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The Evolution of Technology in Call Centers

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The Evolution of Technology in Call Centers

by

Julieo S. Thompson

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in
Computing Technology in Education

College of Engineering and Computing
Nova Southeastern University

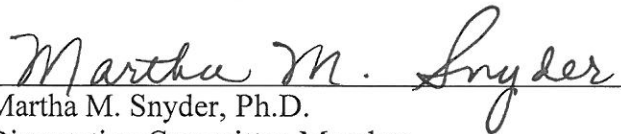
2019

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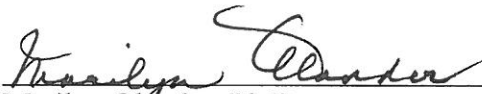
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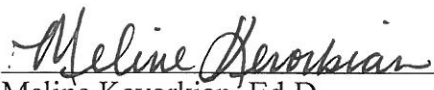
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An Abstract of a Dissertation Submitted to Nova Southeastern University in Partial
Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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Historical research was conducted through literature. The report traces the evolution of technology in call centers (CCs) from their early inception to 2018. CCs are integrated into many facets of multidisciplinary areas of business, industry, and public and private institutions of higher education. Three research questions were addressed:

1. What technologies enabled the start of CCs? How did the communications between customers and CSRs take place? What was the content of the earlier communications?
2. How did services and communications evolve as technology matured?
3. What are the current state-of-the-art technologies that exist in CCs? Which industries appear to have the best solutions? What are these solutions?

Photograph Analysis Worksheets and Written Document Analysis Worksheets from the National Archives and Records Administration were used to analyze primary source materials. Also, used were Primary Source Analysis Tools from the Library of Congress. The final report offers a comprehensive history of the technology evolution within the industry. Included are a discussion of state-of-the-art technologies, the range of their applications and suggestions for staff training.

Acknowledgments

I wish to express my sincere appreciation to my advisor, Dr. Trudy Abramson for her time, talent and treasure of knowledge throughout the dissertation process. I am very humbled and honored to have been a student of Dr. Abramson and would not be the person who I am today without her exceptional guidance and wisdom. A very special thank you to both Dr. Marti Snyder and Dr. Marilyn Olander for your contribution as committee members. Your editorial feedback, personal encouragement, and genuine interest in my research pursuit contributed to the successful completion of this report and were vital to my success.

I would like to thank my mother, Gloria Thompson, grateful to my late father, James Thompson, and honored by every family member, colleague and friend for your support, thoughts, and prayers over the years. Finally, to all the people that answer the telephone or send emails at call centers each and every day, you do make a difference, you are valued, and I thank you - this is only just the beginning.

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Chapter 1

Introduction

Background

Rowe, Marciniak, and Clergeau (2011), suggested that call centers (CCs) “are often considered to be a hotbed for testing new information technologies (p. 337).” Such technologies play an important role in the delivery of excellent customer service, no matter the industry, as well as reduce stress within the CC environment. The key metric to improve customer experience is efficient use of communication channels that attract, connect, and retain clientele (Sencer & Ozel, 2013).

The technological contribution to CC development and the way it enables new organizational forms, has been previously examined, but few studies explicitly focus on the evolution of technology in CCs. This study employed a historical research methodology, developed an understanding of the past through the examination and interpretation of evidence, and made predictions about the future on the speed at which new technologies emerged and ultimately changing CC operations.

By understanding the evolutionary role of CCs, sometimes known as Customer Contact Centers (CCCs) in many contemporary and multifaceted settings and the use of technologies CC industry stakeholders have provided better service and utilized resources effectively. In fact, CCs reflect a much wider function work since they became the centralized and integral telecommunication gateways for many industry stakeholders, for

example private sector businesses, and entities including telemarketing agencies, postsecondary institutions of higher education, U.S. government agencies, and those that provide emergency response services. These infrastructures represent a set of resources, employees, and technologies serving as a communication exchange between customers and service providers (Aksin, Armony, & Mehrotra, 2007) and now serve as a strategic central hub for marketing, branding and customer engagement.

In addition, CCs as a crucial segment of the customer experience use technology that standardize, streamline, and uniform service across multiple contact channels (e.g. voice, fax, e-mail and Internet), and operating in a single network call queue or multiple call queues. Moreover, the CC industry continues to grow exponentially to sustain entry-level employment, deliver customer service beyond the use of the phone, impact business, and produce economic gains (Cook et al., 2013; Murthy, Challagalla, Vincent, & Shervani, 2008; Sitzmann, 2011). As admonished by Sencer and Ozel (2013), CCs handle large volumes of service requests over the telephone, have expanded their operations to include contact functions such as processing letters, faxes, and e-mails and provide extended services through synchronous online chats.

Problem Statement

Early communications in the 1870s through 1960s which were telegraph messages, telephone and the switchboard, and the Automatic Call Distributor (ACD) marked more efficiency in business as well as cost-efficiency. By the late 1990s and early 2000s advances in technology challenged companies on scaling services and fulfilling operations. Notwithstanding the challenges, CCs became major contributors to

the financial sector of many economies worldwide. According to Pande (2005), the convergence of computing and advancements in telecommunications and satellite technology altered the landscape of work in CCs. Indeed, Wilson (2010), admonishes that CCs as a multi-billion-dollar industry employs approximately one to two percent of working citizens and as much as four percent of populations in some regions of the world.

Pande (2005), further noted that there are great opportunities for businesses to progress and offer new ways of communication to their customers in accordance with customers changing expectations and demands. Understanding, by review of literatures, the growth and evolution of CCs for the past few decades as it moved from back-office entity to strategic partnership with other business elucidated at length the phenomena of technology that made the industry a key player in the customer-centric age. The problem addressed was understanding the evolution of technology, which pushed the limits for what CCs became and challenged companies to evolve. For example, software application that run automated tasks through scripts over the Internet called artificial intelligence (AI) chatbots, appeared to threaten to replace humans versus being supplement to them (Dale, 2016). Online chatbots are a computer program or AI that appears to hold a conversation exchange with customer through voice prompts in natural language, text and essential respond in ways that a human agent would. The results of this work enable companies to cut customer defections using technology to ensure great customer service provided by an effective knowledge base beyond automating simple requests. Chatbots are able to fulfil tasks and provide assistance by accessing information quickly and in an efficient way to optimize the service experience. To this

end, all stakeholders of CCs should take advantage of the best possible solutions of how CCs are changing. These solutions must be presented in a form usable by all stakeholders.

As noted, the 1990s led to the exponential growth of CCs, including quality customer support and CC success in the United States and abroad due to technological advances: the computer, Internet, websites, and advanced telephone hardware and software equipment (D'Alleva, 2015; Holland & Lambert, 2013). As customers mandate added functions and responsibilities, CCs required increasingly sophisticated technology and personnel who are trained to maximize performance through service and information delivery.

Goal

Technology has reshaped multiple sectors of the global economy in far reaching ways as noted by Tracy, Norhman and Wieck (2016), and the acceptance of technology is the industry standard for business, education, and lifestyle. The goals were to conduct an extensive literature search on the evolution of technology in CCs and to create a report that would help organizations maximize the technology and applications in use today.

The phenomenon and evolution of technology in CCs were examined through the development of a descriptive and historical study. The study addressed industry needs from the 1950s to 2018 and the state-of-the-art technologies created and expanded upon to meet those needs. Furthermore, the use of more advanced technology in CCs has led to an increase in the skill required for customer service representatives (CSRs) to adequately perform their job. Correspondingly, Zito, Emanuel, Molino, Cortese,

Ghislieri, and Colombo (2018), citing the work of Bakker, Demorouti and Schufeli informed that main characteristics of the call center job include performance monitoring to lack of control on activity. Therefore, the study also looked at training best practices for CSRs and procedures unique to this industry as recommendations for stakeholders. The analysis of existing literature led to the necessity of reframing of belief on the effect of technology on CCs essence.

Research Questions

To guide the investigation, three major questions were formulated. All were amended as the literature search progressed. They appear here in their final form and are addressed within the document. The first revolves around issues that elaborate upon the beginning of the industry. The second traces its evolution and the third looks at state-of-the-art technologies.

1. What technologies enabled the start of CCs? How did the communications between customers and CSRs take place? What was the content of the earlier communications?
2. How did services and communications evolve as technology matured?
3. What are the current state-of-the-art technologies that exist in CCs? Which industries appear to have the best solutions? What are these solutions?

Relevance and Significance

The explosion of online shopping for clothing, food, furniture and insurance as well as the growing expansion of telemedicine and related services have made the need for effective, remote customer service a vital and expanding industry. Call centers have been in existence about 70 years. This limited history makes it possible to present a complete picture of the past and the present. In order to provide the best possible solutions to meet current needs, stakeholders are presented with a complete picture of technology and the ways in which it is/was used for communication.

A historical study is unlike traditional studies in which the literature review serves as a basis for methodology. Although the literature is always the starting point, chapter two, as presented in this report, is the end product built on top of the original. It evolved during methodology and was constantly updated to provide the comprehensive picture that was achieved.

Hannif, Cox, and Almeida (2017), recognized that the business cycle of many organizations revolve around CCs as a critical link between customers and the product or service being sought. Of course, the relationship between information and communication technologies and employee quality of work life, drives employee performance (Hannif et al., 2017). Correspondently, the technology change as new ACDs, IVRs, and other CTI advancements become available (Cox, 1999).

In addition to what has been stated above, the significance of the research can also be understood as revealing any understudied issues concerning the evolution of technology, more specific to communication with customers in accordance with customers changing expectations and demands. To this end, historical evidence

pertaining to the advancement of technology was reviewed. In truth, the study of history is a phenomenon because historical information possesses a practical, intrinsic, and educational value (McDowell, 2013). Under those circumstances, the relevance and significance of understanding the evolution of technology as a driver of CCs advancement historically, is warranted.

Generally speaking, CCs handle customer queries, provide helpline services and certain aspects of sales and marketing activities. Prior to the 1970's and 1980's IT equipment was cost prohibitive for smaller companies. By the late 2000's with the Internet boom transmission channel capacity became vital to success. Hannined and Harialuto (2017), found that channel effectiveness and communication quality as mediators of customer loyalty. The work distinguished technology channels in CCs encompassed a wide range of hardware and software tools such as email, chat, and social media. In the same fashion, Samarajiva and Shields (1990), argued that the field of telecommunication looks at channels and network of communication and their underlying technologies, to create value together. Telecommunications are used to organize computer systems into telecommunications networks, for communication of information.

