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# Understanding Social Motivation in Scan and Go Technology

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## ABSTRACT

This paper offers novel insights into the embedding of self-service technology in consumers' daily buying behaviors at supermarkets. It takes a social constructivist perspective so that the process of the research goes beyond standard technology adoption frameworks to highlight specifically how consumers interact with technology. A mixed methods design was applied involving internet-based reviews and focus group discussions. Two stages of data collection occurred, which initially involved analyzing social media and YouTube for feedback on scan and go app before participating in discussions with "scan and go" app users. Analysis of the collected data was based on thematic analysis, and this resulted in the creation of the Three-Level Technology Incorporation model. This study makes a significant theoretical contribution by delineating various dimensions of dissatisfaction, satisfaction, and incorporator roles across three levels during the technology adoption process. These findings have substantial implications, providing fresh perspectives on the optimal design and integration of technology into consumer routines.

## KEYWORDS

Incorporators; scan and go apps; buying behavior; reliability; privacy risk

## Introduction

In the increasingly digital and interactive world, the retail sector has embarked on a journey of transformation. The advent of technology applications that foster dynamic interactions has been the cornerstone of this paradigm shift, ushering in a new era of consumer interactions and transactions.<sup>1</sup> Such unprecedented advancements present an exciting array of potential benefits; however, they also serve as a Gordian knot for marketers who find themselves navigating a labyrinth of consumer responses to such technologies.<sup>2,3</sup> As interactive technology applications burgeon, the traditional fabric of in-store shopping is being rewoven. Shoppers now experience reduced wait times, enhanced product exploration, and secure payment processes.<sup>4,5</sup> The ambiance of supermarkets has been dramatically reimaged with the incorporation of technology, leading to increased social engagement and immersive shopping experiences.<sup>6-8</sup>

The most significant technological insurgence in the retail sector has been the advent of in-store technologies, especially self-service technologies (SSTs), which have transformed the landscape of service provision. These technologies, by expanding and sometimes replacing traditional customer-staff interactions, have reframed the retail consumer experience.<sup>5-9</sup> While a substantial body of research has been dedicated to understanding the impact of SSTs on the consumer experience,<sup>10,11</sup> there

remains a void in understanding customer experiences and challenges associated with the use of scan and go apps. Furthermore, there is a need to understand how these experiences shape the competence of customers who use in-store technology, and the meaning they attach to such technologies.<sup>9,12</sup> Existing research has provided robust field evidence of the impact of handheld scanners on sales and has afforded glimpses into the future of in-store technology.<sup>6,7</sup> However, it has largely overlooked subjective customer experiences while utilizing scan-and-go apps. The field is ripe for exploration, particularly of the unique intersection of in-store technologies and their impact on consumer experiences.<sup>13</sup>

This paper, therefore, endeavors to bridge the gap, focusing on scan and go apps and the consumers' experience. Drawing on calls for more comprehensive qualitative research,<sup>14</sup> the aim is to garner rich insights into the complex interplay of customer satisfaction and dissatisfactions, their competence to use in-store technology, and the meanings that customers attach to these emerging digital tools. Interactive technologies have revolutionized the shopping environment of supermarkets.<sup>15</sup> Yet, this transition has not been without its challenges. Customer reactions to these innovations have been as diverse as the technology itself, with some embracing these new applications, while others struggle to adapt to them. The integration of technology into the shopping

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experience has thus become a balancing act for retailers who strive to satisfy the needs of tech-savvy consumers without alienating those that are less comfortable with such technologies.<sup>9</sup>

The need for this research is clear when considering the gaps in current literature. While studies have explored the initial acceptance and usefulness of SSTs, the long-term emotional and experiential aspects of their incorporation into daily routines remain underresearched. By focusing on how and why consumers integrate “scan and go” apps into their regular shopping activities, this research fills a critical gap in terms of illuminating the sustainability of such technologies. Without this deeper insight, retailers and technology developers may fail to design features that align with user expectations, leading to dissatisfaction, underuse, and the eventual abandonment of such technologies. Answering this fundamental question—what the widespread incorporation of scan-and-go apps is doing to our everyday shopping activities—has tremendous utility. On one hand, it creates an overview of what customers are satisfied with, while on the other it uncovers the key challenges associated with the adoption and ongoing use of these technologies among customers. Second, by adopting a new theoretical lens that extends beyond adoption models, the study offers a comprehensive framework for understanding technology as a socially embedded practice. The value of this insight is thus just theoretical, but also practical, signposting a variety of retailers toward creating more user-friendly, secure and emotionally resonant technologies to enrich consumer lifestyles. This research sheds light on the next wave of retail technology innovation by portraying how consumers adopt and incorporate new technology. The development of the Theory of Three-Level Technology Incorporation is a unique contribution to scientific knowledge which offers managerial recommendations for companies. By addressing the research questions, it provides an important contribution to both academic literature and industry practice in retail technology design, so as to better support customer experiences with scan and go apps.

This research delves into the complex nexus of in-store technologies and customer experiences, specifically emphasizing “scan and go” apps. Apps present an unmatched opportunity to explore consumer behaviors within physical retail spaces.<sup>13</sup> This investigation of nuanced customer interactions with scan-and-go apps exposes varied levels of technology incorporation into regular shopping. While this paper aims to develop a process of technology incorporation for understanding these interactions, the specific need for this research is to identify how scan-and-go apps influence buyer activity in retail settings. It also identifies the roles that social and technological factors play in shaping these activities.

## Literature review

### *Self-service and in-store technologies*

Many studies have been conducted on interactive, self-service, and in-store technologies, but there is a lack of in-depth understanding of consumers’ real experiences of the buying process.<sup>7–16</sup> There is a need for more research on the design and features of mobile shopping apps linked with real consumer experiences.<sup>17</sup> There is a linked need to better understand emerging innovative shopping apps and their specific features to enhance consumer experiences,<sup>18</sup> and a further need to investigate how consumers and retailers can harness consumer-interfacing retail technologies.<sup>5</sup> There have also been calls for greater exploration of which app attributes make them easier to use in physical stores.<sup>13</sup> To address these gaps, this research focuses on understanding how retailers can leverage consumer insights and address challenges related to scan and go technologies. This will ultimately contribute to the development of seamless and satisfying consumer experiences that are linked with consumer goals. There is a growing body of literature that seeks to understand the role of technology in the retail industry and its impact on consumer behavior. Much of it focuses on mobile shopping and app usage, underscoring the need to link app features with real customer experiences and app visual appeal.<sup>17–19</sup> This creates an opportunity to understand customer satisfaction or dissatisfaction with specific in-store technologies like “scan and go” apps. Such studies highlight the role of self-service technologies (SSTs) and their impact on customer satisfaction, indicating the necessity to investigate customer intentions in the context of multiple SSTs.<sup>16–20</sup>

The TAM model is commonly used in existing previous studies, but this model has several limitations, rendering it unsuitable for the current study. Firstly, the lack of depth associated with TAM and its oversimplification in terms of capturing the intricacies of customer experiences with interactive technology is a weakness.<sup>21,22</sup> The model’s focus on perceived usefulness and ease of use neglects the important influence of individual differences, social practices, and contextual factors.<sup>23</sup> Secondly, its disregard for affective elements, such as emotional and experiential factors, limits its effectiveness in the context of technology incorporation where customer satisfaction or dissatisfaction, influenced by their actual achievements or issues with the technology, play a significant role.<sup>24</sup> Thirdly, the lack of longitudinal insight and focus on initial adoption rather than routine use limit the ability of TAM to provide a comprehensive understanding of the evolution of usage patterns, the learning curve, and the skills development associated with the use of this technology.<sup>25–27</sup> The lack of environmental sensitivity and the

underestimation of external factors overlook the potential influence of the physical store environment on customers' interactions with scan-and-go apps.<sup>21</sup> Finally, the absence of cultural context associated with TAM and its underemphasis on the rapid evolution of technologies undermine its applicability to diverse user groups and technologies such as scan-and-go apps.<sup>28,29</sup> TAM's focus on perceived rather than actual user experience, and adoption rather than incorporation, hinders its potential to deliver the theoretical insights required for this study.<sup>22–25</sup>

