

From Shelves to Screens: Conceptualizing Phygital Retailing in Supermarkets through the S-O-R Framework

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Abstract: This conceptual paper will explore a hybrid approach of phygital retailing, which merges physical and digital shopping experiences to enhance customer engagement and satisfaction. Retailers who want to meet the demands of today's consumers must comprehend the dynamics of physical encounters as retail settings change in tandem with technology. Retailers need to utilize cutting-edge technology that connects online and offline experiences. Physical shopping provides customers with distinctive value propositions. On the other hand, phygital retailing advantages by emphasizing the potential of digital sensing technologies and augmented reality to counter issues in digital purchasing, highlighting their role in creating immersive shopping experiences that mimic the appeal of in-person shopping while retaining the benefits of electronic convenience. This intersection of physical and digital spaces empowers retailers to engage customers on multiple sensory levels, leading to deeper emotional connections and increased purchase intention. Hence, the Stimulus-Organism-Response (S-O-R) theory is deemed appropriate to underpin the research framework. The S-O-R will explain how phygital retailing influences the customer's response, such as purchase intention. Moreover, the relationship between technology and consumer experience poses new opportunities for retailers because the emergence of phygital retailing represents a new strategy in how retailers interact with consumers. Considering positivism as a primary paradigm for this research, the quantitative approach is deemed an appropriate research method to test the proposed model with empirical results. Finally, the outcome of this proposed research framework will help the researcher and manager to explore and further understand the integration of technology with consumer behaviours in the retail setting. In conclusion, phygital retailing is urged to redefine consumer experiences by merging the tactile and immediate benefits of physical retail with the convenience and personalized nature of digital interactions. Retailers can effectively harness this fusion to create engaging, memorable experiences that drive customer loyalty and satisfaction in an ever-evolving retail environment.

Keywords: *Supermarket Innovation, Phygital retailing, P-A-D, Purchase Intention, S-O-R Framework*

1. Introduction and Background

COVID-19 has disrupted the traditional retail landscape into a new retail landscape. Lockdown and social distancing have pressured retailers to introduce new interaction methods in the customer journey. Moreover, the customers also desire less human interaction for safety and convenience in their purchases. Stan et al. (2024) mentioned that the interaction of technology during the COVID-19 pandemic has led to faster and safer customer service in business practices. Most retailers launched self-service technologies in their retail stores to enhance their customer experience through contactless payment, mobile commerce, virtual try-on, augmented reality, self-checkout and others. Therefore, the emergence of phygital retailing has fundamentally altered the retailing landscape, especially supermarkets, by blending the physical shopping experience with digital technology in innovative ways. This hybrid approach, called "phygital," leverages the strengths of both physical and digital channels to enhance consumer experiences, hence creating a seamless shopping journey that caters to evolving consumer preferences (Kumar et al., 2023).

While the retail industry continues to adapt to technological advancements and consumer expectations, employing frameworks such as the Stimulus-Organism-Response (S-O-R) model proves essential in understanding how these changes affect consumer behaviour and shopping experiences. In the context of supermarkets, the S-O-R framework provides a robust basis for analysing how various stimuli which ranging from store layout to digital interfaces to influence consumer perceptions and interactions (Pereira et al., 2023). Specifically, the stimuli can include the ambience of the store, promotional displays, and the integration

of digital tools like apps for online shopping. The organisms—consumers—then process these stimuli, shaping their emotional responses and cognitive evaluations, which ultimately drive their purchasing decisions and overall satisfaction (Wang et al., 2022). Sensory inputs both physical and digital domains must harmoniously converge to evoke positive shopping that is crucial in a phygital retail environment.

Recent consumer behaviour research highlights that the integration of visual merchandising and technology within supermarkets significantly impacts impulse buying and overall consumer engagement (Sahari et al., 2024). Digital signage and interactive displays as visual elements are not only capturing consumer attention but also crucial in forming their perceptions about product value and brand equity (KÖSEOĞLU & Tuncer, 2023). This interaction between stimuli and consumer response can lead to increased patronage intentions, vital for supermarkets aiming to enhance consumer loyalty in a fiercely competitive market (Tatua et al., 2023). As consumers increasingly demand flexibility and convenience, understanding the influences behind their purchasing behaviours through frameworks like S-O-R becomes paramount. This contextual understanding can guide supermarket retail management in leveraging both physical aspects and digital technologies to craft experiences that resonate with their target demographics (Kumar et al., 2023).

