A STUDY OF CLOUD COMPUTING IN MSMES

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ABSTRACT

A popular technology for companies of all kinds, including Micro, Small, and Medium Businesses, is cloud computing (MSMEs). The advantages of cloud computing for MSMEs are examined in this research, including lower prices, more scalability, higher accessibility, and improved security. The use of cloud computing by MSMEs faces several difficulties, including restricted internet connectivity, a lack of technical skills, and worries about data security and privacy. The report argues that MSMEs can benefit from working with cloud service providers, establishing best practices for data security, and adopting cloud-based software solutions suited to their particular requirements to overcome these difficulties. According to the study's findings, cloud computing can help MSMEs compete successfully in the digital economy and increase productivity and profitability.

Keywords: cloud computing, MSMEs, technology, cloud-based applications, trends in MSMEs, adoption of cloud services, cloud deployment models, secure solutions

I. INTRODUCTION

Small and medium enterprises (SMEs) are a key market for cloud-based offerings to reduce operational costs and improve efficiencies. Cloud computing offers reduced costs and reduced return on investment. SMEs are a major source of employment, revenues, and export earnings, making them an important part of a nation's economy. Cloud computing is essential for SMEs to integrate into global businesses. Cloud Computing offers many benefits, such as agility, elastic scalability, and low costs. Cloud computing has the potential to boost SMEs' growth and encourage entrepreneurial practices, but Indian SMEs are not taking advantage of its cost-effective solutions. Cloud computing is an ideal solution for innovation-driven alliances between universities and companies, but there is a lack of qualified professionals.

Technology assessment is essential to evaluate cloud technology's merits and demerits before decision-making. Cloud adoption is low in SMEs due to a lack of confidence and interest, unresolved issues, vendor lock-ins, service level agreements, and migration interfaces. Cloud Computing needs to be researched from commercial and business relevance to address drivers and barriers of cloud adoption, financial metrics, security, and privacy concerns. Cloud computing is important for governance structure, green benefits, and adoption.

This paper aims to identify areas where MSMEs need to improve skills or create new competencies.

II. LITERATURE REVIEW

The objective is to create awareness among MSMEs for the recent development in Information Technology through cloud computing, which will enable them to utilize the latest information technology. Enablers include low cost, information availability, and awareness (Narendra Bhende, June 2015). The objective of this study was to analyze the scope of cloud computing for SMEs in India and compare the difficulty level for adaptability between traditional ERP systems and SaaS-based ERPs. The average amount saved was 37000 per user per year. (Monika Sharma, May 2010). Cloud computing adoption by SMEs is driven by relative advantage, security concerns, top management support, external pressure, and service providers' support (Devesh Kumar, 2017). Cloud computing is an important enabler of MSMEs, providing multi-tenant, ubiquitous, on-demand computing services (Chakraborty, 2013). Cloud Computing has the potential to support increased capacity or extended firms' capabilities, without incurring extra costs. Government must continue an aggressive broadband rollout to ensure all Indian SMEs are no longer disadvantaged (Singh, 2016). Digital MSME can be implemented with the help of the Digital India program to support cloud adoption in SMEs, but national policies need to be integrated to enable smooth diffusion and implementation (Rajesh, 2020). Indian Government and states should provide support to SMEs to help them migrate to the Cloud environment, which can improve financial competitiveness and provide many benefits. (Gide, 2019). This study reviewed the factors affecting Cloud Computing adoption in SMEs, focusing on top management support, technology readiness, security concern, and relative advantage (Giang Thi Nguyen, 2022). The risk associated with Cloud Computing adoption in SMEs is low (Pragati Priyadarshinee M.K. Jha, 2014).

