Technological Forecasting & Social Change 173 (2021) 121118

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Smart mirror fashion technology for the retail chain transformation

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ARTICLE INFO

Keywords:
Smart mirror fashion technology
Innovation
Service quality
Offline retail
Brick-and-mortar store

ABSTRACT

As the digitalisation of businesses continues to change customers' purchasing habits, brick-and-mortar retail SMEs (Small and Medium Enterprises) are confronted with unprecedented challenges. The proliferation of e-commerce and digital businesses is not only changing the rules of business but disrupting them by introducing new possibilities, especially with the integration of new technology. Studies that have attempted to measure technology-based service quality in retail settings are limited to online service experiences, creating a significant gap in the literature. The primary purpose of this paper is to explore how the service quality of brick-and-mortar clothing retail chains can be improved using innovative technology such as smart mirror fashion technology (SMFT), something academic research has not yet specifically addressed. This study used a qualitative approach with Soft System Methodology (SSM), based upon interviews triangulated with observations and field notes. It focused on the top five UK clothing retail chains, measured by market capitalisation. We found that the quality of service received is currently perceived as low when compared to customers' expectations; however, use of technology enhanced service quality and influenced customer satisfaction. There was a positive relationship between service quality, customer satisfaction and the use of SMFT. The contribution of this study lies in the development of a new framework that integrates SMFT with traditional in-store transaction processes, resulting in improvements in service delivery and managerial practices of the offline clothing retail service providers. The study concludes that embracing SMFT can help provide high-quality service, creating value for customers.

1. Introduction

Around the world, the retail industry is experiencing revolutionary changes initiated by the proliferation of e-commerce and digital businesses – plus the COVID-19 pandemic which took businesses and society by surprise (Safari et al., 2015; Wren-Lewis, 2020; Carlsson-Szlezak et al., 2020). E-commerce and online shopping continue to command retail success by attracting the younger generations. Meanwhile, the older generations of customers are refraining from shopping at brick-and-mortar stores due to poor service experiences and appalling customer relations (Acquila-Natale and Iglesias-Pradas, 2020).

Service quality management techniques that worked for decades in the traditional retail sector are being reshaped in the UK clothing brick-and-mortar sector (Nelson et al., 2017). Oy (2017) reported a surge in the number of clothing retail stores going into administration or liquidation, and/or closing down, as shoppers continued to migrate to online shopping. Thus, brick-and-mortar retail stores are being forced to revamp their strategies and reengineer their products and service delivery systems in order to improve service quality and ensure the delivery of seamless shopping experiences (Balakrishnan, 2013; Giovanis et al., 2015, Sorin and Antonio de Lucas, 2020). Improvement in service quality is believed to improve profitability and customers' perception of organisational services. However, such improvement requires continuous monitoring and measurement of service performance in the retail sector to determine the standards of service quality (Willems et al., 2017; Achchuthan and Charles, 2017).

Technological innovations such as virtual-try-on and smart mirror fashion technology (SMFT) are rapidly making the retail setting smarter, reshaping its landscape by enhancing customers' experience in offline stores (Vermeeren et al., 2010; Willems et al., 2017; Rese et al., 2017; Dacko, 2017). SMFT uses algorithms to collect, analyse and make meaningful inferences from data with multiple images. It is gaining more attention from SMEs (Small and Medium Enterprises) as well, especially among fashion, cosmetics and groceries retailers (Kim and

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https://doi.org/10.1016/j.techfore.2021.121118
Received 29 December 2020; Received in revised form 7 August 2021; Accepted 12 August 2021
Available online 6 September 2021

Forsythe, 2008; Kell, 2011; Radley, 2014; Javornik et al., 2016; Rauschnabel and Ro, 2016). SMFT is a self-service-based technology provision machine that is incorporated into physical stores to enhance service provision and delivery processes (Fiore et al., 2005; Demirkan and Spohrer, 2014; Javornik, 2016).

As a self-service-based technology provision machine, SMFT explains products in a more compelling and effective way by reflecting customers' images back to them in a 360-degree panoramic augmented fashion, and it allows customers to choose bespoke styles and colours that match their needs (Avelino et al., 2019). This artificially intelligent, augmented gesture recognition technology, utilising a two-way mirror with cameras, electronic displays and sensors behind the glass, offers suggestions and changes light levels to demonstrate what outfits look like at different times of day (Daniel, 2018).

Although academic studies have been conducted on various aspects of innovative technology, retailing and service quality, the literature to date (Parasuraman et al., 1988; Cronin and Taylor, 1992; Dabholkar et al 1996; Bahia and Nantel, 2000; Yoo and Donthu, 2001; Aldlaigan and Buttle, 2002; Parasuraman et al., 2005; Minh et al., 2015; Dacko, 2017; Narteh, 2018; Iqbal et al., 2017 and Rauschnabel and Ro, 2016) fails to address the appropriateness of SMFT in UK clothing retail stores. Other authors have addressed service quality management in retail service-oriented settings and the use of augmented reality in online retailing and smart homes. None have focused on the significance of SMFT to brick-and-mortar clothing retail stores' service quality improvement (Dhavale et al., 2019; Pradhan et al., 2020; Jain and Gandhi, 2021). Smart homes and smart hotels are known by many, but SMFT is basically a new concept, especially in the brick-and-mortar clothing retail sector (Yang et al., 2021; Guha et al., 2021; Alam et al., 2021). The question of how SMFT can enhance service quality management and elevate customer engagement in the clothing retail sector is yet to be fully explored. This study fills in this research gap by focusing mainly on SMFT applications in the retail sector.

The aim of this research is to examine the key benefits of using SMFT in the case of the UK clothing retail sector and to establish how innovation in SMFT can enhance service quality management and increase value to customers. Thus, the study answers the research questions: 1) How can innovation in SMFT benefit the UK clothing retail sector? 2) What are the challenges facing the sector with respect to service quality management? 3) What recommendations can be made to effectively use SMFT to enhance the current service quality management in this sector? The paper proposes recommendations in the short-term and long-term and provides the UK's brick-and-mortar clothing retail stores with actionable insights into how they should improve service quality and increase customer satisfaction, thus providing better value for money.

The study adopted an inductive approach within the interpretivism paradigm. It was undertaken using a qualitative research approach, based upon interviews triangulated with observations and field notes. The primary data collection generated 27 in-depth interviews, 10 observations, and 10 field notes from customers, staff, team leaders and managers of the top five UK clothing retail stores, selected based on market capitalisation. Data were interpreted through thematic analysis to contextualise the findings. This qualitative research explores the perception of the UK clothing retail stores' consumers, staff and managers of how innovation in SMFT can help shape the process of providing quality service to customers in brick-and-mortar clothing retail stores. The research examines the link between SMFT and service quality provision. The data that were gathered and analysed provide valuable information of how service quality problems can be addressed using SMFT.

The findings showed that the quality of service received is currently perceived as low compared to customers' expectations. The findings also showed that the use of technology enhanced service quality and influenced customer satisfaction. There was a positive relationship between service quality, customer satisfaction and the use of SMFT. The contribution of the paper lies in the development of a new framework that integrates SMFT with traditional in-store transaction processes, resulting in improvements in the service delivery and managerial practices of offline clothing retail service providers in the UK. Re-contextualisation of existing published literature is an important contribution to the body of knowledge. Another contribution is the development of a generic qualitative research method by triangulating three different perspectives (interviews, observations, and field notes) to gain purposeful research evidence from different social actors (communities) for tackling the relevant issues with SMFT. Both the empirical findings and the theoretical literature in the paper contribute to our understanding of the service quality challenges facing the UK's brick-and-mortar clothing retail stores.

In the remainder of this paper, we first provide a brief literature synthesis on technology, SMFT and service quality conceptual issues, followed by methodology, data analyses, recommendations, discussions and conclusion.

