-provisioning process and would have at least three years of experience. The third assumption was that the sample size would be sufficient for collecting and analyzing data. Fourth, to ensure the information provided by the participants was trustworthy and valid, participants would provide the information without any bias or fear of repercussion from their employer. The names of the

participants remained confidential to mitigate this risk. The final assumption was that this study would provide managers with vital information that will help them to improve the service-provisioning cycle and increase customer satisfaction.

Scope and Delimitations

The scope of the study was to explore the phenomenon by evaluating information and feedback from the technical implementation team, service-provisioning team, infrastructure team, decision makers, and the subscribers involved in the service-provisioning life cycle of a service provider organization in the State of Kuwait. The focus of the study was to evaluate the influence of social and technical elements involved in service provisioning, such as:

- Implementation of new products and services.
- Organizational strategy and management's attitude.
- Organizational processes to support the product and services.
- Infrastructure readiness.
- Employee awareness and competency.
- Installation and deployment procedures.
- Management and support systems.
- Subscriber's satisfaction.

The units of analysis for this study were four projects of large-scale installations evaluating success and failure factors in service provisioning. The information gained from these projects assisted in identifying critical success and failure factors associated with telecom service provisioning.

Limitations

I was the primary instrument in this exploratory case study and conducted the data collection and analysis. There were limitation on the number of participants directly related to the service-provisioning unit, as the organization under study is small. The study was limited to the ISP environment of Kuwait, as every country has a different culture, physical infrastructure, and user perceptions, and it may be difficult to transfer the findings, as certain attributes may not match the study criteria.

Significance

In this study, I addressed the gap in the literature of understanding the influence of social, technical, and environmental factors on service-provisioning life cycle in a service provider of Kuwait. Komunda and Osarenkhoe (2012) contended that failures in service provisioning lead to customer dissatisfaction, loss of revenue, increased costs, and customer defection. Furthermore, the case study illuminated critical success and failure factors associated with the service provisioning of telecom services. The provisioning life cycle involves site readiness, network equipment, tools, resources, culture, and end users. I focused on exploring the social, technological, and environmental factors influencing the provisioning of telecom services. The study contributed to the literature and provided telecom practitioners with a view of comprehending the relationship between social, technical, and environmental elements (Armenta, Serrano, Cabrera, & Conte, 2012) in reducing the service-provisioning errors and increasing the success rate in deploying subscriber services.

Reduced rates of failure and an increase in service-provisioning success can ensure business retention and customer satisfaction. Heikkinen and Jänti (2012) suggested integrating and streamlining people, processes, and technological factors to deliver end-to-end services successfully. The inability to manage complexity and risk in IT deployments contributes toward the inability to promote positive social change and sustainability (Mishra & Mishra, 2012). Identification of critical success and failure factors should assist telecom providers in potentially reducing their shortfalls and enhancing their service-provisioning life cycle. The results identified with this study may lead to an opportunity to develop a framework that incorporates the critical success factors and minimizes the impact of failure factors to standardize and improve the service-provisioning processes.

Summary

The background of the study depicted how business demands are challenging Internet and data service providers to adopt and implement new technologies. The rapid growth in service providers' product and services portfolio burdens the organizational leaders to implement, manage, and support the services during their life cycle. Failure to understand the sociotechnical factors associated with the telecom service-provisioning cycle led to an informed problem statement. The failures in service provisioning not only affect the end users but also influence customer retention and long-term survival of the service providers. Identifying the critical success and failure factors can enhance the user experience, address critical problems, increase the efficient use of resources, decrease implementation and support costs, and provide competitive advantages.

In this chapter, I presented the purpose and the significance of the study on the importance of understanding the influence of sociotechnical attributes as they influence the implementation of end-user services, subscribers, resources, and the service provider. The conceptual framework includes the sociotechnical systems theory to assist in evaluating the social and technical attributes associated with the service-provisioning life cycle in an ISP environment. The next chapter will include a detailed literature review that lays the foundation for the study.

Chapter 2: Literature Review

Introduction

Chapter 2 begins with a discussion of the history of the Internet and ICT. It includes detailed analysis of peer-reviewed literature related to sociotechnical systems theory, the evolution of the Internet, ISPs, the adaptation of ICT infrastructure and service, Kuwait's ICT readiness failures in telecom services, cultural influence, organizational alignment and processes, customer satisfaction and retention, and correlation and cross-functional communication. An evaluation of literature concerning the sociotechnical factors associated with network outages helped my understanding the impact of social and technical elements on service failures. I developed the theoretical framework using the literature relevant to sociotechnical systems theory, Internet, service providers, ICT, organizational culture, and social elements. The literature researched was from Business Source Complete; ABI/INFORM Complete, ScienceDirect, and ProQuest Dissertations and Theses Full-Text databases; Google Scholar; and the Google search engine.

Literature Search Strategy

To understand the influence of sociotechnical factor on service provisioning, I reviewed peer-reviewed journals, standards, reports, and conference proceedings related to service provisioning in a service provider environment. I searched the following keywords to ensure I included the relevant topic in the review process: *service provisioning, telecom failures, ICT, ICT failures, organizational processes, sociotechnical systems, network, network infrastructure, resiliency, availability, network*

outages, organizational culture, organizational alignment, cultural influence, cultural diversity, organizational performance, ISPs, Kuwait ICT, cross-functional communication, Internet access providers, services providers, and *cloud computing.* I also reviewed texts, literature, and applied practices by leading authors relevant to the conceptual framework of the study, sociotechnical systems theory.

Conceptual Framework

Sociotechnical Systems Theory

Researchers conceptualize technology-enabled organizations from social and technical perspectives using the framework of sociotechnical systems theory. In a sociotechnical system, participants are autonomous and linked with social dependencies, and the operational environment is volatile (Dalpiaz, Giorgini, & Mylopoulos, 2011). Researchers who support the sociotechnical systems theory recognize the existence of a relationship between humans and technology in the organizational environment, and researchers use sociotechnical systems theory to classify an organization as one of subsystems: a social system and a technical system.

Identifying critical success and failure factors requires a holistic approach to understanding the social, technological, and environmental elements of a service-provisioning system. According to sociotechnical systems theory, a relationship exists between people and technology (Klein, 2014). During the 1950s, social scientists and psychologists developed the foundation of sociotechnical systems theory, which was a term coined by researchers at the Tavistock Institute of Human Relations to influence the quality of technical change and the working environment (Read, Salmon, Lenné, &

Stanton, 2014). The sociotechnical systems theory has evolved into a rich body of theory and practice used in organizations worldwide. Read, Salmon, Lenné, and Stanton (2014) argue that a sociotechnical systems perspective can gain insight into organizational systems that can help develop an understanding of various external and internal influences on the systems.

A sociotechnical organizational system comprises technological components and a social system. A sociotechnical system is formed by integrating the human resources and technical systems to achieve the organizational objectives **(**Maguire, 2014). In the context of sociotechnical systems, a provisioning life cycle involves: (a) technological components, including network equipment, a wired or wireless medium of communication, and associated hardware and (b) social elements comprised of human resources, organizational culture, user attitude, and end. The technical and social systems are independent of each other, but they correlate to transform work task inputs into products or services as outputs. Studying individuals' attitudes and perceptions of cultural archetypes in adopting technologies is important (Parthasarathy, 2013). Therefore, conducting a sociotechnical analysis to identify the critical factors that influence the success or failure of service provisioning is also important.

The process of services provisioning involves understanding the requirements, scheduling the resources, procuring and installing equipment, configuring the network services, and validating service operations as per customer's expectations. Empirical studies reveal the importance of quality management in the service delivery process (Dao & Yang, 2014; Poku et al., 2014). However, the effects of sociotechnical factors on the

services provider's service-provisioning life cycle in Kuwait are not explicitly identified (Gelvanovska, Rogy, & Rossotto, 2014; Ragnedda & Muschert, 2013). It is essential to comprehend how technological advances, human nature, organizational culture, subscribers' attitude, and external factors affect service provisioning.

Sociotechnical systems theory enables practitioners to recognize the interaction between technology and people in a complex organization. The sociotechnical systems theory influences organization-wide technical implementations that support existing and new products or services and processes involved in the service-provisioning life cycle. The focus of the study involved evaluating the influence of technological implementations and user awareness, human behavior and resistance, organizational cultural and external control, technical readiness and organizational objectives, and subscribers' attitude and acceptance in a service-delivery life cycle**.**

Literature Review

Data communication networks have become the foundation of economies and the information age. Whether surfing the web for leisure or running businesses online, the Internet has become an integral part of life. Societies have become heavily dependent on the Internet, and its unavailability could have highly disruptive consequences that affect societies, economies, governments, and commerce (Tiropanis, Hall, Crowcroft, Contractor, & Tassiulas, 2015). Researchers are conducting extensive research on enhancing the privacy, openness, security, and sustainability of the Internet. The Internet is a successful catalyst for driving social and economic development around the world;

however, an inadequate ICT infrastructure is negatively affecting the growth of economic and social development in developing countries.

The literature on the diffusion of ICT and its effects in developing countries is growing. Many researchers have indicated that ICT has the potential to contribute toward improving the economies of developing countries (Cardona, Kretschmer, & Strobel, 2013; Gallego, Gutierrez, & Lee, 2014; Hanclova, Doucek, Fisher, & Vltavska, 2015). The adaptation of ICT has resulted in increased productivity, profitability, and efficient decision-making. Information and communications technologies have driven a myriad of innovations in the digital world and have changed the way people create, work, socialize, organize, and share the flow of information and knowledge. However, the achievements in the ICT domain cannot exclude the substantial role of the Internet, which provides the platform for connectivity, information processing, and execution. As a part of ICT adoption, Internet access and information availability have become primary business enablers for developed and developing countries.

The Internet, which is a fundamental driver of the knowledge economy, has played an important part in shifting the paradigm of societies from the industrial age to the information age. The Internet has affected all spheres of human life in both developed and developing countries (Gernsbacher, 2015; Meesuwan, 2016; Trossen, Sathiaseelan, & Ott, 2016). More than 30% of the world's population has access to the Internet, which contributes to the growth of the political, economic, and social life of societies (Curran, Fenton, & Freedman, 2012). Access to the Internet has become the primary economic enabler, as witnessed by the strong growth of Internet penetration in global economies.

Evolution of the Internet

The Internet has become one of the most important commodities in the information age and revolutionized information dissemination, collaboration, and communication. The evolution of the Internet involved many phases. From the early 1960s to the mid-1980s, scientists and engineers largely contributed to the development of the Internet, and the primary users of communication technology were individuals at universities and in the research community (Mowery & Simcoe, 2002). Campbell-Kelly and Garcia-Swartz (2013) provided an in-depth review of the main historical developments that led to the evolution of the Internet (see Table 1)

Table 1

An Internet Timeline

Year	General network developments	ARPA-related developments
(A) 1938-1969		
1938	Wells, World Brain	
1945	Bush, 'As We May Think'	
1958		ARPA established
1960		Licklider, Man Computer Symbiosis
1961	MIT Compatible Time-Sharing	
1962	SAGE system	Licklider Program Director at ARPA
	ERMA banking network	IPTO formed at ARPA
		Baran's packet-switching paper
1965	SABRE reservations system	ARPA network study
	MIT Project MAC	Davies' packet-switched network
	Commercial time-sharing	
	Remote processing systems	
	Online information systems	
1967		ARPA adopts packet-switching
1969		First ARPANET node at UCLA
(B) 1971-1995		
1971	Tymnet packet-switched network	
1972		
1973	First EDI network (railroads)	
1974	IBM announces SNA	TCP specified
1975	Telenet packet-switched network	
	X.25 defined by the CCITT	
1976	UPC in supermarkets	
1977	OSI project	
1978	First Bulletin Board System	TCP/IP specified
	MicroNET (CompuServe)	
1979	First videotex systems	
1983	AOL online service	Milnet separated from ARPANET
	MCI e-mail service	
1984	Prodigy online service	
1986		NSFNET established by the NSF
		X.400 protocol specified
1990	WWW functional at CERN	ARPA Internet subsumed into NSFNET
1991	Gopher live	
	WWW released by CERN	
	WAIS invented	
1993	MOSAIC browser	
1994	First Internet service provider	
1995	The Internet a private entity	The Internet a private entity

Note. Adapted from "The History of the Internet: The Missing Narratives," by M. Campbell-Kelly and D. D. Garcia-Swartz, *Journal of Information Technology, 28*(1), pp. 20. Copyright 2013 by Macmillan Publishers Ltd. Reprinted with permission.

In the 1950s, packet networking was developed in laboratories across the United States, United Kingdom, and France that resulted in the U.S. Department of Defense awarding the contract of developing the first packet network system. (Kim, 2005; Leiner et al., 2009; Ma et al., 2013). The Internet originated as an experimental program in late 1960 as a government-owned network called ARPANET that incorporated packet-switching network technology and evolved into multiple independent networks of autonomous systems (Leiner et al., 2009; Ma et al., 2013). Campbell-Kelly and Garcia-Swartz (2013) posited that during the 1970s, many standards emerged, and hundreds of large-scale networks came into existence as the technology was under development. The concepts of public and private information led to the classification of two types of networks. Private networks typically existed within an organization system, and users of public networks relied on the global interconnection of the network.

The Internet has now evolved into a public network of autonomous systems. The autonomous systems, owned by public and private service providers, interconnect to deliver various types of content and services to users (Ma et al., 2013). Internet access media and bandwidth have improved from the early dial-up connectivity over copper to current broadband access over fiber. Speed and bandwidth have increased dramatically since the emergence of the Internet, when the bandwidth was a few kilobits per second (Leiner, et al., 2009). Current technologies support a higher rate of data transfer that can reach above 1,000 megabits per second (Leiner et al., 2009; Oksman et al., 2016); however, the data transfer rates are restricted to the type of media used for data transmission such as copper, fiber, or wireless.

Internet Service Providers

Users initially used ARPANET for connecting defense-related data centers and universities. In 1968, leaders at the Advanced Research Projects Agency (ARPA) contracted with Bolt Beranek and Newman, Inc. to expand the ARPA network using their packet routers (Severance, 2014a). In 1972, Bolt Beranek and Newman, Inc. formed a subsidiary, Telenet Communications Corp., to commercialize the packet-switching technology and formed the first ISP (Mathison, Roberts, & Walker, 2012). Access to the Internet became more accessible as various ISPs emerged over time. A brief history of the early commercial data network services providers appears in Table 2.

Table 2

Commercial Data Network Service Providers in the 1970s and 1980s

Type of network	Company	Description
All-digital fast circuit switching network	Datran	1969 — Datran filed an application with the FCC for a $375 million all-digital circuit switched microwave network, with Datran-furnished local distribution facilities. The Datran network was partially deployed beginning in 1971. AT&T opposed Datran before the FCC, by introducing aggressively priced digital transmission services, and by supporting value-added packet carriers.
Domestic satellite systems	Satellite Systems	1975 — IBM acquired a controlling interest in the CML (Comsat-MCI-Lockheed) domestic satellite venture, and after FCC approval, created Satellite Business Systems, with Comsat and Aetna participation.
	Satellite Business Systems	In 1980 SBS launched an all-digital satellite system to provide private switched enterprise communication networks for integrated voice, data and image applications
Packet network carriers	Telenet Communications Corp.	1972 — Bolt Beranek and Newman, the company that built and operated the ARPANET packet switches, formed a separate subsidiary called Telenet Communications Corp. for the purpose of commercializing packet switching technology.
	AT&T Transaction Network Service (TNS)	1976 — AT&T introduced the Transaction Network Service in several cities. TNS was the first packet type service offered by AT&TTNS was offered in a few cities with limited success and was terminated shortly thereafter.
	AT&T Net 1000 Service	1982 — AT&T subsidiary American Bell announced the introduction of the Net 1000 service, which consisted of distributed processing centers linked together by the AT&T Long Lines X.25 Basic Packet Switching Service. The service failed to attract many customers and was terminated in 1984.
	Regional Bell Operating Companies (RBOCs)	After divestiture of the Bell Operating Companies from AT&T, the RBOCs deployed packet networks within their franchised local exchange areas. By the time the RBOCs had X.25 packet networks widely deployed, the industry moved away from X.25 packet network standards towards an open TCP/IP architecture. Eventually, the RBOCs became leading providers of Internet access services utilizing ADSL technology.

Note. Adapted from "The History of Telenet and the Commercialization of Packet Switching in the U.S.," by S. L. Mathison, L. G. Roberts, and P. M. Walker, *IEEE Communications Magazine, 50*(5), pp. 28.

In the 1980s, the National Science Foundation (NSF) established various national supercomputing centers at different universities. The NSF set the foundations of supercomputing centers to provide interconnectivity and expanded network access to research and educational organizations (Gottlieb, 2015). The NSF became an ISP and used the TCP/IP network for the research and defense organizations that became known as NSFNET. Commercial ISPs began to form in the late 1980s, as represented in Table 2. Severance (2014b) indicated that NSFNET decommissioned its backbone service in 1995, which removed all the restrictions and allowed the Internet to become a commercial service.

Internet service providers interconnect to provide access to global information. Internet service providers fit into three hierarchical tiers: Tier 1, Tier 2, and Tier 3 (Ma et al., 2013; Schwartz & Preoteasa, 2015). Tier 1 providers are large international organizations that have the ability to reach all regional and global networks. Tier 2 ISPs have access to networks in specific regions, but they pair with Tier 1 providers to reach the global networks. Tier 3 ISPs are small-scale national providers that interconnect with Tier 2 ISPs to gain access to the Internet.

Internet services providers are primarily responsible for providing access to the Internet. However, despite being a publicly available service, governments or privately owned organizations are the primary owners of the infrastructure used for providing access to the Internet within a country (Schwartz & Preoteasa, 2015). Access to the Internet was initially available using the copper infrastructure primarily used for the telephone network within a country (Haigh et al., 2015). However, copper-based Internet

access has many limitations, such as lower access speeds/bandwidths and disruptions of service because of copper deterioration. Many countries have upgraded their infrastructure to fiber optics to cope with the requirements for higher bandwidth and faster Internet access.

Internet services providers face consistent challenges to maintain the high levels of infrastructure availability for access to the Internet and other value-added services. Reliability (probability of a system failure within a time duration) and resiliency (ability of a system to maintain acceptable levels service availability during faults or other issues) of the network infrastructure affects the availability of services (Çetinkaya et al., 2015; Moreno-Vozmediano et al., 2013). Service providers must maintain a physical and logical layer of resiliency in their infrastructure to attain higher levels of availability. Maintaining higher levels of network availability warrants a continuous investment in enhancing and upgrading the network infrastructure, which has been a challenge for many service providers because of cost implications.

Adaptation of Information Communication and Technology

Internet service providers are primarily responsible for providing Internet access and data connectivity services to consumers. Khan et al. (2014) posited that providing access to the Internet is no longer profitable and requires service providers to roll out new and differentiated services. Internet service providers have added various services in their portfolio to meet the global demands of customers that include Internet access, data access, e-mail accounts, web hosting, cloud hosting and computing, and other value-added services (Chiou, 2004; X. Xu, 2012; Zissis & Lekkas, 2012). Telecom operators

are adopting a new strategy of incorporating ICT and various value-added services to gain new subscribers from competitors and to retain existing customers (Srinuan et al., 2014; Zaballos, 2013). The convergence of various services deployed over a shared network infrastructure has increased business management and service support complexities.

To stay competitive, ISPs are investing in ICT infrastructure as a service to subscribers. The overarching benefits of virtualization and cloud-based computing have resulted in a paradigm shift for service providers who are adopting a model of incorporating services based on virtualized ICT as part of their products and services (Aruna & Aramudhan, 2016; Jain & Paul, 2013). Service providers' ICT portfolios encompass services such as virtual servers, cloud storage and backup, videoconferencing bridges, hosted IP telephony, virtual firewall and security, and other virtualization services for corporate and retail customers.

The unprecedented growth in the field of ICT has triggered a paradigm shift for ISPs to invest in ICT infrastructure and package it as a service to their subscribers bundled with Internet access and data connectivity. Cardona et al. (2013) indicated that ICT is the driving force that has become the economic enabler to provide the foundation for sustained economic growth and competitiveness. Researchers of empirical studies have demonstrated that ICT adaptation has led to improvements in decision-making and in productivity of organizational systems (Bertschek & Kaiser, 2001; Holt & Jamison, 2009; Kretschmer, 2012). Information and communications technology is becoming a prominent driving force of productivity for organizations globally.

Investments in the field of IT have grown considerably with the availability of cloud computing and virtualization services. Subscribers who use cloud computing empowered by virtualization technologies can acquire storage, security, computational power, and business applications as services over the Internet from service providers (Zissis & Lekkas, 2012). Service providers offer three models of cloud services: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS; Hashem et al., 2015; Li & Li, 2013; Noor, Sheng, Ngu, & Dustdar, 2014). The IaaS model provides primary computing resources (e.g., processing power, storage, and networks) as a service to allow subscribers to run their applications and services. The focus of the PaaS model is on providing developers with a platform to develop, test, and deploy applications (e.g., Google App Engine, Microsoft Azure Services, and Force.com platform). The SaaS model provides preinstalled software and applications to subscribers that support their day-to-day business needs (e.g., Google Apps, Dropbox, and others).

Cloud computing has become a business enabler for organizations, as it directly contributes toward reducing the cost of infrastructure investments (X. Xu, 2012). Marston et al. (2011) contended that organizations could use cloud computing and virtualization services to decrease the investment in IT infrastructure, increase return on investment, enhance green computing capabilities, and maintain a sustainable environment. The high implementation rate of cloud-computing technologies has shifted the paradigm of traditional management practices by challenging decisions makers to manage geographically diverse resources efficiently (Ryan, 2013). To ensure customer

satisfaction and retention, service providers should meet the demands of service availability, wider bandwidth spectrum, and reliability.

