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FACTORS INFLUENCING SHOPPER PREFERENCES FOR SELF-SERVICE TECHNOLOGIES VS. CASHIER CHECKOUT: A TECHNOLOGY ACCEPTANCE MODEL (TAM) PERSPECTIVE

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ABSTRACT

This study explores factors influencing shopper preferences for self-service technologies (SSTs) versus cashier-assisted checkout using the Technology Acceptance Model (TAM). Through 15 semi-structured interviews, we found that Perceived Ease of Use (PEOU) strongly predicts a preference for SSTs, while Perceived Usefulness (PU) and situational factors like queue length and item type also play significant roles. The results emphasize the need for user-friendly SST designs and suggest that retailers should optimize both SST and cashier experiences. Future research should examine the impact of situational and personal factors on SST adoption.

Keywords: Strategy, Strategy formulation, Strategy implementation, Strategic plan, Employee adaptability, Successful implementation of strategic plan.

1. INTRODUCTION

The retail landscape has been significantly transformed by the advent of self-service technologies (SSTs), offering consumers an alternative to traditional cashier-assisted checkouts. As retailers like Vons, Ralphs, and Target increasingly adopt these technologies, it becomes crucial to understand the factors influencing consumer preferences for SSTs over cashiers, especially in brick-and-mortar settings. The Technology Acceptance Model (TAM), developed by Davis (1989), provides a robust framework for examining technology acceptance. According to TAM, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) are key determinants of whether users accept a technology. PEOU refers to the extent to which individuals believe that using a particular technology will be effortless, while PU pertains to the perceived enhancement of the user's experience or job performance.

While much of the existing literature, such as the work of Meuter et al. (2000) and Curran and Meuter (2005), has quantitatively explored the factors affecting SST adoption, there is a notable gap in qualitative research that delves into the underlying reasons for consumer preferences in different retail settings. This study aims to fill that gap by exploring why shoppers choose between SSTs and cashier-assisted checkouts, hypothesizing that PEOU and PU significantly influence these decisions. Moreover, we propose that situational factors, such as queue length, type of goods, and personal convenience, further moderate these preferences.

To investigate these factors, we conducted semi-structured interviews with shoppers, focusing on the circumstances under which they prefer SSTs or cashiers. Using grounded theory methodology,

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we analyzed the data through open and axial coding to identify key themes and patterns. Our findings contribute to the growing body of literature on technology acceptance and consumer behavior in the retail sector. They offer practical implications for retailers aiming to enhance the checkout experience, ensuring it is seamless and efficient for all customers.

2. THEORETICAL FRAMEWORK

Our theoretical framework is Technology Acceptance Model (TAM) developed by Davis (Davis et al. 1989). Substantial empirical and theoretical support has accumulated in favor of TAM, especially in modeling how users come to accept and use a technology. As our theory backdrop, we wish to test (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) several factors which can determine a new technology user's decision about how and when they use TAM constructs. Particularly we wish to test Perceived Ease of Use (PEOU) which Davis described as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). This means that if the technology is easy to use, then hurdles toward its use are overcome. And we wish to test Perceived Usefulness (PU) – Davis described this as "the degree to which a person believes that using a particular system would enhance his or her job performance"(Davis 1989). Essentially this means that a user perceives a technology to be helpful for what they want to achieve.

Preferences are, in a sense, an evaluative judgment between liking or disliking an object such as a technological artifact like SST (Scherer 2005). Our research provides useful information about what shoppers ' preferences are when choosing to use SST or a cashier, depending on their circumstances. Retailers will likely want to understand this phenomenon as they attempt to improve the checkout experience, making it more efficient and giving shoppers choices between a cashier or a SST.

Our research asks the question: In a brick-and-mortar retail setting when choosing between SST (automated check-out), a cashier during checkout, or depending on their circumstances, why do shoppers prefer any of these choices?

3. METHODOLOGY

We use the case study method to investigate our research question, because it is preferred when "how" and "why" questions are being posed; when the extent of control of the researcher is little; when the focus is on a contemporary phenomenon and not on historical events (Yin 2008); and when the focus is on understanding the dynamics within a single setting (Eisenhardt1989).