2. Theoretical background and literature review

This section reviews the theoretical background of innovative technology, innovation in service quality, and the relevance of technological interfaces in the chosen sector. It also provides an overview of the relevant concepts of virtual mirrors and augmented reality, service design, and the need for new service development using the latest technology. It reflects on the importance of service quality management to the UK clothing retail sector, presents the influence on customer perception of self-service technology quality, and contextualises the potential widespread use of smart mirror fashion technology (SMFT). Furthermore, it paves the way for designing a theoretical framework that guides the data collection and analysis in the later sections of the paper.

2.1. The transformative effect of technology on the retail industry

As we can see around us, technology has become one of the most important elements in today's business service provision. Its role keeps getting more complex because of the way it is fundamentally changing the service delivery process (Wahab et al., 2012, Mahto et al., 2020; Islam et al., 2020). Technology is not only changing the way organisations perform in a highly competitive market: it is also changing how retailers physically and virtually deliver their services to customers, both online and offline (Kapperman, 2013, Singhal et al., 2020).

The technology footprint that leads this transformation is impacting lots of customer-facing functionalities like service quality, customer engagements, service delivery processes and in-store operations. Boeck et al (2009) asserted that the use of mobile payments, interactive kiosks, RFID-tagged products, BLE technology, smart shopping carts, and self-service technology (SST) in the form of smart mirror fashion technology (SMFT), which takes customers on a virtual reality and augmented interactive tour and provides an exciting retail experience, is now obviating the need for long waits, thus reducing the need to queue and poor service quality processes in brick-and-mortar stores.

2.2. Technology services (TS)

Technology services are professional services designed to facilitate the use of technology by service providers and end users (Huang, 2017). With the rise of service innovation, technology services are no longer considered as peripheral to the business environment but as a core offering to the enhancement of a customer's service experience (Kearney, 2017).

While technology services are often related to information technology, they are also associated with other forms of technology as well. Technology saves free customers from the complexity of installing and operating the technology themselves (Rindfleisch et al., 2017; Singhal et al., 2020). With the aid of technology services, organisations can give

their customers what they want, when they want it, and where they want it (Jia-Jhou et al, 2017). Technology services are delivered according to business requirements and cover a broad range of industries and service delivery sectors (Boon-itt, 2015).

2.3. Self-service technology (SST)

The growth of new technology is revolutionising the retail landscape. Many retailers are beginning to use a wide range of technologies to allow customers to co-create and consume services electronically, without direct contact with the firms' employees (Meuter et al., 2005; Toni et al, 2013; Muhammad Shahid et al, 2018). By introducing technology-based self-service systems, organisations are supposedly improving the quality of customer service (Barnes and Lea-Greenwood, 2010; Geum et al., 2011). For many companies, the idea of self-service technology seems like a win-win proposition, because much of the delivered service is initiated and carried out by the consumers (Bitner et al., 2008; Sedighimanesh et al., 2017).

The rapid innovation of self-service technology and its adoption have brought about an increase in the productivity growth rate, a cost reduction, and an increase in the speed of service delivery to customers (Peter et al., 1983; Joel et al, 2014). Self-service technology is increasingly changing the way customers interact with firms to create service outcomes (Salomann et al., 2006). In Barnes and Lea-Greenwood's (2010) view, delivering services through this system is generally more cost-effective, reliable and efficient for both the customer and the service provider.

2.4. Service quality (SQ)

The term service quality (SQ) refers to a customer's opinion of the quality of the service (whether excellent or otherwise). There are many definitions for SQ in the existing literature. One school of thought traditionally defines SQ as a perceived judgment resulting from an evaluation process where customers compare the services they perceive themselves to have received to their expectations (Hapsari et al., 2017; Yas et al., 2020). SQ is the assessment of how well services are delivered in conformity to the client's expectations.

Khudhair et al (2019) and Gogoi and Jyoti (2020) are of the opinion that SQ is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. It is an extrinsically perceived attribute, based on customers' experiences of services rendered by the service provider. Wang et al (2020) and Rahman et al (2020) conceptualise SQ as the degree of discrepancy between the customer's normative expectations for services and their perceptions of service performances.

2.5. Smart mirror fashion technology (SMFT)

The use of computer-driven store digital technology to enhance the provision of a unique quality service is becoming a common practice in the retail sector. According to Strohanova (2019), SMFT is an interactive experience of a real-world environment technology. It enables the customer to stand in front of the mirror and choose from a variety of clothes. It produces meaningful experiences and sufficient information, enabling customers to evaluate the targeted products (Kim and Forsythe, 2008; Sahana et al., 2021) and helps them make viable decisions with more certainty (Oh et al., 2008; Yuan et al., 2018). This two-way mirror with an electronic display behind the glass can also be called a magic mirror, interactive mirror, digital mirror or SMFT (Martínez-Navarro et al., 2019; Dongare et al., 2020). Swan and Gabbard (2005) noted that SMFT is an augmented enhancement machine with a collection of viewing features. It helps customers visualise clothes in three dimensions (3D), while enabling them to observe the clothes on themselves from every angle.

Hassenzahl and Tractinsky (2006) and Longo et al (2020) highlighted that SMFT's attributes include the hedonic quality (HQ), pragmatic quality (PQ) and aesthetic quality (AQ). There are reports of improved customer experiences and service quality from trials of SMFT. According to Huang and Roland (2018), SMFT will save the retailers between £2 trillion and £3 trillion a year by making shops more efficient and reducing long queues in stores. The use of SMFT technology in clothing retailing is intended to facilitate both brick-and-mortar space and web-based clothing selections, reduce long in-store queues, and reduce levels of purchase returns by ensuring that the clothing provides the right fit and is of the right shape and size for the customers (Craik, 2018; Senel, 2020).

2.6. Augmented reality technology (AR)

To augment something is to increase or enhance it. Augmented Reality is enhanced Virtual Reality, where live direct or indirect views of physical real-world environments are augmented with superimposed, computer-generated images (Carmigniani and Furtht, 2011; Webel, 2013; Yim et al., 2017; Beck and Crie, 2018; Henningsson et al., 2020). The AR fuses and entangles branded content with the users' own environment and bodies. SMFT is a form of augmented reality technology (Jung et al., 2015; Boardman et al., 2020). As both virtual and real worlds harmoniously coexist, users of the SMFT experience a new and improved natural world where virtual information is used as a tool to aid in everyday activity.

Miell et al (2018) noted that SMFT adds graphics, sounds, haptic feedback and smell to the natural world as it exists. It enhances one's current perceptions of reality (Kim and Forsythe, 2008; Antonioli et al., 2014; Tan et al., 2021). Bulearca and Tamarjan (2010) assert that SMFT takes the world around the user and adds virtual content on top, such that it looks like it is there in the real world. It keeps the real world central, but it enhances it with other digital details by layering new strata of perception onto the user's reality (Huang and Hsu-liu, 2014; Hilken et al., 2017; David et al., 2021).

2.7. The influence of SMFT on clothing retail stores' service quality

Nikkel (2018), Barbara (2018) and Ashish (2020) assert that SMFT has helped various clothing retail organisations in Japan, China, Russia and the USA by providing immediate access to information (data) on the changing needs of their customers while helping retail organizations to develop a high-quality service delivery technique to meet those needs. It opens retail organisations in these parts of the world to the possibility of exploring new customers' trends and offering them exceptional services (Min et al., 2015; Kukard and Wood, 2017).

Bardi (2019) describes the use of a display of outfits on a screen in a 360° formation, with real-time inventory. This increased sales by 11%, reduced time spent in stores, and provided cloud-based analytical insights that expressed customers' buying intentions and how satisfied they were with the organisational service provision processes. Many brands within the Chinese clothing retail sector are linking this smart technology with social media to engage effectively with their customers and bridge the gap between the online and offline services delivery processes (William, 2014; Ashish, 2020).