While the Unified Theory of Acceptance and Use of Technology (UTAUT) provides a more comprehensive model than TAM by integrating factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions,<sup>27</sup> this model also has limitations. It is particularly weak when it comes to addressing the emotional and experiential dimensions of technology use. UTAUT's focus is primarily on predicting user intention and behavior through these constructs, but it tends to overlook the deeper emotional responses and lived experiences of users when interacting with technologies like “scan and go” apps. By contrast, the Two-Factor and social practice theories offer a richer understanding of technology integration by giving consideration to feelings and tangible experiences. The Two-Factor theory by Herzberg makes a distinction between hygiene factors (that can lead to dissatisfaction) and motivators (leading to satisfaction), rendering it useful for explaining how scan-and-go apps can affect user satisfaction and irritation. Social practice theory goes even further by taking into account not only the competences and routines of consumers, but also the socio-cultural context in which they use certain technologies.<sup>30</sup> These three levels of technology incorporation encapsulate how routinized usage and “store surroundings” impact the act of adoption and integration of scan-and-go apps. In short, these theories offer a much more complete understanding of what is going on in the heads of consumers, beyond just making a decision about whether or not to use technology.

In light of these limitations, Herzberg's two-factor and social practice theories are selected for this study as they offer a broader understanding of technology adoption. The two-factor theory emphasizes the role of intrinsic and extrinsic motivational factors, while social practice theory accounts for the influence of sociocultural context and habituated practices on technology usage, thereby presenting a comprehensive view of the interplay between individual and organizational factors in technology adoption.<sup>30</sup> Social Practice Theory provides a more nuanced understanding of how the incorporation of “scan and go” apps influences

customers' routine purchasing activities by considering the intertwined elements of meanings, materials, and competencies. It offers a robust theory that can enhance our understanding of customer experiences with in-store technologies beyond the limitations of the TAM model. Indeed, the Two-Factor and social practice theories provide comprehensive perspectives on both the emotional and experiential aspects of technology incorporation, which are essential for enhancing understanding of customer experiences with in-store technologies.

## Methodology

“The validity and generalizability of research are enhanced by utilizing different methods and sources of data collection.<sup>31,32</sup> Existing studies show that data collection using different methods and multiple sources can generate insights that are helpful for devising a research framework.<sup>31</sup> Therefore, the current study uses online data, specifically Twitter reviews, YouTube reviews, and online app reviews. Semi-structured interviews are a valuable method for addressing “why” and “how” questions, providing insights into the selected phenomenon by exploring customer opinions on how various factors influence the use of scan-and-go apps in routine shopping and why these factors are significant for different shopping activities. This approach enables rich interpretations of customer experiences, which can be achieved through the qualitative analysis of participant experiences.<sup>33</sup>

Data were collected across two stages. During the first stage, online reviews were collected from YouTube, Twitter and scan-and-go app reviews from the app store. The purpose of the first stage was to identify the major issues associated with the use of apps in routine shopping, with online data analyzed using thematic analysis. Thematic analysis was conducted to generate initial codes to understand satisfaction and dissatisfaction levels among customers, which motivated them to use apps. The thematic analysis was conducted solely to categorize issues and understand the role of technological factors in contributing to satisfaction or dissatisfaction with incorporating technology into routine shopping. The thematic analysis included six steps based on selected quotations, keywords, codes, themes, conceptualizations, and the development of a conceptual framework.<sup>34</sup> The first stage of data collection analysis was limited to the development of codes to gain an initial understanding of the issues attached to different routine shopping activities. These included risk issues, functionality issues and various motivations to use the apps. The first stage of data collection involved analyzing customer reviews from app stores

to understand the experiences of users of these apps. Ten apps were selected based on their number of installations, ratings, and reviews (see Table 1).

During stage 2, focus group discussions (see Appendix 3) were conducted with customers who had used scan and go apps in the last four months. The major purpose of the group discussion was to gather the diverse and constructive views of participants (see Appendix 4 for groups discussion questions) to understand how scan and go apps are used as part of routine shopping. Group discussions had seemed as essential for gathering diverse perspectives, fostering critical thinking in group, and uncovering insights that might not emerge in individual settings.<sup>35</sup> As such, group discussions were useful for understanding user perspectives, highlighting alignments and differences based on their individual experiences with scan-and-go apps. This setting promoted interactive dialogue, enabling a deeper exploration of complex topics.<sup>36</sup> As such, the group discussions were helpful to understand the complexity surrounding consumer satisfaction, dissatisfaction and usability issues relating to scan-and-go apps. Additionally, group dynamics often stimulate ideas and provide a naturalistic environment for understanding opinions, which is useful in qualitative research.<sup>37,38</sup>

Following the collection of online reviews, the second stage involved focus group discussions. Purposive sampling was employed, as it allowed the researchers to deliberately select participants with specific characteristics or experiences relevant to the study.<sup>39</sup> For example, participants who had some experience with scan-and-go apps in the last four months were selected. Purposive sampling was applied to recruit participants who were located in the UK who had at least one month of experience using a “scan and go” apps. Recruitment was aimed at obtaining a variety of diverse perspectives from customers by recruiting participants on the basis of demographic differences, age groups, and shopping frequency. This method ensured the inclusion of individuals with sufficient expertise or knowledge to address the research questions.<sup>40</sup> By focusing on

targeted populations, purposive sampling enhances the depth and relevance of data collected, and is particularly useful for understanding participant experiences in a specific context.<sup>41</sup> Therefore, with a focus on gaining insights rather than achieving universal results, this phase involved detailed discussions with 30 participants across five groups. Participants were individuals aged 18 years or above, who had actively used a scan-and-go app (see Appendix 3).

Multiple methods were used to collect sufficient data to devise a rich holistic theory for conceptualizing and understanding the usage of scan and go apps, and the overall consumer shopping experience using two-factor motivation and social practice theories. The major findings of this paper: the Theory of Three Levels of Technology Incorporation theory required data triangulation to increase the validity of the findings. Indeed, data triangulation enhances research validity by integrating multiple data sources to cross-verify findings and to obtain richer insights.<sup>42</sup> The use of multiple types of data helps reduce bias and should be underpinned by relevant theories. Therefore, the final theory is based on the two-factor theory of motivation, which helps explore and analyze customer satisfaction and dissatisfaction in the context of using scan-and-go apps for routine shopping. The methods include combining qualitative approaches using various sources of data to incorporate and consulting a diverse range of views from stakeholders.<sup>43</sup> This ensures comprehensive and diverse perspectives on the research problem.<sup>40</sup> For effective triangulation, researchers must systematically analyze and synthesize these data sources.<sup>44</sup> This research therefore applied steps of thematic analyses to analyze the data.<sup>34</sup>

### Data analysis

This research applied thematic analysis and previous research on similar topics has also utilized this approach for data analysis.<sup>31 – 32</sup> The data comprised 213 pages of transcripts, and these were analyzed across two stages. Systematic thematic analysis was undertaken first<sup>34</sup> to ensure consistency and depth in

**Table 1.** Selected smart shopping app features.

Smart shop app names	Smart shop app rating	Smart shop app Installs	Number of online reviews
Sainsbury's (SA1)	4.8/5	One million (+)	137.5 thousand
Walmart Shopping and Grocery (SA2)	4.6/5	Fifty million	1.762 million
Sam's Club (SA3)	4.7/5	Ten million	181 thousand
OfferUp (SA4)	4.1/5	Fifty million (+)	1.01 million
Meijer's (SA5)	4.1/5	Ten million (+)	42.18 thousand
Scan and go (SA6)	2/5	Fifty thousand (+)	1.52 thousand
Scan it (SA7)	2.3/5	Fifty thousand (+)	147 reviews
Amazon go (SA8)	4.3/5	Five hundred million (+)	2.6 million
B.J.'s (SA9)	4.6/5	Ten million (+)	366.04 thousand
Kroger (SA10)	4.5/5	Ten million (+)	60.30 thousand

interpreting data from Twitter (see Appendix 1), YouTube (see Appendix 2), App reviews and focus groups' discussions. This first step began with transcription and familiarization, capturing meaningful quotes. The second step involved keyword selection. As such, keywords were selected based on the 6Rs—realness, richness, repetition, rationale, repartee, and regal—to ensure they reflected authentic experiences of scan and go app uses.