Scope of the Study (Limitations and Delimitations)

Limitations

The first limitation identified was the study looked at one aspect, evolution in technology, which in turn ignored whether the demands on CC drove the need for changes in technologies. Second, the number of prior research studies on the topic were

limited. There was a plethora of literature on CCs and how it evolved to become CCCs and its use of technology, but few literatures discussed the timeline of the evolution of technology and limited the scope of the study. The goal was to provide a comprehensive, detailed account of several aspects of the evolution of CC technology. However, as no historical study is all inclusive, it allowed for future research to expand the study to include if the demands on CCs influenced changes in technology in a rapidly growing and changing all-inclusive industry. Nonetheless, the study was manageable, and the goal was achieved.

Delimitation

The delimited factors imposed on the study included, the choice of goals, the research questions, population, and theoretical perspectives. The result of this study was generalizable to (a) CCs stakeholders within in the industry, (b) in the United States and (c) inbound CSRs. The first delimitation was the choice of problem itself, the evolution of technology in CCs, which failed to consider among other things, financial impact to organization, and hirability (i.e., skillsets).

Definition of Terms

Listed in this section are definitions of some essential terms used throughout this study.

After-call work: Work that is required of an agent immediately following an inbound call is after-call work. This work often includes entering data, filling out forms, and making outbound calls necessary to complete the transaction. The agent is considered unavailable to receive another inbound call while in this mode. After-call work is also

known as *wrap-up* and *post call processing* (North American Quitline Consortium, 2010).

Agent: A person who handles telephone calls in a CC is an agent or a CSR. Besides answering the phone to talk with clients and customers, agents may perform any of several tasks depending on the industry in which they work. Tasks agents perform include product knowledge, presales support, help with problems, order taking, and client counseling (Bodin & Dawson, 1999; North American Quitline Consortium, 2010).

Automatic call distributor: This system automatically routes an incoming call to the next available agent or CSR. Many software and hardware systems on the market effectively handle automatic call distributor functions (Testik, Cochran, & Runger, 2004).

Call center (CC): An operation with two or more people who handle, direct, make and receive calls, and provide a service is a CC. Inbound and outbound calls require a service action to be performed. CCs may be help desks, customer service centers, catalog sales centers, reservations centers, telemarketing firms, or collections operations. The CC also may be referred to as a *contact center* (North American Quitline Consortium, 2010).

Call volume: The number of calls received in the CC within a specific timeframe is call volume (Bodin & Dawson, 1999).

Contact center: This term is sometimes used in place of the term *call center* because these centers often handle customer contacts from e-mail and the World Wide Web as well as phone calls (Ambriola, Bertagnini, & Pratesi, 2007).

Customer service representative (CSR): In the context of this dissertation, a CSR refers to a person who handles telephone calls in a CC, or an agent (Bodin & Dawson, 1999).

First-call resolution: In this situation, a caller's question is answered or problem solved during the initial call; no follow-up is necessary. First-call resolution is highly correlated with overall customer satisfaction (Gomes & Meile, 2002; North American Quitline Consortium, 2010).

Inbound CC: In this type of CC, agents wait for outside calls to come in to them rather than make calls out. CSRs perform many varied tasks, such as sales, customer support, and help desk coverage (Ambriola et al., 2007; Bodin & Dawson, 1999).

Interactive voice response (IVR): IVR is a computerized telephony system using voice prompt menus to enable identification, segmentation, and routing of callers to the most appropriate agent within a team of employees (Robbins, Medeiros, & Dum, 2006).

Monitoring: The practice of listening to agents' telephone calls to assess customer response quality is monitoring, which may be silent, announced, or recorded for later review. Monitoring is also referred to as *service observation* (North American Quitline Consortium, 2010).

Outbound CC: In this type of CC, agents make outgoing calls rather than wait for incoming calls. The CSR performs many tasks, such as telesales, follow-up support, and opinion surveys, to name a few (Ambriola et al., 2007).

Queue: In the context of CCs, a queue is the waiting line for delayed calls. A queue holds the call until an agent is available (North American Quitline Consortium,

2010). Calls are usually processed in the order received (first in, first out), though not necessarily. Callers are often given music, product advertisements, or a selection of automated services while they wait on hold in a queue.

Service quality: This term refers to “a measure of how well a call is handled, including consistency and friendliness of greeting, and the ability to handle a call to completion” (North American Quitline Consortium, 2010, p. 7).

Skill-based routing: In this method of routing calls, the call is routed to the agent with the skillset best able to meet the caller’s needs, rather than to the first agent available (North American Quitline Consortium, 2010).

Usability: The ease of use and acceptability of systems for selected classes of users and specific tasks in a given environment is termed *usability* (Holzinger, 2005).

Organization of the Study

The investigation is segmented into a five-chapter model within the framework of documenting the research undertaken. Chapter One began with an introduction and overview that initiated the investigation by defining the CC industry and the importance of technology to support service delivery in business and industry, government, and university CCs and defined commonly used terms. Following the background, the problem to be investigated and the goal to be achieved was described. The goal produced a comprehensive report describing all aspects of state-of-the-art CCs and technology.

In Chapter One, three open-ended research questions were established to move the investigation from the problem to the solution in a logical sequence. In Chapter Two, a thorough review of literature was provided. The literature review covered the

underlying foundation of CCs, evolution of technology, and the impact on various industries. The historical research methodology is detailed in Chapter Three. It includes the steps of how the study was conducted, and how the data were analyzed and synthesized. Results are presented in Chapter Four, and in Chapter Five, a discussion about each question and the conclusion drawn is presented, the contribution of technology to the CCs field that discussed, along with implications, and recommendations for future research.

Chapter 2

Review of Literature

The review of the literature pertained to the establishment of state-of-the-art CCs, the changes in technology, and how they have affected the changes in services provided by the CCs. The first section presented a brief overview of the history of CCs and defined both Customer Contact Centers (CCCs) and CCs as entities that are characterized independently or interchangeably. The review provided a fundamental starting point in history that summarized what was known about the industry and its impact. The section also traced the evolution of CCs from the 1950s to the 1990s and then described the integration of CC technology in business and industry, as well as public and private institutions of higher education. The final section discussed how technologies have affected the changes in services provided by CSRs, the skills and competencies typically required for employment, the training necessary, common areas of service, and accompanying issues according to the relationship of the literature to the study and impact on CCs.

History of CCs

There is no universally accepted definition of CC or *Customer Contact Center* (CCCs), although several suggestions are proposed. For instance, Mehrotra (1997) defined CCs as “any group whose principal business is talking over the telephone to customers or prospects” (p. 18). According to Holland and Lambert (2013), CCs are fast-paced facilities established by large corporations, academic institutions, and agencies to

provide services and support to consumers who expect direct access to information instantaneously and problems solved effectively over the telephone. On the other hand, CCs however, use other resources beyond the telephone, such as fax, e-mail, and instant messaging. Nonetheless, both definitions can be used independently or interchangeably. CCs facilitate a keen overarching relationship between customers and corporate or government entities. Leaders in these entities recognize the importance of CCs and the continual need for an infusion of funding to enhance technologies for service delivery (Subroto & Sivakumar, 2007).

The first CC in the United States reportedly was established in the late 1950s as a telemarketing company called DialAmerica. In 1963, *LIFE Magazine* was the first large company to use a CC for readers with questions. The goal of the company was to conduct business transactions over the telephone to increase magazine subscriptions from consumers (D'Alleva, 2015).

During the 1960s, Ford Motor Company pioneered CCs; although ordered by a federal court to establish a toll-free telephone number to respond to customer complaints regarding a vehicle recall, Ford's success leading towards other service areas was phenomenal (Holland & Lambert, 2013). To recount, the technology used in the late 1950s and 1960s was large switchboards called private manual branch exchanges that were utilized by individuals called *operators* who manually connected calls (D'Alleva, 2015). The later integration of computers moved private manual branch exchanges from manual to automatic, furthering the advancement in technology of telephones and more reliable call distribution systems in the late 1970s and early 1980s (Holland & Lambert, 2013). Moreover, in the 1970s, the establishment of wide-area telephone service enabled

many companies to use telephone technology to dial across the country and apply charges based on the state and geography. Shortly thereafter, toll-free 1-800 numbers were created to allow consumers to contact companies who were not in local areas at no cost (TCN, 2015). The 1990s led to the exponential growth of CCs as well as quality customer support in the United States and abroad due to the computer, Internet, websites, and advanced telephone hardware and software equipment (D'Alleva, 2015; Holland & Lambert, 2013).

Business and Industry CCs

According to the Bureau of Labor Statistics (2018) of the United States Department of Labor, there were approximately 2,784,500 CSR employees in the U.S. in 2016. CSR employment in telephone CCs is expected to increase 36% from 2016 to 2026 (Bureau of Labor Statistics, 2018). Moreover, U.S. based CCs represent an \$18 billion industry (Murthy et al., 2008; Statista, 2013).

CCs in various economies have become not only a front-line point of contact for companies connecting with clients, but also a great investment for many small to large organizations focused on quality customer service. Employing the most qualified number of people at the right moment to service customers and providing them with the right resources result in the best CCs (Bouzada, 2009). Providing quality service through CSRs as they quickly utilize computing technologies and advanced telephone systems results in improved just-in-time holistic service, and time saved thus reduces the overall cost of operating the business (Sharma, Mathur, & Dhawan, 2009).

In large successful business and industry CCs, hundreds of CC employees can service many thousands of customers per hour. The falling cost of telecommunication and information technology has led to the consolidation of information delivery services, resulting in the growth of the customer service industry, leading service providers to handle large volumes of telephone calls. Advancements in telecommunication technologies have facilitated sophisticated skills-based routing of calls to the best qualified agent (Aksin et al., 2007). CCs also have experienced phenomenal international growth as advancements in information technology allow agents to handle customer inquiries with high levels of efficiency (Holman, Batt, & Holtgrewe, 2007).

Public and Private Institutions of Higher Education CCs

CCs in higher education are integrated in the collegiate system to streamline administrative functions to enhance the student services and support experience. Academic CCs can assist in many auxiliary areas such as academic advising, bookstore support and sales, alumni relations outreach, capital fundraising campaigns, and ticket purchasing for college sports or general community events. Higher education as an industry has a unique set of service needs when compared to businesses and government entities. As nontraditional customers, prospective and current students may ask questions regarding their admissions status, course registration, financial aid, payment, student activities, on-campus health care services, and housing. Student services needs can be met either formally with a fully operated CC or informally with a team of people among existing departments who provide service via telephone (NEC Corporation of America, 2012; Supiano, 2012).