SMFT gives customers simpler ways to search for and try on clothes, plus more convenient ways to pay for them in-store without queuing up for service representatives' attention (Klein, 2003; Peace et al., 2006; Yim et al., 2017). This innovative technology is being tested with great success by retailers including Ikea, Topshop, Gap, Uniqlo in San Francisco and Tokyo, Ralph Lauren's Polo and the Rebecca Minkoff store in New York, La Praille store in Geneva, Elle fashion show, and Aggreko and Expo Noivas in Brazil (Baldwin, 2012; Javornik et al., 2016; Rauschnabel et al, 2016; Imms, 2019). Chitrakorn (2018) highlighted that one of the unique features of this technology is that it would create a practical omnichannel shopping solution, making it look as if the customers were within an online shopping environment.

A recent survey finds that SMFT increases customer satisfaction by 20% and lowers the cost of serving the customers by 15% (Bidwell, 2020). Pantano et al (2017) argue that there are three key areas where retailers can see unique benefits from this technology:

i) immersive marketing (creating a greater connection with the customers);
ii) aiding practical functionality (e.g. trying on a dress without taking any clothes off);
iii) allowing brands to create virtual representations of their own stores. SMFT helps brick-and-mortar clothing retailers reassure their customers that they are purchasing the real thing (Wright, 2020).

3. Research method

This research took a qualitative approach to develop an understanding of how the use of SMFT will influence and perhaps improve the service quality of brick-and-mortar clothing retailers in the UK. We conducted interviews (27) in conjunction with observations (10) and field notes (10), focusing on the top 5 UK clothing retail chains by the criterion of market capitalisation. This approach was adopted to capture insights through the experience of the world in which the respondents live (King and Horrocks, 2010; Sandy and Dumany, 2011). The justification for using this qualitative research approach is that it enables researchers to study things in their natural settings and interpret phenomena. This approach also enables researchers to capture verbal

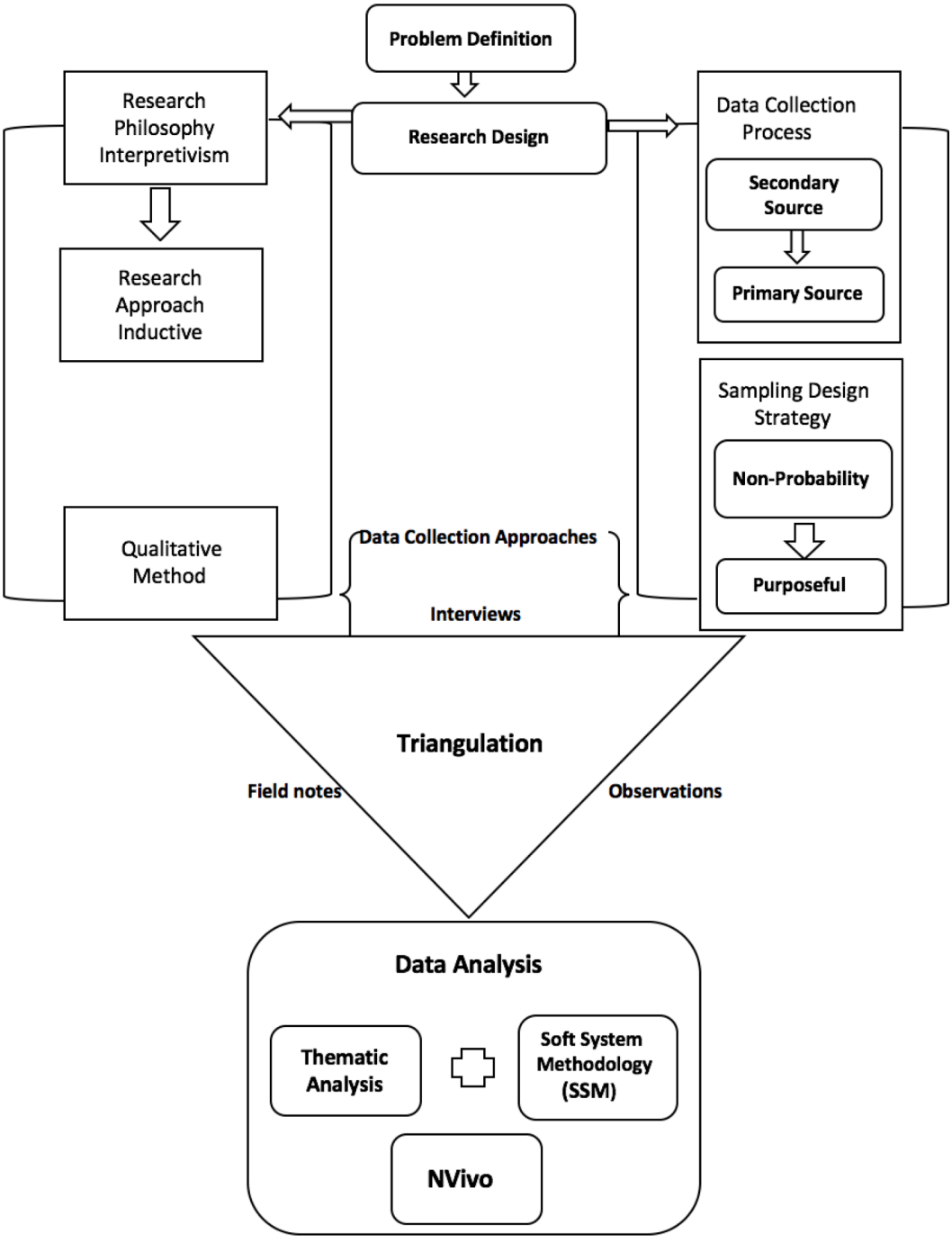

Fig. 1. Outline of research method.

and non-verbal cues in the data collection process. Fig. 1 presents a sketch outlining the research methodology and the steps followed in the data collection process.

Using Soft System Methodology (Checkland and Scholes, 1990), commonly known as SSM, the research has been undertaken in three phases:

- In the first phase, 10 covert observations were carried out within the top 5 UK clothing retail chains selected on market capitalisation to extract viable information. This would reduce the likelihood of bias in later semi-structured interviews, which could then provide a comprehensive understanding of customers' perceptions of service quality with the usage of self-service technology.
- In the second phase, an in-depth literature review was conducted in order to identify additional variables for measuring service quality so as to develop a conceptual framework. After identifying the theoretical construct, 10 face-to-face conversations using field notes were carried out.
- In the third phase, semi-structured interviews were undertaken with customers of clothing retail stores so as to develop an in-depth description of the social phenomena affecting brick-and-mortar clothing retail stores' service quality and customer representatives' attitude toward the service quality management process. More than 40 customers and staff in the UK were approached, but due to GDPR, only 27 participants agreed to take part. The data collected from these primary sources were used to conduct thematic analysis, in order to confirm the overarching themes.

We used a purposive non-probability sampling technique (Easterby-Smith et al., 2012) to find out the causal relationships between the variables and to identify any emergent factors that may have been missed by previous studies. Triangulated semi-structured interviews with observations and field notes proved to be a relatively inexpensive method of fast data collection. They provided access to a wide range of participants. Our naturalistic inquiries led to an in-depth understanding of the social phenomena shaping whether SMFT helps brick-and-mortar clothing retail stores to improve customer relations and service quality in stores. Interviews were carried out across several weeks. Respondents could give meaningful responses regarding their shopping experience (Dabholkar et al., 1996).

