PMS-SYSTEMS IN THE HOSPITALITY INDUSTRY: SPECIFICS OF IMPLEMENTATION

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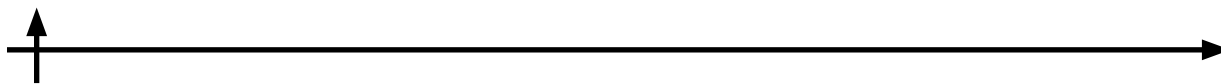
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Abstract. This article aims to assess the specifics and key properties of PMS-systems in order to evaluate the prospects for their adoption in the hospitality industry. In the course of the research, the authors have reviewed the theoretical foundation of cloud-based PMS and studied the market for IT solutions available in the Russian Federation. They have also analyzed and classified the automated control systems of the hotel market and concluded that the implementation of cloud-based PMS systems and process automation can optimize hotel management and improve service quality. Based on these findings, it will be possible to design a project for the PMS-systems implementation with due consideration of the unique operational needs of hospitality industry.

Keywords: process automation, hotel business, cloud PMS, implementation project, multi properties, process unification, management company

ОСОБЕННОСТИ ВНЕДРЕНИЯ PMS-СИСТЕМ НА ПРЕДПРИЯТИЯХ ИНДУСТРИИ ГОСТЕПРИИМСТВА

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Аннотация. Данная статья посвящена анализу особенностей и ключевых характеристик функционала PMS-систем с целью оценки перспектив их внедрения на предприятия индустрии гостеприимства. В ходе исследования авторами были рассмотрены теоретические основы облачных PMS решений, изучен рынок IT решений, актуальных на территории Российской Федерации на текущий момент, а также проанализированы и классифицированы доступные на рынке гостиничной индустрии предложения по автоматизированным системам управления. В результате, было установлено, что внедрение облачных PMS систем, а также автоматизация процессов могут способствовать оптимизации управления гостиничным предприятием и улучшить качество предоставляемых услуг. На основании полученных результатов в будущем возможно проектирование процесса внедрения PMS системы с учетом всех особенностей операционного управления предприятиями сферы гостеприимства.

Ключевые слова: автоматизация процессов, гостиничный бизнес, облачные PMS, проект внедрения, мульти проперти, унификация процессов, управляющая компания

Introduction

In today's rapidly evolving domestic hotel industry, the success of hospitality businesses is largely dependent on the level of automation. The competitive edge of hotels is not only determined by management's ability to create effective personnel models and maintain guest loyalty but also by the state of the physical and technical infrastructure, the capabilities of IT solutions deployed within the organization, and how well these solutions integrate with operational processes.

The COVID-19 pandemic and economic sanctions against the Russian Federation have led to a significant transformation of the tourism sector in our country. Following the crisis, the industry has lost billions of rubles and thousands of jobs. However, at the same time, there has been a surge in domestic automation projects and digital startups that offer new opportunities for hoteliers in Russia (Balshina, 2022; Vasiliev et al., 2025).

The introduction of cloud-based property management systems (PMS), integrations, and automation of processes can help a hotel enterprise optimize its management, improve the quality of services offered, and ensure a more enjoyable stay for guests.

Materials and Methods

To effectively assess the performance of IT solutions and justify the need for a cloud-based
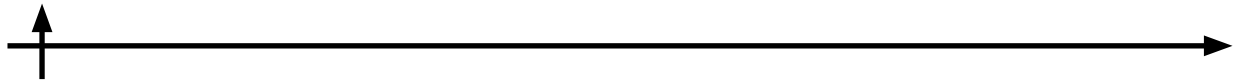
property management system (PMS) in the hospitality industry, the researchers conducted expert assessments, opinion polls, and reviewed domestic and international scientific papers on efficient hotel process automation.

Results and Discussion

A cloud platform is a complex of interconnected services that provide the user with the opportunity to quickly and reliably rent computing resources in the required volume. The user gets access to these facilities via the Internet. This method of using computing resources is called "cloud computing."

Cloud computing acts as a replacement and complement to traditional data centres with the customer's local IT infrastructure. You do not need to purchase, connect, and maintain physical equipment yourself. All these tasks are taken over by the cloud provider, which is responsible for maintaining the operability and optimal performance of the necessary hardware and software. The client gets the opportunity to temporarily use computing resources in the required volumes.

The advantages of cloud technologies over physical hardware include the following:

1. Speeding up the scaling process;
2. High level of security;
3. Accelerating the market entry of new digital products;
4. Reducing the time and number of procurement stages;
5. Financial flexibility and cost optimization.

Currently, there are three types of clouds: public, private, and hybrid. Table 1 shows the advantages of each type.

