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The concept of interoperability in call centres and its associated benefits

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Background: Call centres, operating for over two decades and using human agents or self-help options, remain essential in customer service but struggle with fragmented information systems. Staff often lack integrated client profiles and critical information, relying on multiple platforms that hinder efficient customer service.

Objectives: This study aimed to explore interoperability in call centres and analyse its operational benefits.

Method: A qualitative methodology was used, with semi-structured interviews and focus groups involving 16 participants comprising frontline staff, managers, and support staff from two call centres. Content analysis identified key themes from transcribed recordings.

Results: Key themes highlighted challenges in information management and its negative impact on customer service, brand credibility, and revenue. Effective information access proved crucial for maintaining service quality and reputation.

Conclusion: The study emphasises the need for an interoperable technology landscape to enable seamless, real-time information sharing within call centres.

Contribution: The study highlights challenges in providing information to frontline call centre staff and assists corporate and governmental organisations in developing strategies related to information management and technology architecture. This research aids organisations in developing better information management and technology strategies. Future studies could compare South Africa's interoperability with other developing nations or examine integration impacts on staff.

Keywords: call centre industry; customer service; information; interoperability; qualitative methodology; system integration; technology.

Introduction

The call centre industry has experienced significant changes over the past two decades, becoming a crucial channel for customers to connect with various businesses (Calvert 2017). Demonstrating resilience, call centres have weathered economic crises with minimal impact (Srivastav et al. 2019), including the COVID-19 pandemic and its lockdown restrictions (Hrabí 2020). Pawlik et al. (2022) highlight that more personal and business interactions are happening remotely via call centres, with this trend expected to continue.

With the variety of channels available to customers, such as telephone, self-service, face-to-face interactions, email and portals, it is essential to maintain the same standard and accessibility of information across all channels through an integrated blend of technology and business processes (Smith & Bottorff 2024). Consistency in the information provided across these channels ensures a consistent customer experience, regardless of the communication method used (Suchanek & Kralova 2023).

Call centres require integrated systems to meet customers' specific needs and build relationships with them (Calvert 2017). Kazalarska (2017) highlights that technical systems are crucial for a call centre environment aiming to deliver exceptional customer service. To effectively serve customers through various channels, the omnichannel approach necessitates the implementation of relevant call centre technologies (Calvert 2017). According to Tortorella et al. (2022), these technologies include the Internet of Things (IoT), cloud computing, artificial intelligence (AI), remote monitoring and wireless sensors, which enhance call centre staff performance and reduce frustration. The aforementioned can be seen as interoperability that involves a set of components

that should function together as a cohesive unit, ideally through a single platform that centralises access to various types of information. Interoperability is further described as the ability of multiple systems or components to share information and effectively utilise the shared data (American City & County 2021; Burns, Cosgrove & Doyle 2019). While real-time capabilities are essential, information is often not readily available, and data are not promptly converted into meaningful insights.

Although interoperability in call centres offers numerous benefits, such as improved efficiency, enhanced customer experience and streamlined operations, many organisations struggle to implement interoperable systems. These challenges arise from technical complexities, integration issues (Leal, Guédria & Panetto 2019) and the substantial investment required in technology and training. As a result, organisations are unable to capitalise on the numerous benefits of interoperability in call centres, which would enable seamless customer service (Lai & Deng 2018).

The article is organised to present a literature review that offers supporting information on the benefits of interoperability in call centres. Furthermore, the article summarises the research design and methodology, followed by a discussion and a concluding section to address the objective of the study, which was to explore and understand the concept of interoperability in greater detail and identify and analyse the associated benefits.

Literature review

This section reviews the existing literature on call centres and the accessibility of information for frontline staff when assisting customers. The section also provides additional insights into the concept of interoperability. This review aims to develop a theoretical framework and identify gaps in the current research (Potlaki & Naidoo 2024).

Overview of the call centre industry

Gartner (2022) defines a call centre as a unit handling incoming and outgoing calls, serving internal customers via helpdesks or external customers through service centres. Globally, call centres enhance accessibility to products and services. For instance, the Joint United Nations Programme on HIV and AIDS (UNAIDS) call centre in Zimbabwe supports people with human immunodeficiency virus (HIV) and tuberculosis, reducing clinic visits and increasing access to assistance (Mukwenha et al. 2020). Exceptional customer experience in call centres involves automation, self-service tools or knowledgeable representatives (Eggers et al. 2022), which can only be possible if systems are integrated and information is made readily available to frontline staff at any given time.

Investments in African technology companies surpassed 1 billion dollars in 2018 and doubled to 2 billion in 2019, driven by fintech startups providing customer support through call centres (Pollio & Cirolia 2022). South Africa, a hub for business process outsourcing, hosts call centres for global companies like Amazon, Lufthansa and Shell. The industry has grown, offering services in banking, insurance and legal sectors (Businesswire 2021).

