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AUTOMATION IN RETAIL: REFLECTION ON THE ADVANTAGES AND DISADVANTAGES OF AUTONOMOUS STORES

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ABSTRACT

Technology evolves at an unstoppable pace. The conventional retail sector has been adapting to technological innovations. Currently, the so-called autonomous stores are emerging, which can be understood as commercial spaces in which the human intervention of shopkeepers in the purchase process is abolished. The objective of this article is to, through a bibliographic research, reflect on the advantages and disadvantages of the purchase process in autonomous stores. Consulting some recent literature on the subject, it is concluded that the consumer is facing a new way of shopping, increasingly personalized and autonomous, with positive impacts on the elimination of queues, the reduction of deadlines, access to the store 24 hours a day, among others. In turn, the entrepreneur obtains greater fluidity inside the store, reduces costs, encourages loyalty and sees the process of replenishment on the shelves facilitated. From the point of view of inconveniences, the reduction of jobs and the difficulties in the process for older people or those with difficulties in handling the technologies involved in the process stand out.

Keywords: Autonomous stores. Consumer. Purchase process. Customization.

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INTRODUCTION

Conventional retail has been growing over the years, but some problems persist, namely in terms of the fluidity of customers inside the stores. According to DA SILVA (2023, p. 6), "(...) Consumers identify several disadvantages and limitations associated with conventional purchases, such as queues, crowds of people, limited capacity, among many other disadvantages, (...)".

This sector has been able to adapt to numerous technological challenges, in order to captivate consumers to buy in its stores, as well as to facilitate the respective purchase process. Digital advertising, QR codes, discounted digital coupons, mobile *apps*, and digital tags are just some of the technologies that have been adapted over the past few years.

For all these reasons, physical commercial spaces are increasingly equipped with cutting-edge technologies that aim to understand what the customer wants to buy, in order to ensure their loyalty.

Artificial Intelligence (AI), the Internet of Things (IoT), cloud computing and other recent technologies enable increased process automation, which is now very present in the most varied contexts, namely in the retail sector.

The pandemic has instilled greater speed in digital transformations in this area (HA *et al*., 2025, p. 1) and, in some way, as can be deduced from the words of BORDOKAN *et al*. (2021, p. 2), boosted autonomous retail.

The so-called autonomous stores, whose purchase process is fully automated, do not require employees (BENOIT *et al*., 2019, p. 217), in essence, imply a new shopping experience for the consumer DA SILVA (2023, p. 1).

It is justified to develop a study that presents a reflection on the advantages and disadvantages of shopping in autonomous stores.

PURCHASE PROCESS IN AUTONOMOUS STORES

In general, in order to make purchases in autonomous stores, the user must first create an account in the respective store's application, so that they can be properly identified. When you go to the entrance door of the store in question, you must scan the QR code with your smartphone, so that you can access the interior of the store. Once inside, to start the purchase process, you must point your smartphone to the codes of the desired products. The respective products are added to a virtual shopping cart visible on the user's smartphone or tablet.

In other cases, it is enough to just add the products to the bag, without the need to point to the QR codes, that is, it is the surveillance cameras installed in the store that detect the

products. This scenario is possible in the autonomous store of the Zaitt brand (ZAITT, 2025), in which it is even possible to consume some products inside the store, after the respective payment (NOVAREJO, 2019).

The sensors and cameras installed on the ceiling do all the work of recognizing the purchase. As HERSEN & DA SILVA (2022, p. 60) points out, we have "(...) cameras that do the customer's body biometrics that are associated with the token generated in the application and with this, it is possible to detect all customer movements and how many people are inside the establishment".

At the end of the process, you must proceed with the respective payment, through digital means on the smartphone.

We are in the presence of the *so-called self-checkout*, a system that, in some way, we are already a little used to in some commercial surfaces, which provide some ATMs.

The interaction of the installed system with the user is a fundamental element in the entire shopping process in fully autonomous stores, which is why BARRETO FERNANDES & ORTUÑO (2017, p. 254) point out that "These electronic equipment must be designed in such a way as to facilitate interaction with the user, allowing the task to be completed with the fewest possible actions, because all delays in the interaction experience are seen as negative."