After undertaking observations and field notes, interviews were conducted. Each interview took 45-60 minutes. Thus, research findings offered a logical and triangulated variety of evidence (Lapan and Armfield, 2009). Based on the triangulation of the findings, a conceptual framework was developed to enhance the integration of SMFT with traditional in-store transaction processes in order to improve the UK brick-and-mortar clothing retail stores' service quality provision.

4. Results

Firstly, in analysing the collated data, the findings for each community (i.e. customers, customers' representatives, store managers and observers) were divided into core categories (selective code). Secondly, themes from the transcripts of the interviews, the covert observations and field notes were extracted from NVivo 12. Finally, Soft System Methodology (SSM) was used to present a contextualised snapshot of the problems based on this rich picture while proposing solutions.

To give more detail, a clustering descriptive and interpretive coding with SSM was performed on the collected data (27 semi-structured interviews, 10 covert observations and 10 field notes) that reflect the perception of service quality of UK clothing retail stores. The NVivo coding themes frequency results (Service 0.91%, Experience 0.51%, Buying 0.49% and Customers 2.14%) indicated that three-stage thematic analysis coding used was appropriate. Thus, the resultant frequency count on shopping of 249 at 0.85%, queues of 237 at 0.81%, and returns of 168 at 0.57% show that the quality of service received compared to the expected customer service quality perception is low. The frequencies of themes are summarised in Table 1 below. These factors were similar to the context of text passages traceable from the contextualised core categories elaborated in Table 2.

In analysing the collated data, the findings for each community (i.e. customers, customers' representatives, store managers and observers) are divided into core categories (selective code) as drawn from the analysis code linked to the initial nodes' hierarchies in NVivo 12 (see Table 2). Each of the selective codes in Table 2 is used to define the implicit and explicit idea of the sub-categories for the orchestration of the central phenomena for keywords in contextualised and indigenous terms. These findings emerge from the linguistic devices employed by each community to express the long-term impact of their experiences of UK clothing retail stores' service quality.

These core categories are summarised into six main segments as presented in Table 2. This visualises the structural elements of Fitting Room Condition, Queues in the Store Area, Store Layout & Racks Arrangement, Till Payment Area, Customer Engagement & Relations, and Technology and Innovation to enhance their contextualisation. These categories are discussed in detail in the next section.

4.1. Core category one: fitting room condition

The use of fitting rooms while shopping for clothes and the condition of those rooms are crucial touch points that drive consumers' shopping experiences in brick-and-mortar clothing retail stores. Respondents mentioned that *"fitting rooms create an advantage for shoppers to check the fitting of clothes and influenced consumers' purchasing decision."* Team leaders and managers of retail clothing stores emphasised that nearly all their customers used the fitting rooms. This was supported by statements from respondents that they enjoyed the convenience and experience of using the fitting rooms, and that the rooms saved them time and reduced their returns of unfit clothes and unnecessary exchanges.

However, other respondents had different views about fitting rooms

Table 1
Frequency of themes.

Word	Length	Frequency Count	Weighted Percentage
Store	5	974	3.31%
Clothes	7	936	3.18%
Customers	9	628	2.14%
Fitting	7	573	1.95%
Time	4	535	1.82%
Customer	8	372	1.27%
Rooms	5	333	1.13%
Buy	3	326	1.11%
Staff	5	295	1.00%
Online	6	279	0.95%
Service	7	267	0.91%
Use	3	264	0.90%
Racks	5	254	0.86%
Queue	5	253	0.86%
Shopping	8	249	0.85%
Queues	6	237	0.81%
Shop	4	236	0.80%
Section	7	231	0.79%
Room	4	219	0.74%
Payment	7	199	0.68%
Size	4	196	0.67%
Find	4	183	0.62%
Return	6	168	0.57%
Like	4	158	0.54%
Check	5	155	0.53%
Experience	10	150	0.51%
Try	3	146	0.50%
Buying	6	143	0.49%
Till	4	136	0.46%
Waiting	7	135	0.46%
Help	4	131	0.45%
Staffs	6	122	0.41%

Table 2
Core categories with the central phenomena identified in the research analyses.

Core categories (Selective code)	Sub-categories	Central phenomena that relate to core categories (Selective code)
Fitting rooms condition	Fitting Rooms Usage Time spent in the fitting room	Little or no privacy Too small and poorly designed space Dirty and poorly maintained fitting rooms Wrong lighting and fixtures Tried-on dresses left behind in the fitting room Fewer fitting rooms
Queues in the store areas	Queues statistics Time spent waiting in stores	Unpleasant waiting experience, inconvenience, frustration, annoyance and agitation
Till payment area	Paying for service bags Returns and exchanges	Limited number of tills working Limited number of till machines
Store layout & racks arrangement	Easy access to items Inconsistency in clothing sizes	Unstructured store layout and improper racks arrangement Lots of clothes on racks Racks not sign-posted and size inconsistencies Unpleasant return and exchange experiences
Customer Engagement & Relation	Clothing Stores Staffing Level Staff Products Knowledge	Poor customer relations Poor service experiences Proactive services Personal interactions and connected experiences
Technology & innovation	Self-service Facilities Purchasing Clothes Online Click and Collect in Store	Obsolete technology Lack of equipment and facilities

in the UK's clothing retail stores and the physical conditions of those fitting rooms. One customer said: "*the fitting room is sometimes too small for me to get into and use properly; so, for that reason, whenever I need to try on clothes in the fitting rooms, I either have to bend down or sit down to have access to more space."* This was corroborated by observations confirming that the fitting rooms in the women's section of one clothing store were small. Furthermore, drawing cotton lines were used as doors. These did not protect customer privacy, because other customers could walk into the fitting rooms accidentally while people were changing.

The fitting rooms are even more challenging for customers shopping with babies and children. One customer said: "*If I am with my daughter in the buggy, using the fitting room could be very difficult because most clothing stores only have one or two fitting rooms with extra spaces, and this is shared with people with disabilities. I not only have to queue for the fitting rooms, but I still need to wait to get a fitting room with a bigger space, otherwise I can't keep an eye on my baby."*

4.2. Core category two: queues in the clothing store area

The longer the queues in the clothing retail store area, the higher the likelihood that customers will have adverse perceptions about the store's service quality. Customers spend a significant amount of time waiting in line, but every customer has limits on how much they will tolerate. One respondent mentioned that *"we have dropped the clothes that we wanted to purchase and walked out of the store because we were put off by the stress and the frustration of long waiting queues on so many occasions."* This was supported by observations that one customer left the queue, handed back all the clothes she was about to purchase, and walked out of the store without buying anything. According to the response from some store managers and team leaders, "*our store does experience long customers' waiting queues particularly during the busy hours but not as much that we cannot handle."*

Customers cannot be any clearer in their desire for faster quality service provisions and the importance that it will play in their overall satisfaction levels. This was reflected in one respondent's comment: *"the queues in the store are major problems that every organisation needs to critically look into because it is impacting on their ability to shop in brick-and-mortar stores due to their time consumption."* In this regard, one regional manager mentioned that the issue of queues was one the clothing retail stores had been trying to control and for which they had been trying to find an alternative. Keeping the consumer waiting in a long queue was not viable for clothing stores aiming for unique customer experiences. Another customer said: *"Sometimes we are in the queue for 30 to 50 minutes and if the other people have more clothes in their hands to try on, you can spend more time than expected. It is not only in the fitting rooms area that you experience the long waiting queues, the cashiers' till payment area is also another one that takes at least 45 minutes to an hour of your time, which is ridiculous."* This was verified by observations of queues that lasted for about 52 minutes in the till payment area of one clothing store.