Several researchers have analyzed the challenges of cloud computing throughout the literature. Armbrust et al. (2010) ranked the critical obstacles to the growth of cloud computing and highlighted the corresponding research and development initiatives. Greenberg, Hamilton, Maltz, and Patel (2008) identified various design challenges and significant research opportunities in the cloud computing industry. There are major research and development projects carried out in the area of cloud computing; however, cloud service providers face many technological challenges to implement and maintain the services as the access to the services is dependent on the existing infrastructure of the service provider.

Kuwait's ICT Readiness

In the past few years, the Gulf countries have witnessed a drastic growth in the telecom sector. The Kuwait telecom industry has matured with advanced technologies and high penetration rates; however, Kuwait's penetration rate is the lowest among all the Gulf countries, which indicates potential for further growth in this sector (Abbas & Hamdy, 2015). According to Dutta and Osorio (2012),

> Kuwait, in the 62nd position, is the laggard in the region regarding embracing ICT. Despite a fairly good ICT-related infrastructure development, the high costs of accessing it and the population's relatively low level of skills are affecting the ICT readiness of the country. As a result, Kuwait depicts fairly poor rates of ICT usage (67th) that, coupled with a less business friendly environment for

> entrepreneurship (56th) than other Gulf Cooperation Council states, result in low levels of ICT impacts (93rd). (p. 23)

The Kuwait telecom sector been open to competition since 1991, and Zajil Telecom was the first Internet and data service provider in the country. Following Zajil Telecom, three other providers, Qualitynet, Gulfnet, and Fast Telecommunication, received licenses to provide Internet and data connectivity services in the State of Kuwait. Internet subscription is reaching a point of saturation, with an approximate Internet penetration of 86.9% users of the total population of Kuwait (Central Intelligence Agency, 2013), which creates competitive demand for a reliable and robust Internet and value-added services to target new subscribers as well as ensure a higher level of service quality to retain existing customers.

Despite the growth in the ICT market of Kuwait, numerous challenges continue to exist within the telecom sector that the government is gradually addressing. The primary issue is that there is no telecom regulatory authority to control and strategize the growth of the telecom sector (Hakim & Neaime, 2014). The Ministry of Communication owns the country's cable infrastructure, which creates a challenge for ISPs to provide a reliable Internet access and value-added services. Lack of regulatory bodies has limited the growth of the telecom infrastructure, specifically the fixed-line Internet access technologies.

Telecom service providers in Kuwait are struggling to meet the demands of providing services to multinational organizations and other subscribers to compete in the global market. A study conducted by Garg (2010) highlighted that lack of understanding

the impact of sociotechnical factors has resulted in the failure of adapting new technologies and services. Garg (2010) noted that organizations have put excessive emphasis on information technology but ignored the most important factor that technology adaptation should be people-centric. It is important to understand the impact of the social and technological aspects while implementing new products and services in the service provider environment. Grag (2010) reported that STS elements should be considered by organizations while adapting or improving technology. The advent of new technologies and services leads to a challenge of implementation for service providers, and failure would lead to customer dissatisfaction.

Failures in Telecom Services

Communications and information availability play a vital role in the information age, as they increase critical dependency on the communication infrastructure. However, network infrastructure and Internet services face numerous challenges, such as infrastructure failures, attacks, natural disasters, and other technical failures (Çetinkaya, Broyles, Dandekar, Srinivasan, & Sterbenz, 2013; Doerr & Kuipers, 2014). Hardware failure, power outages, and cable failures are some of the most commonly observed failures in a network infrastructure (Doerr & Kuipers, 2014). It is crucial to determine the challenges of maintaining a highly available network infrastructure to optimize and improve the experience for end users. Retail and corporate users' expectations have increased regarding network dependability and performance to support their personal and business requirements.

Global demands for low-latency network and service availability have burdened the service providers in establishing and maintaining a resilient and highly available network infrastructure. The primary factor that affects service availability is the reliability of the network infrastructure and the wide-area connections (Potharaju & Jain, 2013). The reliability of a network is a critical factor, as failures can cause loss of data and revenue. For instance, Dropbox services had two major outages that prevented users from accessing the site and synchronizing files (H. Xu & Bhalerao, 2015). In 2011, Amazon services failed due to a faulty failover that affected many popular services such as Foursquare, Instagram, Dropbox, and Reddit (Potharaju & Jain, 2013). Loss of connectivity and network outages can significantly affect businesses that depend on communication infrastructure.

Internet outages have been an area of concern for business owners and service providers. Researchers have identified various factors such as natural disasters, security threats, network attacks, and unreliable infrastructure that can compromise network reachability (Bush, Maennel, Roughan, & Uhlig, 2009; Hong, Ju, & Hong, 2012; Katz-Bassett et al., 2012). Service providers must understand the behavior of the network when it encounters a failure. Recognition of network-related disruptions and identification of their cause are crucial for effectively planning and optimizing network topology and upgrades.

Organizational leaders have started to incorporate business continuity and disaster recovery plans to recover from network and system outages. Researchers have emphasized detecting and localizing network outages (Glatz & Dimitropoulos, 2012;

Guo, Chen, & Huang, 2015; Katz-Bassett et al., 2012). Service providers are consistently optimizing their network to reduce single points of failure. However, many areas remain a challenge, such as physical path diversity, a single path for cable entry on the premises, and dependency on the on-site cable system.

Network outages have affected many businesses, and it is important that service providers incorporate a strategy of providing a resilient and robust network infrastructure. Many studies highlight the importance of network resiliency and survivability (Jaiswal, Sen, & Verma, 2014; Newell, Obenshain, Tantillo, Nita-Rotaru, & Amir, 2015; Shirazi, Diaz, & Wright, 2015). Humans build network infrastructures, and they are not completely resilient due to cost constraints or design flaws, which can lead to single points of failure or to decreased tolerance levels of network anomalies. Therefore, it is necessary to understand critical failure factors and their effect on the network to ensure acceptable services are available to customers.

The network infrastructure design of service providers needs to include the factors of reliability, security, diversity, and resiliency to ensure high tolerance for network failures and outages. Networks with homogeneous nodes are at a higher risk of failure, as a failure in a single node can compromise network availability (Newell, Obenshain, Tantillo, Nita-Rotaru, & Amir, 2013). A resilient network should be able to overcome and endure the presence of the unreliable and compromised component to reduce the impact of network outages (Erdene-Ochir, Kountouris, Minier, & Valois, 2012). However, due to cost constraints, it is practically impossible to have a fully resilient network.

Service providers need to build resiliency in the network architecture that can operate within an acceptable level of operations when it encounters various issues. Researchers have emphasized the importance of incorporating network resiliency to reduce the impact of network outages and cost of failure (Çetinkaya et al., 2015; Smith et al., 2011; Rohrer, Jabbar, & Sterbenz, 2013). Internet service providers need to meet the demands of high network availability by improving their network infrastructure and increasing resiliency. Service providers must improve their level of services to the customers by identifying critical failure factors and enhancing their designs to increase fault tolerance.

Service providers' telecom infrastructure requires enhancement to support the delivery of various value-added services. Service providers want to sell different services to gain a competitive edge and increase their subscriber base (Üner et al., 2015). Configurations, complexity, and disruptions are significant challenges for service providers (Benson, Akella, & Shaikh, 2011). The demands to move ahead of the competition increase pressure on implementing new services and burden the resources and the system to provide, maintain, and support the services, thereby reducing quality in service deployments and increasing the rate of service failures.

Cultural Influence

Kuwait is a multicultural society with more than 70% of the skilled workforce comprised of expatriates. Cultural diversity is a major factor that can profoundly impact performance and employee well-being in an organizational system; therefore, it is important to understand cultural influence and actively manage aspects of diversity for a

healthier work environment (Chien, Wu, & Hsu, 2014; Fitzsimmons, 2015; Jansen, Otten, & Zee, 2015; Podsiadlowski, Gröschke, Kogler, Springer, & Zee, 2013). Individuals from diverse backgrounds may provide an alternative perspective to solve problems and accomplish tasks, which can help to enhance a workplace environment. However, existing social inequalities and perceived differences require a strategic approach to manage cultural diversity and use the phenomenon to increase productivity.

Leaders have helped their organizations take varied approaches to cultural diversity, ranging from no action to creating a fully developed strategic plan that integrates into the organizational systems. Researchers have highlighted the benefits of cultural diversity and the importance of organizational environments supporting it (Guimond, Sablonnière, & Nugier, 2014; Meeussen, Otten, & Phalet, 2014; Podsiadlowski et al., 2013). Managers must understand and strategize the importance of cultural diversity for the benefit of their organization. However, changes and new implementations in an organization can result in resistance from the staff and require intervention for a successful completion.

Culture plays an important role in ICT adaptation. Researchers have agreed that the culture of users toward ICT adaptation influences their attitude (Azam & Quaddus, 2013; Kaba & Osei-Bryson, 2013; Shah, Gao, & Mittal, 2015). There has been substantial growth in the adaptation of ICT globally, especially in developing countries. Organizational leaders must understand cultural diversity factors and strategize about their implementation to ensure a positive attitude and success in implementing the ICT infrastructure.

The business demands of maintaining a robust and resilient network infrastructure have led IT managers to develop a policy of continuous improvement of their ICT architecture with innovations and enhancements in technology. However, technology-enabled changes in an organizational system are prone to resistance from users (Ali, Zhou, Miller, & Ieromonachou, 2016; Hon, Bloom, & Crant, 2014; Klaus, Blanton, & Wingreen, 2015; Rafferty, Jimmieson, & Armenakis, 2013). One factor of resistance can be the result of an established organizational culture. It is crucial to identify the influence of organization culture on an IT implementation to reduce user resistance and increase technology acceptance among users.

Supporters of sociotechnical systems theory recommend optimizing and assimilating both technology and users for an efficient technological implementation in an organizational culture. Organizational culture refers to an attitude, value, or common belief shared within a team or group resulting from preexisting behaviors and task execution norms (Lukas, Whitwell, & Heide, 2013; Meissonier, Houzé, & Bessière, 2013; Momeni, Amir, & Saadat, 2012). Social attitude, language barriers, and the skills and education of the staff influence organizational culture. Strategic alignment of culture with staff behavior and objectives can influence product capabilities and acceptance.

Cloud based products have failed in various situations, as the service provider did not calibrate them to the customer's needs. Organizational culture can influence the capabilities of a product and result in the underprovisioning or overprovisioning of features (Lukas et al., 2013). It is crucial to understand the criticality of cultural factors as they affect the business environments (Shah et al., 2015). Management should enable an

environment of transition to support a paradigm shift that will favor technology-enabled change within an organization.

In a service provider environment, understanding the organizational work culture is paramount, as people tend to react differently when they encounter change. Managers focus on building an organizational culture that is capable of responding to the competitive market requirements (Hon et al., 2014; Rafferty et al., 2013). Dynamic market demands and complexity necessitate that organizational leaders rapidly adopt changes to survive. Managers strive to increase employee creativity as they adapt to the challenges of a rapidly changing environment.

Cultural friction warrants managerial recognition of effective philosophies to design and implement IT systems in an organization successfully. Adaptation of new technology requires a signification amount change from employees, which includes the continual redefinition and adjustment of activities; however, most people find it difficult to accept change at this level (Battilana & Casciaro, 2013; Hon et al., 2014; Ijaz, 2013). Individuals typically want to maintain their routine habits and therefore resist any change to the status quo. Overcoming the detrimental effects of employee resistance requires an environment influenced by leadership styles, positive attitude, employee buy-in, and an organizational culture that promotes creativity.

Organizational systems are built upon the knowledge held by individuals, but individual knowledge is not sufficient to create a competitive advantage and requires a collective level of efforts and collaboration from individuals to support organizational objectives. The attitude of employees, their wiliness, their level of commitment, and the

organizational culture are central to achieving a knowledge-centric organization (Swart, Kinnie, Rossenberg, & Yalabik, 2014; Tong, Tak, & Wong, 2015). Knowledge sharing in a service provider environment is crucial, and the expertise of individuals can assist in identifying challenges, addressing issues, and contributing toward a successful deployment. However, managers must create an environment that promotes individuals' creativity and supports cross-functional knowledge sharing to meet the goals of the organization.

Knowledge sharing plays a vital part in organizational cultural management. Organizational culture influences knowledge sharing and employee creativity (Mueller, 2014; Tong et al., 2015; Zhang, Pablos, & Xu, 2014). Knowledge sharing refers to the activities involved in distributing knowledge among members of an organization, where individuals exchange their explicit and tacit knowledge and help to create new knowledge. Organizational leaders should promote an environment that supports knowledge sharing and reduces user resistance to become more productive and successful in providing services.

User resistance has become an area of primary concern in ICT-related projects. Many researchers have focused on understanding user resistance and its impact on business and productivity (Ali et al., 2016; Klaus et al., 2015; Ritbumroong, Tanlamai, & Santivejkul, 2014; Vrhovec, 2016). It is vital to understand the underlying cause of user resistance in an IT implementation, as it has become a critical factor in the failure of many IT-related projects. Effectively understanding user attitude and identifying factors that can trigger user resistance in ICT adaptation are crucial for managers to address

challenges by aligning environmental factors and organizational processes and to support the implementation.

Organizational Alignment and Environmental Inputs and Outputs

In a service provider environment, competitive advantage is in a state of constant flux, which requires organizational leaders to innovate ways to improve their existence without falling apart. The technological advancements drive the service providers to change their business models and processes to adopt and enhance organizational performance (Cram, Brohman, Chan, & Gallupe, 2016; Hiekkanen, Helenius, Korhonen, & Patricio, 2013; Woitsch & Utz, 2015). Organizational leaders must adapt to the strategy-shaping role of IT and review the context of contemporary policy and aspects of strategizing. Management must incorporate technological advancements into the organizational strategy to ensure a competitive edge in the market.

Implementing new technology necessitates a change in an organization and requires the alignment of people, processes, and technologies to become efficient and productive. The importance of organizational alignment such as policies, processes, strategies, rules, and procedures with external and internal environmental factors has received extensive consideration in the literature (Hiekkanen, Pekkala, & Collin, 2015; Rieley, 2014; Self, Self, Matuszek, & Schraeder, 2015; Wagner, Beimborn, & Weitzel, 2014). Organizational leaders view the alignment of technology, business, and employees as a desirable factor for optimizing performance and productivity. Organizational leaders should understand the importance of aligning technological factors with employee

creativity to boost organizational performance (Herndon, 1997). Herndon (1997) also noted,

> The design and use of technology reflect existing values that are now, at the end of the twentieth century, in a period of transition. From the Sociotechnical Systems (STS) perspective, technology is designed to enhance or augment human skills, rather than merely to replicate them. As a result, human needs, skills, and decisions are fore-grounded, with technology serving as a resource or support. This results in significant demands both on people as users and on the technology itself. Individuals must be adequately prepared and trained, both in technology use and in decision-making. Additionally, the technology employed must be flexible and adaptable, allowing maximum creativity. (p. 124)

Organizational alignment has affected the performance of organizations. Organizational leaders who understand the importance of strategic alignment can achieve competitive advantage by leveraging ICT adaptation innovatively and optimizing the cost of IT (Gerow et al., 2014; Hiekkanen et al., 2015; Wiengarten, Humphreys, Cao, & McHugh, 2013). Alignment of IT and business is important to ensure IT infrastructure can support the operations and drive organizational performance effectively. However, organizational alignment requires a fit between IT strategies, business plans, and organizational goals.

The importance of social IT and business alignment has been a focus of many researchers, as it directly links with the performance of an organization. Researchers have indicated the importance of social linkage in IT and business and highlighted the

alignment of common language, shared understanding, communication quality, and shared knowledge as critical factors for organizational performance (Gerow et al., 2014; Luftman, Lyytinen, & Zvi, 2015; Wiengarten et al., 2013). Managers need to align business objectives and IT resources to support the organizational system. However, it is important to create an environment and processes that will have the ability to adapt to changes with the adaptation of new technologies and improvement.

Information technology systems are constantly evolving, and new technologies emerge. An effective approach to continuous improvement that aligns social and IT measures is to have an environment based on dynamic adaptation to improve organizational performance. The aspects of the dynamic organizational environment that can align the constantly changing IT environment with business goals and organizational processes have gained more attention (Hiekkanen et al., 2013; Hylton, 2013; Luftman et al., 2015; Nissen, 2014). In a service provider environment, technological breakthroughs, discontinuities, and new regulations are frequent (Hiekkanen et al., 2013). Service providers must incorporate new technologies and enhance their infrastructure rapidly due to complexity, the uncertainty of change in the environment, and market competition.

Services provider environments experience service implementation failures as they fail to align business models with dynamic changes in the IT systems. Researchers have emphasized the importance of comprehending and aligning three critical factors to support organizational systems: (a) adequate infrastructure, (b) employee skill set, and (c) IT budget (Alshardan, Goodwin, & Rampersad, 2015; Ohlsson, Han, Hultin, & Rosengren, 2016; Tarutė & Gatautis, 2014). Organizational readiness and environmental

factors are significant determinants of success in technological adaptation. However, the environment, both external and internal factors, plays a vital role in influencing the strategic alignment of the business model and IT.

The strategic importance of an IT implementation and improvement initiative in an organization requires a strategic alignment of organizational processes and effective decision-making. Strategic alignment of IT systems and organizational processes can improve decision-making, generate competitive advantage, and capitalize on new opportunities (Balocco, Ciappini, & Rangone, 2013; Loukis, Janssen, Dawes, & Zheng, 2015; Montenegro & Flores, 2015). Information and communication technologies governance has drawn attention over effectively aligning business models and IT systems (Balocco et al., 2013), and ICT management focuses on decision-making and aligning organizational processes to benefit from IT investments.

There is a paradigm shift in the service provider industry toward incorporating new technologies to meet the competitive demands of the market. Service providers' environment necessitates a structural change as an enabler of transforming the business model that will support the organizational strategy (Khanagha, Volberda, & Oshri, 2014; Lavikka, Smeds, & Jaatinen, 2015; Rekik, Boukadi, & Abdallah, 2015). Organizational leaders understand the importance of reevaluating their business models through an in-depth analysis of their resources, processes, IT investments, and customer value propositions. However, effective decision-making requires adequate information, which necessitates efficient cross-functional communication to reevaluate the organizational structure and processes to support the IT investments.

Cross-functional Communication

It is becoming critical for organizational leaders to integrate their functions and assimilate the information required to drive innovative performance and productivity. Empirical evidence has revealed that as resources and skills become distributed across the organization, it is imperative to integrate information by effectively managing cross-functional communication (Darawong, 2015; Strese, Meuer, Flatten, & Brettel, 2016; Tsai & Hsu, 2014). Cross-functional communication within a service provider environment occurs between team members of different functional units who have particular areas of expertise and knowledge that need integrating to provide and deliver services to customers. It is important to communicate with other functional units to apply knowledge and information that will assist in successful deployments.

Services providers must design a process that should incorporate cross-functional communication to benefit from information and expertise across the organization effectively. Cross-functional communication improves organizational productivity, increases performance, reduces conflicts, and drives team performance (Darawong, 2015). Cross-functional communication is dependent on the degree of cooperation between the team members of functional units; however, organizational politics, negative attitude, and an unhealthy environment can result in information gaps and negatively affect productivity and efficient service delivery. Service delivery failures can occur due to inadequate information and integration with other functional units that may result in unsuccessful service provisioning, cost overrun, and customer dissatisfaction.

In large-scale deployment where leaders of organizations such as airlines, banks, and others contract service providers to connect their global offices together, it becomes crucial to manage cross-functional communication, as there are significant dependencies among local and worldwide teams and business units that have to work together in delivering business critical projects constrained by time and money. Researchers have studied project deployment failures across decades and have contended that lack of coordination and cross-functional communication has been one of the critical failure factors (Anthony, Green, & McComb, 2014; Santos, Uitdewilligen, & Passos, 2015). Damian, Helms, Kwan, Marczak, and Koelewijn (2013) posited that sociotechnical alignment can facilitate cross-functional communication and coordination with team members of various functions based on task dependencies. Cross-functional communication and coordination are antecedent to effective decision-making, as it requires integration and transparency of information.

Cross-functional collaboration requires alignment of functional units and understanding interdependencies to achieve organizational objectives. Inadequate communication and coordination breakdown can result in the failure of integration and can affect task execution (Damian et al., 2013; Strese et al., 2016; Zimmermann & Cardinal, 2015). In an ultracompetitive environment, quick responses and information availability become critical factors to gain a competitive edge in the service provider industry. The increasing intensity of competitiveness requires a strategy to ensure effective organization-wide communication and cooperation based on objectives.

Cross-functional integration and openness to knowledge are prone to internal resistance and conflicts from resources. Various factors such as internal competition, flexibility and commitment of resources, function dependency, and interaction inevitably create conflicts, which requires either a competitive or a cooperative approach in addressing the conflicts (Clercq, Thongpapanl, & Dimov, 2013; Gounaris, Chatzipanagiotou, Boukis, & Perks, 2016; Opute, 2014). Clercq et al. (2013) noted the importance of conflict management approaches to reduce resistance and increase productivity in cross-functional communication. Transparency of information and availability of adequate information can reduce internal resistance and conflict between cross-functional teams, but this requires an organization-wide mechanism to support knowledge sharing and to promote the concepts of a learning organization.

The interdependency and interaction of various organizational functions are crucial in a service provider environment, where each unit plays a vital role in coordinating and executing the tasks required to complete and deliver a project. The importance of cross-functional knowledge sharing and its influence on productivity has received attention from many researchers (Frankel & Diane, 2015; Lin, Wang, & Kung, 2015; Swink & Schoenherr, 2014). However, service provider organizations that are evolving and improving constantly need a dynamic process that can assimilate efficiently the information required from various functions to provide and maintain services for customers. The service provider environment lacks a framework of communication that can integrate the dynamic nature of the business and evolve technologies that are continually upgraded to remain competitive.

