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*Odessa National Academy  
of Food Technologies*



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**BLACK SEA SCIENCE 2021**

**Information Technology, Automation and Robotics**

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**INFORMATION AND TECHNOLOGICAL RESTART OF THE HOTEL AND RESTAURANT BUSINESS IN POST COVID-19 CONDITIONS**

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**Abstract.** *The domestic market of hotel and restaurant services is developing unevenly. Therefore, a lot of hospitality companies are characterized by arrhythmic application of information technology capabilities.*

*Nowadays the main problem of hotel and restaurant functioning is the existence of business opportunities in the market of services in general. It primarily happens due to external factors, in particular the COVID-19 pandemic, which has led to the closure of the greatest number of hotel and restaurant businesses and continues to have a negative impact on those companies that "survive" in a global pandemic.*

**Keywords:** *information technologies, hospitality industry, innovations, COVID-19 pandemic, adaptation of hotel and restaurant business, digitalization.*

**I. INTRODUCTION**

Information systems and technologies have become an integral part of the functioning of the hospitality industry. Today, they are used both by large and network establishments with a wide range of services, and by enterprises with limited supply. The degree of innovative solutions penetration into the context of the use of information technology in the activities of the hotel and restaurant business depends primarily on its goals and financial capabilities. The increase in the amount of information and the need for high speed processing and transmission encourage companies to informatize all key business processes. This is facilitated by the constant emergence of new specialized software products that are adapted to different models of hotel and restaurant business. The world practice of using IT in the activities of hospitality enterprises clearly reflects their wide range of opportunities in various areas, such as the accumulation of information about the guest, its storage and use by the hotel and restaurant, management of financial and economic activities of the enterprise, demand forecasting, reporting, video surveillance in the institution, relationship establishing between structural units, control over the performance of their work, personnel management, personnel selection, automation of marketing activities, establishing contact with the consumer, increasing his loyalty to the company; collaboration with partners and other organizations.

Modern pandemic conditions have made significant adjustments in the activities of hotels and restaurants, including the use of information technology to support communication and provide with quality operational services are the actual factors this scientific work in the chosen field is aimed at.

## **II. LITERATURE ANALYSIS**

Automation of business entities has become an integral part of their effective functioning in most areas and types of economic activity, including hotel and restaurant business.

A large number of domestic and foreign scientists study the application of information systems and technologies.

### **2.1. Authors of works with a scientific approach**

Scientific approaches to the definition of "information systems", "information technology" and related concepts are covered in the works: Lazora J., Yudkova K., Melnichenko S., Danilenko M., Senenko I [1].

At the same time, the substantiation of the above concepts taking into account the specifics of the hotel and restaurant business is reflected in the works of the following scientists: A. Perepelytsia, Dotsenko VF, Shidlovskaya OB, Medvid I., Bedusenko L., Fedosova K [2].

### **2.2. Classifications and characteristics**

It is important to single out the issues of classification approaches and features of information technology. Today, such scientists as: Yudkova K., Chernyshyna G., Romanyshyna O., Kysil N., Gatalyak Z., Horbal N. are engaged in this direction.

### **2.3. Other approaches and features**

Substantiation of types of audit of information systems and their features are covered in the works: Us R., Gurevich R., Monakhova V., Bogdanova I.

## **III. OBJECT, SUBJECT, AND METHODS OF RESEARCH**

The research objectivity is the process of using information technologies of hotel and restaurant business in post Covid-19 conditions.

The research subjectivity is the hotel and restaurant business establishments.

The research methodology is experiment, survey, description, analysis, generalization.

## **IV. RESULTS**

The pandemic has confronted the hospitality industry with an unprecedented challenge. Almost all restaurants were asked to limit their operations to only take-outs. The restrictions oriented to travelling and stay-at-home orders issued by the authorities led to sharp decline in hotel occupancies and revenues. However, the reopening process has begun slowly and the authorities have started to ease restrictions.

The analysis of statistical data also supplies with the information that around one-third of restaurant customers and around 40% of the hotel customers are willing to pay more for the increased safety precautions. While customers expect hospitality businesses to implement more rigorous safety/cleaning procedures, a portion of them are willing to pay for those added safety measures [3].

The analysis of statistical data also indicates that a large proportion of restaurant customers (64.71%) and the majority of hotel customers (70.42%) believe that the use of various technologies in service delivery will be necessary in the

COVID-19 environment in order to minimize human-to-human contact (the examples are service robots, contactless payment such as Apply pay or contactless bank cards, digital menus that can be viewed on personal mobile devices via QR codes, contactless digital payments, keyless entry, touchless elevators, etc.) [3]. These findings strongly suggest that technology integration and adoption into hospitality operations should be integral in the nearest future.