4.3. Core category three: store layout & racks arrangement

The retail clothing stores' arrangement and layout, including the display racks, has been found to have significantly impacted consumer purchasing intentions and attitudes toward the clothing stores in the high street. The greatest concerns identified by consumers in physical clothing stores were the store layout and lack of proper information to guide consumers to that for which they were looking. This is reflected in one respondent's comment that: "*the clothing stores' racks and layout are improperly arranged and are not designed to give easy access to finding what the customers are looking for."* This leads to spending more time in a store sifting through large numbers of racks and clothes while purchasing fewer items than intended.

Further, clothing stores have a problem staying up to date with information about price drops and changes on clothes that are on display, particularly outfits that are on sale with reduced prices. One respondent, whose comments were representative of those of the majority said: "*You can spend over an hour or more in clothing stores due to all sort of reasons ranging from ill-designed store layout, lack of proper display of information on clothes, hidden signposts and unclear signage. It leads one to seek for help from customer representatives who at times can't be found on the shop floor. The racks are not signposted, and clothes are crammed up in large numbers on the hangers of each racks, which makes finding what you are looking for more difficult, stressful and disorienting."*

4.4. Core category four: till payment area

The point of payment is ordinarily the final step in any customer's transaction journey. Customers want a simplified process of payment and easy access experiences when shopping for clothes. Although the majority are historically brick-and-mortar clothing shoppers, many are now switching to online shopping due to poor service experiences. This is reflected in one respondent's response: "*the queue at the cashier's till payment area is one of the reasons why we don't like shopping in physical clothing stores, because it is a time-consuming experience that is off-putting and wastes a lot of our time."*

Other customer(s) said: *"The most annoying experience in the clothing store is when there are only 2 till machines working to service more than 25 people in the queue and the remaining 4 till machines are out of service due to shortage of staff or the equipment is faulty."* This comment was validated by an observation of a long waiting queue of about 23 customers in the cashier payment area of the women's section of one high-street clothing store, which had 5 payment till machines with only 2 staff attending both to customers paying for new purchases and others returning items previously purchased from the store.

4.5. Core category five: customer engagement and relations

Every customer wants a unique experience provided through effective customer relations and engagement. Customer engagement and staff interaction can have an impact on their desire to either continue shopping or walk out of the store without purchasing anything. But keeping customers engaged is difficult due to unknowledgeable or sometimes overly attentive staff, as well as the unavailability of items. This was supported by a customer's response: *"generally speaking, some of the staff in the UK clothing retail stores are very unfriendly, unwelcoming, rude and their approaches to customer relations are appalling, mostly when it comes to returns."*

The core of every customer engagement is caring for the consumers. Some customers refrain from seeking help from store assistants when shopping in stores, because the assistants are either too busy or are not interested in helping them find what they are looking for. According to one customer: *"half of the time you would find out that some of the staff lack insightful knowledge about their brands/products and even when they have the clothes, some are very hesitant to even go and check in the back office. They will tell you straight away without checking that they don't have it since it is not on display, which is why some of the customers, or should I say myself, do not personally like engaging with them."*

4.6. Core category six: technology and innovation

Our findings indicate that half of the respondents interviewed preferred to shop online, only occasionally visiting local stores for urgent shopping and collections. Reasons given for preferring online shopping to in-store shopping included: online stores can easily be navigated, clothes can quickly be reviewed, one can compare dozens of clothing stores and their products at a glance without queues, and people can find quality discounted items at cheaper prices without having to travel from store to store. Some respondents said they used hybrid shopping systems: they visited brick-and-mortar clothes stores to check the trends/styles in vogue and try them on and then purchased online at better prices and picked up the clothes in-store afterwards. Other respondents mentioned that they first checked online before heading to stores to be sure the clothes they wanted were available in that store. On the other hand, using a self-service technology has become a welcome alternative for many of these consumers, who want to reduce their waiting times in the stores by having everything done as quickly and as conveniently as possible.

According to a respondent: *"the introduction of self-service checkout facilities in clothing stores will take away the stress and the pressures of long waiting and fast-track the shopping processes. The only condition that can prevent us from not using it is if it is not properly updated with all the necessary information like the prices, discounts, size confirmation, tag removals, authorisation of the vouchers, processing of exchanges and payments' confirmation, etc."*

Interestingly, although some customers preferred online to in-store shopping, other respondents had contrary opinions about online shopping. They perceived it as antisocial, arguing that it does not allow customers to engage with, feel, touch and try on the clothes before buying. This was supported by responses from customer(s) who said *"we wouldn't trust buying clothes from online stores because of the clothing size measurement inconsistency and the inability to see, touch and feel the clothes' fabrics before buying which could result in regular returns and exchanges. We prefer high street shopping because it provides us with the opportunity to try the clothes on and be sure they fit before paying."*

To online shoppers, buying online and picking it up in stores creates a seamless experience, with convenience in both buying and collection. This was mentioned by some respondent(s) who said *"we do buy clothes online and collect in stores because it is cheaper, quicker and more effective. For collection of clothes through click and collect; you don't need to queue and it's less time consuming. We do more of online shopping because most of our favourite stores have click and collect service with next day collection."*

Despite the utmost importance of technology as the core of service production, many of the physical clothing retail stores still rely on outdated equipment, manual inventories and facilities, which have not been updated or replaced to meet today's drastically changing retail landscape. The use of obsolete technology and lack of adequate equipment with poor facilities are some of the other concerns identified as deterring shoppers from the brick-and-mortar clothing retail stores as mentioned by one of the respondents who said: *"most of the clothing retail stores need to continually train their staff and upgrade their infrastructure."*

Based on the core categories used for data contextualisation, the code book report in Table 3 is generated from the NVivo 12 software. The data collected from interview reports, obsrvations and field notes are used for analysis to present the number of files coded in each core category. The references in the report represent the total number of times that data from interview reports, observations and field notes match and confirm the research objectives when calculated using NVivo 12 software coding for each of the core categories to validate the findings.

As shown in the code book report, queue has the largest number of triangulated data sources coded to it from the NVivo analysis of the interview reports, observations and field notes data with 260 coded references of 43 files. This indicates that queues in the UK clothing retail store are a major issue that is impacting customers' buying decision-making. However, other categories such as customer engagement and relations (259 coded references) and store layouts and racks arrangements (245 coded references) did contribute significantly to the poor service quality that has impacted customers' unfavourable buying decisions. Fitting room condition (217 coded references) has a minor impact on customers' buying decisions as well. The references in this code book report indicate the number of times each word in the name section of the code book report table appears when analysing the collected data on NVivo software. The files indicate the list of words that makes up the description in NVivo when extracting the data (interview reports, observations and field notes).

In essence, to gain a more holistic perspective on the data, the development of a rich picture from SSM, as shown in Fig. 2, is used to put into context the factors that respondents identified as affecting service quality provision along with those deterring customers from shopping in the UK's brick-and-mortar clothing retail stores.

The information obtained from the transcripts of the data sources was combined with the validated literature reviewed to develop this rich picture. The rich picture was generated from the themes of the transcripts of the interviews, the covert observations, the field notes, and the quotations linked to the manual codes from NVivo 12. The extracted central phenomena that relate to core categories (as in Table 2) connect the factors in the rich picture to the description context in the code book report in Table 3. The rich picture essentially depicts the factors that affect customers' shopping in the UK's clothing retail stores and their impact on service quality provisions.

Each of these factors has a significant connection to a decline in sales of the clothing retail store in the centre of the rich picture. Poor staff training is interlinked with inexperienced staff which resulted in rude and insincere responses from staff when the customer requests information on products and services. Poor information display is connected to unclear and lack of proper information which leads to staff communicating poorly or offering misleading information to customers about the products and services offered by the clothing retail store. Thus, other factors like the long waiting queues in the fitting rooms area and till payment area that are linked directly to the clothing retail store in the centre of the rich picture also contribute to the poor customer engagement that brings about poor quality control in managing the service quality which resulted in sales decline.

