OPTIMIZATION OF COSTS IN BUSINESS PROCESSES THROUGH CLOUD TECHNOLOGY

Saitkamolov Mukhammadkhoja Sabirkhoja ugli

Tashkent University of Information Technologies,

Dean of the Faculty of Economics and Management in the Field of ICT,

Doctor of Economic Sciences,

mukhammadkhujasaitkamolov@gmail.com

Karabaev Rustam Zafarovich

Tashkent University of Information Technologies,

3rd year student of the Faculty of Economics and

Management in the Field of ICT,

russokarabayev@gmail.com

Abstract: The article analyzes the effectiveness of using cloud technologies to optimize costs in business processes. The main advantages of cloud solutions in reducing operating costs and increasing the flexibility of business infrastructure are analyzed. The study also examines ways to optimize equestrian infrastructure costs, including reducing equipment and maintenance costs. Examples of successful implementation of cloud solutions in various areas are given, as well as an assessment of their impact on the overall efficiency of business processes.

Key words: business processes, cloud technologies, operating costs, cloud solutions.

Аннотация: Ушбу мақолада бизнес жараёнларида харажатларни оптималлаштириш учун булутли технологиялардан фойдаланиш самарадорлигини таҳлил қилади. Операцион харажатларни камайтириш ва бизнес инфратузилмасининг мослашувчанлигини оширишда булутли ечимларнинг асосий

афзалликлари таҳлил қилинади. Тадқиқот шунингдек, от инфратузилмаси харажатларини оптималлаштириш, шу жумладан аппарат ва техник харажатларни камайтириш йўлларини кўриб чиқади. Турли соҳаларда булутли ечимларни муваффақиятли амалга ошириш, шунингдек уларнинг бизнес-жараёнларнинг умумий самарадорлигига таъсирини баҳолаш мисоллари келтирилган.

Калит сўзлар: бизнес жараенлар, булутли технологиялар, операцион харажатлар, булутли ечимлар.

Аннотация: В данной статье анализируется эффективность использования облачных технологий для оптимизации затрат в бизнес-процессах. Проанализированы основные преимущества облачных решений в снижении эксплуатационных затрат и повышении гибкости бизнес-инфраструктуры. В исследовании также рассматриваются способы оптимизации затрат на конную инфраструктуру, включая снижение затрат на оборудование и техническое обслуживание. Приведены примеры успешного внедрения облачных решений в различных сферах, а также оценка их влияния на общую эффективность бизнес-процессов

Ключевые слова: бизнес-процессы, облачные технологии, эксплуатационные расходы, облачные решения.

Cloud technology has its roots in early ideas of providing access to computing resources remotely over a network. However, the concept of cloud computing as we know it today began to take shape in the early 2000s. In the early 2000s, companies began to realize the potential of cloud technologies to manage and distribute computing resources more efficiently. One of the important events in the history of cloud technologies was the emergence of Amazon Web Services (AWS)[1] in 2006, which offered a wide range of cloud services, including data storage, computing power and many others. We can say that with the development of virtualization technologies and the spread of broadband Internet, cloud

---

[1] Amazon - https://www.amazon.com/

technologies have become increasingly accessible and popular. Major technology companies such as Microsoft, Google and IBM have also been introducing their cloud platforms and services. Over time, cloud technologies have become an integral part of modern IT infrastructure[2]many companies and organizations, providing flexibility, scalability and cost-effectiveness. Today, cloud technologies continue to evolve, introducing new capabilities such as artificial intelligence, big data analytics and the Internet of Things, and they remain an important factor in the digital transformation of business and society. Cloud computing is an information technology delivery model in which users access computing resources (such as processing power, data storage, applications and services) over the Internet, typically through a web browser, without the need to invest in their own infrastructure. The role of cloud technologies[3]in the digital economy. Cloud technologies play a key role in the digital economy, providing the basis for innovation, business growth and improved productivity. Here are a few ways cloud technology is impacting the digital economy:

Flexibility and scalability: Cloud platforms allow companies to quickly scale their computing resources depending on their needs, which is especially important in a rapidly changing digital environment.

Economic efficiency:[4]The use of cloud services reduces IT infrastructure costs, since the company no longer needs to invest in its own servers and equipment.

Innovation: Cloud platforms provide access to cutting-edge technologies such as artificial intelligence, data analytics, Internet of Things and blockchain, enabling innovation and the development of new business models.

Global access and collaboration: Cloud solutions provide the ability to access data and applications from anywhere in the world using the Internet, making it easier for employees and partners to collaborate and share information.