At many higher education institutions, CCs are not a formal entity. The CCs may employ a university receptionist to perform switchboard or operator tasks and teams of individuals who answer commonly asked questions until they are able to field callers to subject matter experts if additional assistance is necessary (NEC Corporation of America, 2012; Supiano, 2012). To improve the effective use of people as resources, universities can assign telephone functions to full-time employee within timed shifts. Small groups of individuals across cross-functional departments can be arranged into teams to meet the needs of the campus community (NEC Corporation of America, 2012; Supiano, 2012).

Other institutions also hire students on a part-time basis to provide services that require less expertise to assist callers. When combined, the individuals supporting caller needs can provide an informal CC operation. All individuals require significant training to gain knowledge, utilize computer systems, and perform roles efficiently within a specific timeframe before engaging in telephone tasks (NEC Corporation of America, 2012; Supiano, 2012).

CC Training

CC work can be challenging and demanding on training resources. On average, CC agent training in many countries, including the United States, spans 8–16 weeks of instruction and reinforcement activities (Holman & Holtgrewe, 2007). Customer service issues exist in CCs, which could be attributed to the average turnover rate of 30–33%, supporting the need for timely, effective, and efficient training development and delivery programs (Aksin et al., 2007; Murthy et al., 2008).

Employee turnover in CCs has direct financial implications on companies. Increased hiring cost and turnover affect company performance because new employees have learning curves (Aksin et al., 2007). A high rate of employee turnover implies CSRs must be trained quickly and effectively (Murthy et al., 2008). CC agents must be trained on how to handle calls of a difficult nature with tact and empathy without becoming pressured and demoralized. Customers at times may become angry and verbally abrasive.

Training and talent development are essential and should be aligned with the organization's vision, mission, and strategic priorities. Moreover, employees should be independently driven to achieve self-actualization of value-added knowledge. Training ultimately should impact employee engagement and performance, which leads to work output and learning success. Colleges and universities should continue to invest in training to ensure employees attain the right competencies and skills for accurate information delivery and customer or student service throughout the organization (Wilson, 2010).

The training and talent development life cycle, which is sometimes called the analysis, design, delivery, and evaluation (ADDIE) model, establishes a formalized structure and strategy (Molenda, 2003). Training structure and strategies also can be synthesized with the attitude, behavior, and cognition aspects of learning. Attitude impacts the affective aspects of people, behavior is linked to skills, and cognition is knowledge acquisition (Wilson, 2009). The inclusion of all three areas of learning ensures that CSRs attain the ability to counsel callers no matter how challenging the questions may seem. Therefore, learning is essentially not the all-inclusive ultimate

objective; performance is. Training and talent development are important; therefore, university CC employees should be fully engaged in the process, individually and collectively. Knowledge, skills, and abilities, coupled with the attitude, behavior, and cognition aspects of learning, work in conjunction to establish and affirm best practices of ensuring quality guest and student services (Wilson, 2009).

Training and development are critical to ensure sustainability, growth, and success in all CCs (Wilson, 2009). The growth of the CC industry has become a major research focus for behavioral scientists and scholars focused on operations management research. Operations management research is one example of a management area that focuses on business practices, staffing, process of production of goods and services, people skills, creativity, and communication (Aksin et al., 2007). The role of a CSR or agent in a CC is to perform several multitasking skills such as listening, communication, technological navigation, and data entry (Wilson, 2009). Training with technology solutions inclusive of telephone, e-mail, and web chat must be robust and versatile (Read, 2009). Therefore, CC training must be ongoing and creative with a focus on how to engage callers effectively in conversation.

Management should focus on several key areas when designing CC training: how to deliver quality customer service, problem de-escalation strategies with difficult customers, when to outsource training, and how to measure and evaluate performance (Wilson, 2009). Moreover, soft skills such as empathy and hard skills like support are arguably the best set of tools to equip CC staff so companies grow and remain competitive (Read, 2009). Read (2009) suggested that organizational leaders realize that CCs play a vital role in their business structure and cultivate a learning culture.

Organizations are developing coaching and mentoring programs among their employees. Coaching and mentoring in the CC environment cultivate leadership and talent (Wilson, 2009). Efficiency benefits in CCs are achieved by cross-training agents within customer service environments. Cross-training agents to perform their job functions can improve customer service deliverables by matching best skills and next available agent with the customer service request and department the agent is assigned to (Tekin, Hopp, & Van Oyen, 2009). When the skill level required is low, a CC may train each and every agent to handle every type of call. In settings that require high skills, each agent may be trained to be specialized in one subset of the types of calls that CCs serve. Pooling strategies for CCs with multiple functions and departments is a strategy where two or more CC departments in a larger department are combined and then cross-train other departments on their functions. Alternatives to pooling strategies also should be examined to determine any similarities between pooling strategies and more elaborate programs for cross-training (Tekin et al., 2009).

Several empirical studies have been conducted on CC training and the impact on organizational performance. Holman and Holtgrewe (2007) evaluated over 2,500 CCs in 17 countries including North American nations, resulting in the largest international study on CC management and employment practices. On average, many similarities and differences were identified in managing and operating CCs across widely diverse cultures and countries: emerging markets, service delivery, organizational composition, training, and personnel characteristics (Holman & Holtgrewe, 2007). Further, CC operations are relatively standard across many countries. A CC in the United Kingdom can be compared to one in South Africa, the Netherlands, or Brazil. These similarities suggest a

converging set of management and operation principles and industry uniformity (Blumenstyk, 2011).

Selective hiring, extensive training, and ongoing learning may lead to streamlined job designs (Aksin et al., 2007). Customer-service training modules based on emotional intelligence practices closely mirror behaviorist theory of learning (Blumenstyk, 2011). The behaviorist theory of learning is grounded in the writings of John B. Watson and B. F. Skinner, notable scholars in psychology. Behaviorism in educational settings is focused on three ideas:

1. External behavior is driven by a large amount of repetition of desired actions, coupled with rewards.
2. Corrective action is taken when unfavorable behavior exists.
3. Learning can occur by observable behaviors of others.

Behaviorist theories are directed towards behavior modification through stimulus responses and reinforcement (Bandura, 1977; Skinner, 1974). Some examples of behavioral-based strategies are the following (Ally, 2004; Jonassen & Land, 2012):

1. Learners should be informed of the expected outcomes of learning to understand whether or not they have met the objectives of the training.
2. Learners must be assessed to determine if they have met the desired achievement level and outcome.
3. Learning tutorials, resources, and job aids must be organized in an appropriate sequence to promote learning, such as simple to complex.
4. Learners must receive immediate feedback to reinforce their knowledge and have training progress monitored, with corrective action if required.

The training and project development lifecycles encompass needs assessment, design, delivery, and evaluation to support fundamental behavioral theories applicable to CCs (Wilson, 2009). The training lifecycle must be evaluated, studied, and developed to address real-world challenges and opportunities (Wilson, 2009). As the global CC industry grows, future research opportunities exist in the areas of theoretical and empirical research, advancements in information technology, performance metrics, and agent competencies through training (Aksin et al., 2007).

Skills and Competencies

The knowledge, skills, and abilities required of contact center and CC employees differ according to the scope of business and product of service being offered. In general, CSR requires multitasking skills (listening while navigating technology and entering data) and communication and interpersonal skills compatible with the established business model of the company or university (Wilson, 2009). The goal of first-call resolution is to resolve problems efficiently, without the transfer of calls to another agent. Therefore, CSR agents should be equipped and trained to effectively answer questions and to use supplementary support services and systems to locate and find appropriate results (Wilson, 2009). CC staff require facility with different types of technological communication, including e-mail and web chat (Read, 2009) as well as sophisticated databases. In many CCs, agents must have soft skills to be able to handle angry, difficult callers with tact (Murthy et al., 2008). The multifaceted complexity of CC work, the environment, repetitive tasks, and the expectations of meeting high levels of consistent information delivery often result in psychological stress, which leads to fatigue, absenteeism, and attrition (Holland & Lambert, 2013).

Training Issues in Higher Education CCs

Training and development of a CSR is an involved process among the trainer, the expectations of the university, and the CSR. An in-depth review of what is involved and expected in training and development for different responsibilities should be explored. Administrative and Student Services Offices are involved in several transactional processes at the beginning of a semester or term. Students contact the offices for several reasons, such as to finalize or change their course registration and schedules, complete financial aid requirements, settle outstanding balances, and move into on-campus housing (NEC Corporation of America, 2012).

CC routing systems must be able to effectively present calls to the next available, best qualified CSR to manage high call volume. CSRs should be ready to service callers by utilizing standard greetings, authenticating the caller, and using appropriate scripts before using their own judgment in providing a holistic review of the student record and an accurate response. Therefore, for registration and scheduling questions, CSRs may address questions such as these:

- How do I register for my classes?
- How do I get my enrollment verified?
- Whom should I contact for scheduling advice?

CSRs must be knowledgeable of the academic calendar including registration and schedule deadlines; be able to locate where the resource is stored, whether online or in paper form such as school catalogs; and understand when to reach out to others for assistance (NEC Corporation of America, 2012). CSRs also should be able to navigate the administrative campus's customer relationship management or enterprise

performance management database systems. Various system screens and forms include data that must be reviewed, interpreted, and synthesized. CSRs must be articulate in how they communicate results to callers.

Financial aid questions are often the most complex and challenging ones because no two student records are the same, and financial aid is heavily regulated by governmental and institutional policy. Some questions CSRs may handle from students are the following:

- Where can I find out about scholarship information?
- How can I pay for my books?
- What happens to my financial aid if I withdraw from school?

CSRs should be trained on how to interpret governing regulations and decipher and use appropriate language to simplify answers. Training on how to evaluate and determine if a financial aid form is complete or incomplete means that the CSR should know what information is necessary to satisfy outstanding requirements (NEC Corporation of America, 2012).

Bursar or business office questions about settling account balances from students making a payment require the CSR to be proficient in basic math calculation and accounting. Some questions a CSR may be asked are the following:

- When will I receive a billing statement?
- When is my payment due?
- Why was I charged a late fee?

Therefore, CSRs must be trained on how to read and interpret the student account record by transaction and semester or term applied. Then, the CSR must be able to

facilitate taking payments over the telephone or guide the student through the online payment submission process. CSRs serving student accounts therefore must be fully trained on the Payment Card Industry Data Security Standard. The standard requires all companies to abide by a set of requirements to ensure that credit card information is processed, stored, and transmitted in a secured system by trustworthy and authorized individuals (Control Scan, 2018).