Call centres increasingly rely on technologies like IoT to empower employees and customers, enhancing service quality and responsiveness (Patterson 2015). Maintaining service quality and first-call resolution is crucial, especially when systems fail or information is unavailable (Chicu et al. 2019).

Consistent information provided across the call centre landscape

Businesses from various industries are attracted to call centres because of their ability to reduce costs, improve efficiency, enhance productivity and increase profits (Gounder 2014). These centres facilitate customer access to products and services through virtual operations, serving sectors such as telecommunications, insurance, banking and financial services (Bodri 2009).

With the variety of channels available to customers, such as telephone, self-service, face-to-face interactions, email and portals, it is essential to maintain the same standard and accessibility of information across all channels through an integrated blend of technology and business processes (Smith & Bottorff 2024). Consistency in the information provided across these channels ensures a uniform customer experience, regardless of the communication method used (Suchanek & Kralova 2023).

Berning, Amadi-Echendu and Naidoo (2024) note that effective information management is crucial for customer service, as non-integrated systems lead to inefficiencies and customer frustration. Berning et al. (2024) highlight that technical systems are essential for excellent service and brand credibility. A reputation for poor service can damage a brand's image, making it harder to attract new customers and retain existing customers. As customers leave because of poor service, the company loses sales and revenue. Additionally, attracting new customers can be more expensive than retaining existing ones, further impacting the bottom line.

Expanding on the concept of interoperability

Although interoperability has become increasingly important, there has been relatively limited emphasis on developing technological solutions to underscore its significance (Gopstein et al. 2021). It is important to note that integration is crucial because it helps organisations understand and manage customer relationships, embrace digital transformation and interact effectively with customers. Integration, therefore, enables organisations to meet customer needs, whether it is providing a service or developing new products (Kaondera et al. 2023). Bouzerzour, Ghazouani and

Slimani (2020) further highlight the important link between cloud computing and interoperability in allowing effective use of data in solutions and services.

Overview of challenges that arise when information is not readily available

Several challenges can be highlighted from a customer and business perspective, should information not be readily available. The need to access multiple systems to assist customers complicates matters for both the customers and the call centre staff. The lack of access to information from one system results in a poorer customer experience and reduces the efficiency of the call centre. This issue is very important and should not be overlooked. The evolution of automation technologies within businesses will rely heavily on interoperability among numerous systems and devices (Saturno et al. 2017).

The inter-system flow of critical information does not always occur. Without system integration, information at all levels is not readily available, which hinders operational streamlining and efficiency improvements. As a result, both staff and customers are impacted. Rychalski and Palmer (2017) highlight that, in some cases, lengthy call waiting times are experienced when systems do not communicate with each other or where a call centre agent does not have access to a particular system to service a customer. Additionally, the lack of access to relevant customer information can lead to call centre agents transferring customers between departments, which increases customer frustration (Eggers et al. 2022).

Interoperability is effective when systems are integrated within a specific environment (Drew 2019:1). However, when adding more workflows and dataflows, the complexity increases, leading to potential connection issues between different systems, which is a result of varying standards, data types and coding systems. This is a global challenge in the context of the Fourth Industrial Revolution (4IR), not just a problem in South Africa. The World Economic Forum emphasises the need to address these challenges worldwide. One proposed solution is the introduction of global standards for new platforms, architectures and frameworks (Burns et al. 2019).

The benefits of an interoperable system ecosystem

As technology improves to allow different systems to work together more effectively (interoperability), the information they exchange will be more useful if it follows a standardised format. Essentially, having a common model of information helps to ensure that all systems understand and process the data in the same way, which supports more efficient and effective business processes (Hardin et al. 2015).

Mistry et al. (2022) provide a comprehensive summary of the benefits of interoperability, where they note with specific reference to streamlined access to information that enhances efficiencies and leads to overall better customer service. Burns et al. (2019) highlight that the benefit of providing real-time information is that it will support organisations with useful insights that help them make better decisions and improve their operations. In the context of automation and connectivity resulting in a smart environment, interoperability is essential for devices to integrate and utilise relevant technologies. By doing so, these devices can achieve better performance and functionality (Burns et al. 2019). Essentially, interoperability ensures that all parts of a smart environment can function optimally, leading to improved overall performance. In accordance with the general systems theory, the entire call centre with its different technological systems should be viewed as one system and therefore managed as such.

Research methods and design

In this article, the research design was structured and developed by systematically navigating through the layers of Saunders, Lewis and Thornbill's (2009) research onion. The research design aims to outline a detailed plan of how the researcher will address the research question (Mardiana 2020).

