

Innovative technologies in trade and their implementation

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Abstract. The article discusses innovations used in the retail industry. The retail sector is currently undergoing a dramatic transformation driven by innovative technologies that provide unprecedented opportunities. The expediency of introducing elements of the digital economy into trade is argued. The main trends in the field of informatization in trade are presented. A set of measures is proposed to stimulate the introduction of innovations in trade. The author also dwells on one of the most important problems in the development of information technology - ensuring information security.

Keywords: innovation, information technology, trade, retail

Introduction

Retail trade is an important element of any country's economy. After all, all efforts in the development, production, promotion of products and services are aimed at selling the results of this work to the final consumer. Retail trade performs the function of communication - it buys goods from manufacturers, distributes them through a network of stores, displays goods on the shelf, gives advice and helps the buyer to make a choice.

With all the different forms of retailing, the key for businesses is to build a long-term and trusting relationship with the customer, while offering friendly service and competitive prices.

Retailing performs many functions, the main ones being:

- Study of market conditions;
- Determination of supply and demand for a specific product;
- Search for goods for retail sale;
- Selection of goods, as well as their sorting;
- Payment for goods delivered from the supplier;
- Carrying out operations related to receiving goods, their storage and labeling and pricing;
- Providing various services to suppliers and consumers [1].

Formation of GDP and population employment. According to the data of 2021, 7% of the GDP of our country corresponded to the share of trade, living and catering services. The volume of wholesale and retail trade in the same year amounted to more than 104 billion soums [2].

One of the modern means of increasing the share of trade services in GDP is the application of innovative technologies in the field.

Literature review

As international and domestic experience shows, it is possible to dramatically increase the quality and efficiency of trade processes by introducing elements of the digital economy into this segment. Global trends that determine the future of trade are closely related to information technology, which provides ample opportunities for development.

Trade is already one of the major consumers of information technologies, since they allow solving the most important tasks for trade enterprises: demand forecasting, procurement planning, inventory management, efficiency analysis, etc. [3].

According to I.S. Ratina, trade today is one of the few sectors of the Russian economy that can invest in the latest developments in the field of IT, which are quickly applied in various areas of work of trading companies: for data processing and forecasting, in omnichannel solutions, various services and so on [4].

Modern information systems make it possible to optimize internal and external business processes: optimize inventory and product range management, create flexible pricing mechanisms, and automate customer relationships. Ultimately, investing in innovation allows you to more clearly control trading processes and increase financial results[5].

All major retail chains have been automating their main business processes for a long time [6].

According to the forecasts of the consulting company Deloitte, the time has come for a radical transformation in the retail sector. Consumers are shaping new trends in shopping behavior, driven by innovative technology that keeps them always connected and provides unprecedented opportunities.[7]

It is possible to improve the quality of customer service and optimize sales processes through the use of modern equipment, such as "smart" carts, self-service cash registers, "smart" scales, etc. [8].

Research methodology

In this scientific article, the theoretical foundations of the use of innovative technologies in trade were studied through the method of scientific abstraction, and the innovative methods used in foreign countries were identified through the methods of analysis and synthesis.

Analysis and results

Customers of the Tesco retail chain will never see empty shelves on the sales floor, and store employees will always tell you how much product is still available, what its price is and whether promotions are currently active. All this became possible thanks to the introduction of IoT devices and special software. Miniature cameras and sensors are installed in each department of the store - they monitor changes on the shelves and signal sellers when they need to report goods.

American pharmacy chain Walgreens uses smart refrigerators to track customer demographics and target them correctly. The touch doors of the refrigerating chambers are equipped with special displays that show the contents of the refrigerator. Cameras are installed in the displays that take pictures of a person, and AI analyzes facial parameters, such as the distance from lips to eyes, and calculates an approximate result. So the system understands who opened the refrigerator door - a man in his 20s or a woman over 60. Based on this data, AI personalizes ads for specific groups of buyers. And this technology also helps in inventory - when the goods are running out, the system signals the workers in the warehouse to replenish the stock.

Electronic price tags, or ESL systems (Electronic Shelf Labels), were first tested by Best Buy, a retail chain of electronics and home appliances back in 2016. Then it was in 60 stores, and now the devices are used in 240 outlets of the network. This technology not only saves sellers time (Gap Intelligence estimates that it takes up to 40 hours a week to adjust paper price tags even in a small store), but also provides the buyer with much more information about the product. For example, by the price tag, you can find out the technical characteristics, warranty period, packaging method, and more.

Chinese retail software developer AiFi has opened the world's first store without cash registers and staff, and manages the point of artificial intelligence. About 200 cameras have been installed throughout the store (370 sq.m.), which monitor the movement of customers. A unique technology determines which goods the customer took with him and which he returned to the shelf - each visitor's virtual shopping cart is updated in real time. After a person leaves the store, the system sends him an electronic check and debits the amount of purchases from the account [9].