Recent developments in artificial intelligence (AI) and social service robot technologies have enabled the use of AI technologies in service delivery and the Covid-19 pandemic may precipitate the popularity of such technology for public safety reasons[4].

It is sure to be important for the hotel and restaurant business to provide it with the highest quality services. Nowadays, it is difficult to imagine any hotel or restaurant in which thousands of tasks of daily business would be carried out mechanically [5].

Modern innovations in the field of information technology, which are used in the hotel and restaurant business, play one of the key roles in the hypercompetitive struggle for a client. The theme of using the latest information technologies is especially relevant now that the whole world is in a common struggle for the survival due to the catastrophic impact of the COVID-19 pandemic not only on the industry of hotel and restaurant services, but also on all spheres and economic activities in general. Due to the closure or temporary suspension of activities during the first wave of quarantine, a large number of hotel and restaurant businesses were not prepared for such crisis conditions. So, there is an urgent need to adapt the business to today's conditions, find innovative technological solutions for further service of visitors to the institution, and also support the ways of communication with a personnel in the conditions of quarantine.

According to the results of research, obtained on the basis of analytical data of the world experts in the field of information technology, the share of work is performed at the expense of human resources, robotization of hotel and restaurant business enterprises by major business processes including the following percentage: 1) information and data processing - 53% due to the use of human resources and 47% due to the robotization of the same business processes; 2) performance of physical works - 69% and 31%; 3) administration - 72% and 28%; 4) treatment and interaction - 77% and 23%; 5) coordination, consulting - 81% and 19%; 6) decision making - 81% and 19%.

In conclusion, the application of the latest technologies in the hotel and restaurant industry allows hoteliers and restaurateurs to increase the efficiency of their activities, find new ways to improve the quality of service and compete in the market as a whole, especially in modern quarantine conditions.

It is important to point out the list of conveniences as a part of the adaptive innovative solutions in the information technology using in hotel and restaurant business activities in the domestic market of modern business conditions services. They are 5 G-Internet, Face ID to simplify the guest registration process, RFID bracelets that securely store guest payment information for cardless transactions, e-

Menu, which has become a channel of communication between customers and management, and allows the administration to quickly edit the menu and add new dishes, robotization of the main business processes at the enterprise, such as cleaning hotel rooms, luggage delivery to the room, customer service in the restaurant hall, etc.

These are the implementations of innovative solutions that have led to a mini-research, in which we have presented the detailed description.

The new 5G is ready to help guests download content and transfer data much faster than ever before. This connection is becoming increasingly important as hotels continue to innovate [6]. Face ID is used to scanning the faces of hotel guests and creating personalized room key cards. This makes check-in much faster and easier for all guests. Due to this technology, guests avoid constant contact with the keys, which can carry out many germs and other harmful substances. RFID bracelets help guests check in, securely store guest payment information for cardless transactions, and assist hotel staff with providing the quality services. But for RFID bracelets, the consumer would not have the access to opening the door and entering the room [7].

Robots in a hotel can help with household chores such as a floor hoovering and microbial destruction, which can be especially important for the safety of staying healthy and avoiding COVID-19. Some hotels also use robots to carry luggages, security system, room service and so on.

There is a chart below from which you can learn about the percentage of these innovations that are represented in the hotel business nowadays (Fig.1).