To help the researcher select the most suitable methodology, a comparative framework (ed. Oflazoglu 2017) was used, outlining the differences between qualitative and quantitative methodologies. According to this framework, qualitative research was identified as the most appropriate for this article, as it assesses subjective data and depends on participants' opinions and emotions (ed. Oflazoglu 2017). Semi-structured interviews, conducted both in-person and virtually, served as the primary data collection method for this qualitative study. We gathered insights from stakeholders at two call centres through both individual interviews and focus groups. These methods offered comprehensive insights, emphasising lived experiences within their context and interpreting participants' perspectives and narratives (Tracy 2019) to explore interoperability in call centres and the benefits thereof.

The unit of analysis for this study was the call centre environment, which relies on different interactions with various technological systems to function as a unit or system. This study's population consisted of South African insurance call centres within a specific insurance group. The population was narrowed down to two call centres that both consist of frontline staff, management and support staff. Because of time and capacity constraints, the researchers used purposeful sampling to select participants with relevant knowledge, ensuring a representative sample of the call centre population. Participants had first-hand experience of the culture, social interaction or phenomenon of interest. The participants are all exposed to multiple systems used daily to provide a service to customers.

The sample selection involved choosing two call centres in South Africa, one in Gauteng and the other in KwaZulu-

Natal, to ensure diverse experiences. Call centres older than 10 years with legacy systems were targeted. Participants aged 18–65 with at least 1 year of experience were purposefully selected. Participants needed to work with front-end systems with knowledge of call centre technology and operations. Ten participants, primarily operational staff, were selected for interviews. Additionally, three focus groups, each comprising three participants, which included senior management and support staff from IT Architecture and the Service Quality Department, were conducted.

This exploratory literature research analysed data collected from various sources, including books, journals, theses, websites and professional magazines. Additional data were gathered through semi-structured interviews and focus groups, allowing for real-life experiences to be shared with the researchers. Given the semi-structured format of the interviews, the interviewer posed additional probing questions to elicit more in-depth responses from the participants. Each interview lasted approximately 1 h, while each focus group session extended to 2 h. Seven interviews took place before thematic saturation was achieved. Three focus groups were completed, bringing the total participants to 16. The data collected from the interviews and focus groups were substantial, allowing the researcher to thoroughly and comprehensively describe all participants' explanations and answers.

Table 1 aims to provide a summary of the participants as noted in the aforementioned section. The summary includes a view of participants per call centre, as well as representation from the Service Quality Department and Group Technology, which includes a unique identifier to ensure anonymity, gender, role within the call centre setup and whether the data collection took place in-person or virtually via Microsoft Teams.

After completing the data collection process, the data were analysed, translated and categorised based on themes identified through content analysis (Myers 2019). The participants included individuals who design and build the systems, those who use the systems and those who assess the quality of the system users, ensuring excellent representation across various disciplines within the call centre landscape. Interviews and focus groups were conducted either in-person or via the Microsoft Teams platform, allowing key participants to partake in the data collection process. The entire data collection process occurred between March 2024 and July 2024 to ensure the availability of key individuals for interviews or focus groups. The data analysis process that was followed was the same for interviews and focus groups. The process included audio recordings that were transcribed, using pseudonyms to ensure participants' confidentiality. The transcriptions were verified for accuracy, and the data were organised and prepared for analysis by sorting and ordering the raw data from the researcher's notes. All data were reviewed and coded, with summaries created by assigning content to established themes from individual interviews. New themes were added where necessary to enhance feedback and insights.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of South Africa College of Economic and Management Sciences Research Ethics Committee (No. 1927). Before data collection commenced, detailed participation information and a consent form were shared. Consent was obtained from the relevant participants orally and was reconfirmed and recorded at the start of each interview and focus group. Participation was voluntary, and confidentiality was ensured using pseudonyms. The researcher upheld integrity, credited sources and obtained gatekeeper approval.

Results

Themes identified

Content analysis was used to analyse the interview and focus group data. Audio recordings were transcribed, and open coding was used to identify key themes. The analysis of interview data revealed recurring themes, which aided the data analysis phase and allowed for data to be presented in a structured manner. These themes emerged from similar feedback, highlighting patterns, concerns and shared experiences among participants. After completing the focus groups, it became clear that consistent themes emerged in both the focus groups and the interviews, allowing the data to be presented in a structured manner. Patterns, concerns and shared experiences from participants were used to identify these themes. Open-ended questions and probing questions were asked to ensure comprehensive responses were received from participants.

Figure 1 provides a summary of data-gathering methods and key themes identified relating to the objective. The themes were identified from the participants' feedback and were consistent across both the interview and focus groups. Each theme is thoroughly detailed, which is followed by key findings that are supported by quotations from participants in both the interview and focus groups. This provides valuable insights into the data collected during the data collection process.

The following section elaborates on the key themes identified during the interview and focus group process, providing detailed insights as illustrated in Figure 1. Note that this is not an exhaustive summary of the data collected.