Table 1. Advantages of different cloud systems (designed by the author)

Public Cloud	Private Cloud	Hybrid Cloud
Instant access to updates: The provider constantly implements new technologies and improvements.	Flexibility and customization are key features of a private cloud. It can be tailored to meet any business's specific needs, including unique security, networking, and application configurations.	High fault tolerance — if some of the capacities fail, workflows can be moved to the cloud.
No infrastructure costs. All equipment is provided and maintained by the provider.	High level of security. The entire infrastructure is used by only one company, which eliminates the risks associated with shared access.	Flexibility — sensitive data can be stored in a private cloud, and applications that do not require special security measures can be operated in a public environment.
Flexibility and scalability. The amount of resources can be increased or decreased as needed.	Compliance with regulatory requirements. A private cloud makes it easy to implement solutions that meet the requirements of data protection laws for government agencies or CII facilities.	Scalability — additional resources can be added or disabled at any time.
High fault tolerance. The infrastructure is designed so that there is always a reserve of resources, which ensures the smooth operation of services even if individual components fail.	High performance. The physical hardware is not shared with other users, which ensures a guaranteed level of performance.	Cost—effectiveness is the reduction of capital expenditures on new servers and their upgrades, paying only for the resources actually consumed.
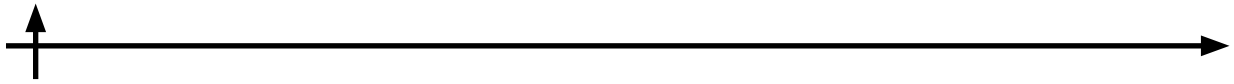
Each type of cloud service has its own unique advantages, and choosing the right solution should depend more on understanding the specific needs of the customer. It also depends on the scale of the project and the amount of data that needs to be stored on the server (Gurieva, 2017).

In Russia, multi-cloud technologies are just beginning to gain popularity, and many companies are still opting for hybrid or public cloud solutions. According to iKS-Consulting, the volume of the cloud market in Russia in 2018 was 68.4 billion rubles ($1.1 billion), and the forecast for 2022 is more than 155 billion rubles with an annual growth rate of 23%.

After the adoption of the 152-FZ law on personal data, Russian companies began to switch to virtual services more actively. According to a PwC study, 66% of companies are currently using cloud technologies, either at an advanced or intermediate level.

For most companies, cloud technologies are not a new concept—29% have been using them for more than 5 years and another 28% for 3-5 years. At the same time, many companies use a hybrid (30%) or private cloud (29%) approach.

The main obstacles to implementing clouds into business processes include:
- The risk of data leakage and loss;
- Fear of losing control of processes;
- Concerns about potential problems with cloud providers;
- Lack of information about cloud systems;
- Internal resistance to change;
- Compliance with regulations and requirements.

To correctly formulate the requirements for a cloud service, it is important to have a general understanding of its structure. The cloud can be roughly divided into several infrastructure levels.

1. Data Processing Centre (DPC)

It is based on a data processing centre, or data centre—a specialized building that houses server and network equipment. It is on the basis of this equipment that services are provided: servers, data storage systems, routers, switches, cables, and more.

2. Virtualization layer

The next level is virtualization. It is a technology that allows you to create virtual computing environments on physical hardware (virtual resources, software-defined networks, and overlay). Virtualization makes it possible to share physical hardware resources between multiple virtual machines that operate independently of each other, even if they use the same server.
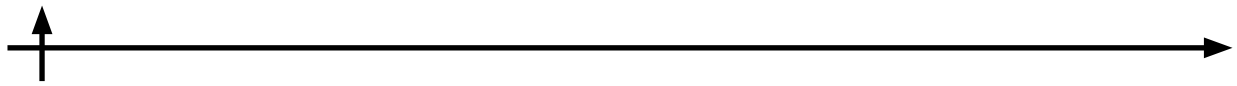
3. The software that manages server virtualization is called a hypervisor. Different cloud providers use different hypervisors to organize their virtual resources.

When ordering cloud services, you are not actually purchasing a data centre, physical hardware, or a hypervisor. Instead, you are purchasing the services that are located above these infrastructure levels (Pandya, 2023). These services are the ones that you get a temporary right to use, which is what a cloud service actually is.

There are several cloud service delivery models available, including IaaS, PaaS, and SaaS. Depending on the model you choose, the responsibility for data security and safety will change (Figure 1).

The IaaS (Infrastructure as a Service) model assumes that the provider is responsible for the physical security and fault tolerance of the cloud platform, as well as for network protection and event logging of all infrastructure components (Stratan, 2017). Clients are responsible for backing up virtual machines and ensuring the security of virtual networks and guest operating systems. They also control user access.

When using PaaS (Platform as a Service) or SaaS (Software as a Service), clients trans-

fer more functions to providers, including security and fault tolerance for virtual machines (Shrivastav, 2021). However, clients retain responsibility for managing user access and configuring products and services.