For on-campus housing inquiries, questions CSRs may be asked include these:

- What is the cost for a two-bedroom apartment?
- What are the terms of the contract?

CSRs should be trained on the options available for students, such as a single, double, or triple room with or without a meal plan, and the terms and conditions of the contract (NEC Corporation of America, 2012). Most details are available on institutional websites; however, callers may not know where to access the information online or parents may rather speak with a live person over the telephone to discuss options. CSRs must be able to read and interpret information located online and also be aware of contact information for responsible individuals who are better equipped to answer in-depth questions that are beyond a basic inquiry.

Revenue-generating entities of colleges or universities benefit from CC operations because customer and student support services impact the financing of campus initiatives for sustainability (NEC Corporation of America, 2012). These services may include student housing, athletics, events, bookstore sales, and food services. CSRs should be trained on how to actively listen and be attentive to callers by assessing their needs. They must be productive in navigating other campus support systems, proficient in

multitasking efforts, and savvy in searching websites and resources with an ultimate goal of providing quality and holistic services. Although self-service applications allow students and the campus community the ability to interact with the university online without real-time communications over the telephone, some callers prefer interacting traditionally with people over the telephone. CSRs can provide immediate answers to frequently asked questions and lead conversational dialogues about campus life, activities, and upcoming events, thereby maintaining the human touch in servicing callers (NEC Corporation of America, 2012).

Student tuition and fees collected by colleges and universities are typically not sufficient to support and fund all capital, operational, and institutional scholarship projects required for sustainability, student life, and campus growth. Each year, fundraising initiatives may be required to offset the financial burdens of operating a college campus. CCs can assist the university's development and alumni offices with fundraising ventures by contacting alumni, local businesses, and the campus community to give back to the university. However, the effective deployment of any capital fundraising project is contingent on talented CSRs who can build relationships and possess sales and solicitation skills. CSRs must be trained on how to effectively cultivate and harness rapport with benefactors and sell the vision of the campus (NEC Corporation of America, 2012).

Information technology is vital to most universities in delivering 21st century education. Therefore, resources for technology troubleshooting and support are provided typically by a student support services help desk. This entity can support information technology (i.e., computers and networking), audio-visual services (i.e., projectors,

display monitors, microphones), online learning management systems for online classes, and resource scheduling such as Wi-Fi connection and other technical support questions. CCs may support help desk operations by employing CSRs with technical and troubleshooting skills to analyze and resolve technological issues. CSRs may address frequently asked questions regarding technology and help desk such as these:

- How do I reset my student account password?
- How do I log on to my online class?
- How do I access the campus wireless network from the library?

Furthermore, advancements in telephone technology such as recording software can be used to sort and organize calls to sample and listen for frequently asked questions and answers necessary to develop a library of articles. The increased development of new technologies has presented greater opportunities for learning and development in organizations (Rastegarpour, 2011).

Relationship of the Literature to the Study

The extensive investigation of empirical literature and peer-reviewed journals revealed a wide spectrum of information with regard to the types of CC, the implementation of various technological systems, and the financial contributions to society and the economy. However, no existing studies have traced the value of CCs to those stakeholders and improvements in computing technology to be of value to others. The contribution this study makes to the field is significant as modern CCs continue to evolve, producing state-of-the-art technologies. The use of historical research methodology is appropriate as the topic is complex and not well understood (McDowell,

2013). This empirical research study was designed to increase understanding of the historical evolution of technology in CCs from the 1950s to 2018. The review of literature examines carefully and thoroughly scholarly journal articles, books, and many other referenced materials relevant to critically evaluate prior work in the context of the research problem being investigated (Fink, 2014). The significant contribution to the telecommunications field community of practice is to add to existing literature from historical precedent and show how the phenomena emerged in the literature by tracing the evolution of CCs and to identify promising directions for future research in state-of-the-art developments in technology. In addition to adding to the literature on the evolution of technology in CCs, findings from this investigation and study of the industry should provide CC stakeholders and leaders with invaluable information on existing computing systems, technology on the horizon, and the human–computer interaction experienced by employees. This research was designed to produce a comprehensive report describing aspects of state-of-the art CCs and innovative technologies.

Chapter 3

Methodology

The goal of this study was to produce a detailed report tracing the evolution of technology in CCs during pivotal times in history since the 1950s, describe state-of-the-art technologies developed towards 2018, and discuss those CC technologies on the horizon. A literature review was essential to present the state of knowledge of the topic and offered insight concerning the methodology (Pickard, 2013). The methodology used answered each research question with a process strategically aligned to meet the goal. This chapter describes the research design and strategies incorporated, tools and resources employed, and data-gathering mechanisms and procedures used to analyze and synthesize information. In great detail, every step of the research process was necessary as the phenomenon studied is complex and not well understood (Krippendorff, 2013).

The strategic partnerships between CCs and various industry stakeholders are streamlined through the modernization and integration of technology to meet service needs and communication demands of customers (Subroto & Sivakumar, 2007). Therefore, the problem addressed was the speed at which new technologies are changing CC operations. CC leaders should take advantage of the best possible solutions, and those solutions must be presented in a form usable by all stakeholders, such as investors, owners of CCs, managers, CSRs, and entities that use CCs to deliver customer service. The review and analysis of literature suggested the value of CCs to businesses, government agencies, and postsecondary education institutions has improved because of ongoing enhancements in computing technology and systems deployed.

An extensive empirical literature review and analysis of scholarly and peer-reviewed journals was conducted and used as the research method to address the three research questions. According to Pickard (2013), a review of available literature and subsequent analysis allow those who conduct research to demonstrate critical thinking and scholarly exploration of a topic, discover themes to cover issues and problems that remain, and unveil theories prominent in the field of study being researched. Hence, the complexity and novelty of this research resulted in the establishment of best practices ascertained in the CC context.

Research Design

The research design followed a historical research methodology model, as described in McDowell (2013), which is used for the development of a detailed, descriptive, and historical report. Historical studies broaden the understanding of cultures, human interactions with one another, motives, and behavior to find answers to questions (McDowell, 2013). Historians evaluate past events contextually to provide possible answers to current issues and problems. Beyond describing how things were, historians explore and address why events led to specific pathways, provide insight to represent those events of historical significance, and then compare them to a series of other events (McDowell, 2013).

According to McDowell (2013), historians first should distinguish between primary and secondary source materials. A report written at the time of a specific event is regarded as a primary source material. Secondary sources are reports established after an event by individuals who were not present and include interpretative information from

primary sources. Pickard (2013) suggested that to examine past events using both primary and secondary sources, an extensive document analysis of the literature is paramount. The historical research method is also referred to as *desk research*, since information is already on record, and the research being undertaken is to locate, analyze, and compare existing information (Pickard, 2013).

Document analysis was used to evaluate both primary and secondary source materials to extrapolate pertinent information for the development of the final report. Bowen (2009) noted document analysis provides context for the phenomenon, questions remaining, corroboration of research data, and a “means of tracking change and development” (p. 30). Bowen emphasized document analysis is a cost-effective tool used to acquire empirical data that are unobtrusive, in other words, unaffected by the research process. The identification of historical source materials and information alone does not determine the quality of research (McDowell, 2013). Therefore, all documents presented were scrutinized for validity and authenticity to affirm the goal, context, and transparency (Bowen, 2009).

CC operations that enhance their technology provide CSRs advanced opportunities to utilize tools effectively to communicate just-in-time with customers through telephone, Internet, and other technologies (Aksin et al., 2007). An analysis of empirical literature through a historical study was used as the research method to answer the research questions. A thorough, extensive search of scholarly literature, article abstracts, and peer-review journals was carried out to answer each of the research questions. The goal was to determine whether newer technologies are improving CCs and to document improvements that may be of value to others. The CC industry is

worldwide and customer service focused (Aksin et al., 2007). Historical research for empirical content analysis is essential and significant. Information was drawn from an extensive review of the literature and web resources to assemble the report (Bowen, 2009; Creswell, 2013; Kenworthy & Balakrishnan, 2016).

According to McDowell (2013), individuals who conduct research using a historical research methodology attempt to distinguish facts from fiction. Historical research establishes a framework and understanding of a complex world. People are inquisitive and often compare and contrast historic events to shape perceptions in order to understand actions. Through such an exploratory nature and quest for greater knowledge, people can evaluate the past to make decisions about the present, in preparation for an unknown future. Pickard (2013) noted, “History means far more than a chronology of a series of events; it is usually a historian’s interpretation of events constructed from primary sources” (p. 168). The exploratory research through literature reviews was designed to provide valuable insight on tracing the developments of complex technology and industry trends related to CCs.

Research Questions

Three research questions guided the phenomenon studied from the initial problem statement to a solution. Each question was answered as explained below using specific literature.

Research Question One asked, “What technologies enabled the start of CCs? How did the communications between customers and CSRs take place? What was the content of the earlier communications?” This multiple-part question was a starting point

for CC historical analysis and early forms of computing technology within the industry. Chapter Two was developed from the literature search and review regarding the history of CC from the 1950s to 2018. A thorough Internet search about the history of CCs was conducted to locate literature. Research Question One was designed to determine what technologies enabled the start of CCs, how the communications between customers and CSRs took place, and the content of the earlier communications. Prior studies revealed the importance of CC usage in business, government, and private and public institutions of higher education; the implementation of various technological systems most CCs use; and the financial contributions CCs make to societies and global economies of scale. Nonetheless, no single investigation has traced the fundamental history of CC communications with a comprehensive scope, including the content of the initial communications and the future direction of this phenomenon. Creswell (2009) recommended conducting an in-depth review of literature to provide context necessary to solidify and sustain the problem statement and ground it within current empirical research. Therefore, information was obtained from scholarly journal articles and industry magazines, such as those published in *Journal of Operations and Supply Chain Management* and *Customer Interactions Solutions* magazine.

Research Question Two asked, “How did services and communications evolve as technology matured.” The question traced the evolution of CCs and was answered by the review of the literature and analysis of library research publications and industry magazines. Research Question Two concerned how services and communications evolved as technology matured in the CC framework. The literature review examined technology advancements as well as the increasing number and complexity of services

currently provided. Major sources of documents examined were public records, biographies, newspapers, reports and blueprints, and visual documents including photography and infographic charts.

Research Question Three asked, “What are the current state-of-the-art technologies that exist in CCs? Which industries appear to have the best solutions? What are these solutions?” The analysis and answer lead to today’s optimal technological solutions and presentation of state-of-the-art CCs in corporate America and postsecondary institutions. Since 2000, the literature has suggested an increasing interest in the impact of technology on CCs; therefore, Research Question Three addressed current state-of-the-art technologies in CCs, which industries appear to have the best solutions, and what these solutions are.