Challenges of information management and the impact thereof

The use of multiple systems in organisations leads to inefficiencies, as navigating these systems results in longer call durations and reduced productivity. Fragmented information across different platforms makes it difficult for employees to access necessary data efficiently, causing frustration and mental overload. This impacts staff morale and efficiency, as they must remember and navigate multiple systems. Outdated systems that are not easily integrated with newer technologies pose accessibility issues, highlighting the

TABLE 1: Sample summary of participants.

Variables	Participant identifier	Gender	Role	Teams or Face-to-Face
Interviews Call Centre 1 (JHB)	I-P1	Male	Subject Matter Expert	Teams
	I-P4	Female	Head of Operations	Teams
	I-P7	Female	SQA Evaluator	Face-to-Face
Interviews Call Centre 2 (KZN)	I-P2	Female	Subject Matter Expert	Face-to-Face
	I-P3	Male	Head of Operations	Teams
	I-P5	Male	Operational Manager	Teams
	I-P6	Female	SQA Evaluator	Teams
Focus Group 1 (Call Centre Operations)	FG1-P1	Female	Senior Manager	Face-to-Face
	FG1-P2	Male	Operational Manager	-
	FG1-P3	Female	Operational Manager	-
Focus Group 2 (Service Quality Assurance)	FG2-P1	Female	SQA Evaluator	Teams
	FG2-P2	Female	SQA Evaluator	-
	FG2-P3	Female	SQA Evaluator	-
Focus Group 3 (Group Technology Architecture)	FG3-P1	Male	Systems Architect	Teams
	FG3-P2	Male	Systems Architect	-
	FG3-P3	Male	Systems Architect	-

Note: Call centres – Total interviews = 7 participants in total took part in the interviews. Focus groups = 3 focus groups, with nine participants partaking in the focus groups. To ensure anonymity, participants were coded by using 'identifiers' as indicated in Table 1.

SQA, service quality assurance; KZN, KwaZulu-Natal; JHB, Johannesburg.

critical need for integrated systems to enhance operational efficiency and streamline processes. Relying on multiple systems complicates management and analytical tasks, and maintaining these systems presents challenges and risks of failure when updates or expansions are attempted.

The inefficiencies caused by retrieving data from various systems lead to operational challenges and delays in accessing necessary information. This places a cognitive burden on staff who must remember numerous passwords for different systems, making it difficult to efficiently access information and perform their duties. The situation underscores the need for standardised data and centralised access. Without these, employees in different departments may struggle to access relevant information, resulting in poor customer service and overall inefficiencies:

> 'There is a vast amount of information but it's not into one central platform that everyone has access to.' **(**I-P2, Female, Subject Matter Expert**)**

> 'Systems are all separate in isolation, gaining massive inefficiency, which is firstly costly to business and not the best experience for a customer.' **(**I-P4, Female, Head of Operations**)**

> 'The data is pulled from different systems and obviously that is basically the issue.' (FG1-P2, Male, Operational Manager**)**

> 'You have to remember this whole cohort of passwords, which almost becomes impossible.' (FG1-P3, Female, Operational Manager**)**

Customer service and experience

Resolving customer issues on the first call is crucial for meeting expectations and enhancing satisfaction. Customer service agents need to effectively and proactively use available information to address customer needs efficiently. Repeating information frustrates customers, negatively impacting their experience and perception of the service. The goal is to create a smooth and efficient customer journey, ensuring interactions are pleasant and brief to improve overall satisfaction. Unfulfilled customer expectations can lead to dissatisfaction and potentially losing customers to competitors. Non-integrated systems cause repeated frustrations, leading to a negative perception of the service and increased operational inefficiencies:

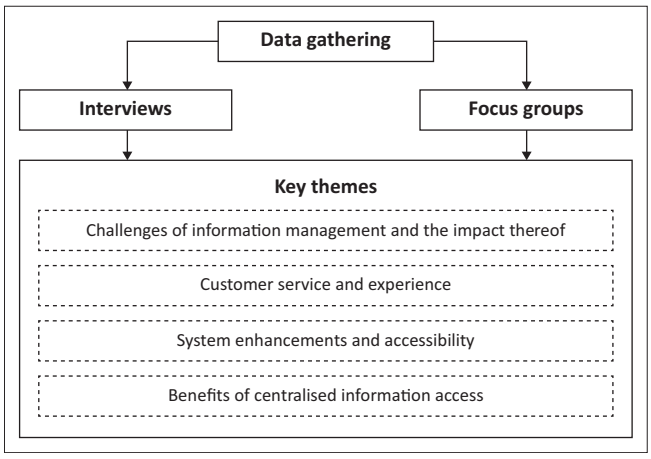

FIGURE 1: Summary of data-gathering methods and key themes identified relating to the objective.

