Generational Differences in the Perceptions and Usage of Self-Scanning and Paying Counters in Supermarkets

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Abstract

The study analyses generational differences in the perception and use of self-scanning and self-service technologies in supermarkets in Romania. Using a quantitative methodology based on an online questionnaire applied to a sample of 126 urban respondents, the research examines four hypotheses regarding generational differences. Results indicate significant discrepancies between age groups: young consumers (under 25) are more motivated to visit supermarkets with self-scanning and self-service facilities, and this motivation decreases with age. People under 35 perceive these technologies as very beneficial, while older respondents see them as moderately beneficial. In terms of ease of use, most age groups find the technologies accessible, with the exception of those over 45, who report moderate difficulties. Time efficiency is also perceived differently - younger users experience time savings, while older respondents find the time spent comparable with traditional methods. The results suggest the need for tailored strategies to improve the experience of consumers of different generations when interacting with self-service retail technologies.

Keywords
Generational differences, Self-scanning technologies, Consumer behavior, Digitalized supermarkets, Technological Perception.

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Introduction

Widespread adoption of self-scan and pay counters and electronic payment systems has substantially altered consumer purchasing behaviour. Such innovations as self-service kiosks and electronic wallets provide increased convenience while simultaneously introducing new dynamics in terms of spending habits, fiscal responsibility, and the acceptance of technology across different demographic segments. Time pressure and the desire for control are contextual factors that also impact the use of self-payment technologies. For instance, individuals aiming for fast service providers, for example, supermarkets and fast food outlets, have a greater inclination to use self-checkout machines in the interests of saving time (Kim, Kim and Lee, 2023). This behaviour is considered to be explained by the ease of use and the convenience provided by the self-payment technology, which in turn, might account for increased spending readiness, most especially for youth segment of population and individuals with advanced degrees of digital literacy (Hayrapetyan and Petrosyan, 2023; Goyal, 2024). The time-saving gains due to the reduced waiting lines of self-payment technologies represent a main driver for consumers to accept these technologies (Vakulenko, Oghazi and Hellström, 2019; Le et al., 2024). Though there are studies addressing consumer responses to digital technologies used by companies during their dealings with customers, the particular area of self-scanning and paying technologies in stores is not adequately researched. Hence, the present study attempts to

understand the attitudes and behaviour of different generations while shopping, particularly with regard to the self-scanning and self-payment technologies employed by supermarkets.

Thus, the first part of the paper analyses the various factors linked to consumer behaviour when self-paying for various services, while the second part of the paper analyses the way generations regard and behave in the presence of these technologies of self -scanning and self-paying in the physical shopping settings of supermarkets.

1. Literature review

The use of self-service cash counters is affected by a mix of technological, psychological, and environmental factors. Researchers have indicated that consumers' inclination to use various technologies is fuelled by the technologies' perceived usefulness, ease of use, and convenience (Vakulenko, Oghazi and Hellström, 2019; Kim and Lee, 2020; Le et al., 2024). Also, research about the Technology Acceptance Model (TAM), indicates that users will adopt self-pay technologies more readily if they perceive these systems as easy to use and useful (Vakulenko, Oghazi and Hellström, 2019).

Likewise, the usability of these systems, with their intuitive interfaces and reduced levels of complexity, favours greater levels of consumer willingness to use them (Vakulenko, Oghazi and Hellström, 2019; Kim and Lee, 2020). For instance, research concerning self-service kiosks indicated that control and convenience were among the variables with the highest influence in lowering consumer reluctance to these technologies (Kim and Lee, 2020).

Trust is one of the key drivers of the adoption of self-payment technologies. Consumers are more willing to use such systems if they find them secure and reliable (Le et al., 2024). Nevertheless, data security concerns and privacy issues may be obstacles to adoption, especially for the more aged consumers. Empirical findings indicate that shopping at self-service counters has both positive and negative impacts on consumer spending behaviour. On one hand, these technologies can facilitate impulse purchasing and increase the willingness to spend due to their ease of use and to reduced unpleasantness when paying (Hayrapetyan and Petrosyan, 2023; Yousef, 2024). On the other hand, based on some studies, self-pay technologies can promote financial discipline and can increase financial responsibility by providing consumers with tools to track their spending and manage their budgets. For instance, electronic wallets with spending-tracking features have proven to improve the financial management skills, particularly in the young adult population (Yousef, 2024).