Information derived from a systematic review and sampling of documents was compiled as a working trend analysis, using a combination of proven research techniques tailored to support the goal. Relevant, up-to-date, and reliable data sources were indexed and analyzed to support and qualify the established objectives and goals. The findings are synthesized and discussed in depth in Chapter Four and make an important contribution to the customer service industry.

Instrumentation

A combination of primary and secondary source document analysis and empirical literature research was the general focus to answer the research questions. According to the National Archives and Records Administration (2017), document analysis is the foundation for working with primary sources to gain a contextual understanding of the

past by extracting information to make informed decisions. Document analysis worksheets have been created to help individuals evaluate documents within predefined and consistent steps. Materials created by the National Archives and Records Administration are available for general use and scholarly exploration in the public domain, and thus written permission was not required. The Photograph Analysis Worksheet (Appendix A) and Written Document Analysis Worksheet (Appendix B) from the National Archives and Records Administration were used to analyze primary source materials.

In addition, the Library of Congress (n.d.) developed a free online Primary Source Analysis Tool (Appendix C) to record responses to primary sources. This tool allows end-users to use a drop-down box to select a format for primary sources such as books, other printed texts, photographs, and prints. Users then can input information into four categories: observe, reflect, question, and further examination. A download, print, and e-mail hyperlink is included to export the information (Library of Congress, n.d.). This tool was used as well. Both the National Archives and Records Administration and Library of Congress were credible sources providing tools and instruments in the analysis phase that have been adopted widely, from school-age students to avid explorers of research. Therefore, the tools were appropriate research instruments.

EndNote X9 software is a bibliographic database and document publishing tool used by students, scholars, and academic institutions. The software program was used to manage the compilation of scholarly references for the manuscript and improve strategy in analyzing journal articles. EndNote allows annotations and attachments to be added in the system. Notes were both handwritten and electronic as a Microsoft Word document,

converted to a PDF and later uploaded in the EndNote system as an attachment for storing and future retrieval. Using EndNote promoted proficiency and productivity by automatically formatting citations into a database along with adherence to American Psychological Association (APA) rules and protocols.

Approach

A qualitative approach was used to guide the literature review and content analysis to provide a thorough understanding of the phenomenon (Krippendorff, 2013). The steps prescribed by McDowell (2013) were followed.

1. Identify and choose a general research subject area. Based upon professional experience in training postsecondary CC employees, interest, and expertise, the general research subject area selected combined computing technology exploration with CCs, from postsecondary CCs to 911 operators and CSRs at government organizations.
2. Select a research topic and identify themes, objectives, and opportunities. This step was completed through an extensive literature search of peer-reviewed and scholarly journals. Through Google Scholar, over 197,000 articles were returned since 2014, based on a search criteria relating to CS technology. A narrower search was executed within the initial search. Then, article abstracts were reviewed based on the relevance of the topic.
3. Create an index of source materials and determine if the source is sufficient, which is necessary to establish a bibliography. Nova Southeastern University (NSU) (2018) has obtained an official license for faculty, staff, and students to

download Thomas Reuters' EndNote software at no cost. EndNote X9 software was downloaded and used as a reference management tool to organize and manage bibliographies, citations, and references as the report was written. The software is widely used for research development and is compatible with NSU library databases, several web browsers, and Microsoft Office applications.

4. Identify various research methodologies to potentially incorporate in the report. According to Pickard (2013), the historical research method is qualitative because of the interpretation of information, yet quantifiable and tangible data are explored; therefore, this methodology was used.
5. Review the methodology, identify and refine topics, and record new hypotheses uncovered. As an experimental study was not being conducted, a hypothesis was not necessary.
6. Construct an outline draft, highlighting all topics to be reviewed. This was accomplished by incorporating two document analysis tools: worksheets developed by the National Archives and Records Administration (2017) and the Primary Source Analysis Tool developed by the Library of Congress (n.d.). The Photograph Analysis Worksheet and Written Document Analysis Worksheet were used as instruments to evaluate primary source materials. Additionally, the Primary Source Analysis Tool was used to record responses to primary sources. The worksheet templates can be accessed in the open domain and used without written permission for research and teaching exercises (Library of Congress, n.d.; National Archives and Records

Administration, 2017). The worksheets were completed and organized as the analysis of primary source materials occurred and stored in a file.

7. Make research notes after scanning through source materials. This step was ongoing, and the anticipated findings were gathered in each section of the report. A document journal was created in Microsoft Word format as general notes. EndNote X9 allowed supporting documents in PDF format to be attached and stored in the system. Moreover, each Primary Source Analysis Tool (Appendix C) contained a section called “further investigation,” which was used to record information.
8. Organize research notes and materials and establish a list of topical areas or issues. This was accomplished with the continuous use of journal entry.
9. Arrange research questions in the order of each topic, thereby establishing a link to each section. This was accomplished in Chapter One.
10. Arrange a detailed research proposal and organize the report by chapter titles and outlines. The NSU College of Engineering and Computing (2016) dissertation guide was used to guide the outlined format and information for the report.
11. Organize work into sections. This step was ongoing, and the final report is the outcome.
12. Complete a reference list of source materials. A detailed reference list was compiled and is included after the final section of the report.

13. Edit the first draft. Once the draft of the report was completed, this step was accomplished with the assistance of the dissertation chair, who reviewed the draft.
14. Prepare a final draft of the document. This step was complete and the report is the result.
15. Use a word processor to type the final draft of the document. Microsoft Word processor was the chosen software.
16. Review document carefully for errors. This step was accomplished as new information was sourced and added, and the final draft is complete.
17. Submit document to readers. This will occur once the final draft has been completed and approved. Institutional Review Board permission was not necessary because humans were not used as subjects to collect data for the investigative report.

Data Collection

Document analysis played an integral role in developing empirical research through systematic review and sampling of documents. A systematic review is a form of literature review that accumulates and analyzes critically several research studies that are related to a topic to answer research questions (Petticrew & Roberts, 2006). According to Petticrew and Roberts (2006), a systematic review has five main stages:

1. Define a question.
2. Search for relevant data.
3. Extract relevant data.

4. Assess the quality of the data.
5. Analyze and combine the data using complex statistical methods.

According to Smiciklas (2012), infographic charts are widely adopted to present a visual representation of information, graphically display information, and chart a timeline to quickly feature documents selected in a visual form. Infographic charts assist readers in analyzing informational data visually and creatively (Smiciklas, 2012). A table presenting the history of CCs and evolution of technology usage in the United States is in Chapter Four.

Document analysis is a form of qualitative research and a pivotal way of collecting empirical data to conduct historical research to be analyzed. The methodology guided the assembly of information from existing literature without relying on interviews, administering questionnaires, or observing human interaction and behavior. Once documents were analyzed, the content was organized and coded (Bowen, 2009).

Format for Presenting Results

A database was created for storing essential components of all resources located. The report provides an expanded understanding and view of CCs for readers. A thorough review and analysis of state-of-the-art CCs was conducted. Chapter Four presents the narrative results of report, outcome of how the step-by-step plans were executed to substantiate the problem, the baseline set for the investigation, and procedures used to convert data into information. The findings are shared and presented with narrative descriptions in Chapter Five along with answers to each research question and presents conclusions of the analysis.

Resources

The literature was accessed using the NSU electronic library. Resources included scholarly journals, textbooks, and online materials. The NSU library databases found most useful were ProQuest and Wiley-Blackwell Publishers with relevant journals such as *Production and Operations Management*, *The Chronicle of Higher Education*, *Journal of Operations and Supply Chain Management*, *Communications of the ACM*, *Management Science*, *Technology and Culture*, *Performance Improvement*, and *Personnel Psychology*. Additional information was acquired through NSU websites. Some credible industry magazines were used, such as *CIO Today*. EndNote X9 software was downloaded and installed on a Dell Inspiron 560 personal computer with the following configuration and software:

- Operating System: Microsoft Windows 10 Home;
- Processor: Pentium(R) Dual-Core CPU, E5700, 3.00GHz, 2 Core(s), 2 Logical Processor(s);
- Memory: 4.00 GB RAM;
- System Type: 64-bit operating system, x64-based processor;
- Microsoft Word 2007;
- Microsoft Excel 2007; and
- EndNote X9.

Summary

This chapter describes the steps within the plan as carried out, research design and strategies incorporated, tools and resources employed, and data-gathering mechanisms

and procedures used to analyze and synthesize information. The research design followed a historical research methodology model, as described in McDowell (2013), which is used for the development of a detailed, descriptive, and historical report. A thorough, extensive search of scholarly literature, article abstracts, and peer-review journals was carried out to answer each of the research questions. Information derived from a systematic review and sampling of documents was compiled as a working trend analysis, using a combination of proven research techniques tailored to support the goal. A combination of primary and secondary source document analysis and empirical literature research was the general focus to answer the research questions. The Photograph Analysis Worksheet (Appendix A) and Written Document Analysis Worksheet (Appendix B) from the National Archives and Records Administration were used to analyze primary source materials. In addition, the Library of Congress (n.d.) developed a free online Primary Source Analysis Tool (Appendix C) to record responses to primary sources. EndNote X9 software is a bibliographic database and document publishing tool that was downloaded and used. The software program was used to manage the compilation of scholarly references for the manuscript and improve strategy in analyzing journal articles. Notes were both handwritten and electronic as a Microsoft Word document, converted to a PDF and later uploaded in the EndNote system as an attachment for storing and future retrieval. The data were extracted and coded using MS Excel worksheets to identify literary themes and trends. Overall, the application of a qualitative research approach was used to guide the literature review and content analysis to provide a thorough understanding of the phenomenon of the evolution of technology in CCs (Krippendorff, 2013).

Chapter 4

Results

Historical research methodology is an approach used for the analysis of primary and secondary documents in order to reveal recorded facts and ideas about preserved historical information in the context of the time. It also provides guidelines for the analysis of secondary documents as a way to interpret history. The problem addressed was the speed at which new technologies are changing CC operations. The goal was to produce a comprehensive report describing all aspects of state-of-the-art CCs and technology. The phenomenon and evolution of technology in CCs were examined and substantiated through the development of a comprehensive, descriptive, and historical study. Leaders of CCs should take advantage of the best possible solutions available of new technologies on the horizon but first understand the evolution and impact of technology in CCs of the past. The plan to solve the problem was grounded in a review of literature that describes the evolutionary journey of technology in the CC industry from its early stages. The review was focused on the phenomenon within the past 10 years to the present day, 2018. Therefore, taking the literature from one period to another further resulted in the identification of trends. A qualitative approach was used as a baseline for the investigation to guide the literature review process and content analysis in order for a thorough understanding of the phenomenon (Krippendorff, 2013) to occur, and used to answer the research questions in a sequential order. The steps prescribed by McDowell (2013) were followed, as discussed in Chapter Three but significant parts will be briefly deliberated in this chapter.