> 'First-time-call resolution is key.' (I-P1, Male, Subject Matter)

> 'After your fourth call of a customer screaming and shouting because they need to give you the same information, it does influence you negatively.' (I-P2, Female, Subject Matter Expert)

> 'Use that information appropriately and proactively.' (I-P3, Male, Head of Operations)

> 'It frustrates the customers also and that's why we're losing customers.' (FG2-P3, Female, SQA Evaluator)

System enhancements and accessibility

Working with outdated systems that lack compatibility with modern technologies leads to inefficiencies and integration challenges. Enhancing systems can significantly improve operational efficiency and customer satisfaction by streamlining processes and providing better service. Seamless integration of systems is essential, ensuring different technologies can communicate and function as a cohesive unit for effective implementation and operation. Repurposing legacy systems by creating a data mart allows for the consolidation and efficient use of data from older systems, making it more accessible and useful for current needs. Relying on outdated code and systems has limitations, as more efficient and effective modern solutions are available that could improve operations. Important considerations for system enhancements include ensuring availability, maintaining strong security and offering comprehensive support and documentation. These factors are crucial for the successful integration and operation of enhanced systems:

> 'Systems that are legacy generally and cannot integrate with newer systems … Make things better for us and our customers.' (I-P1, Male, Subject Matter)

> 'We sit with old code that was written in the nineties, which is still running but there are better ways to do many things.' (FG3-P2, Male, Systems Architect)

> 'Availability, security, and I think that's … and obviously, with the support, includes documentation.' (FG3-P1, Male, Systems Architect)

Benefits of centralised information access

Centralised information access allows customer service agents to quickly find necessary information, leading to faster and more effective customer assistance. This approach also makes it easier for agents to connect with customers and personalise interactions, enhancing the quality of customer service and overall experience. It simplifies tasks for staff by reducing complexity, enabling them to provide better and more efficient service. Additionally, centralised information access offers multifaceted benefits, including simplified data management, enhanced cybersecurity through better monitoring of data transfers and responsible, secure data handling. This comprehensive strategy supports both operational efficiency and data protection. For the organisation, centralising information streamlines operations, reduces redundancy and improves data management and access:

> 'If you had one system to log into and everything is readily available for you, you can assist your customers that are in need … The one-stop shop will be much easier because everything is in the same place.' (I-P1, Male, Subject Matter)

> '… you would use that data to model appropriately your segmentation on who to target and what to target.' (FG3-P1, Male, Systems Architect)

> 'Makes it relevant and easier for the agent to connect with that specific potential customer and also bring some relevance to the conversation.' (FG3-P1, Male, Systems Architect)

The section below summarises the key themes identified during the interview and focus group process, providing detailed insights. Note that this is not an exhaustive summary of the data collected. In the light of the specific industry context, the level of demographic detail was carefully considered to avoid compromising participant anonymity. To ensure confidentiality, potentially identifiable information was removed. This approach ensured that insights could be shared without compromising confidentiality. The findings, however, indicated that male participants were more focused on the technical aspects during interviews, whereas female participants focused on the people elements. The intention to include gender was to see whether there were substantial differences in how the genders responded, but only one difference was uncovered, as noted.

Interoperability and its role in call centres

The need to access multiple systems to assist customers complicates matters for both customers and call centre staff, resulting in a poorer customer experience and reduced efficiency. This issue is critical and should not be overlooked. The evolution of automation technologies within organisations will heavily rely on interoperability among various systems and devices (Saturno et al. 2017). Management and the Service Quality Department emphasised the need for interoperability to improve access to critical information, ensuring a smooth customer experience:

> 'We need interoperability.' (I-P1, Male, Subject Matter)

> '… if maybe there was one system that was being used, like a live system, should the customer changes anything online then immediately on the policy administration system, the information pulls through immediately. There's no delay … Whatever you do online must immediately populates on the other side.' (FG1-P1, Female, Senior Manager)

Effective interoperability allows departments to share information and collaborate, providing a smooth and cohesive customer experience (Bouzerzour et al. 2020; Ndlovu, Scott & Mars 2021). Addressing interoperability issues within a call centre ensures customer information is shared seamlessly across departments, leading to quicker resolutions, eliminating inconsistent responses and enhancing overall customer experience. A unified view of customer information can significantly boost customer satisfaction and loyalty.