The choice of service model has a direct impact on the allocation of security responsibilities. Physical security of data centres and equipment is always the responsibility of the cloud provider. Typically, the infrastructure and management aspects are taken over by the provider, while application software and additional services are under the control of the customer. However, the client always maintains control over access to data (Moisescu, 2024; Oskam, 2022).
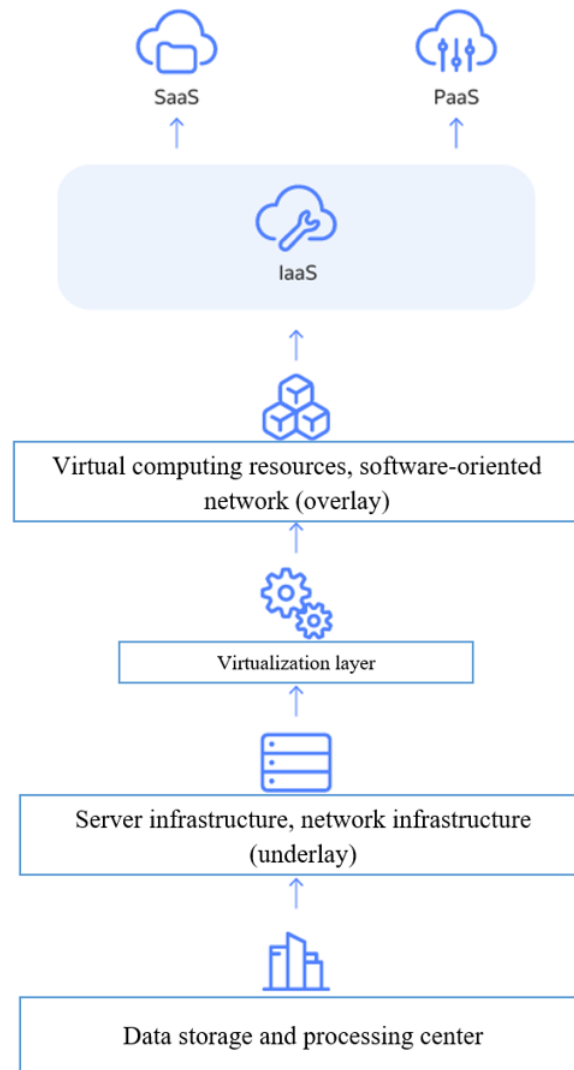

Fig. 1. Delivery models of cloud service: IaaS, PaaS, SaaS.

According to CorpSoft24, the cloud market in Russia is growing primarily due to the IaaS (Infrastructure as a Service) model. Companies are migrating their on-premise infrastructure to the cloud, as the cost of hardware and delivery times have increased, and the import substitution factor remains significant. By September 2023, cloud business growth in Russia was 35% compared to the previous year.

PMS (Property Management System) is software used in the hotel and tourism industry to automate various aspects of hotel management (Zakic, 2022). It helps with booking management, customer service, room accounting, availability, rate tracking, payment processing, and
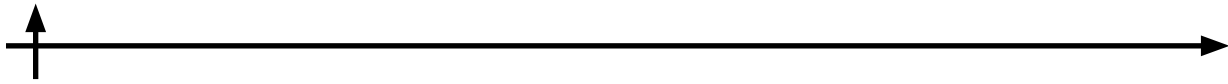
billing (Sheresheva, 2016).

PSM is the main solution for hotels, allowing them to automate many tasks. Some of the main benefits of PMS include the ability to manage room reservations, assign tasks to employees, generate financial reports, and track statistics (Shinkov, 2021).

The main functions of a PMS (property management system) include:

− Booking management: Automation of the booking process, including online booking through the hotel's website and integration with various booking platforms;

− Room management: Monitoring room availability, conditions, cleaning, and maintenance;

− Customer service: Managing customer information, preferences, and history and providing feedback;

− Financial accounting: Automation of billing, payment processing, and financial management;

− Reporting and analytics: Providing reports and analytical data to optimize operations and make informed decisions.

PMS for a hotel can be cloud-based or local. The cloud-based option is more popular in the hotel industry, as it does not require licenses. The software does not need to be installed on each computer. When buying software from a provider, the hotel manager receives a username and password to access the service (Thusi, 2022). The program can be used at the hotel on a desktop computer, laptop, tablet, or smartphone. An internet connection is usually required, although some mobile apps offer an offline version.

Hotel management systems have a modular structure. Users can add additional features such as accounting, sales analysis, room reservations, and more. This approach is more efficient than buying separate software for each task.

PMS is often integrated with other systems, such as customer relationship management (CRM), human resources (HR), and accounting systems, to ensure efficient and effective facility management. This integration helps to improve overall service quality and increase customer satisfaction, making a business more competitive in the market.

To boost sales, most hotels integrate all possible booking channels. However, managing OTAs manually can be time-consuming and prone to errors.