---

[2]Judith Hurwitz, Robin Bloor, Marcia Kaufman and Fern Halper. Cloud Computing For Dummies. - 2019
[3]IEEE Xplore - https://ieeexplore.ieee.org/
[4]Google Scholar - https://scholar.google.com/

Fig.1 Features of cloud computing[5]

Security and Compliance: Cloud service providers typically provide high levels of security and compliance, making cloud solutions attractive to companies operating in regulated industries.

Small Business Development: Cloud technologies make advanced IT resources available to small and medium-sized businesses, allowing them to compete with large players in the market and expand their business without significant capital investment. These factors confirm that cloud technology plays an important role in the development of the digital economy, improving efficiency, driving innovation and facilitating business growth in the modern world. According to research[6]cloud technologies remain relevant in the modern world due to a number of reasons:

Flexibility and Scalability: Cloud platforms allow organizations to scale their resources based on needs, making them an ideal choice for companies of any size.

Cost-effective: Using cloud services reduces infrastructure and hardware costs because business owners no longer need to purchase and maintain their own servers and hardware.

Innovation and Digital Transformation: Cloud platforms enable the development of new technologies and capabilities such as artificial intelligence, data analytics, Internet of Things and more, which help companies become more competitive. Security and Reliability: Cloud service providers typically provide a high level of data security and

---

[5]Author's development
[6]Michael J. Kavis. Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS). - 2014

reliability, which makes cloud solutions attractive to companies, especially given the growing cybersecurity threats. From my point of view, the main characteristics of cloud technologies include: On-demand instantiation: Users can instantly access the necessary resources as needed, without having to pre-order or install hardware. Scalability: Cloud services provide the ability to scale computing resources depending on the needs of the business or project, which allows you to quickly adapt to changing conditions. Sharing: Resources in the cloud can be shared simultaneously with multiple users in different locations, providing flexibility and ease of collaboration. Pay-as-you-go: Billing for cloud resources is often based on a pay-for-what-you-use model, allowing organizations to optimize IT costs and avoid the costs of unused resources. Problems of cloud technologies:[7]

1. Data security: Moving data to the cloud may involve the risk of data leakage or unauthorized access.

2. Service reliability and availability: Cloud unavailability can lead to business downtime and data loss.

3. High cost: Using cloud services can be expensive for small companies.

4. Compatibility and integration: difficulties in compatibility and integration of various cloud services with each other. Let's consider their solutions in detail according to the description of the problem: Data security.[8]Use of data encryption mechanisms at rest and in motion to protect information from unauthorized access. Implement authentication and authorization mechanisms, such as multi-factor authentication, to ensure secure access to cloud resources. Regularly conduct security audits and event monitoring for early detection and prevention of possible security incidents. Training company employees in the rules of safe use of cloud services and regularly informing them about potential threats and methods of preventing them.

---

[7]Rajkumar Buyya, James Broberg, Andrzej Goscinski. Cloud Computing: Principles and Paradigms. - 2011
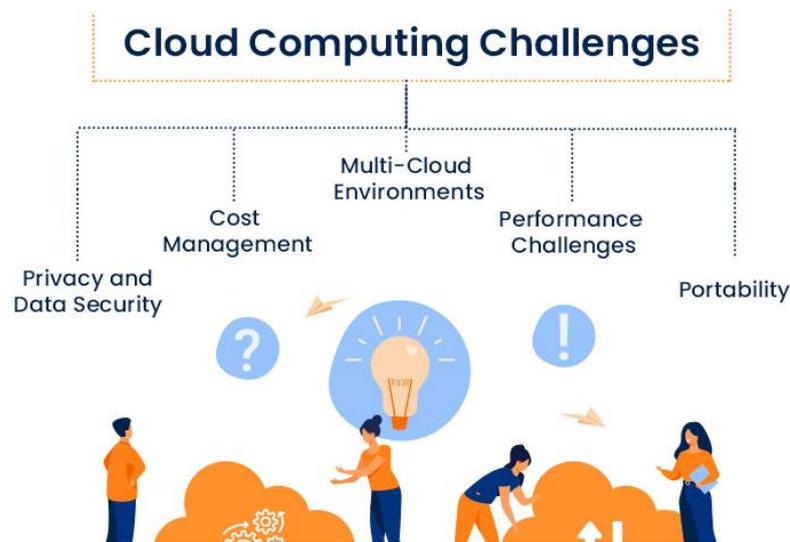[8]Cornelia Davis. Cloud Native Patterns: Designing Change-Tolerant Software. - 2019

Fig.2 Cloud computing challenges by area[9]

Reliability and availability of services. Use of multiple regional data centers and data duplication to ensure high availability and fault tolerance of cloud services. Develop and implement data backup strategies with regular creation and testing of backups to minimize data loss in the event of a disaster or failure. Constant monitoring[10] and optimizing the performance of cloud resources to prevent overloads and ensure stable operation of services.