Participants noted the need for real-time updated information, preferably in a single view that allows users to access all required information. Concerns were raised about the dependency on critical systems, which, if unavailable, would impact operations. Accessing multiple systems, especially legacy systems, requires all systems to be available simultaneously:

> '… I think that is paramount, the dashboards, and that they update very frequently – Literally seconds, that it's almost live.' (FG1-P3, Female, Operational Manager)

Focus group 3, made up of IT representatives, emphasised the need for systems to work together for real-time information. Seamless integration provides better business insights and a comprehensive view of customer interactions. This dependency ensures quicker customer service, higher first-call resolution and overall call centre efficiency:

> '… we're missing out on a whole bunch of scientific, probably, learnings, I would say, on our data because we're not real-time.' (FG3-P1, Male, Systems Architect)

> '… Information should be readily available … ' (FG3-P2, Male, Systems Architect)

The Service Quality Department (Focus group 2) noted that systems that are not updating each other caused service quality issues, duplicate work and lowered staff productivity and morale. They stress the urgent need for technical solutions to ensure seamless integration and improve operational efficiency:

> '… they need to hurry up and get on with this new system so that everything can work concurrently …' (FG2-P2, Female, SQA Evaluator)

> '… when customers capture the claim online. Sometimes the information does not pull through or, when it does pull through, the consultant will still confirm what was written …' (FG2-P3, Female, SQA Evaluator)

Importance of information to service customers

Operational management depends on accessing various systems to gather and compile information for efficient performance and service to customers. However, there is often a lack of necessary information to service customers, solve problems or address queries. Kaigorodova, Mustafina and Alyakina (2018) emphasise that real-time information is crucial for customer service. Call centre staff face significant challenges if systems fail or if information is not readily available or accessible in a usable format to address customer requests. These challenges highlight the dependency of operational staff on timely access to relevant data.

Participants in both interviews and focus groups highlighted several benefits. Feedback from participants, supported by literature, shows that centralised and easily accessible information benefits various stakeholders. Centralised access to information and a single view of the truth can streamline operations and enhance efficiencies for both management and staff. Additional benefits include reduced operating costs, improved customer experience, increased staff satisfaction and the capability to explore 4IR technologies in operations.

It is important for systems to not operate in isolation and to enable data-sharing between various systems. Systems that can share data and operate as a unit will allow information to be readily available in one place, ensuring first-call resolution and avoiding negative customer experiences:

> '… the customer has already finalised everything online, but now, since the consultant cannot see that information on their side, they will write up another policy.' (FG2-P1, Female, SQA Evaluator)

> '… even though they did bring some of the information over, not all information was brought over.' (FG2-P2, Female, SQA Evaluator)

The availability of information is important, but so is the interpretation and effective use of this information in daily operations. A single view of the truth, whether in the form of real-time updated dashboards, ensures current and accessible information, which is critical for effective operations management and customer service:

> '… they've got to understand their data, understand the impacts that data have when it is published.' (FG3-P2, Male, Systems Architect)

Feedback indicates that call centre agents are limited in the information they can access and view, preventing them from seeing information in other areas related to the same customer. This limitation is not because of the mandate and controls but because information resides on different systems, creating access limitations. It is important that call centre agents clearly understand the available information. Change management can ensure that data translated into information is used effectively and that call centre staff introduce customers to alternative channels, particularly automation technologies, which offer convenience benefits.

Systems in the context of call centres

Systems are the backbone of organisations, enabling efficient work environments. Annett (2019) emphasises that technology systems enhance process efficiency and effectiveness. However, legacy systems present challenges because of outdated technologies, making integration difficult and costly. Accessing data from these systems can be slow, hindering timely information delivery. Despite limitations, many companies repurpose legacy systems to leverage their data capabilities (Balasundaram & Venkatagiri 2020). Participants during the interview process highlighted that organisations cannot afford to wait longer to execute their future technology plans:

> '… you need to have a lot of information and a lot of thinking surrounding technologies of current and how it will look in the future.' (I-P1, Male, Subject Matter)

> 'Information is not on my legacy system where that information is available … I now need to open another system, sign on there, and then go and find the customer detail and then I can answer the question.' (I-P2, Female, Subject Matter Expert)

It was evident that participants from both interviews and focus groups were of the view that organisations must continuously enhance systems for seamless integration, making information readily accessible for customer service. Forward-thinking in terms of technology came out strong, with participants noting that by not keeping up, organisations

will fall behind and not be relevant in a few years. Buhalis and Sinarta (2019) support this view that effective data management is essential for valuable insights from big data, improving customer service:

> 'Forward-thinking, with digitalisation, omnichannel and artificial intelligence … we need to be able to utilise that to see what will happen and the rapid change that's happening.' (I-P1, Male, Subject Matter)

> 'I think there is an easier way for us to kind of collaborate all of the information or condense it.' (FG1-P2, Male, Operational Manager)

Participants highlighted that multiple systems constrain frontline staff, requiring them to switch between systems. Replacing legacy systems is complex, requiring an understanding of the technology landscape:

> '… probably where the biggest pain-point is, is actually connecting to the legacy system because maybe it doesn't support the newest way of doing things from a modern side of things.' (FG3-P1, Male, Systems Architect)