In addition to the experience of foreign countries, there are also innovative technologies used in the trade sector. Including:

1. Process Mining

This innovation allows you to predict the real course of business processes. In areas where it is impossible to replace a person with innovative equipment, it is important to control business processes, monitor all kinds of delays, and identify insufficient qualifications of employees.

2. Computer vision

One of the most popular and practical innovations in trading has been the use of video surveillance powered by neural networks and artificial intelligence. This innovation is also called computer vision. An analysis using this technology of the most visited departments, the gender and age of visitors, made it possible to identify the most cost-effective location of departments and goods. Based on many studies, it has been proven that the correct location of goods on the shelf is the key to the successful operation of the store.

Also, computer vision sends a signal to the responsible employee when the product shelf or stand needs to be replenished with products, and in case of its absence in the warehouse, selects a replacement. The same technology sends a signal to open an additional checkout when there are more than five people in line. Thus, the use of computer vision methods allows us to solve a number of the following problems:

Ensuring control over the availability of goods and the correctness of its display.

Control over the number of visitors to the store and avoid long queues at the checkout. Theft prevention.

3. Big data technology

Today's shoppers are no longer a faceless mass of statistics, but well-defined individuals with unique characteristics and needs. They are selective and will switch to a competitor's brand without regret if their offer seems more attractive. That is why

retailers use big data, which allows them to interact with customers in a targeted and accurate way, focusing on the principle of "a unique consumer - a unique service."

1. Personalized assortment and efficient use of space.

In most cases, the final decision "to buy or not to buy" takes place already in the store near the shelf with goods. According to Nielsen statistics, the buyer spends only 15 seconds searching for the right product on the shelf. This means that it is very important for a business to supply the optimal assortment to a particular store and present it correctly.

In order for the assortment to meet demand, and the display to promote sales, it is necessary to study different categories of big data:

- local demographics,
- solvency,
- buying perception,
- loyalty program purchases and much more.

For example, assessing the frequency of purchases of a certain category of goods and measuring the "switchability" of a buyer from one product to another will help to immediately understand which item sells better, which is redundant, and, therefore, more rationally redistribute cash resources and plan store space.

It is important for a modern buyer to receive the desired product quickly, regardless of whether it is the delivery of an order from an online store or the arrival of the desired products on the supermarket shelves. But speed alone is not enough: today everything is delivered quickly. The individual approach is also valuable.

Most large retailers and carriers have vehicles equipped with many sensors and RFID tags (used to identify and track goods), from which huge amounts of information are received: data on the current location, size and weight of the cargo, traffic congestion, weather conditions, and even driver behavior.

The analysis of this data not only helps to create the most economical and fastest track of the route in real time, but also ensures the transparency of the delivery process for buyers, who have the opportunity to track the movement of their order [10].

1. Smart contracts

This innovation is based on electronic calculation and the construction of an algorithm that describes a set of conditions, the fulfillment of which entails certain events in the real world or digital systems (Table 1).

Table 1. Advantages of smart contract

A simple contract	Smart contract
It takes 1-3 days	Signed in seconds and minutes
Manual translation	Automatic translation
A deposit is required	No deposit required
Maintenance is expensive	Maintenance is cheap
Live participation in the signing of the contract	An electronic signature is used to sign the contract.

The use of smart contracts requires a decentralized environment that excludes the human factor, and to be able to use a smart contract for the transfer of value, a cryptocurrency is required (digital counting units, the accounting of which is decentralized) [11].

Conclusions and recommendations

It is necessary to solve the following problems of implementing innovations in the process of trade services of Uzbekistan:

Firstly, training and retraining of specialists who use innovative technologies in their professional activities.

Secondly, the creation of infrastructure. Now in Uzbekistan there is a shortage of computing power, cloud computing services, communication channels. Without this infrastructure, it is impossible to apply digital technologies. A lot of work needs to be done to develop broadband Internet access in the regions and ensure digital equality.

It should be taken into account that modern technologies bring not only advantages, but also threats. An important task for commercial enterprises is the protection of infrastructure and information. According to PricewaterhouseCoopers' 2021 Global Investor Survey, 41% of investors consider cyberattacks to be the biggest threat to global business.

Currently, the management of many commercial enterprises tends to consider the cost of cybersecurity to be excessive. This speaks to the need to raise awareness of existing risks and address the shortage of cybersecurity professionals.

The state should become one of the main guarantors of providing a reliable and secure infrastructure for the digital market. The information security system should ensure the preservation of personal data of citizens, protect the information and telecommunications infrastructure, information resources from the impact of cyber weapons, threats, information terrorism and crime.

However, the role of the state should not be limited to prohibitions alone. It should also create incentives for the transition to the digital economy and provide appropriate support measures. Without the participation of the state, the introduction of elements of the digital economy will be ineffective. Therefore, the author proposes to establish tax and other benefits for trade enterprises selling via the Internet to stimulate the development of electronic commerce.

In addition, it is necessary to create information support tools for retail organizations. A striking example of such support is the Chinese state information service CSMEO, on whose website entrepreneurs can get information about the state of the business climate and the latest changes in legislation.

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