

Impact of Conversational Agents on Customer Service Employees

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments) nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Arlene H. Ugale

Abstract

Many organisations are implementing conversational agents (CAs) such as chatbots and virtual assistants to perform customer service functions due to the technology's cost-effectiveness and ease of use for customers. The literature offers two opposing views regarding the effects of CAs on the future of the human workforce. This research explores these opposing views and investigates the effects of CAs from the employee's perspective. Therefore, my research questions focus on the effects of CAs on the (1) work practices of customer service employees and (2) job satisfaction and job security of customer service employees.

Applying a qualitative research approach, the study shows that the actualisation of the technology affordances of CAs changes the work practices of customer service employees. The study finds a relationship between the work practices and job satisfaction (and job security) of customer service employees by implementing the Job Characteristics Model (JCM). These relationships suggest that the implementation of CAs is positively associated with customer service employees' job satisfaction and security. This is illustrated through a proposed extension to the JCM. The discussion of the findings provides theoretical and practical contributions, limitations and suggestions for future research.

Keywords: conversational agents, technology affordances, work practices, job satisfaction, and job security

Chapter 1. Introduction

1.1. Research background and focus

Conversational agents (CAs) (Griol, Carbo, & Molina, 2013) have experienced an increase in deployment in the service field of customer service (Chakrabarti & Luger, 2015; Huang & Rust, 2018; Kirkpatrick, 2017; Xu, Liu, Guo, Sinha, & Akkiraju, 2017), primarily because of the technological advances in natural language processing (NLP) and machine learning (ML) (Gnewuch, Morana, & Maedche, 2017; Luger & Sellen, 2016). They come in different forms such as chatbots, digital assistants, virtual companions, or online avatars (Luger & Sellen, 2016). CAs represent intelligent software interfaces that use NLP in effectively managing a conversation. Many organisations in different industries have started adopting the use of CAs because of their capability to provide a speedy and accurate response to customers (Bassett, 2018; Kirkpatrick, 2017; Xu et al., 2017) around the clock and at a lesser cost (Bassett, 2018; Chong, 2017; Kirkpatrick, 2017). Furthermore, CAs can effectively handle massive amounts of information (Brandtzaeg & Følstad, 2017) that enables them to be cognisant of previous interactions (Bickmore, Caruso, Clough-Gorr, & Heeren, 2005), identify errors, and make recommendations (McGoldrick, Keeling, & Beatty, 2008). They can also recognise non-verbal cues, perform social dialogue, and display empathy (Bickmore et al., 2005), which may enable them to act as effective service agents.

The increase in the popularity and adoption of CAs by many organisations makes it important to understand the impact of technology on human service employees, particularly on their job satisfaction and security. The findings from this research can have an impact on the future of employment in customer service and customer engagement. The evidence from this study may also encourage companies to identify relevant attributes and skills necessary for hiring new employees and at the same time,

developing the skills of current employees. This is to keep up with changes that are underway in the field of customer service. Moreover, it can encourage organisations who have outsourced their customer service to reinstate their customer service operation in-house if the adoption of CAs can be a more fitting strategy to gain competitive advantage and to save cost.

1.2. The relevance of the research

Conversational agents (CAs) offer an alternative channel for organisations to communicate with their customers, thus leading to a change in how both parties interact with each other (Chakrabarti & Luger, 2015). There is limited knowledge on the impact of CAs on the human service workforce even though many organisations have deployed the technology. The literature on CAs and artificial intelligence (AI) in general, presents paradoxical views regarding the effect of CAs on the human workforce, both now and in the future. CAs are becoming more intelligent, potentially posing a significant threat to human service employees (Huang & Rust, 2018) with the advancement of AI in the field of customer service; AI-enabled technologies could ultimately bring about massive unemployment (Huang & Rust, 2018; Makridakis, 2017). Other researchers believe that AI-enabled technologies, such as CAs, will augment human capabilities (Bassett, 2018; Chong, 2017; Jarrahi, 2018) promoting symbiosis of human and computer intelligence (Bassett, 2018; Chong, 2017; Jarrahi, 2018). From this perspective, the collaboration between humans and intelligent systems will open a gateway to a hybrid workforce where humans and intelligent systems can teach and learn from each other (Plastino & Purdy, 2018). Both views are predominantly conceptual and lack empirical research that delves into the actual perceptions and experiences of human service employees working alongside CAs, a gap that this research addresses.

This research can give clarity on the future of the service workforce and provide insights for organisations in order to better manage both human employees and CAs

through an understanding of the perceptions and experiences of human service employees working alongside CAs. Therefore, one of the objectives of this research is to explore how the implementation of CAs affects human service employees' work practices. In addition, the literature lacks empirical studies that explore the effects of CAs on human service employees' job satisfaction and job security. For that reason, the second objective of this research is to examine whether intelligent systems such as CAs are indeed a threat or rather an enrichment to human capital. This is done by investigating how working with CAs affects the overall job satisfaction and job security of human employees through the identified changes in work practices. Relatedly, any resulting insights have the potential to provide practical implications for business operations. Insights could pave the way towards the direction of customer engagement and could identify any potential job creation onshore. Likewise, the study might give insights into the future of outsourcing.

1.3. Research questions

Overall, this research study aims to identify the impact of CAs on customer service employees.

Specifically, it raises the following questions to address the existing research gaps:

- a. How do CAs affect the work practices of customer service employees?
- b. How do CAs affect job satisfaction and job security of customer service employees?

Following this section, Chapter Two introduces the impact of Information and Communications Technology (ICT) on work to gain insight on how it differs or resembles CAs impact on work. This chapter provides an overview of CAs' literature to show the current knowledge around CAs and its impact on the customer service human workforce. It also presents an overview of job satisfaction, job security and the theoretical lenses used in the study. This serves as a baseline of understanding of all variables used in this research. Chapter Three describes the research design and includes the approach used in

the research, methodology, data collection method and data analysis technique. Chapter Four presents the findings derived from the study. Finally, Chapter Five provides a discussion that encapsulates the findings; it outlines the contributions to the existing literature and provides both theoretical and practical implications; thus, it leads to the conclusions, limitations, and areas for future research.

Chapter 2. Literature Review

The first part of this chapter provides an introductory discussion on the impact of Information and Communications Technology (ICT) on work in general. The purpose of this introduction to CAs is to be able to make sense of the similarities and differences in ICT's impact whenever new technologies are introduced and adopted in the workplace.

The second part of this chapter outlines seven themes drawn from the literature on CAs. The first theme provides a definition of CAs. The second theme presents and describes its types and classification. The third theme provides the algorithm, techniques, and technologies used to develop a CA. This supports an understanding of CAs structure from a technical perspective. The fourth theme discusses the different use cases, i.e., how CAs are used across different industries. This provides a snapshot of CAs' prevalence in today's world. The fifth theme discusses the role of CAs in customer service, which is the heart of the study; the subsections under this theme highlight the nature of service tasks that CAs can perform, the design goals of CAs in the customer service space, and the changes in customer service work practices as a result of CAs' implementation. The sixth theme draws out how users perceive CAs, that is, whether they are viewed merely as a device, seen as a customer service agent or something else. The last theme presents contradictory views on the impact of CAs on the human service workforce. Some researchers point out that CAs are a serious threat to the human workforce, whilst others posit that technology can augment the capabilities of human employees.

The third part of this chapter introduces the concepts of job satisfaction and job security. This part promotes a basic understanding of how job satisfaction and job security fit in the context of CAs.

Finally, the last part of the chapter presents and explains the theoretical lenses used in the study. The lens of technology affordance and Job Characteristic model are relevant

in understanding the relationship between human actors of the study and the CA, on how the CAs can influence customer service work practices and how all these relationships and influences can impact job satisfaction and job security of customer service employees.

2.1. The impact of Information and Communications Technology (ICT) on work

The advancements in ICT have fundamentally altered the business processes (Barnes, 2012; Koutsoutos & Westerholt, 2005; Tarute & Gatautis, 2014), work practices (Barnes, 2012) and job conditions (Chesley, 2014). These changes have impacted both employees and organisations as a whole. For example, on the employee level Barnes (2012) studied the differential impact of ICT on employees' work practice. His study found that employees that utilise ICT functions are able to work 'smart' (Barnes, 2012). This means that employees apply ICT to organise and manage their tasks fast and efficiently whether on an individual basis or working as a team. Smart working practices of employees are manifested through the use of messages and data exchange via electronic mail, meetings via teleconferencing that promotes flexibility and the use of both internet and intranet to easy access information (Barnes, 2012). Through the practice of working smart, employees observed an increase in speed, efficiency, and productivity at work (Barnes, 2012). On a business level, organisations reaped the benefits of ICT adoption as it impacts their overall business performance typically associated with financial gain (Tarute & Gatautis, 2014). It is realised through streamlined processes (Koutsoutos & Westerholt, 2005), expansion of knowledge and information flow within the organisation (Barnes, 2012), improvement of speed and quality in service delivery and data reporting (Lacity & Willcocks, 2016; Moffitt, Rozario & Vasarhelyi, 2018) and expansion of availability of services and options to stakeholders (Collier & Kimes, 2012; Curran & Meuter, 2005; Lacity & Willcocks, 2016). These ICT effects boost productivity

and growth (Barnes, 2012; Koutsoutos & Westerholt, 2005; Tarute & Gatautis, 2014), increase market and sale potential and ultimately reduce cost (Collier & Kimes, 2012).

Conversely, a different impact of ICT is also observed on employee and organisational level as a result of these positive benefits. According to (Barnes, 2012), the increase in ease and speed of communication exchange encourages quick response to recipients that adds to the intensification work. In addition, the improved processes that allow them to multitask eventually result in strain especially in a fast-paced environment (Barnes, 2012; Chesley, 2014). The easy access to information made employees feel overwhelmed and lost in the vast amount of available information (Barnes, 2012). On a business level, rapid advancements in ICT demanded the upskilling of staff members in order to use different software (Koutsoutos & Westerholt, 2005). In relation to this, the employment requirement is also impacted in order to utilize the capacity of ICT (Yeo & Grant, 2019) and maximize the cost of ICT investment (Curran & Meuter, 2005). This means that there is a demand for having a stable and competent workforce to achieve desired results in ICT implementation (Yeo & Grant, 2019) implying that not all benefits of ICT investments are fully realised (Curran & Meuter, 2005).

ICT's strong impact on work, in general, is seen in the proliferation of technologically-based innovation processes such as self-service technologies (SST) and robotic process automation (RPA). Self-service technologies (SST) are a technology interface that allows customers to perform service without employee intervention (Hilton, Hughes, Little & Marandi, 2013; Meuter et al., 2005). Automated-teller machines (ATMs), online banking, self-checkouts in the grocery stores and self-check-in kiosks at the airports are examples of SST. The main goal of process innovation is to standardise or structure the workflow in order to produce a service without employee intervention. This process strategy can ultimately reduce labour cost whilst expanding more service delivery options to customers (Curran & Meuter, 2005). Curran & Meuter (2005) and

Wang et al., (2013) agree that intention to use SST is derived from the convenience it gives (Curran & Meuter, 2005; Wang et al., 2013), accuracy and speed (Wang et al., 2013). Both of their studies show that the need for human employee intervention is relatively low in the SST experience except for the judgment of perceived service satisfaction (Wang et al., 2013). Interestingly, Wang et al., (2012) study shows that users' attitudes toward SST might change if there are multiple options available to deliver a service or when situational factors arise such as perceived wait time, complexity in a task and environmental influence such as a companion. These are instances where customers call for aid from human employees. This allows effective use of human employees through application of human service expertise and tacit knowledge (Hilton et al., 2013). On the other hand, RPA shares a common characteristic with SST in terms of reliance on structured tasks or processes. However, unlike SST that focuses on delivering automated services to individual customers, RPA is targeting the automation of business processes within the organisation (Asatiani & Penttinen, 2016) or business-to-business transactions. Robotic Processing Automation (RPA) is defined as a technological replica of humans mimicking the use of one or more unrelated software in executing an autonomous combination of transactions, processes, and activities in a cost-efficient and swift manner (Asatiani & Penttinen, 2016; IEEE Corporate Advisory Group, 2017). Software robots are implemented to automate tasks that were previously executed by human employees. (Asatiani & Penttinen, 2016). The impact of RPA on work is the significant speed in the implementation of processes (Asatiani & Penttinen, 2016, Moffitt et al., 2018, Lacity & Willcocks, 2016) such as shortening of new software initial phase of implementation from months to weeks (Asatiani & Penttinen, 2016). RPA is where companies start their automation service journey (Lacity & Willcocks, 2016) by automating basic and monotonous human tasks that in order to manage the volume (Fitsource, 2019).

As the software designs proliferate in the service automation field, a more advanced type of software tools emerged in the form of cognitive automation that is the elemental concept of CAs. CAs as an example of cognitive automation that works similarly with RPA but differs in terms of service characteristics (Lacity & Willcocks, 2016) and scope of application (Fitsource, 2019). In terms of service characteristics, RPA applies rule-based approach to process structured data in order to generate a single correct answer (Lacity & Willcocks, 2016). In contrast, CAs applies inference-based approach to interpret unstructured data in order to generate a set of probable answers (Lacity & Willcocks, 2016). This is how CAs interprets the query and provide probable answers and solutions in a chat environment. Additionally, RPA entirely relies on easily implemented basic technologies that uses an 'if-then- approach in processing data whereas, CAs rely on knowledge base using complex technologies such as NLP and ML algorithm to process the complex data (Fitsource, 2019). In terms of scope of application, RPA performs monotonous tasks with precision and accuracy due to its ability to processes monotonous human tasks and rule-based approach. Examples of these monotonous tasks include maintaining records, performing calculations and back-office processing that does not require cognitive thinking or analytical skills (Fitsource, 2019). On the other hand, cognitive automation such as CAs use particular AI techniques (Fitsource, 2019) such as NLP and ML in order analyse data contextually, learns from the data continuously and make predictive analysis.

Whilst ICT had proven to improve employee practices at work (Barnes, 2012), SST and RPA aimed at reducing or eliminating human employee work practices especially repetitive and structured activities and transactions (Asatiani & Penttinen, 2016; Hilton, Hughes, Little & Marandi, 2013; Meuter et al., 2005). In the context of CAs, however, little is known on how CAs' adoption impact employees work practices. Thus, this study examines how CAs affect customer service employees' work practices. In addition, the

paradox of ICT, SST, and RPA is that these technologies offer great benefits to employees' productivity allowing them to focus more on complex cases whilst at the same time posing a potential threat to human employment. I claim that a similar paradox could be observed in the CA context. The implementation of CAs provides a lot of benefits for the human employees potentially improving their job satisfaction, whilst at the same time presenting a threat for employment affecting the employees' perceived sense of job security. Therefore, the study aims to understand how CAs affect job satisfaction and job security.

Overall, this section provides an overview of ICT and automation to understand their impact on work. This will provide a baseline for comparison between the effects of ICT and the impact of CAs on work practices.

2.2. Conversational agents - An overview

2.2.1. Definition.

Griol, et al. (2013) defined a CA as software that “accepts natural language as input and generates natural language as output, engaging in a conversation with the user” (p. 760). The main feature of this technology is the integration of computational linguistic techniques using the internet as a communication channel (Lester, Branting & Mott, 2004). CAs have five functionalities that allow them to effectively manage a conversation. These are natural language understanding (Griol et al., 2013; Lester et al., 2004), automatic speech recognition (Cassell, 2000; Griol et al., 2013), dialogue management, natural language generation and text-to-speech synthesis (Griol et al., 2013). The purpose of CAs is to naturally mimic a human conversation and perform service tasks through knowledge sharing (Chakrabarti & Luger, 2015) and social support (Verhagen, Van Nes, & Feldberg, 2014; Xu et al., 2017) regardless of their digital interface (e.g. text-based, voice-based, etc.).

2.2.2. Typology and classification.

Conversational Agents (CAs) represent all types of conversational intelligent systems (Gnewuch, Morana, & Maedche, 2017) that use natural language software powered by Artificial Intelligence (AI) (Lester, Branting, & Mott, 2004). AI is a concept that has no definite meaning but it can be generally defined as “intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals” (Lester et al., 2004, p. 1). This concept originated from Alan Turing in the 1950s. He theorised that a machine can be considered truly intelligent if it can impersonate a human in a text-conversation without being distinguished (AI Forum of New Zealand, 2018; Lui & Lamb, 2018; Octane AI, 2018).

The interfaces of CAs vary in types and are classified differently causing people to have a plethora of terms relating to CAs and use them interchangeably (Luger & Sellen, 2016; McGoldrick, et al., 2008). For example, people consider CAs as chatbots, embodied conversational agents (ECA), avatars, intelligent personal assistants (IPA) and digital or virtual assistant interface agent. Therefore, CAs can be seen as the umbrella term for software that incorporates Natural Language Processing (NLP) in order to converse in natural language with its user. To clearly distinguish one from the other, Luger and Sellen (2016) characterised the type of CAs from a functional perspective as chatbots or digital companions. A chatbot is characterised as a CA that can imitate a conversation but does not store any knowledge or information of the user whereas, a digital companion, which is a smarter CA, can store and recall information making it capable of building a relationship with the user (Luger & Sellen, 2016).

On the contrary, Gnewuch et al. (2017) classified CAs based on two aspects: (a) method used for communication and (b) context. Their categorisation of CAs was more defined compared to that of Luger and Sellen (2016) because it covered the mode of communication that can either be through text or speech. More importantly, they

classified CAs according to the specific purpose they served. This implies that their functionality may be restricted to a specific domain such as CAs deployed to answer basic banking queries or be more general like digital assistants such as Siri (by Apple Inc.) and Alexa (By Amazon) that perform a wide range of voice-activated commands (Gnewuch et al., 2017). This type of categorisation of CAs further strengthened my understanding of how each of the participants in my research perceived the CAs deployed at their work.

2.2.3. Foundational technology and techniques in CAs' development.

The development of conversational systems over the last 50 years changed the manner of human-machine interaction and is leaning towards natural language-based interfaces (Masche & Le, 2018). Masche and Le (2018) reviewed the most common technologies used in developing CAs. Their study provides a basic understanding of the fundamental technologies used in developing a CA. In their study, they highlighted several technologies that are divided into two categories of conversational systems that support the human-machine interaction.

The first category is labelled as 'chatbot' that originated from the system called 'chatterbot' (Masche & Le, 2018). The chatbot system consisted of technologies that supports the processing steps of CAs from a technical perspective summarised by Kluwer (2011) as: (1) filtration of input (removes and substitute words and characters such as contractions and smileys; (2) pattern-matching algorithm that matches the initial input against filtered input; (3) identification of the response templates; and, (4) generation of response. The techniques developed under the chatbot system to operate the four processes include the following:

Keyword and Pattern Matching algorithms. This is a technique that analyses the input sentence from left to right. The words are searched into the keywords dictionary before decomposition rule applies (Lokman & Zain, 2010). Then the matching process will start to obtain the longest pattern match until the right match is found (Shawar &

Atwell, 2007). Once a match is found then it will select the template that best interprets the match to process the output construction (Shawar & Atwell, 2007). This is a technique suitable for retrieving accurate information (Abdul-Kader & Woods, 2015)

Artificial Intelligence Mark-up Language (AIML). It is an extensible mark-up language that stores and transports data that is based on category pattern-matching that covers a larger range of potential user's inputs using wildcards (Abdul-Kader & Woods, 2015; Masche & Le, 2018; Shawar & Atwell, 2007). Shawar and Atwell (2007) present three categories namely atomic categories, default category and recursive category. The atomic category excludes wildcard symbols whilst the default category does otherwise. The recursive category uses various applications such as the reduction of complex grammatical forms and converts it to simpler ones and tackling synonyms. AIML is considered as one of the core techniques in CAs' design (Abdul-Kader & Woods, 2015) and is commonly used in most of the CAs (Abdul-Kader & Woods, 2015; Masche & Le, 2018).

Chats Script. This language also uses a pattern-matching technique but it does include a distinct feature called 'Concept Set' (Masche & Le, 2018). The concept set applies semantic-related concepts (Masche & Le, 2018) that make a conversation more interactive. This technique is also deployed on occasions when AIML is unable to find a match and focuses on the "the best syntax to build a sensible default answer" (Abdul-Kader & Woods, 2015, p. 73).

Language Tricks. This technique uses phrases, sentences, and paragraphs to give variety in the answers and to look more convincing (Abdul-Kader & Woods, 2015; Masche & Le, 2018). These language tricks are: (a) canned responses; (b) model of personal history; (c) typing errors and simulation of keystrokes; and (d) no logical or non-sequitur conclusion (Abdul-Kader & Woods, 2015; Masche & Le, 2018).

The second category of conversational systems is called a dialog system (Lester et al., 2004), A dialogue system covers the steps deployed in the Natural Language Processing or NLP technology that is further discussed below:

NLP - As earlier discussed, NLP is incorporated in CAs design in order to deliver a natural conversation to a user. NLP is a process that understands the interactions of humans and computer systems using different modes of communication such as speech, text or other similar materials (Chowdhury, 2003). What it does is extract and analyse the meaning of responses received through multiple forms of communication (Levy, 2018) using speech recognition, natural language understanding, and response generation (Lester et al., 2004; Masche & Le, 2018). NLP is also considered as a subfield of AI and one of the oldest areas in AI research (Lester, et al., 2004). It remains one of the fundamental components in CA's structure and design.

ML – With the emergence of other AI systems (Kietzmann, Paschen, & Treen, 2018), developers have started to use Machine Learning (ML) algorithms. ML is the study of algorithms and other statistical models that enables computer systems to teach itself and improve (Lester et al., 2004) based on the loaded data that can vary in size (Baier, Rese, & Röglinger, 2018; Huang & Rust, 2018). The key feature of ML is the ability to recognize patterns (Lester et al., 2004) and to make predictions of values (Kietzmann et al., 2018; Lui & Lamb, 2018). This enables CAs to offer solutions and recommendations by learning from the customer's historical records and behaviors (Kietzmann et al., 2018; Levy, 2018).

Both NLP and ML are advanced techniques crucial in CAs' architectural structure of the modern age. However, not all CAs make use of NLP and ML algorithm. For this reason, scholars have called for further developments of NLP and ML (Han & Yang, 2018; Qian et al., 2018).

2.2.4. Applications of CAs.

Because of the growing interest in CAs, developers and researchers in the field of human-computer interaction and AI have developed different models and frameworks that aim to enhance the abilities of CAs. For example, organisations within the healthcare industry have worked to improve the social and emotional capabilities of CAs (Bickmore et al., 2005). These enhancements aim to make CAs more human-like and to fulfill social roles making CAs effective companions for patients that need care and support.

As a result of exhaustive experimentations and refinements of previous work of many developers and researchers, CAs are now widely deployed in various sectors such as financial services, insurance, online retail and the public sector and are becoming omnipresent in our daily activities (Luger & Sellen, 2016). In the next section, a review of CAs' use cases across different industries is presented in a descending order based on the prevalence of use.

Financial services. In financial services, Lui and Lamb (2018) confirmed that many financial institutions were investing in CAs in the form of chatbots or digital assistants which were hosted on their respective websites or their Facebook Messenger apps. CAs are used because of their higher cost-effectiveness (Bassett, 2018; Chong, 2017; Kirkpatrick, 2017; Lui & Lamb, 2018) as compared to humans when answering queries, processing simple requests instantaneously and being able to perform personalised services (Bassett, 2018; Lui & Lamb, 2018). In addition, Lui and Lamb (2018) found that customers seemed to display more trust in these chatbots than humans for certain types of financial advice because of the absence of self-interest. This justifies why the financial services industry was one of the first to adopt CAs as part of their digital transformation (Sousa & Rocha, 2019).

E-Commerce. In e-commerce, McGoldrick et al. (2008) explored the roles that CAs play in an online shopping environment. They found that friendly and functional help

roles appealed more to women and younger consumers, aged 18 to 34. One of the help functionalities that was preferred by online consumers was the CAs' ability to identify possible errors in their product selection, followed by the ability to make recommendations (McGoldrick et al., 2008). It is important to note that the use of CAs in the electronic retailing industry was still in an early stage at the time of the study. It was conducted almost a decade ago therefore, consumer preferences were yet to be shaped and the uptake of technology was still low.

Presently, the substantial advances in computing technology increased internet use and widespread use of mobile devices and messenger apps has rekindled an interest in CAs, most often as chatbots (Brandtzaeg & Følstad, 2017). CAs have opened an alternative way for customers to communicate directly with retailers (Van Eeuwen, 2017). The advances in AI allow the upskilling of chatbots and other intelligent CAs so that they can be deployed in order to automate the interaction between customers and businesses (Baier et al., 2018; Van Eeuwen, 2017). CAs are able to personalise services, making the interaction more natural even if they are complex (Baier et al., 2018). Therefore, many online retailers discuss whether to invest in 'conversational commerce' or not (Baier et al., 2018). Messina (2016) defined conversational commerce on his blog on Medium as "utilizing chat, messaging, or other natural language interfaces (i.e. voice) to interact with people, brands, or services and bots that heretofore have had no real place in the bidirectional, asynchronous messaging context". In simpler terms, instead of browsing products when shopping online, you can ask CAs to perform the task. Lego created a chatbot called Ralph that assisted customers in choosing the right gift by personalising gift recommendations to users within the Facebook Messenger app. Introducing Ralph helped Lego to reduce its cost-per-conversion by 31% as compared to other conversion-based advertising and the company achieved six times higher returns on advertising spend (Read, 2018).

