

## **A Review Of Cloud Computing And Its Opportunities In The Development Of Information Systems For SMEs**

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### **Abstract**

This paper reviews the main characteristics of cloud computing, where they are exposed their main components and ways of use. In addition to the technological review that is done, is also carried out a critical analysis of their potential and challenges in the context of SMEs. To understand how cloud computing can lead to a powerful ally of SMEs in the context of organizational competitiveness in a world where the role of information systems for a long time proved decisive, it is a reflection that the SMEs, whose core business is not technology, need to carry out.

### **Introduction**

Cloud Computing (CC) has been in recent years an excellent platform for the development of computational solutions for multiple fields of knowledge. This new computational approach has introduced a large number of advantages but also entails a number of challenges. The CC was a response to the current scenario where tasks such as sharing, obtaining and handling massive amounts of information are a reality. However, this scenario proves to be extremely demanding in terms of computing resources that have to exist for it is demonstrated feasible to perform these tasks with acceptable performance. The CC has, with regard to computing resources, a vision of unlimited resources. Not because they in fact are, but by a transparently scaling approach. That is, the ability to grow cloud resources (by adding resources to a distributed cluster) shows become invisible to the end user. This just sets and engages resources, scaling this hiring according to their temporal needs without resource scarcity concerns. In fact, this is not the concern of the CC customer, but to the provider of the resources. This way of looking at computing presents to customers (typically organizations) as an important advantage. It ceases to be a concern installation, maintenance and processing infrastructure management. One begins to deal with a vision of computing resources, be they infrastructure, services or development platforms; as with the simple access to the Internet - it hires, binds, it is available and someone (the supplier) is responsible for ensuring the quality of service. The CC enables organizations to focus their attention on their business, and provides them a scalability scenario, both in terms of services and infrastructure, which become "unlimited". The cost, whose detailed analysis will not be the target of this paper is presented as globally advantageous.

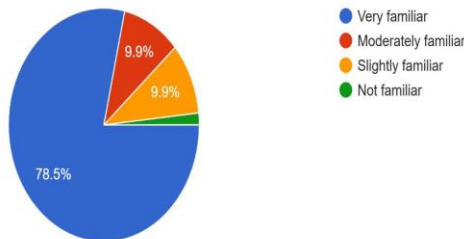
## Objective of the study

1. To review cloud computing technologies and evaluate their opportunities in the development and improvement of information systems for Small and Medium-sized Enterprises (SMEs).
2. To examine the concept, characteristics, and service models of cloud computing.
3. To analyze the role of cloud computing in the development of information systems for SMEs.
4. To identify the key benefits of cloud computing adoption for SMEs, such as cost reduction, scalability, and flexibility.
5. To assess the challenges and risks associated with using cloud-based information systems in SMEs.
6. To evaluate how cloud computing supports business efficiency, data management, and decision-making in SMEs.

## Data Analysis:

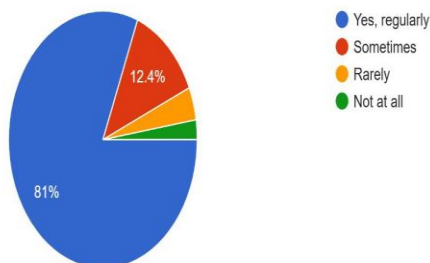
1) How familiar are you with cloud computing?

121 responses



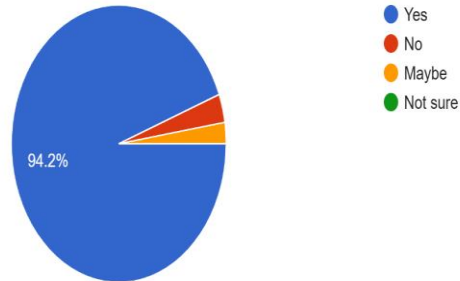
2) Do you use computers or mobile apps for daily business work?