Risk Assessment and Decision-making

Information and computer technology adaptation and technology upgrades require a thorough understanding of organizational risk involving both technical and business models in a sociotechnical system. Risk assessment is a complicated exercise in a complex sociotechnical environment comprised of IT infrastructure, organizational processes, and human factors (Madria & Sen, 2015; Nidd, Ivanova, Probst, & Tanner, 2015; Oliveira, Thomas, & Espadanal, 2014). Risk analysis is an essential component of identifying curtailing factors that may influence organizational performance in a technology adaptation or upgrade project. The dynamic capabilities of the service provider environment need a thorough assessment of risks to reduce technological failure, improve the efficacy of internal processes, and support the business strategy to increase organizational performance.

Understanding, assessing, and mitigating risk is vital in a service provider environment. Researchers of empirical studies have suggested that service-provisioning failures in a service provider environment are prone to various risks such as infrastructure failure, media access issues, inadequate skill set, organizational process misalignment, and configuration challenges (Brender & Markov, 2013; Chołda et al., 2013; Prasad & Green, 2015). Service providers' primary concern is to create a risk-aware environment that will mitigate connectivity restoration issues, increase fault tolerance, reduce downtimes, and optimize network services. Adequate risk management practices can reduce service-provisioning errors and increase productivity.

Service providers are contractually committed to maintaining service levels as defined in their SLAs, which increases the liability of the providers. The dependability of the SLA through a technical lens may not suffice, as the services depend on the human factors, infrastructure, and environmental influences (Anya, Ludwig, Mohamed, & Tata, 2016; Casalicchio & Silvestri, 2013; Chołda, et al., 2013). However, an effective approach will be to use sociotechnical risk assessment that can supplement a deterministic judgment of analyzing social and technical risk factors. The purpose of a detailed sociotechnical risk assessment is to interpret the observations and illuminate the challenges for effective decision-making.

Effective decision-making in a services provisioning cycle requires a holistic understanding of customer requirements and associated risks that need aligning with internal and external factors for successful service implementation. Researchers emphasize the criticality of detecting organizational weaknesses to avert detrimental technological failures (Ergu, Kou, Shi, & Shi, 2014; Izaddoost & Heydari, 2014; Tipper, 2013). Tipper (2013) contended that typical events of concern include hardware malfunction, power outage, cable cuts, natural disasters, human errors, and accidents. As dependency on connectivity has increased, risk avoidance and prevention techniques can assist in improving system reliability and reduce fault occurrence.

Service provider survivability techniques fit into three categories: (a) network design, (b) prevention, and (c) restoration. In a network design consideration, effects of system failures need mitigating, whereas the focus of prevention is on improving system tolerance and fault reduction; similarly, the focus of restoration procedures is toward

reducing the impact of system failures and restoring services using the contingency (Chołda et al., 2013; Doerr & Kuipers, 2014; Tipper, 2013). Tripper (2013) posited that ISPs can achieve service continuity by designing a robust network infrastructure that is inherently self-healing and fault tolerant. However, a robust infrastructure design requires a detailed risk assessment of the sociotechnical factors associated with the services to provide.

Risk assessment that involves taking the sociotechnical aspect into consideration can help provide multilevel analysis by recognizing the causal relationships among various constructs of an organization. Empirical evidence indicates that the integration of organizational factors and technical factors in a risk modeling system can help in the decision-making process of a high-risk organization (Abraha & Liyanage, 2014; Nidd et al., 2015; Potryasaev, Sokolov, Yusupov, & Merkuryev, 2013; Sokolov, Yusupov, & Ivanov, 2015). The effectiveness of managerial decision-making depends on the consistency and the degree of certainty in the information available. Decision-making in the context of management and technology adaptation consists of goal setting, governance, planning, control, coordination, and monitoring functions aligned with organizational objectives and supported by adequate risk assessment and mitigation strategy.

In the context of service provisioning, services implementation fits into two categories, (a) projects and (b) business-as-usual, where the project is a mid- to large-scale deployment of customized services, and smaller installations such as residential Internet access setup fall under business as usual. Project management practices are

necessary for project-based implementation; however, conducting a detailed project management approach for business-as-usual activity is not a recommendation (Gladden, 2015; Project Management Institute, 2013; Ramazani & Jergeas, 2015). As business-as-usual activities do not follow project management practices, lacking adequate risk management practices may result in the unsuccessful provisioning of services and cost implications. A strategic approach would be to incorporate the relevant project management practices that managers should customize to support business-as-usual activities without increasing time and cost constraints.

Risk management practices are significant for telecom providers as they strive for resiliency and high availability for their services. Service provider infrastructure encompasses complex architectures such as the cable and wireless infrastructure, core network equipment and systems, and technical expertise, which is in a state of continuous evolution and requires effective risk management practices to increase success and reduce failure in the service-provisioning phase (Vriezekolk, Etalle, & Wieringa, 2015). Telecom operators are reliant on third-party providers and government bodies that may own the cabling infrastructure and associated components, which increases the lack of discernibility on their issues and challenges. An effective risk assessment methodology requires a quantitative analysis of internal and external factors that can influence the services provisioning cycle; however, insufficient information and lack of visibility will be subject to qualitative decision-making and expert judgment to execute the tasks, which may face unknown challenges. A balance of risk tolerance and decision-making is important for managers to provide services and ensure customer satisfaction.

Customer Satisfaction and Retention

Customer satisfaction and retention have been the core challenge of the service provider industry, where service degradation and other issues have caused customers to switch. Researchers have identified some of the major factors that have led customers to switch services providers: high prices, competition, ethical problems, inconvenience, service quality degradation, and core services failure (Ahmad, Hussain, & Rajput, 2015; Liang, Ma, & Qi, 2013; Thaichon, Lobo, Prentice, & Quach, 2014). Liang et al. (2013) posited that core network failure is one of the most prominent reasons for customer switching. Customer switching can greatly affect the service provider brand and threaten their long-term survival.

Internet services providers do no operate their business on the Internet, but they are the providers of the platform and infrastructure that give the e-commerce industry and end-users accessibility to the Internet. The e-commerce industry and business and home users have become heavily dependent on service providers, which requires considerable effort on the part of the providers to maintain a robust network and services infrastructure; failure can result in loss of services and negatively affect the provider–customer relationship (Miranda, Rubio, & Chamorro, 2014; Quach, Jebarajakirthy, & Thaichon, 2016; Thaichon & Quach, 2015). The burden of maintaining high levels of services availability requires continuous network improvement and cost investment by the service providers. However, the high cost of IT investments has become a curtailing factor for the service provider, which requires a strategic balance between service quality and acceptable infrastructure limitations to serve the needs of the customer.

The domain of customer satisfaction, loyalty, and retention has gained a lot of attention as the competitiveness of the market is increasing. The literature on consumer behavior indicates a complex association between the service providers and customers in which customer retention is directly related to profitability, quality, satisfaction and loyalty (Dahiya & Bhatia, 2015; Eskafi, Hosseini, & Yazd, 2013; Jahromi, Stakhovych, & Ewing, 2014; Miranda et al., 2014). However, the concept of customer loyalty is dependent on service quality, customer service, user attitude, and cost of the service provider. It is crucial to know that customer loyalty is the primary determinant of success for the service provider industry.

Attracting new customers to the service provider industry has become increasingly competitive, which has led to a managerial focus on customer retention and customer satisfaction initiatives. There has been a paradigm shift in the service provider industry toward a focus on new strategies to retain customers to influence the long-term profitability and survival of service providers by increasing customer satisfaction and adding value (Kumar, Sharma, Shah, & Rajan, 2013; Nasir, Mushtaq, & Rizwan, 2014; Prasad & Mishra, 2014). A sustainable environment may not be achievable, as many external factors influence the services of providers, such as external cable infrastructure, equipment dependency, skill set, and price competition. An emphasis on increased quality of service, communication, and value addition can strengthen the relationship between customers and service providers.

Service providers strive to maintain a high rate of customer satisfaction; however, technological failure, service representatives' attitude, and response time to resolve issues

have become the primary factor for driving customer satisfaction. Customer satisfaction is reliant on the actual performance of the services rather than customer expectations, and empirical evidence indicates that a positive influence by means of exceptional service, value addition, and service providers' mediating role can lead to improved customer satisfaction (Poku et al., 2014; Prasad & Mishra, 2014; Sengupta, Balaji, & Krishnan, 2015). Service providers must focus on strategizing the area of customer satisfaction by improving their infrastructure, educating call center staff, and maintaining a level of communication according to the expectations of the customers. It is important to meet customer expectations by decreasing the information gap and mediating in the case of disasters.

Service provisioning is prone to failure; hence, identifying customer expectations and ensuring the plans devised will provide transparency of actions and periodic communication that will give the desired level of comfort to the customer and assist in maintaining a healthy professional relationship are important. Several researchers have noted the importance of assurance, empathy, and positivity on customer satisfaction and its positive influence on retention (Akroush, Dawood, & Affara, 2015; Olatokun & Ojo, 2014; Poku et al., 2014). Telecom service failure can have a major impact on e-commerce and organizational functions that are dependent on connectivity; however, many failures are the result of external factors such as cut cables or hardware failures. Service providers must create an environment that will foster empathy, assure the customer of the steps taken for the restoration, and improve service quality to reduce future failures.

Service quality is an antecedent to customer satisfaction, as the basis of customer experience and perception is the outcome of the services provided by the provider. Researchers have highlighted the availability of services, security, simplicity, and reliability as the criteria of service quality (Blut, Beatty, Evanschitzky, & Brock, 2014; Chen & Yang, 2015; Moghaddam, Lemieux, & Cheriet, 2016). It is important to understand the perceptions of customers on the service quality of the provider, as it becomes the primary determinant of customer satisfaction. Services providers must comprehend the perceptions of customers and their expectation of the services to develop a strong bond of customer loyalty and secure the long-term survival of service providers.

Customer loyalty requires a strategy that goes beyond the boundaries of customer satisfaction, creates a relationship based on commitment, and ensures immunity for service providers against the pressure of the competitive market. The increased dependency on technology, value-added services, and customer involvement in the service-provisioning process have fostered the prominence of customer loyalty in the service provider industry (Alok & Srivastava, 2013; Lee, Verma, & Roth, 2015; Schuster, Drennan, & Lings, 2015). Customer loyalty not only ensures the renewal of services but also increases the potential of a sustainable competitive edge for service providers by providing positive publicity and long-lasting commitment. Customer loyalty open doors to new products and services that can increase organizational profitability, improve tolerance toward failures, and reduce resistance to price increases, thereby increasing customer dependency on services and reinforcing retention.

In the era of aggressive competition, reducing fallibilities, and strengthening the bond of enduring loyalty with customers can serve as the primary means of sustainable growth and profitability for service providers. Researchers of empirical studies have indicated that a systematic and well-assisted approach to developing a customer loyalty program can benefit the existence and profitability of an organization (Gupta & Sahu, 2015; Kumar et al., 2013; Schumann, Wünderlich, & Evanschitzky, 2014). Hence, there is a pressing need to explore factors that can increase customer loyalty in the telecom sector to ensure the sustained growth of service providers. The dynamics responsible for realizing customer loyalty, customer satisfaction, and customer retention have become more palpable in the service provider environment.

Gap in Literature

The review of the current literature revealed that the factors affecting service-provisioning failures in a service provider environment span various domains, such as technology, organization, process, people, culture, and the environment. Researchers have focused on the individual domains of an organizational system but have not explored the interaction of social, technical, cultural, and environmental factors on the success of a complex ISP's environment, specifically in the State of Kuwait. Many researchers have highlighted individual areas of failure in the telecom service-provisioning process; however, there is a clear lack of research on the holistic influence of sociotechnical factors on telecom services provisioning. The dynamicity of the service provider environment necessitates a thorough understanding of key components and integration to remain competitive. Furthermore, no researchers have conducted studies on

the ISP environment in Kuwait, where the service-provisioning approach of the Western world may not be successful due to the lack of empirical studies on infrastructural limitations, multicultural influences, environmental effects, customer attitudes, and technical factors.

Managers may fail to comprehend the importance of organization integration and cross-functional communication and the role of culture in an organization driven by multicultural value, which has led to a gap in information exchange and failures in service provisioning. Technology is constantly evolving and requires improvements in the service provider environment to meet the demands of business. The lack of holistic exploration and research on the interdependencies and integration of organizational culture, adequate skills, risk management approach, and technological limitations is a major area of concern that can influence the effectiveness of service provisioning. Furthermore, the lack of information on the interdependencies of people, processes, and technologies in a highly dynamic environment has become an area of concern in effectively understanding the critical success and failure factors that can influence the service-provisioning life cycle.

Summary and Conclusion

A review of the literature revealed the need to evaluate the sociotechnical factors that influence the telecom service-provisioning life cycle. The review of literature indicated that service delivery failures can occur due to inadequate information and integration with other functional units that may result in unsuccessful service provisioning, cost overruns, and customer dissatisfaction. Decision makers require a clear

understanding of organizational, cultural, and technical factors that are responsible for efficient service provisioning and customer satisfaction. The literature review revealed a lack of research about the telecom sector in Kuwait, which necessitates an evaluation of the current methodology and the influence of both internal and external factors in an ISP environment.

Such research may be useful in comprehending the critical success and failure factors in a highly dynamic and complex service provider environment. The literature review indicated that constant technological evolution and market demands warrant frequent IT investments; however, managers must find a balance between IT investments and the limitations of internal and external factors for effective decision-making. The literature review showed existing social inequalities, and perceived differences require a strategic approach to managing cultural diversity and use the phenomenon to increase productivity. It was important to evaluate the sociotechnical factors that influence the service-provisioning process to identify the critical success and failure factors that managers can use in effective decision-making and problem solving.

Chapter 3: Research Method

Introduction

The objective of this qualitative research was to conduct an exploratory case study to evaluate the sociotechnical factors associated with telecom service provisioning. Services provisioning is a complex process and requires considerable integration and understanding of various internal and external inputs to deliver services to customers, whereas failures in service provisioning lead to customer dissatisfaction, loss of revenue, increased costs, and customer defection (Komunda & Osarenkhoe, 2012). The large number of service-provisioning failures necessitated a study that involved holistically evaluating the influence of sociotechnical factors and identifying critical success factors that will help managers understand and increase the rate of success in telecom services provisioning. This study took place at an ISP in Kuwait, to facilitate the exploration of various internal and external factors that influence the service-provisioning life cycle.

Chapter 3 includes the research design and rationale for the study. Topics in this chapter include my role as the researcher, research methodology, participant selection logic, instrumentation, data collection procedure, and data collection plan. This chapter also includes specific information concerning the issues of trustworthiness, i.e. credibility, transferability, dependability, and confirmability. Finally, the chapter includes a discussion on various ethical considerations such as Institutional Review Board (IRB) approval and privacy protection, treatment of participants, treatment of data, and data disposal procedure. The purpose of this chapter is to summarize the foundation of the

study and highlight the appropriateness of the selected methodology pertaining to the study.

Research Design and Rationale

Various research methodologies can be used to conduct studies. The quantitative methodology includes a framework of numerically analyzing data collected using questionnaires, surveys, or scientific experiments to answer hypothesis (Yoshikawa, Weisner, Kalil, & Way, 2013). Researchers select the qualitative methodology to become the instrument of data collection who compiles the data from various sources such as observations, in-depth interviews, documents, and archives that are descriptive (Lewis, 2015). Choosing the appropriate research method depends on the nature of the problem, personal experience, audience, and the issue addressed.

A quantitative methodology was not suitable for this study because the data collection instrument would be rigid and standardized and therefore could not account for the diverse experience and perspectives of the people with undetermined categories. Furthermore, a quantitative study required the identification of variables to compute the statistical data and generate results. A quantitative methodology was not suitable in this study because of the diversity of information and the exploratory nature of the study in which defining the variables, identifying causality, and having control was not conceivable (Yin, 2014). Answering the research questions involved understanding a wealth of information and a diversity of perspectives from participants that I could not have attained using a quantitative design.

I used a qualitative research methodology and employed a case study research design to explore the people, processes, and cultural and technological aspects of service provisioning in a telecom service provider environment. Yin (2014) highlighted that a qualitative approach is flexible, descriptive, and unconstrained. A qualitative methodology can help achieve an understanding of a particular situation, individual, group, or a culture. Furthermore, exploring in depth the ways sociotechnical factors influenced the success or failure of telecom service provisioning was important. Patton (2015) highlighted five modes of qualitative inquiry that are popular in the social sciences: narrative, phenomenology, ethnography, grounded theory, and case study.

Researchers use narrative strategy to highlight stories told by individuals, such as biographies, whereas a phenomenological study involves interpreting a phenomenon based on the lived experiences of individuals. Ethnography is a research strategy that includes an ethnic group as its focus. Researchers use grounded theory to discover or generate theory developed by interactions or processes through interrelating categories of information based on the data collected from individuals (Patton, 2015). Yin (2013) contended that a case study is an in-depth investigation strategy with a focus on examining an event, activity, program, process, individuals, or groups. In a case study, researchers collect descriptive data from various sources.

The complexity of understanding numerous sociotechnical variables associated with services provisioning led to my decision to use a qualitative rather than a quantitative mode of inquiry. A case study approach was the most suitable approach, as

there were multiple variables of interest, which allowed an in-depth exploration of the phenomenon (Yin, 2014).

This study involved examining social and technical factors; hence, a case study approach allowed me to observe the individual and group behaviors, work processes, and environmental factors as they influence the services provisioning process. Yin (2014) posited that an exploratory case study is the preferred approach when investigating a phenomenon that influences a process. Furthermore, an exploratory case study is the platform to discover new, not yet documented, knowledge (Yin, 2014).

Researchers conducting the exploratory case study design can gain an in-depth, real-life, and comprehensive understanding of a phenomenon. The case study design was also compatible with the sociotechnical systems theory, which assisted in providing adequate bounds to the case study (Yin, 2014). Together, the sociotechnical systems theory and the exploratory case study design served as an appropriate strategy to answer the following research questions:

The central research questions are as follows:

CRQ1. How do managers ensure successful deployment of subscriber services in the telecom sector in Kuwait?

CRQ2. How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment?

The sub-research questions are as follows:

SRQ1. What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment?

SRQ2. What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service-provisioning errors?

SRQ3. What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services?

Role of the Researcher

In my role as an independent researcher, I observed and encouraged participants to provide comprehensive, honest, and open feedback. As a practitioner, I possessed extensive understanding of the organizational structure, internal processes, technological innovations, and infrastructural roadmap of the telecom industry in Kuwait, and I worked with technical and engineering teams, provisioning and project management teams, and management. Patton (2015) contended that the voice, perspective, and reflexivity of the researcher are vital for a study. As a self-aware network manager in the telecom industry, I had a basic understanding of the social, political, cultural, technological, and environmental perspectives of the industry. Although I did not have power or authority over the participants, I was aware of the prevailing challenges in the telecom industry of Kuwait. My approach was to become the facilitator in conducting open-ended interviews and solicit accurate data for analysis.

As an employee of the organization under study, I oversaw the presales of network and value-added services. I was responsible for improving technology and adding new services to the portfolio, which provides me with exposure to various functional units involved in the product development life cycle from inception to completion. I was involved in developing organizational policies to support the internal

processes and implementation of the services. I also oversaw and directed projects and deployments classified as strategic to the organizational objectives. I acknowledged and inherently believed that service provisioning plays a vital role in developing and maintaining the image of the organization in the consumer's market. Thus, a potential bias was that increasing the effectiveness of the service-provisioning practices could leverage the telecom brand and promote a sustainable business model.

Despite having prior knowledge and background, I bracketed my bias and excluded it from the study. Davidsen (2013) stated that researchers must isolate any preconceived ideas or notions and must ensure the study involves facts and evidence. Patton (2002) contended that it is important to address the reflexivity of the researcher to strengthen the credibility of the research. While potential bias may be a limitation, the strength lay in my experience and knowledge of the organization, which had helped in gaining access to data needed for this study. To mitigate potential bias and ensure the accuracy of the data collection process, I crosschecked, triangulated, and member-checked the data, a process that is elaborated further in the coming sections.

As the instrument of this study, I brought a pragmatic yet conservative view to the people, processes, and technological aspects of telecom service delivery. It was important to make effective decisions regarding who would be participating to avoid conflicts and reduce bias. A systematic process was appropriate for collecting data from participants within various functions, which helped in triangulating data and minimizing researcher bias. The identities of the participants remained confidential to avoid any conflicts or bias in the responses.

Methodology

The objective of this study was to determine the sociotechnical influence on service delivery in a telecom organization; thus, I built this study on the concepts of sociotechnical systems theory. Considering the uniqueness in ordering, planning, executing, and delivering service, the focus of this qualitative exploratory case study was on evaluating four projects of services delivered to customers. Yin (2014) posited that examining multiple projects would enhance the reliability and validity of the study. I purposefully selected these projects based on a set of pre-established selection criteria. It was crucial to select an appropriate methodology that would provide a framework, which would be valid, rigorous, transferable, and replicable (Elo et al., 2014). There were three primary sources of data collection: semistructured interviews, project activity logs, and a follow-up questionnaire. The data collection and analysis of multiple sources of data provided depth in triangulation.

Participant Selection Logic

The key element of any study is selecting an appropriate sample and setting from the main population. Robinson (2014) contended that it is important to establish the bounds of a study by developing a sampling strategy and determining the sampling size to provide depth. The study included a purposeful sampling strategy to recruit participants within the organization based on their experience and connection with the phenomenon. Multiple data sources underwent evaluation to ensure in-depth analysis, triangulation, and accuracy of the data collected.