Recruitment. In the recruitment space, Pickard, Burns, and Moffitt, (2013) examined how CAs were deployed to conduct interviews for hiring accountants. Pickard et al. (2013) recognised the huge potential of using CAs to automate and augment the accounting-related interview process because the series of actions were more detailed and complicated than a normal interview task. The complexity found in the nature of this interview was the handling of necessary yet sensitive enquiries about internal controls, fraud risks, processes and audit events held both internally and externally. As a result of the complexity, a huge interest prompted these scholars to investigate the potential of CAs in this sector.

At present, CAs are used in the recruitment sector to execute a range of tasks from providing concierge services to potential job candidates to resolving problems received through the recruitment helpdesk (Sumser, 2016). An example of a recruitment chatbot is Mya who does end-to-end recruitment tasks from career site engagement, pre-screening and shortlisting of candidates, to matching employees to the next job opportunity (Mya Systems, 2018; Silverman, 2017). Mya can also engage with passive candidates and reactivate their profiles for open roles (Mya Systems, 2018). One of Mya System's biggest client, Adecco, a recruitment specialist, acknowledged the benefits of using CAs based on the observed improvement of communication between them and their candidates (Mya Systems, 2018).

Health. In the health sector, a relational agent called Laura was developed by Bickmore et al. (2005) and was used as an exercise advisor for older adults. Because of Laura's ability to display relational behaviours such as the use of social dialogue and empathy, and to recall previous interactions with users, Laura was an effective motivator and agent for health behaviour change (Bickmore et. al., 2005; Schulman, Bickmore, & Sidner, 2011). Another example is the chatbot Florence that can be plugged into Facebook Messenger, Skype or Kik, reminding users to take their pills and tracking their body

weight or mood in order to achieve their health goals (The Medical Futurist, 2018). Today, CAs are integrated into robotics designed for healthcare. Softbank's humanoid robot, Pepper, is able to fulfill social roles through its empathetic capabilities making it a perfect companion for the elderly (Bolton et al., 2018).

Legal services. CAs are known to provide legal advice and, in some cases, generate documents based on the conversation between the user and the CA (Dale, 2018) using NLP. There are many law firms that are now implementing CAs. For example, in the US, Baker and Hostetler's AI lawyer chatbot, Ross, is in charge of bankruptcy practice (Bolton et al., 2018; Chowdhry, 2016). Meanwhile, Norton Rose Fulbright have Parker (Dale, 2018) who responds to privacy and data breach issues in Australia (Norton Rose Fulbright, 2017).

Therefore, in this section, we learnt that CAs of various types are being used to deliver different services across a range of industries, such as financial services, e-commerce, recruitment, health, and legal services. This reveals the ubiquity and acceptance of CAs in many aspects of our daily lives as they have become a common way of communicating and interacting with different business entities.

2.2.5. CAs and customer service.

In the earlier part of this section, the applications of CAs were illustrated to see how these intelligent systems were being used differently across various industries. However, the fundamental and universal function of CAs across all these industries was to provide services that delivered a more engaging user experience (Luger & Sellen, 2016). The services rendered by CAs catered to different purposes such as information sharing, social and emotional support, entertainment, connectivity to other people or machines as well as customer service (Brandtzaeg & Følstad, 2017). Therefore, it is important to delve deeper and understand: (a) the nature of tasks in the service industry; (b) CAs' mechanism through design goals familiarisation that helps evaluate their capabilities and reasons for

adoption; and, (c) how CAs adoption influences the work practices of human service employees. An understanding of these three elements will help reveal the impact of CAs on human service employees working alongside them. More specifically, this research will focus on a contact centre environment to explore the impact of CAs on human customer service employees.

Nature of tasks in the service industry. Huang and Rust (2018) specified four types of intelligence that were required to carry out a task depending on the nature of service by synthesising literature in human intelligence and AI. These types of intelligence were categorised as: (a) mechanical; (b) analytical; (c) intuitive; and (d) empathetic. The types of intelligence were presented in an order based on the degree of challenge for AI to imitate. This means that the hierarchy of intelligence starts off with mechanical that is ranked the lowest because it is the type of intelligence that is the easiest to emulate by AI. Followed by analytical, intuitive and lastly, empathetic. Therefore, empathetic intelligence ranked the highest in the order because it was the hardest type of intelligence that AI could mimic as illustrated in Figure 1.

Mechanical intelligence of humans can be emulated in customer service by CAs through performing standardised, routine, transactional and repetitive tasks (Chakrabarti & Luger, 2015; Cui et al., 2017; Huang & Rust, 2018; Xu et al., 2017) that require consistency with a minimum degree of learning or adaptation. An example would be informational tasks carried out by call centre agents, wait staff and retail sales staff. Informational tasks are knowledge-sharing activities performed by customer service employees such as attending to basic enquiries like providing a bank account balance, flight booking confirmation, food or retail shopping recommendation or order-taking. Tasks under this level of intelligence are the easiest to automate.

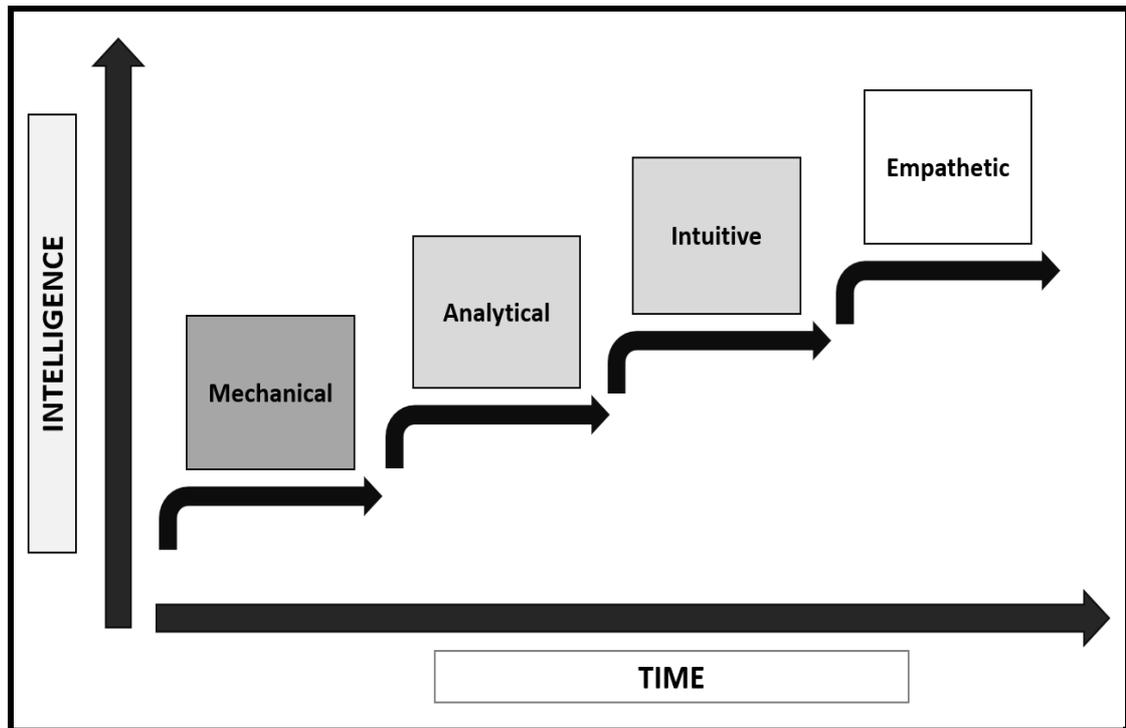


Figure 1. Four levels of intelligence. Adapted from Huang, M., & Rust, R. (2018). Artificial intelligence in service. *Journal of Service Research*, 21(2), 158. Copyright (2018) by Ming-Hui Huang and Roland Rust.

The next level of intelligence is classified as analytical. This rank of intelligence is appropriate for performing tasks that require logical thinking and decision-making skills (Huang & Rust, 2018). This type of intelligence is needed in performing more complex tasks that are characterised as “systematic, consistent and predictable” (Huang & Rust, 2018, p. 158). Tasks are described as such because resolving such tasks involves a process that begins with logical thinking that relies on acquired data, followed by learning from the same data and adapting systematically (Huang & Rust, 2018). CAs with ML algorithms can perform tasks that require analytical intelligence because of their ability to troubleshoot and make recommendations that personalise services based on historical records of customer preferences (Lui & Lamb, 2018; Verhagen et al., 2014). Examples of companies that use CAs and algorithms to perform analytical tasks include FinTech start-up companies MortgageGym and Habito. Both of these offer tailored and accurate mortgage advice (Lui & Lamb, 2018) based on historical data of each of the customers they serve.

Intuitive intelligence is more complex, holistic, experiential, creative and context-based than analytical intelligence. This level of intelligence allows intuitive learning and adaptation based on an understanding of the data and its context (Huang & Rust, 2018). Typical service examples requiring this level of intelligence include providing legal advice that is carried out by lawyers and performing diagnostics by medical professionals (Huang & Rust, 2018). An example of AI that can perform a task requiring intuitive intelligence is IBM Watson for Oncology. IBM Watson supports clinicians through the consumption of medical literature that includes the patient data and matches that with other data such as medical trial guidelines and articles. Once data is consumed, IBM Watson interrogates longitudinal medical records using NLP and the deep learning technique. This provides data insights, such as potential treatments, backed up with a rationale and supporting evidence (IBM Corporation, 2019). This allows oncologists to identify the most appropriate treatment for the patient by combining the data analysis performed by intelligent software with their own professional expertise.

Lastly, empathetic intelligence is needed when the task is highly emotional, social, communicative, and interactive. It is the type of intelligence that enables learning and adaptation based on experience in a manner that is empathetic (Huang & Rust, 2018). In addition, it is also described as the most complex type of intelligence, making it the highest form amongst all types. It is also the type of intelligence that AI cannot easily emulate. For that reason, Huang & Rust (2018) claimed that “soft people skills will ultimately be the most important factor for employability” (p. 167) for humans in the future. Tasks requiring this type of intelligence normally apply to jobs that aim to build interpersonal relationships such as politicians, negotiators, and psychiatrists. However, CAs such as Replika and humanoid robot Pepper (Pardes, 2018) are slowly encroaching this space as well. These types of CAs are designed to probe our emotions and become digital companions to their users. They can create an impression of empathetic

intelligence by understanding certain types of emotions and respond appropriately with words, however, they may not necessarily draw out deep and strong emotions that can influence or affect the user or customer.

In this section, the four levels of intelligence were described by Huang and Rust (2018) as both to be parallel and ordinal in structure. This means that once AI manages to reach a certain level of intelligence that it can mimic, all lower intelligence can coexist to deliver a service. Therefore, Huang and Rust (2018) theorised that advancements in AI will “result in a fundamental threat to human employment” (p. 168) based on the ordinal and parallel structure of intelligence needed to perform a service task and the rapid advancements of technology mimicking the intelligence types. This theory is supported by McKinley, Houke, Kizer, & Raynor III (2017), who saw automation as a disruption and a “wicked problem” (p. 82), where a wicked problem was one caused by numerous reasons, not clearly describable and with no appropriate solution (Camillus, 2008).

It is important to understand the level of intelligence that can be emulated by AI. This helps categorise the skills of customer service employees based on their experience and interactions with their customers. This will also provide insights on the kind of threat that CAs may pose to customer service employees as per the level of intelligence possessed by their organisation’s CA and the changes that the CA brings to the human customer service employees’ work practices.

The design goals of CAs in customer service. Customer service is the support arm of most industries since many organisations understand that improving customer experience is paramount to their financial performance. Therefore, businesses invest heavily in human resources and technology to ensure customer satisfaction (Koch, 2015; Qian et al., 2018). According to Qian et al. (2018), customer experience ideally comprised a series of “psychological processes such as comfort, appreciation, praise, and aftertaste” (p. 439), noting that these processes resulted in the user feeling valued (p. 439). In

contrast, Bolton et al. (2018) argued that customer experience was not just about a customers' perspectives of the holistic experience in their interactions but also included aspects in the physical and digital realm. Physical realm refers to the physical service landscape of an organisation such as furnishings and cultural elements that enhances customer engagement. Digital realm refers to digital technologies that provide more immersive and highly personalised interactions. Therefore, offering a broader sensory experience through the integration of all psychological, physical, and digital aspects of an interaction can ultimately produce a seamless and unforgettable customer experience. Presently, most of the researchers in the field of CAs are trying to improve the natural language processing (NLP) design structure and other software components that enhance the digital domain of the customer experience. This improvement enables organisations to leverage digital technologies and gain competitive advantage (Bolton et al., 2018) through the creation of a seamless customer experience that is highly interactive and comparable to human-customer conversations.

The potential diffusion of CAs within the customer service domain has attracted many scholars to study how they can further improve CAs' design and attributes. However, despite advances in the technology in recent years, many implemented CAs have failed to meet expectations and have disappeared due to design failure (Gnewuch et al., 2017) as well as unclear purpose and limited usability (Brandtzaeg & Følstad, 2017). One example of design failure is the lack of design knowledge for CAs in customer service that inhibits successful implementation (Gnewuch et al., 2017). In the study of Gnewuch et al. (2017), it was recommended that designs of CAs in customer service will do better to focus more on humanness in the use of language, interactivity, and social roles as opposed to visual anthropomorphism (i.e. human-like physical appearance) to enhance their presence as social actors rather than simply as medium. This finding was similar to that of Han and Yang (2018) who studied human behavioural intentions in the

continued use of an intelligent personal assistant (IPA). Their study showed that physical attraction had lesser influence on the para-social relationship between an IPA and its user compared to social attraction. To put it simply, humanness in voice and language has more impact than visual elements (Han & Yang, 2018; Qian et al., 2018; Verhagen, Van Nes, & Feldberg, 2014; Wirtz et al., 2018). Furthermore, Duffy (2003) discouraged strong visual human appearance in CAs because it could increase a customer's expectations of their behaviour. Customers might compare this interaction to an actual human experience which could lead to disappointment if expectations are not met.

Meanwhile, a recent study in this domain suggested that delivery of quality service was the most important attribute of CAs in customer service in order for the intelligent software to be effective (Chakrabarti & Luger, 2015; Gnewuch, et. al., 2017; Qian et al., 2018). Gnewuch et al. (2017) used design science research (DSR) as a framework to improve the CAs' design that aimed to improve the quality of service of CAs by following five service quality dimensions namely, reliability, assurance, empathy, responsiveness, and tangibility (Parasuraman, Zeithaml, & Berry, 1985, 1988, in press). Chakrabarti and Luger (2015) also tested a framework to generate quality artificial conversations by combining both content semantics (delivering meaning through knowledge base) and pragmatics through a conversation engine (e.g. casual and other relations between words and/or expressions). As a result, the bot could hold a short conversation but only in a single context such as a discussion on opening a bank account.

A second significant aspect of quality in customer service was manifested in a study by McLean and Osei-Frimpong (2017). They empirically explored the variables that greatly influenced customer service satisfaction in a live-chat experience. However, the study involved human chat agents and not CAs. In their study, the quality in service, information, and system, display of empathy and responsiveness were key influencers in customer service satisfaction. This study aligns with the DSR framework used by

Gnewuch et al. (2017) following dimensional aspects of service quality namely, reliability and assurance as perceived information quality, responsiveness and empathy (Parasuraman et al., 1985, 1988, in press). Even though there is a multitude of studies on how to enhance the capacity and efficacy of CAs, designing an effective conversation model is still in its early stage hence, more developments are expected to come.

The following section explores the importance of empathy in delivering a satisfactory customer service experience. In the research project conducted by Xu et al. (2017), they created a chatbot hosted on Twitter that auto-generated a response for customers' requests utilising the advanced deep learning technique. They found that 40% of user requests were emotional; the conversation system they designed and tested was nearly as good as human agents in providing an empathetic response. For example, customers used twitter to express disappointment about a service encountered rather than seek information about a service purchased. Therefore, the authors suggested a potential integration of chatbot with human employees to service customers that uses the social media platform and to address these types of emotional requests. However, they did not explain in detail how intelligent chatbots could be integrated into the human workforce and what the effects of this process might be, apart from improving the speed of response.

One possible way to integrate a chatbot in the human workforce is in situations where decision making is required (Jarrahi, 2018). Because of CAs broad knowledge base, information can be accessed instantaneously (Wirtz et al., 2018) and frequently asked questions can be responded quickly (Bassett, 2018; Kirkpatrick, 2017; Xu et al., 2017). This gives human service employees time to handle complex cases (Kirkpatrick, 2017) that require effective decision making or addressing high-level emotional states of their customers. Similarly, McLean and Osei-Frimpong's (2017) study confirmed that empathy could greatly influence customer experience in a live-chat discussion where decision support was needed. Decisions normally need to be taken when cases are

complex, for example in a dispute or when problem resolution is required (Bassett, 2018; Chong, 2017; Jarrahi, 2018). This is where humans can intervene because of their capability to deal with and ascertain the intensity of displayed emotion that is critical in identifying a suitable approach to resolve a problem. This suggests that the nature of customer service is volatile; thus, the responses cannot be fully automated (Kirkpatrick, 2017). Rather, there is a need to personalise the approach to a response or service request (Bassett, 2018) depending on the intensity of emotions displayed by the user in a conversation.

Changes brought by CAs in customer service work practices. Advancements in technology such as the implementation of CAs, currently revolutionise the very nature of the organisational front-line and change how customers interact with businesses (Keyser, Köcher, Alkire, Verbeeck, & Kandampully, 2019). These changes in interactions can consequently alter the work practices within the organisation. This means that having multiple touchpoints available for the customer to communicate with the organisation and with the new systems, requires new practices and processes to support the new communication channels. This need for a new system is supported by Gnewuch et al. (2017), who understood the potential of CAs not only as a technology but also as something that could be “leveraged as a service system” (p. 4).

According to Salesforce.com, Inc. (2019), the customer relationship management (CRM) software market value between 2014 to 2015 increased by 12.3% and was on a steady rise due to the integration of AI-powered technologies, such as CAs, in the service platforms that supported business operations. A technology-based CRM is a web-based software that helps maintain good relationships and interactions with the customer through data handling technologies and synchronised communication of front-end and back-end teams (Aliyu & Nyadzayo, 2018). Salesforce.com, Inc. (2019) noted on their website that with the integration of AI to an organisation’s platforms, such as CRM

systems, a business could generate real-time insights (Jarrahi, 2018) across all customer contact channels; optimise agent availability, wait times (Cui et al., 2017), and opportunities for proactive service delivery; automatically escalate and classify cases using sensitivity and domain-expertise predictive analytics; power chatbots to deliver knowledge (Chakrabarti & Luger, 2015) using automated workflows; enable field agents to deliver service based on access to CRM data; and, deliver personalised services (Lui & Lamb, 2018; Verhagen et al., 2014) anywhere. Furthermore, Swanson (2018) claimed that AI-enabled chatbots eliminated two competitive advantages of outsourcing namely, lowered cost and scale of available workers offshore. With the increasing adoption of CAs in service operations, further restructuring of roles and practices are likely to happen. There is a lack of research on the changes in work practices brought on by CAs despite the vast adoption of CAs across many industries. This research aims to address this gap by conducting an empirical study exploring changes in the work practices of customer service employees working alongside CAs.

2.2.6. Human perceptions of CAs.

It is important to understand how humans perceive CAs during an interaction based on their own knowledge, views, and experience. These perceptions lay the foundation of this study in order to identify the relationship between humans and CAs. This research explores the perceptions of customer service employees to assess the impact of CAs on their work practices. Each employee may view CAs differently or they may have a complex combination of views. The literature presents several studies that understand how customers perceive CAs. The findings of the study can lead us to assess whether employees share the same views on CAs as their customers or if they view CAs differently. The study can also highlight motivations of customer service employees in interacting with CAs. For example, McGoldrick et al. (2008) studied the potential roles of avatars in an e-commerce setting. They found that customers used the internet to not

only make an online purchase but also to engage in some form of social interaction with the avatar. This suggests that humans might unconsciously perceive a CA as an actor capable of forming a relationship besides being a helpful tool. This unconscious perception can shed light on whether a CA might have the same effect on human employees working alongside it. Similarly, Brandtzaeg and Følstad (2017) and Luger and Sellen (2016) found that social properties of CAs enabled them to become a tool, a toy, and a friend (Brandtzaeg & Følstad, 2017), thus promoting long-term use of CAs (Luger & Sellen, 2016). Cassell and Bickmore (2003) designed Rea to engage in small talk to gain trust and become an ideal real estate agent, as its functions and dialogue manifested a certain persona. The design framework they used on Rea proved to be effective because it was consistent with the results of Ho, Hancock, and Miner's (2018) study that proved that CAs were as effective as humans when establishing psychological and emotional benefits. In this study, I explore if employees share the same view that CAs are, indeed, at par with humans when dealing with the emotions of customers.

In contrast to earlier findings, Luger and Sellen's (2016) exploration of human experiences and motivating factors behind the frequent use of CAs showed that a number of regular users generally viewed CAs simply as tools. Similarly, Kocielnik et al. (2018) designed a chatbot that helped and motivated knowledge-workers by journaling their activities and supporting their self-learning abilities through reflection. What the chatbot did was keep employees updated on their journaling activities, organised their daily tasks, informed them of other important tasks that needed to be done and answered employees' questions about their reflection activity. Their study showed that the chatbot was purely viewed as a functional tool that enhanced knowledge-workers' capabilities and helped change their perspective towards work by making them more reflective about things that the chatbot highlighted. Employees were assisted by the chatbot to discover more meaning to their work that could potentially lead to work satisfaction (Kocielnik et

al., 2018) during their journaling activity. Therefore, users view CAs as functional tools to assist them with tasks and as companions that help them in many ways, or even a combination of both.

It is important to understand the perception of human employees who work alongside CAs to really understand the full impact of this technology. At the same time, it is equally important to note how the end-users of CAs perceive the technology. My focus here is on human service employees' experiences of working with CAs. End-users, such as customers, may perceive CAs as functional tools or as friendly companions that help them fulfil their tasks whilst being able to engage in social interactions. Unlike end-users, the perceptions of service employees working alongside CAs are hardly researched. Therefore, I aim to understand how customer service employees working with CAs perceive the technology. This will pave the way to understanding the impact of CAs on human employees and the future of the human workforce.

2.2.7. The paradoxical views on the future of the human workforce.

The digital information revolution undoubtedly had a substantial impact on organisations and employment. Many people wonder whether the AI revolution will have the same or an even bigger impact on these entities (Makridakis, 2017). As a result, a growing uncertainty is beginning to emerge in the business world regarding what AI means to innovation, growth (Plastino & Purdy, 2018), and employment (McKinley, et al., 2017; Plastino & Purdy, 2018). Some researchers believe that AI will ultimately replace human employment whilst others say it will augment human capabilities. It can even lay the groundwork for a hybrid workforce where “humans and machines will be collaborating, teaching each other and learning from one another” (Plastino & Purdy, 2018, p. 20).

CAs as a threat to employment. Sousa and Rocha (2019) concluded that industry 4.0, where cognitive computing technologies such as NLP and ML were the game changers, will ultimately lead to reduced labour costs resulting in a decrease in employment in the human workforce. In the context of CAs, Wirtz et. al (2018) noted how CAs could do better than humans in customer service. They distinctively highlighted the disadvantages of human service employees such as the need for individual training due to their varying skillsets, limitation in absorbing information and experiencing fatigue as basic human tendency. CAs, on the other hand, can be integrated into any service system to acquire knowledge and learn from it "instantaneously and system-wide" (Wirtz et al., 2018, p. 910), have "virtually endless memory and access" (Wirtz et al., 2018, p. 910) and are upgradable, which makes CAs better than human employees. In a real-life context, the threat to human employment seems to hold true, as illustrated when AI lawyer Ross at the law firm Baker and Hostetler replaced 50 human lawyers (Bolton et al., 2018). Ross was able to perform a whole, complex task starting from reading, understanding, and analysing bankruptcy-related queries to producing responses that were substantiated with legal references, which is traditionally done by junior lawyers.

The threats resulting from the proliferation of cognitive computing has attracted many scholars to take a historical review of the impact of technological advancements in order to take a more pragmatic stance. For example, Makridakis (2017) reviewed the predictions regarding the AI revolution in 1995 and investigated the existing and future advancement of AI. He claimed that AI "aims to substitute, supplement, and amplify" (p. 54) all human tasks, making AI a "serious competitor" (p. 54) in employment. This included a progression of CAs' capabilities that could have the potential to fully replace human service employees. However, the impact of the advancements in AI will depend on the individual's views and feelings towards CAs (Callaghan, 2018). An optimistic person may take a utopian view of CAs' impact on the workforce and society in general

such as creation of new jobs whereas, a pessimist may take a dystopian view of the perceived effects of the technology such as large-scale unemployment (Callaghan, 2018). Makridakis (2017) suggested that the uncertainty of the future posed by AI technology, such as CAs, was an issue that needed to be dealt with effectively. This can be done by taking well-informed steps towards their implementation since the previous digital revolution decreased employment rather than increasing it. Additionally, Makridakis (2017) marked the impact of job displacements brought by AI technology, specifically in developing countries, as labour cost reduction could be realised with the utilisation of AI as opposed to outsourcing. He foresaw AI enabling a trend of service operations returning to their home countries.

