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The impact of using cloud computing on the economic prosperity of e-businesses

Abstract. Cloud computing is one of the new concepts in the field of information and communication technology, which means the use of computing resources (hardware and software) and a set of servers through a network. The main purpose of the present study is to design a conceptual model of business based on cloud computing. Therefore, in this study, researchers have used a qualitative research method and a content analysis strategy to identify important factors and components related to the phenomenon of sustainable cloud businesses. The statistical population of the study consists of all managers and experts familiar with data and communication technology in the field of electronic businesses in Uzbekistan, and the sample of the statistical population includes 145 people. The sampling method used in the study is whole-number sampling. A questionnaire was used to collect data related to factors affecting the use of cloud computing. The validity of the questionnaire was examined and confirmed by professors and experts in the field of data and communication technology. The reliability of the questionnaire was calculated at a good level using Cronbach's alpha coefficient of 0.92.

Based on the research findings, five influential factors (cost, innovation, security, interaction, performance) were identified in the use of cloud computing. In the next step, and in the analysis of the five factors affecting the use of cloud computing, it was determined. The innovation and interaction factors explain 28.25 and 13.58% of the total variance, respectively, which indicates that these factors are more important than the other five factors. The results of this research identify the competitive advantages of using cloud computing for companies operating in the field of e-commerce and provide implementation strategies for its use.

Keywords: Cloud Computing; Economic Prosperity; E-Business; Competitive Advantage; AI; SME

JEL Classifications: E24; E41; E64; I18; J28; J31

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1. Introduction and Brief Literature Review

Today, cloud computing is an emerging mechanism for high-level computing as a storage system in which clouds charge their users based on the amount of resource usage and provide their services to them. Therefore, cloud services can be considered to contribute to creating an incentive to start a business with lower financial costs. The emergence of the famous phenomenon of cloud computing represents a fundamental change in the direction of IT services that are innovative, developed, expanded, scaled, updated, maintained and paid (Sareddy, 2023; Sondakh et al., 2024). Cloud computing uses the Internet platform to connect to network hosts, infrastructures, applications and provide reliable services. In the cloud, each service is provided according to the customer's needs (Yamali et al., 2025). If we want to look at the cloud network from a programmer's perspective, the information transmission networks become large, flat and more ambiguous. That is, the complexity of programming for this network model is reduced. The network itself establishes the necessary communication and, as far as possible, the software layers are related, all the necessary services are performed by virtual tools or cloud services (Ivanisević et al., 2019). If we look at the cloud network from the perspective of service providers, all this is done on the physical structure automatically and without external intervention. This view actually increases the scope and speed of operation in this model of information transmission networks.

The e-commerce environment is changing rapidly and now various variables such as competition, demand for sustainability and participation, rapid development of cloud computing offerings, social web, etc. are changing. Cloud computing promises to solve a number of these challenges. However, many concerns about transparency, data security and quality of service prevent companies from adopting this approach (Fatimah et al., 2023; Mshvidobadze, 2022). Cloud computing promises to provide all the functions of existing IT services and enable new functions that have not been implemented so far, in a way that significantly reduces computing costs. Today, small businesses are finding that they can easily leverage the cloud to gain immediate access to best-in-class business applications or to leverage their infrastructure resources at a fraction of the cost. Gartner defines cloud computing as «a computing style that delivers massive IT capabilities as a service to external customers using Internet technologies» (Attaran, 2017). What distinguishes cloud computing from traditional hosting and outsourcing approaches is its focus on throughput and consumption model.

2. Cloud Computing as a Business Model

A business model describes a way to create value for customers. A business model describes how a business transforms market opportunities into profits through its actors, activities, and collaborations (Taherdoost, 2023). A business model describes how inputs (resources) are transformed into outputs (values). Cloud computing can be considered as an emerging business model, providing layers of services that are delivered to end users. The cloud computing business model includes three components: infrastructure, hardware platform, and software platform. These three components of the cloud business model framework describe business organizations based on the type of service they provide. This framework describes different business roles for customers. Organizations can move and operate in a specific business direction, which are: infrastructure providers, hardware platform providers, service providers, bulk service providers, consulting. In fact, all the roles mentioned above can be combined and placed in a single value chain. This single value chain is actually cloud computing (Nugroho et al., 2025).