This paper aims to explore the characteristics of phygital retailing in the context of supermarkets through the lens of the S-O-R framework. The integration of traditional retail elements with digital innovations shapes the pleasure, arousal and dominance of customers in the retail environment, hence will influence their purchase intention. By examining these dimensions, the researchers try to provide a comprehensive understanding of the evolving nature of supermarket retail and the implications for future retail strategies.

2. Literature Review

The overview of supermarket innovation

The landscape of supermarket innovation is evolving rapidly, driven by advancements in technology that enhance operational efficiency through customer experience and engagement. Supermarket innovation aims to enhance customer experiences and meet the evolving preferences of consumers in a highly competitive landscape among retailers through phygital retailing. This approach blends physical and digital experiences to create a more immersive customer journey, enhancing satisfaction and engagement. A significant driver of supermarket innovation is the rise of phygital marketing strategies, which leverage advanced technologies such as artificial intelligence, augmented reality, and the Internet of Things (IoT). All these drivers were developed to enhance customer engagement. The concept of "digital convenience" is another facet of supermarket innovation that aims to streamline the customer journey. Dimitrova (2024) highlights how retail operations are increasingly adopting technologies to cater to consumer expectations regarding convenience throughout the shopping process. The trend towards integrating online and offline sales reflects a broader shift towards omnichannel strategies that enhance customer satisfaction. By providing various digital tools within physical stores, supermarkets can offer customers the convenience of digital solutions without losing the tactile experience of shopping.

Farahita & Kurniawati (2022) asserted that smart technologies facilitate retail transactions that do not require much of traditional interactions. On the other hand, it improves the overall shopping experience. For example, the integration of self-checkout systems and mobile applications demonstrates the movement towards automating shopping processes while maintaining consumer engagement. The integration of self-checkout systems has greatly streamlined the shopping experience and allows customers to process their transactions independently. Moreover, it will reduce queue times, which subsequently will improve overall satisfaction. In addition, mobile checkout solutions, where customers can scan products using their smartphones, are gaining traction, effectively decentralising the billing system and expediting the checkout process without the need for traditional cashier services. This trend aligns with the broader movement towards automating services within supermarkets, as evidenced by studies reflecting heightened convenience and preference for self-service technology among shoppers (Bauerová, 2019). Apart from that, the implementation of innovative store formats, such as automated supermarkets, indicates significant innovations within the supermarket sector. Zhao (2023) examines how these formats aim to maintain competitiveness and adapt to new consumer behaviours.

Technology has evolved and modified many of the retail activities. Supermarkets are experimenting with unmanned services that promise increased efficiency and cost-effectiveness, catering to a tech-savvy customer base that values speed and convenience. Wu (2024) highlighted the necessity for a different approach in the grocery sector through the innovative blend of online and offline interactions. The concept of new business models, like food delivery, underscores the importance of leveraging consumer proximity and real-time data to enhance revenue while delivering an unparalleled shopping experience. Thus, supermarket innovation relies heavily on the integration of digital technologies and innovative strategies that redefine the customer experience. By embracing phygital marketing, enhancing convenience through technology, and exploring new store formats, supermarkets are not only fostering customer loyalty but also adapting to the rapidly changing retail landscape.

The overview of phygital retailing

The emergence of omnichannel retailing, particularly post-COVID-19, has catalysed this transformation. Studies indicate that consumers have become increasingly tech-savvy and are looking for integrated shopping experiences where they can transition seamlessly between physical and digital realms (Lisnawati et al., 2023; Barbosa & Casais, 2022). Retailers are tasked with adopting strategies that not only combine multiple sales channels but also ensure a consistent and cohesive brand experience across these channels (Ahmed, 2023; Yin et al., 2022). For instance, the integration of technological tools—like mobile applications—into physical retail spaces allows customers to engage interactively, compare prices, and check stock availability in real-time, creating a more improved shopping journey (Khrais & Alghamdi, 2021). Sukheeja & Shekhawat (2025) discuss how phygital marketing merges physical and digital experiences, transforming consumer interaction with brands. Such innovations encourage supermarkets to create environments where customers can enjoy seamless transitions between online and offline shopping, hence enhancing overall shopping convenience.