CAs as enrichment to human workforce. In contrast, Jarrahi (2018) believed that AI-powered technology, such as CAs, and human service employees could work together given their unique strengths. His research suggested a productive collaboration of both human and AI, especially for decision-making. Jarrahi stated that their complementary skillset would be especially valuable in situations where there was a lot of uncertainty. Humans can make fast intuitive decisions in unknown situations based on real-time information access that AI can provide. In addition, Jarrahi perceived that by combining the speed of AI in analysing a large amount of data with humans' intuitive insights and judgment could make humans capable of achieving better decisions in lesser time.

The positive view adopted by Jarrahi (2018) on human-CA effective task combination aligns with Lui and Lamb's (2018) analysis which concluded that humans play an essential role in the field of service management. For example, human intervention is required in situations where CAs are unable to respond due to their lack of judgment and empathy. This will enable humans to create a unique solution to cover areas where CAs are lacking in knowledge and skills once the case is escalated by the CA. This type of situation suggests a human-AI collaboration. Wirtz et al. (2018) agreed

with Lui and Lamb (2018) that CAs may not be able to handle services that required a high level of complexity in analytical and emotional tasks, hence the need for human-computer collaboration. In a real-life context, human-AI collaboration exists in the form of CAs' deployment in customer service. Bassett (2018) and Chong (2017) explained how chatbots were effectively deployed in the insurance industry through pre-claim engagement allowing case managers and other insurance staff to focus on more important and complex cases. Kirkpatrick (2017) explored the use of bots by Celaton called inSTREAM in which an intelligent bot filtered emails by assessing the nature of the request and routed the email to the right second-level live agent. This afforded more time to human agents so that they could focus on complex and urgent tasks that required a higher level of attention (Luger & Sellen, 2016).

Based on the paradoxical findings in the literature with regards to the future of the human workforce in light of the development of CAs, this research will take a more fine-grained perspective and explore the perceptions of human service employees when they work alongside CAs in their workplace. The study aims to shed light on human agents' opinion on CAs: whether CAs contribute to the enrichment of the human workforce or act as a threat to their employment; and how CAs affect human service agents' overall perspective towards job satisfaction and job security. Given the uncertainties around the change in work practices brought by technological advancements in conversational interfaces, "it is necessary to consider all voices" (Callaghan, 2018, p. 102). These views and perceptions should not be limited to the end-users of this technology (i.e., customers) but also include the perception of people who work alongside CAs in order to understand how CAs could be leveraged to support the human workforce. Therefore, I aim to explore the relationship between human employees and CAs within the customer service industry with a focus on how CAs affect employees' work practices. In the current literature, there is a lack of empirical studies exploring the perception of human employees on CAs and

their effect on their job satisfaction and job security. Most research to date is conceptual and design-focussed, aiming to improve the efficacy of CAs and perception of end-users. Therefore, an empirical study is conducted to address the lacuna in literature.

2.3. Job satisfaction and Job security – An overview

2.3.1. Job satisfaction.

Job satisfaction is one of the most explored concepts in the literature on organisational behavior (Testa, 2001) with more than 11,000 published studies that comprise research on this subject (Judge, Parker, Colbert, Heller, & Ilies, 2002). Most scholars defined job satisfaction as an individual's positive feelings or reactions towards various elements of their job (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Fried & Ferris, 1987; Spector, 1997). On the other hand, Spector (1997) described job satisfaction as an attitudinal variable that extended to both positive and negative feelings about different facets of the job. A facet is described as any aspect or part of a job that affects a person's positive or negative inclination towards their job. Spector (1997) cited common facets of job satisfaction such as appreciation, recognition, nature of work, communication, security, remuneration, job conditions, policies and procedures, supervisors and promotion.

To further elaborate, employees feel satisfied at work if they find the remuneration and pay rise structure competitive and achievable. Others may consider the relational aspect of the job such as a good working relationship with colleagues and supervisors that makes them feel happy or miserable at work. Some may consider the nature of work, whether it is meaningful and fulfilling, which would help keep them contented with their jobs. Different facets are associated with different reasons as to why they affect an individual's attitude towards a job (Spector, 1997). This explains why many organisations use this approach to identify and assess which particular aspect of the job produces the greatest satisfaction or dissatisfaction to an individual by employing various scales or

measures (Spector, 1997; Nagy, 2002). In this study, however, only certain aspects of the job are given focus due to their relevance to the research and association with CAs' implementation in customer service. These facets of job satisfaction are nature of work, communication, recognition, appreciation, and security.

In the field of technology, some scholars have studied the relationship between job satisfaction and technology. Limbu et al. (2014) explored the role of information and communication technology (ICT) on job satisfaction and employees' sales performance of pharmaceutical sales representatives in India. They found that ICT infrastructure, training, and support indirectly affected job satisfaction through the administrative performance of the workforce (Limbu et al., 2014). Roman, Rodriguez, and Faramillo (2018) studied the use of mobile technology such as laptops, tablets, and smartphones during working hours and its impact on the job satisfaction and role stress of employees in Spain using the Job-Demand Control (JDC) model. Their findings revealed that the use of mobile technologies positively affected job satisfaction. Consistent with the JDC model, their study showed that the use of mobile technology increased control through effective handling of high-demand situations. As a result, it led to a reduction in role stress that eventually led to higher job satisfaction.

In the context of CAs, there is insufficient knowledge about how this type of technology can influence job satisfaction. It is important to identify its impact due to the significant uptake of CAs in many organisations today. Therefore, one of the objectives of the research is to understand how CAs affect customer service employees' job satisfaction. We can understand the overall functioning of an organisation by taking an interest in job satisfaction in situations where a technological imperative such as CAs' implementation is in place (Spector, 1997).

2.3.2. Job security.

Job security is defined as how employees perceive the stability of their job existence (George, 2003). It is mainly associated as a facet of job satisfaction that is relatively unexplored (Nagy, 2002). For example, Probst's (2003) study of developing and validating scales to measure job security showed that job security was the "sixth component of job satisfaction" (p. 464) that was unique in nature, antecedents, and consequences, thus, accounts for a "unique variance" (p. 464) to further explore. In addition, Probst's (2003) conceptual model of job security antecedents and consequences showed technological change as one of these antecedents. Behaghel and Moschion (2006) shared the same view as they observed that the rapid diffusion of information technology in its many forms is always linked to job instability. Historical findings support the view that the technological revolution hugely affected jobs in the primary and secondary sectors such as farming and manufacturing, respectively (Brougham & Haar, 2017), and will continue to affect almost all professions, especially service industries (Brougham & Haar, 2017; Huang & Rust, 2018; Levy, 2018; Wirtz et al., 2018). Therefore, it is important to look at job security as potentially being distinct from job satisfaction because of its unique nature as a facet of job satisfaction (Probst, 2003). In addition, the clear association of job security with technological change (Behaghel & Moschion, 2006; Probst, 2003) such as CAs' implementation in customer service, justifies the distinction of job security from job satisfaction.

Most of the studies that explore the impact of the AI-revolution on human service employees are conceptual however, there are some scholars who provide empirical data regarding this phenomenon. For example, Brougham and Haar (2017) investigated employees' perspectives on the automation of their jobs and careers in the age of technological advancements specifically with the existence of STARRA (smart technology, artificial intelligence, automation, robotics, and algorithms) (p. 213).

Brougham and Haar (2017) found that job control was a key predictor of the repetitive nature of a job and complexity of a job whilst conducting a quantitative study with employees working in the service sector in New Zealand. This, in turn, becomes a predictor of the potential redundancy of the job as a result of STARRA and not the employees' awareness of STARRA which they initially hypothesised. Their study about employees' perceptions of STARRA was limited to the participants' knowledge of STARRA and did not include actual employees' experiences working alongside these technologies. Therefore, this study aims to obtain a more detailed approach using a qualitative study that can produce concrete and transferable data by understanding the perceptions and experiences of employees who have worked with CAs.

2.4. Theoretical Background

2.4.1. Technological affordances of CAs.

In the early part of this section, an emphasis was given to how CAs revolutionise an organisation through a change in the interaction between customers and front-line employees (Keyser et al., 2019). These changes in interactions are likely to lead to alterations in work practices of front-line employees, which is further explored in this study. To fully understand how these changes take place, it is important to first understand the relationship between CAs and their users. Therefore, I used 'affordance theory' (Gibson, 1977) to better understand this relationship. The following sections define affordance theory, give meaning to technology affordance, its application in the field of Information System (IS) and an explanation as to why the theory was applied in the study.

The affordance theory started with Gibson (1977) in ecological psychology. He emphasised that animals perceived what the environment could potentially offer. The affordance theory has been revisited in the field of Information System (IS) literature and Information and Communication Technology (ICT) (Bernhard, Recker, & Burton-Jones, 2013; Conole & Dyke, 2004; Glowalla, Rosenkranz, & Sunyaev, 2014; Majchrzak &

Markus, 2012; Markus & Silver, 2008; Pozzi, Pigni, & Vitari, 2014; Savoli & Barki, 2013; Stoeckli, Uebernickel, & Brenner, 2017; Strong et al., 2014) owing to the knowledge that it provided to explain the consequences of using information technology (IT) in any organisation. Majchrzak and Markus (2012) applied the affordance theory on technology use. They defined and referred technology affordance as “an action potential, that is, to what an individual or organisation with a particular purpose can do with a technology or information system” (Majchrzak & Markus, 2012, p. 1). For example, the social networking site Facebook, is primarily used to socially connect online with friends within a network from any parts of the world. The affordance of Facebook to connect with friends can also be utilised for learning and development if a user’s goal is to share knowledge and information that can reach a wider audience at a minimum effort. They can post videos and other learning materials that can be publicly shared. Technology affordance also supports the understanding of how IT artefacts such as CAs can lead to changes in the organisation (Strong et al., 2014) that relates well to the research objective of understanding how CAs affect work practices.

The affordance theory is also applied in Sociology. For example, Hutchby (2001) applied the affordance concept to IT artefacts. His study illustrated how to analyse the shaping of technology in society by emphasising affordances as both functional and relational. An affordance is functional when an actor is enabled or constrained in the process of involvement in an activity. An example would be using a CA to search for information online. Whereas, the relational aspect of an affordance implies that an affordance of an artefact might differ from one user to another. To illustrate, Hutchby (2001) presented an analogy in his article on the ‘walk-on ability’ of water as an affordance. He explained that this affordance might be available to an insect but not to humans or other mammals. He concluded that uses and interpretations of technology can be analysed through the affordances it possesses (Hutchby, 2001). Therefore, he

highlighted that social processes have to be recognised as active players in all aspects of technology rather than imposing their effect on society.

As discussed earlier, many scholars in the field of IS and ICT have applied the affordance theory because of its realised significance to explain the interplay between IT artefacts and users (Pozzi et al., 2014). One of the most notable studies of affordance theory applied in IS and ICT is Markus and Silver's (2008) conceptual study on IT effects. Markus and Silver (2008) proposed three concepts that helped in understanding the use and effect of IT using an affordance theory. The first concept was technical object that referred to the component parts of IT that were real and had properties such as mass, colour, and volume that people could perceive and cause potential use to derive an outcome (Markus & Silver, 2008). The second concept was functional affordances (FAs) that referred to the relationships between the specified user and the technical object that was dependent on the user's capabilities and objectives (Markus & Silver, 2008; Savoli & Barki, 2013). This is the most used concept in the IS literature, as exemplified in a study by Savoli and Barki (2013). Savoli and Barki (2013) studied conditions where FAs led, or did not lead, to positive outcomes. In their study, they proposed four archetypes of perceived functional affordances (PFA) namely, PFA as a facilitator commonly regarded as a tool that enabled an activity; as an inhibitor that prevented the user from performing a desired action; as guardian angel when an IT artefact did something that they approved of; and lastly, as an imposer if the IT artefact did something against the user's desires. The study showed that IT was perceivably dominant as a facilitator. This means that users perceive themselves as actors using IT as a tool to facilitate an activity (Savoli & Barki, 2013). Finally, the third concept proposed by Markus and Silver (2008) was the symbolic expression that "captures the intent and values as they are holistically presented to the user by a system" (p. 622). This means that users are assumed to be active

participants, by the researchers, in the interpretation and co-construction process of the IT systems and that IT artefacts contribute to users' perceptions (Markus & Silver, 2008).

Building on existence, nature, and user perceptions, Bernhard et al. (2013), Pozzi et al. (2014) and Strong et al. (2014) introduced the concepts of actualisation, effects, and changes to the organisation as a result of these affordances. Bernhard et al. (2013) proposed a framework that explained the concepts of affordance emergence, perception, and actualisation as processes that appeared overtime. Their framework suggested that an object's features along with information on the existence of affordances were variables to predict an individual's affordance perception that may potentially lead to actualisation. Pozzi et al. (2014) synthesised relevant IS literature using the affordance theory to determine the usefulness of this theory to the IS research. They developed a theoretical framework as a four-step process that involved an organisation and IT artefact as well as the relationship of all constructs. The four-step process includes: (1) affordances existence – this is where the affordance exists regardless of whether the actors are aware of it or not or are able to perceive its usefulness; (2) affordances perception – where the actor recognises potential based on their goals, the features of the object, the capability of an actor and other external factors; (3) affordances actualisation – where actors take advantage of the realised affordance through using the technology in order to achieve an outcome that supports the goals of an organisation; and, (4) affordance effect – where an actualisation of an affordance has the potential to cause an event or produce empirical result. The framework suggested by Pozzi et al. (2014) is more holistic and simplified that can be applied to similar types of research in the IS literature. Lastly, the longitudinal study of Strong et al. (2014) identified that IT could lead to several effects on the organisation as each actuation of affordance from the bottom rank to the top-level could create change and achieve organisational goals.

The affordance theory in the context of technology (e.g. IS and ICT) is notably useful based on varying objectives of the studies by many scholars. Thus, I use the lens of technology affordances in order to better understand which affordances of CAs are perceived and actualised by customers and employees in order to explore the effects on their work practices as well as their job satisfaction and security.

2.4.2. Job Characteristics Model (JCM).

In order to explore the effect of CAs on customer service employees' job satisfaction and job security, I used the Job Characteristics Model (JCM) by Hackman & Oldham (1975, 1976, in press). The JCM explains that the "five core job characteristics (i.e., skill variety, task identity, task significance, autonomy, and feedback) affect the three psychological states (i.e., experienced meaningfulness of work, experienced responsibility for outcomes of the work, and knowledge of the actual results of the work activities) (Fried & Ferris, 1987, p. 287-288) that produce positive work outcomes. These are high internal work motivation, high quality work performance, high satisfaction with work and low absenteeism and labour turnover (see Figure 2). The definition of these core job characteristics and explanation of these relationships in light of the current study is discussed in the subsequent sections. The JCM has been validated by various studies such as Fried and Ferris's (1987) meta-analysis of the model's validity. They used nearly 200 studies on the model and found that both psychological and behavioural outcomes were related to job characteristics however, psychological outcomes were much stronger than the latter. Psychological outcomes include higher work motivation and satisfaction with work whilst behavioural outcomes refer to absenteeism, labour turnover and work performance. In the context of technology, Limbu, Jayachandran, and Babin (2014) used the JCM to examine the role of ICT infrastructure, support, and training towards the job satisfaction of sales employees in a business-to-business environment. Their findings showed that ICT had positively affected employees' job satisfaction indirectly through

an improvement in administrative tasks that affected their overall performance (Limbu et al., 2014).

Combining the lens of technology affordances and JCM, I was able to explain why and how work practices changed and how these changes affected the job characteristics, psychological states, and ultimately the perceived job satisfaction and job security of the employees.

In the subsequent section, the five core job dimensions and their relationships to the critical psychological states are defined. The purpose is to provide a base to support the proposed framework in the discussion section of this research.

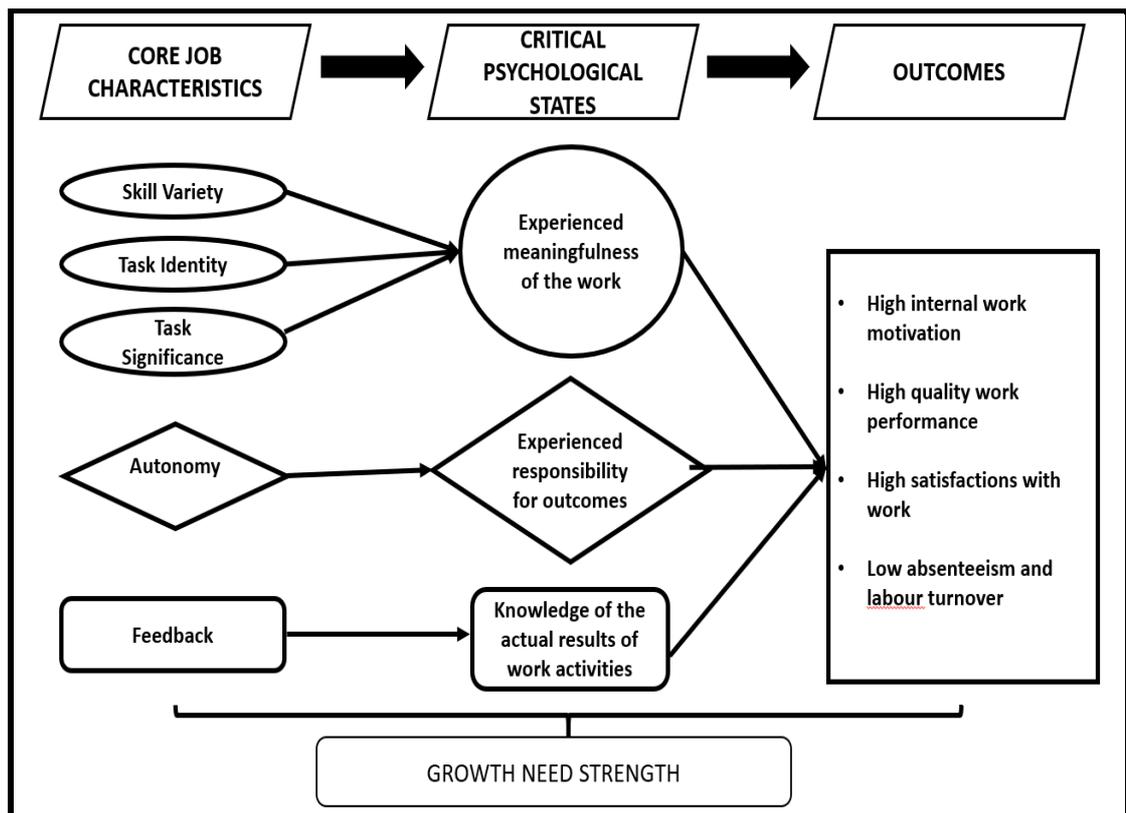


Figure 2: Job Characteristics Model (JCM). Adapted from Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60(2), 161.

Skill variety, task identity, task significance, and experienced meaningfulness at work. Skill variety pertains to the number and variety of skills involved that are

required to execute the work (Hackman & Oldham, 1975; Spector, 1997). In the literature, customer service is often viewed as a job that requires low-level skills (Huang & Rust, 2018) because the nature of work is mundane and repetitive. A typical example is call centre operators, where the underlying tasks in the job can easily be codified (Brougham & Haar, 2017). However, with the introduction of CAs in customer service, most of the design goals of software developers are to automate the repetitive nature of the job in order to free up the time taken by customer service employees so that they can attend to higher-value tasks (Bassett, 2018; Cui et al., 2017). This study will ascertain if CAs' implementation indeed reduces the repetitive nature of the customer service employees' job. The study may also highlight any other applications of skillsets utilised in their roles.

Task identity relates to the degree of completion of an entirety of a job. The degree is assessed based on the employees' involvement in an action of a job process whether it covers the job in its entirety or in parts (Hackman & Oldham, 1975; Spector, 1997). Task identity is high if involvement in a job is from start to finish and low if the employee does only parts of the entire piece of work. This study will investigate whether the CAs implementation affects task identity of customer service employees.

Task significance is defined as the degree to which employees feel that their job has a considerable amount of impact on other people, be it at work or outside (Hackman & Oldham, 1975; Spector, 1997). As customer service employees are front-liners, the study investigates if CAs' implementation increases or decreases the employees' value towards the customer they are directly servicing. According to the model, if the job is complex and requires an employee to use a variety of skills in the role, see the job through from start to finish and positively affect other people once completed, it creates a sense of meaning and value to an employee (Spector, 1997). In this study, perceptions towards customer service are sought to investigate whether CAs' implementation influences the job characteristics of employees along the dimensions of the JCM.

Depending on the patterns that emerged from the data, the study investigates if CAs affect the use of different skills of customer service employees. It examines if CAs influence the completion of employees' tasks (Hackman & Oldham, 1975; Spector, 1997). Saying differently, whether CAs have an impact on how much of the entire task employees are going to do. Lastly, the study investigates if CAs' implementation in the customer service workforce affects how customer service employees feel about the significance of their role (Hackman & Oldham, 1975; Spector, 1997). Identifying the impact of CAs on each of the three job characteristics namely skill variety, task identity, and task significance will either show support or lack of support to the psychological state of experienced meaningfulness of work.

Autonomy and experienced responsibility for outcomes. This relates to the degree of control or freedom that can be exercised in a job as per the employees of an organisation (Spector, 1997). Autonomy at work refers to an employee's independence and discretion in identifying suitable ways to carry out a job (Hackman & Oldham, 1975). In this study, I examine how CAs influence the autonomy of customer service employees by specifically identifying areas where they display control or freedom at work.

The JCM framework proposes that an employee who exercises higher control over how the job is performed perceives more responsibility for the outcomes. This means that individual employees exercise discretion and are accountable for any work outcomes as a result of their own initiative or effort instead of following a strict directive from superiors or manuals (Hackman & Oldham, 1976).

Feedback and knowledge of actual results of work activities. Feedback is a job characteristic that enables employees to know how well they carried out their job (Hackman & Oldham, 1975; Spector, 1997). The source of feedback can either come from colleagues internally or externally, such as from customers (Hackman & Oldham, 1975). My focus is solely on employees' knowledge of performance on the job through

customer feedback. Therefore, employees in this study obtain knowledge on how well they do their job based on the feedback they receive from their customers.

Outcomes. The JCM suggests that if the five core job characteristics are present at work, this would lead to the three critical psychological states. In turn, these three states could create positive work outcomes such as increased work motivation, increased job satisfaction, increased quality work performance, and low absenteeism rate. To put it simply, the JCM argues that a job that is more complex and challenging could lead employees to harbour positive feelings and reactions toward their jobs, which, in turn, may produce favourable work outcomes (Hackman, 1978; Hackman & Oldham, 1975, 1976; Spector, 1997; Wall et al., 1978).

In this research, the focus is to specifically explore the CAs' impact on job satisfaction and job security. Although, job security is not a direct work outcome in the original JCM model, I assume that a possible increase in task significance and task variety may lead to feelings of enhanced job security. Therefore, I explore if perceived job security could be an additional work outcome in the JCM through the change in job characteristics and psychological states.

The literature review chapter focused on four key discussions critical to the research's objective. The first key discussion is about the impact of ICT and automation that posits positive effects on employees' and organisation's work practices and job conditions. In spite of the positive effects of technology advancements, some scholars remained averse to ICT's impact on human employment. The information about the impact of ICT and automation on employees' work practices should set the stage and allow me to compare how CAs as a new technology is different or similar to previous (automation) technologies. The second key discussion is around CAs technical and social dimensions. Technical aspects of CAs are discussed to gain familiarity with its technical features, operational mechanism, use cases specifically in the customer service industry

that is central to the study. This section highlighted the importance of NLP and ML in CAs architectural structure. It also showed how the use of CAs slowly encroached a multitude of industries impacting our daily lives. In addition, human perceptions about their relationship with CAs were also discussed. It highlighted how CA's social dimensions can influence perceptions about CAs. The discourse about human's perceptions of CAs is salient to the understanding of human and CA's interaction and potential effects. The literature suggests that CAs are seen as more than a tool due to their ability to mimic a natural conversation of humans. The discussion around perceived CAs impact on the human workforce presented two opposing views: CAs as threat or CAs as an enrichment. Whilst scholars believe that CAs can augment human's ability, many were convinced that CAs remain a threat for human employees due to the advancement in AI technologies. The third key discussion covered an overview of job satisfaction and job security. It explained how these two concepts can fit into the context of technological advancements. It is evident that knowledge is lacking about CAs impact on job satisfaction and job security primarily due to its novelty. The fourth and final key discussion in this chapter tackles the use of two theoretical lenses used to achieve the research objectives. The next chapter discusses the research design of this study.

Chapter 3. Methodology and methods

This chapter describes the framework used and techniques implemented to answer the two research questions. A brief explanation of the methodological assumptions and justification of the methods and tools in data collection, analysis, and ethical considerations are discussed.