Purposeful sampling is an approach used in qualitative research to select and identify information-rich participants. A purposeful sampling strategy was suitable to recruit the sample from the population for the purpose of this study. Purposeful sampling methodology allows researchers to collect data from sources that have direct experience with the phenomenon of interest (Palinkas et al., 2015). Purposeful sampling may have a limitation in representing statistical significance; however, it has been advantageous for qualitative studies (Robinson, 2014; Trafimow, 2014). The primary consideration of purposeful sampling was to explore and obtain depth of information from the phenomenon under study.

The target population for the study was from the following functional areas within in the service provider organization: service-provisioning team, field engineering team, field technicians, backbone configuration team, network engineering team, order processing team, network operations center, quality assurance, and the customers. Table 3 includes the descriptions of various interconnected organizational functions that form the service-provisioning life cycle. The relevance of each function to the service delivery process and the purposeful sampling criteria appears in Table 4.

Table 3

Organizational Functions

Functional area	Description of the function
Service provisioning	Service-provisioning unit is responsible for the delivery and provisioning of the services requested by the customers
Field technicians	The role of the field technicians is to establish the cabling infrastructure that is required for implementing the services, which is required for delivering the services
Field engineering	Field engineers are responsible for installing and configuring the hardware at the customer site that is required for the services to be operational
Backbone engineering	The role of the Backbone Engineering team is to configure the necessary objects and equipment in service provider's backbone and infrastructure to extend the network connectivity and services.
Network engineering	Network engineering team comprises of senior network engineers, who are responsible for installing, managing, improving and supporting the service provider's complete infrastructure and services
Network operations center	The network operations center is the first line of defense for the service provider, which provides the 1st and 2nd level of support by raising trouble tickets, recording events, and troubleshooting service related issues for the customer.
Quality assurance	The quality assurance team is responsible for ensuring the pre-established levels of quality in installing and maintaining the services.
Sales	Sales team is primary point of contact between the service provider and the customer. They are not only responsible for selling the services but also ensure customer satisfaction of continual support and interaction

Table 4

Purposeful Sample Selection Criteria

Functional area	Relevance to the study
Service provisioning	Service-provisioning unit is responsible for planning, and executing the implementation of services. Their experience formed the foundation of the study
Field technicians	The on-ground knowledge and experience of the field technicians can help in understanding the external factors and challenges that influence the services provisioning
Field engineering	The experiences of the field engineer can help the study in identifying the influence of customer's expectation, hardware challenges, and other technological factors.
Backbone engineering	Backbone engineers knowledge of the technological factors and infrastructural limitations can assist the study
Network engineering	The knowledge of core technologies, services, and limitation that run on the service provider platform can assist in gaining insight on technological influence in provisioning services for customers.
Network operations center	Experiences of the network operations center personnel can help in understanding the customer expectation and common challenges of services offered.
Quality assurance	Understanding the expectation and standards of service delivery is crucial for the study.
Sales	Sales team can provide an insight of the market conditions, customer expectation, and brand loyalty.

The sample was recruited from one ISP organization of Kuwait and the sample size of the participants was 19; I was able to successfully recruit all 19 participants for the study; however, one participant had to travel out of country on a work assignment and was therefore, excluded. The breakdown of the sample selected from various functional areas appears in Table 5. Finding participants who had firsthand knowledge of the service-provisioning life cycle was critical for the success of the study. Therefore, I selected participants from all the functional areas that were either part of or responsible for the service delivery life cycle.

Table 5

Participant Selection per Functional Area

Functional area and designation	*n*
Service provisioning	
Service-provisioning managers	3
Field technicians	
Supervisor	1
Field technicians	2
Field engineering	
Field engineers	3
Backbone engineering	
Backbone engineers	2
Network engineering	
Senior network manager	1
Senior network engineers	2
Network operations center	
Manager	1
Quality assurance	
Manager	1
Sales	
Sales manager	1
Sales executives	2
Total	19

The sample size of qualitative research was dependent on the following factors: purpose of the study, credibility, reliability, availability of resources, and time constraints. Robinson (2014) noted that the sample size can be large or small, but it should be representative of the population and allow generalization of the study based on the findings. Furthermore, it was crucial to ensure the saturation of data based on the sample size, which allowed the researcher to have sufficient depth in data analysis and reporting. Dworkin (2012) indicated that saturation occurs when no new ideas or themes can emerge from the information collected.

Instrumentation

As the researcher is the primary instrument for a qualitative study, I had conducted all the semistructured interviews. Doody and Noonan (2013) noted that semistructured interviews involve a two-way and focused communication between the researcher and the participant. Researchers conducting semistructured interviews develop a set of questions that help direct the communication on the phenomenon under study. An interview guide ensured that a systematic protocol was in place to direct the interview sessions. The interview guide included the introduction, purpose, confidentiality details, consent, data collection process, and interview questions to assist in maintaining consistency in the interview sessions and managed the line of questioning. I created a follow-up questionnaire from the collected data that validate the identified critical success and failure factors that influence the services provisioning life cycle.

A combination of tools and documents served as the sources of data for the study. Yin (2014) posited that researchers increases the validity and reliability of a study by using multiple sources of data for the purpose of triangulation. To supplement the interviews, I reviewed and analyzed project activity logs, which included the entire project related activities and events to support the study. The organizational documents assisted in providing information related to the service delivery life cycle that included initiation request, planning and scheduling, resource allocation, issues and challenges, and customer expectations. The researcher-designed instrument included an interview guide, observation sheet, and an audio-recording device that facilitated the data collection process, in addition to the organizational documents and archival records.

Procedures for Recruitment, Participation, and Data Collection

The purpose of the case study was to evaluate the influence of sociotechnical factors on services provisioning by exploring the experience of various organizational staff members who were part of the service-provisioning life cycle. As highlighted in Table 5, the number of participants for the study was 19. Robinson (2014) posited that the selected sample size should be adequate to support generalization and must be representative of the population. The opportunity to utilize multiple sources of data leveraged the strength of the case study. Yin (2014) theorized that some of the most common sources of data in case study research include interviews, direct observations, archival records, physical artifacts, and documents.

Recruitment. The initial step before soliciting participants was to receive the signed letter of cooperation from the organization, which became the foundation of recruiting the participants for the study. Based on the purposeful sampling criteria highlighted in Tables 4 and 5, I contacted the participants directly by e-mail and making a phone call to share the details of the study and the importance of their experience to evaluate the service-provisioning life cycle. After gaining approval from the participants, I contacted their functional managers to obtain their approval on the selected subjects and recruited them to be part of the study. Upon receiving acceptance from the participants, they received a consent form that they signed to document their participation in the study**.**

Participation. Participants received a copy of the interview guide that included an introduction, purpose, confidentiality details, consent, data collection process, and interview questions. I conducted face-to-face interviews with the participants that took

between 15 and 30 minutes. Face-to-face interviews allowed the observer to evaluate nonverbal messages that can conform to the trustworthiness of the information (Yin, 2014). A semistructured interview approach was suitable to maintain focus on the topic of interest, and participants were able to express their views. I conducted all the interviews, which assisted in maintaining consistency and validity. The identified sample received an e-mail with the invitation to participate along with the signed letter of cooperation from the organization. I scheduled the interviews with individuals who showed interest in the study based on their availability. The interview guide ensured that I followed the protocols and assisted in maintaining the context of the study.

Data collection. A voice recorder application on a mobile and an observation sheet were the tools used to collect the interview data. Furthermore, I collected organizational documents such as project plans, incident reports, organizational processes, and archival records from various functional units. I transcribed the interviews into Microsoft Word documents and to increase the credibility, reduce errors, enhance accuracy, and maintain higher levels of quality, I reviewed the recordings and verify them twice. I forwarded the transcribed interviews to the participants for the member checking process. Participants received a follow-up questionnaire after the data analysis phase that included a consolidation of the critical success and failure factors identified. The questionnaire included a rating approach so the participants rated the identified factors according to their level of importance or impact on the service-provisioning process. This questionnaire assisted in presenting the perceived critical success and

failure factors suitable for evaluating the organizational strategy and process to increase the effectiveness of service provisioning.

Data Analysis Plan

Data analysis in qualitative research is an iterative process during which researchers can refine the data as they collect more information. The iteration process assisted in sorting the data and identifying patterns and factors in each interview. The data collected using the interviews and organizational documents underwent analysis using thematic analysis.

Thematic analysis was suitable for identifying patterns emerging from the collected data. Thematic analysis is an approach used to identify, analyze, and report the patterns that emerge from within the data (Vaismoradi, Turunen, & Bondas, 2013) and involves identifying common threads that span across a set of interviews. The thematic analysis process assisted in classifying key data from the interview transcripts and project workflow logs. This approach helped in generalizing the findings.

Data analysis involved using QSR's NVivo software. NVivo improves the ease of organizing and coding data, identifying patterns, creating themes, and presenting clear and concise information (AlYahmady & Abri, 2013). Coding data, creating themes, and clustering information involve various factors. After I entered the information in NVivo, the software inductively interpreted the data based on the data's consistency in words, repetitive phrases, and inferences. I identified critical factors by organizing, merging, and creating categories based on their influence on success or failure of the service-provisioning life cycle. The next step was to present these factors in a follow-up

questionnaire that the participants ranked according to their perceived importance and impact on the service-provisioning life cycle.

Issues of Trustworthiness

Ensuring trustworthiness, specifically the criteria to ensure validity, reliability, and generalizability, is crucial for a study to gain acceptance into the pantheon of knowledge and receive recognition as being appropriate for use. Lincoln and Guba (1985) presented various criteria and techniques that can help in establishing issues of trustworthiness (see Table 6). Researchers can improve the trustworthiness of a study by ensuring the degree to which the findings of a study resulted from the data captured from various sources and do not represent other views, biases, and motivations. Maintaining control and following the proposed procedure helped to ensure the trustworthiness of the study. I took the necessary steps to scrutinize the data for credibility, transferability, dependability, and confirmability.

Table 6

Lincoln and Guba's (1985) Criteria and Techniques of Establishing Trustworthiness

Criteria	Techniques	Page Number
Credibility	Prolonged engagement	(p.301)
	Persistent observation	(p.304)
	Triangulation	(p.305)
	Negative case analysis	(p.309)
	Peer debriefing	(p.308)
	Member check	(p.314)
	Referential adequacy	(p.313)
	Reflexive journal	(p.327)
Transferability	Thick description	(p.316)
	Reflexive journal	(p.327)
Dependability	Audit (examining the process of inquiry)	(p.317)
	Overlap method (i.e., triangulation of methods)	(p.317)
	Reflexive journal	(p.327)
Confirmability	Auditing and attesting findings and interpretations supported by data	(p.318)
	Reflexive journal	(p.327)

Credibility

Credibility is one of the most important factors in ensuring the trustworthiness of a study. Yin (2014) indicated the importance of incorporating adequate operational measures in a study to maintain credibility. It is important to strengthen the internal validity of a case study by eliminating alternate explanations and identifying false relationships (Yin, 2014). Cope (2014) theorized that a researcher's ability to authenticate research and recount the experiences accurately could increase the credibility of the study. The commitment to build rapport with the participants of a study and collect precise data for analysis strengthened the credibility of the study (Cope, 2014; Yin, 2014). Additionally, Yin (2014) contended that minimizing history or maturation helped to increase the credibility of the case study. I used crosschecking, member checking, triangulation, and data saturation to increase the credibility of the study.

Triangulation. Triangulation is a qualitative research strategy that can help in reinforcing the validity and creativity of a study. Triangulation is a process of developing a comprehensive understanding of a phenomenon by using multiple sources of data in a qualitative study (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Researchers use triangulation to overcome the challenges of evaluating a single source of data and driving inconclusive results. Limiting data collection to a single source of data may decrease the credibility of a study. In this study, I analyzed data encompassing interviews, organizational documents, and questionnaires. The data from multiple projects and organizational documents assisted in evaluating and validating the findings across the data sources. The similarity of findings between the data from multiple

projects for the same question attested to the validity and confirmability of the findings, which further strengthened the results of the study.

Data saturation. Data saturation is crucial in a qualitative research. Failure to reach data saturation can hamper the quality and content validity of research (Elo et al., 2014). Emerging themes and data repetition helped in the validation of data saturation and guided the study in avoiding premature conclusiveness. To achieve data saturation, it was important to collect both quality and quantity of data to ensure the richness and adequacy of information. In this study, I selected participants from various functional areas who had exposure to different aspects of service provisioning and interview data collected from the diverse group of participants helped in achieving data saturation on common factors that influences the service-provisioning life cycle.

Member checking. Member checking is a process of participants verifying the transcriptions from their interviews. Houghton, Casey, Shaw, and Murphy (2013) contended that the process of member checking requires the participants to verify, correct, or obtain additional information from the transcript of interviews conducted by a researcher. Member checking involves participants reviewing and assessing any errors or challenges that they might perceive as a wrong interpretation of the information they provided. Furthermore, member checking provides an opportunity for participants to add information that reviewing the data might stimulate.

In this study, I forwarded a copy of the transcript to every participant to ensure I accurately captured and interpreted the information from the interview. The goal of member checking was to eliminate and mitigate any misinterpretation and ensured the

accuracy of the information captured (Houghton et al., 2013). The member-checking process allowed an assessment of data in terms of adequacy and confirmed the recorded data are correct. Member checking also assisted in increasing the credibility of the study.

Transferability

Transferability is a process of internal validity focused on the importance of transferring findings beyond the bounds of a study. Researchers highlighted transferability as an important part of research to ensure researchers can duplicate thick descriptions and results of a study in comparable settings and circumstances (Cope, 2014; Elo et al., 2014; Houghton et al., 2013). Researchers must take adequate measures and provide sufficient details to ensure the findings can foster future research within a similar environment. Transferability indicates that the findings of a study can be applicable to comparable settings. The proposed study included a single case study approach that leveraged in duplicating the findings using data from multiple projects to other service provider organizations.

Transferability was critical for this study, as the findings would be beneficial to the service providers of Kuwait and the surrounding region. Transferability was possible in this case study, as the focus was on the service-provisioning life cycle of a service provider in Kuwait. Unlike other countries, the environment and setting of ISPs in Kuwait are similar with regard to technology, organizational culture, and external factors. Furthermore, researchers in the neighboring region may also duplicate the findings of the study, with slight adjustments, as few external and organizational factors vary across the Arab world.

Dependability

Dependability is a process of ensuring the stability and consistency of an inquiry methodology used over time. I established the dependability of the study by incorporating the process of triangulation and documenting every phase of the study. Elo et al. (2014) posited that researchers should provide evidence to support the methodology and findings of a study. Ensuring the stability of findings over conditions and over time for meeting the criteria of dependability is crucial. Dependability of the study improved by adhering to the processes of member checking, documenting decisions and processes throughout the study, and reviewing the process with the participants.

The dependability of a qualitative study relied on the importance of carefully conceptualizing the study, collecting data, interpreting the findings, and reporting the results. Furthermore, categorizing and coding all relevant data to achieve data saturation strengthened dependability of the study (Elo et al., 2014). It was important to ensure data saturation, as incomplete data would have been a curtailing factor for linking and coding information. The dependability of a study depends on the researcher's ability to comprehend the constantly changing and socially built reality that needs capturing in a study. Using multiple projects in the study enhanced the stability of the study, as repetitive observation and data helped in achieving saturation and triangulation.

Confirmability

Confirmability refers to the quality of the findings produced by the study in context of how well the participants and events that are independent of the researcher support it. Empirical evidence suggests that researchers can achieve confirmability of a

study by managing the errors of interpretation and the bias of the researcher (Cope, 2014; Yin, 2014). An important aspect of confirmability is researchers' ability to bracket their bias and influence on the study, which can improve by confirming the findings of the study with the participants. Confirmability warrants that researchers comprehend the meaning of the information collected from various sources of data.

To support the aspect of confirmability, the study included a process of reflexivity. Reflexivity is the "active acknowledgement by the researcher that her/his own actions and decisions will inevitably impact upon the meaning and context of the experience under investigation" (Horsburgh, 2003, p. 309). Monitoring the credibility of findings by accounting for researchers' beliefs, knowledge, value, and biases is important. Reflexivity is the process of researchers' detachment and involvement in a study as a means to enhance the ethics and rigor of the study (Berger, 2013). The position of a researcher could have affected the participants; therefore, it was crucial to bracket the knowledge and experience of the researcher to avoid potential bias in the study. Reflexivity involved providing a transparent and detailed report of the judgments and their rationales during the study.

Ethical Procedures

IRB approval and privacy protection. In preparation, this study entailed few ethical considerations that aligned with Walden University's IRB to safeguard the participation of human subjects: "The Institutional Review Board (IRB) is responsible for ensuring that all Walden University research complies with the university's ethical standards as well as U.S. federal regulations" (Walden University, 2016, para.1). Before

the data collection process began, the interview guide, instruments, consent form draft, and organizational agreement drafts received IRB approval. Walden University's IRB approval number for this study is 2-12-16-0287269. To ensure privacy standards, minimizing risks by ensuring the protection of participants' rights and workplace is important. The study took place in accordance with the guidelines established with Walden University's IRB.

Treatment of participants. All participants were working adults over the age of 21; the study did not involve treatment of human participants. All the participants received assurance from the onset of the study that they had the right to withdraw at any stage without any implications. I conducted the study in my workplace, but to eliminate any conflict of interest, I informed the participants that the interview, observation of documents, and the process of data analysis would proceed such that all the information provided by the participants would remain private, confidential, and secure. I conducted the interviews within my organizations; therefore, I followed the IRB guidelines to safeguard against unethical behavior. I did not gather or provide sensitive information to protect against potential conflicts of interest; I informed participants that there would be no promises, coercion, compensation, or incentives; and participation was voluntary.

After receiving approval from the organization involved in the study, I e-mailed a copy of the informed consent (see Appendix B) to the participants. Participants received a written consent that included a description of the study, criteria of the study, purpose of the study, acknowledgment that participation is voluntary, description of confidentiality, and my details. To ensure the privacy and confidentiality, I did not use participants'

personal information outside of this study. I assigned all the participants a unique identifier that I used to refer to them within the study to mitigate the risk of privacy and establish confidentiality. Safeguarding the personal information of the participants improved the validity of the research data. All the data captured was password protected and are securely stored in a private cloud.

Treatment of data. Data collection procedures involved seeking approval from Walden University's IRB before the study commenced to ensure I addressed all ethical concerns. I primarily collected data using interviews, organizational documents in electronic format, and observation notes, and I had maintained the data in a secure cloud-based encrypted folder that is not accessible to the public. I avoided collecting hard copies of documents; however, I scanned and uploaded the hard copies of the consent forms and follow-up questionnaire to a secure online storage. All hard copies or paper documents would remain in a secure cabinet locked and managed only by me. To ensure privacy and confidentially of participants in the study, I had assigned a code to each participant, I had only referred to the participants using these codes, and had not disclosed participants' names or contact information.

Disposal of data. I would maintain the original interviews, transcripts, organizational documents, and other artifacts for at least five years in case a need arises to trace the result from the analysis. After completion of the study, physical documents were shredded and only scanned softcopies of the documents were stored and retained for five years in a secure online cloud storage. I had consolidated all the data in a compressed file format encrypted using 256-bit Advanced Encryption Standard and secured with a

strong password that was more than nine characters long and included a combination of capital letters, lowercase letters, numbers, and special characters for added security. The data is in a private online cloud-based storage facility that is accessible only by me and the storage is password protected.

Summary

Chapter 3 included a discussion of the research design, methodology, and rationale for choosing an exploratory case study design. The objective of the study was to evaluate the influence of sociotechnical factors or service provisioning. My goal was to identify critical success and failure factors from the findings of the study, which may assist managers in the telecom industry to improve their service delivery process. This chapter included the measures that I took to validate the issues of trustworthiness of the research data. This chapter also included the steps chosen to recruit participants, the data collection process, and the data analysis plan. Furthermore, I incorporated the importance of ethics and the ethical procedure in the study design to protect the participants and data, in accordance with IRB guidelines.

Chapter 4 includes a detailed account of the study that elaborates on the procedure of recruiting participants, the instrumentation used for conducting the semistructured interview, the details of how the interviews took place, and the description of collecting data from other sources. I presented a discussion on the process of member checking, bracketing biases and personal knowledge, and reporting researcher's hermeneutics. I included the details of the data analysis steps using QSR's NVivo. Chapter 4 also include the findings of the study.

Chapter 4: Analysis and Results

This chapter includes a comprehensive analysis of the data collection and results of this study. The purpose of this exploratory case study was to evaluate the sociotechnical factors associated with telecom service provisioning in the telecom sector of Kuwait. The specific problem addressed in this study was exploring the sociotechnical factors and their influence on service provisioning, as well as the critical success and failure factors that can help in improving the service-provisioning life cycle. The results of this study answsered following the research questions.

The central research questions were as follows:

CRQ1. How do managers ensure the successful deployment of subscriber services in the telecom sector in Kuwait?

CRQ2. How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment?

The sub-research questions were as follows:

SRQ1. What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment?

SRQ2. What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service-provisioning errors?

SRQ3. What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services?

This chapter includes a detailed description of data collection and analysis, participant selection and recruitment, and the evidence of trustworthiness. The chapter

includes results of the data analysis that align with the research questions. The chapter also includes the summary of thematized social, technical, and environmental factors organized into categories.

Research Setting

The research setting for the study was an ISP organization in the State of Kuwait. The ISP was one of the four service providers that provide the Internet, data connectivity, and other value-added services. The scope of the research study was exploring the service-provisioning life cycle in the service provider environment. The organization had more than a decade-long presence in the region and was well-respected as an Internet and data service provider. The conditions in the ISP organization were ideal, as the study took place in the environment in which various functional units are involved in the service-provisioning process.