These keywords and relevant quotations were used to develop codes that form the basis of 6Rs-based coding: robust (comprehensive), reflective (interpretive), resplendent (context-rich), relevant (aligned with research questions), radical (unique and precise), and righteous (consistent and logical). The inductive coding process was used to name the codes on the basis of relevant keywords and quotations which reflect customer satisfaction levels with the apps. Since inductive coding is a qualitative data analysis method where researchers derive codes directly from the data, rather than applying preexisting frameworks or theories, the codes were derived from the keywords and selected quotations.<sup>45</sup> It involves identifying patterns, and

categories that emerge naturally during the analysis process.<sup>46</sup> This approach is particularly useful for exploratory studies<sup>47</sup> which enabled the researchers to construct a grounded understanding of the data-driving codes from the wording of scan and app users.

Creating themes is about grouping codes on the basis of their relevance to the research question. Therefore, codes were merged on the basis of the two-factor theory, which is a form of deductive theming. Additional codes were grouped into themes using the 4Rs—reciprocal (interrelated), recognizable (data-rooted), responsive (goal-aligned), and resourceful (insight-providing).<sup>34</sup> These steps culminate in a conceptualization of the data in the form of the three levels of the technology incorporation model. This was arrived at after refining keywords, codes, and themes into a coherent narrative. Finally, a conceptual model was developed, called the three-level model, in visual form, to address the research questions and contribute to theoretical knowledge. This systematic process ensures rigor and clarity throughout the analysis because the codes and themes are deeply rooted with the data and theoretical underpinnings of this research (see Figure 1 for detail of systematic thematic analysis).

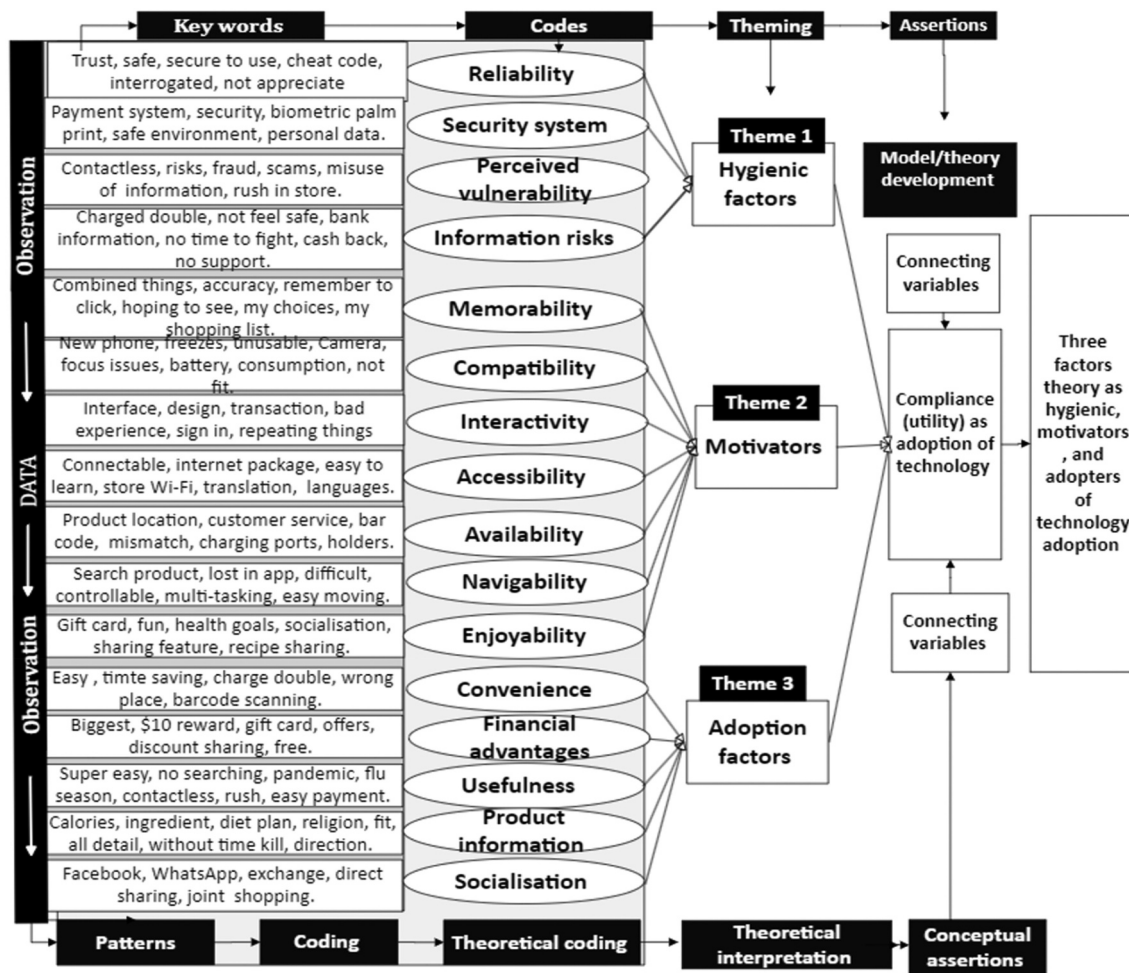


Figure 1. Systematic thematic analysis process.

## Findings and analysis

### Main theme 1: Core factors

Core Factors refer to the essential elements that determine the user's experience and overall trust in a scan and go shopping application. These factors are critical as they influence the user's decision to adopt the application for shopping, impacting their perceived pragmatic empowerment and reliability of the system. The main aspects of this theme include reliability, security risk, perceived vulnerability, and privacy risk.

Code: Reliability

Keywords: distrust, safe, secure to use, cheat code, interrogated, not appreciate.

Reliability symbolizes the concept of reliable passage or transmission. In the context of a scan and go shopping application, it signifies the application's consistent performance and its ability to deliver accurate and dependable results. It encompasses the reliability of system functions such as accurate scanning, correct pricing, and seamless checkout processes.

It is about the user's trust in the application as a reliable medium for their shopping needs. For example, *"my friends consistently used this shopping app, and they said it is safe and secure to use"* (SA 27, P11, focus group). However, some users showed distrust in scan-and-go apps and posted negative reviews on Twitter; such reviews could discourage new users. For example, *"Sam's Club Scan & Go is literally a cheat code"* (SA 03, Twitter, 19 December 2021). Others felt that scan and go apps are not fully capable of identifying shoplifters. As a result, if Walmart employees frequently manually check groceries, then there is no reason to try this app, as it involves double the effort.

Code: Security risk

Keywords: payment system, security, biometric palm print, safe environment, personal data.