The results of previous research showed that the virtualization situation in the world and for technology companies is on a fertile slope, and various companies such as Cisco, Microsoft, VMware, Oracle, etc. are producing and developing their products and competing to gain a larger share of the market. The use of this technology in Uzbekistan had almost reached its peak in terms of expectations in 2015. It is noteworthy that the order of attention to infrastructure and software services in Uzbekistan is the opposite of their order in the world (Kamaev, 2025). This has caused, in general, the analysis of concepts and analysis of the cloud computing market in Uzbekistan to be different from its analysis in the world. For example, what has led to the growth of infrastructure services in the world is the existence of demand at the level of providing software services, but in Uzbekistan, the lack of this demand has changed the equations, and what is currently emerging as a fever for providing infrastructure services has been created falsely and more under the influence of marketing by the world's leading industries and has not been influenced by domestic needs.

Today, small businesses are finding that they can easily and affordably benefit from the cloud by leveraging their best-in-class business applications or by effectively increasing their infrastructure resources at a negligible cost. In this view, cloud computing is a computing style that delivers the enormous capabilities of information technology as a service to external customers using Internet technologies (Castillo & Taherdoost, 2023). What distinguishes cloud computing from traditional outsourcing and hosting approaches is its focus on outputs and consumption models. This study evaluates the impact of cloud computing on e-commerce businesses in Uzbekistan and examines the factors affecting business success.

3. Method

Cloud computing has brought about a huge change in the world of information technology. In simple terms, cloud computing is the use of computing, storage, and software resources over the Internet, without the need to purchase and maintain local hardware. These resources are provided as services that users can use according to their needs. The 5 influential factors in the field of cloud computing from the perspective of experts were considered as follows:

- 1) Performance: With cloud computing, you can quickly scale up or down your resources without worrying about your hardware capacity.
- 2) Cost: The initial investment costs for purchasing hardware are eliminated, and you only pay for what you use.
- 3) Interoperability: With an internet connection, you can access your data and applications from any device.
- 4) Security: Cloud service providers usually have strong security systems in place to protect your data.
- 5) Innovation: Cloud computing allows for faster development and testing of new applications and services.

3.1. Main Characteristics of Cloud Computing

The National Institute of Standards and Technology defines the characteristics of cloud computing as follows:

On-demand services: A customer can unilaterally request computing facilities and services, such as servers and network storage space, from any provider as needed, automatically and without the need to interact with Get and use the service provider. This means we don't need to hire full-time network administrators to manage the cloud infrastructure. Most cloud services have self-service portals that are easy to manage.

Wide-area network accessibility: Existing capabilities are accessible over the network through standard mechanisms that promote the use of heterogeneous methods (thin and thick client platforms, such as mobile phones, laptops).

Resource pooling: Using a multi-tenancy model, computing resource providers can automatically allocate and take away various physical and virtual resources from the consumer based on his request. The consumer does not have control and information about the exact location of the provided resources, but can the higher abstraction (country or state or data center) specifies the location. Resources can include storage, processors, memory, bandwidth, or virtual machines.

Rapid Responsiveness: Capabilities can be provided quickly and with resiliency. That is, they are automatically provisioned based on the volume and rate of demand during peak times from

a customer, ramped up to the level necessary for appropriate responsiveness, and then ramped down quickly after the need is gone, i.e., to the extent of return before the peak of demand. Often, such a customer perceives that services are infinite, meaning that these services can be purchased at any time in any volume and quantity (Olaopa & Alsuhaybany, 2023).

Factors affecting cloud computing and the development of SMEs which were studied in our research model are outlined in Figure 1.