The study was timely, as the organization leaders wanted to improve the service-provisioning process and increase the rate of success for service deployments. Staff from various functional units in the ISP organization provided their support in conducting the study. A private room was available for conducting the interviews within the building. The room included the resources needed for conducting the interview, including adequate seating. All the participants had an association with this organization and were part of the service-provisioning life cycle. I contacted participants by telephone, briefed them about the study requirements, and followed up with an e-mail with the consent form and interview schedule options. Upon confirmation from the participants, I scheduled the interviews. All the volunteers met the purposeful selection criteria. The interviews took

place privately in the office on an agreed-upon schedule during working hours. There were no indications of any internal or external factors that would influence the participants or the environment during the research.

Demographics

All the participants were from one ISP organization in Kuwait. The participant selection process included the purposeful sampling criteria, and the participants were from various functional units, as highlighted in Table 4. Within each functional unit, I targeted a variety of specialties to identify volunteers who had adequate experience and insight on the service-provisioning life cycle. Four service-provisioning projects served as the primary source of data for this study, and I recruited participants involved in either one or all of the projects. I initially selected 19 participants from various functional units, as shown in Table 5. The hierarchical levels represented included senior managers, managers, supervisors, and technical staff. One senior manager was unavailable for the interview because of work-related travel, but the remaining 18 participants participated in the face-to-face interviews, member checking, and follow-up questionnaires. Data saturation occurred after 13 interviews, and subsequent participants provided no new information; however, the interview process continued with the remaining five participants to reinforce the data collection and findings.

Data Collection

The service provisioning life-cycle comprises a sequence of activities involving various departments in the service provider organization. Each function plays an important role in the service provisioning life-cycle as highlighted in Table 4. In order to

explore the sociotechnical factors associated with service provisioning, participant selection involved individuals from multiple departments, as it was crucial to understand the perception of staff from all the relevant functional units. Figure 2 provides a graphical depiction of the involvement of various organizational functions to complete the service provisioning life-cycle.

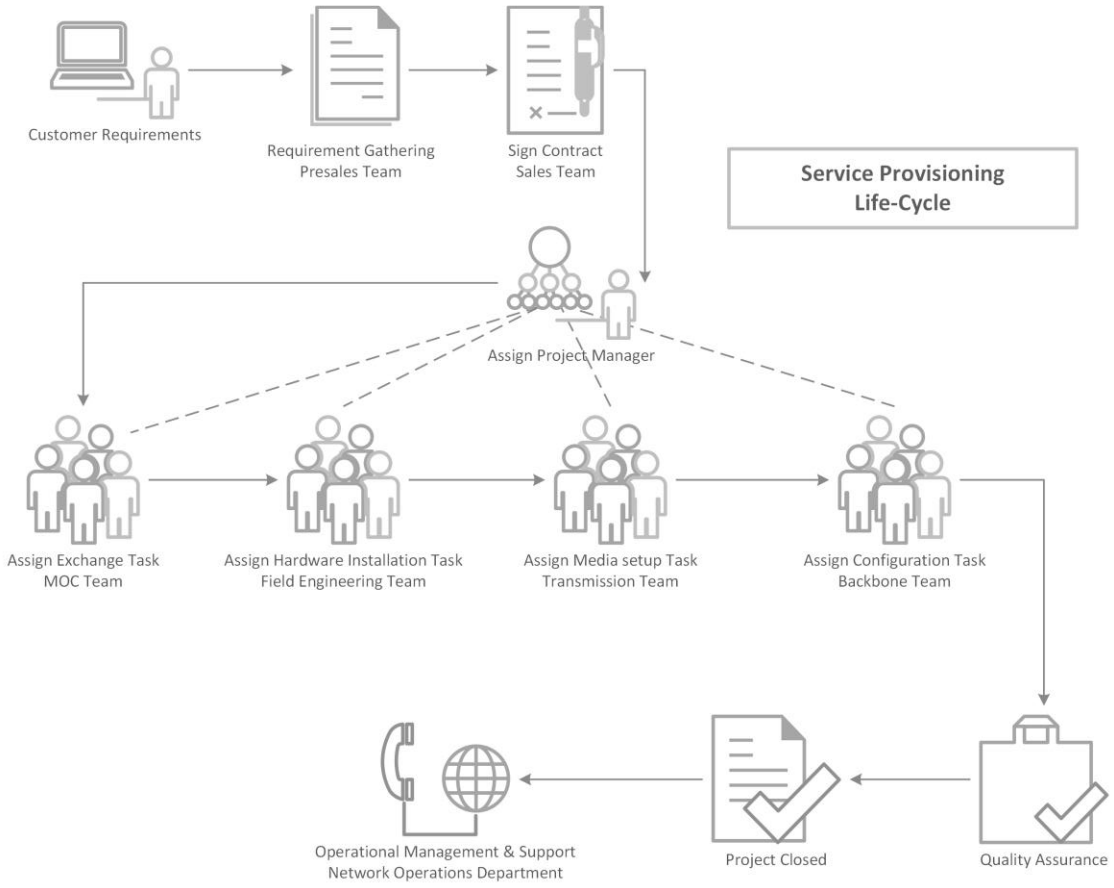

Figure 2. Graphical depiction of various functional units involved in the service-provisioning life cycle.

The data collection process took place in December 2016 and involved face-to-face interviews with 18 participants, as well as the collection of various organizational documents for four projects. An interview guide that included a semistructured interview

questions directed the interview process. The two sets of consent forms that I developed included a consent form for recruiting participants via e-mail and a consent form signed by the participants on the day of the interview. Both consent forms went to the IRB for approval prior to commencing the data collection process. Participant contact occurred via e-mails and phone calls. Sixteen participants consented to participate in the study via e-mail, and two participants consented over the phone and signed the consent forms on the day of the interview.

All the interviews took place over 3 days, and I scheduled participants back-to-back to ensure the timely completion of the data collection process. The schedule for the interviews took place at the participants' convenience; three participants scheduled the interview after their working hours. The interviews took place in a private office within the organization. At the outset of each interview, I verbally explained the rights of the participants, along with the details of the study, to ensure the participants had a detailed understanding of their rights, the process, and the importance of their contribution to the study. I also explained to the interviewees that they would receive a transcript of the interview for member checking and that a follow-up questionnaire would require their feedback to validate the findings.

I was the data collection instrument, and I conducted the interviews, which lasted between 15 and 30 minutes. The interviews took place based on the guidelines recommended by Yin (2013). The interviews were primarily audio-recorded using RecForge Pro audio recording software for mobile phones. I used my mobile phone as the audio-recording instrument, as the microphone of a mobile phone can intercept audio

using high-quality hardware and software. To avoid technical difficulties or software or hardware malfunctions during the interview, I simultaneously recorded the interviews on my laptop using the sound recorder application. All interview recordings had high-definition audio quality, which assisted in the transcribing process.

I transcribed the interview by using a traditional playback and typing approach, as many of the different types of voice recognition and transcribing software I tried were not able to provide accurate results because of the variation in the non-native English language accent. I transcribed the interviews in Microsoft Word and reviewed each interview three times to correct any errors and to maintain a high level of accuracy during the transcription process. After transcribing the interviews, I visited the participants with the printed copy of the transcripts at their convenience and asked them to review the transcripts. All 18 participants returned the transcripts with the acknowledgments and confirmations of the recorded data without any modifications. The member-checking process did not take more than 7 minutes for each participant.

A secondary source of data was the organizational documents acquired from the service-provisioning department, which included project activity logs. The project activity log files provided the details of the complete service provisioning activities from the initial phase until the completion. The project activity log consists of details of the issues and challenges encountered during the service-provisioning life cycle. The data from the log file contained time stamped events and details of the task assignments to individuals/teams of various departments. Each resource updated the activity log with the status and issues during the implementation phase. The log files assisted in the

triangulation process by validating the findings of the data from the interview against the recorded events.

I input the transcribed interviews and the organizational documents into NVivo for coding and data analysis. After the data analysis, the next step involved developing a list of critical success and failure factors from the emerging themes and incorporating these factors in a follow-up questionnaire (see Appendix D). The follow-up questionnaire received IRB approval. Upon acquiring IRB approval, I contacted the participants, and based on their availability, I met them with the printed copies of the follow-up questionnaire. I explained the details of the questionnaire and the source of data and requested their response. The follow-up questionnaire included two parts: (a) critical success factors and (b) critical failure factors. Each section required the participants to rate the identified factors on a scale of 0 and 3, where 0 denoted *not important/no impact* and 3 denoted *highly important/high impact*. The details of the rating scale appear in the follow-up questionnaire in Appendix D. The participants provided their responses in writing on the follow-up questionnaire and completed the entire data collection process within 15 minutes, in accordance with the allocated period. Appendix G presents the summary of the responses from the follow-up questionnaire. The data from the follow-up questionnaire assisted in validating the findings of the study.

Data Analysis

A qualitative thematic analysis was suitable for analyzing the interviews with the 18 participants. According to Braun and Clarke (2006), a qualitative thematic analysis approach is a method that aims to "identify, analyze, and report patterns" (p. 79) found in

the data collected. Pope, Mays, and Popay (2007) also explained that thematic analysis involves searching and looking into data in depth to reflect the "main ideas and conclusions" (p. 96) found in the data evidence. Therefore, the research design was vital in addressing the purpose and research questions of the study given that the researcher could examine the participants' firsthand perceptions and experiences to discover the sociotechnical factors associated with service provisioning in the telecom sector of Kuwait. Through the thematic analysis of the interviews and the project log files for the four projects, the social, technical, and environmental factors that affect the service provisioning of telecom providers in Kuwait emerged, which may help in improving the service-provisioning life cycle, customer satisfaction, and retention. While using the qualitative thematic analysis, the most meaningful parts of the responses by the participants, aligned with the activities recorded in the project log files, about the central and sub-research questions of the study surfaced. I formed patterns of the responses of the participants, identified the essences of the perceptions and experiences of the participants, and grouped them to establish various themes.

In this research study, I used NVivo software to help me in the data analysis process. I followed Braun and Clarke's (2006) six stages of completing a thematic analysis. As noted in Jason and Glenwick (2016), the first stage was my immersion in the data process, which included an initial review of the collected data. This stage involved reviewing the data in preparation for labelling the data with codes that may be helpful in the next stages. The second stage involved generating the initial codes. During this step, I took note of and listed the codes and units that were helpful to building answers to the

research questions. The next stage involved searching for themes, which involved identifying and organizing the codes assigned and formed from the previous stage to determine the patterns from the participants' responses. Upon a closer examination of the patterns, I established themes. The themes deemed irrelevant to the subject underwent an early elimination. Appendix E contains the data-coding table that highlights the participant responses, codes assigned, themes formed under each sub-research question and central research question.

The fourth step of the analysis involved reviewing the formed themes from the responses and organizational documents. This stage involved cross-checking all the data to see if I had coded all themes related to the subject and to determine whether any idea or theme was missing. The fifth stage of the analysis involved naming and defining themes. During the review of the themes, the relationships of the themes became more evident, which led to further identifying and naming of themes. Upon naming the themes, their meanings became more apparent, and clustering of data again took place. Appendix F contains the final worksheet from NVivo that highlights the breakdown of all the themes and their number of references. The sixth stage involved reporting the data findings, which appear in the next section. The themes with the most occurrences became the major themes, and those that received fewer occurrences became the minor themes of the study.

Evidence of Trustworthiness

The study involved testing the analyzed data for credibility, transferability, dependability, and confirmability. Testing the credibility of the research study involved

ensuring that the subject of the research, as well as the truthfulness of the results, consistently emulated the sociotechnical factors associated with telecom service provisioning in the telecom sector of Kuwait. Member checking served to validate the authenticity of the collected responses of the participants. The member-checking process involved asking the participants to review their responses and to clarify, correct, or explain their answers if needed. The second qualitative characteristic found in the study was the transferability of data. Through the audio recordings, transcriptions, and notes from the interviews, the descriptions of the 18 participants were thick and meaningful. Reflexivity occurred, as the content and interpretations of the interviews came from the actual responses from the data collected, and the established findings were impartial and unbiased. The careful and systematic organization of the interviews collected helped to ensure the dependability and confirmability of the data. Streubert and Carpenter (2011) suggested producing audit trails to locate, examine, and verify any needed information; the study also included audit trails.

Credibility

To ensure credibility, the study included various measures such as member checking, cross-checking, and triangulation. The process involved accurately transcribing interview using multiple passes and ensuring the accuracy of the data collected by performing member checks with the participants to validate the data captured. Member checking involved providing the transcripts of the recorded interviews to the participants for their validation and confirmation. Participants requested no changes during the member-checking process. The commonalities in the findings across all four projects

helped achieve data saturation and validated and confirmed the results. Cross-checking took place while coding the transcripts and organizational documents. The commonalities in the themes that emerged from the interview data across all four projects and the supporting organizational documents also helped in triangulating the findings. I followed a recommendation found in Cilesiz (2011), who suggested that researchers carefully bracket their experience and background by following the interview guide and avoiding any communication with the participants that could influence their responses during the interview cycle. In this study, I analyzed data from multiple projects encompassing interviews, organizational documents, and follow-up questionnaires. The triangulation of data from multiple projects and organizational documents assisted in evaluating and validating the findings across the data sources. The similarity of findings between the data from multiple projects for the same question attested to the validity and confirmability of the findings, which further strengthened the results of the study. The credibility of a study was also improved by validating the findings using a follow-up questionnaire and by verifying the critical success and failure factors from the participants (Fram, 2013). There was no deviation between the final credibility and anticipated credibility of the study.

Transferability

The findings may be transferable within the ISP organizations of Kuwait. The findings of the study, with slight considerations, may also be transferable within the GCC countries, as they have a similar telecommunication infrastructure. Similarities in the telecom-governing policies are prevalent. However, due to the small sample size of 18

participants and the fact that the data came from only one ISP organization in Kuwait, it may be difficult to transfer the data.

Dependability

Incorporating the process of triangulation, several iterations of coding and analysis, two rounds of data collection and validation, and the process of member checking and thematizing data ensured the data were dependable. Face-to-face interviews were the primary source of data, and various organizational documents served as the secondary sources of data. The study involved cross-verifying the findings against both sources of data and using the follow-up questionnaire to validate the findings. Involving the participants in the member-checking process and the data-validation process by using the follow-up questionnaire preserved the objectivity of the study.

Confirmability

Bracketing my background and experience during the interview process established confirmability. I avoided providing any feedback during the interview to ensure I did not influence the participants. The interview guide included semistructured interview questions. Because participant selection involved a purposeful sampling strategy, the participants were well aware of the phenomenon under study and did not require any clarification on the interview question, which also helped restrict my feedback during the interview process. The member checking also assisted in establishing the confirmability of the study. I transcribed the data collected during the interviews into Word documents and provided them to the participants for their review and confirmation. All 18 participants acknowledged and confirmed the transcripts without any

modification, which also improved the confirmability of the data. I validated the findings across the data collected in all four projects, which resulted in a generalized list of critical success and failure factors sent to the participants using a follow-up questionnaire to rate the factors according to their importance or impact on the service-provisioning life cycle. The results generated from the follow-up questionnaire confirmed the findings.

Results of the Study

Upon the completion of the thematic analysis of the data collected from all four projects, five major themes and several other minor themes emerged that all addressed the central and sub-research questions. I used the three sub-research questions to address the main ideas and queries that related to the central research questions. This section includes the developed themes along with verbatim text to support the perceptions and experiences of the participants.

Sub-research Question 1

Sub-Research Question 1 was as follows: What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment? This question was about the three factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment. Under the first sub-research question, three major themes developed that addressed how to use these different factors to ensure the success of the service-provisioning life cycle of the service providers in Kuwait. The complete results appear in Table 7. The table includes only the themes that received three occurrences or 20% and above of the study; those that received fewer occurrences appear in their respective tables.

Table 7

Breakdown of the Results addressing SRQ1

Category and themes	*n*
A. Social factors	
Practicing a cross-functional communication within the organization	16
All members or departments must be capable of performing their role	
Practice of teamwork	
Representing the company effectively	5
Taking care of the customers	
Language used by the service provider employees	2
Considering the cultural issues in Kuwait	2
Practicing effective planning	1
B. Environmental factors	
Keeping in mind Kuwait's culture	25
Language barrier	
Lacking time orientation	
Manner of working	
Lacking knowledge on technology	
Following the organizational policies and regulations	3
C. Technical factors	
Ensuring the employment of qualified and capable people	15
Following strict service requirements	11
Updating of infrastructure to keep up with the changes	2

Thematic Category A: Social factors. The first thematic category was the social factors that affect the service-provisioning life cycle in a Kuwait-based service provider environment. According to the interviewed participants, the most important social factor was practicing cross-functional communication within the organization. The participants identified the significance of working effectively across the different teams and departments to achieve a common goal. Another perception was the need to represent the company effectively at all times.

Major Theme 1: Practicing cross-functional communication within the organization. The first major theme that emerged was the social factor practicing cross-functional communication within the organization. Participants shared that different

groups and teams working together to provide the best service possible to their consumers was more effective. The major theme had four subthemes, which were ideas and perceptions related to cross-functional communication within the company. The first subtheme was the belief that all members and departments must be capable of performing their roles in the company, and the second subtheme was the belief in the need to practice teamwork within the organization. Participant 1 (BB1) shared that one social aspect that was significant to the life cycle of his company was the functioning of the different departments and teams as effective units and working together to achieve a common goal. Participant 1 explained that the various teams are aware of their roles and are able to complete each task to implement their projects successfully:

> Starting from sales, coming to presales, engineering, implementation, field engineers, transmission engineers, complete team will be involved in the implementation of the project from A to Z. Each team will have their own roles assigned by the allocated project managers with their specific tasks and their deadlines to be achieved. There are some criteria within each team's role, which they need to make sure that it is met in order for the second team to accept the first task… Well, primarily every department needs to know with whom they are actually communicating and what is their level of knowledge and understanding of that particular project.

Participant 2 (BB2) explained that the different departments within his organization, from sales to transmission, play their role in processing and implementing the service needed from them. Project managers manage and convey information effectively within each

department to ensure they cover all aspects, leading to the successful implementation of the project.

> Various departments such as sales, presales, service provisioning, backbone engineering, field engineering, and transmission play a role in service provisioning. Each department has a specific role such as to gather the information, forward the information, assign tasks, and do the implementation. With regards to the LMG project, the project manager was the central point of communication. Information was controlled and managed by him and he was the one who forwarded the information to the relevant departments and the customer. I believe the information was managed adequately.

Participant 4 (FE2) highlighted the cross-functional communication between and within the various departments of his organization. Participant 4 noted that the project manager plays an important role by communicating and collaborating with the rest of the stakeholders of the project:

> When you say cross-functional communication, this is basically between the different departments in the company. I would say it is not perfect, though you get work done, there are procedures and policies implemented in the company, but it becomes difficult to implement anything and everything. Some of them are skipped and people do go above the company policies at times. This is just how their culture is basically.
>
> There is a lot of cross-functional communication in every project and the project manager is the heart of the communication. It is important that the project

> manager understands the project and then assign the right tasks to the teams. He has to coordinate with the teams from field engineering, backbone engineering, and transmission, Ministry of Communication liaison, and the customer. He needs to know what information should be given to whom and when.

Participant 5 (PM1) emphasized that cross-functional communication highlights teamwork as well as good relationships between the members of the departments involved. In this regard, each member must have a commitment to the success of the implementation to keep the customers and clients satisfied:

> So, in that case it is good to have good team work for which you have to have again a friendly relationship, apart from a professional relationship. So, when I say friendly relationship, you will have to have the team and confidence so they also should know what is that they are delivering to the customer. Everybody should be on the same page. So, whenever they have a concern or they are not comfortable with certain requirement or not understanding a requirement. They should feel free as a project manager, they should feel free to come back to you to say or to highlight if there is a risk factor or highlight if there is something going to get delayed which will keep the customer as well as the team in the same page. Well cross-functional communication; we do have teams but the cross-functional teams in our company are not always incorporated, of course but yes, we do have the cross- functional communication. So, we have the privilege, the middle management has the privilege to communicate at a higher management as well as for the staff below them. So, that really helps because you just don't wait for the

> last, you just don't wait for the surprise to come to you, you always take the help from them. You know what are the actual issues the low-level staff are facing and when they visit the site, if they have any concerns, they communicate to you and when the higher management is involved or you have different functional teams involved, you get to know the issues, you get to discuss the issues. So, that really helps.

Participant 6 (PM2) explained how cross-functional communication works. After one task is complete, an individual sends it to the next person, who must know what to do and what should follow next in the process:

> It is mostly sent in, with the work order to respective person. Once that person completes the job then to move forward we send another work order to the next person who has to carry it forward till it is implemented. Mostly it is done in work orders unless we need to just pick up a phone call or send an email.

Participant 7 (PM3) also noted the need to have the proper knowledge and skills to be able to function with the other individuals in each department. Participant 7 explained,

> Yes, as you handle the project you have to start from the scope of the work through sale. You have to understand the scope completely and you have to know the deliverable from the customer. Sales department is very much involved; sales should provide actual scope of work by the customer to the provisioner. So as a provisioner or project manager, we have to co-ordinate with sale and the technical department to deliver the services as per as the scope.

Participant 8 (PM4) expressed that another social factor significant in his field was knowing everyone's roles and having the ability to stay within the parts assigned to them. Participant 8 discussed the different teams and departments involved in completing a project or task:

> For the social factors, we are involved as a project manager with the sales department. You know the structure, we are service implementing department, we are getting the order from sales. We are not interfering into any commercial discussions in the beginning. So once the order is in place, we are getting in contact with the sales and then customers, who we are involving and updating them about the delivery lead time, how the site is ready and other information. As a standard solution, usually we do not refer back to any technical people, so we just go for implementation. Later on, we are coordinating internally with our field engineer, backbones, Ministry of Communication teams and transmission team.