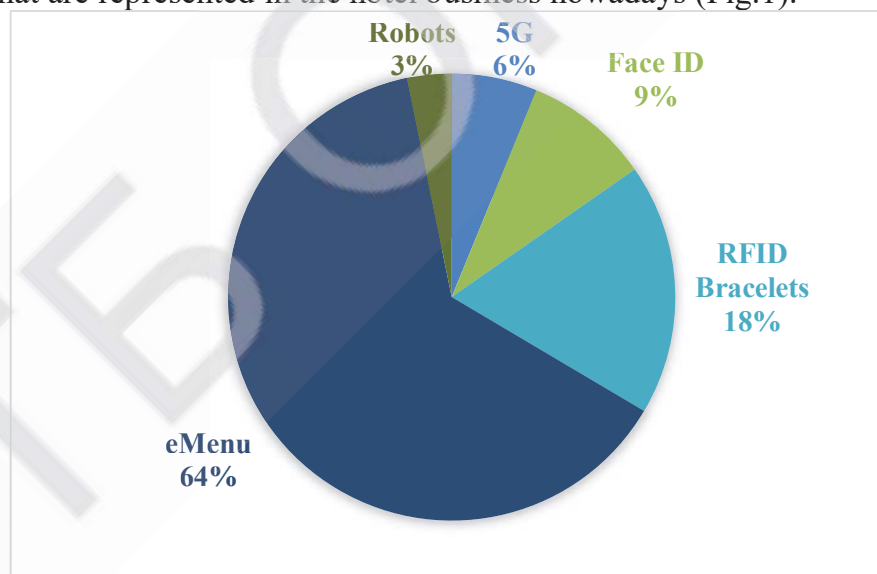


Fig.1. The information and technological solutions in the activities of the hotel business

*Source: Compiled by the authors*

Traditionally, the use of IT in the hotel business can be divided into two areas: for business management and for the formation of a system of interaction with consumers and partners [8]. The market of specialized programs to ensure the internal functioning of the hotel is represented by many proposals: Fidelio V8, Opera Enterprise Solution, Intellect Style, Servio HMS, Libra On Demand, Parus and

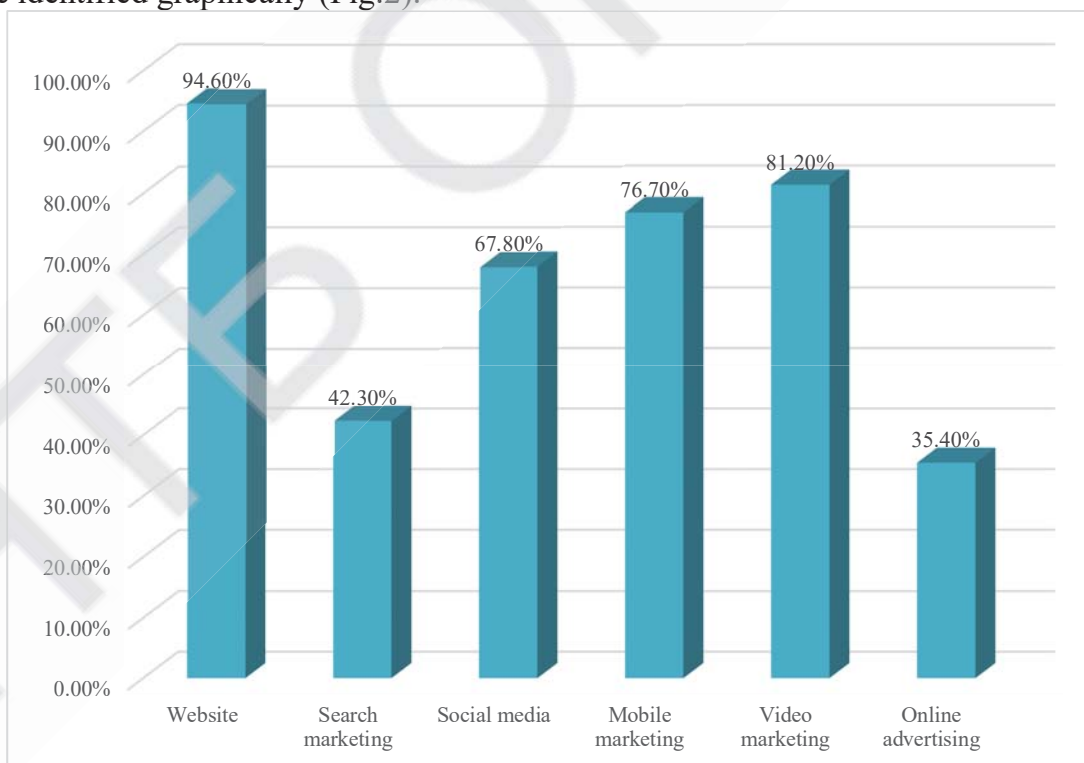
others. Each of them differs in functionality, set of modules and consumer characteristics [1].

The implementation of the second direction of the use of IT to establish a relationship with consumers is mainly due to a separate component of IT - Internet marketing. This is due to the ever-growing number of Internet users, the availability of Internet technologies for businesses and individuals and consumer convenience. There are now a significant number of internet marketing tools [1]. The most typical for the field of research are the following:

- website;
- search marketing;
- social media;
- mobile marketing;
- video marketing;
- online advertising.

It should be noted that the list of tools is constantly updated due to both the emergence of new and transformation of existing ones. For example, the merger of the Internet and mobile technologies has given rise to mobile marketing, and the combination of mobile marketing and social media has created an effective means of communication with consumers and within the enterprise - mobile social media [1].