The impact of self-pay technologies on consumer spending varies across generations. For example, Generation Z, as digital natives, will more likely engage in indulgent purchasing when using mobile payments, while earlier generations may exhibit more frugal spending behaviour due to security and privacy issues (Goyal, 2024; Thoumrungroje and Suprawan, 2024).

The repeated use of self-service and payment technology is determined by consumer attitudes, perceived benefits, and satisfaction with the technology. The literature indicates that favourable attitudes towards self-service payment technologies, including perceived enjoyment and satisfaction, are strong predictors of repeated usage (Vakulenko, Oghazi and Hellström, 2019; Kim and Lee, 2020; Le et al., 2024). Individuals who have enjoyed a good experience with self-service and payment technologies will tend to repeat the process in the future shopping sessions. This is also confirmed by a study on self-service kiosks which indicated that customers who found the systems to be entertaining and convenient used them more frequently (Kim and Lee, 2020). It can be concluded that perceived benefits of self-pay technology, such as time saving, convenience, and control, also significantly affect intentions to use. Consumers with favourable attitudes toward these benefits will be more likely to adopt and continue to use self-pay systems (Vakulenko, Oghazi and Hellström, 2019; Le et al., 2024).

Despite the benefits, some consumers may be hesitant to use self-payment technologies because of factors like feelings of human alienation, lack of trust, and perceived complexity (Kim and Lee, 2020; Le et al., 2024). There is a need to overcome such barriers to maximize the adoption and continued use of self-payment technologies. Organizations can enable the use of self-payment technologies by improving the user interface, ensuring security protocols, and alleviating trust and privacy concerns (Le et al., 2024). In addition, the provision of incentives, such as promotional offers and rewards, can encourage consumers to use these systems (Yousef, 2024). Policymakers in conjunction with financial institutions can play a crucial role in the responsible promotion of self-pay technologies by encouraging financial awareness and offering education on the risks involved in impulsive buying and overspending (Yousef, 2024).

Several factors moderate the relationship between self-scan and pay counters and consumer behaviour, including demographic characteristics, financial education, and psychological traits.

Age, gender, and generational differences significantly influence consumer behaviour in the context of self-pay technologies. For example, younger generations, such as Millennials and Generation Z, are more likely to adopt and use self-pay technologies due to their higher levels of digital literacy and comfort with technology (Goyal, 2024; Thoumrungroje and Suprawan, 2024). Gender also plays a role, with some studies suggesting that females may be more susceptible to overspending when using mobile payments (Goyal, 2024).

Financial awareness and education is another important moderator of consumer behaviour. Consumers with higher levels of financial literacy are more likely to use self-pay technologies responsibly, while those with lower levels may be more prone to impulsive buying and financial mismanagement (Yousef, 2024).

Psychological traits, such as self-control and risk tolerance, also influence consumer behaviour when using self-pay technologies. For example, consumers with higher levels of self-control are less likely to engage in impulsive buying, while those with lower levels may be more susceptible to the convenience and ease of use of these technologies (Karthika, Chaidir and Suprapti, 2024).

Businesses should also consider generational differences when designing and marketing self-pay technologies. For example, older generations may require more support and education to feel comfortable using these systems, while younger generations may be more responsive to innovative features and incentives (Thoumrungroje and Suprawan, 2024).

2. Methodology of research, objectives and hypotheses

This study employed a cross-sectional survey design utilizing an online questionnaire to gather data on consumer behaviour in respect with self-pay cash counters. The questionnaire was developed using Google Forms and distributed via digital channels, including social media platforms and email invitations. A non-probability, self-selection sampling technique was employed, 126 answers from participants of both genders and various ages being recorded. Consequently, the research results are limited to the particularities of the sample and may not accurately reflect the broader population, and findings should be interpreted with caution.

The main objective of the research is to analyse the way consumers of various generations respond to the introduction of digital technologies in supermarkets that allow them the self-scanning and self-paying of own shopping baskets in the physical setting of supermarkets. As such, the following research hypotheses have been set: *H1*. There is a difference between generations about being motivated to visit a supermarket that has self-scanning and paying counters. *H2.* There is a difference between generations about perceiving self-scanning and paying counters as beneficial for customers. *H3*. There is a difference between generations about the perceived ease of use self-scanning and paying at counters. *H4.* There is a difference between generations in what concerns the time spent for self-scanning and paying at counters, as compared with the time spent for traditional counters operated by human workforce.