The main modules of the PMS (Property Management System) include:

1. Booking module: This allows users to quickly customize the search form for rooms on the hotel website using CSS styles that fit seamlessly into the overall design. Visitors can book a room directly through the hotel website without the need for intermediaries;

2. Calendar: This is a clear and intuitive interface element. The days of the week are represented by columns, with numbers divided into categories along the lines. At the intersections, the number of available rooms is displayed. To enhance readability, the calendar is coloured in different shades. When the user hovers the cursor over a booking, information about the guest and payment details appears;

3. Income management tools: To manage income within the PMS, a reporting module connects with various tools, including Manager's report—statistics on key hotel metrics.

The following modules work together to provide a comprehensive and efficient system for managing a hotel's operations:

− Pick-up—reflects the changes in working with numbers and revenue during the specified period and tracks the growth rate of bookings;

− Nutrition reports—provides nutrition reports and guest information, as well as their chosen rate;

− Room upload reporting—monitors the number of downloads by room category and the
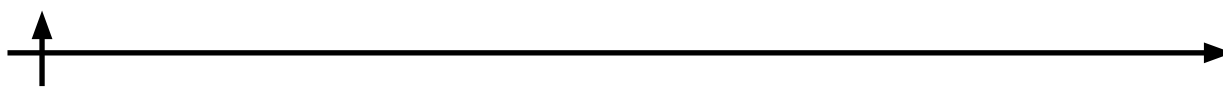
total for the selected period;

— Sales of additional services reporting—tracks the number of services sold and the amount booked/credited by date;

— Revenue reporting for rooms—reflects the amount of bookings for each room or category;

— Cash flow—clearly shows receipts and expenses for the items for the specified period.

4. Business Service Module: The hotel management system's maintenance module allows you to create tasks, assign them to employees, and notify them via the smartphone application. Thanks to fast data exchange, you can monitor staff work every minute, automatically generate cleaning schedules, and check cleaning status. These measures increase customer loyalty and service levels.

5. Email List and Feedback Module: The PMS (property management system) for hotels has an IP telephony function. You can monitor customer calls, record them, and generate reports on quality and quantity. The service automatically sends newsletters to users according to their preferences, analyzes reviews from various sites, and provides timely feedback.

Conclusion

In order to choose the right PMS (Property Management System) for a hotel, it is important to consider several factors:

1. Identify your top priorities: Determine which aspects of your business are most important, such as booking, restaurant management, or reporting. Choose a PMS that meets the specific needs of your hotel.

2. Assess scaling potential: Analyze whether your company has the potential for growth. Will the PMS be able to support an increased number of bookings and new features?

3. Look for future growth: Consider the developer's plans for the system. Will they continue to develop and improve it? Will it be able to adapt to changing business needs?

By taking these factors into account, you can make an informed decision about which PMS will best suit your hotel's needs and support its growth.

— Request information about the possibility of integration with other software. It is important to consider the potential for combining the PM system with other services, such as CRM, channel managers, fiscal terminals, and electronic locks. For certain types of businesses, this is crucial.

— Cost of tariff plans: Analyze the prices of various suppliers and assess their compatibility with your company's budget. Also, consider how well your budget is structured.

— Data protection: Verify whether PMS offers reliable information protection and ensures confidentiality of customer data. This is a critical requirement in the hospitality industry.
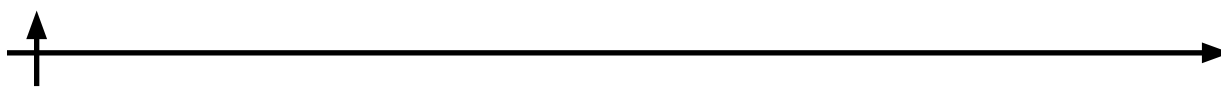
— Technical support: Gather information about its quality by reviewing reviews or consulting with colleagues who use the PMS.

The results of this study can be applied in the development of roadmaps, the implementation of algorithms, and the creation of instructions for the transition or implementation of cloud-based property management systems at hotels.

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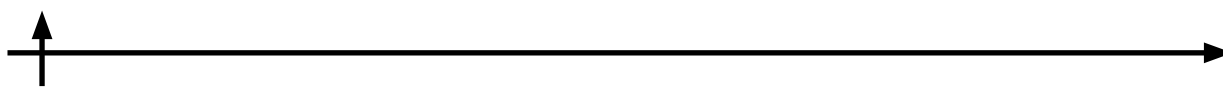
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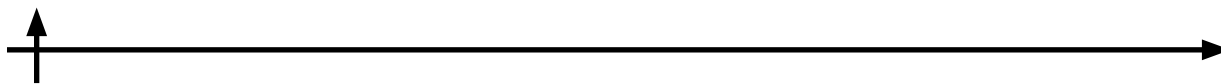
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