High price. Optimize the use of cloud resources by monitoring and managing costs, such as turning off unused virtual machines or resources during inactivity. Leverage cloud provider pricing models, such as pay-per-use or pay-for-what-you-use models, to reduce cloud service costs. Consider using open and free cloud solutions[11], where possible, as well as moving to cheaper cloud providers while maintaining the required functionality. Compatibility and integration. Use of standardized protocols and APIs to ensure interoperability between different cloud platforms and facilitate integration between them.

---

[9]Author's development
[10]Thomas Erl. Cloud Computing: Concepts, Technology & Architecture. - 2013
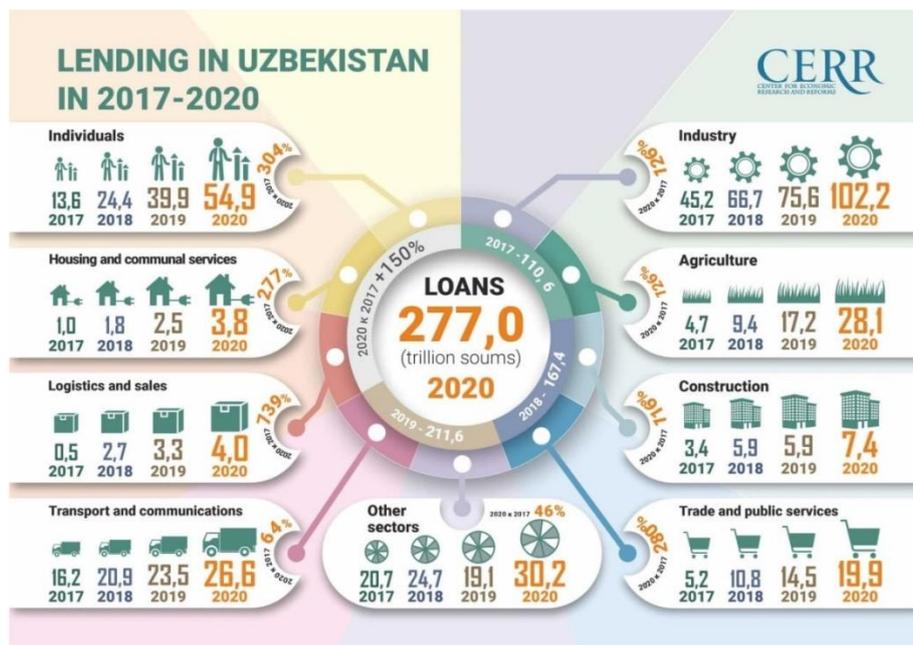[11]Joe Weinman. Cloudonomics: The Business Value of Cloud Computing. - 2012

Fig.3 Statistics on the activities of entrepreneurs in Uzbekistan in 2017-2020.[12]

Development and use of specialized solutions for integrating cloud services, such as data adapters or data integration platforms, to ensure the collaboration of various cloud and local applications and services. In the end, we came to the conclusion that cloud technologies play a key role in the modern world of information technology, providing organizations and users with access to computing resources and applications via the Internet. They offer a number of advantages, including flexibility, scalability, availability and pay-per-use, making them an attractive choice for a wide range of applications and needs. At the end of the study, we concluded that by using cloud technologies, organizations can significantly reduce IT costs, increase the efficiency of their operations and speed up the deployment of new applications and services. Cloud technologies provide users with the ability to access their data and applications from anywhere in the world and from any device, which increases their mobility and productivity. However, for all their benefits, cloud technologies also present some challenges and risks, such as data security, service reliability, high cost, and compatibility and integration difficulties. However, these challenges can be successfully addressed through appropriate strategies and technologies, such as encryption and authentication mechanisms, data backup strategies, cost optimization, and the use of interoperability standards. Overall, cloud

---

[12]Author's development

technologies represent a powerful tool for the digital transformation of business and everyday life, providing the flexibility, scalability and accessibility that are necessary to successfully function in today's information society.

List of used literature:

1. Rajkumar Buyya, James Broberg, Andrzej Goscinski. Cloud Computing: Principles and Paradigms. - 2011

2. Joe Weinman. Cloudonomics: The Business Value of Cloud Computing. - 2012

3. Michael J. Kavis. Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS). - 2014

4. Thomas Erl. Cloud Computing: Concepts, Technology & Architecture. - 2013

5. Cornelia Davis. Cloud Native Patterns: Designing Change-Tolerant Software. - 2019