Cost reduction is not the most important factor for MSMEs to adopt accounting applications with cloud computing technology (Wahyuni, 2017). Cloud computing could improve SMEs' performance, competitiveness, and resilience during the Covid19 pandemic (S Kamarudin, 2022). SMEs use Cloud Computing to reduce their expense and time on IT, but there are risks such as outsourcing opportunism and technology development risks. Future work will focus on reducing these risks and suggesting the best approach (Mojtaba Alizadeh, 2013). Cloud-based services are in high demand due to reduced costs, improved flexibility, and scalability, but SMEs have raised issues such as security and privacy, availability, and reliability (Monisha Singh, 2017). Cloud computing offers a variety of opportunities and benefits for SMEs, such as the chance to test new software, assess third-party applications, boost capacity, and provide software as a service (Javaid, 2014). Micro, Small, and Medium Enterprises (MSMEs) are the biggest source of domestic employment and

are a great marketplace for cloud-based services, allowing them to benefit from economies of scale and access new IT resources (Ahmad Amini, 2013). Single point of access, support, and service acquisition is key to success for MSMEs in the current economic climate (Yamartino, 2012). The most important idea is that there is a need for a standard metric to measure the suitability of cloud applications for business and that the cloud adoption determinants identified in the paper can help SMEs choose the right cloud application (R. Vidhyalakshmi, 2016). This research examines factors that influence IT adoption in SMEs, lists benefits, and suggests ways to use analytics for business growth (Rajeshwar S Kadadevaramath, 2014). Developed countries are struggling to understand environmental factors for increasing cloud adoption, while SMEs in developing countries are aware of the benefits of cloud computing such as cost reduction, flexibility, reliability, innovation, and business agility. Challenges faced by SMEs include security and privacy concerns, lack of control, and network dependencies (Vikas R Gangadhar, 2020). This research raised concerns about the lock-in period, network bandwidth, availability, and legal implication related to data security and privacy. SMEs should be encouraged to cloud adoption to realize the business benefits and cost-saving measures. However, there are limited efforts to measure the impact of cloud adoption on actual business outcomes. (Sandu, 2017)

III.   NEED OF THE STUDY

The research aims to take theoretical insights and confirm them in real-world situations using qualitative and quantitative data. Validity is the measure of the correctness of an instrument used in a study, while variable validity is the perpendicular communication between a theoretical concept and a specific measuring procedure.

Cloud computing is altering the face of technology. The increasing popularity of subscription models is allowing businesses to become more efficient. Cloud technology provides numerous advantages, including increased productivity, agility, cost savings, and operational efficiencies. Future generations must be aware of the concepts and technologies that shape the cloud. There is a need to understand the opportunities that lie ahead, and businesses should keep track of market dynamics.

IV.　OBJECTIVE OF THE STUDY

The current study's goal is to propose a framework for understanding the influence of Cloud Computing adoption on corporate performance, as well as the Questionnaire designed to measure the effect. Cloud computing is a paradigm change that must be understood for the technology to be used. It is critical to understand firms' perspectives on Cloud computing and technology adoption since it may be used to determine the elements that are

likely to affect business performance. About the problem statement, this study will concentrate on industries that aspire to or have already adopted cloud computing. Understanding the correlations between the various variables will assist us in determining which ones have the greatest impact on business performance. The study will be based on tried-and-true principles in technology acceptance to determine which variables play a significant role in defining cloud adoption. This study's aims are based on how different variables link to business performance through Cloud adoption, this study has the following objectives:

i)　To understand how cloud computing benefits worldwide

ii)　To know which service has been mostly adopted by different MSMEs

iii)　To understand which sector has a better understanding of cloud computing

iv)　To know the concerns why MSMEs are not adopting cloud computing

V.　RESEARCH METHODOLOGY AND ANALYSIS

The questionnaire includes general corporate information, software usage, and cloud computing inquiries. Tables 1–8 present the questions and findings of the questionnaire addressed to all partner nations, as follows:

1. How does your business use IT daily?

2. Do you use cloud computing services in your organization?

3. What are the factors that make you adopt cloud computing?

4. Why don't you use cloud computing services in your organization?

5. Which cloud computing service do you use in your organization?

6. What are the benefits cloud computing offer to your organization?

7. Which cloud services do you aspire to use in your organization?

8. Which of these abilities and competencies are essential for successful cloud computing implementation in your organization?

Q1. How does your business use IT daily?