The main reasons reported by customers for being deterred from shopping in the UK's clothing stores are the long waiting queues and inexperienced staff with limited numbers of payment tills. Other areas highlighted are improper racks arrangements, poor structural layouts of stores, and poor engagement with customers. The smallness and lack of

Table 3
Code book report.

Name	Description	Files	References
Factors related to customer engagement and relation	The effects of poor customer relation, poor service experience, proactive service, personal interaction and connected experiences on in-store shopping decisions	40	259
Clothing stores staffing level	High staff turnover, excessive workload, bottlenecks in communication, increase in customer complaints, increase in absences, late in delivery and poor performance	37	116
Staff products knowledge	Lack adequate products knowledge, customer dissatisfaction, misleading information, poor communication, incompetent staff	14	25
Factors related to fitting rooms condition	The impacts of little or no privacy, too small and poorly designed space, dirty and badly maintained fitting room, wrong lighting and fixture, leaving tried-on dresses behind in the fitting room, limited number of fitting rooms for customers when making buying decisions	38	217
Fitting rooms usage	Fitting room area is too small, not enough hangers and hooks, fitting room is littered with dirt, mirror is not clear and no space for seating	17	30
Time spent in fitting room	No staff to offer support in the fitting room area; inconvenient to change in the fitting rooms due to limited space, lack of privacy	15	20
Factors related to queues	Statements that have more validity and accuracy depending on the views and opinions of the participants (customers, staff, and observers) on unpleasant waiting experience, inconvenience, frustration, annoyance and agitation	43	260
Queues statistics	Poor management of queues will result in loss of sales, reduction in customer spending, customer dissatisfaction, reduction in customer patronage	15	22
Time spent waiting in store	Excess queue due to limited number of staff and limited number of fitting rooms	29	68
Factors related to stores layout and racks arrangement	Customers' expression of their view on the impact that unstructured store layout and improper racks arrangement, lots of clothes on racks, racks not signposted, size inconsistency, unpleasant return and exchange experiences have on perception on quality service provision	54	245
Easy access to items	It is difficult for customers to easily access what they are looking to buy from the shop floor. There is no proper sign post for items	16	28
Inconsistency in clothing sizes	Different clothing brands have different measurements for the same clothing size	18	66
Factors related to technology & innovation	Customers' expectations and the impact of obsolete technology, lack of equipment and facilities on their shopping experience	43	125
Purchasing clothes online	Cheaper pricing, quick delivery, access to more items, price comparison, 24-hour shopping, quick and timely payment process	31	124
Self-service facilities	Opportunity for personalized service, quick payment process and service, improved customer satisfaction and experience	13	25
Factors related to the till payment area	Customers' views and opinions on activities within the till payment area and what they experience, i.e., limited number of tills working, limited number of till machines, delays and disappointment	44	238
Click and collect in store	Eliminates the risk and cost of missed delivery, convenient, 24/7 pick-up, drives foot traffic, reduces wait time	11	26
Paying for packaging	Customers don't like paying for packaging because it tears too easily, not eco-friendly, won't stay closed	7	8
Returns and exchange	Inconvenient return policy, unfriendly staff response when returning items, no money back but gift card in exchange	35	102

cleanliness of the limited number of fitting rooms also deterred consumers from trying clothes on when shopping. Furthermore, inconsistencies in sizing and the lack of proper displays of information to guide consumers were other areas of dissatisfaction on which the customers commented.

Following the rich picture in Fig. 2, and in cognisance of the current situation identified in the UK's brick-and-mortar clothing stores, a conceptual model (Fig. 3) was developed to propose a strategy for actionable recommendations in the current service quality provision. In this conceptual model, we provide a concise transformation agenda that needs to be put in place on a step-by-step basis for the transformation of the UK's clothing retail stores' service quality. The implementation of the proposed strategy for actionable change will create a perfect blend of immediacy and convenience that will enhance value creation and further extend the design logic of retail clothing stores' service delivery strategy. Putting the transformation agenda in place will help with the development of activities that will enhance the integration of smart mirror fashion technology with the traditional brick-and-mortar service transaction processes.

This conceptual model is developed through an interpretation of the findings in the literature, interview reports, observations and field notes to provide viable guidelines for actionable recommendations.

In this conceptual model, the concise transformation agenda that needs to be put in place is present in the form of a hierarchical structure, with the major elements in the second layer and the sub-elements cascading from the third layer down to the last layer. The development of the major elements and sub-elements of this transformation process is categorised into two long-term implementation processes which are 2 to 7 years and a short-term implementation process which is 1 to 3 years. Each layer of the major element should be prioritised to formulate the planning process and implementation strategy that will align with the actionable recommendations.

4.7. Actionable recommendations

Shopping in-store is no longer about merely a product purchase, but it is just as much about having an engaging specialised experience driven by innovative business models. This article proposes the implementation of the following measures to help improve the quality of service and consumers' shopping experiences in the UK's brick-and-mortar clothing retail stores:

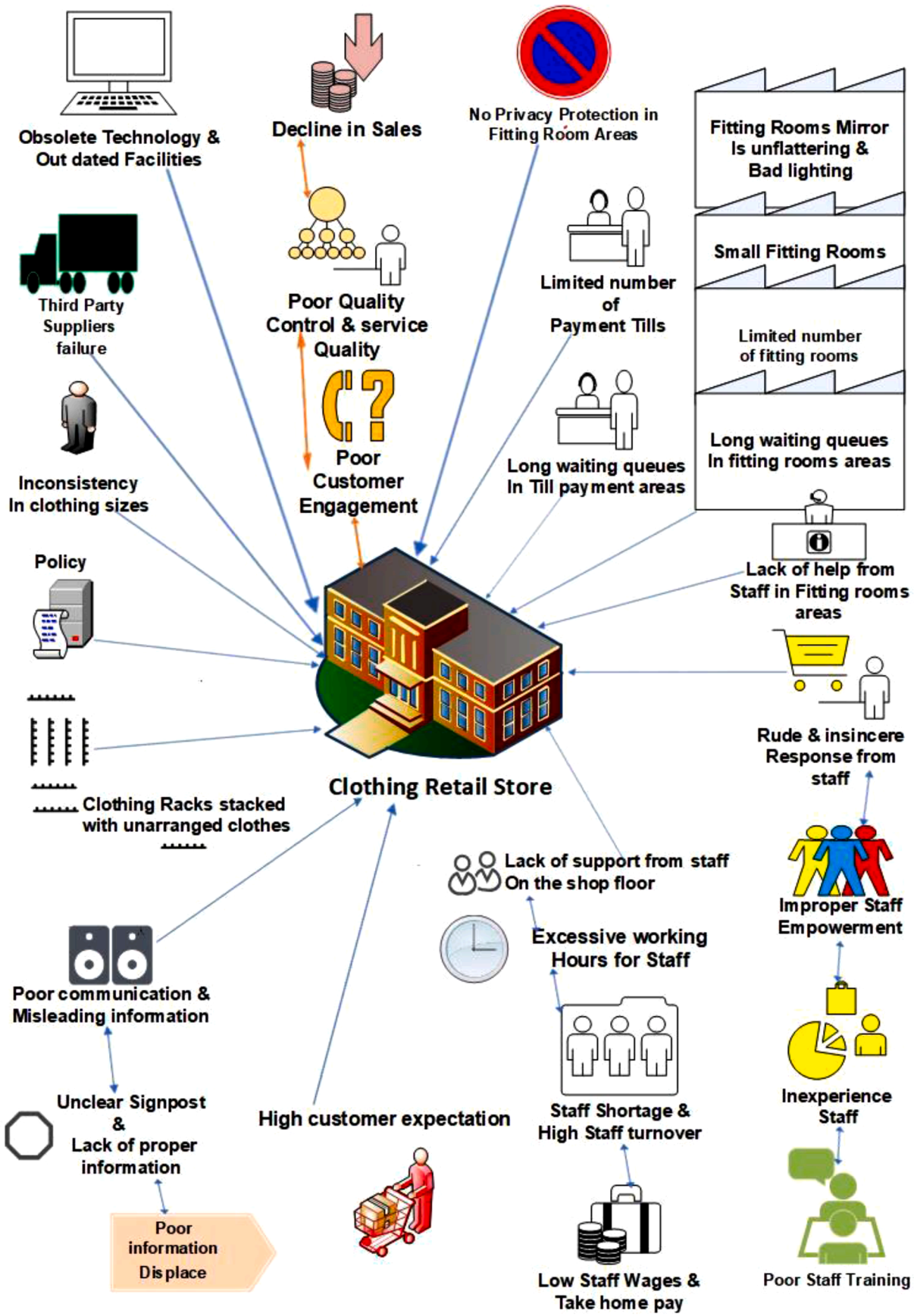

Fig. 2. Rich picture for innovation in service quality management.