Participant 9 (S1) indicated that the relationships of humans play a big role for social factors. In this case, members must know how to relate with one another to practice teamwork in the process of completing the cycle of service and implementation:

> Well as social factors, we are talking about human and personal relations. Well their attitude and character will of course affect the service provisioning and implementation life-cycle. We should have sense of team work between all the departments and everyone should be cooperative, understanding and all working with the same objective of implementing the required service.

Participant 10 (S2) echoed Participants 5 and 9 in terms of having the sense to succeed by practicing teamwork and good relationships with the rest of their members. Participant 10 also shared various social factors, such as the following:

> Specifically speaking, social factors influencing the service provisioning, I feel your personal relationship, language, communication skills, plays a major role during the service provisioning life-cycle. We encountered, especially, during the AUB project, due to our personal relationship, we were able to get things done very quickly, during the provisioning phase.

Participant 15 (SN2) shared that the communication and coordination with the other stakeholders and departments was the main highlight of the social interactions in his industry:

> With regards to those projects, what I have seen that human interaction is very important, coordination with different parties from within the organization and at the same time also with the customer. Informing the customer in timely manner, which is very critical so that the customer is aware of what is going on during the service delivery lifecycle and whether it meets the expectations.

The project logs for all four projects indicated a sequential activity of work assignments. Sales team created the tasks and assigned to the project managers. The project managers sequentially assigned tasks to individuals from different function such as MOC liaison team, backbone engineering, field engineering, and transmission teams. Upon completion of an activity, the project manager updates the work assignment and generates a new task for the next activity to the relevant resource/department.

Minor Theme 1: Representing the company effectively. The third subtheme was the social factor or representing the company effectively. For the participants, it was also important to be responsible for their actions, as they were the models and representatives of their organizations. One subtheme was taking care of customers. Participant 4 (FE2) believed that the professionalism of employees was also significant as they presented and represented themselves outside their organization, especially to their customers. Participant 4 stated, "And the level of professionalism. It is important to be as professional as one can be to represent himself as well as his organization." Participant 14 (SN1) expressed that employees needed the right communication skills and attitudes in servicing their clients. Employees needed the capability to represent their company positively: "Basically, the most important as per my view is communication skills, the right attitude, behavior and interpersonal skills. Because these are the main social factors which influence the provision here in Kuwait" (Participant 14).

Subtheme 1: Taking care of the customers. Participants also believed in the positive outcome of taking care of customers. For Participant 5 (PM1), employees must always keep their customers as their priority. ISP representatives must take care of their customer and keep them satisfied to ensure successful service provisioning, customer satisfaction, and customer retention:

> Well, when I say social factors influencing the service provisioning lifecycle, I should be talking about the repo that we developed with the customer, understanding the requirements and going an extra mile in understanding and being at the point of delivering the services. Probably most of the customers

> would prefer a timely delivery and in case we have a concern in delivering, we find something risky, we will have to notify them. It is always good to be honest and keep the customer informed well ahead instead of going to them as a last-minute surprise. So, that has to be there, that one to one communication and keeping the customer comfortable of what we deliver is always important, which is in relation to the customer and in order to achieve this, you are not working as an individual, you always have to work as a team.

Participant 17 (T2) also highlighted the importance of a positive interaction between the employees and their customers: "The social factors that influence the services provisioning are human attitude, language barrier, relationship with the customers and human interaction."

Thematic Category B: Environmental factors. The second thematic category was the environmental factors that affect the service-provisioning life cycle in a Kuwait-based service provider environment. For the participants, Kuwait's culture had the greatest impact in their business service and industry. Following the organizational policies and regulations was another environmental factor.

Major Theme 2: Keeping in mind Kuwait's culture. The second major theme of the study was the environmental factor the different aspects of the culture of Kuwait. For the participants, Kuwait's culture had four main components: language, time orientation, manner of working, and knowledge. Each component was a subtheme under the major theme.

Subtheme 1: Language barrier. The first subtheme was the language barrier, where participants believed that business entities should use a common language to initiate business between organizations, government entities, and clients. Participant 1 (BB1) noted that the language barrier is one main concern in his industry. Participant 1 explained that a mutual language is necessary to complete projects in the allocated time frame. The Arabic language also emerged as an important factor, as it is the national language of Kuwait:

> Based on the social factors, the language barrier matters definitely. Knowledge, like in the sense of the partners, who we are dealing with for e.g. related to the TR project, the communication language played an important role; unless both parties are not agreeing on a mutual language they can't really move ahead.
>
> Because Kuwait is an Arabic speaking country and it definitely effects, when we communicate with their government sector, language barrier is the main thing as per my understanding. Secondly, references and contacts will also help in Kuwait to speed up an office document or the process of documentation within the government sector.

Participant 2 (BB2) shared that it was also difficult to provision and implement services successfully if a company and its clients do not use a common language: "The culture of Kuwait has a major effect on the service provisioning because we are dealing with both Arabs and non-Arabs. Firstly, there is a language barrier and it becomes difficult to communicate or understand the requirements." Project Log-TR indicated language barrier as an area of concern: "job completed; however, customer did not speak English and it

was difficult to take customer acceptance". Participant 4 (FE2) explained that by keeping the culture of Kuwait in mind, an Arabic speaker receives more preference than those who do not speak Arabic. Participant 4 shared that the English language was gaining more attention and recognition:

> Culture of Kuwait does have an impact on service provisioning, as many things have to follow the way people work in this country. As I said before Arabic speaker are given preferences as they are more clearly understood but nowadays people are becoming better in English and things are moving well. I see that there are improvements but it will take time. Sometimes people also are not punctual so they will give the time and will not be available. I think people have to become more professional.

Project Log-AUB indicated the challenges in relation to Arabic language, where "documents should be converted in Arabic before processing". Participant 5 (PM1) echoed that people in Kuwait prefer those who speak their Arabic language. Participant 5 could not speak the local language, and he shared a story:

> Well, culture of Kuwait, my personal opinion is people are friendly, though but when it is coming to language, especially, when we are delivering services in Kuwait, I would say there are people who prefer people speaking only Arabic. That is one issue that I have faced personally because I didn't speak Arabic neither understand it.
>
> That is one thing especially when we have to deliver services in Kuwait we need to take documents, which are all in Arabic. So, I always seek help from one of my

> colleagues to review the documents if the documents are fine or to go back to the customers that this is missing or something is missing in the documentation. So, that is a pain!

For Participant 6 (PM2), the main issue was the language barrier, as non-Arabic speakers might experience a lack of communication: "The main factor would be the language barrier, which mostly people tend not to understand. So, I would say that is the most important thing." Participant 9 (S1) also noted that one main issue is the language barrier. Participant 9 indicated people may face problems if they do not speak the local language, as the service providers may not be able to communicate effectively with their clients: "Well, the culture of Kuwait affects. Let us say if you are not an Arabic speaker, you might face a problem in communicating with the customer who only speaks Arabic. So, language barrier can be an obstacle." Participant 16 (T1) admitted that a communication gap exists and the Arabic language is dominant and noted that when a person does not understand English, the business process becomes even more difficult: "Culture, because of, Kuwait affect service provisioning because of communication gap and language barrier. Most people speak Arabic and it becomes difficult to communicate or understand if they do not speak English."

Subtheme 2: Lacking time orientation. The second subtheme was the belief that the local culture is lacking in time orientation. Participant 2 (BB2) stated that another cultural concern or issue is the lack of time orientation of the locals. Participant 2 shared how the customers and the Ministry of Communication often fail to follow agreed-upon dates, deadlines, and timelines.

> This is a common issue and it happens both at the customer side as well as when dealing with the Ministry of Communication. Processes are not defined and there is no definite timeline for anything. Commitments are not honored many times.

Participant 4 (FE2) complained that aside from the language barrier, another issue is the lack of punctuality and respect for time. Participant 4 added that people should be more professional when it comes to business and formal dealings:

> Culture of Kuwait does have an impact on service provisioning, as many things have to follow the way people work in this country. As I said before Arabic speaker are given preferences as they are more clearly understood but nowadays people are becomin better in English and things are moving well. I see that there are improvements but it still will take time. Sometimes people also are not punctual so they will give the time and will not be available. I think people have to become more professional.

Participant 5 (PM1) shared that one issue is the delays, especially during the holy month Ramadan. Some people fail to deliver when there are special occasions due to their refusal to work and fulfill their duties:

> Apart from that, one more thing I feel what actually delays things is during Ramadan people don't literally want to work. It is not only in this Kuwait, it is in the region, like that is a very slow month. Things hardly moves in that month. Otherwise, there are customers who say, like people who say IN SHA ALLAH and you leave it to God forever. So, things do not move. Otherwise, I do not really have any difficulty in delivering services in Kuwait.

Participant 6 (PM2) gave another example when a customer did not honor their meeting. Participant 6 shared how the customer did not respect the value of time for two possible issues:

> Yeah, the culture affects because sometimes if you call the customer and you speak to him, you tell him you are going to come on a certain day; you are scheduling something and the customer either doesn't understand what you are saying or he is not there at that moment for whatever reason.

Participant 10 (S2) shared that taking time for granted is part of Kuwait's culture. In addition, Participant 10 indicated that even formal organizations and institutions such as the government fail to give importance to the value of time:

> The culture of Kuwait, out here, people take you for granted. There are government regulations and people have the attitude like "come tomorrow". These are the factors that affect the provisioning of the services. you need to take care of all these considerations before actually planning out or phasing out. These are some of the factors that need to be taken in to consideration.

Subtheme 3: Manner of working. Another component or subtheme was the locals' manner of working. Participant 3 (FE1) explained that individuals and people in Kuwait work with great consideration to their culture. Participant 3 expressed that Kuwaitis are friendly and respectful. However, they also have a distinct manner of working:

> From a personal prospective, the life in Kuwait, everything you do in Kuwait is based on culture. Even the organization that function here though they have rules, procedures mostly it goes on the culture of the country. The management, unless

> and until it is a foreign own MNC and the management is foreign then you have a different culture, a western culture basically. But if you have a local management, local people, the culture is very obvious and it is very important for the people over here, it is a part of their life actually. And that is how they work. The factors for this are that they are very interlinked with each other and because of this their behavior is different, their attitude towards work, towards people is different. They interact differently with different set of people. You know when they need each other there is a lot of hello's and health related issues asked, lot of greetings and this basically whatever the culture I am talking about refers to the Arab population, the Arab management. These people are very friendly; it is in their culture to be friendly and forth coming and giving. They have a lot of respect for their colleagues, their people, and their workers. This is the management level that I am talking about. They do respect the people that they have and sometimes they are a little reluctant with outsiders but they are at ease with their own community.

Participant 12 (S4) again indicated the need for the local culture to be more professional, especially when working with customers. Participant 12 believed that the working attitude in the country must improve:

> Culture of Kuwait, actually attitude plays an important role. In Kuwait unfortunately,… we need more professional people the attitude actually plays an important role, we need to be more professional, we need to have an attitude of being more customer centric to satisfy the customer. All these play an important

> role , which unfortunately is lacking in Middle East so, yes, obviously the culture of the people will play an important role and this needs to be changed.

Subtheme 4: Lacking knowledge on technology. The last subtheme was the belief that Kuwait as a country is still lacking knowledge on technology. Participant 15 (SN2) explained that Kuwait is a small country and still needs to improve current knowledge about technology, especially because technology is constantly and quickly advancing and the local industries and their stakeholders must work to keep up with these changes:

> Kuwait being a very small country and income per capita per person is very high. So, in this region, in this country, people have an attitude of saying I can do it! and I am the only one who can do it. Therefore, there is an attitude issue in this country. Second, there is lack of knowledge. The companies or the organizations in Kuwait, they expect to have the best but at the same time they do not know how to go about those technologies.

Minor Theme 1: Following organizational policies and regulations. The first minor theme that emerged was the need to follow organizational policies and regulations as an environmental factor. Participant 1 (BB1) stated that one environmental factor is the need to follow his organizational policies and regulations in terms of completing a project plan. Participant 1 described the various departments and specific resources required by his company in servicing his clients:

> A complete project plan needs to be handed over to all the parties that are involved, which needs to be covering all the details starting from the media, the cabling used, the ports allocation, the VLAN ID, the infrastructure readiness at

> the customer side as well as the exchange side, and if there are any sub-contractors involved, the quality of service parameters. We need to cover each and every detail and bits and pieces.

Participant 2 (BB2) related the environmental factor to the social factor of cross-functional communication. Participant 2 highlighted how the project managers follow a specific process in managing the projects. Project log-LMG indicated a sequential work assignment to various departments by the project manager during the project. Participant 2 expressed:

> With regards for the LMG project, the project manager was the central point of communication. Information was controlled and managed by him and he was the one who forwarded the information to the relevant departments and the customer. I believe the information was managed adequately

Thematic Category C: Technical factors. The third and final category was the technical factor of the service-provisioning life cycle in a Kuwait-based service provider environment. For the majority of the participants, it was important to ensure they have qualified and capable people or staff members to implement and apply their services to their consumers. One minor theme that emerged was the technical need to strictly follow the service requirements of the company.

Major Theme 3: Ensuring the employment of qualified and capable people. The third major theme of the study was the technical component of ensuring that companies have highly skilled and capable members. Participant 2 (BB2) believed that, for the technical factors, there is a need to employ proper and capable individuals who can

handle all the technical aspects to complete the service and implementation. The individuals must also practice good communication and customer skills, aside from the technical knowledge required:

> Well, it is important to have people who are qualified and have the right education. They should be capable of handling technology related things as well as human interactions. They should be good with the customer and should have the ability to get the work done.

Participant 3 (FE1) pointed out the different skills and capabilities required to be part of the telecom sector. Under the service provisioning, one must have not only have the technical knowledge and expertise but also the social abilities to interact and relate with colleagues and customers:

> For service provisioning, in the field that we are in, IT, then when you look at the population over here, majority of them are Arab. So, in the provisioning fields, you need to know the language, you need to know the people's culture when you communicate with them because not only knowing the language is enough. Everyone has their own culture. If you tend to speak loudly with the customer, they get annoyed because in their culture it is not so. Then some of them do not know English so they find it rude because they think you should be knowing Arabic since you are in their country. So, these are a part of it. You should know their culture; you should walk and talk like they do. At least if not fully or completely but to an extent where you can get your work done.

Participant 4 (FE2) highlighted that it is vital for individuals to have the proper educational and technical requirements. Project Log-TR indicated a potential delay in project implementation due to skill limitations: “please assign alternate resource as the existing technician is unaware of the GPON technology”. Participant 4 explained that by being equipped with such knowledge and skills, the services offered to the customers should be of quality and value:

> I believe it is important to have the education and technical background, especially, in terms of the products and services that are offered. The person should be up-to-date in terms of managing the project, should have project management knowledge and education and should be a people’s person, who can get the work done.

Participant 6 (PM2) expressed that individuals must have both the skills to acquire and maintain customers, as well as the technical knowledge to implement the services required from them. Participant 6 explained,

> You need to know, starting from; if it comes from the sales then the sales need to know what the customer requires. Then when it goes on to the next level, it goes to the provisions or the project managers. They need to see what exactly is in the service order from the customer side. They have to confirm with the customer what they require then go ahead.
>
> First of all, the provisioning team needs some basic technical knowledge. They have to know what hardware can be used for which service then accordingly they can move forward.

Participant 7 (PM3) shared that individuals from different service teams must be able to relate with and manage the needs of their clients to deliver their products and services successfully. Project Log-SITA echoed the importance of technical knowledge for the project managers, where project manager was unable to comprehend the requirements: "please provide explanation of the solution. Assigned to: [Presales]". Participant 7 stated,

> As per me, yes you have to understand the technical requirement from customer according to the scope of the work and a project manager should have at least a technical background of delivering the service. You have to understand what the deliverables are and you have to deliver the service as per the scope.

Participant 16 (T1) shared the various skills needed from the members of service teams: "knowledge, basic knowledge and education and knowledge of product and also good communication skills." Participant 17 (T2) stated that an individual must have an educational and professional background to fulfill his duties: "First of all, the person who is in provisioning, he should be a graduate and professionally qualified and he has to know the equipment and should have the knowledge for that. This is the important thing."

Minor Theme 1: Following strict service requirements. Another theme or perception that followed was the need to have strict service requirements. Participant 4 (FE2) stated that aside from educational capabilities, strict service requirements are also crucial in terms of maintaining and keeping the service cycle successful: "There are many technical factors such as the details service requirement like bandwidth, media type, quality of service parameters, hardware requirements, infrastructure readiness to deliver the services in that area.". All project logs indicated that presales team provided a

technical solution for all the projects. Participant 12 (S4) believed that, given the industry, adherence to strict technical requirements is necessary. Services must revolve around providing the best possible product to consumers, coming from the technical resources and requirements that they employ:

> Yes, since we are actually from the telecom industry, from an ISP industry, technical will play an important role, that's where our presales and our solution architect comes into the picture, where he actually get engaged with the customer and take their respective requirements, build the proposal based on their technical questionnaire, and they are the one who actually design the solution so technical factor do play an important role.

Participant 13 (SA1) shared that the technical factors include the hardware and network components; in addition, the quality of the link is a factor in completing and implementing their services:

> Technical factors, definitely are, the quality of the hardware and network components involved, the quality of the link what we are provisioning, and the quality of the entire network associated with it; along with the configuration, I would include routing protocols, and class of services, and the test result after the provisioning is completed.

Participant 17 (T2) elaborated on and specified the different technical resources and requirements employed: "There are two types of media, fiber and copper, that are the primary mode of establishing connection. The other factors also include hardware, infrastructure, and the configuration." Participant 18 (T3) also gave examples on the

technical requirements that project manager and technical team need to follow and use when servicing their clients. Participant 18 shared,

> Technical competencies required for service provisioning are the understanding of the customer's scope of work; based on which we will identify the relevant equipment that will be used to support the implementation.
>
> There are many technical factors like the media that will be used to deliver the services, for example, fiber or copper. Also, the hardware that will be installed and the equipment at our exchange side that will be used to extend the services to the customer.

Sub-research Question 2

Sub-research Question 2 was as follows: What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service-provisioning errors? The second sub-research question of the study led to a discussion on how the critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service provisioning errors. This section includes a discussion on the participants' perceptions of the factors needed to succeed within their sector. Sub-research Question 2 also contained the answers to the first central research question of the study, further explained in Chapter 5. Table 8 includes the findings from the thematic analysis of the interviews with the 18 participants. Only the themes that received three occurrences have additional information provided, and those that had fewer occurrences appear in Table 8 and may need further research to show their credibility.

Table 8

Breakdown of the Results addressing SRQ2

Themes	*n*
Meeting the requirements and satisfaction of customers	25
Conducting after-sales and installation check-ups	
Delivery time of product and service	
Adhering to customer requests and needs	
Having a risk management plan	9
Training the staff to keep up with service updates	3
Having clear and detailed goals per project	1
Having a competent and capable staff	1

Major Theme 4: Meeting the requirements and satisfaction of customers. The fourth major theme of the study was the success factor of meeting the requirements and satisfaction of customers. There are three main components under the fulfillment of customer needs. Participant 2 (BB2) shared that one important factor of service provisioning success is keeping the customers satisfied to retain them as loyal clients of the ISP organization. Participant 2 highlighted that it is important to keep the customers happy by making them their biggest priority:

> Customer retention is a very important issue. Especially in Kuwait where the market is very small and customers rotate between the service providers. We have to make sure that the customer is happy i.e. by giving him a revised financial proposal to kill the competition and by upgrading and improving his services. We have to support them and prioritize their calls.

Participant 8 (PM4) shared the different methods to follow to keep customers happy and satisfied with their service. Participant 8 noted that it is crucial to keep an open and honest communication with the customers to provide the best service possible:

> The customer satisfaction can be achieved by ensuring adequate communication, building trust. I have noticed that if you tell the customer the truth and explain him that the lead-time will be 10 days and if you meet the time or deliver it earlier, the customer will be happy; and if he is updated on any issues, the customer would accept the delay without challenges. The most important thing is to keep in contact with the customer and give him the confidence that their service implementation is not neglected and is under process. Be transparent to the customer in terms of communication.

Subtheme 1: Conducting after-sales and installation check-ups. The first subtheme that followed was the manner of conducting after-sales and installation check-ups. Participant 1 (BB1) explained that it is also important to show the customers that the providers care about them, even after the service installment. Participant 1 shared that customer satisfaction should always be the main priority of the providers and the company:

> To ensure that the customer is satisfied even after the installation, we need to constantly keep up with them on if we come across with new or let's assume a shortest path to deliver his service, which might minimize his delay, definitely we might request the sales to get in touch and advise them if the customer wants to update his infrastructure based on the updated network.
>
> Definitely, customer satisfaction is our first and last call. The things which will matter to him is the network stability because the customer is paying for his services and he will not be accepting any outage or service interruption, he will

> not even bother if the infrastructure of any ISP is affected; all he needs it 100% uptime. Regular follow-ups and providing him with latest in the market technology.

Participant 4 (FE2) indicated that keeping in touch with the customers, even after the installation, is the key to maintaining customers within the company, notwithstanding the tight competition in the industry: “Well, we focus on keeping the customer happy by improving his services, constantly contacting and staying in touch, providing them good offers and helping them in case of any issues”. Participant 8 (PM4) shared his company’s after-service implementation policy. Through forms, project manager documents the clients’ feedback and they can always improve as needed and requested. All project logs echoed that a service acceptance and feedback form is sent to the customer upon implementation of the service. Participant (PM4) stated,

> After each service implementation, we do have a form, called service acceptance form. This form is usually signed by the customer, if we meet his requirement. So, this is our benchmark, if the customer has signed it then he has accepted the services.