Thus, the concept of a phygital store shift is driven by advancements in technology and the evolving preferences of consumers who demand seamless interactions in retail activities. Phygital retailing represents a transformative approach that integrates the physical and digital aspects into a seamless retail experience. Also, aiming to provide customers with a unified and enhanced shopping journey (Ryu et al., 2023; Solem et al., 2022; Lang & Bressolles, 2013). Phygital retailing can fundamentally reshape how consumers interact with retailers. This approach integrates technology and in-person experiences, enhancing accessibility and engagement while satisfying evolving consumer expectations. The key characteristics of phygital retailing include a hyper-focused customer experience, the incorporation of interactive technologies, and the agility of businesses to adapt to market changes. According to Gagné et al. (2024), the deployment of self-service technologies can significantly impact customer satisfaction and buying intentions, emphasising the necessity of a fluid omnichannel experience within retail. This seamless transition between online and physical shopping not only meets consumer expectations but also enhances overall satisfaction by enabling effortless interaction across multiple channels. Lawry (2022) highlights that luxury retail shoppers balance hedonic and status-driven goals through these integrated experiences and illustrating the need for a harmonious blend between physical and digital retail strategies.

The role of technology in phygital retailing is very important because interactive technologies enrich the customer experience while actively engaging users (Boudkouss and Djelassi 2021). Retailers are increasingly adopting these technologies to create memorable shopping experiences that extend beyond traditional retail paradigms. Sharma et al. (2024) note that research on habit development should include these technologies to facilitate personalised customer journeys in phygital environments. Hence, it will help retailers build long-lasting relationships with their consumers. Guzzetti et al. (2024) argue that phygital frameworks significantly redefine how consumers perceive luxury retailing, potentially positioning these approaches as disruptive innovations in the sector. Moreover, phygital retailing requires adaptive business models to accommodate the rapidly changing retail consumer landscape. As businesses adopt more consumer-centric strategies, the shift from traditional multichannel approaches to more sophisticated omnichannel strategies becomes evident. Purcărea et al. (2025) propose a framework that leverages data-driven insights and adaptive technologies to enhance the phygital shopping experience. This transition of adaptability allows retailers to remain competitive and responsive to consumer preferences, further reinforcing the dynamic nature of phygital retailing.

Indeed, phygital retailing embodies an innovative integration of physical and digital retail experiences, characterised by a seamless customer journey, the utilisation of advanced technologies, and a commitment to adaptability. As the retail landscape continues to evolve, the insights gained from phygital approaches will be invaluable for retailers striving to meet the needs and expectations of modern consumers.

The characteristics of phygital retailing (S)

Phygital retailing in supermarkets combines wide technological advancements that increase customer engagement and upgrade the shopping experience holistically. There are several key characteristics of this integrated approach, including click and collect, in-store reviews, augmented reality (AR), location-based push notifications, contactless payments, self-checkout, and self-ordering systems. Each of these elements plays a vital role in developing immersive, seamless interactions between physical and digital environments that cater to the evolving needs and preferences of consumers.

Click and Collect: The click and collect service offers customers the convenience of purchasing products online and picking them up at a physical store. This hybrid model reduces wait times and allows for greater efficiency. Wieland (2021) described that this approach caters to contemporary consumer needs by enabling them to research products online before making a purchase, thus combining the benefits of immediate physical access with the ease of digital shopping. Click and collect allows customers to buy products online and pick them up at a physical store or designated collection point. This approach effectively merges online shopping convenience with the immediate gratification of in-store purchases. This model resembles aspects of traditional retailing, making it an effective solution for consumers seeking flexibility and efficiency (Shahmohammadi et al., 2020). This hybrid strategy adopted by retailers can leverage inventory management systems to provide real-time stock data. It also ensures that customers find their desired items when they arrive in-store. For instance, Grab provides this service to Grab users, where customers can buy groceries through the Grab platform and choose to self-collect their order at the chosen supermarket.