After analyzing the most inherent research tools of Internet marketing, trends can be identified graphically (Fig.2).



**Fig.2. Internet marketing tools in the hotel and restaurant industry**

*Source: Compiled by the authors*

The website is the most popular internet marketing tool and is not inferior to its position. As for the rest of the tools, most of them are also widely used.

The above issues and the current pandemic conditions of the hotel and restaurant business have led to a survey (students, friends, parents) to determine the current areas of IT use right now.

A survey of potential customers and consumers of hotel and restaurant services revealed that young people predominate among them (57.1%). 33.3% - persons aged 21 to 30 years.

It turned out that the majority of women surveyed - 52.4%. Men - 47.6%. The difference is not large, so we can say that both women and men equally use IT technology in the hotel and restaurant business (Fig.3).

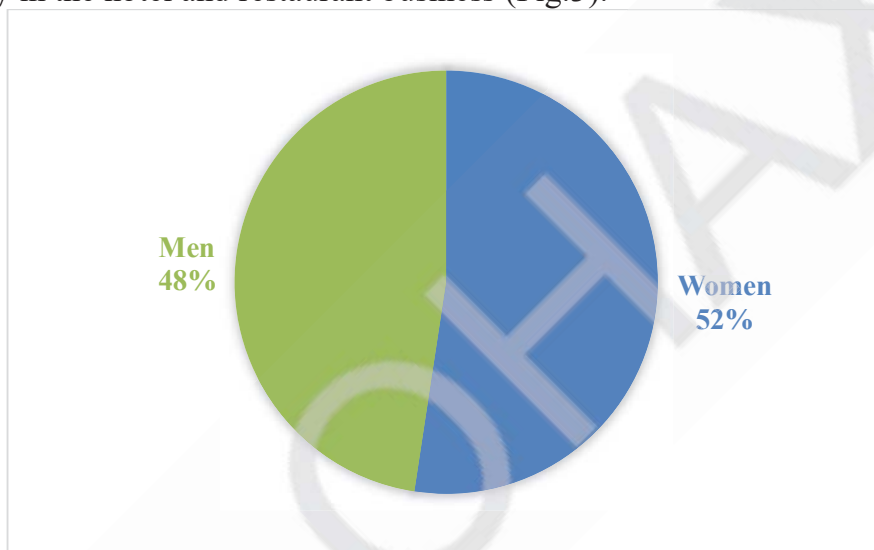


Fig.3. Percentage of women and men

*Source: Compiled by the authors*

The most popular means of booking hotel services today is the online booking system. Fax, correspondence and the hotel website are not so popular means of communication with the company. Half of the respondents consider the presence of such institutions in social networks a vital condition.

Almost 62% browse their websites, web pages, online magazines and publications before visiting the hotel. Therefore, hotel businesses need to update information from time to time, post news, notifications of discounts, offers, etc., follow the advertising on social networks.

For the majority (61.9%) the use of IT technology in the hotel business is very convenient, because it saves time, it is easy and affordable. IT technologies play a significant role in this area, which greatly facilitates the work for both consumers and staff.

The introduction of electronic menus has become the most popular in restaurants. Having pandemic conditions nowadays, this innovation is more relevant than ever. As a result, contact with a waiter has been reduced to minimum [7]. There are many benefits of using the menu on the iPad in restaurants (Table 1).

Table1. Advantages of using the menu on the iPad in restaurants

№	Benefits for guests	Benefits for restaurants
1	Convenient, clear touch interface.	Prompt and clear execution of orders.
2	Bright and color photos.	Reducing the burden on staff.
3	Easy navigation and quick access to the desired menu category.	Increases loyalty of regular customers.
4	All information about the dish: photo, description, ingredients, calories, etc.	Increases the overall efficiency of the business in general.
5	Access to games, the Internet in general.	Games and a bright interface will interest the youngest visitors and their parents.

Source: Compiled by the authors

To satisfy a customer demands this menu allows:

- to choose wine from the wine list of the institution according to the price, year release, region, bouquet as addition to a dish from the menu;
- to calculate the caloric content of the suggested dishes;
- to see the final check of the order as quick as possible when choosing dishes from the menu;
- to play games, learn the latest news, chat on social networks while waiting for the order.

In addition to the electronic menu, there are several other innovations in the field of IT that are widely used in the post-codification period:

- audio-visual displays;
- mobile payment;
- online and mobile ordering.

After conducting a mini-research, a diagram was formed, which shows the percentage of implementation of these innovations (Fig.4).