Security risk in this context represents the security architecture employed by the application to protect users' personal and financial information. This includes measures such as secure payment gateways, data encryption, and user authentication processes. It is the assurance to the user that the application is a safe platform to use for shopping activities, reflecting the robustness of the application's security risk. For example, *"I read hundreds of reviews before use it and I did not find any major issue with the security of payment system, so our personal data is in safe hands"* (SA 03, P13, focus group). Some stores have launched biometric palm print scanners that create more safety and security for customers and employees in stores. For example, *"Amazon*

*Go launched biometric palm print scanners so people can do shopping in safe and healthy environment"* (SA 08, P11, focus group). This encouraged more people to visit stores and have a shopping experience through the Amazon Go app and biometric palm security risk.

Code: Perceived vulnerability

Keywords: contactless, blessing, risks, stories, fraud, scams, misuse of financial information, cash/card information, rush in store.

"Perceived vulnerability denotes the user's perception of potential risks and vulnerabilities when using the application. This includes concerns about system glitches, data breaches, or fears of falling victim to scams. This theme is about the user's sense of insecurity or susceptibility while navigating the app, which could influence their usage patterns or willingness to share personal or financial data. For example, *'this app is looking like a blessing especially when many are thinking how they can do contactless shopping in stores'* (SA 3, P11, focus group). Other customers felt that they had encountered limited negative word of mouth about the financial risk of scan-and-go apps. As such, they were willing to attempt some "pragmatic empowerment" while shopping. For example, *"A high number of scams and fraud stories are circulating, but we do not hear any of this risk for this shopping app"* (SA 5, P23, focus group). It was found that some people had negative past experiences, such as someone taking a picture of their credit/debit card or stealing their wallet when they were in a long queue. The use of scan-and-go apps can reduce the risks of carrying cash or debit/credit cards that can be captured, and the financial information misused.

Code: Privacy Risk

Keywords: scam, privacy permission, charged double, not feel safe, bank information, no time to fight, cash back, no support.

Privacy Risk signifies the mistaken belief or illusion of complete safety and security that users might hold when sharing their personal and financial information with applications. It emphasizes the risk of data misuse, double charging, or scamming that users may face despite the perceived security measures in place. Some customers don't want to give access to their personal information like P23 said that *"why they are asking to access my contract, photos and to my device and there is not any privacy setting to limit that"* (SA 5, P23, focus group). This concept underscores the potential pitfalls of overconfidence in the app's security mechanisms, leading to inadvertent exposure to financial and personal information risks. For example, *"my friends said it is a 'Scam and*

go' app as it charged them double many times, so I do not feel safe to share by bank information and must spend time to fight to get my cash back and why they are asking to get access to my information" (SA 3, P25, focus group). Many customers are motivated to try a scan and go app to save time, but if they hear that others have been charged double, they may feel more reluctant to try the app. For example, "It has counted nearly everything twice in my shopping and customer service is not responsive. I was in such a rush that I didn't check so I am posting this review" (@sainsburys, Twitter, Mar 17, 2020).

### Main theme 2: Usability factors

In the context of system usability, this study discusses several factors based on experiences that provide an understanding of the pragmatic empowerment of systems. These usability factors can be instrumental in decision-making among shoppers, particularly if they feel that the system has unique features that can help them to achieve their shopping goals.

Code: Memorability

Keywords: combined things, accurately giving, remember to click, hoping to see, my choices, my shopping list.

"Memorability" measures the extent to which a scan and go app system is capable of memorizing information to use technology and offering products that shoppers like to see or buy. For example, some users felt that the apps were unable to memorize menu items, or combined everything, thus making shopping more difficult. For example, "this one is just awful! Why is everything combined into one now, and every time I load a page, I have to remember to click in the menu as I only want to see items available for curbside pickup? Even the menus to find food are not user friendly" (SA2, December 21, 2021). Conversely, some shoppers were satisfied with the quality of the system and its ability to memorize what they were looking for. For example, "It was a really wonderful experience for me when I tried this app the third time as it accurately gave me those products and prices that I was hoping to see" (SA1, P5, focus group).

Code: Compatibility

Keywords: freezes, unusable, camera focus issues, battery consumption, not fit.

"Compatibility" refers to two different systems of smart shopping apps, working together to achieve shopping goals. The compatibility of a shopper's mobile phone with a smart shopping app can create the possibility of testing the pragmatic empowerment (customer empowerment) of the system. Some shoppers had experienced scan-

and-go apps that were compatible with only a few mobile models. For example, "I used the scan bag go app and loved it. I had to get a new phone and the app is no longer available" (SA10, YouTube, January 1, 2022). Other users found that the apps were not compatible with their mobile device's operating system. For example, "it constantly freezes on iOS 15 iPhone 10. When clicking on a product. Becomes unusable" (SA 3, November 11, 2021). Other users found that a particular scan-and-go app was not compatible with their mobile. For example, "the camera has trouble focusing. Not a phone issue. Works great at Sam's with no focus issues" (SA 09, November 19, 2021).

Code: Interactivity

Keywords: interface, design, logged out, sign in, repeating things, not work, not load.

"Interactivity" can be defined as "the extent to which an actor ... perceives ... to be reciprocal, responsive, speedy and characterized by the use of nonverbal information" (Johnson et al. 2006, p. 41). Interactivity is usually evaluated after testing reciprocity, responsiveness, the speed of response or the physical setting. Some users found that the design, interface and control of scan and go apps were efficient, and they enjoyed using them. For example, "very smooth interface. Design is clear, concise, and effective. Easy to navigate and control" (SA 06, August 6, 2021). Therefore, they had considered switching to another app. For example, "I especially enjoyed the scan and go option. But two times in the last 30 days while I was using the scan and go app I was logged out by the app. And was not able to complete my transaction. Seriously thinking about becoming a Costco shopper after the bad experience with the app" (SA 03, December 31, 2021). Other users found that the scan and go app was too slow to process their request and sometimes they had to repeat sign-in procedures to make a successful interaction.

Code: Accessibility

Keywords: connectable, internet package, easy to learn, store Wi-Fi, translation, adaptation, other languages.

"Accessibility" determines the extent to which scan-and-go apps are useful, workable and understandable for shoppers. Some users believed that Amazon Go is accessible because it is easy to connect with, and it can cope with slow internet speeds. For example, "Walmart really needs to look at the Amazon app and try to copy it: Amazon Go is easy to connect, works on slow internet; with plenty of info on every product they sell" (SA 2, December 27, 2021). Other users believed that scan and go apps were becoming easier to understand and learn as there were many tutorial videos available on different social media platforms that helped to make



their learning and shopping life easy. For example, *“crazy how much innovation I’ve learned from just watching YouTube channels”* (SA 8, YouTube, 1 year ago). Other users found that the internet speed in stores was too slow, so the system took more time to scan the products. For example, *“the store’s Wi-Fi was too slow as it takes 30 seconds to scan each product”* (SA 1, App online review, June 11, 2021).

Code: Availability

Keywords: product location, pick up, customer service, terrible, add bar code, charging ports, mobile phone holders.

The availability of support, guidance, product location, manual addition of barcodes, a mobile holder on the shopping cart, and charger ports can facilitate the buying process.

Some shoppers praised the pragmatic empowerment of scan-and-go apps, as they found that they saved time because the app identified the location of products, which was especially useful if shoppers were new to the store. For example, *“you create your shopping list, walk into a store, and the app will guide you to which aisle you need to go, pick up, scan in app and go”* (SA 2, Twitter, October 01, 2020). Some shoppers found that the scanner system of the app and the inventory system in the store were mismatched, causing the system to be unable to accurately determine the availability of products. For example, *“the price scanner rarely works. It says the item is out of stock even though there is a rack full. When I look up an item that is supposed to be in store (it says in stock and has an aisle number) associates tell me they don’t even carry that item”* (SA2, December 6, 2021). There were many complaints about bar codes, and some users found that some of the items were not scannable and the app did not provide the option to manually add them.