Word Processor	48%
ERP	14%
CRM	2.8%
Social Media	4.1%
Software Development	31%
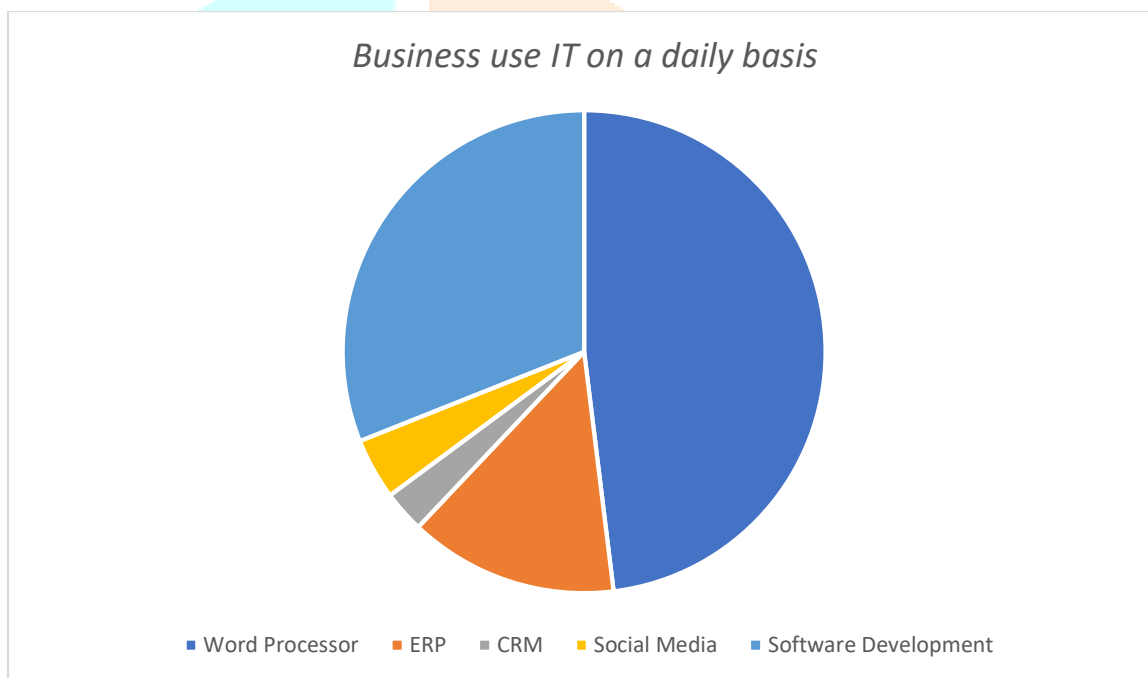
Word processing is the most commonly used tool, followed by ERP (Enterprise Resource Planning) and software development. CRM (Customer Relationship Management) is the least used tool, with only 2.8% of users relying on it daily. Social media is used by 4.1% of users but can provide valuable insights into customer behavior and market trends.

Q2. Do you use cloud computing in your organization?