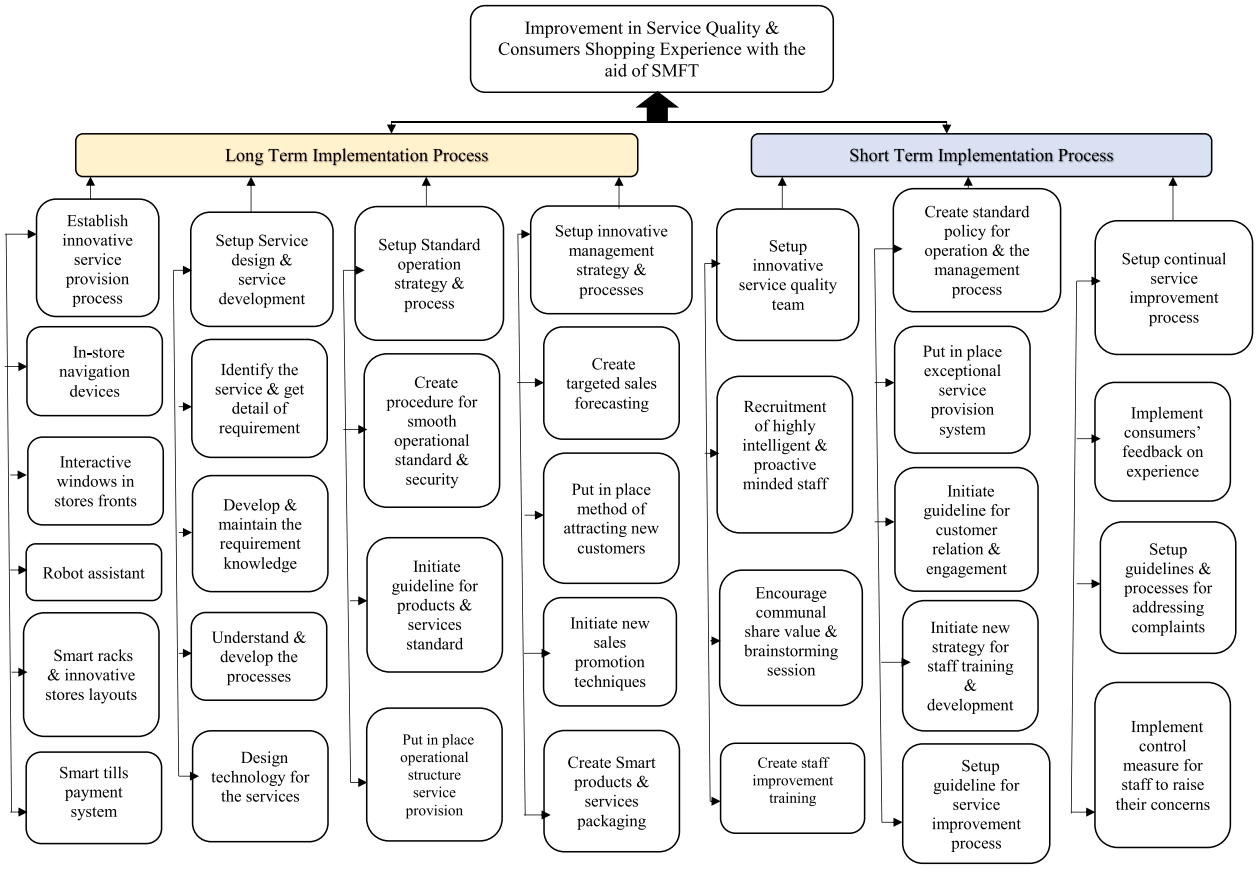

Fig. 3. Conceptual model for the UK's clothing retail stores transformation.

- establish innovative service provision processes through the integration of smart mirror fashion technology with the traditional brick-and-mortar service transaction processes (Fig. 4);
- create smooth and effective communication channels through efficient customer engagement;
- set up service design and service development through the usage of omnichannel service processes and state-of-the-art technological facilities;
- create standards for the development of innovative services through continuous service improvement processes.

To ensure the quality of services delivered by the UK's clothing retail stores, cutting-edge technology must be integrated into the brick-and-mortar clothing space to expand the service horizon. Economically, the implementation of SMFT as an actionable 'change' concept will increase service efficiency, reduce cost, stock-out and lost sales, thus paving the way for increased revenues. In the long run, this smart retailing approach will help the cause of workforce development on par with international standards and create jobs in the economy due to increased business performance. It will offer efficient outputs to customers, which will result in value for money, at times exceeding customers' expectations. However, it must be noted that SMFT must be used in a meaningful way to tailor services to consumers' needs, i.e., to try clothes on without a fitting room and to help solve the real problem of long queues.

From an operational perspective, the use of SMFT will enhance growth in productivity, which will result in significant savings that will be passed on to consumers in the form of lower prices and better-quality service. The integration of SMFT will augment the delivery of better engagement and a highly personalised customer experience. The unification of SMFT with the traditional clothing retail store will provide the customer with a sense of control over their own shopping and service delivery, preventing breaches of confidentiality and security, and obviating any legal issues as the customers themselves opt-in. The customer will have autonomy over their security, profile and protection while using the services. Profile management features of SMFT will make it possible for customers to protectively generate, update and delete account information without having to seek assistance from retail staff or experience interference. For users' security, two-factor authentication is configured into the system for the convenience of end users and their password protection when inputting information or making payments. Thus, SMFT has good feasibility from economic, legal, operational, privacy and security perspectives.

As Fig. 4 shows, the intent of this research is to integrate traditional transaction processes that take place in clothing stores with new technology like SMFT. The integration shows the role that SMFT can play in alleviating some of the stress factors that customers experience in stores today. It is a halfway house between remote online and traditionally-run physical stores, both of which have many limitations.