Code: Navigability

Keywords: search product, lost in app, difficult, controllable, multi-tasking, easy moving.

“Navigation” refers to the extent to which scan and go app systems help users easily find products or move from one section of the app to another (multi-tasking). For example, *“I just love this app. I find it very easy to search for a product and when I have had an issue, the customer service was amazing”* (SA 6, December 8, 2021). Other shoppers complained that they could not easily control the search engine, and sometimes got “lost” in the app while searching for products. They felt the app was not convenient. For example, *“product searching is not easy in this app as sometimes I get lost in the app and then come face difficult to come back on main page”* (SA 7, P21, focus group). Conversely, some shoppers were satisfied as they

found it easy to navigate the app to find products. For example, *“this app is easily controllable as I can easily move among various sections, that’s why I can select the best product at good prices”* (SA 8, P21, focus group).

Code: Enjoyability

Keywords: life better, gift card, fun, health goals, socialization, sharing feature, family, friends, recipe sharing.

“Enjoyability” is about determining how useful the system features are to engage with and the extent to which shoppers enjoyed the buying process. Enjoyability varied among different users. Some liked the gift card features, while others found the scan-and-go app enjoyable because it helped build a combined shopping list based on low-calorie products that helped them achieve healthy lifestyle goals. For example, *“we are a health-conscious family, so we loved this app as it provides calorie details for each product and builds a shopping list for low calorie products”* (SA 1, P15, focus group). Many shoppers enjoyed the pragmatic empowerment of scan-and-go apps in 2021. For example, *“Apple Pay and Sam’s Club Scan & Go are the two things which are enjoyable for this year. They have changed my life for the better”* (SA 3, Twitter, December 29, 2021). Others believed scan and go apps were enjoyable as they rewarded shoppers, which increased their level of engagement. For example, *“knowing I get \$20 gift card and other goodies, makes it twice as enjoyable. It’s so easy to use and fun”* (SA 06, September 28, 2021).

### **Main theme 3: Incorporators**

Incorporators as a main theme in the context of user behaviors toward scan-and-go apps refers to users who successfully incorporate and integrate these apps into their shopping routines. This incorporation of technology into routine shopping was facilitated by frictionless odyssey, economical aspirations, pragmatic empowerment, enlightened consumerism, and communal integration.

Code: Frictionless Odyssey

Keywords: easy to operate, difficult, skills, old shopping practices, charge double, wrong place, barcode scanning.

The term “Frictionless Odyssey” captures the effortless journey of the user in navigating the application, emphasizing the absence of obstacles and the user’s interaction with the app as an adventurous journey. For example, *“I trust the app, and its system is really useful; that’s why I feel that it’s really easy to operate for weekly shopping”* (SA 10, P12, focus group). However, if users lack the necessary skills and awareness, then they receive no

benefit from the core factors, as they are not capable of experiencing the pragmatic empowerment of scan and go apps; for example: *“My wife finds it difficult to use as she is not very skilled; that’s why she prefers to stick with old shopping practices”* (SA 4, P18, focus group). Some shoppers found the apps inconvenient because they wasted user time due to technical errors; for example: *“The app lets me scan all of my purchases and doesn’t force me to sign in until I’m ready to check out. Why not tell me that I’m not logged in before I scan all my groceries?”* (SA 7, August 05, 2021). The Amazon Go store has a biometric palm system to avoid shoplifting: when anyone picks an item and does not place it accurately in the system, it charges it directly to their account.

Code: Economical Aspirations

Keywords: worth, no weight, biggest, best deals, reasonable, high prices, overcharged.

Economical Aspirations’ underscore the financial ambitions of users. It implies not just the attainment of coveted deals but efforts to strive for economic empowerment through smart purchasing and savings. For example, some users found that new stores, such as Amazon Go, did not offer a weight system, so they could provide an advantage to those who wanted to buy products in lower quantities. For example, *“I think it’s worth going there for the produce. Since they can’t weight the item, you can grab the biggest, sweet potato for instance and only pay 50 cents for it”* (SA 08, 1 year ago). Some shoppers did not feel qualified to search for products that could help them achieve savings. For example, *“I do not know how to search best deals in this app, so I am looking for help”* (SA 1, P9, focus group). Some shoppers were motivated to join Amazon Go and scan their palm due to positive word of mouth and the incentives offered. For example, *“Amazon will pay you \$10 for a scan of your palm print: Amazon last year introduced biometric palm print scanners at its stores”* (SA 8, Twitter, August 03, 2021).

Code: Pragmatic Empowerment

Keywords: super easy, no searching, contactless, new payment system, safe community, safe environment.

The pragmatic empowerment of scan-and-go apps enabled users to achieve their shopping goals, which varied. Some shoppers believed the apps were useful because they necessitated less contact or “touch” with humans or systems, therefore decreasing their vulnerability to COVID-19. For example, *“It is super easy to use. No more searching for your card. It’s stores that and your payment info too. No waiting in lines to check out. Particularly great during the pandemic and flu season. Less close contact and/or touching”* (SA 03, December 24, 2021). Others believed the scan and go app was not fully

functional as some items did not have bar codes. As a result, they had to stand in queues with limited numbers of cash registers in the store. Furthermore, their objective in using the app, to arrive and exit the store quickly without making any contact, was frustrated. For example, *“With COVID going around I want in and out. They had four lines open and there was an extreme rush, and many of the people were those who wanted to scan one or two items that had not scanned in the app”* (SA 5, YouTube, 1 year ago).

Code: Enlightened Consumerism

Keywords: calories, ingredient, diet plan, religion, fit, all detail, without time kill, direction.

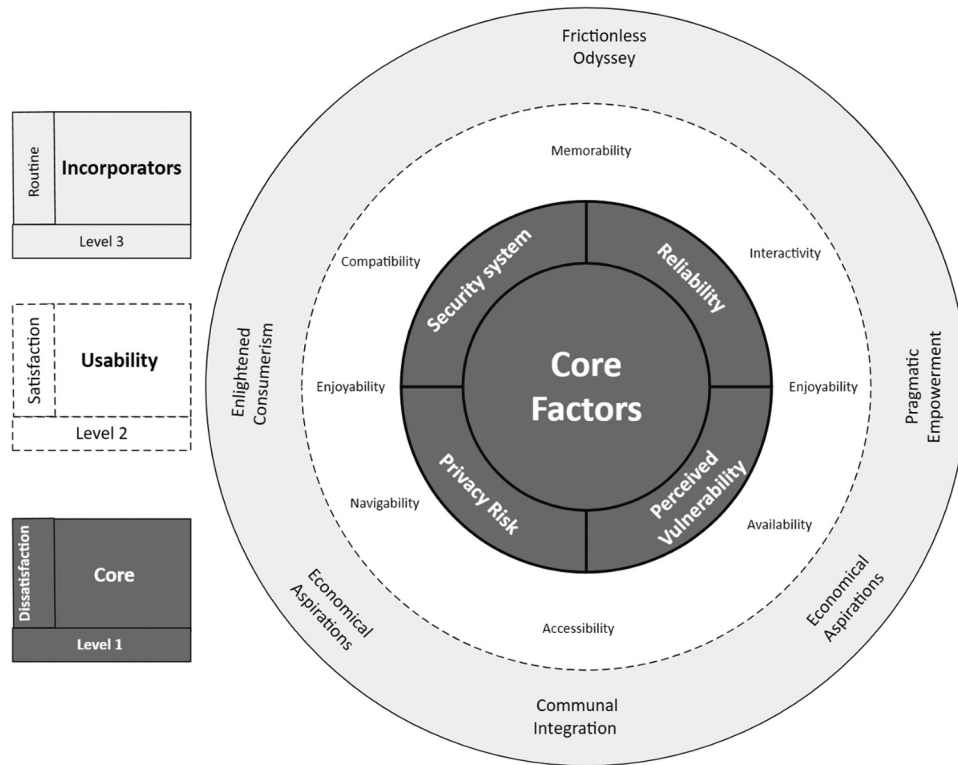
“Enlightened Consumerism” symbolizes the importance of detailed product knowledge in enabling conscious, informed decisions. It resonates with the idea of users becoming enlightened through information and using this knowledge for ethical and healthy consumption. Some users liked adopting the app because they found adequate information to meet their health and meal planning goals. For example, *“I really like this app as it provides information about the calories of each ingredient that really helped us to plan our diet”* (SA 04, P4, focus group). Some shoppers believed that the apps should include information about ingredients to understand whether or not products aligned with the philosophy of their religion. For example, *“I really liked to see that my product should not have alcohol because it can give allergy to me as well as not religiously fit for me”* (SA 10, P9, focus group). Some users of scan and go apps were satisfied because they found all the information that they required when choosing products. For example, *“Adequate detailed explanation/direction about product, without overkill. All of the necessary information is readily available and easy to access”* (SA 06, August 6, 2021).