Yes	84%
No	5%
Maybe in future	9%
Unsure	2%
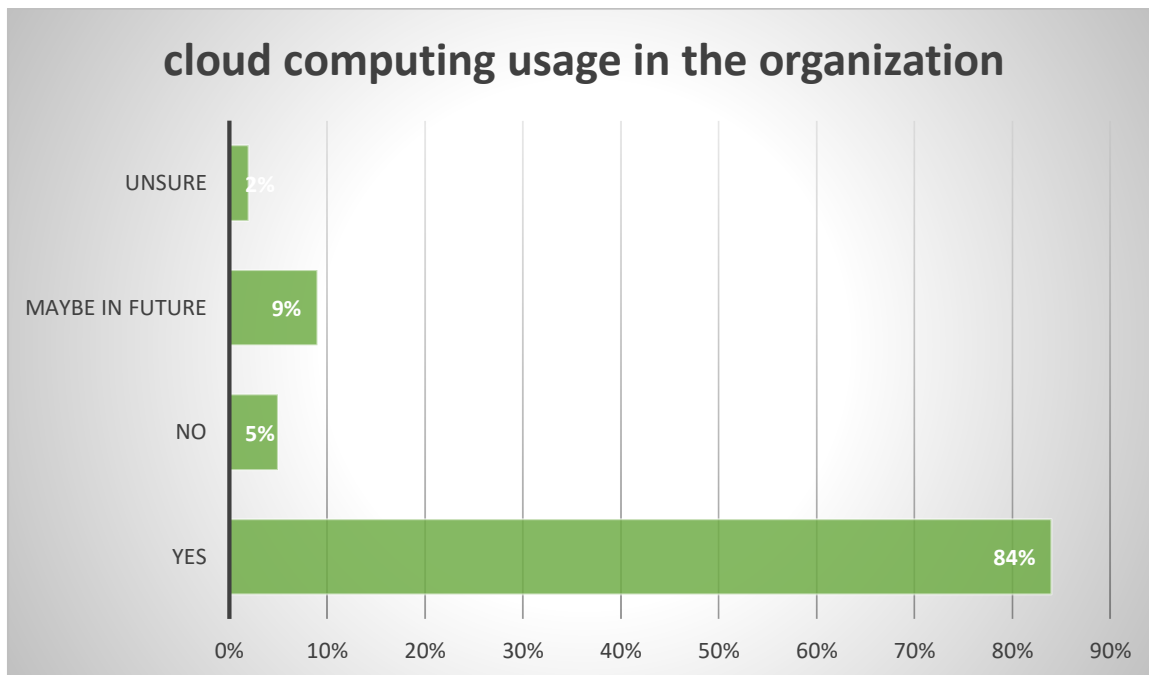
Cloud computing services are becoming increasingly popular for businesses and organizations due to their benefits such as scalability, flexibility, cost savings, and improved data security.

Q3. What are the factors that make you adopt cloud computing?

Cost reduction	73.2%
Ease of accessibility	69.2%
On-demand service	80%
Performance	54%
User-friendliness	88%
Customization	46.2%
Integration	33%
Security	60%

the factors that make you adopt cloud computing
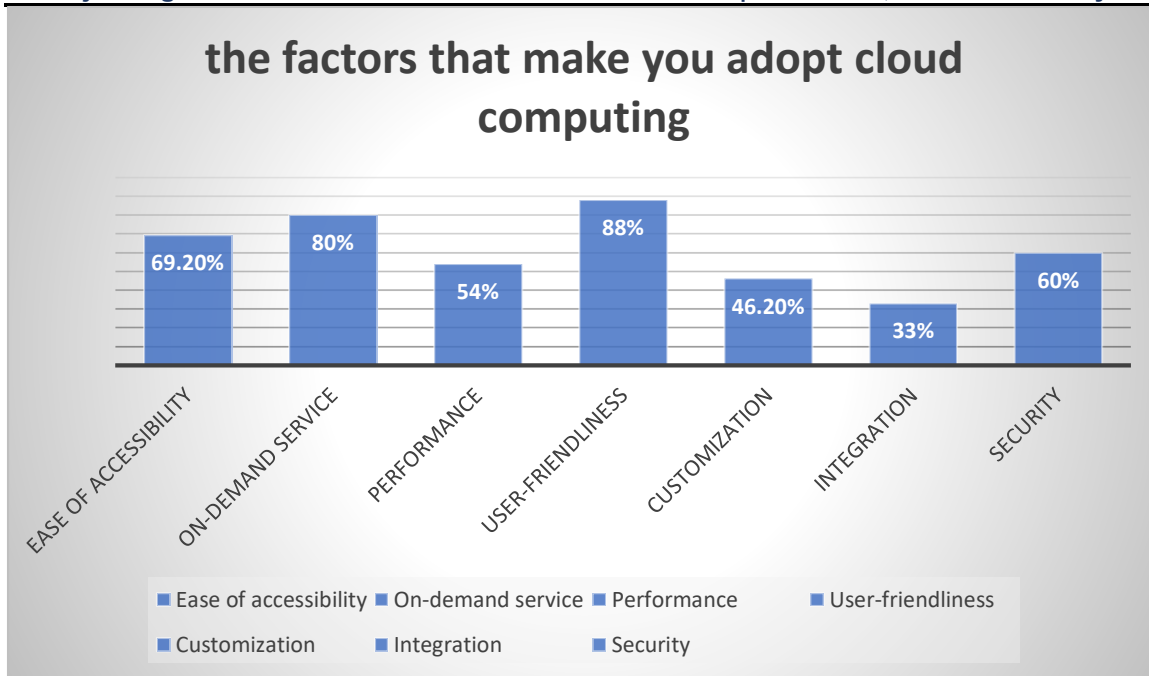
Expense reduction: With a high relevance rating of 73.2%, this aspect is highly valued by the user. It shows that customers wish to cut back on expenses related to the good or service.