3.1. Research design

The study applied a qualitative approach with an interpretive lens and abductive logic. As the research aimed to explore the impact of CAs on human customer service employees, it was vital to examine these employees' views and observations through their experiences working alongside CAs. The understanding of this phenomenon from employees' perspective working alongside CAs was scarce. And, for that reason, a qualitative research and exploratory approach helped me to examine the experiences of human employees (Polit & Beck, 2012), to identify the key issues and to advance the existing theory in the field

Following the philosophical underpinnings of Interpretivism, I wanted to understand how human employees perceive CAs and the impact of the technology on their job satisfaction and security (Scotland, 2012). This was achieved by engaging with customer service employees who presented multiple views and insights of CAs' impact on their work based on their individual experiences working alongside the CA. (Scotland, 2012). In order to fully capture the impact of CAs on employees, current understanding on CAs was set aside and instead, focus was directed towards the experiences of customer service employees working alongside CAs to better explain the phenomenon (Gray, 2018). Thus, the study took a relativist ontological position to understand the truth about CAs' impact on customer service employees. In line with this research paradigm, the participants' perceptions of CAs and their insights from their experience with CAs might

have been culturally shaped and historically derived (Crotty, 1998; Gray, 2018; Scotland, 2012). This means that the data itself might have had varying interpretations. In addition, exploring the relationship between human employees and CAs allowed me to learn how CAs impact human employees' work practices and helped me identify how CAs impacted human employees' overall job satisfaction and job security. Therefore, constructivism reflected the epistemological stance of the study, mainly because the knowledge and meaning derived from the data were socially constructed dependent on the interactions of human employees with the technology (Gray, 2018; Scotland, 2012). In this study, my intention as a researcher was to attentively listen to the participants and try to grasp the phenomenon through their eyes in pursuit of "understanding their experiences and the meaning ascribed to them" (Grant & Giddings, 2002, p. 17). This process was not limited to me only listening to the participants' description of their perceptions and experiences but also to observe their actions as they spoke (Grant & Giddings, 2002; Gray, 2018) in order to "identify new layers of understanding" (Scotland, 2012, p. 12) that could add richness to the interview data.

The research followed an abductive logic that allowed me to explain how the different patterns that emerged from the data were related to each other (Dubois & Gadde, 2002; Paavola, 2004; Patton, 2010). The JCM was used as a sensitizing device that guided me during the coding phase of the study. The abductive approach allowed me to identify the JCM model and technology affordances as theoretical lenses. The abductive reasoning promoted my understanding of the patterns in the data, gave better interpretation on the findings and, in turn, enabled me to extend the JCM based on the data insights.

The interpretive qualitative research design allowed me to listen to the voices of people, identify, and analyse the common themes through their meanings and deliberately provide a synopsis of findings that was linked to the theory of technology affordances and the JCM (Smythe, 2012).

3.2. Data collection

The study exclusively used primary data through the application of semi-structured interviews. By employing semi-structured interviews with customer service employees as my data collection method I was able to get insights into participants' perceptions and experiences to gain a better understanding of their disposition whilst working alongside CAs (DeCuir-Gunby, Marshall, & McCulloch, 2011; Gray, 2014; Gray, 2018). It led me to understand the effects of CAs on human employees' job satisfaction and job security and their current work practices (Gray, 2018). Additionally, it helped me gather substantial information on participants' knowledge and opinions about CAs, as participants were free to expand their answers (Gray, 2018). The approachable nature of conversation in a semi-structured interview enabled me to spot critical issues that were not covered in the interview guidelines and that were conducive to answering my research questions. The semi-structured interview guidelines are included in Appendix A.

The interview questions sought to identify how CAs impacted human service employees and their emotional state. The questions focused on the employees' feelings, attitudes, and expectations towards the implementation of CAs, and the technology itself before and after the implementation. They also aimed to examine any work-related changes resulting from the implementation of CAs. These questions served as an outline or guide to the flow of the conversation but more details about work practices, job satisfaction and security were probed during the interviews. This helped me understand employees' reactions towards the implementation of CAs in their organisation with regard to the perceived threats and potential benefits that CAs can bring to the human workforce. The interview guidelines were also designed to understand the level of participants' job satisfaction in the context of CAs' implementation.

A copy of the participant's information sheet (PIS) (see Appendix B) was distributed to all willing participants before the interview commenced. A printed copy

was also given before the actual interview session. The PIS included relevant information about the research objectives, process, participants rights, and protection information, as well as contact details in case they had further questions.

All the interviews were audio-recorded and digitally transcribed by Transcribe (<https://transcribe.wreally.com/>), an online transcriptions service that converts audio file to text using natural language processing (NLP). However, I revised each audio recording and corrected errors that the NLP algorithm was unable to translate due to the varying accents of some participants and the noise from background conversations that were captured in the recording; thus, affecting the accuracy of the transcribed interviews.

3.3. Sample

Research proposals were sent to seven organisations that have a fully operational CAs. These organisations were identified through personal connections and university affiliations for greater chance of data access..I had the opportunity to discuss my research further with four organisations however, only one company gave positive confirmation within the timeframe I had set. An employer consent form was forwarded first to the key contact persons in the organisations (see Appendix C) in order to gain access to the employees. The aim of the study and confidentiality were highlighted in the employer's participant information sheet (see Appendix D) together with the interview guidelines. Tact and diplomacy were exercised in engaging with the key contacts in the organisation in order to gain access (Gray, 2018).

There were challenges in accessing employees of the organisation. This was due to the questions found in the interview guidelines (See Appendix A) about employee's view on their job security as a result of CAs implementation. The organisation that allowed access to its employees was the airline industry located in the Oceania region. To protect the anonymity of the company, no name, and address was disclosed. Co-A was the pseudonym used to identify the company in the interview transcripts. Co-A employed the

chatbot on their website; the chatbot worked alongside the digital team that consisted of the human live-chat agents. The pseudonym for the chatbot was Xavier, which is used to identify the CA in the findings section. In addition, the company operated a call centre that handled inbound calls to service international flight passengers. Access to employees was approved by the key person in the call centre of Co-A. They allocated two days for me to complete eight interviews that each lasted approximately one hour. The interview was conducted within the premises of Co-A in an open and relaxed setting.

The purposive sampling technique was employed in order to gain rich information extracted from a relatively small pool of eight participant employees (Gray, 2018). Three criteria were set to ensure the appropriateness of the participants in the study. These stipulated that: (1) they worked for a company that had a fully AI-operated CA; (2) they had been in the customer service role before and after the implementation of the CA; and, (3) they had experience working alongside the CAs. The rationale behind these selection criteria was to obtain rich narratives that would help reveal participants' perceptions and experiences towards CAs before and after implementation. This comparison helped me further interpret and evaluate their responses as to how they perceived the CAs, the changes in their work practices, and how it impacted their job satisfaction and job security. However, despite the clear instructions in the invitation on the criteria, two out of eight employees did not satisfy the second criteria, having only worked after the CA was already in place. I have decided to include their data in the analysis as they opened up other changes in work practices that were unexpected and still deemed important in the study. The eight participants were not the entire population of the customer support staff. They were employees that expressed interest in participating in the study and were scheduled to work on the day that the interviews were conducted. Most of the participants were senior staff members who were working in the contact centre prior to the implementation of the CA. They were able to share valuable insights and comparison on

their work experiences pre and post implementation of the CA albeit the non-involvement in the CA's design and development. Some of the participants were pulled out from the hotline in order to support the digital team behind the CA during the early phases of its implementation. Thus, the employees that participated in the interview were the most likely to have valuable insights on how the CA influenced their work practices, their job satisfaction and job security.

The non-standardised nature of semi-structured interviews proved to be effective to gather required perceptions and experiences. It allowed me to alter the phrasing of questions as necessary, and continue to gain their views and opinions required to meet my research objectives (Gray, 2018). All participants were given a token as a gesture of appreciation for participating in the study. The key contact and seven out of eight participants were keen to learn the findings hence, a report will be sent to their email. Table 1 below describes the customer service employees who voluntarily participated in the study. The demographic of the participants were diverse in terms of academic qualifications and tenure. Majority of the participants were in their mid-twenties to mid-thirties and half were from New Zealand.

All the customer service employees who participated in the study are all from the call centre hotline support unit of Co-A. The call centre initially has three divisions. The first division handles all international flight transactions. The second division is a dedicated hotline for frequent flyer members or VIP customers of the airline. The employees in the first and second division are all in-house customer service agents employed by Co-A. The third division handles domestic flights but the service delivery is made by an outsourced unit that is located in the same country as the first two divisions.

Table 1: Description of Participants

Name (in Pseudonyms)	Age	Gender	Origin/ Ethnicity	Highest Academic Qualification	Years in a customer service role
Cersei	36	Female	Samoa	Travel Certificate	15 years
Danny	59	Female	New Zealand	Bachelor's degree - Dentistry	9 years
Arya	48	Female	Not given	College level	30 years
Jon	24	Male	New Zealand	Bachelor's degree - Marketing	10 months
Brandon	Early 30's	Male	India	Post-graduate level - Tourism	3 years
Sansa	29	Female	New Zealand Tongan	Customer Service Certificate	5 months
Margaery	34	Female	New Zealand	College level	10 years
Ygritte	28	Female	Not given	Bachelor's degree - Sociology	2 years

The above participants are all from the first two divisions. When the CA was introduced, a new unit was formed called the 'digital team'. The digital team receives the escalated cases from the chatbot if the chatbot doesn't understand the intents of the customers. The digital team consists of human live chat agents that perform chat-based services and ad-hoc call back requests for those escalated cases.

3.4. Xavier – the CA

The CA featured in the study was introduced by the organisation in February 2017. It was developed in-house and was launched as a beta product that gave customers an active role in training Xavier. The customer led-approach in the design of Xavier allowed

Co-A to gather the types of information that customer wanted to know and the language they used for better communication as opposed to sticking with the often-used jargons. This gave Xavier an edge to cover a wide range of topics to discuss that consequently resulted to a better outcome to Co-A's customers. Since the launch of Xavier, it answered a wide range of inquiries of approximately 460 topics. Xavier had made 2500 discussions per day that solved approximately 75% of customer's enquiries. Information about the use of Xavier was widely discussed in the media. Co-A also shared how Xavier was developed and the technology that runs it. Xavier is deployed to answer basic enquiries through multiple platforms such as CO-A's website, Facebook page and other messaging platforms.

Xavier is running on NLP and ML algorithm as the CA continuously learns as its chats with customers every day. Its functionality grows as new content is being added regularly. It has also evolved into a sophisticated CA that is adaptable and accessible to any devices and platforms (e.g. Social networking sites, mobile apps, and the CO-A website). Xavier's adaptability is shown on his ability to identify and de-identify the conversation as possible and will only ask personal information when needed if a customer is logged on to their account. Xavier's accessibility feature enables him to answer customer's query using any device or other online platforms 24/7 at a wider scale. Customers can just type simple phrases of commonly asked questions such as 'book or change a flight' or 'confirm my seat' or 'confirm my bag allowance'.

In addition, Xavier is designed by Co-A to display a unique personality to display social presence (Verhagen et al., 2014) and can reply to other questions or requests such as telling a joke. This ability can make a conversation feel natural and conversational.

3.5. Data analysis

Thematic analysis is a foundational method used to interpret qualitative data (Braun and Clarke, 2006). The multi-step thematic analysis technique by Braun and

Clarke (2009) was employed in this “sense-making endeavor” (DeCuir-Gunby et al., 2011) in order to achieve the goals of the research. Furthermore, due to its step by step approach, it was a suitable method especially for a novice researcher like me to develop main themes and patterns across the data. The steps taken are illustrated in Table 2 below that describes the two phases of analysis. I deviated slightly from the original thematic analysis framework of Braun and Clarke (2009) because of the application of the abductive approach. It included a systematic combination of two theoretical lenses (Dubois & Gadde, 2002) to better explain the patterns that emerged from the data (Dubois & Gadde, 2002; Patton 2010).

3.5.1. Data familiarisation.

Data familiarisation started at the process of transcription. Trends in the data were observed at the outset when the interviews were transcribed. After the transcription process, interview transcripts were read twice more to gain additional familiarity with the data before commencing with the coding process (Gray, 2018). In the second round, important excerpts were selected and highlighted in order for the coding process to begin. Another personal technique I employed to get an overview of the data’s descriptive nature was by creating a summary of answers for each interview participant in a spreadsheet. It was helpful in identifying views that were in unison or those that varied. It served as a bedrock of information in its lowest form to help identify meanings that were relevant to the research questions.

Table 2: Phases Thematic Analysis

Phase One	Description of the Process
1. Data familiarisation	Data transcription, repeated reading of the data, note-taking of initial ideas
2. Generation of initial codes	Tagging and labeling of interesting units of the meaning in the data in form of phrases
3. Identification of themes	Codes are reduced and grouped into potential themes; each code collates all data relevant to each potential theme.
4. Review of themes	Making sense of the theme if it links to the coded extracts and relates to the entire data set. Generation of thematic ‘map’ of the analysis.
Phase Two	Theoretical re-description (abduction)
5. Refinement and labeling of themes	Based on the emerging themes, I searched for theoretical lenses that allowed me to best explain the patterns in the data. After identifying the lens of technology affordances and the JCM model I revisited the codes and themes in the light of the technology affordance theory and the JCM. I then went back and forth between data and theory to be able to explain the emerging patterns and their relationships.
6. Production of report	Selection of compelling extract examples that embodies the analysis of the research

Note: Adapted from “Using thematic analysis in Psychology” by V. Braun and V. Clarke, 2006, *Qualitative Research in Psychology*, Volume 3, Issue 2 p. 87

3.5.2. Generation of initial codes.

The first analytic step in the process occurred in this phase where descriptive understanding of the data transitioned to create concepts behind the data (Gubrium & Holstein, 2002). As this step was challenging mainly because of the number of transcripts to be coded, NVIVO software and its functionalities assisted me in organising my codes, which was similar to using a spreadsheet. The ‘memo’ function in the software allowed me to make remarks about any observed underlying patterns or trends within a code. Each of the interviews generated an average of 120 to 150 initial codes. These codes ranged

from low-level codes such as personal details of the participants to high-level codes like role description and human-CA synergy.

3.5.3. Identification of themes.

The first round of analysis resulted in 1140 codes. I revisited the codes to fully understand their meaning and recognise any emergent patterns. This helped me group the codes into themes based on the common patterns that emerged from the generated codes. I started out with ten main themes. Out of the ten main themes, only seven themes established links to the main findings of the study. The first theme comprised all codes related to CAs labelled as ‘constructs of CAs’ that described the nature, perceptions, benefits, and changes brought by the implementation of CAs. This theme led me to identify the key attributes of CAs that were then conceptualised as CAs technology affordances after several iterations in the analysis phase. The second theme was ‘personal details’ comprising low-level codes such as age, qualification, etc. This helped me see if there are common patterns between similar profile attributes such as age and years of experience at work towards CA’s behaviour. The third theme was ‘constructs of customer service’ that described the role itself, the complexity or challenges faced, different channels that employees supported and the skills required for the role. This theme helped identify changes in the work practices after the CA is implemented. The fourth theme was ‘service by humans’ that consisted of codes to distinguish human service from automated service. Similar to the third theme, ‘constructs of customer service’ as an initial theme did not only help me see the difference between two types of services, but also realise the interplay between CAs and human employees in delivering a service, thus leading to the concept of affordances. The fifth theme was made up of codes that expanded on the positive and negative factors affecting the job satisfaction of employees at work. This theme paved the way in locating CA’s position in understanding job satisfaction of employees in the context of CA’s adoption. The sixth theme consisted of codes that

suggested human-CA synergy at the workplace. Similar to the third and fourth theme, this theme reinforced the concept of technology affordances. The seventh theme consisted of codes that showed employees' contradictory views on job security as a result of CAs' implementation. This theme revealed the gravity of affordance actualisation to understand the impact of CA's implementation on employee's views about job security. The remaining themes identified in the data were found to be insignificant to the overall findings of the study.

3.5.4. Review of themes.

After all the ten themes were derived, the storyline in the data remained incongruous and inconspicuous to answer the research questions. Therefore, these themes were reviewed repeatedly from the main theme down to the codes to re-examine the concepts prevalent in the group of codes. In this stage, I made a series of iterations and structured movements of codes. Several movements of codes and re-grouping of themes were made to identify a compelling storyline that answered the research questions. I further reduced the ten initial themes to six themes that described the antecedents of human employee satisfaction, antecedents of job satisfaction, impact of CAs' perceptions, new work practices, neutrality in views, and roles of CAs.

3.5.5. Refinement and labeling of themes.

The abductive logic was used in the second phase of analysis. It allowed me to identify two theoretical lenses to help me interpret the findings and allow me to best explain the relationships between the emergent themes identified in the data (Dubois & Gadde, 2002; Patton 2010).

After reflecting on the emerging themes, the technology affordance theory (Hutchby, 2001; Majchrzak & Markus, 2012) was chosen as a theoretical lens. It helped me illustrate how CAs' adoption changes the work practices of customer service employees. The JCM framework (Hackman & Oldham, 1975,1976, in press) promoted a

better understanding of how the changes in work practices influenced the customer service employee's job satisfaction and job security.

Having both theoretical lenses in mind, ongoing analysis and comparisons between the theory and the data were made. The derived final main themes described the six technological affordances brought by the implementation of CAs that directly impacted the work practices of customer service employees. The identified changes in work practices influenced certain variables in the JCM that lead to an adequate explanation of how CAs impact employees' job satisfaction and job security. These themes are presented in the findings section.

3.6. Ethical considerations

Ethical considerations were made and submitted for approval by AUTEK since this study was focussed on interviews conducted with human service employees as subjects (see Appendix G).

The first ethical consideration in this study that required AUTEK approval was the use of interviews with highly engaged participants who worked alongside CAs deployed by their organisations. The invitation email (see Appendix E) and participants' information sheets were handed out to the willing respondents to ensure that the expectations were set and the research objectives were clearly stated. A consent form was also provided (see Appendix F), which served as an agreement by the participant to voluntarily partake in the research with the researcher. Participants were informed of the tools that were to be used to record the interview, transcribe, and analyse the data. Information on the use of pseudonyms, how the data would be stored prior to analysis, and the manner in which it would be deleted post-analysis was also communicated. An assurance was given to the participants that their data would only be used for research purposes (Oliver, 2010). Participants were given the choice to review the transcription of their respective interviews, as well as comment on and edit their transcribed interviews.

The second ethical consideration was avoiding harm to participants and their organisations by assuring confidentiality (Gray, 2018). This was achieved partly through the use of pseudonyms. All copies and recordings of transcripts are safely secured in an electronic device that only myself and my supervisors have access to. In addition, before starting the interview, employees were given the option to withdraw at any time should they feel uncomfortable sharing their views about the topic. Participants were also assured that neither the procedure nor the outcomes of the research had any cultural implications.

The final ethical consideration was promise and reciprocity. The key findings of the research will be communicated to the key contact of the organisation and to the participants who expressed an interest in learning about the findings.

Chapter 4. Findings

An analysis of the data derived from the interview revealed six specific technology affordances of CAs that are actualised by customers and employees, i.e., these six types of affordances represent the use of technology to support specific broader work practices. These technology affordances are ‘educating the customer on foundational knowledge’, ‘providing information to customer service employees’, ‘executing repetitive and mundane tasks’, ‘escalating complex cases to human employees’, ‘allowing customer to self-service’, and ‘providing consistent responses’. They are hierarchically presented in Figure 3 below with the size of each theme representing its frequency in the data. It shows that 34% of the codes point at the affordance of ‘educating the customer on foundational knowledge’ and 24% links to ‘providing information to customer service employees’. Both affordances share a common trait of knowledge sharing capability of the CA. ‘Executing repetitive and mundane tasks’ and ‘escalating complex cases to human employees’ share the same percentage of 14% in the data. ‘Allowing customer to self-service’ and ‘providing consistent responses’ share the least percentage of 9% and 5% respectively. Thus, educating the customer is the most common theme and is accorded the most space. Each of the affordances was compared with the number of coding references and items coded.

The actualisation of these affordances has led to the change in work practices. The changes identified in the data are further discussed in this chapter and are visually presented in Figure 4. It is important to note that each change in work practices was either a result of one or more actualised affordances. Based on the statements of the participants, there appears to be a link between the changes in work practices, and job satisfaction and job security for some.

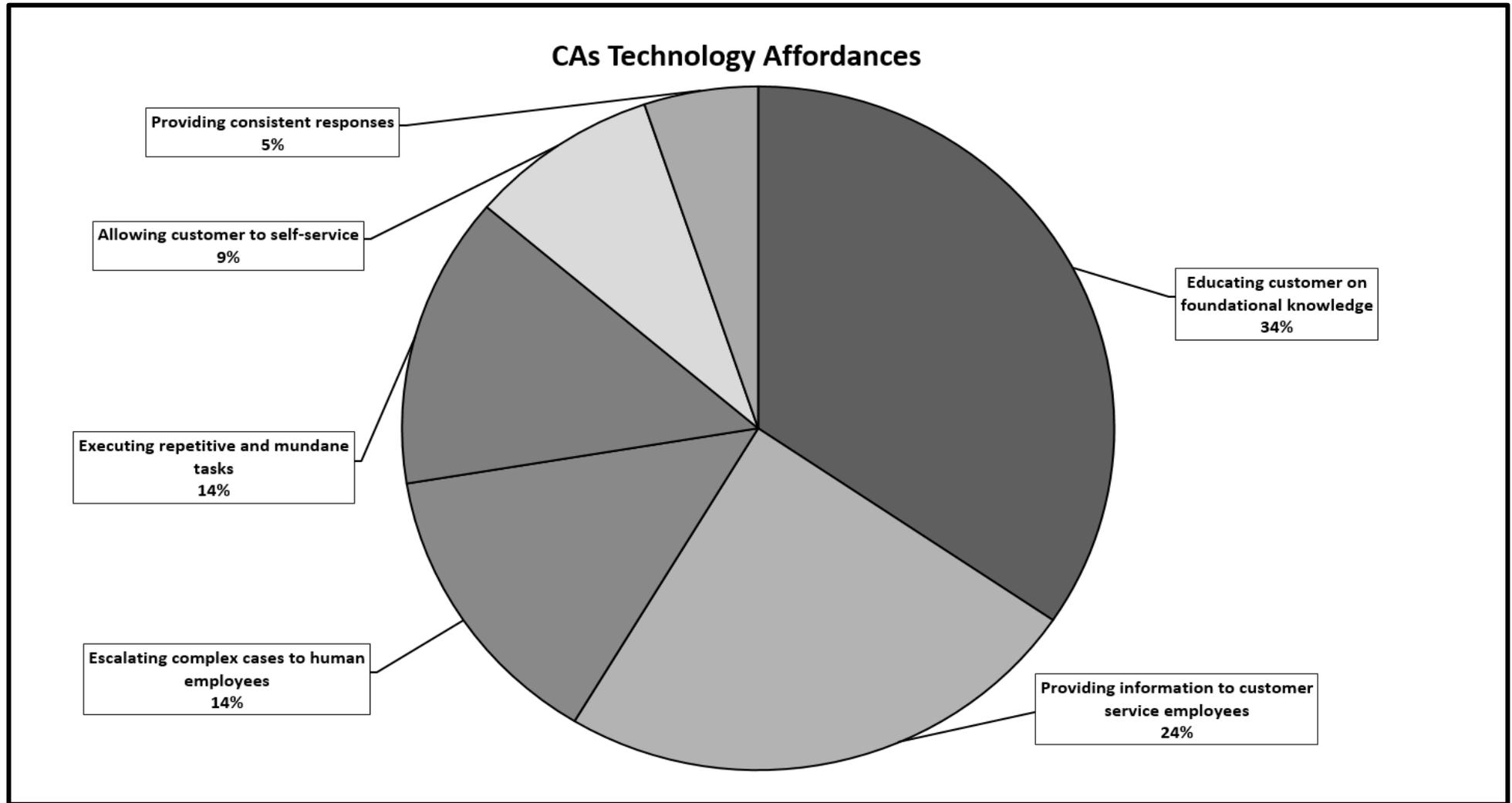


Figure 3. Comparison of CAs Technological Affordance

In the following section, we look into this change of practices in more detail and present it in the manner of who is actualising the affordance. In the data, it is found that four technology affordances are actualised by the customers. These are: (1) executing repetitive and mundane tasks; (2) allowing customers to self-service; (3) escalating complex cases to humans; and, (4) educating the customer on foundational knowledge. These technology affordances were actualised by customers when they used the CAs' function and features when trying to make enquiries or transactions with the organisation.