Data Collection: This research employs an interpretive theory-testing case study methodology (Markus, 1983; Myers, 1995) by conducting 15 semi-structured interviews over a three-month period, utilizing telephone or Zoom video conference platforms. The interviews adhered to the semi-structured format proposed by Kvale (1996) and Charmaz (2006), following the recommendations of Myers and Newman (2007). Each interview lasted between 10 to 15 minutes, resulting in a total of 32 pages of transcripts. We employed convenience sampling and chose a small sample size, leveraging video conference/telephone interviews for data collection. Our study focuses on the community of shoppers within the sociological setting of brick-and-mortar stores, interacting with cashiers and self-service technologies (SSTs) to make socio-economic decisions.

Data Analysis: The interview transcripts were transcribed using Otter.ai, a free online transcription software. Each author independently conducted open coding, summarizing the text

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to develop concise codes. This was followed by a collective process of axial coding, where we refined conceptual constructs and explored the relationships between associated descriptive categories (Glaser, 1978, 1992). The coding process adhered to Strauss and Corbin's (1990) grounded theory approach. However, we did not pursue theoretical coding, as our goal was not to develop a substantive theory but to test an existing one.

A hermeneutic approach was employed to deduce meaning through a dialectic process, balancing an understanding of the interviews as a whole with the interpretation of their individual parts. This method aimed to identify whether one or more major themes emerged (Radnitzky, 1970; Gadamer, 1976).

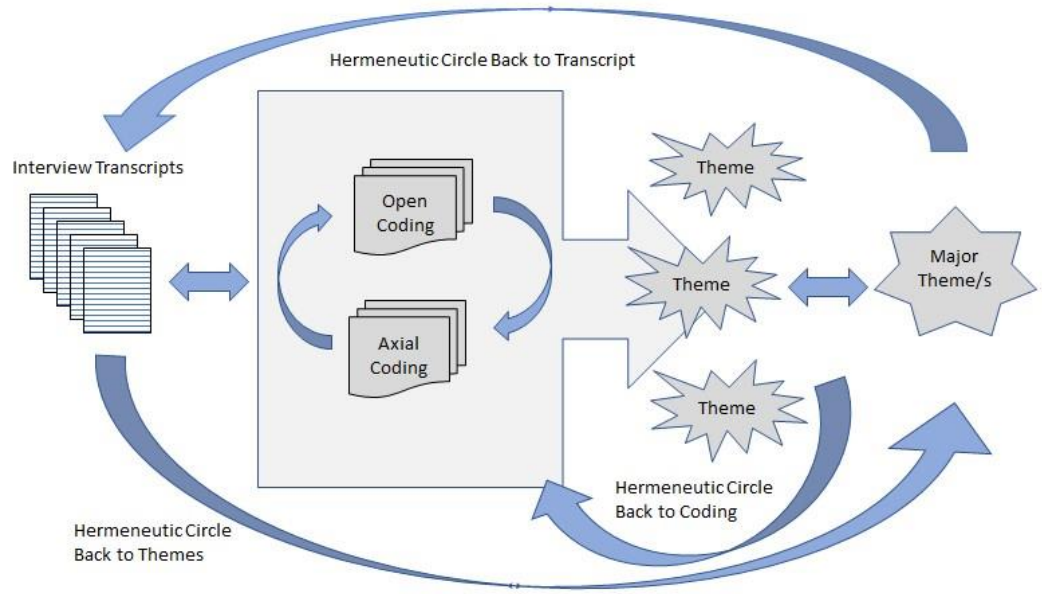

Figure 1 – Methodology process

"Texts do 'speak,' but without speaking" (Peter Haidu, 1990). Figure 1 depicts our methodology up to this point. As themes emerged from the coding process, we found ourselves in the midst of the hermeneutic circle, prompting us to question our coding and concepts. This led us to revisit the source transcripts, examining the context and confirming ideas and themes to uncover potential hidden meanings and nuances we may have missed. We were able to exit the cyclical nature of this process once saturation and consolidation of ideas and themes were achieved.