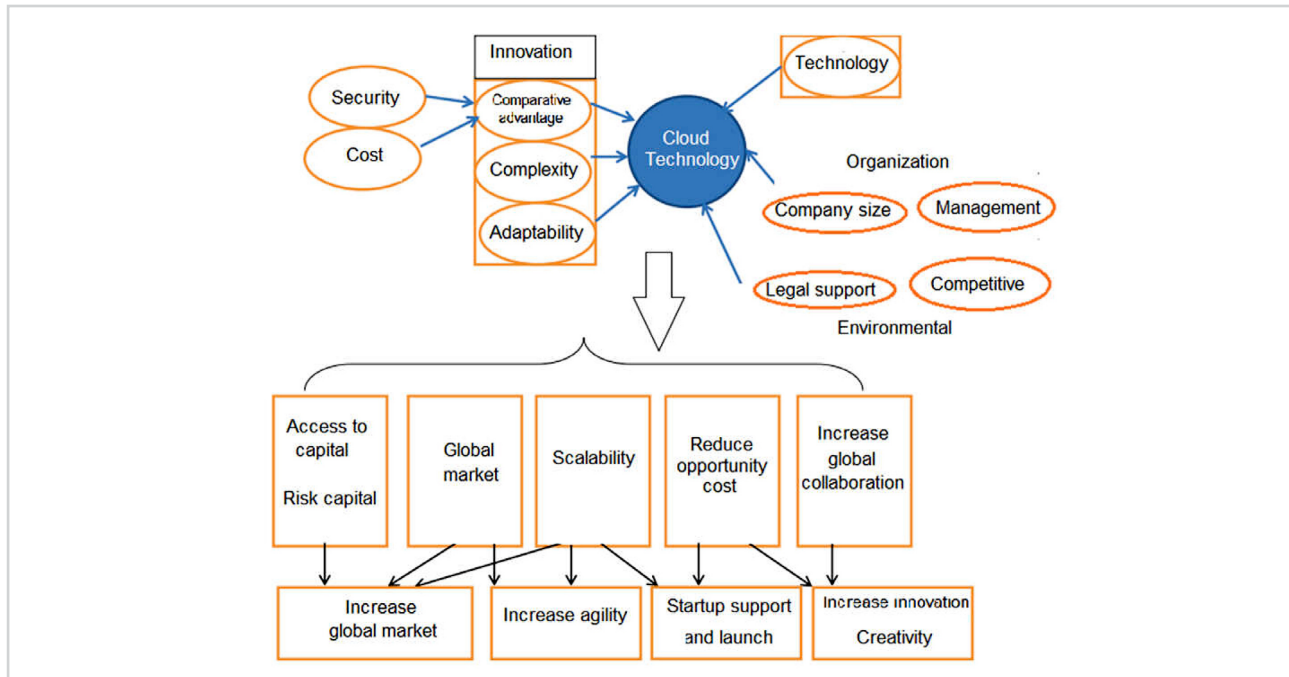


Figure 1:
Factors affecting cloud computing and factors affecting the development of small and medium-sized businesses

Source: Authors' own findings

This research was conducted in a descriptive-exploratory manner using a survey method. The statistical population included all managers and experts in the field of e-business in Uzbekistan, 145 people, who were selected as a sample using the census method during 2024. The validity of the interview protocol was examined based on its face and content validity analysis from the perspective of 2 experts active in the field of qualitative research, the results of which are summarized in Table 1. In general, in the interview method, validity should be considered for each stage of the research so that the results obtained are reliable and trustworthy. In order to analyze the data collected using the questionnaire, the factor analysis method was used. All statistical analyses were performed using SPSS software.

Table 1:
Evaluation of face and content validity of the preliminary questionnaire

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Item composition	5	4	4	5	5
Item fit with constructs	5	4	3	4	3
Item fit with research focus	4	4	5	3	5
Item adequacy	5	5	3	4	5
Need for item change	4	3	4	4	4
Average scores	4.6	4	3.8	4	4.4
Total average: 4.16; Data validity: 0.81					

Source: Authors' own findings

4. Results

While many businesses have promoted and marketed virtual environments as a solution to current security concerns, a closer look reveals that virtualization adds additional software to the network system that, if poorly built and deployed, can have a negative impact on security. Additionally, data center hubs link their servers together through software, meaning that if something goes

wrong, the net effect can be detrimental to security. Consumers must rely on trust mechanisms because they have no control over cloud resources.

The results of the description of demographic characteristics can be seen in Table 2. According to Table 2, to confirm the adequacy of the selected data in the factor analysis test, Bartlett's test and KMO coefficient were used.