Accessibility: With a score of 69.2%, this element is also highly significant. It implies that customers desire to be able to conveniently obtain the good or service.

On-demand service: With an 80% priority rating, this aspect is very important. It implies that customers want to have access to the good or service whenever they require it.

Performance: This factor has a 54% grade for moderate importance. It implies that while people want the product or service to function smoothly, this is not the most crucial aspect.

User-friendliness: With an 88% satisfaction rating, this factor is highly regarded. It indicates that customers are generally happy with how simple the product or service is to use.

Customization: Rated at 46.2% important, this characteristic is less significant. It suggests that users are less interested in the ability to customize the good or service.

Integration: With a 33% relevance rating, this element ranks last in importance. It implies that customers don't give the product or service's system integration much thought.

Security: receives a 60% moderate satisfaction rating. It denotes a certain level of user satisfaction with the security measures implemented for the good or service.

Q4. Why don't you use cloud computing services in your organization?

The long-term cost is higher	15.8%
You are locked into the subscription model	10.5%
Cloud-based services are hacker targets	5.3%
Extra vendors to deal with	5.3%
You can't control reliability	5.3%
others	57.9%

Companies may be concerned about the long-term cost of using cloud services due to factors such as subscription fees, data transfer costs, or the need to pay for additional services. They may also be locked into a subscription model, have extra vendors to deal with, or can't control reliability. Additionally, a majority of respondents cited other reasons for not using cloud computing services, such as data sovereignty, compliance with regulations, performance, or lack of expertise in working with cloud infrastructure

*Q5. Which cloud computing service do you use in your organization?*

Word Processing	30%
Microsoft Azure	66%
Data storage	72%
Virtual machines and infrastructure	54%
Extension of application through cloud APIs	20%
Extension of computer resources	35%
Software development	26%
EC2	54%

Which cloud computing service do you use in your organization?
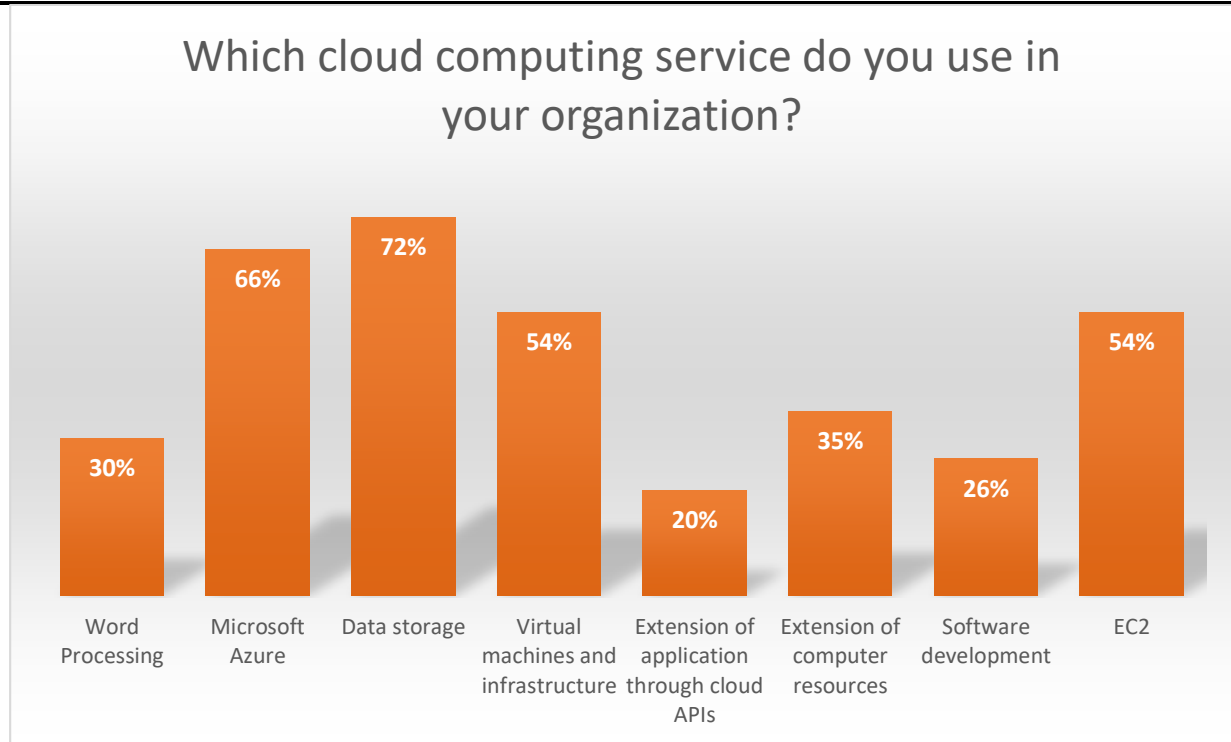
Microsoft Azure is the most heavily used platform for cloud computing, with 66% of the workload running on it. Data storage and virtual machines/infrastructure are also important components. Word processing is less important.