## Discussion

The theory of three levels of technology incorporation seeks to explain the multifaceted nature of user interactions with and the incorporation of new technologies such as scan and go applications. The theory consists of core factors, usability factors, and incorporators (see Figure 2).

### Three levels of technology incorporation

Technology incorporation unfolds in three progressive levels: core factors, usability factors, and incorporators. These levels build upon one another to drive user adoption, satisfaction, and integration into daily routines. Technology use progresses from adoption, which includes the core factors and usability factors, to



**Figure 2.** Three levels of technology incorporation theory.

incorporation, reflecting a shift from initial usage to integration into daily routines. This is because specific benefits cannot be gained without using that particular technology. In other words, adoption refers to the decision to use a technology because of its core factors or because of the usability experience of users, which can be discontinued if dissatisfaction arises or because of low satisfaction levels. In contrast, incorporation occurs when technology becomes embedded into routine practices which also includes low levels of dissatisfaction and higher levels of motivation, making it an indispensable part of daily life because of the unique benefits of technology.

The journey of incorporation can be understood through three levels: core factors, usability factors, and incorporators. These levels sequentially build upon each other, beginning with foundational elements that reduce dissatisfaction, progressing to features that motivate engagement, and culminating in unique advantages that integrate technology into everyday practices.

#### **Core factors: Educing dissatisfaction**

These are foundational elements of technology that reduce dissatisfaction but do not necessarily motivate usage. They include reliability, security, privacy, and perceived risk. Their absence or malfunction leads to

dissatisfaction, but mitigation of these risks merely meets baseline user expectations. Yet these factors cannot motivate the use of technology because usability is linked to motivational factors to use the technology.

#### **Usability factors: Satisfaction/motivators**

These factors enhance user motivation and satisfaction by making technology engaging and helping the customer achieve their goals, such as empowerment and time-saving. They include features such as memorability, compatibility, interactivity, accessibility, and enjoyability. Usability factors go beyond functionality, fostering motivation by creating efficient, effective, and satisfying user experiences through error-free and enjoyable interactions.

#### **Incorporators: Routine**

These are among the more advanced features of technology that integrate it into daily routines by offering unique benefits that are otherwise unattainable without the technology. For example, personalized shopping features in apps, budget alerts, seamless product navigation in stores, creating family shopping lists, and keeping paperless shopping receipts ensure the embedding of technology into everyday social practices, providing pragmatic

empowerment for routine activities that would not be possible without these technologies.

### Core factors

These are foundational elements of technology that need to be present for users, so the presence of these factors reduces customer dissatisfaction. These factors are called hygiene factors (e.g., reliability, security risk, perceived vulnerability, and privacy risk) that do not directly lead to positive satisfaction or higher motivation but can cause dissatisfaction if they are absent. If these core elements are missing or malfunctioning, users are likely to experience dissatisfaction.

The literature also notes that perceived risk and privacy concerns significantly influence technology using behaviors.<sup>48</sup> Perceived risk involves users' evaluation of potential negative outcomes<sup>49</sup> associated with adopting new technologies.<sup>50</sup> This includes financial, performance, social aspects, and privacy risks perceived by users.<sup>51</sup> For instance, users may hesitate to adopt digital payment platforms due to potential financial loss<sup>52</sup> as the possibility of any kind of risk impacts the use of new technology. Privacy risk, a specific dimension of perceived risk, pertains to concerns about unauthorized access to personal data. These risks are heightened in technologies involving sensitive data such as sharing a personalized shopping cart with family members.<sup>53</sup>

Privacy risk is closely aligned to security issues as well as perceived susceptibility. Comments such as "My friends said it is a 'Scam and Go' app as it charged them double many times, so I do not feel safe to share my bank information" (SA 3, P25, focus group) highlight a general reluctance to share sensitive data because of fears of double charges or scams. Such concerns echo,<sup>42</sup> who underscored the role of perceived data security in cultivating user trust.

Risks in terms of privacy also act as a factor of dissatisfaction based on Herzberg's theory and the negative implications of the app in social practice theory. Users with a high level of trust in technology providers have lower risk perceptions, making trust a mediating factor. On the other hand, low trust amplifies the impact of privacy concerns, negatively affecting technology adoption.<sup>54</sup> Research suggests that any perceived privacy risk leads to lower acceptance of technology. Further, privacy risk perception is influenced by regulatory environments as a strict regulation.<sup>55</sup>

Perceived risk is a major barrier to emerging technology, which requires the transparent use of customer data, such as access to contact lists or photos.<sup>56</sup>

Some participants mentioned that they do not want to give permission for these apps to access their contact

list or photos, highlighting the need to provide transparent information to customers and ensure user privacy and security. Thus, alleviating perceived risks through education and security precautions promotes technology usage.<sup>57</sup> These factors have been widely discussed, with studies claiming that mitigating privacy and security risks develops trust, which encourages customers to use technology. However, this study explored how mitigating these risks only reduces dissatisfaction, which in turn improves trust in technology. Trust alone is not sufficient to incorporate technology into routine practices, as usability and incorporation factors are also required. The concept of core factors aligns with the fundamentals of hygiene factors in Herzberg's theory, where these factors do not lead to positive satisfaction or higher motivation but can cause dissatisfaction when absent.

### Usability factors

The second-level concerns features that enhance user satisfaction and make the experience more enjoyable. These factors elevate technology from being merely functional to providing an engaging and user-friendly experience for customers. Therefore, these factors motivate users to achieve shopping objectives with efficiency, and satisfaction when using scan and go apps for supermarket shopping. In the current context, usability factors include memorability, compatibility, interactivity, accessibility, availability, navigability, and enjoyability. These create a user-friendly interface, intuitive navigation, personalized recommendations, and real-time tracking. The user-friendly features of the apps satisfy users due to their effectiveness and efficiency, which include money saving, time saving, ease of use, and ease of remembering how to use the app. These elements go beyond the basic usability requirements of the app's functionality and contribute to a satisfying, streamlined shopping experience that motivates continued use of the technology.

Human-centered technology design heavily relies on the design aspects of usability and how users interact with our designs and systems, a concept referred to as the interactivity of technology in this research. "Design of app is confusing and not that much responsive" (P2).

Several key characteristics of usability have been mentioned in previous studies, such as learnability, efficiency, memorability, errors, and satisfaction, all of which directly influence system adoption and user engagement. Learnability ensures that users can quickly understand and use the system, which is a critical attribute for first-time users. However, it has been identified that users face difficulties learning about the

personalization options in scan-and-go apps. Yet many studies indicate that the personalization of technology increases customer satisfaction.<sup>58</sup> However, users may also face challenges due to issues such as lack of accessibility, memorability, unavailability of features, or compatibility issues with the apps. However, personalization could also be affected by a lack of interactivity in the apps, which is necessary for smooth use and system interaction. The efficiency of technology usability enables users to interact with the system with less effort. It has also been identified that the incompatibility of technology with specific users can discourage them from using the technology or certain features of the app. For example, incompatible systems can cause significant disruption. One participant highlighted, “Constantly freezes on iOS 15 iPhone 10. When clicking on a product. Becomes unusable” (SA3, November 11, 2021).