In-Store Reviews: In-store reviews empower customers to make informed purchasing decisions by providing feedback from previous buyers right at the point of sale. The incorporation of interactive technologies in retailing serves to validate purchasing choices and enhances the overall confidence of consumers (Boudkouss & Djelassi, 2021). When customers encounter product reviews posted in-store, they are more likely to feel assured about their choices, especially for products and services perceived as risky or of high cost. Aw et al. (2021) reveal that the inclusion of interactive online reviews aids in promoting "webrooming," where consumers research products online before purchasing them in-store. This real-time customer feedback can enhance validation, reducing perceived uncertainty regarding product quality. By displaying reviews through digital interfaces or integrated mobile applications, supermarkets can tap into social proof to increase customer involvement and engagement, which will lead to satisfaction.

Augmented Reality (AR): The integration of AR happened through interactive tools such as augmented reality and digital kiosks that reinforce the in-store experience (Boudkouss & Djelassi, 2021; Prats, 2022). Retailers facilitate this integration by deploying technologies that allow customers to visualise products in a physical context while accessing additional information seamlessly via digital mediums. For example, interactive mirrors and touch screens enable consumers to virtually try products or personalise their shopping experience, thus enhancing engagement and satisfaction (Prats, 2022; Massi et al., 2025). All interactive features can be particularly beneficial in supermarkets, where customers can use their mobile devices to see how certain products look in their homes or to view additional product information through virtual overlays (Çakırkaya & Koçyiğit, 2024). Bonfanti et al. (2023) found that such immersive experiences engage consumers more effectively and can lead to higher conversion rates and consumer loyalty.

Location-Based Push Notifications: Molitor et al. (2025) define Location-based push notifications as providing retailers with the ability to deliver messages directly to consumers' smartphones when they are within a designated area or near a retail location. Utilising GPS technology, supermarkets can send personalised offers and notifications to customers' smartphones as they enter a store or navigate different aisles. These push notifications can guide consumers toward sales or promotions, thus enhancing the shopping experience with timely information. Kumar et al. highlight that such strategies significantly boost customer engagement by creating relevant and enjoyable in-store experiences tailored to individual shopping

behaviours (Kumar et al., 2023). For example, the customer will receive the notification of promotion, loyalty program, exclusive deal and so on.

Contactless Payment: The integration of contactless payment systems revolutionises the checkout process, allowing customers to complete transactions swiftly and securely using smartphones or contactless cards. Johnson and Barlow discuss how this convenience aligns with consumer preferences for ease of use and speed, especially in a post-pandemic world where hygiene concerns are heightened (Johnson & Barlow, 2021). Retailers can improve customer turnover rates with quick checkouts enabled by contactless systems. Park et al. (2022) identified that users' intentions to adopt contactless payment systems are significantly influenced by their satisfaction with the seamlessness of these transactions. Customers appreciate instant payments simply by tapping their cards or mobile devices at the point of sale, which eliminates cash handling and reduces queuing times.

Self-Checkout: Self-checkout systems provide customers with autonomy and control over their shopping experience. By allowing consumers to scan and pay for items without cashier assistance, supermarkets can reduce waiting times and enhance convenience, which is paramount in today's retail environment (Mikheev et al., 2021). Rashid et al. (2024) added that self-checkout can contribute positively to customer usage intention by reducing the wait associated with traditional cashier-operated checkouts, and Zaveri et al. (2022) affirmed that these systems can effectively mitigate long queues in supermarkets.

Self-Ordering Systems: Supermarkets are increasingly incorporating self-ordering kiosks, enabling customers to place orders for prepared foods or catering services directly from in-store systems. This not only speeds up the process but also allows customers to customise their orders precisely to their preferences, enhancing satisfaction (Marta & Wahyudib, 2023). Self-ordering systems will provide a touchscreen kiosk within the retail space (Weny et al., 2024), facilitate order customisation, and a user-friendly interface (Heriyanto & Husni, 2023) to encourage efficiency & speed.