> '… performance around that legacy … the speed it's gonna depend on if that is typically a big data consumer then pulling large volumes of data could hinder the performance.' (FG3-P3, Male, Systems Architect)

Challenges experienced if effective data-sharing is not in place

Inter-system information flow often fails, hindering operational efficiency and impacting staff and customers. Rychalski and Palmer (2017) note that lengthy call waiting times occur when systems do not communicate or when agents lack access to necessary systems, leading to customer frustration and multiple transfers (Eggers et al. 2022):

> '… after your fourth call of a customer screaming and shouting because they need to give you the same information, it does influence you negatively.' (I-P2, Female, Subject Matter Expert)

> 'Customers don't want to be transferred from pillar to post … obviously from a customer experience point of view, it's not a good experience for the customer.' (I-P6, Female, SQA Evaluator)

Participants highlighted customer frustration when put on hold or transferred. Call centre staff face inefficiencies using multiple systems, leading to repeated and duplicated information. Without the necessary data, efforts become unfocused and ineffective, and incorrect data can cause significant issues. Legacy systems are complex and resource-intensive, making integration with newer systems difficult. This impacts staff, who struggle to access and interpret essential information, hindering customer service. Increased handling times and multiple transfers raise operational expenses and negatively affect staff morale and job satisfaction (Subramaniam et al. 2024):

> '… we know in business and call centres, a lot of the times customers are calling in and were holding on to transfer, and that's frustrating.' (FG1-P2, Male, Operational Manager)

> '… what is currently happening is a person, for example, would require three screens.' (FG1-P3, Female, Operational Manager)

> '… it also frustrates our staff members because it's from one system to the next and then, from time-to-time.' (FG1-P3, Female, Operational Manager)

Operational challenges include inefficient information retrieval and complex system navigation. These issues impact both customers and call centre operations, particularly frontline staff. Accessing critical information is crucial for staff morale, job satisfaction and customer service, emphasising the need for timely access to relevant data.

Considerations for effective system integration

System integration enables data consolidation into a single view, crucial for displaying information. Berning et al. (2024) describe integration as combining touchpoints for effective coordination and seamless information sharing. Integrated systems in call centres improve customer relations and enable real-time performance monitoring (Shire, Holtgrewe & Kerst 2017). Kazalarska (2017) emphasises that integration allows data exchange between systems, providing meaningful information during customer interactions. An integrated ecosystem enhances customer service.

Integrating digital technologies transforms how insurers operate, improving efficiency, customer experience and decision-making (Eling & Lehmann 2018). While system integration is essential, the human element is crucial to complement technical solutions. Despite the known importance of integration, data and systems often fail to integrate effectively. Dependencies must be addressed before integrating new systems. Linking systems, including AI and automation, improves data interpretation and decision-making.

Findings highlight the importance of integrating technology with human interaction to enhance customer service and operational efficiency. Call centre staff play a crucial role in supporting technology, with the human touch being essential for understanding customer needs and providing personalised service. Effective collaboration between AI and humans is vital for meeting customer needs, as AI depends on system integration and a balance with human agents:

> 'Systems are all separate in isolation, gaining massive inefficiency, which is firstly costly to business and not the best experience for a customer.' (I-P4, Female, Head of Operations)

> '… you've got to obviously rely on a couple of systems or data …' (I-P5, Male, Operational Manager)

Organisations rely on integrated systems to collate data and provide meaningful information to frontline staff. Participants from both interviews and focus groups reiterated that isolated systems create inefficiencies and harm customer experience. Support staff with system knowledge are essential for smooth operations and rapid problem resolution. Lack of integration results in multiple reports, hindering operational tasks. Effective integration provides several benefits, including full functionality of system integrations:

> '… with any system integration or any system upgrades, you need smart people that can support, that can almost be your go-to people or go-to team, that knows the ins and outs of a system plus the system that it's actually integrated into.' (I-P3, Male, Head of Operations)

> '… probably where the biggest pain-point is, is actually connecting to the legacy system because maybe it doesn't support the newest way of doing things from a modern side of things, but at the end of the day there is always a way to connect to these different systems and, once you can connect to it, extracting the data is just a matter of transforming it and putting it into a readable format.' (FG3-P1, Male, Systems Architect)

While interoperability may indeed yield efficiency gains for organisations, it can also fundamentally reshape internal and external relationships. The implementation of interoperable systems often centralises control and visibility with management, thereby shifting power dynamics within the organisation. This can disempower frontline staff by reducing their discretion and can reconfigure customer relationships to be more transactional and less agent-led. These changes risk diminishing staff autonomy, heightening surveillance and privileging process standardisation above personalised customer service. A proactive approach to change management is crucial to mitigate these risks. Organisations should champion the technology as a tool to augment staff expertise, rather than replace it, and involve frontline employees in the design and implementation process from the outset.