Consequently, the lack of personalization impacts the continued use of the technology on a routine basis.<sup>59</sup> One participant felt it was “difficult to remember the application of the discount process (P, 25). The lack of memorability could be addressed by providing helpful tutorials and straightforward navigation, which could lead to quicker adoption. A simple interface, such as clear and responsive designs, is also required to improve the user experience. One participant remarked on a “very smooth interface. Design is straightforward, unambiguous, and purposeful.”<sup>60</sup> “Easy to navigate and control” (SA06, Aug. 6, 2021). Therefore, it has also been established that a simple and user-friendly design can address memorability issues, as users do not need to remember each step to perform routine shopping activities.

Finally, enjoyment enhances the user experience, connecting functional utilization to emotional gratification. However, enjoyable customer experiences also depend on the ease of memorability and the ease with which routine shopping activities can be performed. A high level of interactivity, compatibility, accessibility, navigability of information and products, as well as the availability of required information and products, all contribute to a positive user experience. Engagement is boosted with features such as health goal tracking and rewards. For example, one participant commended the health-oriented approach which included the achievement of personal goals linked to health or money. The participant noted, “this will provide you with a calorie value for every product and construct a list of low-calorie foods” (SA1, P15, focus group). Gift cards and seamless experiences also increased user pleasure, with another user stating, “Knowing I get \$20 gift card and other goodies makes it twice as enjoyable” (SA06,

September 28, 2021). Therefore, this research establishes that usability features motivate customers to use technology in their routines due to the enjoyable experience provided by the efficiency of learnability, memorability, compatibility, interactivity, accessibility, and enjoyability. These factors highlight the significance of user-centered design. By addressing these elements, systems can improve customer satisfaction and encourage the incorporation of technology into routines. However, the absence of any of these factors can negatively affect the use of technology in daily routines.

### ***Incorporators***

The third level represents users who have successfully incorporated the technology into their routines due to the unique features that are not possible without using the technology. For example, customers can save time by scanning and adding products to their cart while picking them off the shelves. Additionally, customers can use store navigators to find product locations, receive personalized product information, get price and budget alerts, save paperless receipts, and access customized offers. These benefits can only be obtained by using the apps, and without them, customers would miss out on these advantages. Therefore, these incorporator advantages can only be realized if customers use the technology. These benefits and customer goals can only be achieved through the use of specific technology, and when customers incorporate the app into their daily shopping routines, they move beyond initial usage toward sustained use and integration into everyday shopping practices. Each shopping experience contributes to future purchases, such as price customization, product integration, content personalization, budget control, and receiving offers based on past purchases. Additionally, these apps become embedded in the overall social practices of shopping, for example, by allowing families to create shared shopping lists.

Incorporators can include specific features such as a frictionless experience, economical aspirations (including economic advantages like customer promotions or budget management), pragmatic empowerment (where customers gain empowerment in everyday shopping), enlightened consumerism (where customers are fully supported with the information they need to perform routine practices), and communal integration (which relates to the integration of technology into overall life practices, like family shopping lists). These incorporators encourage consumers to routinely use the technology because they cannot access these benefits without it. As a result, they will continue using the technology. However, organizations must continuously

offer essential features that support daily life, such as family use, more personalized features like product recommendations, and personalized offers based on shopping history. These features will encourage users to incorporate technology into their routine lives.

### **Conclusion and contributions**

This study offers a comprehensive exploration of the incorporation of “scan and go” apps into consumers’ routine shopping activities through the development of the Theory of Three-Level Technology Incorporation model. By addressing both dissatisfaction and satisfaction factors, which are deeply rooted in Herzberg’s two-factor motivation theory, and introducing the concept of Incorporators, the current research provides a deeper understanding of how technologies become integrated into daily consumer behavior. Core factors such as security, reliability, and privacy, along with motivational factors like usability, efficiency, and the ability to achieve customer shopping goals, are essential. Therefore, the first contribution of this research is the distinction between two levels of technology use: technology adoption and incorporation. Incorporation refers to the phase in which users experience additional benefits that cannot be achieved without using that specific technology. These benefits include time and money savings, enjoyment of shopping, paperless receipts, family shopping lists, empowerment, and other economic advantages. These factors are called incorporators because they offer unique benefits that motivate users to continue using the technology to gain these advantages.

Consequently, the three levels of technology incorporation extend beyond traditional theoretical understandings of technology adoption because they are not a linear process. These factors are not alternatives to each other. If core factors are not met, they can lead to dissatisfaction. Core factors prevent dissatisfaction but do not necessarily increase user satisfaction or encourage technology adoption. They are essential for ensuring user safety and maintaining baseline contentment with the technology. In contrast, usability factors are motivators. These actively promote user satisfaction and drive users through the process of excelling in the activities they expect to perform with the technology. Examples of these factors include compatibility, accessibility, navigability, and memorability, which make the technology more efficient in achieving the attached goals. Motivators are usability factors that primarily influence the level of user satisfaction, particularly by enhancing the technology’s ability to help users achieve their goals efficiently.

Another theoretical contribution of this research is the extension of the adoption-incorporation model by adding a third stage called “technology incorporation,” which is based on incorporator factors. These factors keep users engaged with the technology in their routine because certain advantages cannot be obtained without using that specific technology, and these factors are referred to as incorporators.

Consequently, this research successfully develops a three-level technology incorporation theory, which includes core factors, usability factors, and incorporators, each playing a role in the integration of technology. This unique theoretical contribution not only distinguishes the roles of dissatisfaction, satisfaction, and incorporator factors but also provides insights into the factors that allow technology to transition from being an ad-hoc tool to becoming an ingrained part of a customer’s routine buying behavior.

### **Practical implications**

The practical contribution of this study enables technology developers and marketers a new way to understand customer experiences, and how technology is incorporated into routine buying as a social practice. The theory of three levels of technology incorporation thus shifts the focus from the adoption to the complete integration of technology into customers’ daily buying behavior. Therefore, marketers and technology developers can collaborate to improve technological reliability by ensuring that privacy and other risks attached to technology are mitigated. Marketers can use effective communication to communicate the required information in terms of security and risk to improve their ability to deal with dissatisfaction among users. Additionally, usability factors also require a mix of efforts from both developers and marketers. For example, the availability of required information, enjoyability, and accessibility depend on collaboration between these professionals. The incorporator factors also benefit from this professional collaboration, offering unique advantages such as economic benefits, empowerment, and continuous rewards that encourage users to incorporate the technology into their routine shopping.

The insights gained from understanding social motivation in scan-and-go technology reveal several key practical implications for retailers, app developers, and businesses looking to enhance user adoption and satisfaction with self-service technologies. These implications are rooted in the three-level technology incorporation model, which includes Core Factors, Usability Factors, and Incorporators. Each plays a vital role in shaping the customer experience. Retailers must

prioritize building trust in the security mechanisms of their scan-and-go applications. Consumers' trust in secure payment systems, data protection, and biometric features (e.g., palm scanners) is critical for preventing dissatisfaction. Implementing robust security measures such as encryption, biometric verification, and transparent data policies can help alleviate concerns about potential fraud or data breaches.