3. Results and discussions

The sample consisted of 126 respondents of both genders and all ages, living in urban area and having access to supermarkets equipped with self-scanning and paying counters. By looking in general at the shopping behaviour of the respondents we can say that, in general, respondents shop physically in supermarkets, at least once /week or more frequent, as a result of Wilcoxon Signed test for median applied in conditions of approximate symmetry (the skewness coefficient is -0.24), the cut-off significance value being set at 0.05. Hence, their opportunities for interacting with self-scanning and paying equipment in supermarkets are numerous, creating thus the premises for answers founded on real user experience.

In terms of identifying the motivation of consumers to visit a supermarket based also on self-scan and pay counters, given the non-normal distribution of ordinal data, Mood's test has been applied, the results being shown in Table no. 1.

Table no.1. Mood's Median Test: motivation for visiting a supermarket with self-scan and pay counters cross age

Age.	Median	N < Overall Median	N >= Overall Median	Q3 – Q1	95% Median CI
1 (<25 years)	3	24	58	1.0	(3, 3)
2 (26-35 years)	2	12	10	1.0	(2, 3)
3 (36 -45 years)	1	12	2	1.0	(1, 2)
4 (>46 years)	2	6	2	1.5	(1, 3)
`Overall	3				

Test

Null hypothesis	H_0: The population medians are all equal
Alternative hypothesis	H_1: The population medians are not all equal

DF	Chi-Square	P-Value
3	21.29	0.000

The Mood test shows that the self-scan and pay counters tend to decrease as motivation to visit a supermarket with age, the youngest segment - below 25 years, being the one that appreciates the most this digital facility of self-scanning and paying the shopping basket. While young people find self-scan and pay counters as highly motivating them for visiting a supermarket, the age group 26-35 years displays an average level of motivation, while the age category 36-45 places the least level of importance on self-scanning and paying counters in choosing a supermarket to go shopping. A slight increase in median is shown in the group >46 years (average motivation). However, this result can be explained by the small number of respondents in this group category, the confidence interval of median ranging from 1-3, with a greater variability in the data (as shown by the higher interquartile range of 1.5), which makes estimates for this age group above 45 years less precise.

Overall, the p-value below 0.05 shows that there are differences between generations in terms of considering self-scanning and paying counters as motivation for visiting a supermarket, and, as such, the H1 research hypothesis is confirmed.

Next we analysed the perceived benefits of self-scanning and paying counters across generations, the results being shown in table no. 2.

Table no. 2. Mood's Median Test: the benefits of self-scanning and paying counters for customers cross age

Age	Median	N < Overall Median	N >= Overall Median	Q3 – Q1	95% Median CI
1 (<25 years)	3	13	69	0.00	(3, 3)
2 (26-35 years)	3	4	18	0.00	(3, 3)
3 (36 -45 years)	2	8	6	2.00	(1, 3)
4 (>46 years)	2	6	2	0.75	(2, 3)
Overall	3				

Test

Null hypothesis	H_0: The population medians are all equal
Alternative hypothesis	H_1: The population medians are not all equal

DF	Chi-Square	P-Value
3	22.82	0.000

Again, there is a difference between generations in what concerns how beneficial self-scanning counters are in the supermarkets, as young respondents below 35 years old consider these digital instruments benefit to a high extent, while the older respondents have a lower median of their answers, signifying a moderate beneficial equipment for customers introduced by the supermarkets. Thus, H2 research is confirmed.

Next we wanted to find out what are the main drivers for the motivation and the perception of benefits brought by this ICT technology allowing self-scanning and paying in supermarkets, and we took into

account the ease of use of these machines (results are shown in table no3) and the time spent for self operating at these counters (table no.4).

Table no. 3. Mood's Median Test: ease of use of self-scanning and paying counters cross age

Descriptive Statistics

Age	Median	N < Overall Median	N >= Overall Median	Q3 – Q1	95% Median CI
1 (<25 years)	3.0	7	75	0.00	(3, 3)
2 (26-35 years)	3.0	2	20	0.00	(3, 3)
3 (36 -45 years)	3.0	4	10	1.00	(2, 3)
4 (>46 years)	2.5	4	4	1.75	(1, 3)
Overall	3.0				

Test

Null hypothesis	H_0: The population medians are all equal
Alternative hypothesis	H_1: The population medians are not all equal