Basically, we are in the presence of a process that works almost as if we are purchasing products *online*, but with the particularity of being inside a physical store and taking the products at the end of the process.

Inside the store, additional information about the products, advertisements presented using augmented reality technology, for example, can be made available. As seen in FERNANDES (2023, p. 12790), "(...) AR is also a tool that enables personalization, that is, it becomes possible to collect information from the tastes shown (...)", so it can be adapted in this context. While purchasing certain items, the customer may view advertisements for other complementary items.

In fact, from the above, it appears that technology is present throughout the autonomous store, so that, "(...) integrates with the layout of the purchasing environment (...)" (SARCINELLI, 2021, *et al*. p. 2).

Naturally, a store with these characteristics must be equipped with appropriate technologies, namely the following: video cameras, artificial intelligence, various sensors, QR codes, digital payment systems, automatic doors, digital tags, as can be deduced from the considerations of several authors: SARCINELLI (2021, *et al*. p. 2), HERSEN & DA SILVA (2022, p. 60) and NOVAREJO, (2019).

OBJECTIVE

This article aims to analyze the advantages and disadvantages of the buying process in autonomous stores.

METHODOLOGY

From the methodological point of view, a bibliographic research followed, which according to DE SOUSA *et al*. (2021, p. 66) “(…) it consists of a set of information and data contained in printed documents, articles, dissertations, published books; (…)”. Scopus and Google Scholar were used to select some recent texts on the topic under analysis.

REFLECTION ON ADVANTAGES AND INCONVENIENCES OF AUTONOMOUS SHOPS

This business model brings advantages and disadvantages for entrepreneurs and consumers. From the consumer's perspective, one of the great advantages is the obvious speed of the process, especially at the payment stage. The products are instantly added to the virtual cart (BORDOKAN *et al*., 2021, p. 2), and payment is easily made using digital means.

Since the "(...) queue at the end of the process of selling services and products is a recurring challenge for companies" (FERNANDES *et al*, 2021, p. 2), with this system, queues and congestion inside the store are avoided. The customer enters the store, removes the products from the shelves, proceeds to pay through the smartphone and leaves again.

Another advantageous aspect for the consumer is the fact that these spaces are open to the public 24 hours a day (BORDOKAN *et al*., 2021, p. 2), which is not the case in other commercial areas. The user can use these establishments at the time that is most favorable to him, he does not have to depend on fixed schedules.

Looking at the benefits from the shopkeeper/entrepreneur's perspective, the speed of the process is also a positive aspect, as it avoids congestion and queues inside your store. It allows for greater fluidity in the entry and exit of customers.

Loyalty is also a crucial element for any store, which can be fine-tuned in this context. The time it takes a customer to observe the characteristics of a product label, the items they buy, the products they abandoned and put back on the shelf draw a profile of the customer's tastes.

An important element is the issue of replacement. According to DA SILVA RIBEIRO (2019, p. 2) "Most of the time the merchant cannot control the state of his product, that is, how many times it has been moved and has not been bought or relocated to another shelf". In this type of store, the replenishment process is facilitated.

The opening of stores of this type does not need as many employees as a conventional store, at least in direct contact with the customer, which translates into a reduction in costs for the entrepreneur (salaries, social security contributions).

On the other hand, the negative point is that human jobs are being replaced by technology, which translates into higher unemployment.

Another negative aspect has to do with the difficulties in accessing these stores. Elderly people or those with difficulty dealing with applications, smartphones, QR codes and electronic payments will find it more difficult to make purchases in autonomous stores.

FINAL CONSIDERATIONS

The retail sector has evolved significantly in recent years, mainly due to technological evolutions. The recent evolution towards commercial spaces without employees, the so-called autonomous stores, justified a reflection on the advantages and disadvantages of shopping for consumers and shopkeepers.

It is concluded that speed and agility in the process, elimination of queues and access to the store 24 hours a day are advantages for the consumer. The owner of the autonomous store gains from the reduction of congestion inside the store, with a smaller number of queues, with cost reduction, with a smaller number of employees and with a more functional replenishment system. It is also possible to obtain information about the customer's purchase profile, being able to encourage measures that guarantee their loyalty.

The negative aspects include the elimination/reduction of jobs and the difficulties in developing the process by older people or those with less appetite to handle the technologies involved.

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