*Q6. What are the benefits that cloud computing offer to your organization?*

Cost Efficiency	81%
Scalability and flexibility	67%
Sustainability	10%
Maintenance by the cloud provider	48%
Security	17%
Improved service delivery	23%
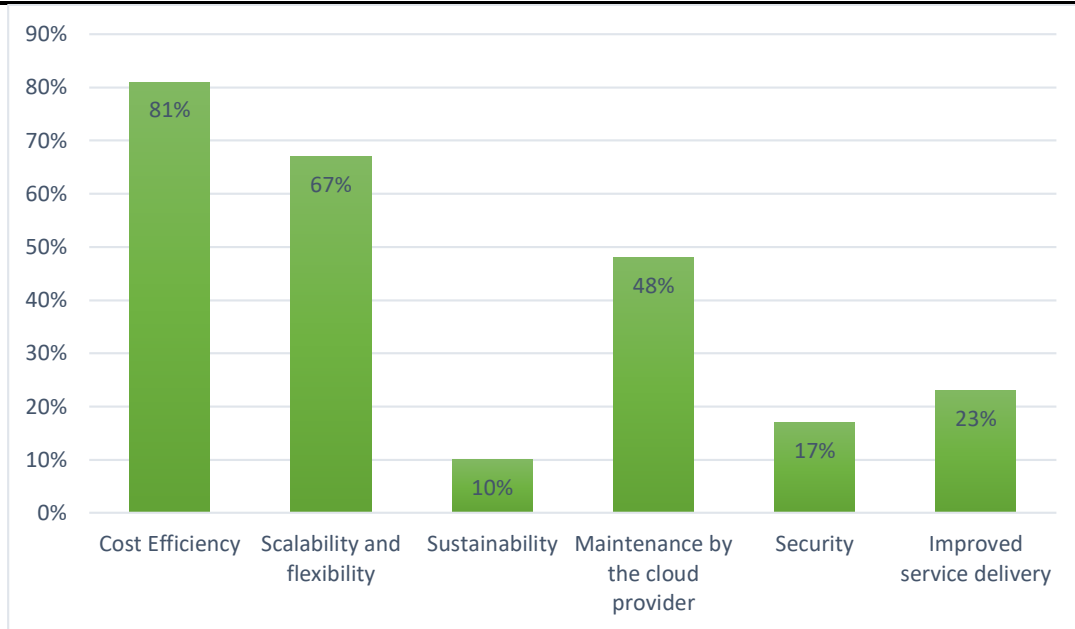
Cloud computing offers various advantages to businesses, the most notable of which is cost efficiency and scalability/flexibility. Cloud computing also enables enterprises to benefit from cloud provider maintenance, improved service delivery, and enhanced security. While most firms do not prioritize sustainability, cloud computing can help by lowering energy use and carbon emissions.