DF	Chi-Square	P-Value
3	13.95	0.003

The median test applied across generations indicates that only respondents above 45 years consider the use of self-scanning and paying counters slightly more complicated than respondents younger. While the interquartile range for this group is higher (1.75) than for the other groups, placing less confidence on the estimates, the overall result of the test with the p-value of 0.003, below the cut-off value of 0.05 indicates that there are differences among generations about the perceived ease of use, confirming thus the research hypothesis H3. At the same time, it can be inferred that a more complicated perception for the use of these self-scanning and paying tools at shopping is translated through increased self- operating times, hence the lack of interest in using these in the physical shopping process. The Spearman correlation coefficient calculated between ease of use and time spent at self-scan and pay counters as compared to traditional counters operated by human workers shows a value of -0.399, p-value<0.05. This shows only a moderate negative connection, meaning that there are other factors than ease of use that may contribute to the amount of time spent at these self-pay counters as compared to the traditional counters. Nevertheless, the same tendency is preserved across generations both at ease of use and of time spent at self-scan and pay counters (see table no. 4).

Table no. 4. Mood's Median Test: time spent at self-scan and pay counters as compared to traditional human operated counters cross age

Descriptive Statistics

Age	Median	N <= Overall Median	N > Overall Median	Q3 – Q1	95% Median CI
1 (<25 years)	1	72	10	0.0	(1, 1)
2 (26-35 years)	1	18	4	0.0	(1, 1)
3 (36 -45 years)	1	8	6	1.0	(1, 2)
4 (>46 years)	2	2	6	1.5	(1, 3)
Overall	1				

Test

Null hypothesis	H_0: The population medians are all equal
Alternative hypothesis	H_1: The population medians are not all equal

DF	Chi-Square	P-Value
3	22.31	0.000

In line with the findings of the preceding assessment in relation to perceived ease of use, it is notable that participants in the age bracket over 46 years assert that, on average, the duration they take to self-scan and pay for their shopping trolley is comparable to the amount of time they would have taken to use conventional, human-operated checkout tills. In summary, a p-value less than 0.05 suggests the existence

of statistically significant disparities among generations regarding the duration allocated to the self-scanning and payment procedures, thereby validating hypothesis H4.

Conclusions

The impact of self-pay cash counters on consumer behaviour is multidimensional and complex, driven by a variety of technological, psychological, and demographic conditions. By understanding these factors and addressing the associated challenges, businesses and policymakers can promote the adoption and responsible use of self-pay cash counters, ultimately enhancing consumer well-being and businesses resilience. The current study aimed to analyse the factor of age This study explored generational differences in consumer attitudes and behaviours toward self-scanning and self-paying technologies in supermarkets. Using an online questionnaire, data from 126 urban respondents across various age groups were analysed.

The findings reveal significant generational differences in the perceptions and usage of self-service technologies:

- **Motivation to visit supermarkets with self-scanning and paying options**. Younger consumers, particularly those under 25, are more inclined to visit supermarkets offering self-scanning and self-paying facilities, this motivation decreasing with age.

- **Perceived benefits**. Respondents under 35 perceive self-service technologies as highly beneficial, whereas older participants view them as moderately advantageous.

- **Ease of use**. While most age groups find these technologies user-friendly, those over 45 years report slightly more difficult, indicating potential usability challenges for older consumers.

- **Time efficiency**. Younger users generally experience time savings with self-scanning and paying options, as compared to traditionally human operated counters. However, older respondents often find the time spent comparable to traditional checkout methods.

The study contributes to the scientific literature on technology acceptance by providing age-specific insights into consumer behaviour toward self-service technologies, reinforcing theories such as the Technology Acceptance Model within a generational context. Moreover, it highlights age-specific patterns in motivation, perceived benefits, ease of use, and time efficiency with practical benefits for the management of service providers as it supports decision making to enhance usability and convenience for the customers.

Several limitations should be considered when interpreting these findings, given by the sampling method, since the use of a non-probability, self-selection sampling technique limits the extrapolation of the results to all population, as well as the relatively sample size in the over 46 age group and the particularities of demographics - confined to urban residents potentially excluding perspectives from rural or less technologically connected populations. Nevertheless, the study results align with existing literature suggesting that younger generations are more receptive to technological innovations in retail settings. More aged consumers may require additional support and education to enhance their comfort and efficiency with such technologies. Future directions of research may address sample and could explore how exposure and training influence consumers' acceptance of self-service technologies.

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