Literature Review and Analysis

The review of the literature that pertained to the establishment of state-of-the-art CCs, the advancements and speed of technology, and how technologies have affected changes in services provided by the CCs were sourced and analyzed. A considerable amount of literature has been published on CCs in scholarly journals, textbooks, and online materials. An extensive search of relevant literature was paramount that resulted in an exploration of a wide spectrum of information, but in the context of CCs to build a solid theoretical foundation for the report. Holland and Lambert (2013) suggested that current research-based knowledge about CCs is largely based on empirical studies that investigated how these fast-paced facilities, employing from less than 10 to hundreds of people, provide services and support to consumers over the telephone. CCs are used by large corporations, academic institutions, and agencies. Next, Holland and Lambert's definition of CCs established the framework and scope of the history of CCs. The issues of tracing technology as it continues to evolve rapidly, ever-increasing customer service demands, and evaluation of communications challenges have received considerable critical attention in the literature.

The literature was accessed by using the NSU electronic library. Resources compiled included scholarly journals, textbooks, and online materials. The electronic databases that were found most useful were ProQuest and Wiley-Blackwell Publishers with relevant journals such as *Production and Operations Management*, *The Chronicle of Higher Education*, *Journal of Operations and Supply Chain Management*, *Communications of the ACM*, *Management Science*, *Technology and Culture*, *Performance Improvement*, and *Personnel Psychology*. Other databases used and a free

full text web access sources called Google Scholar (<https://scholar.google.com>) was accessed to source literature.

Database

EndNote version X9 software is a bibliographic database and document management tool used by students, researchers, scholars, and academic institutions. The database was constructed to store and manage the compilation of scholarly references and research materials for the manuscript. The tool allows the creation of in-text bibliographic citations, storing, organizing, and formatting references as journal articles and research documents are identified to be analyzed (EndNote, 2018). A PDF of the article and notes page can be attached in the system. NSU has a site license to EndNote. This license allows faculty, students, and staff the ability to log into the network site to download the software to a local computer at no cost. Creating an EndNote library promoted proficiency and productivity by archiving and formatting citations into a database along with adherence to American Psychological Association (APA) rules and protocols. Figure 1 provides an overall view of the database created.

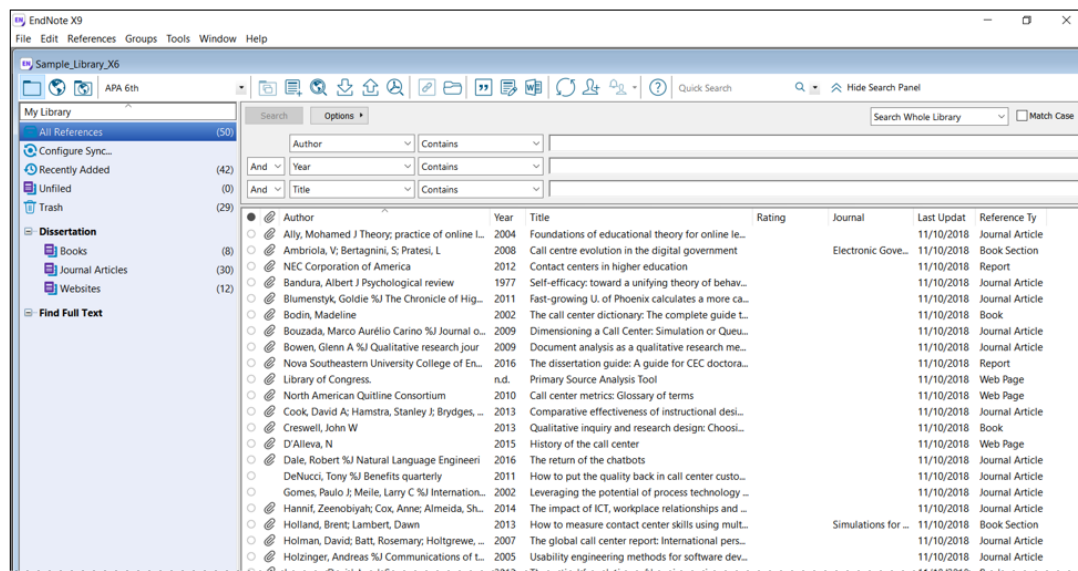


Figure 1 EndNote X9 database for document management.

As credible sources of information were located in electronic databases ProQuest and Wiley-Blackwell Publishers and from relevant journals and full text access sources, the researcher printed, read, and took handwritten notes. If information was value-added, the citation was then downloaded in EndNote X9 software. Secondly, the PDF of the article was saved on the local computer hard drive first, as a backup copy and then later uploaded into the EndNote X9 system as an attachment. The citation was indexed by document type: journal, book, or website and then in alphabetical order by the author's last name to establish a bibliography. Finally, as separate pieces of information were read, the document was analyzed using the research instruments and later entered in the coding worksheet to be further synthesized.

Instruments

Document analysis worksheets were used to evaluate documents within predefined and consistent steps. These worksheets were created by the National Archives and Records Administration (2017) and adopted and applied for scholarly exploration as it is in the public domain and did not require written permission from the administration. In addition, the Library of Congress (n.d.) free online Primary Source Analysis Tool was used to record thoughts and responses as primary sources were analyzed. All tools were simple, easy to use, and intuitive. The completed worksheets were converted into a PDF format and uploaded as another attachment in EndNote X9 for retention, organization and future retrieval. The detailed results of these tools are included in the appendixes of the report.

Document Analysis Worksheets

Document analysis worksheets, specifically Photograph Analysis Worksheet (Appendix A) and Written Document Analysis Worksheet (Appendix B) were used to evaluate both primary and secondary source materials. As was expected, these easy-to-use tools aided in organizing thoughts and information leading to the extrapolation of pertinent ideas and data to be analyzed and turned into information. The one-page document was separated into four sections. The first section required the user to identify the type of written document to be analyzed (e.g. letter, report, newspaper) by placing a check mark next to the item. Next, the question “describe it as if you were explaining to someone who can’t see it” was profound. The question evoked critical thinking to recall what was read from the written document and then succinctly describe it in a few sentences. The second section helped identified the origin of the document. The third section asked five questions that elicited short answer responses to think globally and critically about the information read. The fourth and final section, asked two reflection questions that aided in future exploration of the topic. For example, “what did you find out from this document that you might not learn anywhere else” was a question that evoked deeper thinking and review of the document and use of prior knowledge to determine what was known and recently learned.

Primary Source Analysis Tool

In addition to the two document analysis worksheets used, the Library of Congress (n.d.), makes available a free online Primary Source Analysis Tool to record responses as primary and secondary sources are evaluated. In general, the use of this tool was user-friendly because it included drop-down boxes to select a format for primary sources such as books, other printed texts, photographs, and prints. Information was then

inputted into four categories: observe, reflect, question, and further examination.

Response data were inputted directly in the text boxes and the completed form was available to download, print or email.

Coding

An analysis and synthesis of separate pieces of information occurred as procedures were followed. The purpose of the coding exercise in assessing large volumes of literature is to identify key concepts, thematic analysis, and trends necessary for conclusions to be arrived. As discussed, EndNote X9 was the database used to store information; however, a MS Excel Spreadsheets called Qualitative Research Excel Control Panel was used to organize extrapolated data to be further analyzed. For example, a Google Scholar search resulted in over 197,000 articles that were returned since 2014, based on a search criterion relating to CS technology. A narrower search was performed within the initial search, and then expanded to the year 2018. Then, article thematic analysis was performed based on the relevance of the topic. The final result of all resources included such as scholarly journals, textbooks, and online materials was 53 and therefore compiled in the reference list.

Summary of Results

The overall results of the analysis and synthesis of the separate pieces of data/information indicates that a literature review and document analysis was appropriate for the investigation and intended audience. Moreover, literature review and document analysis were used to answer the three research questions guiding the investigation, drawing upon on a wide range of primary and secondary sources. Technology has

continued to impact CC communication strategies and customer service. For example, literature review findings indicated that the integration of technology in CCs evolved from large manual switchboards to intuitive IVR that activate automatic call distributors, systems for automatically routing an incoming call to the next available agent or CSR. In the 1990s, telephone hardware, software, computers, and other technologies were enhanced and became more sophisticated, facilitating better communications between consumers and service providers. The content of the earlier communications included product knowledge, presales support, equipment troubleshooting, order taking, reservations and telemarketing, client counseling, and billing collections, depending on the industry.

CC services and communications evolved as technology matured. A holistic review of literature and document analysis indicated as customer demands increased, so did the call volume for businesses, entities providing emergency response services, telemarketing agencies, postsecondary institutions, and various U.S. government agencies. CC functions expanded as technology developed.

Regarding state-of-the-art CC technologies, AI and chatbots are recent developments impacting CCs. Much of the current literature suggested the business industry seems to have the best solutions as other industries follow suit. These solutions include an array of systems and technologies to support communication, consumerism, CSR employee engagement, and technology integration. Training of CSRs has been an integral factor to facilitate the transfer of knowledge and preparation to support system developments and changes.

Chapter 5

Conclusions, Implications, Recommendations, and Summary

This chapter describes the conclusions derived from a historical research methodology used to analyze documents and literature related to CC technology. Implications from the analysis are also discussed and recommendations made for further research exploration. The aim was to trace the evolution of technology in CCs. From the first early beginnings in the 1950s to advancements in modern technologies in 2018, CC stakeholders should continue to realize the potential of technology; communication with customers cannot begin and end over the phone. Omni-channel technologies such as text chat, e-mail, instant messaging and video messaging are included and supported among state-of-the-art CC entities. These system platforms and computing infrastructures allow for data mining, retention of information, and ease of systems upgrades, supported by other technology such as cloud computing. However, the speed of technology advancements and innovative solutions of systems may outpace organizations' existing computing infrastructures and current business model support (Subroto & Sivakumar, 2007). According to DeNucci (2011), CC technology can assimilate data to generate reports for stakeholders to evaluate trends, make informed decisions, and adjust training plans for employee behavioral adaptation to achieve the delivery of quality customer service, which is essential. The literature suggested that AI and chatbots likely are the next generation of state-of-the-art technologies (Dale, 2016).