Hence, the key characteristics of phygital retailing in supermarkets—including click and collect, in-store reviews, augmented reality, location-based push notifications, contactless payment, self-checkout, and self-ordering systems—collectively enrich the customer shopping journey. By seamlessly integrating digital tools within physical retail spaces, supermarkets can enhance customer satisfaction, drive engagement, and promote loyalty while staying competitive in a rapidly evolving retail landscape.

Mehrabian and Russell Theory (P-A-D Model) (O)

Mehrabian and Russell (1974) found that pleasure-arousal-dominance (PAD) is the dimension to measure emotions such as pleasure (happiness or satisfaction), arousal (feeling in stimuli) and dominance (feeling to control the situations). Customer pleasure might affect their happiness and satisfaction in influencing their purchase intention, especially in phygital retail. Shang et al. (2023) asserted that the background colours and music can increase pleasure perceptions among customers through an interactive approach in a phygital retail platform can make them excited about the platform. The attractive atmosphere in a digital environment can foster customer pleasure to have a joyful purchase experience. The attractive elements, such as interactive features, visual storytelling, and even ambient digital elements, contribute to creating an inviting online atmosphere that resonates with consumers on an emotional level (Rana et al., 2023). Vicente-Ramos & Cano-Torres (2022) discussed that engaging digital experience not only leads to immediate satisfaction but also encourages repeated engagement, showcasing the interconnectedness of experience design and consumer behaviour in an online retail setting. Furthermore, the immediate feedback provided by mobile payment technologies—such as auditory alerts confirming successful transactions—has been shown to improve transaction satisfaction and reinforce positive feelings associated with spending (Li et al., 2024). Additionally, Wang et al. (2022) asserted that through mobile payment, customers feel satisfied and convenient to spend their time on shopping activities.

Jiang et al. (2022) and Supriatna et al. (2023) supported that heightened arousal enhances emotional engagement among customers and drives them to make purchasing decisions more readily. The interplay between emotional arousal and customer experience is especially salient in contexts where sensory stimuli are involved. As these social cues involve human-like interactions, they can stimulate emotional arousal, thus

positively impacting customer attitudes and purchase intentions (Jiang et al., 2022). Besides that, the consumers are more inclined to engage in purchasing when their emotional needs are met (Supriatna et al., 2023). The emotional responses elicited from customer interactions are not only immediate but can also contribute to repeat purchases and lead to long-term loyalty. It can also reinforce the need for businesses to focus on enhancing emotional engagement strategies (Kosasih et al., 2022).

Customer perceived dominance can enhance the likelihood of making purchase decisions. Jeong et al. (2024) emphasised the impact of emotional experiences on consumers' brand attitudes in the context of luxury goods and found that positive emotional experiences can significantly influence intentions to purchase luxury items. This aligns with Alshohaib (2024), which indicates that emotional states, including feelings of dominance, directly affect online shopping behaviours and contribute to repeat purchase intentions when consumers feel empowered during their shopping experiences. In addition, Taghikhah et al. (2021) mentioned that consumers' willingness to pay a premium price is related to their perceived dominance over their product choices. When consumers feel they have sufficient control and understanding of the value of what they are purchasing, they are more likely to pay higher prices for these goods.

Purchase Intention (R)

Emotional engagement is critical in influencing purchase intention. Mele et al. (2021) emphasised that emotional and behavioural responses arise from various activities and interactions in the phygital environment, which in turn influence both the perceptions and decisions of consumers. Pusceddu et al. (2023) explained that emotions experienced while shopping are not only triggered by the physical environment but are also amplified through digital interactions, which can influence purchase decisions. Moreover, the use of sophisticated technologies, such as augmented reality (AR), can enhance the phygital experience by providing immersive and interactive opportunities for consumers. Johnson and Barlow (2021) found that the innovations in phygital marketing, including digital sensing and AR, can bridge the gap between the traditional in-person shopping experience and the digital landscape, enriching the consumer's overall shopping journey. This convergence supports higher purchase intentions as consumers feel more connected and engaged through personalised and immersive experiences (Yildiz, 2024)