121 responses



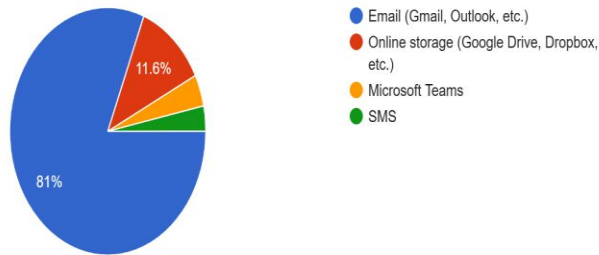
3) Have you heard of online systems like Google Drive, Gmail, or online accounting software?

121 responses



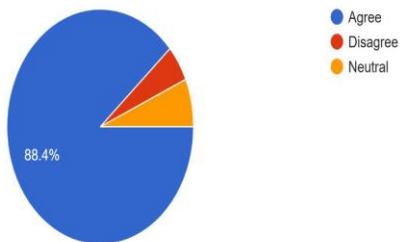
4) Which online tools does your business use?

121 responses



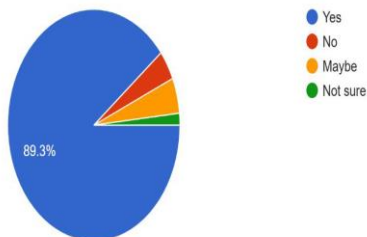
5) Cloud-based systems allow access to data from anywhere.

121 responses



6) Do you think online systems reduce paperwork?

121 responses



## Hypothesis

H1: Cloud computing adoption positively impacts the scalability and operational performance of information systems in SMEs.

Response Category	O <sub>i</sub>	E <sub>i</sub>	O <sub>i</sub> -E <sub>i</sub>	(O <sub>i</sub> - E <sub>i</sub> ) <sup>2</sup>	(O <sub>i</sub> - E <sub>i</sub> ) <sup>2</sup> /E
Agree	84	24.20	59.80	3576.04	147.77
Strongly disagree	20	24.20	-4.20	17.64	0.73
Disagree	6	24.20	-18.20	331.24	13.69
Neutral	11	24.20	-13.20	174.24	7.20
Strongly agree	0	24.20	-24.20	585.64	24.20
<b>Total</b>	121	-	-	-	193.59

$$\Sigma(O_i - E_i)^2 / E = 193.59$$

$$\text{Degrees of Freedom} = 5 - 1 = 4$$

$$\text{Calculated} = 193.59$$

$$\text{Tabulated} = 9.49 \text{ (df} = 4, \alpha = 0.05)$$

$$\text{Since } 193.59 > 9.49$$

H2: Perceived security and reliability of cloud computing significantly influence SMEs' adoption of cloud-based information systems.

Response Category	O <sub>i</sub>	E <sub>i</sub>	O <sub>i</sub> -E <sub>i</sub>	(O <sub>i</sub> - E <sub>i</sub> ) <sup>2</sup>	(O <sub>i</sub> - E <sub>i</sub> ) <sup>2</sup> /E
Concerned	59	30.25	28.75	826.56	27.32
Very concerned	39	30.25	8.75	76.56	2.53
Slightly concerned	15	30.25	-15.25	232.56	7.69
Not concerned	8	30.25	-22.25	495.06	16.37
<b>Total</b>	121	-	-	-	53.91

$$\Sigma(O_i - E_i)^2 / E = 53.91$$

$$\text{Degrees of Freedom} = 4 - 1 = 3$$

$$\text{Calculated } \chi^2 = 53.91$$

$$\text{Tabulated } \chi^2 = 7.81 \text{ (df} = 4 - 1 = 3, \alpha = 0.05) \text{ Since } 53.91 > 7.81$$

## Conclusion:

Cloud computing presents significant opportunities for SMEs to develop and enhance their information systems by reducing infrastructure costs, improving scalability, and supporting innovation. The findings indicate that cloud-based solutions can empower SMEs to compete more effectively in dynamic markets. However, successful adoption requires addressing security risks, regulatory compliance, and skills gaps. Future research should focus on empirical studies and best practices to guide SMEs in maximizing the benefits of cloud computing while minimizing associated challenges.

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