Conclusions

This examination of the evolution of technology in CCs using historical research methodology was designed to produce a comprehensive, descriptive, and historical study. The phenomenon of the evolution of technology in CCs was examined. With technological advances, various aspects of CC function and adaptation to meet industry needs from inception to 2018 were described. As a result, the report can be used by industry stakeholders to understand the past and embrace new trends for the future to enhance CCs, providing a seamless customer service experience delivered with competency and ease, as well as ensuring a profitable business. The evolution of technology is evident in CCs over the years. Conclusions are drawn in response to three research questions. Each question is presented then answered.

The goal was achieved through extensive literature review and document analysis. Answers to the research questions are summarized in this section.

Research Question 1: What Technologies Enabled the Start of CCs?

Central to the establishment of CCs is the integration of technology to facilitate the communication exchange between consumers and service providers. Initially, communications between customers and CSRs took place over the telephone. Technology has a significant impact on CC communication strategies for customer service support and delivery. For example, literature review findings indicated that, before the use of computers, the technology used in late 1950s and 1960s included large switchboards (Figure 2) called private manual branch exchanges utilized by operators who manually connected calls from consumers (Holland & Lambert, 2013).

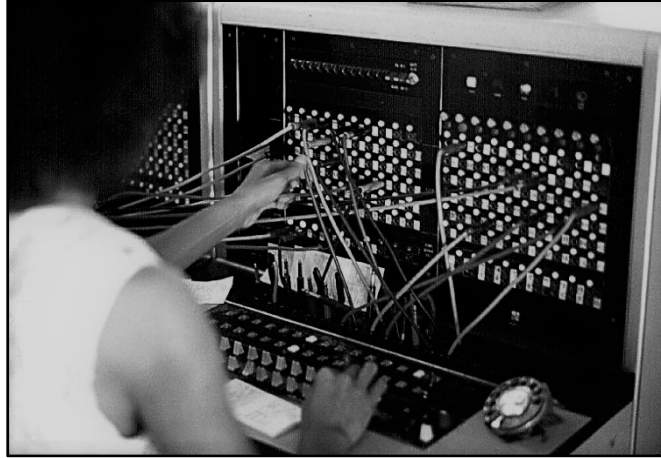


Figure 2 Jersey telecom switchboard and operator photo.

Several years later, the automatic call distributor, a system for automatically routing an incoming call to the next available CSR through touch tone prompts and voice response queues, was a breakthrough in technology for CCs (Testik et al., 2004).

How did the communications between customers and CSRs take place?

Literature review and document analysis revealed that CSRs first began to handle a large volume of service requests from customers by communicating over the telephone with the use of large switchboards. Over the years, and notably in the 1990s, telephone hardware, software, and other equipment technology were enhanced and became more sophisticated. The advent and integration of computers, Internet, websites, and the development of sourcebooks and knowledge databases along with data analytics catapulted CCs to expand their service operations to include additional communication capabilities and execute functions such as processing letters, faxes, and e-mails, called after-call work functions. As technology evolved, CSRs provide extended customer service and support through synchronous SMS chat, text, and instant messaging were integrated by way of the computer, sometimes without the use of a telephone called Voice over Internet Protocol (VoIP) telephone services (Holland & Lambert, 2013).

These VoIP expanded customer service and care to encourage consumerism are central goals of CCs. As such, the advancements in technology improved customer service delivery and satisfaction, resulting in the reduction of operational challenges and inefficiencies (Luo, Liu, & Shao, 2006).

What was the content of the earlier communications?

Studies of CCs showed the importance of technology to facilitate efficient and effective communication since the inception of CCs in the service industry (Subroto & Sivakumar, 2007). Initial CC communication was to field complaints or increase subscriptions. The content of early communication for agents included answers to basic questions such as how to make a payment and when a customer's next appointment was. The integration of artificial intelligence and chatbots recently has enabled self-service for common needs or actions. Since 2016, artificial intelligence and chatbots have been common themes in the CC community and literature (Dale, 2016). Artificial intelligence and chatbots use knowledge databases and programmed repositories to address frequently asked questions and facilitate resolutions without the caller speaking with a human agent (Dale, 2016). Nonetheless, no artificial system is perfect. As such, CSRs are being trained to handle more complex and analytical questions that require human intervention and resolution, thus holding employees at CCs to higher communication and service standards. Literature review findings indicated that earlier communication content for inbound and outbound calls included several service actions to be performed, such as product knowledge, presales support, equipment troubleshooting, order taking, reservations and telemarketing, client counseling, and billing collections, depending on the industry (Subroto & Sivakumar, 2007).

Research Question 2: How did services and communications evolve as technology matured?

As depicted in an infographic by Sharpen (2018), the evolution of technology in CCs and the services and communications can be traced from 1950s to 1990s. The 1990s led to the exponential growth of CCs as well as quality customer support in the United States and abroad due to the computer, Internet, websites, and advanced telephone hardware and software equipment (D'Alleva, 2015; Holland & Lambert, 2013). The move to greater online transactions and electronic commerce resulted in increasing demands for CC service. As the CC technology matured, so did the call volume for businesses, entities providing emergency response services, telemarketing agencies, postsecondary institutions, and U.S. government agencies. As noted in the discussion for Research Question One, recent innovations in artificial intelligence and chatbots allow increased self-service, leading CSRs to focus on more complex questions and functions (Dale, 2016).

In 2002, LiveChat was created to provide another method of real-time customer service (Sharpen, 2018). In 2016, chatbots and artificial intelligence through virtual assistant integration had impacted the CC industry (Dale, 2016). These technologies closely emulate human behavior and response to execute programmable tasks, sometimes completely without human intervention. According to Dale (2016), chatbot technology includes voice-driven digital assistants such as Apple's Siri, Microsoft's Cortana, Amazon's Alexa, and Google Assistant. A chatbot is a computer program that allows users to interact through voice, messaging applications, and direct website interview text

chat windows. Using artificial intelligence to capture data from customers, the chatbot can resolve inquiries through predefined rules from a knowledge base.

Research Question 3: What are the current state-of-the-art technologies that exist in CCs? Which industries appear to have the best solutions? What are these solutions?

The literature review and document analysis from 2000 to 2018 revealed that the best state-of-the-art technologies in CCs are those that include an array of technologies (Holland & Lambert, 2013). Much of the current literature suggested the business industry, with federal and local government and postsecondary education institutions following suit, seems to develop and implement the best solutions due to access to monetary funding, investors, and historic use of CCs from initial inception. These solutions include an array of systems and technologies that support communication, consumerism, CSR employee engagement, and technology integration. According to Robbins et al. (2006), one revolutionary technology is the IVR, a computerized telephony system using voice prompt menus. Use of the IVR enables identification, segmentation, and routing of callers to the most appropriate agent within a team of employees. IVR technology, when combined with an automated call distributor, moves the consumer interaction virtually to the next available, best trained CSR to provide service. Omni-channel technologies such as text chat, e-mail, instant messaging, direct website interface and video messaging are included and supported among state-of-the art CC entities. These system platforms and computing infrastructures allow for data mining, retention of information, and ease of system upgrades. Other technology such as cloud computing is becoming commonplace in CCs. Two major newer technologies exist primarily in the business sector and are being further invested in: artificial intelligence and chatbots.

According to Dale (2016), chatbots and artificial intelligence through virtual assistant integration closely emulate human behavior to execute programmable tasks (Dale, 2016). Chatbot technology has recently dominated customer service industries and research proceedings, as voice-driven digital assistants such as Apple's Siri, Microsoft's Cortana, Amazon's Alexa, and Google Assistant have captivated consumers around the world. A chatbot is a computer program that allows users to interact through voice, messaging applications, and chat windows. Using artificial intelligence to capture data from customers, the chatbot can resolve inquiries through predefined rules from a knowledge base. Finally, CCs will continue to be more web-based, using web chat technology (TCN, 2015). Training of CSRs continues to be an integral factor to facilitate the transfer of knowledge and preparation to support system developments and changes.

Implications

The research was designed to expand existing knowledge about the evolution of technology in CCs and identify trends for the future. As newer technology for CCs is being released at a fast pace because of service demand, the changing scope of physical stores to virtual presences and sales online warrants evaluation of the direction of CCs for the future. Towards this end, understanding the past to project what is to come is a tremendous undertaking of benefit to individuals and companies aspiring to use state-of-the-art technologies and services. Findings from this report provide CC executives with value-added information about the growing multi-billion-dollar industry and how their service organizations can deliver profits to their stakeholders by meeting customers' immediate needs. For CC employees, learning about state-of-the-art CCs can give insight

into ensuring employee success, foster opportunities for career advancement, allow just-in-time training, and develop the ability to partner with technology to do a better job.

The findings provide a conceptual framework for future studies illustrating that history cannot be changed but technology in CCs continues to evolve.

Recommendations

Using a historical research methodology, a comprehensive, descriptive, and historical study examined the evolution of technology in CCs. The information for this report was adequate and demonstrated a good mastery of source material. However, due to practical time constraints, the report did not provide a comprehensive review of all CCs as it was intended to, and therefore only major phenomena were highlighted over a span of several years in a concise manner. Furthermore, literature review findings indicated that the use of historical methodology is an effective tool when comparing similar topics but can take several years to compile extensive information. Perhaps future studies can further explore the phenomenon and expand out the years of industry information to include additional topics and examine in more detail the technological advancements within each year, not only over the decade, therefore a different result may exist. Moreover, future researchers can conduct interviews with companies in different industries to determine what state-of-the-art technologies are currently in use. Additionally, examine the training processes used for getting employees up to speed can be undertaken.

Summary

In Chapter One, the context of the study was introduced to recognize the importance of technology in service industries to support excellence in customer service support and delivery. Next, the concept of CCs as the centralized and integral telecommunication gateways for many businesses, entities providing emergency response services, telemarketing agencies, postsecondary institutions, and U.S. government agencies was presented. The problem addressed was the speed at which new technologies are changing CC operations and how leaders of these entities should take advantage of best possible solutions but present them in a form usable by individuals vested with an interest in the industry. The goal was to produce a comprehensive report describing all aspects of state-of-the-art CCs and technology. More specifically, this work traces the historical evolution of CCs from the 1950s to 2018, to address industry needs and then describes the integration of CC technology in business and industry, as well as public and private institutions of higher education. In addition, the essence of this work was to unveil the phenomenon and evolution of technology in CCs and examine it by developing a descriptive and historical study. Therefore, discussed in Chapter One are the relevance and significance of the study is to document what is currently known as well as set a standard and regimen of how future investigations can continue to preserve history. Next, three research questions guided the phenomenon studied from the initial problem statement to a solution and was therefore delineated. Research Question One aimed to answer a multi-part question in regard to What technologies enabled the start of CCs? How did the communications between customers and CSRs take place? What was the content of the earlier communications? The goal of Research Question Two was to

identify how services and communications evolved as technology matured. The aim of Research Question Three answers another multi-part question, What are the current state-of-the-art technologies that exist in CCs? Which industries appear to have the best solutions? What are these solutions? Chapter One concluded with the scope of the study (limitations and delimitations), and a list of definitions of some essential terms defined and used throughout this research study.