The Stimuli-Organism-Response (S-O-R) & Proposed Conceptual Framework

The Mehrabian and Russell Theory, also known as the stimulus-organism-response (S-O-R) model, provides a framework for understanding consumer emotions and behavioural responses within retail environments. This theory posits that external stimuli (such as environmental factors) influence internal emotional states, which in turn affect consumer behaviours. In the context of modern retailing, particularly phygital retailing, this theory gains new relevance as digital technologies increasingly shape consumer experiences. In retail environments, factors such as store layout, decor, lighting, and interactive displays can affect consumer emotions. These factors aligned with the emotional dimension emphasised in Mehrabian and Russell's model. Guzzetti et al. (2024) suggest that properly designed phygital experiences can ignite emotions that significantly impact consumer engagement behaviour in luxury retail settings. Retailers that successfully integrate technology into the shopping environment are likely to evoke positive emotional responses, leading to enhanced satisfaction and repeat visits.

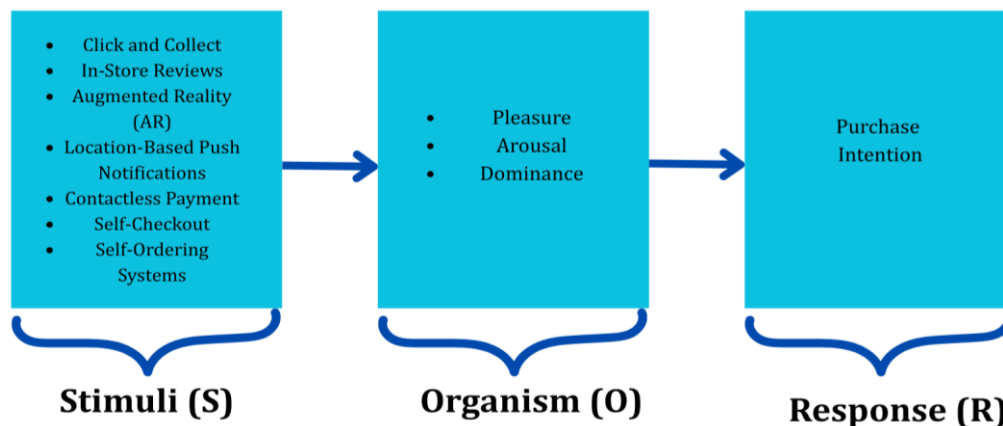
The customer's emotional responses dictate whether consumers engage with a retailer or abandon the shopping experience altogether. Moreover, the emotional engagement facilitated by innovative technologies such as augmented reality contributes to the overall organisational response within the consumer journey. Çakırkaya & Koçyiğit (2024) noted that digital marketing communications, particularly those that employ AR, can improve consumer involvement with brands, creating memorable interactions. This engagement is pivotal, as it transforms passive consumers into active participants in the retail experience, thereby facilitating stronger relationships between consumers and brands. Utilising the S-O-R model also aids in clarifying how different stimuli affect distinct emotional responses, leading to consumer behaviours such as impulse buying. Johnson & Barlow (2021) reinforce this perspective by reviewing the psychological intricacies behind consumer behaviours, explaining how phygital innovations can create moods conducive to purchasing. By combining physical and digital elements, retailers can create environments that encourage positive emotional responses, thereby increasing the likelihood of consumers making purchasing decisions. Furthermore, as noted by Mele et al. (2023), the continuous evolution of phygital retail requires a complex understanding of how stimuli and

emotions interact to guide consumer journeys. An effective phygital strategy incorporates elements designed to evoke specific emotional responses, thus dictating consumer behaviours in line with the S-O-R framework. Ultimately, integrating these insights into the broader marketing and retail strategies enables brands to cater to the emotional needs of consumers, fostering loyalty and enhancing the overall shopping experience.