4.1. Executing repetitive and mundane tasks

All the participants observed that Xavier effectively dealt with all the basic, general, and mundane enquiries and simpler tasks that customers enquired online. The goal of this affordance is to be able to obtain a quick and fast answer to fact-based enquiries without having to search the website or waiting in line to talk to one of the customer service employees. These tasks represented those that were taken over by the CA. Thus, the affordance of 'executing repetitive and mundane tasks' is actualised by significantly reducing the number of tasks that customer service employees received as Xavier would have attended to it. The participants agreed that Xavier mostly took over the repetitive tasks when the questions were asked directly or indirectly. For example, Arya confirmed that Xavier helped in reducing the call volume by taking over "basic queries". Also, Sansa observed that Xavier had significantly helped customer service employees on "little enquiries", a term that refers to the basic type of questions that customers frequently asked. Lastly, Ygritte noticed how Xavier helped the employees in the same role by answering general enquiries when she was asked about the attitude towards the chatbot prior to its implementation:

Yeah, that was the most noticeable differences before Xavier. We would get a lot of just general enquiries. How does this work? How does that work, kind of thing? Whereas after Xavier, as people...it's

just like, you know, you're just typing there and then the answer pops up. So, it definitely made our roles a lot easier. I would say that we weren't constantly repeating the same information. (Ygritte)

Therefore, executing repetitive and mundane tasks as a CA affordance led to reduced pressure on the human employees as Xavier enabled employees to spend more time on complex queries that required a great deal of effort and energy.

Executing repetitive and mundane tasks clearly changed the work practices of customer service employees. It reduced the mundane queries that used to form the majority of calls received by customer service employees. Therefore, this CA affordance created more opportunity for customer service employees to deal with more interesting and complex cases. This suggests that employees' self-esteem and pride in their role was positively affected. They felt that their presence in the workforce remained relevant due to the delivery of their contributions in the organisation that in turn led to an increased significance of the task they performed. For example, when Brandon was asked if the presence of the CA affected his satisfaction, he felt that Xavier's implementation made his role more satisfying because he could pay more attention to complex cases due to a decrease in the repetitive queries that he received.

It did, yeah. Of course, it is. I would say I'm happy because it would approach it the answer. I mean in six months. Xavier have answered 30,000-80,000 queries. So that is of course a good point for us because we can look at the complex issues which needs more attention, right? And I am satisfied with that. (Brandon)

In the data, Danny felt that her tasks in the call centre were far more significant than those of Xavier or of the digital team. Her statement suggests that a reduction in repetitive and mundane tasks hinted at an increase in the task significance of customer

service employees achieved through the actualisation of the CA affordance. Her statement presented a strong sense of pride in her job because her contribution to her role was still paramount, thus giving her a strong sense of job security:

No, no, no, they don't exactly (referring to empowerment), so it's up to us to have a look and see what's available and what can we get them on and if I'm scrambling to try and get the best for the customer that's on the line. And again, even the live chat is that's something like disrupts...that's something the live chat will not handle as well. So yeah, so now, I'm not the least bit threatened by Xavier, believe me...because we are needed for that reason. Yeah. (Danny)

4.2. Allowing customers to self-service

The second theme that emerged relating to the technology affordances of CAs was allowing customers to execute self-service on simple transactions online. CAs have become an important part of the online platform because of their feature to answer questions immediately. Similar to the goal of the first affordance, 'allowing customer to self-service' allows customers to make simple and fast transactions online. And when clarifications are needed, CAs are utilised to obtain information fast without having to call the hotline to obtain guidance in processing simple transactions via the internet. This feature yields greater convenience in making online transactions, especially for customers who prefer self-service. If they have questions prior to performing an online transaction, customers can immediately access the information in an interactive setting that delivers real-time responses without having to resort to a different, slower channel. In the following example, Danny explained that despite the limitations of Xavier, it remained an important tool online because of the advice-giving properties of Xavier as a CA that enabled the customer to employ self-service. Furthermore, because of the learning capability of Xavier via AI, over time Xavier will produce better advice that will help customers to do more online:

I'm sure that as times go on, they will probably improve things more, but I think he's more of a...I think Xavier is more of a giving you advice, so things more of it more advice but I don't think he can he can actually change anything. He can't change bookings, he can't reissue. He can't do anything like that. He can certainly give them advice as to how they can self-service, if they can self-service, but yeah, the more he probably learns and the more he knows things which are...which is good to advise our customers how to self-service... (Danny)

Allowing customers to self-service as a CA affordance created more value to users because of the wider range of options that customer can utilise. Instead of viewing the online self-service option to replace the services that customer service provides in the hotline, what CAs do is giving flexibility to customers by providing more service options that suit the customer's available time, resources and situation at a given point. For example, Brandon explained how a customer has more options now to contact the organisation when asked about any potential confusion in the job role after Xavier was implemented. He confirmed that there is no confusion in responsibilities between Xavier and the hotline team because the end decision of which channel to use will come from the customer. The choice of channel to use is influenced by the time or the situation customer is in:

Nothing, not at all to be honest. I mean, not all. Some queries can be answered but then, I don't know if the passenger went to Xavier. I mean, depending on your time, I mean it doesn't affect Xavier or us. I don't think it affects us in any way because it's the customer's choice of what they want to do... just giving you...options to self-service. Yeah.
(Brandon)

Similar to ‘executing repetitive and mundane tasks’, the affordance of ‘allowing customers to self-service’ brought changes in the work practices of employees by indirectly reducing the repetitive questions and tasks directed to human service employees. The term ‘indirectly’ is used to define the relationship between this affordance and the first affordance. It means that ‘allowing customers to self-service’ as an affordance supplements ‘executing repetitive and mundane tasks’ by making CAs a complementary tool in performing online self-service functions that clearly reduces the repetitive questions and tasks of human service employees. The set of instructions that CAs provide when a customer is making a transaction online allows customers to perform tasks on their own without the need to speak with humans and get assistance from them. The majority of these online customer transactions comprise a series of processes that are easily codified hence, they can be automated. In addition, Ygritte observed that call volumes were easily managed after the implementation of Xavier. She noticed that there were “fewer people phoning through because they're able to self-service things for themselves online” with the help of Xavier. Therefore, this affordance supports the impact of the first affordance in increasing the sense of significance to the actual role of customer service employees.

Another change that is observed under this affordance is the increase in proportion of customers who require reassurance from customer service employees. Once customers perform an online transaction, they might then call the human service employees to ensure that all steps taken were done so, correctly. For example, Margaery shared that customers still called in after performing an online transaction. Customers wanted to make sure that they went through all the steps “correctly” because not all confirmed requests were reflected in the ticket. Margaery believed that customers called in “for their peace of mind just to make sure” and that all customer requests made online were “fully confirmed”.

The sense of reassurance extended by employees to reassure their customers made the human service employees see the value and importance of their own jobs. This affected how employees viewed their job satisfaction and job security and this is further elaborated in the next CA affordance.

4.3. Escalating complex cases to humans

A third theme that came through relating to the CA affordance was ‘escalating complex cases to humans’. One of the idiosyncratic affordances of CAs is their ability to recognise their own limitations. To exemplify, if the CA was unable to grasp the meaning of the enquiry, it would give the user an option to call the customer service hotline or it would provide an option to link the chat to a human chat assistant. The goal of this affordance is to ensure smooth flow of service experience whereby customer will have an option to talk to a human employee if the answer they get from the CA is insufficient. Within the dataset, CAs identified instances where it would prompt customers to call the hotline. In the interview data, Sansa mentioned that they are required to educate customers on the use of online tools such as Xavier for answering customers’ questions. This was to create an awareness in customers that there were alternate channels for them to use for acquiring information. However, if Xavier received an enquiry outside its knowledge base, it instructed the customer to call the customer service hotline.

Many customers turned to interacting with Xavier on the website following the growing awareness of its presence and functionality. Consequently, the organisation conducted a review of customers’ feedback on the use of Xavier to identify areas for improvement and constraints that might be addressed as shared by Cersei:

...through just some research and what our customers wanted was to have another avenue for them when they're online so instead of calling in...because a lot of people don't want to wait on hold for too long. So,

they will prefer to be online just get everything sorted online and they have like a live agent that they can ask questions directly to help.

As a result of management's review of customer feedback on Xavier, they decided to form a digital team separate from the call centre to segregate the queries based on the channel that customers use. This team comprised Xavier and human live-chat agents who worked with Xavier. If a customer preferred the online channel to make an enquiry, Xavier was their first point of contact. If Xavier was unable to answer the question because of the complex nature of the enquiry, it was then escalated to a live-chat agent as explained by Cersei:

So, when they're asking Xavier ...do you ask a question or if you want to speak to a live chat agent, then you just put into Xavier's live chat or it's something that you put in to Xavier and they'll get a live chat agent up and we have a different team who are like within that live chat area who will ...who are there available to answer the queries directly.

If the enquiry or request became so complicated that it affected even a live-chat agent's handling time or availability online, the case was subsequently transferred to the customer service employees to perform the callback.

...many complexities to it, right, because you are chatting to someone and they want to make a booking or pay for it...then you need to switch your system. So, then it becomes more time-consuming...your productivity...you are not as productive as I would say, and because then you know your time is passing...so now, they have their own chat team and they have their own call team within that chat team itself. Previously...it was just the chat team and then the callback teams of a handful of like us but all the chat team is from the contact centre. They

used to do the same role like what I am doing...so what they did...they wanted to go towards the chat team so they moved down there.

(Brandon)

The actualisation of CAs' ability to escalate to humans as an affordance was revealed through the escalation step described in Brandon's statement. This supports employees in the call centre as being at the top of the hierarchy in customer service. The situation presented in Brandon's statement showed how significant the role of customer service employees was in the call centre. Their skills and role could be extended to cross-support other units, which made the employees feel important. It also displayed how flexible their customer service skills were, with employees being able to adapt to different customer service settings, namely digital or virtual platforms. As a result, the participants felt that their roles at the call centre were more than just attending to customer service requests. They also need to cross-support other units such as the digital team that was newly formed in the organisation. This contributed to the positive feeling towards their work.

In spite of Xavier's precision and accuracy in sharing knowledge using pre-set or pre-programmed responses, Xavier could become a liability in situations where it does not change the way answers are phrased in an effort to adjust to the customer's level of understanding. In the interview statement below, Sansa shared that customers were prompted to call the hotline after interacting with Xavier because customers did not understand Xavier's response:

Yeah, I guess Xavier knows, it's right. I guess, you know, we're on the same boat, but the information just comes out differently from Xavier and us, maybe it's right. Maybe it's similar, but the particular person probably doesn't understand...

This ability to escalate to human service employees as an affordance strengthens the argument of human and computer intelligence working side by side to deliver a common output. CAs filter enquiries received by answering the basic, most general queries and escalate to humans those queries that are more complex in nature or need further clarification depending on the users' ability to understand the CAs' response. Escalating complex cases to humans as a technological affordance of CAs changes the work practices by increasing thoughtful enquiries received by the human employees. This is thoroughly explained in the first technology affordance of 'educating customers on foundational knowledge'. Another change that was observed in the data was an increase in the number of tasks that required customer service employees to reassure their customers. Arya, Brandon, and Sansa confirmed situations where customers still called despite obtaining information from Xavier and the website, because customers generally wanted one of the employees to give as much or more understanding on the information obtained from Xavier. In essence, the customers obtained the final confirmation or validity of information or understanding from the customer service employees. This is because human employees are able to adapt to different degrees of customer understanding whereas the CA cannot revise or adjust an answer to assist the customer. As a result, it increases the reassurance tasks of human service employees.

This affordance allows customer service employees to engage in personalised service as a result of varying and diverse elements surrounding an enquiry or a transaction. As shown in Brandon's statement below, he mentioned that that the nature of a customer's query might be simple enough such as about travel bookings however, the elements affecting an enquiry constantly change making the tasks more diverse.

... the elements surrounding each of the tasks might be different from the other although it's the same task that makes the role challenging.

It's very diverse... I can say, because you know, everyone's traveling

different places, of course, we are booking and collecting money for the tickets and everything. But then at the end of the day, it's too much from the start till the end which goes into what we are looking at what customer wants...so you know...there are many elements that always keeps changing and which is in a way keeps you happy with what you are doing because it's not the same thing. There are so much things to it so...(Brandon)

As a result, he had to use different approaches that best answered a query or were more suitable in carrying out a task.

The approach customer service employees used in creating a tailor-fit solution required the utilisation of different skills, such as analytical and empathetic. This created more meaning to the work of customer service employees because they felt that a different skillset was put into action. For example, Ygritte felt she is “better utilised now” because the job allowed her to deal with situations that were “unique to each experience”, employing a more personalised approach in her service delivery. The positive descriptions shared by Ygritte elicited a happy emotion or reaction to her work that positively affected her overall job satisfaction as reflected in her statement below:

It improved my job satisfaction because it (referring to Xavier) made a happier working experience for me. It's like, I feel I am better utilised now. Like you know, compared to that before, you do like every single thing... basic thing for a customer which I feel like a computer could have done that, you know. And now, I'm just taking the building blocks, like I've already got the foundations of a house and now I'm just like filling in the details. Whereas before you have to build the house, right? And it is nice to have a bit of variation. All those things that I'm dealing with now are unique to each experience. It is more personalised. Before

it's just like stock standard of the process is what you have to do and I felt very repetitive in that sense.

As a result of being able to resolve complex cases, reassure customers, and provide customised solutions in unique situations, human employees received positive feedback in the form of appreciative remarks from their customers. For example, Arya “likes” to hear customers feel “happy” and say sincere words of gratitude for “good service” she provided for the customer. Margaery received positive feedback and felt appreciated when she identified a potential need that a customer might have overlooked. She then provides options to that unrealised need suitable for the customer’s situation; this complex problem-solving is something that Xavier is unable to anticipate and provide. Sansa felt satisfied when she heard happy remarks from a customer because she managed to find resolutions for the complications in their booking.

Lastly, customers were transferred to human employees if Xavier was not able to meet their requirements. This results in a personalisation of service where human employees take control of what has to be done in accordance with what the customer requires. Moreover, customers are willing to pay for the service that makes human service costlier compared to self-servicing online with the help of CAs. Therefore, human service employees are expected to perform the task with more precision and accuracy otherwise, a mistake can account for serious escalation and customers may ask for compensation. This makes human employees feel responsible for the outcome of their work that positively affects their job satisfaction.

4.4. Educating customer on foundational knowledge.

One of the most prevalent technology affordances of Xavier was actualised by customers as they became more educated on foundational knowledge of the company’s products and services. The development of Xavier with the primary goal of providing

easy and immediate access to information and knowledge to customers was a key area, with our participants observing the contributions of Xavier to a growing base of educated customers. Many of the participants recognised that customers who called were much more knowledgeable about products and services than before the implementation of the CA. Xavier has been trained to answer fact-based questions such as ‘how many pieces of luggage can I check-in?’ and ‘what are the weight restrictions for my checked-in luggage?’. As many customers did not want to hold the line on the phone, they preferred to ask Xavier such questions online to get simple and straight-forward answers instantaneously. Thus, this additional fast-paced channel of the CA ensured that the remaining queries from customers to the customer service hotline covered more complex enquiries or those that required confirmation on the information obtained from Xavier. Brandon, one of the customer service employees who has been working for the company for three years, emphasised that customers called in for reassurance or confirmation of what Xavier might have given as an answer: “...sometimes people just need *reassurance*. So, of course, Xavier will tell them the same thing if he can, if it is not *complex* for him, you know”. Therefore, through the actualisation of the affordance on ‘educating customers on foundational knowledge’, customers were able to easily learn about luggage restrictions, the earliest time to reach the airport, and flight routes. The customer service team only “needs to fill the gaps” (Ygritte) when more specific information was required as outlined by one of the participants, Ygritte, who has been with the company for two years:

...now, I’m just taking the building blocks, you know, like I’ve already got the foundations of a house and now I’m just like filling in the details, whereas before you have to build the house, right? (Ygritte)

What Ygritte meant on the above statement is that customer already has baseline information when they call the hotline. So, when the inquiry goes in to the human

employees, they no longer have to explain in details the fundamentals of Co-A's products and services and its usual policies and conditions of use. They just need to fill in the gap in the basic knowledge in case a customer is unsure of his or her understanding about certain services.

As more and more people use Xavier, the number of educated customers increases. This was emphasized by one of the senior customer service employee, Cersei, who has been in the role with the same company for fifteen years: "It was probably a little bit harder because the customers weren't that much educated before we had Xavier come along. So, there's like simple questions that Xavier can answer so they can just do everything online." Although she highlighted a slight complexity in her tasks as a result of CAs affordance, she thought it was much easier now for customer service employees to manage their calls due to the reduction of repetitive queries that used to make up the majority of their call volume. As a result of the decrease in the repetitive enquiries that in turn reduced the call volume, influenced their job satisfaction.

As Xavier is trained by the customer service employees, and disseminates its knowledge and the rules and regulations of the company, the knowledge gap between customer service employees and customer decreases. The knowledge is now freely available to customers, at no cost, instantaneously, and throughout the day and night. This facilitated access allows a customer to get much better knowledge about the organisation's products and service that the company is selling, as stated by one of the participants, Jon, who has been with the company for ten months:

...possibly because of Xavier just in general...customers are becoming more and more educated about it, all the more knowledgeable, you know, they are knowing more and more about the stuff that we all know here. And yeah, I think that's going to continue to increase.

To further support the findings, the growing number of educated customers was observed through a change in (a) the nature of enquiries received by the customer service employees and (b) a change in the manner of how the questions were framed and asked. Ygritte described these findings: “Yeah, so they already understand or it's like, you know, if it's like more technical that's the reason why they're phoning us is to get more clarification”. Her statement describes the nature of enquiry as more technical compared to generic types of questions that the employees received before the implementation of Xavier. This shows that customers already possessed the foundational knowledge and simply sought additional clarification if they had a more technical question.

Another change that was observed showed how customers framed their questions when they called the customer service hotline. Ygritte shared that customers now phrased their questions in such a way that basic knowledge was implied. Ygritte observed that she now received more “legitimate” enquiries through the use of more “targeted” and “appropriate” questions eliminating the need to probe further just to identify the information that the customer was particularly seeking. This leads me to understand that the customer service employees can now spend less time in explaining the contextual information or the basic knowledge because the enquiries they get from their customers are very specific.

Because now I've noticed the biggest changes when customers phone through... I want to say like it's more legitimate their ...the queries now. Their questions are more targeted... but I feel like they're just more appropriate questions now. Yeah before they're like very basic things that really ...sometimes common sense would tell... (Ygritte)

The actualisation of ‘educating customer on foundational knowledge’ as a technology affordance of CAs resulted in several changes in their work practices when interacting with their educated customers. These changes include: (a) more complex

enquiries; (b) more thoughtful inquiries that place the human employees on top of the hierarchy; and, (c) reduction of repetitive or mundane questions.

The first prominent change was the increase in complex enquiries from customers. As earlier stated by Cersei, Xavier's implementation made the job "a little bit harder" because Xavier took over the repetitive and mundane tasks that were simpler to perform. Therefore, customer service employees now focus on handling more complex enquiries and tasks. For example, after a major traumatic event in one country where the airline company had many customers, the company provided compassionate fares to customers whose relatives were negatively affected by the incident. The customer service employees had to perform compassionate bookings that followed a different process from their usual routine. The process of performing compassionate bookings requires documentation to support the application for a compassionate airfare, and may sometimes require management's approval. On top of that, when employees are interacting with such customers, the customers are highly emotional due to their distressing situation and employees have to be sensitive to that. Ygritte noticed that the role of customer service employees in such cases extended to even becoming "a bit of a counselor" because some callers were "just looking for a bit of sympathy" or "just want to be heard" or needed "someone to listen to" in order for some customers to feel better. For Ygritte, she felt that handling the emotional side of the service was the part that Xavier could not really replicate:

Yeah, because whilst the nature of our job, it's repetitive otherwise, you know, it (referring to Xavier) takes away the repetitive nature of our jobs and we have room to provide that human element like customer interaction, ...the dealing of the emotional side... which systems aren't created for, you know?

Despite the increased complexity in the interactions with their customers, customer service officers viewed this change as a positive effect of the CA affordance mainly because it made their jobs interesting and less repetitive.

Another example of task complexity is attending to highly sensitive interactions that require extra steps such as customer verification in order for an enquiry or a transaction to be addressed. Margaery's situation is a good example because she is part of the premium team of the call centre that is purely servicing this segment of the company's customer base. Customers in this premium group are those who travel frequently and hence, earn considerable air points or air miles. In the organisation, any points-related enquiries are categorised as sensitive because frequent flyer miles equate to monetary value. Margaery ascertained that Xavier will not answer sensitive and classified information, and in these cases, Xavier transferred the customers to the service hotline instead. Additionally, some interactions required an extra step towards verification for security, such as performing a recorded outbound call using the contact number in their system, and this was not a task that Xavier was able to perform.

In addition, because of customers becoming cognisant of allowable changes in their bookings or utilisation of frequent flyer miles that could be applied to their existing bookings, customer service employees were experiencing an increase in this type of complex request. For example, accommodating changes in a booking is not as easy as clicking icons on the website. Most participants, including Jon, Brandon and Danny, noted that amending bookings was "never or very rarely straightforward" (Brandon) as a process because of the complexity of the software that supported such transactions. Such amendments require the use of multiple systems that make the task itself strenuous to perform. Danny explained how things become messy when there is a disruption in flights and changes are required. Danny noted the terms 'mirroring' and 'matching' that refer to

requires the employees to at least match or upgrade the seat class (match) for the customer and apply the same route (mirror) for the new, replacement flight:

...it's just, it's...more complicated like...when you book a ticket with Co-A okay, when you go online, it just seems so easy you go clicking then comes up. With here, we have to mirror. We've got a lot more availability with the flights we can use we're going to lower the right booking classes. And sometimes, right booking classes are not available on...this particular...so you can have them go up a booking class. And so, all these things have to match, take into account. He can answer questions. He can tell people how to do things but when you are stuck up in LA and you need a flight home ASAP, they (referring to Xavier and chat team) can't do anything like that...

In the statement given by Danny, mirroring or matching an existing booking as a result of disruption required the use of other systems that provided real-time information. This helped find an exact match to the route and the class that the customer originally booked, and the service was within their company's affiliate network. Since not all airlines have the same seat class categorisation, the matching should be done for the same or better seat class type of the passenger. Therefore, several considerations must be accounted for in finding a replacement for a booking, including both flight and seat. In addition, the element of urgency adds up to the level of stress for the customer service employees, especially in cases when a customer's connecting flight is delayed or cancelled. This is because this kind of enquiry requires urgent action and resolution, which Xavier is unable to perform. Therefore, having Xavier working on building foundational knowledge for customers and guiding customers to use the online tools for simpler transactions allows customer service employees to focus on these types of urgent and high-value transactions that are more complex to resolve.

The second change was the transformation of enquiries from basic to more thoughtful ones. As discussed in the earlier part of this section, Ygritte observed that enquiries were more “targeted” and “appropriate”. In some cases, customer service employees receive valid and thoughtful enquiries that require further research, implying that employees might not be able provide immediate answers. Such enquiries might require further investigation or escalation; thus, customer service employees have to perform follow-up calls to resolve such queries. For example, a customer might use Xavier to inquire about a booked flight however, the answer provided by Xavier might not be sufficient to resolve the customer’s queries. The customer will then be transferred to a human live-chat agent for further assistance. However, if even further investigation is needed to address a problem, the case will be referred to the hotline team in the contact centre to perform the necessary call-back and close the case. In this situation, a hierarchy is observed: the enquiry would first reach Xavier, then move up to the human live-chat agent, and then be escalated to the customer service hotline team. Therefore, the enquiry gets resolved the moment it goes up to the hotline team, meaning the customer service employees in the call centre provide the final channel for resolving complex enquiries. This situation is exemplified in one of the statements shared by Brandon in the interview:

So, you know, they are handling what they can handle (referring to the digital team) and they're doing things to solve the small queries. Like what happens is... so Xavier chats to the passenger, right? And then if Xavier can't handle the query and any live chat agent is available that goes to the live chat agent. Now, the chat agent, if it is simple information, like how many bags, which for XYZ reason Xavier can't answer...the chat team will answer...and if there is more investigation which needs to be done or if there is some escalation to that call, maybe

if there is payment that needs to be taken ...then they will set up a query for a call back team to call them.

The final observed change in the work practices that occurred due to the actualisation of the CA affordance, was the reduction of repetitive and mundane tasks. Since the CA mostly answered the basic and general questions that helped create a foundational knowledge for customers, enquiries and tasks that the human employees received were more varied and unique. Therefore, customer service employees on the hotline observed a reduction of simple and general enquiries such as: “how many bags can I carry on?” or “how can I add a piece of baggage?”. Xavier also guided customers in performing simple self-service transactions online by informing them about how to do the same. This reduced the mundane nature of tasks that customer service employees received. This change strongly links to the increase in the complexity of human employees’ interactions with their customers and the legitimacy of the enquiries they receive.

As a result of ‘educating customers on foundational knowledge’, the changes Xavier enabled for the customer service work practices explained in this section led to an increase in the use of different skillsets of the human employees. For example, Ygritte observed that they “have more room to provide the human element” in their interactions with a customer by “dealing with the emotional side which systems are not created for”. In her statement, “dealing with the emotional side” required empathetic intelligence that made her think that her role as a customer service officer even extended to the role of ‘counsellor’ when faced with difference emotions during her customer interactions. Margaery noted the need for caution and discretion in handling highly-sensitive transactions. Danny shared that you had to be “johnny-on-the-spot” in resolving customer issues where the employee should be able to quickly respond to an emergency situation such as travel disruptions and make efficient decisions to address an urgent inquiry. Such tasks

require excellent technical and analytical skills in urgently resolving the complications brought by flight disruptions. An example of a complication brought by flight disruption is finding an exact match of cancelled flights without further compromising the quality of customers' travel experience. The increase in the use of different customer service skills made the employees feel good about their job because they saw their role in customer services as being valuable and indispensable for creating a feeling of satisfaction and security for customers. In the statement given by Danny, she explicitly expressed a sense of security in her role because of the multiple skills that she displayed in her job:

Because as I said like you've got to be johnny-on-the-spot when something happens, you've got to be able to actually like go through and it's a process of finding, you know, like you've got to pick up stuff, like pick up weapons. You've got to be able to call the customers. There will always be cases that need to be calling customers or customers calling us so I don't actually perceive it (Xavier) as a threat.