Providing clear, easily accessible information on the app's security features can enhance user confidence, particularly when dealing with sensitive financial and personal data. To prevent dissatisfaction, scan-and-go apps should ensure consistent performance and reliability, especially in terms of accurate scanning and correct pricing. Retailers must invest in regularly updating their apps to prevent scanning errors, manual price checks, and double charging, which frustrate users and discourage further use. In addition, addressing compatibility issues across different phone models and operating systems will widen the user base, making the app accessible to a broader audience. Moreover, socially connected features like recipe sharing and deal exchanging can increase user engagement by creating community interaction. Retailers can add social features like shareable shopping lists, recipes, and deals. The social components do two things: they create a positive experience for the user while creating a community around the app leading to more incremental use and more effective mouth of word. Additionally, developers and marketers should collaborate to offer more personalized features such as scan-and-go apps that deliver calorie-awareness or highlight allergens and particular dietary restrictions (e.g., Halal). In this way, it is possible to leverage technology even more seamlessly into daily behaviors through educating conscientious shoppers.

### **Limitations and future directions**

Given the theory of the three levels of technology incorporation, which offers a unique, three-tier approach to understanding the integration of technology into customers' routine buying habits, it may not be universally applicable. Different technologies, sectors, or consumer groups may respond to these factors in varying ways. The three-tier theory simplifies a complex reality for analysis, and the distinctions between dissatisfaction, satisfaction, and incorporator factors may not be as clear-cut in real-world settings, with overlap and interplay between these categories. Although the three levels of technology incorporation outline separate stages, establishing clear causal relationships between these factors and the actual incorporation of technology into routine buying might be challenging. Therefore, future research should explore the

relationship between the three levels to determine the sequential relationship between the different factors across these stages.

Future research could focus on further validating these three levels in various contexts, geographical locations, industries (such as the fashion industry), and across a wide range of technologies and consumer demographics. Studies could explore the overlaps and interactions between dissatisfaction, satisfaction, and incorporator factors in the case of different types of technologies, such as augmented reality apps in the fashion industry. This would deepen the understanding of the dynamic nature of technology incorporation into customer routines across different industries. Additionally, longitudinal studies could be conducted to observe shifts in these factors over time, offering deeper insights into how the incorporation process evolves with the ongoing use of technology.

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## Appendices

### Appendix 1. Selected Twitter pages for reviews (n = 8)

Smart shop app names	URL
Sainsbury's (SA1)	<a href="https://twitter.com/sainsburys">https://twitter.com/sainsburys</a> .
Walmart Shopping and Grocery (SA2)	<a href="https://twitter.com/Walmart">https://twitter.com/Walmart</a> .
Sam's Club (SA3)	<a href="https://twitter.com/SamsClub">https://twitter.com/SamsClub</a> .
OfferUp (SA4)	<a href="https://twitter.com/offerup">https://twitter.com/offerup</a> .
Meijer's (SA5)	<a href="https://twitter.com/meijer">https://twitter.com/meijer</a> .
Amazon Go (SA8)	<a href="https://twitter.com/amazon">https://twitter.com/amazon</a> .
B.J.'s (SA9)	<a href="https://twitter.com/BJsWholesale">https://twitter.com/BJsWholesale</a> .
Kroger (SA10)	<a href="https://twitter.com/kroger">https://twitter.com/kroger</a> .

### Appendix 2. Selected YouTube channels for reviews (n = 12)

Videos	URL
SmartShop Mobile Pay App   Sainsbury's	<a href="https://www.youtube.com/watch?v=JccCdvU450Y&amp;t=1s">https://www.youtube.com/watch?v=JccCdvU450Y&amp;t=1s</a> .
Walmart Plus + New Scan and go	<a href="https://www.youtube.com/watch?v=CYJi94m6xOQ&amp;t=1s">https://www.youtube.com/watch?v=CYJi94m6xOQ&amp;t=1s</a> .
Shopping at Sam's Club Vlog	<a href="https://www.youtube.com/watch?v=Nu_QqD1P75Q&amp;t=18s">https://www.youtube.com/watch?v=Nu_QqD1P75Q&amp;t=18s</a> .
Sam's Club Scan & Go App	<a href="https://www.youtube.com/watch?v=bwpY8xjBmeo">https://www.youtube.com/watch?v=bwpY8xjBmeo</a> .
New Scan, Bag, Go App	<a href="https://www.youtube.com/watch?v=1AsZgBj-4io">https://www.youtube.com/watch?v=1AsZgBj-4io</a> .
Best Shopping List App!—Bring! App Review	<a href="https://www.youtube.com/watch?v=hLc8F7xWBN4">https://www.youtube.com/watch?v=hLc8F7xWBN4</a> .
Walmart Plus + New Scan and go	<a href="https://www.youtube.com/watch?v=CYJi94m6xOQ&amp;t=1s">https://www.youtube.com/watch?v=CYJi94m6xOQ&amp;t=1s</a> .
Walmart app hidden clearance   step by step	<a href="https://www.youtube.com/watch?v=tmkNML-eKbU&amp;t=2s">https://www.youtube.com/watch?v=tmkNML-eKbU&amp;t=2s</a> .
Scan, Bag, Go	<a href="https://www.youtube.com/watch?v=P4fxBTgEg2Y">https://www.youtube.com/watch?v=P4fxBTgEg2Y</a> .
Walmart Scan and go	<a href="https://www.youtube.com/watch?v=RPZqcKsCbH0">https://www.youtube.com/watch?v=RPZqcKsCbH0</a> .
Meijer has a new shopping app, here is how it works	<a href="https://www.youtube.com/watch?v=Vwf7SHeUez8">https://www.youtube.com/watch?v=Vwf7SHeUez8</a> .
Inside The NEW Amazon GO	<a href="https://www.youtube.com/watch?v=Uutal2M4VXQ">https://www.youtube.com/watch?v=Uutal2M4VXQ</a> .

### Appendix 3. Group interview participants

Participant ID	Age Range	Gender	Educational Background
P01	18–23	Female	Bachelor's Degree
P02	18–23	Male	High School
P03	24–29	Female	Bachelor's Degree
P04	24–29	Male	Bachelor's Degree
P05	30–35	Female	Master's Degree
P06	30–35	Male	Bachelor's Degree
P07	36–41	Female	PhD
P08	36–41	Male	Master's Degree
P09	42–47	Female	Master's Degree
P10	42–47	Male	High School
P11	48–53	Female	PhD
P12	48–53	Male	Bachelor's Degree
P13	54–59	Female	Master's Degree
P14	54–59	Male	High School
P15	18–23	Female	Bachelor's Degree
P16	24–29	Male	Bachelor's Degree
P17	24–29	Female	Bachelor's Degree
P18	30–35	Male	PhD

(Continued)

Participant ID	Age Range	Gender	Educational Background
P19	30–35	Female	Bachelor's Degree
P20	36–41	Male	Bachelor's Degree
P21	36–41	Female	Master's Degree
P22	42–47	Male	High School
P23	42–47	Female	PhD
P24	48–53	Mal	

#### Appendix 4. Focus group interview questions

Q1: What factors are most important for you to show your trust in scan and go apps?

Q2: Which risks (financial, personal, and/or informational) can discourage you from trying scan-and-go apps?

Q3: What are your experiences regarding the system usefulness of scan and go apps?

Q4: How convenient was it for you to install, operate and use the features of scan and go apps?

Q5: Was it easy for you to find customer support in store as well as online when you had any issues with scan and go apps?

Q6: Which system-related features require the immediate attention of retailers and developers to increase your level of satisfaction with scan and go apps?

Q7: What are the major issues which you have experienced, and did they deter you from using the scan-and-go app?

Q8: What is your major motivation to try a scan and go app and were your expectations met after experiencing a scan and go app?

Q9: Do scan and go apps fulfil your socialisation goals?

Q10: Do you think that scan and go apps can provide you with the best economical prices that can help you to attain your financial goals?

Q11: Did you find enough product and other information to help you to successful complete a buying process using scan and go apps?