The empirical results were then tested against our theoretical construct to answer our research question. This was done through a thorough interpretive discussion among all three researchers to draw our final conclusions.

4. RESULTS AND FINDINGS

Based on the result of the data analysis, six major axial code categories emerged with 45 other code data points we grouped together as minor. See Table 1.

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No. Associated Open Codes Data Point	Axial Codes	Themes
65	Ease of use	Ease of technology is not an impediment to use.
39	Fastness/slowness	Because technology is easy, convenience becomes one of the next most important factors
36	Personal Interaction	Because technology is easy, personal interaction becomes one of the next most important factors
18	Convenience	Because technology is easy convivence becomes one of the next most important factors
9	Personal Feelings	Because technology is easy, personal feelings become one of the next most important factors
45	Other codes	Other categories are particular to individual subjects

Table 1

In probing on one of our major interview questions:
"When you go into the store with self-service checkout technology are you interested in using it or prefer the cashier?"
We found that all of our subjects had used SSTs, and that none stated they would not use them because the technology was too difficult. This emerged as a major theme, in that " perceived ease of use did significantly predict people's preference to select an SST confirming Davis' "Perceived ease-of-use construct." See Figure 2 for representative subject quotes associated with this theme.

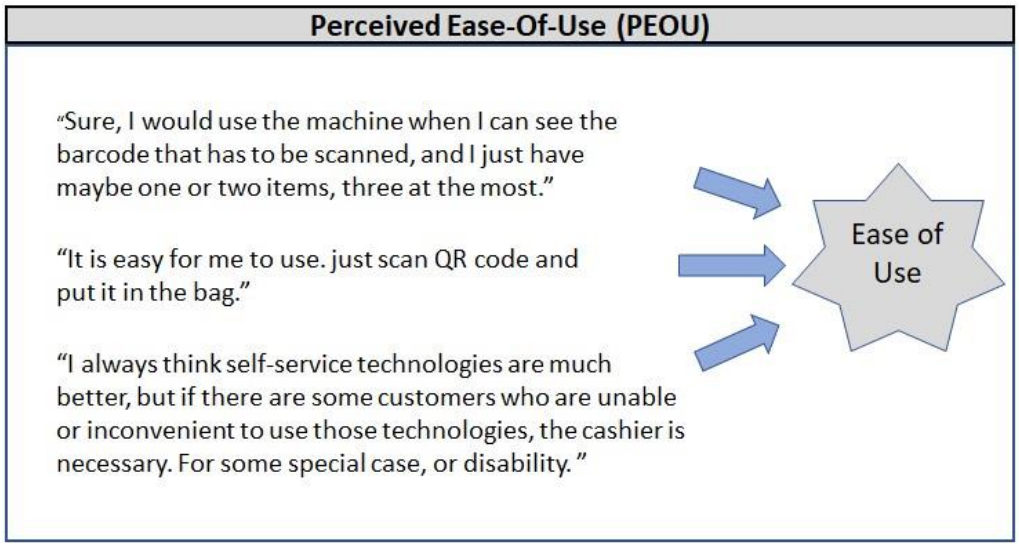

Figure 2

We looked further into what degree our subjects using SSTs would find these systems free from effort to use when deciding between a cashier and SST. We understood that for the shoppers, their major objective is to get through the checkout process. We treated the shopper's decision to select

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the SST or Cashier related to the "Perceived Usefulness" construct to the degree to which a shopper believes that using a SST would enhance their checkout process. Four axial codes lead us to this construct: Fastness/Slowness, Personal Interaction, Convenience, and Personal Feelings. See Figure 3 for representative subject quotes associated with these categories. We determined these categories were the themes associated with this construct and should not be consolidated any further.