Sivasothey et al. (2024) emphasise the enduring significance of the S-O-R framework in the service industry, demonstrating how environmental factors affect emotional states that drive consumer behaviour. This aligns with the findings of Chen et al. (2021), who applied the S-O-R model to identify how emotional evaluations influenced consumer responses in various contexts, including tourism experiences. The emotional engagement facilitated by such stimuli can generate profound effects on customer loyalty and satisfaction levels. Furthermore, emotional responses engendered by stimuli can control behaviours, reinforcing the significance of emotional states in the customer engagement process. Alsaggaf & Althonayan (2018) apply the S-O-R framework to investigate how emotional and cognitive responses mediate relationships influenced by service quality, showcasing how specific stimuli can steer customer loyalty intentions. The findings state that cultivating positive emotional states is vital for enhancing customer loyalty and retention. Additionally, Pambudi et al. (2023) extend the S-O-R model to elucidate how emotional responses linked to trust and perceived value can significantly impact purchase intentions, establishing a framework that connects emotional engagement to consumer behaviour effectively.

Thus, S-O-R theory is relevant for this research to analyse the consumer behaviour in phygital retail by focusing on the supermarket sector. The elements in phygital retail will be analysed to measure the stimuli that can affect customers' pleasure, arousal and dominance. This is essential to know whether the phygital environment can attract purchase intention among the customers in Malaysia.

Figure 1: Proposed Conceptual Framework



3. Research methodology

Considering positivism as a primary paradigm for this research, the quantitative approach is deemed an appropriate research method to test the proposed model with empirical results. Based on the previous studies and data collection methods that involve using certain instruments, such as a survey questionnaire, to gather quantitative data. (Salkind, N. (2013). For this study, the primary data will be from respondents who have experience as customers in phygital retail through a survey questionnaire, which may be written or oral; thus, for this research online survey is the most suitable method to gather the data. A survey questionnaire costs less than other methods and provides greater population coverage for this study. Given this orientation survey questionnaire must be developed to include all the construct variables in the research model.

Quantitative research methodology focuses on the collection and analysis of numerical data to understand patterns, relationships, and phenomena. In developing and executing a quantitative research study, several critical steps are typically followed, which can be articulated through the elements of problem formulation,

hypothesis development, sampling, data collection techniques, and statistical analysis. This study hypothesizes that the integration of digital elements in a physical retail setting enhances customer engagement. Kumar et al. (2023) substantiate this notion, demonstrating how phygital experiences can indeed transform customer engagement and shape their patronage intentions. Quantitative hypotheses formed in this manner are critical as they set the groundwork for statistical testing.

Sampling, which involves selecting a representative subset of the population and effective sampling methods of sampling ensures that the gathered data reflects the larger population's characteristics. This is especially pertinent in retail settings where consumer diversity can influence shopping behaviours (Bonfanti et al., 2023). The research must be explicit about the sampling strategy employed, as it critically affects the generalizability of the findings.

Data collection techniques in this quantitative research typically employ surveys, experiments, or observational methods. In the context of phygital retailing, surveys facilitated through digital platforms can effectively gather consumer experiences and interactions with retail environments. This method allows researchers to quantify variables, such as experiences of technology integration and its impacts on consumer engagement. Moreover, advances in artificial intelligence and digital technologies have opened avenues for novel data collection methods, enriching traditional approaches. Statistical analysis is the culmination of the quantitative research process. Analysing the collected data involves applying appropriate statistical tests to validate or refute the hypotheses. Techniques such as regression analysis, ANOVA, or structural equation modelling are frequently used to evaluate data and ascertain the strength of relationships between factors. For example, analyzing consumers' responses could reveal significant correlations between customer engagement and phygital retailing.

To summarize, a robust quantitative research methodology emphasizes a systematic approach encompassing problem definition, hypothesis formulation, careful sampling, and rigorous data collection and analysis. In the evolving context of phygital retailing, leveraging these steps helps understand intricate consumer behaviours and enhances the overall retail strategy.