5. Discussion and conclusion

The improvement of service quality via integration of SMFT has become a significant marketing tool for brick-and-mortar clothing retail stores. The present study has contributed to the research literature on retail clothing stores' service quality improvement in at least three ways:

(i) by adding to the limited number of studies of offline retail stores' service quality improvement in general;
(ii) by developing the conceptual framework that enhances the integration of SMFT with traditional in-store transaction processes in order to improve brick-and-mortar clothing retail stores' service quality provisions in a cultural setting (United Kingdom) in which they have not previously been applied;

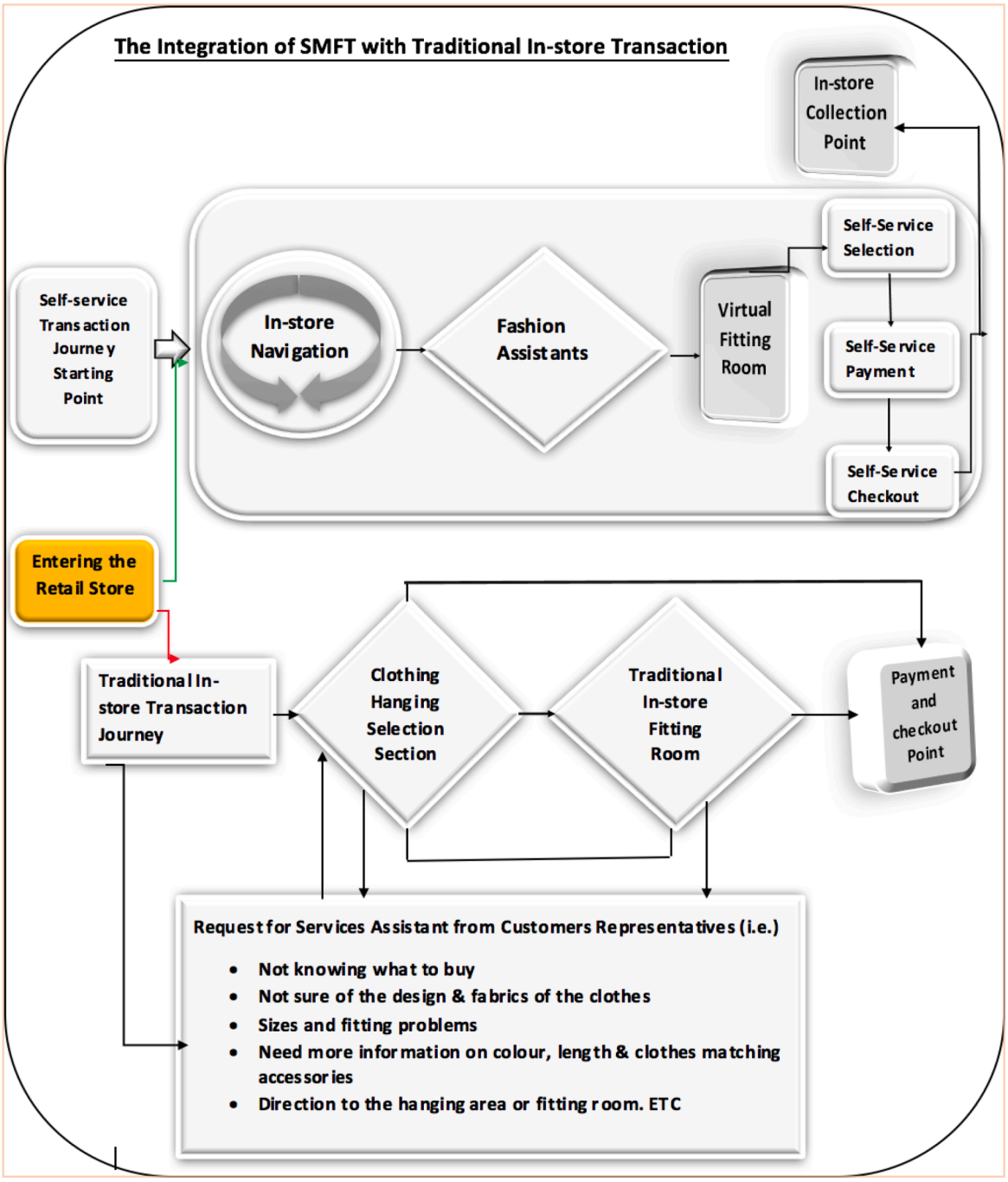

Fig. 4. The integration of SMFT with traditional in-store transactions.

(iii) by triangulating three different research methods (interviews, observations and field notes) to gain a valid empirical evidence base from different social actors (communities), which helps with the discovery of new approaches in tackling the service quality management problems in the UK's brick-and-mortar clothing stores.

From a theoretical perspective, the study offers a significant contribution by expanding and operationalising the notion of intensity for SMFT usage as a source of long-lasting competitive advantage and value creation. Additionally, it contributes theoretically to the field of service quality management by articulating the relevance of smart shopping and its impact on customers' satisfaction and value creation. The contribution to theory is presented by providing a proposed conceptual model for the UK clothing retail stores' transformation. The developed conceptual model is based on the rich picture generated from the themes of the data-collated transcripts linked to manual code from the NVivo 12 software. The proposed conceptual model also aligns well with the integration framework recommendations.

In terms of the managerial contribution, the influence of the SMF technology on customer satisfaction and how it can enhance the service quality of offline retailing will yield a multitude of positive impacts and benefits for the international offline retailing sector, as well as the UK clothing retail stores. On a holistic level, the current findings will help improve the overall performance of the UK clothing retail stores and how they meet their customers' ever-changing needs, as quality service is at the heart of every satisfactory shopping experience. In general, the integration of SMFT into the traditional brick-and-mortar clothing retail

stores will lead to better service quality delivery and thus higher performance and consequently higher customer satisfaction.

Online clothing stores will continue to attract offline stores' customers, and visits to physical clothing stores may drop. However, the managerial benefits of adopting the proposed changes outweigh the risks, because they will provide the UK's clothing retail stores with the opportunity to revamp their business strategies and introduce innovative business tactics that will improve service quality, increase in-store patronage, and provide unique, in-person shopping experiences that will encourage customers' loyalties to the brick-and-mortar clothing stores. Consequently, from the findings and the data analysis, it is clear that the use of innovative technology like SMFT can have a huge impact on the improvement of the UK's brick-and-mortar clothing retail stores' service quality and the creation of value to customers and the retailers.

The UK's brick-and-mortar clothing retail stores must continue to improve their services by 1) offering branded apps and in-store kiosks which enable consumers to watch product demonstrations before visiting the stores; 2) offering consumers personalised recommendations; 3) allowing them to easily navigate around different clothing racks when they are in the store. The UK's brick-and-mortar clothing retail stores should use interactive window displays of clothes to augment service provision and reduce the length of time spent by consumers when shopping for clothes. To reinforce the high street clothing stores' commitment to providing convenient in-store experiences, they must not only adapt their legacy infrastructure to enhance shopping experiences, but they must also embrace innovative technological strategies that deliver great services both physically and digitally. It is apparent that brick-and-mortar clothing retail stores need to improve their service quality to gain and maintain a competitive advantage if they are to survive the ever-changing, highly competitive retail market. To do so, management must offer an engaging high street shopping experience by improving the levels of service quality and a service delivery system. They must create smooth and effective communication channels that enable shoppers to have quality interactions and engagements with knowledgeable customer representatives.

As in any investigation, there are some limitations in this study. One caveat is that the study was focused specifically on offline clothing retailing, which leaves room for further analysis of additional sectors where SMFT could also be considered. As the research is limited to the UK's brick-and-mortar clothing retail stores, it is possible that not all outcomes can be extrapolated to other international markets. Hence there is a requirement for further investigation regarding the application of SMFT to understand its suitability in the wider international context. Another limitation is that interviews in conjunction with observations and field notes could provide biased outcomes due to the context of the discussions and other subjective considerations, as compared to questionnaire or survey-based approaches that could provide quantitative results. Finally, the use of rather generic research terms such as "Service Quality," "Retailing," and "SMFT" may have meant that some technological advances in online shopping are not captured in this inventory.

For future study, research could be undertaken to look at how innovative technology like SMFT can improve the service quality of the brick-and-mortar stores in other regions and countries. Further, research could use different data analysis methods (e.g. quantitative or mixed-method) to investigate the same sector in smaller clothing retail stores.

CRediT authorship contribution statement

Ayotunde Ogunjimi: Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft. **Mizan Rahman:** Supervision, Data curation, Writing – review & editing. **Nazrul Islam:** Supervision, Conceptualization, Writing – original draft, Writing – review & editing. **Rajibul Hasan:** Writing – review & editing.

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