Similarly, the reduction of mundane enquiries as a result of the technology affordance discussed in this section made Brandon happy with what he was doing. This is because his interactions with his customers changed constantly and the elements surrounding each enquiry got more diverse. This made Brandon provide unique approaches to each interaction he has had:

Very diverse...yeah...definitely, I can say because you know, everyone's traveling to different places, of course, we are booking...excuse me...collecting money for the tickets and everything. But then at the end of the day, it's too much from the start 'till the end which goes into what we are looking at what customer wants...so you know...there are many elements which always keeps changing and

which is in a way keeps you happy with what you are doing because it's not the same thing. It's...it's so much things to it so...

The next technology affordance 'providing information to customer service employees' discusses how employees actualises the CAs features for their own personal reasons. Although the CA is designed to create an alternative channel for customers to connect with the organisation, the action potential of CAs extends even to employees working alongside it.

4.5. Providing information to customer service employees.

The fifth affordance extracted from the data, and the second most common, was 'providing information to customer service employees. This is an affordance actualised by employees whose goal is to obtain immediate and updated information in order to better serve a customer whilst in a telephone conversation. It is also an affordance that designers might have never intended. In the AI literature, many scholars view CAs as a threat to human employees (Huang & Rust, 2018; Makridakis, 2017). However, my data supports a contrasting view thereby promoting human-AI collaboration (Bassett, 2018; Chong, 2017; Jarrahi, 2018) in this regard. Providing information to customer service employees is an umbrella term for three other affordances namely: (a) increasing efficiency through easy access to information; (b) converting pre-existing knowledge to updated knowledge, and (c) helping new employees to gain knowledge.

The first sub-affordance is increasing efficiency through easy access to information. Since Xavier was designed to share knowledge instantaneously, customer service employees regarded Xavier as a better search engine compared to their own organisation's knowledge base system. This reveals a direct link to human service employees' efficiency at work. In the sample, Xavier's ability to locate information was much faster and more accurate compared to the use of the company's knowledge base

exclusively available for internal staff members. Ygritte clearly described the effectiveness of Xavier for accessing information at par with Google.

No, because I feel like Xavier is more ...Xavier is like a Google. You ask it a question and it comes back with answers. I feel like it's more efficient than like our own because we've got like internal information inside... the results are not helpful as when you go to Xavier (laughing) and come back the...oh... there you go. That's the answer. It actually is really good at that.

In the statement, employees recognised Xavier as an efficient tool for searching for information compared to the use of their company's internal knowledge base system. Thus, as a CA, Xavier enabled customer service employees to search and validate information much faster whilst interacting with customers over the phone, thus positively affecting their efficiency at work as an effect.

The second sub-affordance of 'providing information to customer service employees' is converting pre-existing knowledge to updated knowledge. Due to CAs' integration with the relevant data system of the organisation, data can be regularly updated with minimum effort. Compared to Xavier's learning process, which is an update in its knowledge base, the human learning process varies depending on each individual's capacity to understand and apply the information. Additionally, human employees require constant retraining to ensure that the knowledge they possess is updated. Although customer service employees seem to have a disadvantage in this area, having collaboration with CAs as a search engine helps customer service employees to stay abreast of changes in the information surrounding the service operation. In the example below, Ygritte felt that Xavier was ahead in terms of company information changes and updates when asked about the observed changes in their customer interactions.

Sometimes I feel like the chatbot is even ahead of us here. You know, like a customer will ask Xavier something it...it actually is better in terms of that. It provides a lot more consistency for the customer...because we're all at different levels of knowledge and some have been here for a short time some are for a long time. And because things change...sometimes I get stuck on the old knowledge...but that's okay...I would have been like this...and then the customer would like...go online and ask Xavier a question...Xavier will give them an answer...like oh...and they phone through to us for clarification and we're like, no, (laughing). You know, like it's not A, it's B and then...then I go but I went online and we go and we check it out as I actually yeah that...that knowledge has been updated. So, what's in my head is no longer correct. (Ygritte)

The interview statement shows that Xavier was more effective in sharing knowledge because he gave updated and accurate information not just to customers but to employees as well. The ease of updating Xavier's knowledge base due to his integration with other systems enables Xavier to produce accurate responses to all user types. This helps build the foundational knowledge of customers, as highlighted in the earlier affordance of 'educating customer on foundational knowledge', and at the same time update the knowledge of employees. This, in some ways, can help an organisation minimise the need to use other resources to conduct retraining sessions with employees. In addition, the consistent information provided by CAs helps customers and employees' knowledge to be on the same wavelength during an interaction, contributing to a more seamless customer experience.

One explanation of why CAs are ahead in gaining updated information is because of the accessible nature of the websites. As the CA responds to customer enquiries through the online channel instantaneously at all times, data is constantly updated, as otherwise it could pose a risk to the company that might lead to severe monetary loss. This means that if CAs provide wrong information online, the error can spread easily affecting multiple users at a given time until the rectification is completed. Thus, the scale of service recovery is much wider if CAs commit an error compared to a mistake that could occur in a human-to-customer interaction. This is because human-to-customer interactions are not as far-reaching compared to multiple customers' interactions with the CAs online. Therefore, organisations prioritise updating information on channels accessible to customers, such as CAs and official websites. Since CAs are first to be updated with any new knowledge as mentioned earlier, customer service employees do not need to rely on retraining sessions with their superiors or constantly browse through their emails about the changes in information. They can use CAs as a faster tool to access updated information.

A third sub-affordance of 'providing information to customer service employees' is helping new employees to gain knowledge. In the sample, Sansa had been with the company for only five months. During her training, she expressed confusion and concern when asked about the attitude towards Xavier before going live in the platform:

... my reaction was wow if that's there, are we actually going to get calls because people can now relate to the website... and that makes us, that makes me think... oh, we're going to get fewer calls in regards to enquiries ... So, I was kind of confused, maybe because I didn't understand Xavier well...I was confused and worried about that... you know, technology about to take over very slowly. (Sansa)

However, after realising the usefulness of Xavier, Sansa felt happy with Xavier's availability because it helped her find the information needed to perform the job. It was discovered that newly-hired customer service employees spent the first three months on training. Thus, establishing foundational knowledge as a new employee can be challenging and overwhelming. This can affect the absorption of foundational knowledge of the company's products and services. New employees such as Sansa regularly rely on Xavier to get information whilst servicing customers. In the sample below, Sansa discreetly used Xavier to find information whilst on the phone with a customer:

Oh, actually I'm happy cause it helps, you know, we do refer to Xavier whilst we're talking with ...when we're helping our customers. ... I refer to Xavier when I'm talking because they don't know if I refer to Xavier. Xavier helps a lot on little things because if you realise in his own everyone has a lot of questions and these little points that... Xavier pinpoints you to where you want to.

Although Sansa was trained to use different systems to acquire knowledge, she employed Xavier for her 'personal use and knowledge'.

Providing information to customer service employees as a technology affordance of Xavier's created a change in the work practices in such a way that employees relied on Xavier to access information in preference to using other databases. This affordance increased customer service efficiency through easy access to information. This supports employees by reducing the time spent on finding answers they require for handling a complex query or transaction. It also displays employees' ability to be resourceful, especially in situations where time is of the essence in resolving a problem. Additionally, using Xavier as a source of updated information allows customer service employees to be on the same wavelength as customers. As such, they can effectively address any concerns that customers may have as both parties share the same understanding of

information, reducing the risk of conflict. This can give employees more time to focus on resolving a problem rather than using most of their time and energy in identifying and validating different knowledge sources to understand which is most recent. This makes employees' interactions with customers more pleasant and mitigates any negative outcomes that can arise as a result of outdated knowledge. In turn, this leads to a positive working experience making employees happier and satisfied with their job. Finally, new employees benefit from this CA affordance by using Xavier as support to gain knowledge as they go through the steep learning curve in order to understand their roles. This allows the employee to gain access to both general and updated information easily as they go live on the service platform. This helps them quickly establish their foundational knowledge and reduces their anxiety of not being able to give the right information during a call. Therefore, this affordance of CAs can shorten the new hires' learning curve and motivate them to be more focused at work as a new employee that makes them happy and satisfied. In addition, the CA is not seen as a threat in the customer service employees due to the help it in their daily role suggesting a positive effect to the employee's sense of job security.

I don't feel threatened because I see Xavier as more of a benefit.

Something that helps us in our role rather than removes our responsibilities. (Ygritte)

The last technology affordance of 'providing consistent responses' is actualised by both customers and employees. This is an affordance that closely links to the two earlier technology affordances 'educating customer on foundational knowledge' and 'providing information to customer service employees' and is further discussed in the below section.

4.6. Providing consistent responses

Many of our participants highlighted the fact that Xavier provided consistent responses to customers. For example, Ygritte identified how Xavier was far better than humans in providing baseline information because of the provision of consistent, accurate responses. In her statement, customer service employees tended to vary in their responses depending on the degree of knowledge he or she had or whether the employee was quick enough to adapt to changes happening in the organisation.

For example, there's more consistency. So, there's less of, I think before, the customer would phone in...and a consultant will tell them...hey...right...and then they like phone back in a different...they'll get somebody else and they...are not that. We are like...I feel like everyone here is clear that like clued up...but like I said, you know people have been here with still old information whereas if they go to Xavier...it is like a baseline for everyone... (Ygritte)

Ygritte compared the situation to a popular children's game called Chinese Whispers, where players form a line and the first person in the line whispers the message to the second person. The process is repeated until the last person in the line is reached and then they are tasked with announcing the message to the entire group which usually comes out as distorted or completely different from the original message. Similarly, if a customer were to speak with two or three different agents regarding the same enquiry, the information that the customer receives may vary from one employee to another, which can be very frustrating for the customer.

...it's like Chinese Whispers almost and then you know...It's like a term that...like a game in a circle of a line and you are like...it's starts from one end and the first person will say something and like from person to person. I feel like it's a little bit like that ... (Ygritte)

Therefore, actualising the affordance of providing consistent responses affects both employees and the customer. The goals of this affordance are to maintain high standards and quality of service by providing accurate and consistent responses. It creates change in the work practices of employees through an increase in thoughtful enquiries as a result of the first CAs' affordance of 'educating the customer on foundational knowledge'. In addition, since employees trusted Xavier due to the reliability with which it gave accurate information, some employees like Ygritte and Sansa relied on Xavier to source information. This technology affordance supplements the effect of the changes in the nature of the job of human service employees as well as the positive work output reported previously in 'educating customer on foundational knowledge' and 'providing information for customer' in the earlier section. The only difference is, this affordance creates a positive working experience for the employees through the reduction of emotional stress brought on by inconsistencies in information that the customer receives from speaking with several employees. The positive state of emotion displayed in the statement below by Ygritte supports an increase in her job satisfaction:

...when you're dealing with a customer that phoned in three times and they're getting three sets of different information, it can be really frustrating for them. So, like I said, like you've got to deal with that energy coming through whereas now there's less of that. There are fewer inconsistencies and, because of that, it makes for happier customer experience...and...happy employee.

Furthermore, 'providing consistent responses' reduces the number of dissatisfied customers contacting customer service. And if there are fewer interactions with dissatisfied customers, it reduces the stress level of employees, and positively affects their job satisfaction.

To conclude this section, all six technology affordances of CAs that directly emerged from the data initiated several changes to the customer service employee work practices. The relationships that emerged between these affordances and the observed changes in the work practices were explained in this section. For the purpose of clarity, Figure 4 is presented to visually explain the relationship of the six technology affordances to the change in the work practices. The left column consists of all the six CA affordances and the right column displays the identified changes in the work practices. Arrows were used to show the type of change each of the affordances initiated after the implementation of the CA.

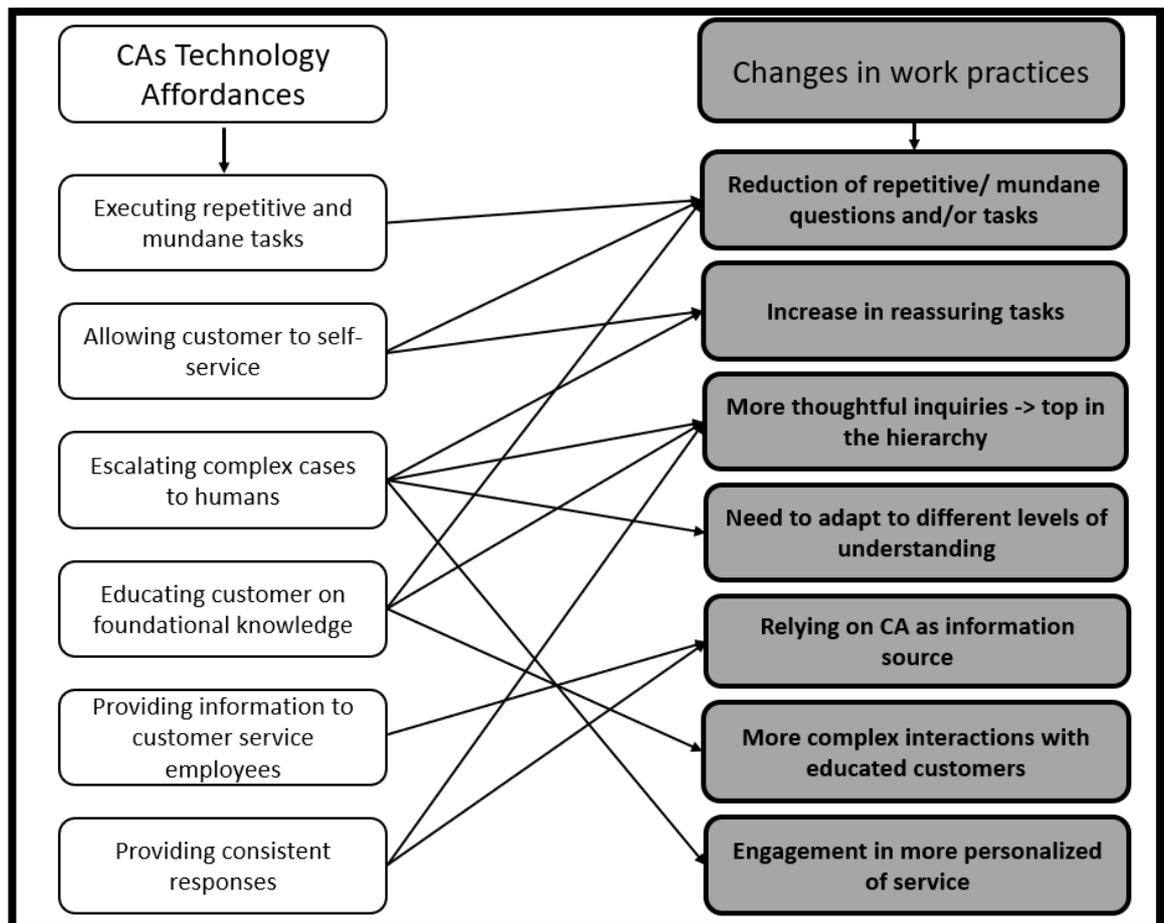


Figure 4. Relationship of CAs affordances and changes in work practices

In the next chapter, I will present the answers to the research questions. In addition, I will discuss how I extended the Job Characteristics Model based on the findings derived from this chapter. And lastly, I will share the contribution of this study to the existing theory and practice.

Chapter 5. Discussion

The study aimed to investigate the impact of CAs on customer service employees' work practices, as well as employees' job satisfaction and job security. The data suggests that CAs can influence customer service employees work practices and that these influences are primarily positive. The changes in work practices identified in the study suggest a link to employee's core job characteristics.

Building on the Job Characteristics Model (JCM) (Hackman & Oldham, 1975) and the lens of technology affordances (Hutchby, 2001; Majchrzak & Markus, 2012; Markus & Silver, 2008) the study suggests a possible link between the changes in work practices as an effect of the actualisation of CAs' technology affordances and the customer service employees' job characteristics. The change in job characteristics suggests that the customer service employees' critical psychological states may have changed which positively influenced the employees' job satisfaction and job sense of job security. Therefore, I propose an extended model of the JCM to illustrate how CAs' implementation affects customer services employees' job satisfaction and job security which will be further discussed in this chapter. In addition, theoretical and practical contributions are discussed in this section.

5.1. Changes in work practices

Similar to Keyser et al. (2019), I found that CAs' deployment in customer service (Chakrabarti & Luger, 2015; Huang & Rust, 2018; Kirkpatrick, 2017; Xu et al., 2017) indeed changed how customers interact with front-line employees. However, in this study, I discovered that the changes that were identified were not associated with CAs' technical features per se but with the actualisation (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) of CAs' functionalities by the user, commonly known as technology affordances (Majchrzak & Markus, 2012; Markus & Silver, 2008). As

individuals have varying intentions of using CAs and possess different skillsets, they realise different affordances of CAs (Markus & Silver, 2008). These technology affordances of CAs must first be realised before they get actualised, which then leads to actual effects or changes (Pozzi et al., 2014). The findings from this study suggests that the changes in work practices are the effects of the six identified technology affordances of CAs actualised by customers and employees, or even both (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014). The identified changes in the work practices of customer service employees are: (a) increase in thoughtful enquiries; (b) engagement in more personalised service; (c) reduction of repetitive and mundane enquiries or tasks; (d) more complex interactions with educated customers; (e) need to adapt to different levels of understanding; (f) relying on CAs as an information source; and, (g) increase in reassuring tasks.

The relationship of affordances of CAs with the changes in work practices is illustrated in Figure 4. It shows how each of the affordance links to one or multiple immediate outcomes (Strong et al., 2014) through the changes (Pozzi et al., 2014) in work practices of customer service employees. In the data, the affordances of ‘educating customer on foundational knowledge’ and ‘escalating complex cases to humans’ are the strongest in terms of effect as both lead to multiple changes (Pozzi et al., 2014) in work practices. For example, ‘educating customer on foundational knowledge’ leads to ‘more thoughtful enquiries’, ‘reduction of repetitive and mundane queries or tasks’ and ‘increase in complex interactions with educated customers’ of customer service employees. The affordance of ‘escalating complex cases to humans’ leads to ‘engagement in personalised service’, ‘need to adapt to different levels of understanding’ and ‘more thoughtful enquiries’.

In the next section, the process of actualisation (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) of CAs' technology affordances by different user types and the changes in the work practices of customer service employees are explained in detail.

5.1.1. Actualised by customers.

Due to the fundamental technical features of CAs such as NLP (Lester et al., 2004; Levy, 2018) and ML, CAs are able to analyse responses received through text (Levy, 2018) and learn from the data (Baier, et al., 2018; Huang & Rust, 2018 Kietzmann et al., 2018; Lui & Lamb, 2018). This enables CAs to execute simple tasks that are repetitive and mundane in nature (Chakrabarti & Luger, 2015; Cui et al., 2017; Huang & Rust, 2018; Xu et al., 2017). Thus, the CA affordance of 'executing repetitive and mundane tasks' is actualised (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) by customers when interacting with CAs online (Messina, 2016). Similar to this affordance, 'allowing customer to self-service' is actualised by the customer when performing an online transaction. If customers are unsure of some steps in performing a task online, they can simply ask the CA via chat (Messina, 2016). And once their queries are resolved, they can complete their transactions such as booking a flight on the website. These CA affordances significantly reduce the repetitive and mundane nature of enquiries and tasks of customer service employees that allows employees to focus on more high-value tasks (Bassett, 2018; Cui et al., 2017; Luger & Sellen, 2016). In addition, the affordance of 'allowing customer to self-service' suggests a change (Pozzi et al., 2014) through an increase in reassuring tasks by human service employees because of customers' need to obtain confirmation that the processed self-service transaction is correct and sufficient. Contrary to findings by Lui and Lamb (2018) that Lui and Lamb (2018) customers displayed more trust in CAs, my findings reflect that assurance is stronger if the confirmation comes from the human employees than CAs. This explains why an increase in reassuring tasks from customer service employees is observed as change. This also

exemplifies how CAs and humans collaborate (Bassett, 2018; Chong, 2017; Jarrahi, 2018; Plastino & Purdy, 2018) in the service industry despite the prevalent use of CAs and other self-service tools online.

The CAs' ability to retrieve information (Brandtzaeg & Følstad, 2017; Chakrabarti & Luger, 2015) makes them powerful tools for customers to gain familiarity through knowledge sharing (Chakrabarti & Luger, 2015) about the company's products and services compared to simply navigating the website and finding information on their own. Thus, the CA affordance of 'educating customer on foundational knowledge' is actualised (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) during each instance when customers use the CA to find information online prior to making a transaction. The actualisation of this affordance seem to influence the growing base of educated customers on foundational knowledge as an effect or change in the work practices of the customer service employees (Pozzi et al., 2014). Furthermore, this affordance suggests other changes such as an increase in more thoughtful and more complex cases or interactions requiring higher attention (Basset, 2018; Chong, 2017; Luger & Sellen, 2016) and reduction of frequently asked questions and requests eliminating the repetitive nature of the tasks received by customer service employees.

The CAs' ability to recognise their own limitations after employing their strengths to troubleshoot using ML algorithms (Lui & Lamb, 2018; Verhagen et al., 2014) provides the customer an option to interact with a live-chat agent or prompt the customer to call the service hotline. In this situation, 'escalating complex cases to humans' as a CAs' technology affordance is actualised (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) by customers when they want to talk to a human employee on a more complex matter. The CAs will prompt several options to the customer if they wish to speak with a human, such as clicking an option to chat with a live agent or speak with a customer service employee. Customer service employees take up the case when the CAs are unable

to respond correctly or sufficiently due to their limitations in handling the complexity of an enquiry or task (Bolton et al., 2018; Lui & Lamb, 2018; Wirtz et al., 2018). These type of enquiries might be cases that require judgment and emotional support (Lui & Lamb, 2018; Wirtz et al., 2018). Therefore, this CA affordance allows the employees to engage in more personalised services by tackling the complexity of the case or adapting to the emotional and psychological states of the customers, thus leading to a change in their work practices (Pozzi et al., 2014). It also implies an increase in reassurance tasks because customer service employees provide the final resolution once the case is escalated to them. The intervention of humans in these situations makes their service role relevant in the field of service management (Lui & Lamb, 2018).

5.1.2. Actualised by employees.

One interesting CA technology affordance identified in the study is ‘providing information to customer service employees’. This affordance is actualised (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) when customer service employees, irrespective of whether they are experienced or new to the job, use CAs to retrieve updated and accurate information quickly (Bassett, 2018; Chakrabarti & Luger, 2015; Kirkpatrick, 2017; Xu et al., 2017). This affordance suggests that customer service employees can rely on CAs to source information as an effect or change in their work practices (Pozzi et al., 2014) rather than going through their usual practice of referring cases to their supervisors or to their internal knowledge base.

5.1.3. Actualised by both customers and employees.

The last CA affordance found in the study is ‘providing consistent responses’. Because a CA is easily integrated into any service system and virtually has endless memory (Wirtz et al., 2018), it can easily be updated with more information (Wirtz et al., 2018). This feature enables the CA to accurately provide updated and consistent

information to customers. The customer becomes more knowledgeable given the consistent responses of the CA. This affordance suggests that customers are observed to ask ‘more thoughtful enquiries’ as a change (Pozzi et al., 2014) in the work practices of employees that might require additional steps and time to resolve. This affordance is also actualised (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) by employees in situations where they are unsure of the accuracy of their knowledge. Because of their awareness that CAs are frequently updated with the latest information and provide consistent responses, they rely on CAs to source updated knowledge (Brandtzaeg & Følstad, 2017; Chakrabarti & Luger, 2015) as a change (Pozzi et al., 2014) in the work practices.

To conclude, this study provides a more fine-grained perspective by describing how CAs affect customer service employees’ work practices through the actualisation (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) of technological affordances of CAs. The data also provides concrete examples of how human employees collaborate with CAs (Bassett, 2018; Chong, 2017; Jarrahi, 2018), such as relying on CAs as an information source (Brandtzaeg & Følstad, 2017; Chakrabarti & Luger, 2015) and dealing with the more complex cases that were escalated by the CA if it could not solve the issue.

5.2. Extended Job Characteristics Model (JCM)

The extended JCM in Figure 5 shows the relationship between CAs’ implementation, employee job satisfaction and job security. The model illustrates the actualised technology affordances of CAs (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) that derive from the interaction between customers and employees with the CAs (Hutchby, 2001). The identified CA affordances are grouped by the types of users actualising the affordance. The actualisation of these CA affordances changes (Pozzi et al., 2014) the work practices of customer service employees which then suggest

a positive influence on their job characteristics. The job characteristics in the model implies a connection to the employees' three critical psychological states that hints at positive affect on their job satisfaction (Hackman & Oldham, 1975, 1976, in press) and job security (George, 2003).