4. Discussion

The concept of phygital retailing includes a blend of physical and digital experiences, which offers a transformative approach to customer engagement and shopping experiences. This convergence has generated interest across multiple disciplines, leading to a rich body of literature exploring its implications, mechanisms, and effectiveness within diverse contexts. Phygital marketing is a pivotal strategy that leverages both physical presence and digital technologies to enhance customer engagement (Sukheeja & Shekhawat, 2025). The necessity of integrating these dimensions to create compelling customer experiences. This notion is echoed by Purcărea et al. (2025), who argue that retailers must utilize data-driven insights and adaptive strategies to optimize phygital experiences, particularly in the context of evolving consumer behaviours. In examining specific consumer behaviours, innovative technologies influence customer experiences (Kumar et al., 2023). Hence, employs the Stimulus-Organism-Response (S-O-R) framework to elucidate the pathways through which phygital elements contribute to customer engagement. Similarly, Pusceddu et al. (2023) explore the typologies of customer experiences in high-tech retail environments, offering insights into how firms can manage and enhance these experiences through agile strategies. This research is deemed to present a unified perspective that the thoughtful integration of digital tools within physical stores can significantly bolster customer experience and engagement. Bartoli et al. delineate nine building blocks of phygital brand environments, demonstrating the complex interplay between consumer experiences, environmental features, and brand interactions (Bartoli et al., 2023). This framework suggests that thoughtful design elements within phygital environments can enhance relationship-building processes between brands and consumers, engendering deeper loyalty and emotional connections.

5. Managerial & Theoretical Implications

The implications of phygital retailing experiences encompass both managerial and theoretical dimensions, reflecting the increasing integration of physical and digital elements in consumer interactions. As organizations

navigate this evolving landscape, understanding and leveraging these dual modalities become paramount. The managerial implications of phygital environments require a strategic focus on enriching consumer journeys, enhancing customer engagement, and optimizing operational efficiencies.

From a managerial perspective, creating a phygital retailing experience involves recognizing the benefits derived from employing a variety of consumer touchpoints. This framework may indicate that customers who encounter multiple touchpoints throughout their shopping journey report enhanced purchase behaviours and overall experience. The ability to blend online elements, such as personalized recommendations and digital storefronts, with in-store experiences can create a richer, more satisfying shopping context that resonates with consumers (Kumar et al., 2023). Furthermore, in navigating the complexities of phygital environments, retailers must adopt flexible strategies that address the diverse needs and preferences of customers. Recent studies emphasize that the effective management of customer experience in phygital contexts not only enhances consumer satisfaction but also fosters loyalty. This necessitates implementing agile strategies that can adapt to varying customer responses in high-tech retail settings. Such approaches allow firms to harness both physical and digital characteristics, tailoring interactions to fit specific consumer demands and thereby enhancing the overall phygital customer experience. Theoretical insights about phygital environments further enrich our understanding of consumer behaviour in these hybrid spaces. This theoretical lens prompts further inquiry into how emotions, contextual factors and consumer touchpoints interact within phygital environments. By examining these dynamic interactions, researchers can better understand the elements that drive customer satisfaction and loyalty in a phygital context.

Moreover, as digital technologies continue to shape the retail landscape, the need for a systematic framework that delineates the components of phygital strategies becomes increasingly important. Identifying key aspects such as technological innovations, the role of physical spaces, and the implications of consumer interactions can inform both academic scholarship and practical applications within retail environments. Such frameworks will assist managers in leveraging insights from consumer behaviour studies to cultivate unique and pertinent phygital strategies that drive competitive advantage. Importantly, as phygital retailing matures, companies must focus on creating immersive and seamless experiences. The alignment of design principles to ensure sensory coherence between physical goods and digital services may significantly enhance customer interaction. This immersive approach not only augments the customer experience but also transforms consumer expectations regarding how products and services are marketed and delivered in a phygital framework.

Conclusion

The objective of this paper was to establish a future possible research framework to explain the phygital retailing profile, compare and explore the characteristics of customers who took part in these retail activities. In conclusion, the integration of physical and digital elements in retail poses both significant challenges and opportunities for managers. Understanding the dualistic nature of consumer experiences in phygital contexts can inform strategies that enhance engagement and operational effectiveness. Theoretical frameworks focused on phygital experiences will continue to evolve, demanding ongoing research to capture the richness of consumer interactions and the implications for retail management practices. The emergence of omnichannel retailing has reshaped consumer expectations and necessitated strategic adjustments among retailers. As consumers increasingly seek integrated shopping experiences, the need for retailers to adopt cohesive and consistent strategies across various channels becomes clear. Research suggests that a broad focus on data integration, supply chain optimization, enhanced engagement, and consistent branding is crucial for retailers aiming to thrive in the new normal.

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