Participant 9 (S1) expressed that, aside from the agreed services, another factor for success is the after-sales support provided by the company. The employees highlighted their genuine concern and care for their customers beyond what the ISP require from them:

> Main thing is to make sure that the customer is getting what he basically has subscribed for and getting the services what he is expecting and having a proper after sales support and customer care.
>
> Well, it is one of the objectives of the company to make sure to retain our customers and to avoid or lose any customer. This is why we are dedicated, we are assigning a dedicated account manager for each customer to understand their needs and to meet their concerns and queries. We have a customer care department also to make sure that they are communicating with the customer, retaining their satisfaction and retaining them with our organization.

Meanwhile, Participant 11 (S3) explained that listening to the customer shows that the service provider is willing to provide what it initially promised. For Participant 11, it was also vital to conduct constant follow-ups through his own team, targeted to address the after-installment needs of the customers:

> In one simple world, just listening to the customer; you need to listen. Customer knows what they want in terms of services and as long as you listen and understand them, you are in a better position to address that requirement. Now it doesn't mean that you have to say yes to everything the customer asks for but you should be in a position to explain to the customer whether the particular thing can be done or it cannot be done and why. It boils down to the word communication. You need to be able to talk with the customer after you have heard the customer first.

> We do have a team that does follow-ups with the customer on regular basis, listening to their pain points and the fact is that the mentality of the organization as a whole today is to address customer pain points and continuously listed to the customer, asking them the right questions, and asking them what they need, what are the difficulties they face, and to address those difficulties is basically most important

Subtheme 2: Delivery time of product and service. The second subtheme was the delivery time of product and service. Participant 1 (BB1) stated that one factor was meeting the agreed timeline and deadline with the clients. The delivery time is an aspect that helps in determining customer satisfaction: "To meet the customer requirement is the best. If the customer's requirement is met on time and target and his 100% satisfied we can say that yes, customer satisfaction has been met." Participant 4 (FE2) highlighted that the service and delivery time, as well as the quality of the output, are main factors to the success of the service provisions: "The success of service implementation depends on the time it took to delivery and the quality of deliverables. If the project meets the requirements of the customer, then it can be called as successful." Participant 5 (PM1) echoed that complete success occurs by meeting the delivery time as well as the quality of delivery. These two factors keep clients satisfied and loyal to the company's services:

> Well, most of the cases like out of say ten services that we have provided, I would say 8 were a success. And for 9 and 10, of course there are multiple factors that really cause the delay. I would not say it was a failure, though it caused a delay in the delivery. Again, there are factors like hardware availability, resource

> availability, field engineer availability and of course, there is a delay from the customer also. So, which really balances and I can still call it a success. However, a little delayed success.
>
> The success factors, if I can say out of 10 services, 8 have been a complete success. When I say complete success, I mean time of delivery and the quality of delivery had been a success.

Participant 6 (PM2) added that delivering the service on time is one of the most crucial factors that customers require from their providers: "Providing the customer, the service on time. Providing it exactly what he requires, not little deviation or something and calling the customer after installation so that they know that somebody wants to know whether they are happy or not." Project Log-AUB and project Log-LMG indicated a timely communication of delays to the customer. Consequently, Participant 9 (S1) again highlighted that customer can measure success through the capability of the company or providers to deliver their promised outputs within a specific and required timeframe: "You determine the success of implementing a service when you really implement the service as per the required scope and within the required timeframe or the promised time frame." Lastly, Participant 16 (T1) discussed the following success factors for the customers: "On-time delivery, happy and satisfied customer. That is it."

Subtheme 3: Adhering to customer requests and needs. The third subtheme was adhering to customer requests and needs. Participant 1 (BB1) explained it is important to be flexible in making adjustments to adhere to the requests and requirements of the customers. Participant 1 shared that even though the project manager cannot fully

acknlowledge and grant the request of customer, they have the duty to provision services close to customer demand:

> Let us assume that the customer wants an E1 service in location A and B. Location A might have the E1 service but location B might not have the E1 infrastructure. So, we need to work around to give the customer something at least not the same level but somehow 99% similar to the original services requirement.

Participant 3 (FE1) believed that the service providers must remember the customers' criteria and expectations. By adjusting to the needs of the customers, the clients will see that they are a priority and valued by the organization:

> The customer has certain criteria's that need to be met initially. They need certain things to be done according to their specifications and whatever you do and however it works. They make it very obvious, specially, the locals they make it very obvious if they either like your services or either disliked them. If they liked it, they would recommend you, and they will be with you for the future. If they do not like you, they make sure that they do not have anything to do with you. When it comes to customer satisfaction, the basics are that you meet all of their requirements and they are pretty happy with it. And if you give them anything more than they asked for or required which is beneficial for them, they tend to be extremely happy and they think good of the company. Like, if they have asked for fiber connection and we give them fiber and then we tell them we will put in Wi-Fi for you for free. This is something they did not know; it becomes good for them.

Participant 16 (T1) shared that it is important to provide the customers with good service, even after installation: “We listen to the customer and we provide them with good support, and we try to give our best to provide them with good service.” Lastly, Participant 18 (T3) stated various points in proving the importance of being present at all times to address the problems and needs of customers. By keeping a close and strong relationship with customers, project manager can ensure they maintain customers and address their needs accordingly:

> The main point of concern is to make sure that if a customer is facing any problem, our staff should coordinate with them and try to understand the issue. Actions should be taken to troubleshoot the issues and fix the problems. These issues during the implementation should be addressed in a timely manner to ensure a successful implementation. The organization focuses on maintaining a strong relation with the customer. We go an extra mile to make sure that the services of the customers are maintained as per the requirements and all the complaints are answered quickly.
>
> I think the most important part to keep the customer happy is to make sure his services are running as per his expectation; and periodically someone should contact him to get his feedback. If he has any issues, we have to answer and resolve them on urgent basis. (Participant 18)

Minor Theme 1: Having a risk management plan. The first minor theme was the need to have a risk management plan. Participant 1 (BB1) believed that another success factor in reducing service-provisioning errors is having a risk management plan prepared.

Participant 1 thought it was important to emphasize this kind of plan to ensure the service provider organization can manage and provide quality service despite the challenges and issues they may face:

> Risk management, yes, well it is the most important thing of project, which needs to be highlighted to each and every department and it definitely plays an important role. Taking the example i.e. if we need to deliver a hardware from one country to another country; the delay, the time it will take from one county, the customs, the immigration, etc. in addition to standardizing the configuration between partner ISP's, because each ISP has its own standards and its own parameters of applying specific configuration, and quality of service parameters that are very sensitive, should be identifed in the risk management approach. These factors do play or which might add into a delay or which might cause a project to fail. But unfortunately, in this project we did not take these points into consideration. I do recommend risk management, which is not part of our critical project life-cycle. So, risk management needs to be emphasized.

Participant 2 (BB2) explained that it is important to identify the risks beforehand to prepare for them accordingly: "Risk management is very important and specially it is critical to identify risks before implementation. However, in the LMG project, we did not do any risk management." Participant 4 (FE2) stated that risk management is important to a company's success, as ISP can save the money, resources, and reputation after a plan is in place: "Risk management is very important. I think everyone should focus on it, as it can save a lot of money and reputation of the company in project implementation;

however, there are no specific risk management conducted in our company." Participant 5 (PM1) shared that planning can help reduce the risks and negative effects that might affect the company after problems and issues arise: "So, it always like, planning is what helping you to identify or mitigate the risk."

Minor Theme 2: Training the staff to keep up with service updates. The other theme that followed was to ensure success, participants believed in the need to train the staff to keep up with service updates. Participant 2 (BB2) believed that there should be periodic training for the staff members to keep them updated with the changes in technology and the environment of their industry: "Yes, I do recommend periodic training on new technologies for all the related staff so they are confident in selling, configuring, and supporting services." Participant 18 (T3) recommended that more training is necessary to ensure staff members are competent and skilled in performing the tasks required of them: "I recommend that we provide more training to the staff and make them more competent in doing their jobs as new technologies are coming in every day."

Sub-research Question 3

Sub-research Question 3 was as follows: What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services? The third and final sub-research question led to a discussion on the factors associated with failures in service provisioning in the Kuwait telecom sector and their affects on the successful deployment of subscriber services. Under the third sub-research question, one major theme and three minor themes emerged. For the majority of the participants, experiencing policy and infrastructure issues was the biggest cause of

failure in their industry. Similarly, the third sub-research question related to the first central research question of the study. The breakdown of the results addressing the third sub-research question appears in Figure 9.

Table 9

Breakdown of the Results Addressing SRQ3

Themes	*n*
Experiencing policy and infrastructure issues Experiencing service delays	10
Needing to follow company policies and requirements more strictly	5
Facing the negative effects of a language barrier	3
Experiencing sudden changes and requests in the installation	2

Major Theme 5: Experiencing policy and infrastructure issues. The fifth and final major theme of the study was experiencing policy and infrastructure issues. Under the major theme, one important failure was experiencing service provisioning delays. Participant 2 (BB2) explained that the telecommunication infrastructure in Kuwait has a vital role in the service provisioning of telecom companies. Telecom companies' huge dependency affects their deliverables after the Ministry of Communication cannot commit and deliver to its promised timeline:

> Telecommunication infrastructure of Kuwait plays a major role in service provisioning. We have a major dependency on Ministry of Communication, where they own the infrastructure. All the services have to proceed via Ministry of Communication and they take their own time. We cannot gain any commitments from Ministry of Communication; however, customer expects a definite timeline so this becomes a challenge in many installations especially in regards to the LMG project.

Participant 4 (FE2) explained that failures may happen due to delays and faulty resources. Project Log-AUB indicated "new fiber pair faulty, request new pair from MOC."As a solution, company leaders must ensure staff members are liable to their duties and the tasks assigned to them:

> Failures can happen because of delays, wrong configuration, faulty media and resource not available. I think a proper project management system should be in place that will connect all the departments together for transparency and task assignment and will make people accountable for their activities.

Participant 9 (S1) also identified that the Ministry of Communication plays a big role in delivery and service outcomes. Therefore, if Ministry of Communication processes and availability do not match their organization, challenges may occur:

> Failure factors: if you fail to provide the service as promised or as described or if you fail to provide it with in the promised period. Of course, we have many challenges, since we have a dependency of the Ministry of Communication; we have to follow their rules and instructions. We have to go through their processes, and the dependency is upon their availability, their support, and their schedule to provide infrastructure or to provide a media. Besides, we are facing challenges in the support required from the Ministry of Communication; they have limited support.

An event in the project Log-LMG indicated: "Copper quality is bad, change the solution to use fiber" causing a substantial delay in the project. Participant 11 (S3) explained that delays might occur regarding the infrastructure, given that a major portion of the

country's infrastructure is old, outdated, and does not meet the technical requirements of delivering services that require a higher data access speed and bandwidth:

> Most of the buildings that we have in Kuwait and most of the infrastructure that we have and I am saying about the copper infrastructure; it is quite old. So, it becomes difficult; and today's telecommunications needs are a lot more bandwidth intensive, there is a lot more data that is involved. There is a lot more graphic that is involved. So, gone are the times when one-megabit connection or two-megabit connection were the norms.
>
> Again, the biggest challenge is always the infrastructure, whether there was copper or fiber, or the wireless connection. SITA bandwidth requirements were not very high so it was pretty much straightforward most of the way. Again, we were using most of our standard equipment, our usual port details. It was straightforward actually.

Finally, Participant 17 (T2) noted that all the organization's resources and processes revolve around the Ministry of Communication. Therefore, if the Ministry of Communication is unavailable, their projects may face delays and other effects as well:

> Because in Kuwait, whatever we need, we have to depend on the Ministry of Communication, either copper or fiber. All the media is owned by the Ministry. So, whatever we require we have to depend on Ministry only.
>
> Yeah, sometimes like if the fiber is not ready, it will take time. Sometime they, Ministry of Communication, are delivering the media on time and sometimes it is taking too much time.

Minor Theme 1: Needing to follow company policies and requirements more strictly. The first minor theme was the need to follow company policies and requirements more strictly to avoid failures and issues. Participant 3 (FE1) indicated that failures stem from not being able to adhere to company policies and rules. However, the need to follow policies also depends on the situation, as changes in processes are sometimes necessary, depending on the requested service:

> Majorly, we need to stick to the company policies, company rules, procedures because the moment you deviate from it everything becomes shady and gets lost. Though it might be for a good cause but it kind of comes out of the system. Somethings are very important that need to be changed; you cannot jump the queue every time because everyone is important, not just your friend or your colleague. So, there are a lot of things that require improvements.

Participant 15 (SN2) explained that because there is a mismatch in deliverables, organizational leaders must be stricter in implementing their processes and policies: "There have been cases where most of the failures have been due to the mismatch in the deliverables and what is delivered." Project Log-TR highlighted a mismatch in the deliverables: "need a revision of the solution, as the customer requested service over fiber and not copper"

Minor Theme 2: Facing the negative effects of the language barrier. The second and final minor theme was failure related to facing the negative effects of the language barrier. Participant 6 (PM2) stated that the language barrier might also cause some delays to the deliverables: "It is straightforward, but then like I said, because of the

language barrier there are delays here and there." Participant 7 (PM3) also indicated that the language barrier is a major challenge:

> As I mentioned earlier that the language barrier is a major concern. To get access to the site you need to have a written form, verbal permission from the clients. These are the challenges that we have faced during this project.

Summary

Chapter 4 included the details of the data collection, data analysis, and results obtained from multiple data points. The chapter contained a discussion of the findings generated by using thematic analysis of the interviews with the 18 participants pertaining to four projects. The study included appropriate steps to adhere to the ethical bounds set forth by the IRB, and incorporating an informed consent approach served to protect the rights of the participants. The purpose of this exploratory case study was to evaluate the sociotechnical factors associated with telecom service provisioning in the telecom sector of Kuwait. The specific problem addressed was the sociotechnical factors and their influence on service provisioning, along with the critical success and failure factors that can help to improve the service-provisioning life cycle.

The qualitative thematic analysis led to five major themes and several minor themes. The analysis of results revealed various social, technical, and environmental attributes that affect the service-provisioning life cycle. Participants validated the findings of the study and reinforced the critical success and failure factors that influence the service provisioning life cycle, identified through the responses to a follow-up questionnaire. The next chapter includes the interpretation of findings, limitations,

recommendations and opportunities for future research, and contribution of this study to social change.

Chapter 5: Conclusion

The fifth chapter of the study contains the discussion of the findings related to the literature about the sociotechnical factors associated with telecom service provisioning. The purpose of the exploratory case study was to evaluate the sociotechnical factors associated with telecom service provisioning in the telecom sector of Kuwait. Furthermore, the specific problem addressed was sociotechnical factors and their influence on service provisioning, along with the critical success and failure factors that can help improve the service provisioning life cycle. A single case study approach involved exploring four projects of services provisioning. The qualitative thematic analysis and led to five major themes, as well as minor and subthemes, related to the research questions. The central research questions were as follows:

CRQ1. How do managers ensure successful deployment of subscriber services in the telecom sector in Kuwait? (Addressed through SRQ2 and SRQ3)

CRQ2. How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment? (Addressed through SRQ1)

The sub-research questions were as follows:

SRQ1. What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment?

SRQ2. What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service-provisioning errors?

SRQ3. What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services?

This chapter includes the interpretation of the findings incorporated into the literature reviewed. The literature grounded in sociotechnical systems theory was suitable for conceptualizing the influence of social, technical, and environmental factors on telecom service provisioning. Key factors highlighted various social, technical, and environmental attributes such as language barrier, cross-functional communication, country's culture, skills and capabilities of the team members, and challenges about the polices and infrastructure of the country.

An exploratory case study approach was suitable for exploring the influence of social, technical, and environmental perspectives of participants on the services-provisioning life cycle. The following sections include a discussion on the interpretation of the findings and the limitations of the study. I also provide recommendations on improving the service-provisioning life cycle and on opportunities for future research. The chapter concludes with a brief discussion of the insights and realizations formed with the results of the study.

Interpretation of the Findings

The purpose of this exploratory case study was to evaluate the sociotechnical factors associated with telecom service provisioning. The analysis of lived experiences provided a rich set of findings that managers might use to improve the service-provisioning life cycle in an Internet service provider organization. This section includes the discussion of the findings in relation to the literature on the subject. The focus of the discussion is the central research questions of the study. I addressed the first central

research question through Sub-research Questions 2 and 3, and I addressed the second central research question through Sub-research Question 1.

Central Research Question 1

Central Research Question 1 was as follows: How do managers ensure successful deployment of subscriber services in the telecom sector in Kuwait? I addressed the first central research question upon completion of the analyses of the second and third sub-research questions by establishing the success and failure components of a service-provisioning life cycle. Two main factors emerged from the analysis on how managers can ensure the successful deployment of subscriber services in the telecom sector in Kuwait. The first factor was meeting the requirements and ensuring the satisfaction of customers (e.g., conducting after-sales and installation check-ups, following the timeline of product and service delivery, and adhering to customer requests and needs). The second factor to ensure success was improving the challenges associated with the policies and infrastructure of the country.

Komunda and Osarenkhoe (2012) stressed that failures in service provisioning can cause many negative effects on a company, such as customer discontent, loss of income, and increased costs. The failures in service provisioning can lead to many negative effects for a company, and one main influence is the ability to convince customers to retain and continue with their service. In addition, the inability of companies to perform social, environmental, and technical functions leads to the failure to satisfy customers, which can lead to negative effects experienced within organizations. Another factor is the core network failure that leads to customer switching (Liang et al., 2013).

The success factors shared by participants highlighted their experiences regarding how to reduce network failures, customer dissatisfaction, and service provisioning delays. This research study involved exploring the idea that customer satisfaction should always be the main priority of service providers. Customer satisfaction is dependent on the concrete performance of the services rather than the customer expectations (Poku et al., 2014; Prasad & Mishra, 2014; Sengupta et al., 2015). Service providers must ensure they are delivering their services as promised and advertised to their consumers. By doing so, they can maintain an environment of satisfied customers by ensuring competitiveness in the market and improving the long-term survival of the service provider in the telecom industry in Kuwait.

Another important success factor was the ability to determine the components of service failures and the willingness to address them. The majority of participants shared ways to resolve policy and infrastructure issues to avoid experiencing service delays. Participants highlighted the challenges and delays that occur due to inadequate infrastructure and governing policies in a country. Çetinkaya et al. (2013) and Doerr and Kuipers (2014) reported infrastructure failures, outbreaks, natural disasters, and other technical issues are the most common challenges service providers face. The review of the literature indicated that Internet service providers must constantly invest in and improve the availability of the network infrastructure.

Another issue identified in the study was the lack of a telecom regulatory authority to govern and manage the growth of the telecom sector within the country (Hakim & Neaime, 2014). The data corroborated this issue, as the participants

highlighted that when there are issues within the Ministry of Communication, they are left with further problems and complications that lead to service provisioning delays. Participants also noted that Internet service providers must incorporate an effective risk management approach to mitigate the highlighted resource and infrastructure issues and address them to improve the service-provisioning life cycle.

Central Research Question 2

Central Research Question 2 was as follows: How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment? The focus of the second central research question was the sociotechnical factors that affect the service-provisioning life cycle in a Kuwait-based service provider environment. The thematic analysis of the study indicated that sociotechnical factors play a major role in the service-provisioning life cycle of telecom organizations. I used (a) social, (b) technical, and (c) environmental categories to address Central Research Question 2, which assisted in exploring the influence of various sociotechnical factors in technology-enabled service provider organizations. Each category had one major theme, which indicated the association of each factor with the service-provisioning cycle.

Social factor. In the social factor category, the majority of the participants reported the effectiveness of practicing a cross-functional communication within the organization. Each member or department must be capable of performing tasks in a predefined period and must comprehend the importance of teamwork. Members of the team within the service provider organization must be capable of working with one another and must have the skills and qualifications required to work using technology.

Team members should understand the importance of performing their tasks in a timely fashion and achieve their main goal of successfully provisioning services to their customers. It is also important to incorporate a continuous improvement process and ensure employees learn new technologies to understand and provision services for customers.

Technical factor. The technical factor associated with the services-provisioning life cycle was the availability of the infrastructure to support the services provided by service providers. The country's infrastructure plays a major role, as it adds a layer of dependency between the service provider and the end user. The limitations and challenges associated with Kuwait's old copper infrastructure can hinder the provisioning of services, which can lead to unsatisfied customers. It is also important to understand the limitations of service providers' ability to address the challenges faced during the provisioning of the services based on the limitations of the infrastructure. Service providers must employ technically qualified and capable people who can address the need to understand, implement, improve, and apply technology in an effective manner. Participants noted the lack of risk-management practices involved in the current service provisioning cycle and recommended adapting the practices to reduce service-provisioning challenges.

Environmental factor. The third factor was the environmental component, where stakeholders must be able to work with the norms and practices within Kuwait's culture. Participants shared that the language barrier, time, work attitudes, and lack of knowledge affect the environmental aspect of the service-provisioning cycle. Understanding various

factors associated with cultural diversity as identified in the literature may resolve these issues. Cultural diversity is one of the main factors that can heavily influence the performance and well-being of the stakeholders in an organizational system (Fitzsimmons, 2015; Jansen et al., 2015; Podsiadlowski et al., 2013). It is imperative to understand cultural influence and effectively manage the different aspects of diversity to develop a conducive and healthier work environment for staff members and to address any cultural issues that may prevail in a multicultural organization.

Limitation of the Study

This study consisted of various forms of data collection that included face-to-face interviews, organizational documents, and follow-up questionnaires. The primary limitation of the study was that it included only one Internet service provider in Kuwait. Although analyzing the responses of all study participants across four projects and validating the data against organizational documents and follow-up questionnaires addressed this challenge, no notable factor hindered the transferability of the study. Due to the limitations of resources and funding, it was not possible to perform the study on multiple service provider organizations in the GCC region. Using the theoretical stance and understanding that GCC countries have a similar infrastructure and governing policies, the results might be transferable; however, further research is necessary to confirm the transferability of results.