Summary

The need to access multiple systems complicates matters for both customers and call centre staff, resulting in a poorer customer experience and reduced efficiency. Addressing these challenges requires a strategic approach, including investing in the right technology. This investment can improve interoperability and information integration, leading to better performance and customer satisfaction. Effective interoperability and system integration are crucial for improving access to critical information, ensuring a smooth customer experience and enhancing operational efficiency.

Limitations of the study

The study faced limitations because of the researcher's employment at the company managing the call centres, restricting the sample to those within the same corporate group. The scope was limited to 16 participants from different departments, and their views may not represent a larger population. Customer input was not sought, as the primary focus of the research was on the experiences and perspectives of call centre staff. Additionally, the research was confined to the insurance industry; therefore, some findings might not apply to other sectors.

Conclusion

The research highlighted that call centres struggle to effectively service customer requests because of the lack of integrated access to relevant customer information, including personal details and previous interactions. The lack of integration hinders call centres' efficiency in assisting customers. However, the study found that system integration enhances interoperability, allowing consultants to access important customer information easily, improving service efficiency and reducing customer frustration.

The findings emphasise the importance of interoperability for real-time data-sharing to enhance customer experience. Challenges include inefficient information retrieval, complex navigation and outdated systems. Recommendations are to promote collaboration between human agents and automation, integrate systems for a unified interface and address legacy system issues.

Significant contributions can be made towards the call centre industry. These contributions aim to enhance customer service, operational efficiency and overall effectiveness in the call centre industry. Senior leadership can promote the integration of human agents and AI technologies to leverage their respective strengths. AI can handle repetitive tasks and provide quick responses, while humans offer empathy and understanding. This collaboration results in a more efficient and compassionate customer service experience. System integration is crucial for call centres, and therefore they need to integrate with various systems to ensure frontline staff have access to critical information. Addressing the challenges posed by legacy systems and providing a unified front-end interface is essential for effective customer service.

The findings of this research will be highly valuable for academics teaching in the field of call centres. They will gain insights into both the current state of call centres and the opportunities to enhance their value for organisations and customers. Additionally, the study provides a further understanding of customer service and experience. It will also benefit students in various call centre sectors by expanding their knowledge of the different technologies used in the industry.

While the study highlights the benefits of seamless service delivery and operational efficiency, it is equally important to acknowledge the potential downsides or trade-offs associated with system integration. These include where employees may experience heightened stress because of constant monitoring and rigid system structures, which can limit their ability to respond flexibly to unique situations. Additionally, customers may have less influence over service design, as automated or standardised systems often reduce opportunities for their voices to be heard. To overcome this, organisations must adopt an ethically grounded implementation strategy that champions the technology as a tool to augment staff expertise, rather than replace it. This involves investing in participative design that includes frontline employees in system development, ensuring transparency in how performance data are used for support rather than solely for scrutiny and deliberately designing systems with discretionary 'override' functions to protect agent autonomy and meaningful customer service.

Instead of just managing calls faster, use agent and customer feedback to identify and fix the recurring issues that generate calls in the first place. This is a strategic alternative that reduces call volume altogether. Before investing in AI, ensure that the existing knowledge base is intuitive, accurate and easily searchable. Often, inefficiency stems from poor information architecture, not a lack of technology. Involve agents directly in the design of workflows, quality criteria and the selection of any new tools. Their frontline experience is an invaluable resource for identifying what truly creates efficiency and quality service.

Future research could explore the impact of system integration on call centre staff and compare South Africa's interoperability with other developing countries. In addition, future research could include critical perspectives, such as studies examining worker experiences of technological surveillance or customer agency in service interactions. While the existing technical and managerial focus is valuable, it is recommended that subsequent work incorporate integrating scholarship on digital labour and the pervasive nature of workplace surveillance to provide a more nuanced understanding. This is especially important for contextualising findings within the specific social and economic dynamics of the South African service sector.

In summary, call centres need integrated system designs to avoid using multiple systems for customer service. Without this integration, customer frustration and negative sentiment will persist. The implications of not providing call centre staff with readily available information are significant, especially in an economy where prioritising the customer is crucial for survival. Crises like COVID-19 have shown that businesses need to be both proactive and reactive. Being reactive means adopting strategies to handle crises effectively. The pandemic has brought both opportunities and challenges, prompting businesses to focus on their operations, employees and customers (Susilo, Hidayat & Marta 2021).

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CRediT authorship contribution

Michael H. Berning: Conceptualisation, Methodology, Formal analysis, Investigation, Writing – original draft, Visualisation, Project administration, Writing – review and editing. Anthea Amadi-Echendu: Writing, Supervision, Funding. Sugandren Naidoo: Writing – review and editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

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Data availability

The data that support the findings of this study are available from Anthea P Amadi-Echendu at amadiap@unisa.ac.za, upon reasonable request.

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