As shown in Table 3, the KMO index with a value of 0.801 indicates the appropriateness of the selected sample size. Also, the Bartlett test value is less than 0.01, which indicates that the factor analysis method can be used to investigate the factors affecting the use of cloud computing in e-business.

The results obtained from the factor analysis test for the 5 influential variables from the experts' perspective (cost, innovation, security, interaction, performance) are presented in Table 3.

In Table 4, each of the five components of the study is placed in different factors based on the correlation coefficient they have with each of the 5 factors obtained. The method of determining which of the 5 components each is placed in is to determine which of the factors this component has a high and, of course, more positive correlation with. The results of this analysis can be seen more clearly in Table 4.

Table 2:
Validity test of the number of samples selected for factor analysis

KMO coefficient for determining the number of samples		0.801
Bartlett test statistic	Chi-square statistic	3.011
	Degrees of freedom	220
	Significance level	0.000

Source: Authors' own findings

Table 3:
Total explained variance

Variable	Initial eigenvalue			Extracted values of the factor load square		
	Cumulative %	Variance %	Total	Cumulative %	Variance %	Total
Innovation	33.43	33.43	9.88	32.98	28.25	9.88
Interaction	44.56	11.13	3.14	46.56	13.58	3.14
Performance	53.31	8.75	2.85	55.79	9.23	2.85
Cost	60.32	7.01	2.11	64.68	8.89	2.11
Security	66.54	6.22	1.98	71.2	6.52	1.98

Source: Authors' own findings

Table 4:
Factors for using cloud computing technology in e-commerce

Variable	Percentage of Variance Explained	Significance Level
Innovation	28.25	0.000
Interaction	13.58	0.001
Performance	9.23	0.001
Cost	8.89	0.000
Security	6.52	0.002

Source: Authors' own findings

The first factor, with the variables of credibility of innovation, explains 28.25% of the total variance. Since the importance of this factor is greater than other factors, it is the most important factor affecting the use of cloud computing in public universities. The last factor, with the variables of data security, service provider honesty, anonymity, persuasiveness, contractual agreements, and limitations, explains 6.52% of the total variance. These factors are, in the next order, factors affecting the use of cloud computing in public universities.

Cloud computing providers are advised to expand their activities in small and medium-sized enterprises and examine the potential and benefits of cloud computing, in addition to identifying the important factors that prevent the adoption of cloud computing and organizing them hierarchically according to their importance in small and medium-sized enterprises. Also, the inattention of managers in how to measure the results of using cloud computing for cost-benefit analysis is a very important obstacle. Companies consider other indicators for not welcoming cloud computing such as: availability and quality of services, potential problems with changing suppliers and compliance with legal data requirements. Identifying the positive impact and benefits of using cloud computing in small and medium-sized enterprises reduces software, hardware and IT costs, scale and flexibility in its use,

access to IT resources are very important for the company. It may even be possible for many small and medium-sized enterprises to increase the level of information security by using cloud computing technology. Small and medium-sized companies have fewer technological resources than large companies, and this may affect the use of technology systems and cloud computing. Cloud computing is a paradigm shift in the delivery of IT services. This transformation has a major impact on the agility, efficiency and flexibility of data centers at a time when data is growing exponentially.

5. Conclusion

The aim of this research was to identify the factors affecting the use of cloud computing in e-business. Therefore, considering the increase in the speed of service delivery to clients and the importance of intra-organizational data exchange, it is of great importance to identify the factors affecting the use of cloud computing. Therefore, organizations can accelerate the identification of factors affecting the use of cloud computing by grouping such factors and examining impact of these categories.

Cloud computing is an example of an innovative system that increasingly replaces traditional information and communication technology as a support for business strategy and creates new and innovative ways to manage the information technology needs of organizations. The development of cloud computing technology creates a global market for the development and sale of products and services based on it. The increasing spread of various platforms such as tablets and smartphones that interact with cloud computing has accelerated the spread of this technology. Research shows that the adoption of cloud-based information technology services may be very suitable for small and medium-sized enterprises because they have the potential to reduce some of the traditional disadvantages that small and medium-sized enterprises have compared to large enterprises, such as capacity and financial constraints, and provide advantages in terms of cost and innovation for e-commerce-based companies.

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