In Chapter Two, the review of the literature that pertains to the establishment of state-of-the-art CCs, the changes in technology, and how they have affected the changes in services provided by the CCs introduces the framework of the investigation. In this chapter, a methodological review of both past and present literature was crucial to unveil what is historically known about CCs, the technology that existed, and those on the horizon to solidify the theoretical and conceptual progress of this work undertaken. Webster and Watson (2002) noted that for an effective literature review, it “creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed” (p.13). The study of history is a phenomenon because historical information possesses a practical, intrinsic, and educational value (McDowell, 2013). Therefore, the first section of Chapter Two presents a brief overview of the history of CCs and defines both customer contact centers and CCs as entities that can be characterized independently or interchangeably. The reason for this is because there was not universally accepted definition of CCs as several suggestions have been proposed. Next, the review provides a fundamental starting point in history that summarizes what was known about the industry and its impact. Chapter Two also traces the evolution of CCs from the 1950s to the

1990s and then describes the integration of CC technology and segmented the chapter in subheadings called business and industry, public and private institutions of higher education CCs, and CC training. The final section on CC training, it discusses how technologies have affected the changes in services provided by CSRs, the skills and competencies typically required for employment, the training necessary, common areas of service, and accompanying issues according to the relationship of the literature to the study and impact on CCs. The contribution this study is intended to make on the telecommunications and service industries is significant and adds to the existing body of literature for future research to build upon as modern CCs continue to evolve producing state-of-the-art technologies. In addition to adding to the literature on the evolution of technology in CCs, findings from this investigation and study of the industry should provide CC stakeholders, such as owners, managers and other leaders with invaluable information on existing computing systems, technology on the horizon, and the human-computer interaction experienced by employees for better organizational planning and overall industry development.

Chapter Three included the methodology that was used in this chapter to answer each research question with a process strategically aligned to meet the goal. This chapter essentially described the various steps within the plan as it was executed. Moreover, research design, strategies, tool and resources, as well as information gathering procedures that were used to both analyze and synthesize information were included. It was prominent that both library research and primary and secondary sourced document analysis and empirical literature research and analysis were applied to address all research questions. The research design followed a historical research methodology

model, as described in McDowell (2013), which is used for the development of a detailed, descriptive, and historical report. Next, a discussion on the steps of how each of the research question were answered and explained proceeded. As noted, no single investigation has traced the fundamental history of CC communications with a comprehensive scope, including the content of the initial communications and the future direction of this phenomenon. The chapter continued with a discussion on instrumentation and the use of document analysis as a foundation for working with primary and secondary sources to gain a contextual understanding of the past by extracting information to make informed decisions. A qualitative approach was used to guide the evidence-based literature review and content analysis to provide a thorough understanding of the phenomenon (Krippendorff, 2013). The steps prescribed by McDowell (2013) were followed and explained in detail. Chapter Three concludes with an explanation of data collection by applying Petticrew and Roberts' (2006) systematic review of literature in five stages. Each literature was stored in EndNote X9, a bibliographic database and document publishing tool. Notes were both handwritten and electronic and the information coded to identify literary themes and trends.

Chapter Four discussed the results based on the outcomes of the steps taken. The results indicated that CC services and communications evolved as technology matured. Regarding state-of-the-art CC technologies, artificial intelligence and chatbots are recent developments impacting CCs. These solutions include an array of systems and technologies to support communication, consumerism, CSR employee engagement, and technology integration. The report ended with Chapter Five, that include the conclusion, implications, recommendations, and summary.

Appendix A

Photo Analysis Worksheet

Analyze a Photograph

Meet the photo.

Quickly scan the photo. What do you notice first?

Type of photo (check all that apply):

<input type="checkbox"/> Portrait	<input type="checkbox"/> Landscape	<input type="checkbox"/> Aerial/Satellite	<input type="checkbox"/> Action	<input type="checkbox"/> Architectural
<input type="checkbox"/> Event	<input type="checkbox"/> Family	<input type="checkbox"/> Panoramic	<input type="checkbox"/> Posed	<input type="checkbox"/> Candid
<input checked="" type="checkbox"/> Documentary	<input type="checkbox"/> Selfie	<input type="checkbox"/> Other		

Is there a caption? yes no

Observe its parts.

List the people, objects and activities you see.

PEOPLE	OBJECTS	ACTIVITIES
Operator	Telephone Switchboard	Connecting wires from one input to another

Write one sentence summarizing this photo.

The telephone switchboard operator is connecting calls by moving wires from one input to another.

Try to make sense of it.

Answer as best you can. The caption, if available, may help.

Who took this photo?
Unknown

Where is it from? <http://JoeTourist.net>
https://upload.wikimedia.org/wikipedia/commons/1/d0/Jersey_Telecom_switchboard_and_operator.jpg

When is it from?
1975

What was happening at the time in history this photo was taken?
In late 1950s and 1960s, large switchboards called private manual branch exchanges were utilized by phone operators.

Why was it taken? List evidence from the photo or your knowledge about the photographer that led you to your conclusion.
To photograph switchboard technology in 1975.

Use it as historical evidence.

What did you find out from this photo that you might not learn anywhere else?
The photo was taken in 1975.

What other documents, photos, or historical evidence are you going to use to help you understand this event or topic?
The copyright holder of the file allows anyone to use it for any purpose, provided that the copyright holder is properly attributed. Redistribution, derivative work, commercial use, and all other use is permitted. Other photos may be accessible via the website.

Reference: <http://JoeTourist.net>
https://upload.wikimedia.org/wikipedia/commons/1/d0/Jersey_Telecom_switchboard_and_operator.jpg

Reference materials created by the National Archives and Research Administration and in the public domain. Retrieved from https://www.archives.gov/files/education/lessons/worksheets/photo_analysis_worksheet.pdf

Reference materials created by the National Archives and Research Administration and in the public domain. Retrieved from https://www.archives.gov/files/education/lessons/worksheets/photo_analysis_worksheet.pdf

Appendix B

Written Document Analysis Worksheet

Analyze a Written Document

Meet the document.

Type (check all that apply):

<input type="checkbox"/> Letter	<input type="checkbox"/> Speech	<input type="checkbox"/> Patent	<input type="checkbox"/> Telegram	<input type="checkbox"/> Court document
<input type="checkbox"/> Chart	<input type="checkbox"/> Newspaper	<input type="checkbox"/> Advertisement	<input type="checkbox"/> Press Release	<input type="checkbox"/> Memorandum
<input type="checkbox"/> Report	<input type="checkbox"/> Email	<input type="checkbox"/> Identification document		<input type="checkbox"/> Presidential document
<input type="checkbox"/> Congressional document	<input checked="" type="checkbox"/> Other Digital magazine			

Describe it as if you were explaining to someone who can't see it.
Think about: Is it handwritten or typed? Is it all by the same person? Are there stamps or other marks? What else do you see on it?

CIO magazine (also known as CIO.com) refers to the job title Chief information officer. A five-page digital magazine article was typewritten by Brendan Read. The article included interviews from industry professionals and reports from conducted case studies.

Observe its parts.

Who wrote it?
Brendan Read

Who read/received it?
Computer-related executives and technology decision makers

When is it from?
September 21, 2009

Where is it from?
<http://www.cio.com>

Try to make sense of it.

What is it talking about?
The title of the article is "Contact Center Agents: Training to Survive."

Write one sentence summarizing this document.
How can companies shift from traditional training formats to technology-based tools.

Why did the author write it?
To educate readers about the importance of training Call Center Agents to survive service changes.


Quote evidence from the document that tells you this.
"Technology-based training solutions are becoming more robust and versatile."

What was happening at the time in history this document was created?
Call Centers began expanding customer service and support via e-mail, SMS and Web chat.

Use it as historical evidence.

What did you find out from this document that you might not learn anywhere else?
Rosarme D'Ausilio, used soft-skills training in a case study that resulted in shortening the calls for a Connecticut utility by 22.3 seconds and saved the company \$325,000 a year.

What other documents or historical evidence are you going to use to help you understand this event or topic?
Refer back to the article source website: <http://www.cio.com> to read additional reports and news that pertains to the readership audience of the digital magazine.




Materials created by the National Archives and Records Administration are in the public domain.

Reference materials created by the National Archives and Research Administration and in the public domain. Retrieved from https://www.archives.gov/files/education/lessons/worksheets/written_document_analysis_worksheet.pdf


Appendix C

Primary Source Analysis Tool

Primary Source Analysis Tool | Teachers - Library of Congress



[The Library of Congress](#) > [Teachers](#) > [Using Primary Sources](#) > Primary Source Analysis Tool



PRIMARY SOURCE ANALYSIS TOOL

Print your analysis

Name your primary source (optional)

URL of primary source (optional)

Your Name (optional)

Date

Your Class (optional)

[Go back to analysis](#)

Select format of your primary source

Photographs and Prints

OBSERVE

The history of the call center picture/Infographic created by Nick DAleiva on April 22, 2015.

It shows a graphic visual representations of information from 1957 to present day which would be when the article was written in 2015.

People and objects are arrange as

REFLECT

The Image was made to to present information quickly and clearly.

Infographics are easy-to-use tools to potentially improve human understanding of information by utilizing images to enhance visual abilities to identify topics, patterns and trends.

QUESTION

Who: I wonder how much time the creator spent to gather the information and how accurate is the data.

What: I wonder what other piece of history was not included.

When: I wonder when the Infographic was published how was it received.

FURTHER INVESTIGATION

I would like to know if there are other representations of the infographic or if the image was edited past 2015 to 2018.

<http://www.loc.gov/teachers/primary-source-analysis-tool/index.php>

1/1

Reference materials created by the Library of Congress and in the public domain.
 Retrieved from <http://www.loc.gov/teachers/primary-source-analysis-tool/>

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