To elaborate on the relationship, the process of achieving job satisfaction and job security of customer service employees begins firstly with the actualisation (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) of the six identified affordances of CAs. However, not all of these affordances are always actualised.

Secondly, the actualisation of the affordances (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) indicates changes (Pozzi et al., 2014) in employees' work practices as described above, suggesting an influence to the job characteristics of the customer service employees.

Thirdly, the job characteristics hint an affect the critical psychological state of the employees. The employees perceive an increase in their skill variety as they engage more in personalised services, complex interactions and in situations where the employee needs to adapt to different levels of understanding when dealing with different types of customers. The increase in personalised services and complex interactions might have resulted from the CAs taking over simpler tasks (Chakrabarti & Luger, 2015; Cui et al., 2017; Huang & Rust, 2018; Xu et al., 2017). Therefore, simpler requests and basic queries are reduced. Once an employee receives the call, the nature of requests tends to be more complex in nature. Therefore, multiple skills are employed in order to resolve complex or high-value transactions (Bassett, 2018; Cui et al., 2017). For example, customer service employees apply different skills such as technical, analytical, and emotional skills in cases where there is a need to decide whether compassionate airfares can apply to customers whose relatives are affected by a traumatic event. In this example, fair judgment is

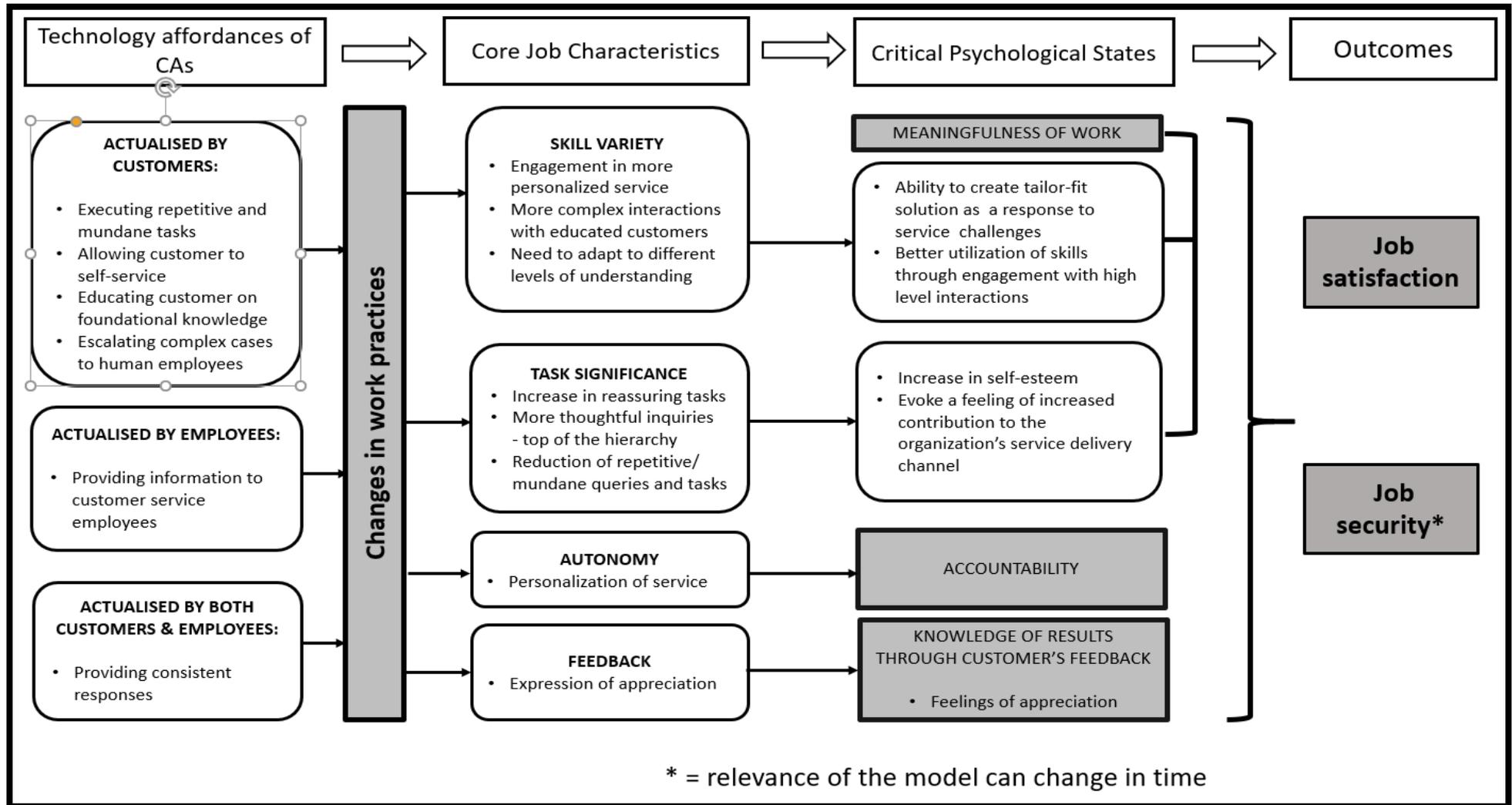


Figure 5. The Extended Job Characteristics Model

required in assessing a situation whilst staying sensitive to the emotions of the customers (Lui & Lamb, 2018; Wirtz et al., 2018). Because of these changes, customer service employees feel that their role in the call centre is far more than just answering queries and performing simple transactions but sometimes extends to other roles such as a ‘counsellor’ who can express ‘sympathy’ towards customers to make them feel better. This is contrary to Huang and Rust (2018), who claimed that call centre tasks are usually repetitive, standardised, and transactional. In the data, I found that customer service employees engaged in complex interactions that required judgment and emotional intelligence (Lui & Lamb, 2018; Wirtz et al., 2018). Their experience at work after the CA’s implementation allowed them to better utilise a variety of skills through the creation of personalised approaches to service challenges and complex interactions. This suggests that the employee is put in a critical psychological state that promotes a sense of meaning to their job (Hackman & Oldham, 1975; Spector, 1997). This implication means that when an employee is able to utilise all of his or her skills and can come up with a unique and effective solution, it makes the job feel more valuable and worthwhile (Hackman & Oldham, 1976). Thus, an employee experiences meaningfulness of work (Hackman & Oldham, 1975; Hackman & Oldham, 1976).

Besides skill variety, the implementation of CAs also affects the task significance of customer service employees. The concept of task significance is evident in situations where there is an ‘increase in reassuring tasks’, when employees receive ‘more thoughtful enquiries’, and where ‘repetitive and mundane tasks are reduced’. The mentioned changes places human service employees at the top of the hierarchy in the escalation process that makes them feel that their role is significant. In the findings section, one of the participants explained the hierarchy of escalation. The enquiry started off by CAs attending to the customer enquiry. Then the CAs assessed the nature of enquiry and identified that it was outside their knowledge base. The CAs then prompted the customer

to select an option to chat with a human live agent classifying a transaction as 'more thoughtful' and not repetitive. By this point, the human chat agent could either resolve the case or if more time was needed to further address the query, the case would then be escalated to the hotline team where they can call the customer back to fully resolve the query. These scenarios, when enquiries are more thoughtful and require human expertise suggest that an employee is placed in a critical psychological state that increases their self-esteem and self-worth. This may be due to the perceived contributions they make that can significantly affect other people, i.e., customers (Hackman & Oldham, 1976; Spector, 1997).

An additional consideration is, when a customer goes online to perform a transaction via self-help, that there are instances where customers do not trust the process of how the transaction was performed online or do not fully grasp the response given by the CA. In these scenarios, customers usually call the hotline. Thus, the prevailing need to speak with a human despite the presence of alternative options available for customer implies a raise in the employees' self-esteem and an increase in their task significance (Hackman & Oldham, 1975; Spector, 1997). This adds more meaning to customer service employees' work through the realised contribution they make for the organisation.

Besides skill variety and task significance, the study implies that customer service employees' autonomy was also affected by the implementation of the CA. Autonomy is manifested in situations where employees can identify and choose an approach in responding to the service challenges encountered in the job. In the data, autonomy is achieved when customer service employees can personalise their services. Services are personalised if cases are more complex to resolve such as providing solutions in the event of flight disruptions when several factors are taken into account. Customer service employees are now more engaged in the personalisation of services due to the reduction of the repetitive nature of tasks and the CAs' ability to escalate complex cases to human

employees. This means that they are empowered to identify and choose the most suitable approach in responding to a challenge. Therefore, employees can decide how to solve customer enquiries (Hackman & Oldham, 1975; Spector, 1997) and act accordingly. These changes in their job characteristics suggest a positive influence to employees' critical psychological state and makes them feel more responsible (Hackman & Oldham, 1975; Spector, 1997) for the actions they choose to perform.

The final core job characteristic is feedback. In this study however, feedback is exemplified through the positive remarks from customers to the customer service employees and not from their immediate superiors. Customers often extend words of appreciation or express their happiness whenever an employee manages to resolve a complex case that CAs were unable to handle. Each time an appreciative remark is received, this feeling is reciprocated by employees, because customers' recognition of the valuable services that employees provide implies an enhancement of employees' motivation and job satisfaction. Therefore, this puts employees in a critical psychological state that allows them to know if they are performing effectively in their role which hints at an increase in their job satisfaction (Hackman & Oldham, 1975; Spector, 1997) and motivation, thus influencing their overall well-being.

Finally, the JCM proposes that the three critical psychological states of meaningfulness of work, accountability, and knowledge of actual results of work activity (Hackman & Oldham, 1975; Spector, 1997) lead to positive work outcomes including higher job satisfaction. In this study, I propose that the implementation of CAs has a positive influence on customer service employees' job satisfaction (Cavanaugh et al., 2000; Fried & Ferris, 1987; Spector, 1997) and job security through the process illustrated in the extended JCM model (see Fig. 5). The extended model explains how the implementation of CAs influences job satisfaction and job security of customer service employees through: (1) A process of actualisation of CAs' technology affordances

(Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014); that relates to, (2) changes in work practices (Pozzi et al., 2014); which potentially, in turn, (3) influences the job characteristics of the customer service employees; and, (4) hints at placing them into critical psychological states (Hackman & Oldham, 1975); which suggests, (5) employees feel satisfied in their jobs (Cavanaugh et al., 2000; Fried & Ferris, 1987; Hackman & Oldham, 1975; Spector, 1997) and increased their sense of job security (George, 2003). Hackman and Oldham's (1975) JCM is a good starting point that provides a foundation to better interpret the relationship among the research findings, job satisfaction and job security. Thereby, I extended the JCM by explaining how the job characteristics are influenced by changes in work practices derived from the actualisation of the technology affordances. Additionally, job security is added in the model. Therefore, I propose an extended JCM in order to fully understand how CAs influence job satisfaction and job security of customer service employees that can be tested and validated using a quantitative approach.

5.3. Reflections

This section illustrates the differentiation between two concepts: (1) first is the comparison of the impact between ICT's and CAs' adoption on work practices; and, (2) second is the differences between the original JCM and the extended JCM developed here.

Similar to ICT's impact on work practices, our findings show that employees display 'smart working' (Barnes, 2012) through actualisation of 'providing information to customer service employees. Employees use the CA to gain updated information fast in order to increase efficiency at work and produce quality service through the provision of updated and accurate information to customers (Bassett, 2018; Kirkpatrick, 2017; Xu et al., 2017). Another similarity shared both by ICT and CAs' impact on work is the redefined communication and information flow (Barnes, 2012). Due to CA's ability to

share and disseminate information fast, customers become more knowledgeable as they can easily access the updated information by chatting with a CA as an alternate option. This reduces the repetitive tasks of customer service employees. The final similarity found between ICT and CA's impact on work is the need of human intervention (Wang et al., 2013) on occasions where tasks become complex. In CAs' context, the similitude is exemplified in the actualisation of 'escalating complex cases to humans'. Therefore, it is safe to say that both ICT and CAs adoption produce parallel influence on work practices. CAs are considered as an alternate channel to produce the same objectives at work but slightly differ in the ease of use with respect to information retrieval. The CA in the study is more effective and accurate in finding the information compared to the use of traditional knowledge base software.

The second concept relates to the distinction between the original JCM and the extended JCM. The first difference is the absence of the core job characteristic of task identity. The data gathered from customer service employees at the airline company in this study did not show any link to task identity. One reason could be that the nature of customer service is enquiry based where customers are attended from the first request until the final resolution but may involve multiple actors in the process of completion. This also didn't change after the implementation of the CA. Thus, I did not observe task identity as a result of the implementation of CAs in the data. Secondly, job security was taken to be separate and distinct from job satisfaction as both were equally important outcome variables that could have changed after the implementation of CAs (Probst, 2003) In addition, I have marked job security with an asterisk to indicate that its inclusion as a separate outcome may change in time that can affect the overall relevance of the model. This is due to the rate of advancements in CAs technology (Baier et al., 2018; Huang & Rust, 2018; Kietzmann et al., 2018; Levy, 2018) that may affect the existence of other affordances relating to the ability to handle complex tasks. Thus, I agree that job

security is indeed unique in its own right due to its distinctive nature and consequences that deserves further exploration (Probst, 2003).

5.4. Theoretical contributions

The study contributes to the theoretical body of knowledge in four ways. First, the study contributes to the literature on human-computer interaction by providing empirical data on CAs' impact on the human service workforce using actual employees' perspectives and experiences working alongside CAs. Since this is an under-explored research area, the findings of the study led me to see how the implementation of CAs had a positive influence on the customer service employees' job satisfaction and job security. This finding was contrary to the negative effects found in other conceptual research in the literature on CAs' impact on the human workforce.

Second, the study identified technology affordances of CAs in the airline industry that positively influenced the work practices of customer service employees therefore, supporting the human-AI collaboration (Bassett, 2018; Chong, 2017; Jarrahi, 2018). Overall, six CA affordances were found and these are: 'executing repetitive and mundane tasks', 'allowing customer to self-service', 'educating customer on foundational knowledge', 'escalating complex cases to human employees', 'providing information to customer service employees', and 'providing consistent responses'. They were all observed as antecedents of job satisfaction and job security that were both positively influenced.

Third, the study contributes to the body of knowledge by extending the JCM. The extended JCM Model (see Fig. 5) explains how job characteristics are influenced by the actualisation of the six CAs' affordances (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014), which suggests a change in the employees' work practices (Pozzi et al., 2014) positively. Thus, the extended model provides a framework of how technology such as CAs can positively relate to work outcomes of individuals, or an organisation,

(Strong et al., 2014) such as job satisfaction and job security through the realisation (Pozzi et al., 2014) and actualisation (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) of technology affordances.

Fourth, the extended JCM added job security as a work outcome that is a relevant concept of job design in the digital age. The findings of the study suggest emphasising on job security in examining the overall work outcomes of the human workforce rather than considering it as only a facet of job satisfaction (Probst, 2003). Job security is clearly an important aspect due to changing customer interactions with front-line employees and businesses. Thus, job security deserves equal importance in re-designing the job to keep up with changes in these interactions (Keyser et al., 2019) and strike a balance between threat of technology advances (Bolton et al., 2018; Brougham & Haar, 2017; Huang & Rust, 2018; Levy, 2018; Makridakis, 2017; Sousa & Rocha, 2019; Wirtz et al., 2018) the threat of technology advances (Bolton et al., 2018; Brougham & Haar, 2017; Huang & Rust, 2018; Levy, 2018; Makridakis, 2017; Sousa & Rocha, 2019; Wirtz et al., 2018) and potential affordances of technology (Bernhard, et al., 2014; Majchrzak & Markus, 2012; Markus & Silver, 2008; Pozzi, Pigni, & Vitari, 2014; Savoli & Barki, 2013; Stoeckli, et al., 2017; Strong et al., 2014).

5.5. Practical implications

I outline four contributions of the study, at progressively micro- through macro-levels. These levels range from employee, management, organisation, and to other industry levels.

For the employee level, the findings show that implementation of CAs augments employee capabilities (Bassett, 2018; Chong, 2017; Jarrahi, 2018) through realising and actualising the CA affordances (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014). Whilst some of the earlier conceptual work showed no clear view on CAs' impact

on the service workforce and mostly predicted negative effects, the study predominantly showed all positive influence of CAs to the human service workforce.

For the management level, the changes in work practices identified in the study provide a core idea on how managers can further enhance their employees' skills. For example, management can work on enhancing front-line employees' relationship-building capabilities. This can be achieved by shifting the focus from knowledge building to emotion management and critical thinking skills since customers are becoming more educated. It can elevate the customer experience by making more memorable and meaningful interactions with customers (Bolton et al., 2018) that can, in turn, foster favourable organisational outcomes (Strong et al., 2014). In addition, the actualised affordance of providing information to customer service employees can open potential integration of the CA system to the Knowledge Management System (KMS) and Training and Development unit (Wirtz et al., 2018). By doing so, other potential CA affordances can be realised that might improve both psychological and behavioural outcomes (Fried & Ferris, 1987) such as motivation and work performance, respectively. Therefore, despite the absence of the management's perspective in this study, the findings are considerably important as managers control the work practices of their employees.

For the organisation level, several contributions are proposed. Firstly, the extended JCM can potentially serve as a foundation for Human Resources in deriving job design principles applicable to roles in customer service of the digital age. Understanding the changes brought by the CA affordances and the relevance of job security as a work outcome can ultimately help to identify key concepts of job design in customer service. In the process, it could identify the relevant attribute of work and relevant skills in the service industry to keep up with the changing customer base and the way customers interact with business entities. Secondly, CAs' implementation initiated the formation of new roles, thus creating new jobs within the organisation located onshore. This is similar

to Swanson's (2018) prediction that CAs' adoption can initiate restructuring of roles and processes. In the study, the digital team that consists of human chat agents was formed to support the CA by taking up enquiries that were more complex to handle. Some of them were originally from the hotline team. Contrary to the forecasts of other futurists and scholars that CAs will replace customer service employees (Huang & Rust, 2018; Makridakis, 2017), my data supports human-CA collaboration (Bassett, 2018; Chong, 2017; Jarrahi, 2018) in the service sector as it made employees feel secure about the continuity of their jobs. The findings however, do not reflect the impact of jobs on the outsourced channel of the organisation as the sample used in the study were all in-house customer service agents. Despite this, the positive influence of CA affordances to the changes in the organisation does question the relevance of outsourcing the service channel and whether it remains a key strategy in gaining competitive advantage (Swanson, 2018). Thirdly, the findings show how strong the CA is in terms of knowledge sharing (Chakrabarti & Luger, 2015) through the actualised affordances of 'educating customer on foundational knowledge' and 'providing information to customer service employees'. Therefore, the organisation can integrate the use of CAs as part of their communication strategy. CAs can be deployed in any form of internal communication between varying departments of the organisation as per the decision of the upper management.

Finally, the last implication of the study talks about the CAs' design. The 'increase in reassuring tasks' as an identified change in the work practices implies a weakness to achieving the CAs' design goals. As discussed in the literature review section, Gnewuch et al. (2017) included the elements of assurance and empathy as two of the five service quality dimensions (Parasuraman et al., 1985, 1988, in press) in improving the quality of service. The CAs' inability to fully respond to the emotional need of a customer, and reassure them, leads the CAs to escalate the case to human service employees. This suggests that more improvements are needed to achieve these two quality dimensions.

For other organisation and industry levels, the positive changes brought by CA affordances to customer service employees' work practices identified in the study and the proposed JCM may encourage other organisations and industries to adopt CAs. They can design and implement CAs with features suitable for the needs of their service operation and possibly achieve greater organisational goals (Pozzi et al., 2014; Savoli & Barki, 2013). As for other industries who have adopted CAs such as financial services, e-commerce, recruitment, health and legal services, the findings show the need for customers to obtain reassurance from human employees in all of their transactions. The trust in the system, and CAs, is still particularly weak for some users therefore, improving the assurance dimension in the CAs' design (Gnewuch et al., 2017) will benefit the financial, e-commerce and recruitment sectors. Similarly, the empathetic dimension (Bickmore et al., 2005; McLean & Osei-Frimpong, 2017) of CAs in our sample was not visible signalling another weakness of the CA. This means that health and legal services may consider refining this dimension in the design of their CAs as the nature of their tasks involves dealing with users who are more emotional compared to others.

Chapter 6. Conclusion

This study presents a fine-grained view of CAs' impact on customer service employees by examining the experiences of human service employees working alongside the technology. The data comprise eight semi-structured interviews conducted with customer service employees working alongside the CA. Analysis of the data identified six technology affordances of CAs. These actualised affordances influence the work practices of customer service employees which, in turn, influence the job characteristics of the customer service employees, and affect their psychological states that leads to a positive effect on job satisfaction and job security. An extended model of JCM is proposed that exhibits the process of how CAs affect job satisfaction and job security of customer service employees.

6.1. Limitations

This study has certain limitations that need to be acknowledged. Firstly, due to the short timeframe available to complete the study, only eight participants were able to be recruited. This is a small sample size even for qualitative data to ensure that data saturation is reached (Guest, Bunce & Johnson, 2006). Despite my efforts to increase the sample size after conducting the first eight interviews, they remained futile due to the challenge in obtaining access to employees from other organisations I approached. Although the research sampling involves *voluntary* participation of front-line employees, I need to respect the participant's *vulnerability* to assure that no form of harm (Gray, 2018) should come to them as result of participating in the study. To ensure this, a separate copy of the interview guideline was sent to the key contact and an employer permission to access form was warranted for the key contact to sign (see Appendix C). The employer permission to access employees form served as a guarantee from the employer that no adverse effect shall apply to their employees as a result of participating

in the interview. This additional step of acquiring employer's permission to access the employees could have caused the delay in obtaining approval or decline in allowing access to potential interviewees of the organisation. This could be due to the perceived sensitivity and risk in answering some of the questions about job security after the CAs implementation. As a result, my objective to increase the sample size became a challenge.

Secondly, the focus of the study was on one customer service team in one company. The team comprised in-house customer service employees in a call centre team and did not include other channels such as live-chat agents and outsourced locations. Therefore, I could only explore the effects of the implementation of CAs for employees in this onshore team. The findings may not be applicable to other customer service employees, offshore employees, or other industries.

Thirdly, the study focused on employees working with CAs and thus, did not include interviews with managers overseeing the CA implementation process. Such additional interviews could have provided further insights, particularly on unexpected impacts of using CAs. We suggest that managers are interviewed in future research on CA's use.

Fourth, we were unable to get any information on the impact of the implementation of the CA on the number of incoming calls and therefore the workload of the customer service employees. In spite of the identified changes in the work practices post-CAs' implementation, the findings of the study are unable to ascertain an increase or decrease in the total workload of customer service employees.

Fifth, not all participants indicated positive effects of CA affordances on job satisfaction and job security, but rather had a neutral stance towards these variables. Notably, no participant reported about negative effects of CAs impact on job satisfaction

and job security. The cause of the neutral position for some of the employees can be an area of interest to explore in the future.

Lastly, a criticism may be levelled at my use of affordances to explain how CAs are used by customers and human service employees. Gibson's (1977) views of affordances in ecological psychology explains the possibility of actions of humans and animals with an object or environment in a situation. This theory has been taking up in the information systems literature following the seminal work of Bernhard et al., (2013); Glowalla et al., (2014), Majchrzak and Markus (2012), Markus and Silver (2008), Pozzi, et al., (2014), Savoli and Barki (2013), Stoeckli et al., (2017) and Strong et al., (2014) to explain the relationship between a user and an IT artifact. However, an alternative view is that these are functionalities or uses of technology rather than affordances (Leidner, Gonzalez, & Koch, 2018). Leidner et al., (2018) argued that research on IS affordance failed to clearly differentiate affordances from "features, use and action" (p.119). This argument would mean that the technology affordance theory is unfit to combine with the concept of JCM therefore affecting the stability of the findings. This could be explored in future research by testing the extended JCM using the concept of technology use rather than technology affordances.

6.2. Future research

The study offers various opportunities for future research. First, scholars can apply quantitative methods to test the extended JCM. Such methods can assess the validity of each affordance to its corresponding changes in the work practices. It can examine the significance of relationships between the identified changes in work practices and job characteristics. The quantitative approach can also show if the changes in job characteristics and psychological states have a significant effect on job security. Using a longitudinal study, it can expand on how the changes in work practices predict job characteristics and psychological states over time.

Second, scholars could use other theoretical frameworks such as the Job-Demand Resource (JD-R) model by Bakker and Demerouti (2007) to explain how CAs' implementation might affect job security and job satisfaction. This can identify a potential relationship between changes in work practices to other attributes impacting employees' well-being.

Third, future researchers can explore if the concept of the extended JCM proposed in this study holds true for other technologies or in another context. By doing so, the study can potentially identify other affordances that can lead to changes in work practices and identify other work outcomes such as performance and motivation. Relatedly, scholars can adapt the framework and use the concept of technology features instead of technology affordances and determine if they produce similar changes in work practices that relates to the concept of the JCM.