Recommendations

The purpose of this study was to evaluate sociotechnical factors associated with telecom service provisioning. The results aggregated from this study revealed the

influence of social, technical, and environmental factors associated with the service-provisioning life cycle, which can help decision makers in service-provider organizations to improve their service-provisioning processes. I developed several recommendations for future research and practice.

Recommendations for Practice

During the study, participants highlighted the importance of cross-functional communication. It is important that service providers improve their cross-functional communication to streamline and reduce the information availability gaps in the service provisioning process. It is also important that staff comprehend the importance of representing the company effectively. Service providers are customer-oriented organizations, and it is crucial that management implements a strategy to ensure staff receives training and is able to handle customer queries from inception to the close of the service implementation. Organizational leaders should incorporate a risk management approach into the service provisioning process to mitigate various known and unknown risks and to increase the success of the service implementation. Having a stricter educational and skill requirement when screening staff members helps to ensure all members are capable of performing their roles within the service provider organization. It is equally important to have an environment of continuous improvement to evaluate the strengths and weaknesses of employees and provide them with regular trainings to remain competitive and productive.

Telecom infrastructure plays a major role in the economic growth of the country, and another recommendation is to establish a telecom regulatory authority that would

take the necessary steps to improve the infrastructure of the country. It is also important to establish stricter processes and polices within government sectors to improve the level of process orientation and punctuality. Delays in processing within governmental organizations affect service providers and consumers and hinder the economic growth of the country.

People from a variety of nationalities live in Kuwait, and encouraging a common language is important, will help in reducing issues that arise due to language barriers, and will improve day-to-day transactions. Another recommendation is that the key decision makers of the service providers in Kuwait periodically review and amend their policies and incorporate the critical success and failure factors shared by the participants in this study. Service providers must incorporate policies that support cultural diversity within their organizations to mitigate the language barrier, negative norms, and negative work attitudes reported in the study. Managers should incorporate the sociotechnical systems theory to understand the social and technical elements that form the technology-enabled organizational system. A sociotechnical lens will assist mangers in improving the policies and procedures that align with the social and technological attributes of the service provider organization.

Recommendations for Future Research

The findings of the study provided the exploratory groundwork to understand various social, technical, and environmental factors associated with telecom service provisioning by using a sociotechnical lens. The results of the study presented a snapshot of a single Internet service provider organization. Thus, future study should involve

employing a broader group of participants involving multiple Internet service providers within Kuwait and the GCC region. By interviewing other service-provisioning stakeholders such as service consumers, future researchers may acquire the perceptions and experiences of the customers to determine whether the Internet service providers are fulfilling the needs and requirements of their consumers. Scholars should consider conducting a quantitative research study that validates the influence of the identified social, technical, and environmental factors across service provider organizations in the GCC region. Another research study recommendation is to employ data records that may show how various functional units practice the social, technical, and environmental factors within the service provider organization. These records can assist in triangulating and validating the findings of the study.

Implications

Significance to Social Change

Implications from this study affect individuals, telecom organizations, and consumers. Telecommunication is one of the most important pillars of economic growth within a country. Evaluating the social, technical, and environmental factors of a telecom service-provisioning life cycle is vital to both achieving transformative positive change in service implementation and mitigating the consequences of service failures. This study involved exploring various social, technical, and environmental factors that are critical to the success of having a stable telecommunication infrastructure at individual, corporate, and government levels. Improving telecommunication services and the infrastructure can directly influence the economic growth of the country.

Successful implementation of Internet services reduces consumer frustration and the effort and time required to resolve connectivity and service-related issues. A successful implementation not only promotes customer retention, but also reduces the challenges consumers experience when they shift from one provider to another. The stability and availability of the Internet services ensures access to ecommerce, online education, and social media, and interruptions in service can lead to major losses for online businesses, financial organizations, and other industries. Thus, the findings of this study may serve as the groundwork for improving services for consumers.

Significance to Theory

Sociotechnical systems theory provides a lens to view the interactions of humans and technology in a technology-enabled service provider organization. Maguire (2014) reported that the sociotechnical system employs technological and social components to maximize the productivity of technology-enabled organizations. A technology-enabled service provider organization can benefit from the sociotechnical perspective provided by the sociotechnical systems theory. Exploring the social, technical, and environmental factors associated with telecom service provisioning using a sociotechnical systems theory perspective led to identifying critical success and failure factors that can reduce service-provisioning failures and increase successful deployments. The findings of the study, in conjunction with the sociotechnical systems theory, contribute to the body of knowledge regarding how telecom organizations can improve the service provisioning life cycle.

Significance to Practice

Service-provisioning failures have led to unpredictable consequences that affect not only service providers but also employees faced with demotivation, frustration, and low morale. Successful implementations will promote an environment of increased employee motivation, productivity, and morale, as well as positive social change. The findings of the study provide the decision makers with an understanding of various critical success and failure factors that can help improve the service-provisioning life cycle. Successful service implementations can reduce customer frustration and increase customer retention, which can help reduce the cost of shifting from one service provider to another.

Conclusion

The purpose of this exploratory case study was to evaluate the sociotechnical factors associated with telecom service provisioning. The service providers of Kuwait constantly experience various issues while provisioning services for their customers. These issues threaten the long-term survival of the service providers, primarily due to dissatisfied customers, loss of revenue, and failure in customer retention. Identifying critical success and failure factors associated with the service-provisioning process can help managers improve the provisioning life cycle. Although this study had limitations that researchers may overcome in future research, the overarching benefits of the study may serve as the groundwork for decision makers in the telecom industry to understand various social, technical, and environmental factors that can help to improve service-provisioning processes. The findings of the study indicated the importance of

incorporating the sociotechnical framework to improve the service-provisioning life cycle of the Internet service provider. The findings of the study also indicated the importance of cross-functional communication, improving the infrastructure of the country, incorporating risk management practices, improving employee skills and qualifications, and functioning as an effective team within the organization to deliver and maintain subscriber services successfully. Therefore, decision makers, managers, planners, and implementers must consider the influence of the identified social, technical, and environmental factors associated with telecom service provisioning and enhance their policies and processes to improve the success of service implementation.

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Appendix A: Permission Letters

Title: The history of telenet and the commercialization of packet switching in the U.S.
Author: Stuart L. Mathison; Lawrence G. Roberts; Philip M. Walker
Publication: IEEE Communications Magazine
Publisher: IEEE
Date: May 2012

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Appendix B: Interview Guide / Semi-structured Questions

A. Interview Preparation Activities:

- Procure digital audio recorder and verify equipment.
- Procure required stationary i.e. notepads and pen.
- Print copies of the interview protocol and consent form.
- Review interview protocol and interview questions.
- Verify the interview site for suitability and ensure a supporting environment.

B. Interview Activities:

- Gain participants signature on the consent form.
- Conduct initial briefing on the purpose of the study, interview, and the data collection activities.
- Start with an Ice breaker question to ease the participants.
- Explain the concepts of the interview and its importance to the study.
- Conduct the interview by following the semi-structured interview questions.
- Maintain focus on the topic by guiding the interview questions.
- Probe participants for clarifications.
- Identify and capture non-verbal cues.
- Record observations.

C. Post Interview Activities:

- Verify recordings to ensure that questions and answers were captured.

- Compile personal reflections.
- Validate if follow-up interview is required.
- Submit recordings for transcription.

Semi-Structured Interview Questions

Central Research Question.

1. How do socio-technical factors affect the service provisioning life-cycle in a Kuwait-based service provider environment?
2. How do sociotechnical factors affect the service-provisioning life cycle in a Kuwait-based service provider environment?

Interview Questions:

Category	**Question**
Social	1. What social factors influence the services provisioning life-cycle? 2. What are the technical competencies required for service provisioning? 3. How is the cross-functional communication managed and controlled to support service provisioning? 4. How do you determine the success or failure of a service implementation? 5. What are the factors that ensure customer satisfaction? 6. What are your recommendations for improving the service provisioning life-cycle?

Environmental	1. How does the culture of Kuwait affect the provisioning of services? 2. What organizational functions are involved in the service provisioning life cycle? What are their roles? 3. What are the organizational processes involved in the services provisioning? 4. What is the importance of risk management in service provisioning? And how does it take place? 5. What are the organizational policies on customer retention? 6. What are the factors that ensure customer satisfaction? 7. What are your recommendations for improving the service provisioning life-cycle?
Technical	1. What are the technical factors involved in the service provisioning life-cycle? 2. How does the current organization's IT infrastructure support the provisioning of products and services? 3. What type of information is needed from each function to support the service provisioning life-cycle? 4. How does the telecommunication infrastructure of Kuwait affect the service provisioning life-cycle? 5. What are the factors that ensure customer satisfaction?

	6. What are your recommendations for improving the service provisioning life-cycle?

Appendix C: Invitation Letter

Date: _____

Dear _____,

My name is Fahad Iqbal and I am a doctoral student at Walden University. I would like to request your participation in a doctoral research study that I am conducting titled: Evaluating Socio-technical Factors Associated with Telecom Service Provisioning – A Case Study. The focus of the study is to evaluate the influence of social, technical, and environmental factors on the service provisioning life-cycle.

The study involves a face-to-face interview and a completing a follow-up questionnaire. Participation is completely voluntary and you may withdraw from the study at any time. Any information provided by you will be kept anonymous.

If you would like to participate in the study, please read the below consent from and reply me with your agreement by stating "I consent" in the email.

Your participation in the research will be of great importance as the focus of the research is to enable successful service provisioning that will promote an environment of increased employee motivation, productivity, employee morale, and positive social change.

Thank you for your time and consideration.

Regards,
Fahad Iqbal,
Doctoral Student,
Walden University

Appendix D: Follow-up Questionnaire

Topic: Evaluating Socio-technical Factors Associated with Telecom Service Provisioning – A Case Study

Thank you for your participation and valuable time to complete this study. This is the final part of the study and you are receiving this follow-up questionnaire to rate the influence of critical success and failure factors on the service provisioning life-cycle. Your experience and opinion is valuable in assisting future research related to improving the telecom service provisioning life-cycle. Data collected using this questionnaire will be synthesized into the overall findings of the study. However, the researcher will not use your personal information for any purpose outside of this research project and no form of name or contact information will be disclosed in the study.

This questionnaire has two parts, Part-A asks you to rate a list of identified success factors based on their importance in improving the service provisioning life-cycle. Part-B asks you to rate a list of identified failure factors based on their impact on the service provisioning life cycle.

Part A: Success Factors	
The first column represents the factors that might assist in improving the service provisioning life cycle in effectively implementing subscriber services.	
The second column asks you to rate the importance of the identified factors using a scale of 0 to 3; where: **0 = Not Important,** **1 = Slightly Important,** **2 = Moderately Important,** **3 = Very Important,** **DU = Don't understand/ Don't Know**	
Success Factors	**Importance (Scale = 0-3)**
On time delivery to client specifications	
Coordination of material and human resources	
Stability in service	
Follow-up communication (with the customer)	
Updated/Latest technology to support product and services	
Arabic language	

Part B: Failure Factors	
The first column represents the factors that might hinder the service provisioning life cycle in effectively implementing subscriber services.	
The second column asks you to rate the impact of the identified factors using a scale of 0 to 3; where: **0 = No Impact,** **1 = Slight Impact,** **2 = Moderate Impact,** **3 = High Impact,** **DU = Don't Understand/ Don't Know**	
Failure Factors	**Impact (Scale = 0-3)**
Lack of coordination within organization	
Resource shortage (equipment and human)	
Hardware malfunctions	
Configuration issues	
Lack of interpersonal connectivity with customers	
Limited staff training in new technologies	

Appendix E: Sample Data Coding Table

Sample Data Coding Table: Qualitative Thematic Analysis

Data	Code Assigned	Themes Formed	SRQ and CRQ
-Participant 1: "Starting from sales, coming to presales, engineering, implementation, field engineers, Transmission engineers, complete team will be involved in the implementation of the project from A to Z." -Participant 2: Various departments such as sales, presales, service provisioning, backbone engineering, field engineering, and transmission play a role in service provisioning. Each department has a specific role such as to gather the information, forward the information, assign tasks, and do the implementation. -Participant 4: "When you say cross functional communication, this is basically between the different departments in the company." -Participant 6: "It is mostly sent in, with the work order to respective person. Once that person completes the job then to move forward we give it to the, we send another work order to the next person who has to carry it forward till it is implemented." Project Log-LMG:	• Cross-Functional Communication • Collaboration • Teamwork • [Work between] Different Departments • Role awareness of each member	Major Theme 1: Practicing a cross-functional communication within the organization	SRQ1-CRQ2

“ 12/05/13 - 16:19, Sales, SO Forwarded to OPS Assigned to: [Project Manager] 23/05/13 - 13:08, Project Manager, WO# 294309 Created - Kindly Apply for one Pair of fiber from Ras Alsalmyia exchange to LMG Assigned to: [MOC Liaison] 01/12/13 - 14:54, Project Manager, WO# 294309 Created - please arrange for patching and coordinate with Field Engineer to bring the fiber up Assigned to: [Transmission Engineer] 02/12/13 - 16:03, Transmission Engineer, WO# 317692 - please arrange for a site survey along to use 1 core of fiber. Re Assigned to: [Transmission Engineer] 08/12/13 - 09:48, Project Manager, WO# 294309 Created - Ras Alsalmyia exchange to LMG and provide the customer with 3 Mbps Data conection pointing to them head office with ADSL backup. { ADSL number will be provided Later }Assigned to: [Backbone Engineer] ” Project Log-AUB: “26/10/16 - 11:40, Sales, SO Forwarded to OPS Assigned to: [Project Manager]			

24/11/16 - 16:06, Project Manager, WO# 446357 Created - Kindly the shift the links Assigned to: [Field Engineer] 24/11/16 - 16:07, Project Manager, WO# 446357 Created - Kindly the shift the links. Assigned to: [Backbone Engineer] ” Project Log-SITA “17/05/16 - 12:45, Sales, SO Forwarded to OPS Assigned to: [Project Manager] 16/06/16 - 13:53, Project Manager, WO# 435258 Created - Kindly do site survey for SITA Kuwait project, Assigned to: [Transmission Engineer] 01/11/16 - 10:58, Project Manager, WO# 435258 Created - As part of SITA Kuwait project, kindly arrange to provide MPLS connectivity to the below site. Assigned to: [Backbone Engineer]”			
-Participant 1: “Because Kuwait is an Arabic speaking country and it definitely effects, when we communicate with their government sector, language barrier is the main thing as per my understanding.” -Participant 6: “Culture, because of, Kuwait affect service provisioning because of communication gap and language barrier. Most people speak Arabic	• Language barrier • Communication • Work culture • Time management	Major Theme 2: Keeping in mind Kuwait’s culture	SRQ1-CRQ2

and it becomes difficult to communicate or understand if they do not speak English." -Participant 17: Yeah, Kuwait culture affect us because we are not Arabic speakers and for coordination with ministry we need to speak Arabic, we need to know Arabic, and it is very important because they are all native Arabs in Ministry of Communication and they are not talking in other language. Language barrier is the main problem here in Kuwait. -Participant 2: This is a common issue and it happens both at the customer side as well as when dealing with the Ministry of Communication. Processes are not defined and there is no definite timeline for anything. Commitments are not honored many times. -Participant 6: Yeah, the culture affects because sometimes if you call the customer you speak to him, you tell him you are going to come on a certain day. You are scheduling something and the customer either doesn't understand what you are saying or he is not there at that moment for whatever reason. -Participant 10: Culture of Kuwait, out here, people take for granted. There are government regulations and people have the attitude like come			

tomorrow. these are the factors that affect the provisioning of the services. you need to take care of all these considerations before actually planning out or phasing out. Project Log-LMG "30/05/13 - 16:02, Project Manager, Delay Reason Updated : MOC process and fiber not ready. Project Log-AUB "26/10/16 - 11:47, Project Manager, Delay: Documents should be converted in Arabic before processing 15/11/16 - 11:26, Project Manager, Delay - fiber not ready from MOC" Project Log-TR "14/02/15 - 22:16, Project Manager, Delay: Installation scheduled for 15th Feb 2015, Customer not available. 17/02/15 - 22:26, Transmission, WO#386733 Closed - Job Completed. However, customer did not speak English and it was difficult to take customer acceptance.			
-Participant 2: Well, it is <u>important to have people who are qualified and have the right education</u>. They should be capable of handling technology related things as well as human interactions. They should be good	• Knowledge • Skills • Capabilities • Right Education	Major Theme 3: Ensuring the employment of qualified and capable people	SRQ1-CRQ2

with the customer and should have the ability to get the work done. -Participant 6: First of all, the provisioning team needs some basic technical knowledge. They have to know what hardware can be used for which service. -Participant 7: As per me, yes you have to understand the technical requirement from customer according to the scope of the work and a project manager should have at least a technical background of delivering the service. -Participant 13: The most important competency, technical competencies required is to have, be the resources involved is the communication skill, and it's very important for anyone for whose involved in the cycle to understand what is his role to be played and what is his responsibility to be played. Project Log-TR "WO# 387784, Re-Assigned - Please assign alternate resource as the existing technician is unaware of the GPON technology"	• Competency		
-Participant 2: Customer retention is a very important issue. Specially in Kuwait where the market is very small and customers rotate between the service providers. We have to make sure that the customer is happy	• After-sales care • Timely delivery of products • Making customers	Major Theme 4: Meeting the requirements and satisfaction of customers	SRQ2-CRQ1

-Participant 8: The customer satisfaction be achieved by ensuring adequate communication, building trust. I have noticed that if you tell the customer the truth and explain him that the lead time will be 10 days and if you meet the time or deliver it earlier, the customer will be happy. -Participant 1: "To meet the customer requirement is the best. If the customer's requirement is met on time and on target and his 100% satisfied we can say that yes, customer satisfaction has been met." -Participant 4: "The success of service implementation depends on the time it took to delivery and the quality of deliverables. If the project meets the requirements of the customer, then it can be called as successful." Project Log-TR " 01/03/15 - 12:52, Project Manager, In-Service Notification sent- Project Closed Successfully Project Log-SITA "05/12/16 - 08:05, Project Manager, In-Service Notification sent to Customer along with the service acceptance and feedback form – Project Closed successfully"	happy • Satisfied/ Satisfaction • Customer retention • Meeting delivery time • Meeting customer requirements • Quality of service		

-Participant 2: Telecommunication infrastructure of Kuwait plays a major role in service provisioning. We have a major dependency on Ministry of Communication where they own the infrastructure. All the services have to be proceed via Ministry of Communication and they take their own time. We cannot gain any commitments from Ministry of Communication; however, customer expects a definite timeline. -Participant 4: "Failures can happen because of delays, wrong configuration, faulty media and resource not available." -Participant 9: "Failure factors, if you fail to provide the service as, as promised or as described or if you fail to provide it with in the promised time frame." Project Log-LMG "27/05/13 - 13:40, MOC Liaison, Copper quality is bad, change the solution to use fiber"	• Delay from government • Unforeseen issues • Infrastructure	Major Theme 5: Experiencing policy and infrastructure issues	SRQ3-CRQ1

Appendix F: NVivo11- List of Themes

Name	Sources	References
SRQ1. What are the social, technical, and environmental factors associated with the service-provisioning life cycle in a Kuwait-based service provider environment	0	0
A. Social Factors	0	0
Practicing a cross-functional communication within the organization	2	16
Each member or department must be capable to perform his, her or their role	0	0
Practice of teamwork	0	0
Representing the company effectively	1	5
Taking care of the customers	1	2
Language used by the service provider employees	2	2
Considering the cultural issues in Kuwait	2	2
Practicing effective planning	1	1
B. Environmental Factors	0	0
Keeping in mind Kuwait's culture	2	25
Language barrier	2	12
Lacking time orientation	2	8
Manner of working	2	4
Lacking knowledge on technology	2	1
Following the organizational policies and regulations	2	3
C. Technical Factors	0	0
Ensuring the employment of qualified and capable people	2	15
Following strict service requirements	2	11
Updating of infrastructure to keep up with the changes	2	2
SRQ2. What critical success factors for service provisioning in the Kuwait telecom sector contribute to reducing service provisioning errors	0	0
Meeting the requirements and satisfaction of customers	1	25
Conducting after-sales and installation check-ups	1	11
Delivery time of product and service	1	9
Adhering to customer requests and needs	1	4
Having a risk management plan	1	9
Training the staff to keep up with service updates	1	3
Having clear and detailed goals per project	1	1
Having a competent and capable staff	1	1

SRQ3, What factors associated with failures in service provisioning in the Kuwait telecom sector affect the successful deployment of subscriber services	0	0
Experiencing policy and infrastructure issues	1	10
Needing to follow company policies and requirements more strictly	1	5
Facing the negative effects of language barrier	1	3
Experiencing sudden changes and requests in the installation	1	2

Appendix G: Follow-up Questionnaire Responses

Participant's response - Total 18 Participants

Success Factors	0 = Not Important,	1 = Slightly Important	2 = Moderately Important,	3 = Very Important,
On time delivery to client specifications				**18**
Coordination of material and human resources				**18**
Stability in service				**18**
Follow-up communication (with the customer)				**18**
Updated/Latest technology to support product and services			**4**	**14**
Arabic language		**1**	**6**	**11**

Failure Factors	0 = No Impact,	1 = Slight Impact,	2 = Moderate Impact,	3 = High Impact,
Lack of coordination within organization				**18**
Resource shortage (equipment and human)				**18**
Hardware malfunctions				**18**
Configuration issues				**18**
Lack of interpersonal connectivity with customers				**18**
Limited staff training in new technologies			**2**	**16**