*Q7. Which cloud services do you aspire to use in your organization?*

Word Processing	91%
Microsoft Azure	66%
Data storage	68%
Virtual machines and infrastructure	33%
Extension of application through cloud APIs	22%
Extension of computer resources	22%
Software development	44%
EC2	46%
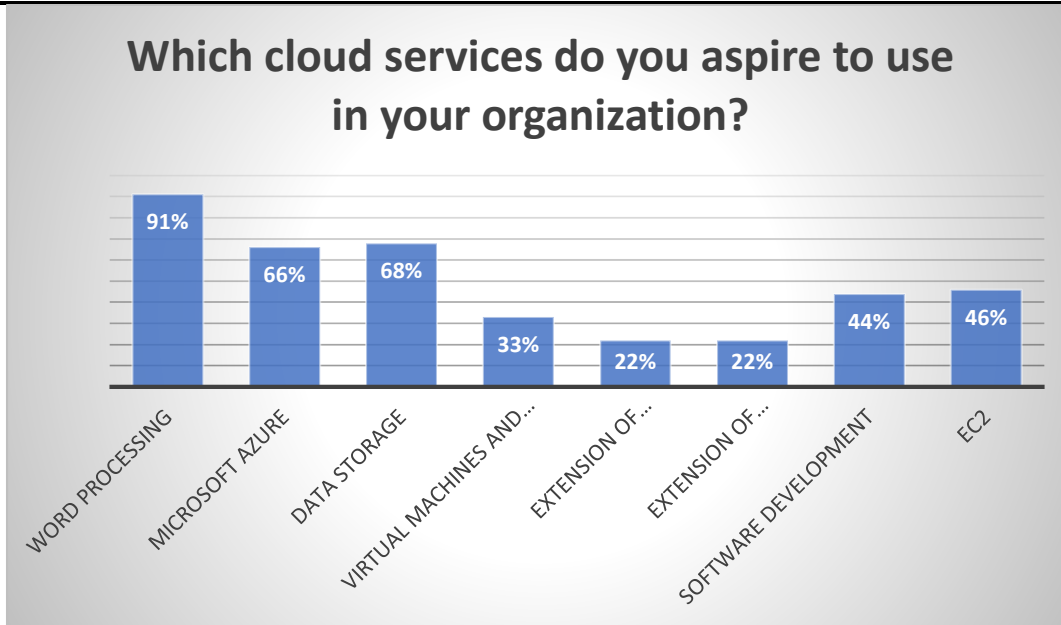
With a high level of confidence (91% and 68%, respectively), it appears that the firm is particularly interested in employing cloud services for word processing and data storage. Microsoft Azure is also a popular choice for cloud services (66%), followed by Amazon's EC2 (46%). The organization appears to be less interested in virtual machines and infrastructure, as well as expanding applications using cloud APIs and computing resources (all below 33%). It's possible that they don't know how to use these services for analysis and interpretation. Generally, while picking cloud services, organizations must analyze their specific objectives and goals, as well as ensure they have the appropriate skills and resources to adopt and maintain them.

Q8. Which of these abilities and competencies are essential for successful cloud computing implementation in your organization?