Fourth, qualitative researchers can also examine the CAs that use voice to communicate (Gnewuch et al., 2017). They can also explore differences in affordances between types of CAs such as voice versus chat-based CAs in both single and multiple contexts. Alongside this, it will be interesting to know if visual anthropomorphism of CAs can realise and actualise unique types of affordances to employees.

Fifth, given the less explored nature of job security as a facet of job satisfaction (Nagy, 2002), qualitative researchers can conduct further studies about IT diffusion's impact to employees' work outcomes. This can strengthen or weaken the study's argument that job security should be treated separate from the concept of job satisfaction.

Sixth, scholars can explore how affordances can be realised by employees working alongside a technology that produces common results such as relationship of CAs and customer service employees. They can also examine variables on why affordances are not realised and actualised if both subjects (IT artefact and employee) are working within the same functional unit of the organisation. By doing so, they can provide

a theoretical framework that explains neutral stance of employees about the impact of CAs on job satisfaction and job security that was cited as one of the limitations of the study.

And finally, future studies can explore the concept of CA affordances focusing on the perspectives of customers. Examples include exploring how customers perceive CAs' affordances and which of these affordances they actualise.

6.3. Conclusion

The study clearly illustrates how CAs impact the customer service employees. Despite the evidence on restructuring of roles and changes in the work practices (Swanson, 2018), the adoption of CAs has positive influence on customer service employees' work practices, job satisfaction and job security. The realised and actualised CAs' affordances (Bernhard et al., 2013; Pozzi et al., 2014; Strong et al., 2014) indeed shows how critical it is "to consider all voices" (Callaghan, 2018, p. 102) to fully understand how customer service employees feel about the stability of their employment and their job satisfaction working alongside CAs. Therefore, I partly agree with Callaghan's (2018) standpoint that the impact of CAs on customer service depends on an individual's perception of CAs. This is where affordances can be realised and potentially actualised that will ultimately lead to a world where humans and CAs can collaborate with one another.

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Glossary

artificial intelligence A concept that demonstrates machine intelligence that mimics the natural intelligence of humans and other animals to achieve complex goals.

avatars – a photographic representation of humans deployed on websites or online platforms in a chat environment.

conversational agents An umbrella term of all types of conversational intelligent systems (chatbot, avatars, embodied conversational agents, virtual assistants etc.) that use natural language technologies (e.g. Natural language processing) to perform service tasks using knowledge-based approach.

chatbots A type of a conversational agent that conducts an online conversation mostly in text mode.

digital or virtual assistants A type of conversational agent that conducts conversation and relies on spoken input.

embodied conversational agents A CA type that displays anthropomorphism. They have the ability to engage to users real-time, engage in a dialogue using speech, gesture, intonation, gaze, posture, intonation, and other verbal and non-verbal channels. The goal is to emulate the experience of human face-to-face interaction.

intelligent personal assistant A CA type that that carries professional, administrative tasks, and provides technical and social assistance to human users by automating and making up the day-to-day activities easier.

machine learning A study of algorithms that learn and improve through experience, and as such is a fundamental concept of AI. This is a type of algorithm that allows a machine to teach itself based on user experience. This distinct feature of ML enables to make predictive analysis based on the patterns in a wide range of data.

natural language processing A process of understanding how texts, speeches and similar materials are used by computerized systems and how they are operated on computers.

robotic process automation A technology that replicates humans in tackling the use of one or multiple unrelated software in order to execute autonomous transactions, processes, and activities. The goal is to be cost-efficient and execute tasks in a swift manner.

self-service technology A type of technology that allows customers to perform service or tasks without the aid of human employees.

Appendices

Appendix A – Interview Guideline



Interview guideline: Employees

Before we begin, I would like to thank you for participating in this interview with me today. Despite your busy schedule, you have allocated your time for this session and because of that, I am truly grateful. In the next 60 minutes, I will be asking questions about a) your perceptions of conversational agents before and after the implementation b) changes that you observed in your work processes and practices after the implementation of conversational agents, and c) how does the implementation of the CA affect your job satisfaction and your views on your job security. When I am asking questions about conversational agents, I refer to chatbots or digital assistants that interact through text, voice chat and/or video using natural language processing.

As indicated in the Participants Information Sheet, I would like to record this interview. Do you agree with this? Please note that all the information you provide is used for research and teaching purposes only and that your personal data like your name will be pseudonymized.

If you have any questions now or during the interview, please feel free to ask anytime.

1. Personal and professional background
 - a. Can you tell me more about yourself? (age, origin, academic qualification, tenure in the company and in the current role current role)
 - b. How would you describe your professional role?
 - c. What are the things you like and dislike about your role and responsibilities that affect your job satisfaction?
2. Human service employees' attitude towards conversational agents (pre-implementation)
 - a. How did you feel when you learned that your company is implementing conversational agents?
 - b. What was your attitude towards conversational agents before the implementation?
 - c. What were your expectations towards a conversational agent before implementation?
3. Work-related changes due to the adoption of conversational agents
 - a. Could you describe the tasks that you were mainly executing before the implementation of CAs? Has there been a change in tasks since CA was implemented? Did stop doing some tasks? Did you get new tasks? Which tasks did the CA took over?
 - b. Have you observed any changes in your role and responsibilities, your work practices, or performance evaluation after CAs were implemented? Can you tell me more about it (if applicable)?
 - c. Did you have any overlapping of tasks that are both supported by you and the CAs? Did it somehow lead to any confusion in your role and responsibilities?
 - d. Have you observed changes in your interactions with your customers when CAs were implemented? If yes... can you share some examples?
 - e. Are you able to assess if the implementation of CAs made your job easier or more made it more challenging? If yes, in what areas does it make easier or challenging?

4. Views on Job satisfaction after the implementation of CAs
 - a. Reflecting upon your job satisfaction, how satisfied were you before and after the implementation of the conversational agent?
 - b. Did the implementation of the CA affect the way customers are interacting with you? If yes, how? Why do you think did these changes occur? Does the way / the changed way they are interacting with you affect your job satisfaction?
 - c. Overall, did the implementation of CAs impacted your job satisfaction? And why?
 - d. Finally, could you give me 2 or 3 reasons why your job satisfaction increased, decreased or remained the same after the implementation of the CA?

5. Human service employees' attitude of CA post-implementation and Job security
 - a. Were your expectations correct after the implementation of conversational agents? How do you feel about it now?
 - b. How is your attitude towards CAs after the implementation? Do you see them as a tool to help you in your job or do you see them as a separate actor that has a persona or something completely different? Can you explain why you see them like that?
 - c. There are a lot of headlines that robots or AI can take over our jobs whilst other sources say that it will support employees and augment human capabilities – what is your stance on that? How do you feel about job security considering the implementation of the CA at your workplace? Why do you feel that way?
 - d. What recommendations would you give your organisation on what to improve with regards to the Conversational agent?

Appendix B – Participant Information Sheet



Participant Information Sheet

Date Information Sheet Produced:

29 January 2019

Project Title

Impact of conversational agents on customer service employees

An Invitation

Warm greetings!

My name is Arlene H. Ugale and I am a student at Auckland University of Technology (AUT) in New Zealand pursuing a Master of Business. I would like to invite you to participate in a research project that aims to explore the perceptions of customer service employees toward conversational agents. Conversational agents such as chatbots and digital assistants is an AI-driven software that uses natural language processing which allows simulating a human to human conversation making it capable to perform customer service tasks.

As the company you are working for has a fully operational conversational agent deployed to work with or alongside human customer service representatives to perform customer service tasks, I would like to invite you for an interview to gain your insights and perceptions on conversational agents. I am very interested to learn how you see this AI-driven technology as part of your company's service workforce and understand its effects on your work processes or practices, your role in the company, your satisfaction as an employee and your job security. Therefore, I would like to invite you to an interview to learn about your experiences.

The interview will take approximately 60 minutes and will be conducted face-to-face or Skype on a date and time of your convenience. Please be assured that your participation is voluntary and is based on informed consent. You can withdraw at any time from participating if you deem necessary prior to the completion of data collection stage. The findings of the study might be used for teaching purposes and published in academic and non-academic outlets in pseudonymized form.

What is the purpose of this research?

The aim of this study is to understand the impact of conversational agents on human service employees from the perspective of human customer service agents based on their actual experiences working alongside intelligent software applications. I would like to learn about your perspectives on CAs and whether you see and treat them as a colleague or simply a tool to help you with your work. In addition, I want to investigate the potential benefits or threats that CAs can bring to your current work affecting your job satisfaction and job security.

The findings of this study will help me illustrate the impact of CAs on human service employees and ascertain if the technology is a threat or an enrichment to human capabilities. Furthermore, the data may also be used to generate academic and non-academic articles in the future that will be published in pseudonymized form to protect your privacy. The goal is to publish the findings from this study in an academic article. The data might also be used in a future comparative study which will be published in another academic article.

How was I identified and why am I being invited to participate in this research?

An informal request letter for an informational interview was sent to my main contact working in your organization. My main contact forwarded the request letter to the key contact in your organization. I coordinated with the key contact by sending the copies of the invitation email, the interview guideline, the

consent form and this participants information sheet for the further evaluation. As the objective of the research is to understand the impact of conversational agents on human service employees, interviews should be conducted with service employees who are working with or alongside a conversational agent. In addition, the participants should have been part of the customer service division before and after the implementation of the technology. As you fulfil these requirements you have been identified by the key contact in your organization who distributed this Participants information sheet to you together with the invitation email and the consent form.

How do I agree to participate in this research?

Your participation in this research is voluntary. It is your choice whether or not you choose to participate in the study and your decision will neither advantage nor disadvantage you.

Should you wish to participate in the study, you can contact me, Arlene Ugale by email (xdd5289@autuni.ac.nz). I will respond to arrange a mutually convenient date, time and place of interview. In addition, you will be requested to complete and sign the consent form previously sent by email. Please return the completed and signed consent form personally or by email before the start of the interview

If you have any questions, please feel free to call me on my mobile at 022 5085457.

What will happen in this research?

If you decide to take part in the research project, you will be asked to participate in a face-to-face interview that will take approximately 60 minutes at a time and location that is mutually agreed. We can also conduct the interview via Skype. Notes will be taken during the interview and if you agree, the interview will be audio-taped and transcribed. The audio files will be transcribed using an online transcription software. The interviews will be self-transcribed (by the applicant) and auto-transcribed (by a natural language processing algorithm).

Topics of discussion will be a) your perceptions of conversational agents as part of your company's service workforce, b) changes that you observed in your work processes and practices after the implementation of conversational agents, and c) how the adoption of conversational agents affects your job satisfaction and job security.

The findings derived from the research can be made available to you should you opt-in to request for it in the consent form. If you desire, I can make the master thesis and any published articles available to you.

What are the benefits?

The benefit of this research is to discuss how you perceive conversational agents as part of your customer service workforce and how the adoption of this technology affected your work practices, your job security and overall job satisfaction. Through the collated pseudonymized feedback, I can help illustrate how conversational agents affect the human service employees by providing empirical evidence that is lacking in this field of study. I can also give insights on how to improve the integration of CAs in the workforce in order to enhance the work processes and practices of employees which might positively affect their job satisfaction.

On a personal level, the data collected from this research project will form the basis of a dissertation required for the Master of Business (MSc) qualification at AUT.

How will my privacy be protected?

All the information you provide will be used for research and teaching purposes only. Only I and my research supervisors [Dr Lena Waizenegger](#) and [Dr Helena Cooper-Thomas](#) will have access to the data. The data of this current study might be used for the development of academic and non-academic articles as well as in a comparative study where the findings of this study will be compared with a follow-up study with a similar focus. The findings of this comparison will be published in academic outlets.

To protect your confidentiality, we refrain from using your real names and organizations in the transcriptions, master thesis and publications. By default, pseudonyms will be used unless you and your organization decide to be named.

The data gathered from the interview will be stored securely and the consent forms will be kept in a separate location to avoid the association of data with specific individuals. However, the confidentiality might be reduced as the pool of potential participants is small in size hence, the possibility of potential candidates to know each other. Moreover, if you choose to be interviewed within the premises of your organization, confidentiality might be impacted.

Please feel free to ask me anytime should you have any questions or concerns about the interview. I will be happy to help.

What opportunity do I have to consider this invitation?

Please respond to this invitation within two weeks so that we can schedule the interview at a time and date of your convenience. The interview can take place via Skype or at the premises of your organizations, at a café nearby or at AUT premises.

Will I receive feedback on the results of this research?

An opportunity to review your transcript prior to the data analysis will be given to you if requested. Once the research project is completed, a feedback presentation on the summary of the most important findings will be shared with you if you indicate your interest in receiving them on the consent form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Lena Waizenegger, lana.waizenegger@aut.ac.nz, +64 (09) 921 9999 – ext: 5711

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Arlene H. Ugale
xdd5289@autuni.ac.nz
 Master of Business Student, Faculty of Business
 AUT University
 55 Wellesley Street East
 Auckland, 2010
 New Zealand
 +64 (22) 5085457

Project Supervisor Contact Details:

Lecturer Dr Lena Waizenegger, Department of Business Information System, Auckland University of Technology, +64 (09) 9219999 or lana.waizenegger@aut.ac.nz

Professor Helena Cooper-Thomas, Associate Dean (Research), Auckland University of Technology, helena.cooper.thomas@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 15 February 2019, AUTEK Reference number 19/31

Appendix C – Employer Permission to Access Form



Employer Permission to Access Form

Project title: **Impact of conversational agents on customer service employees**

Project Supervisor: **Dr. Lena Waizenegger**

Dr. Helena Cooper-Thomas

Researcher: **Arlene H. Ugale**

- I have read and understood the information provided about this research project in the Information Sheet dated 29 January 2019.
- I have had an opportunity to ask questions and to have them answered.
- I fully support this research and agree to give access to my employees. My permission will give them the opportunity to voluntarily participate in the research.
- I understand that only customer service employees who worked with or alongside a conversational agent within the customer service department will be eligible to participate. Furthermore, the employees should be in the customer service role before and after the implementation of the conversational agents.
- I understand that the employees' participation in the study is voluntary and agree that there will be no adverse effects to them as a result of whether they take part or not.
- I understand that my employees participating in the research can withdraw at any time prior to the completion of the data collection stage without having to provide a reason for it.
- I understand that the findings of this research project might be used for teaching purposes and might be published in an academic and non-academic outlets using pseudonyms. The data might also be used in a future comparative study which will be published in another academic article.
- I wish to receive a summary of the research findings (please tick one): Yes No

Signature:

Name:

Organization Presented :

Job Designation :



Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 15 February 2019 AUTEK Reference number 19/31

Note: The Participant should retain a copy of this form.

Appendix D – Employer Information Sheet



Employer Information Sheet

Date Information Sheet Produced:

29 January 2019

Project Title

Impact of conversational agents on customer service employees

An Invitation

Warm greetings!

My name is Arlene H. Ugale and I am a student at Auckland University of Technology (AUT) in New Zealand pursuing a Master of Business. I would like to invite your employees to participate in a research project that aims to explore the perceptions of customer service employees toward conversational agents. Conversational agents such as chatbots and digital assistants is an AI-driven software that uses natural language processing which allows simulating a human to human conversation making it capable to perform customer service tasks.

As your company has a fully operational conversational agent deployed to work with or alongside human customer service representatives to perform customer service tasks, I would like to ask if you are willing to allow your customer service representatives to be invited for an interview. The interview seeks to gain your employees' insights and perceptions on conversational agents, to learn how they see this AI-driven technology as part of your company's service workforce and understand its effects on their work processes or practices, their role in the company, their job satisfaction, and their job security.

The interview will take approximately 60 minutes and will be conducted face-to-face or on Skype on a date and time of their convenience. Please be assured that your employees' participation is voluntary and is based on informed consent. Your company and your employees can withdraw at any time from participating if you deem necessary prior to the completion of the data collection stage. The findings of the study might be used for teaching purposes and published in academic and non-academic outlets in pseudonymized form.

What is the purpose of this research?

The aim of this study is to understand the impact of conversational agents on human service employees from the perspective of human customer service agents based on their actual experiences working alongside intelligent software applications. I would like to learn about your employees' perspectives on CAs and whether they see and treat them as a colleague or simply a tool to help them with their work. In addition, I want to investigate the potential benefits or threats that CAs can bring to their current work affecting their job satisfaction and job security.

The findings of this study will help me illustrate the impact of CAs on human service employees and ascertain if the technology is a threat or an enrichment to human capabilities. Furthermore, the data may also be used to generate academic and non-academic articles in the future that will be published in pseudonymized form to protect your privacy. The goal is to publish the findings from this study in an academic article. The data might also be used in a future comparative study which will be published in another academic article.

How was I identified and why am I being invited to participate in this research?

Your company has implemented a fully operational conversational agent. Therefore, your company is deemed to have eligible participants for this research. An informal request letter for an informational interview was sent to my main contact working in your organization who identified you as a key contact in the company. The research requires participants that work with or alongside a conversational agent. The employee should be in the customer service role before and after the implementation of the conversational agents. Therefore, I would appreciate it a lot if you could forward the invitation letter, the Participant information sheet and the consent form to employees that fulfil these requirements.

How do I agree to participate in this research?

Your employee's participation in this research is voluntary. It is also your choice whether you will allow access to your customer service employees that can voluntarily participate in the study.

If you are willing to allow your employees to participate in the research, please complete the attached employer permission to access form. Thereafter, I will forward the participant's information sheet, consent form and a formal invitation email to be sent to the eligible participants. Your employees will be given two weeks to respond to the invitation and are instructed to contact me if they wish to take part in the study.

If you have any questions, please feel free to call me on my mobile at 022 5085457 or send me an email at xdd5289@autuni.ac.nz.

What will happen in this research?

If you decide to allow your employees to take part in the research project, they will be asked to participate in a face-to-face interview that will take approximately 60 minutes at a time and location that is mutually agreed. We can also conduct the interview via Skype. Notes will be taken during the interview and if they agree, the interview will be audio-taped and transcribed. The audio files will be transcribed using an online transcription software. The interviews will be self-transcribed (by the applicant) and auto-transcribed (by a natural language processing algorithm).

Topics of discussion will be a) customer service employees' perceptions of conversational agents as part of their company's service workforce, b) changes that they observed in your work processes and practices after the implementation of conversational agents, and c) how the adoption of conversational agents affects their job satisfaction and job security.

The findings derived from the research can be made available to your company should you opt-in to request for it in the employer permission to access form. If you desire, I can make the master thesis and any published articles available to you.

What are the benefits?

The benefit of this research is to discuss how your employees perceive conversational agents as part of their customer service workforce and how the adoption of this technology affected their work practices, their job security and their overall job satisfaction. Through the collated pseudonymized feedback, I can help illustrate how conversational agents affect the human service employees by providing empirical evidence that is lacking in this field of study. I can also give insights on how to improve the integration of CAs in the workforce in order to enhance the work processes and practices of employees which might positively affect their job satisfaction.

On a personal level, the data collected from this research project will form the basis of a dissertation required for the Master of Business (MSc) qualification at AUT.

How will my privacy be protected?

All the information gathered from your employees will be used for research and teaching purposes only. Only I and my research supervisors Dr Lena Waizenegger and Dr Helena Cooper-Thomas will have access to the data. The data of this current study might be used for the development of academic and non-academic articles as well

as in a comparative study where the findings of this study will be compared with a follow-up study with a similar focus. The findings of this comparison will be published in academic outlets.

To protect your confidentiality, we refrain from using any identifiable information like real employee names and company names in the transcriptions, master thesis and publications. By default, pseudonyms will be used unless your employee and your organization decide to be named.

The data gathered from the interview will be stored securely and the consent forms will be kept in a separate location to avoid the association of data with specific individuals. However, the confidentiality might be reduced as the pool of potential participants is small in size hence, the possibility of potential candidates to know each other. Moreover, if your employees choose to be interviewed within the premises of your organization, confidentiality might be impacted.

Please feel free to ask me anytime should you have any questions or concerns about the interview. I will be happy to help.

What opportunity do I have to consider this invitation?

May I ask you to respond to this invitation within one week from the receipt of this form. This will allow extra time to organize the distribution of the invitation email, participants information sheet and consent form to your staff member.

Will I receive feedback on the results of this research?

Once the research project is completed, a feedback presentation of the most important findings will be shared with you if you indicate your interest on the consent form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the research Supervisor, Lena Waizenegger, lana.waizenegger@aut.ac.nz, +64 (09) 921 9999 – ext: 5711

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet for your reference. I will be collecting the completed and signed Employer Consent form and will produce a copy of it for your reference as well. You are also able to contact the research team as follows:

Researcher Contact Details:

Arlene H. Ugale
xdd5289@autuni.ac.nz
 Master of Business Student, Faculty of Business
 AUT University
 55 Wellesley Street East
 Auckland, 2010
 New Zealand
 +64 (22) 5085457

Project Supervisor Contact Details:

Lecturer Dr Lena Waizenegger, Department of Business Information System, Auckland University of Technology, +64 (09) 9219999 or lana.waizenegger@aut.ac.nz

Professor Helena Cooper-Thomas, Associate Dean (Research), Auckland University of Technology, helena.cooper.thomas@aut.ac.nz

Appendix E – Invitation Email**Invitation email: Employees**

Dear Mr./Mrs.

My name is Arlene H. Ugale and I am a student at Auckland University of Technology (AUT) in New Zealand pursuing a Master of Business. I would like to invite you to participate in a research project that aims to explore the perceptions of customer service employees towards conversational agents. Conversational agents such as chatbots and digital assistants is an AI-driven software that uses natural language processing that simulates a human to human conversation making it capable of performing customer service function.

As the company you are working for has a fully operational chatbot or digital assistant deployed to work with or alongside human customer service representatives in performing customer service roles, I would like to invite you for an interview to gain your insights and perceptions on conversational agents. I am very keen to know how you see this AI-driven technology as part of your company's service workforce and understand its effects on your work processes or practices, your role in the company and your satisfaction as an employee. It will be my pleasure if you can extend your full participation in the study and honest feedback during the course of the interview.

The interview will take approximately 60 minutes and will be conducted via face-to-face or Skype on a date and time of your convenience. Please be assured that your participation is voluntary and is based on informed consent. You can withdraw at any time from participating if you deem necessary prior to the completion of data collection stage.

You will be pleased to know that the research follows the appropriate Auckland University of Technology (AUT) Ethics committee protocol. We will also be asking your permission to audio record the interview. Only the research team will have access to the recordings. The recordings will be deleted immediately after being transcribed and any published quotes will be pseudonymized.

If you have any questions about the research study, please contact me at xdd5289@autuni.ac.nz or you can call me at +64 22 5085457. This research has been reviewed according to AUT ethics committee procedures for research involving human subjects.

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Executive manager of the AUT ethics committee at ethics@aut.ac.nz.

I look forward to hearing from you soon!

Kind regards,

Arlene H. Ugale
|

Appendix F – Employee Consent Form



Consent Form

Project title: **Impact of conversational agents on customer service employees**

Project Supervisor: **Dr. Lena Waizenegger**

Dr. Helena Cooper-Thomas

Researcher: **Arlene H. Ugale**

- I have read and understood the information provided about this research project in the Information Sheet dated 29 January 2019.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the interview and that the interview will also be audio-taped and transcribed. The audio files will be transcribed using an online transcription software. The interviews will be self-transcribed (by the applicant) and auto-transcribed (by a natural language processing algorithm).
- I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study prior to the completion of the data collection stage without being disadvantaged in any way
- I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- I agree to take part in this research and that the findings might be used for teaching purposes and published in academic and non-academic outlets in pseudonymized form. The goal is to publish the findings from this study in an academic article. The data might also be used in a future comparative study which will be published in another academic article.
- I wish to receive a summary of the research findings (please tick one): Yes No

Participant's signature:

Participant's name:

Participant's Contact Details (if appropriate):

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 15 February 2019 AUTEK Reference number 19/31

Note: The Participant should retain a copy of this form.

Appendix G – AUTEC’s Approval

15 February 2019

Lena Waizenegger
Faculty of Business Economics and Law

Dear Lena

Ethics Application: 19/31 **Impact of conversational agents on customer service employees**

I wish to advise you that the Auckland University of Technology Ethics Committee (AUTEC) has **approved** your ethics application at its meeting of 11 February 2019.

This approval is for three years, expiring 11 February 2022.

Non-Standard Conditions of Approval

1. Alteration of the storage arrangements. AUTEC requires that the data be stored securely on AUT premises in a location separate from the Consent Forms. Electronic data should be downloaded to an external storage device and securely stored. It is not to be stored on the researcher's OneDrive.
2. Alteration of the Employer Permission to Access Form. Employers are not able to consent on behalf of their employees, so this is a permission to access staff, not a consent form. It is the researcher's responsibility to ensure the confidentiality of the staff in relation to the employer and it is the researcher's responsibility to ensure that there are no adverse effects for the employee as a result of taking part in the research, not the employers'. The fifth bullet point of this form needs to be altered accordingly.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/research/researchethics>.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/research/researchethics>.
3. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/research/researchethics>.
4. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. If the research is undertaken outside New Zealand, you need to meet all locality legal and ethical obligations and requirements. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries please contact ethics@aut.ac.nz

Yours sincerely,



Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Cc: xdd5289@autuni.ac.nz; Helena Cooper-Thomas