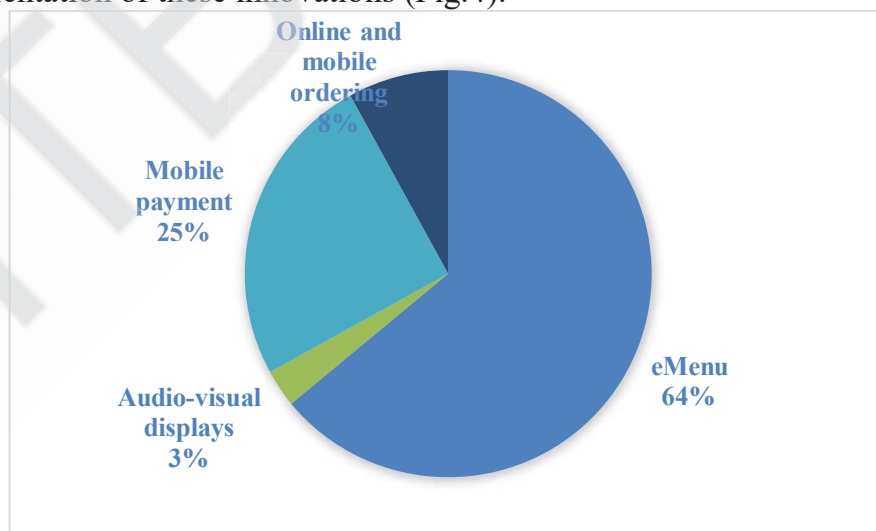


Fig.4. The information and technological solutions in the activities of the restaurant business

*Source: Compiled by the authors*

These innovations will facilitate the process of collecting and issuing orders for both visitors and staff. One of the innovations that can help the staff of the institution may be Dish Sanitizing Technologies. Dish sanitizing technologies provide restaurant a dishwashing system that runs continuously, streamlining the cleaning process.

## **V. CONCLUSIONS**

The dynamic development of information technology plays an important role in the formation of the hospitality industry, especially in those quarantine conditions in which the world market of hotel and restaurant services is. So, you can see the high level of competition, the variety of basic and additional services and the service level increasing in the market of hotel services nowadays. The active introduction of modern information technologies in the activities of hospitality enterprises is a guarantee and a necessary condition for their productive work. It will help modern business to build an effective management system at the enterprise, reducing operating costs, improving hotel and restaurant service with the Internet marketing tools, increasing income, profitability and, accordingly, the profitability of the enterprise, as well as gaining competitive advantage through quality and fast customer service.

In post Covid-19 period hotel and restaurant businesses need to focus on protecting the health of guests and staff. The hotels can deal with service work, contactless payments such as Apply Pay or contactless bank cards, digital electronic menus that can be viewed on personal mobile devices using QR codes, contactless digital payments, keyless access, contactless elevators and so on. Restaurant establishments need to carry out additional cleaning of premises, disinfection, ventilation as well as use electronic menus to minimize communication with staff. If it is necessary, it is possible to rearrange the tables if they are close to each other, use contactless payments such as Apply Pay or contactless bank cards, to organize active delivery. These implementation mechanisms and technologies are necessary for the hotel and restaurant industry in a pandemic condition.

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## **RESEARCH APPLICATION OF THE SPAM FILTERING ALGORITHM ON SOCIAL MEDIA**

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**Abstract:** Today there are a lot of different social networks and messengers, which in today's society, especially in times of pandemic corona-virus have become an integral part of our daily lives, including work activities. At the same time there is a lot of unnecessary information coming to users every second, so the problem of dealing with spam messages in social networks and messengers is now very relevant.

By spam we mean any messages that a person, or an entire company, considers unnecessary in a particular text stream.

The project is devoted to solving the scientific and applied problem of detecting spam messages in the text context of any social network or messenger using various spam detection algorithms. Three algorithms were implemented and investigated: an algorithm using naive Bayesian classifier, Support-vector machine and multilayer perceptron neural network.

The main idea is to develop a spam detection algorithm that is fast and easy to integrate in a messenger (social network). It is proposed to use the obtained solutions for IT companies. The developed algorithm should recognize spam based on the context of a particular firm and quickly remove or mark it. Since the spam detection task is essentially the task of sorting messages into A and B classes, the developed algorithm can be used not only for spam filtering but also, for example, for monitoring chat rooms for the messages that are important to a particular employee of the company.

**Keywords:** spam, social network, naive Bayesian classifier, Support-vector machine, multilayer perceptron neural network.

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