Financial skills	3.24
Technical skills	3.58
Business needs skills	3.43
Project management skills	4.00
Contract and Vendor negotiation	3.29
Understanding of security protocols	2.86
Data integration skills	2.86
Mobile app development skills	2.21
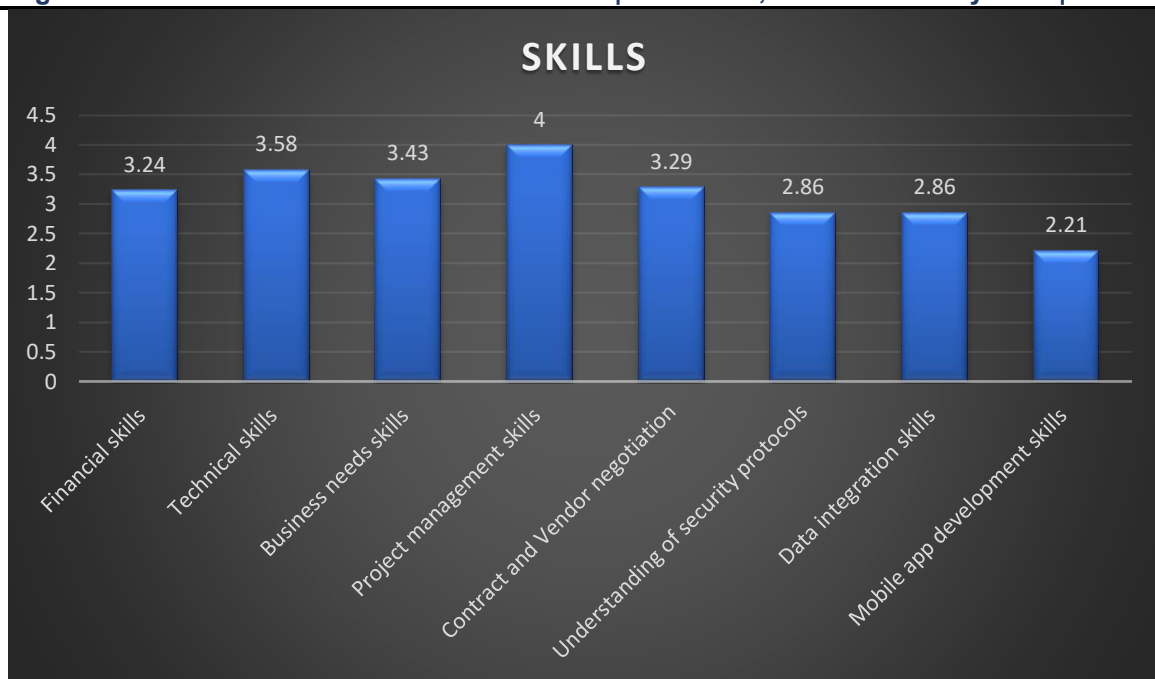
For a company to successfully integrate cloud computing, a combination of project management skills, technical skills, business needs skills, financial abilities, and contract and vendor negotiating skills is required. To guarantee that their cloud computing implementation is effective and secure, organizations should also focus on areas that require improvement, such as security procedures and data integration skills.

VI.   CONCLUSION AND CHALLENGES

Cloud computing has emerged as a game changer for Indian MSMEs, providing cost-effective, flexible, and secure solutions to improve business operations. While implementing cloud technology presents some challenges, the benefits far outweigh the risks. MSMEs in India can use cloud computing to gain a competitive advantage in the market as cloud technology evolves.

Notwithstanding the advantages of cloud computing, MSMEs in India encounter significant difficulties in implementing the technology. These difficulties include worries about data security, a lack of knowledge about cloud computing, and limited IT infrastructure.

Cloud technology adoption by MSMEs in India has increased significantly in recent years. According to Zinnov, the Indian cloud services market is expected to reach $7.1 billion by 2023.

Cloud computing is a cost-effective solution for MSMEs because it eliminates the need for upfront investments in hardware and software infrastructure. Cloud computing allows MSMEs to access data and applications from anywhere, anytime, improving productivity and security.

VII.   RECOMMENDATION

After thorough research regarding the study of cloud computing in MSMEs, the recommendation needed would be evaluating the company's demands and choosing the cloud services that are most appropriate for your operation. Recognize the objectives, what one hopes to accomplish using cloud computing, and how it might help the company. choosing the best cloud service provider, thus, picking the one that best suits one's

company's demands, finances, and specifications. Take into account elements like cost, scalability, security, and reliability. Using the cloud means storing your applications and data on someone else's infrastructure. Therefore, it is crucial to comprehend the security risks involved and implement the necessary safeguards to protect your data. Make sure the workforce is knowledgeable about using cloud services and is aware of the effects cloud computing will have on your company. This will improve productivity, streamline company procedures, and maximize cloud computing. The use of cloud computing does not eliminate the requirement for backups. Make sure you always have a backup of your data in case of an emergency or loss of data. By combining automation, optimization tools, and cloud cost management services, one can reduce costs and maximize their use of the cloud. Overall, MSMEs can gain a lot from cloud computing, including enhanced productivity, scalability, and cost savings. To fully utilize the cloud, you must evaluate your company's needs, pick the best provider, and implement the appropriate security measures.

VIII.   ACKNOWLEDGEMENT

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