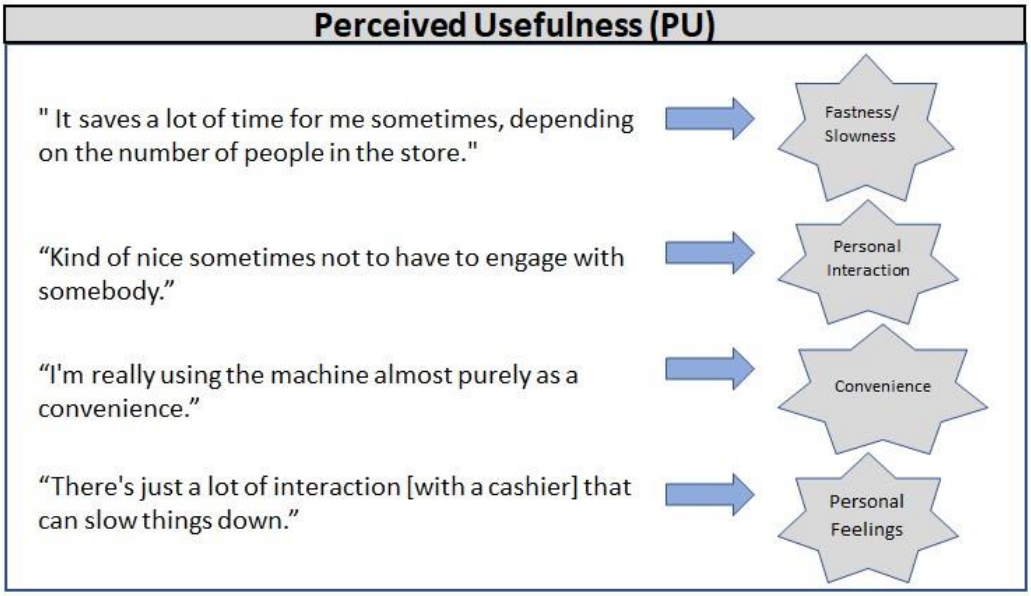

Figure 3

However, from our minor codes, additional sub-themes emerged as facilitating conditions, defined as consumers' perception of the resources and support available to perform a behavior (Venkatesh et al., 2003), stemming from our major themes related to the use of technology and the choice between using a cashier or self-service technologies (SSTs). We identified a subset of cases where subjects were ambivalent about using either SSTs or cashiers, choosing between them based on factors such as the length of the line on a given day. In one case, a subject expressed a perceived ease of use and perceived usefulness of SSTs but stated a preference for using cashiers whenever possible. This demonstrates the need for more refined data collection techniques to uncover potential psychological or sociological factors influencing these preferences.

Additionally, we found specific situations where subjects preferred to use a cashier because they perceived the SSTs as too difficult to use. The most common example was the necessity to look up barcodes for fruits and vegetables, which often led subjects to opt for a cashier. Another example was when subjects had a large number of items; they preferred using a cashier either to be courteous to other shoppers or because they did not want to scan and bag numerous items themselves. These cases confirmed that when subjects perceived the technology as too difficult or not useful, they preferred using a cashier.

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5. CONCLUSION

Our research has shown that "perceived ease of use" and "perceived usefulness" significantly influence the intention to use SSTs. However, the preference for SSTs is further moderated by facilitating conditions. The "perceived ease of use" construct in the Technology Acceptance Model (TAM) has a direct, significant effect on the behavioral intention of shoppers when it comes to the preference for SSTs within the context of checkout in brick-and-mortar stores. However, when choosing between SSTs and cashiers, situational factors such as the number of people in the queue (for both SSTs and cashiers), the quantity or type of goods purchased, and personal factors like convenience significantly influence individual intentions.

The intended contribution of this work to existing research is to inform SST designers of the need to improve barcode scanners and streamline the design of future SSTs to ensure a consistent and user-friendly shopping experience across all stores. It is also a call for brick-and-mortar stores to pay more attention to labeling items with easily scanned barcodes. Additional research should explore the extent to which convenience impacts user preferences between SSTs and cashiers. Furthermore, sub-themes should be analyzed further to understand their moderating effect on the overall impact of TAM constructs.

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