



Research Article

Cloud Computing in Banking Flexibility and Scalability for Financial Institute

Md. Mehedi Hasan^{1,*}, Md. Rakib Mia²

¹Department of Electronics and Communications Engineering, East West University, Jahurul Islam Avenue Jahurul Islam City, Aftabnagar, Dhaka-1212, Bangladesh.

²School of Business, Ahsanullah University of Science and Technology, 141 & 142, Love Road, Tejgaon, Dhaka, 1208, Bangladesh

*Corresponding Author: mehedihasan281295@gmail.com

ARTICLE INFO

Article history:

01 Jul 2024 (Received)

08 Aug 2024 (Accepted)

15 Aug 2024 (Published Online)

Keywords:

Cloud platforms, Cloud computing services, Banking Industry, Financial institutions, Cybersecurity threats.

ABSTRACT

Cloud computing is one of the most significant technological advancements of the present-day financial technology solutions which provide answers to different spheres, including banking. This technology has the advantage of bringing about change and growth in the kind of services offered coupled with flexibility and scalability to financial institutions all at a fairly cheap cost. Thus, this paper identifies and discusses the factors that may impact the uptake and utilization of cloud computing innovations within the banking industry for the enhancement of these innovations. Using self-completed questionnaires administered to 2358 banking professionals including managers, customers, and senior executives, this study assesses their perception of cloud adoption in the financial sector. Using the analysis in the article, we can uncover opportunities, as well as threats to the adoption of cloud technologies by banks. To achieve a more coherent prescription for Cloud adoption, this paper puts forward a five-facet framework of the COTED matrix. It is demonstrated that all the discussed factors greatly impact the adoption of cloud computing in the Banking sector. These findings will help CSPs gain more insights about which factors are most important for enhancing cloud integration with an emphasis on promoting and delivering services.

DOI: <https://doi.org/10.103/xxx> @ 2024 Transactions on Banking, Finance, and Leadership Informatics (TBFLI), C5K Research Publication

1. Introduction

The banking industry is currently going through profound changes which imply that control is moving toward the customers rather than towards the banks. Many current business models are to a large extent based on customer choices. These social and household changes, together with the ability to adopt technology are leading to changes in the way banks are being operated. Banks have to transform their business models, structures, and IT platforms to survive in this environment that is dominated by customers' value. This change makes it possible for banks to provide reliable services from one branch to the other and geographical location and at the same harmonize huge amounts of data and analysis from customers (Awadallah, 2016).

This means that the banks must possess an outward orientation where operations are observed from the eyes of the consumer to achieve changes within the banking system. The changes that are taking place in the industry have shifted dramatically and this calls for better ways to increase profitability and revenues (IBM, 2013). Cloud computing provides secure deployment solutions that can help banks deliver better customer

experiences, improve collaboration, and increase the speed of delivery while achieving greater IT effectiveness. The use of cloud computing has been in demand in various industries and sectors and is also being noticed in the banking industry (Foster et al., 2008; Lee et al., 2014).

The use of cloud computing brings new markets and services, therefore making it possible for banks to develop new strategies in differentiating themselves from their rivals, and, more importantly, in transforming how customers experience their products and services. Implementing cloud technology makes banks more adaptable to financial fluctuations, increasing the interconnection of the global economy, and ever more proficient consumers. They can improve customer segmentation which can be further used to create a set of centralized services matching customers' needs. Also, the issue of channel investments that would allow differentiation based on superior customer service is applicable here as well (Patani et al., 2014).

The demands and challenges of the modern business environment force organizations, therefore banks, to rapidly implement novelty into their operational strategies (Huang et

*Corresponding author: mehedihasan281295@gmail.com (Md. Mehedi Hasan)

All rights are reserved @ 2024 <https://www.c5k.com>, <https://doi.org/10.103/xxx>

Cite: Md. Mehedi Hasan, Md. Rakib Mia (2024). Cloud Computing in Banking Flexibility and Scalability for Financial Institute.

Transactions on Banking, Finance, and Leadership Informatics, 1(1), pp. 17-24.

al., 2011). Consequently, cloud computing in banking aims to benefit two consumer categories (A. J. I. M. O. Jaworski, 2009). The first category here includes; This one, I think comes with the growing use of cloud services in the running of these organizations' frameworks. The second category consists of those customers who perform their daily financial transactions with the help of cloud applications (Huang et al., 2011; A. J. I. M. O. Jaworski, 2009). Cloud capability helps the banks to generate the necessary exposures that could support working in the changing environment, and meeting the new business needs (Patani et al., 2014). Furthermore, cloud computing solutions offer secure models of deployment that can help the banks increase their value proposition and which can help foster collaborations, fasten accessing the markets, and improve the IT environments. This means the employees can dedicate their energies towards the achievement of the vision and mission of the bank (D. Benton, 2010; IBM, 2013).

Benton says (D. Benton, 2010) that cloud applications have two main advantages for bank users as follows. First, they offer an enormous chance for customers to significantly improve their communications with banks (D. a. N. Benton, W., 2010). Second, applications such as service-based applications, especially SaaS, make it easier for customers to do their daily financial transactions with no extra cost borne by them (Huang et al., 2011); unlike client-server technologies which come with considerable cost, time, and resource implications. Regarding cloud-based solutions, the customers are also released from the obligation to install the software locally (Marston et al., 2011).

There is thus the need to establish more information on the factors that may lead to the use of cloud computing among banking organizations (Lundberg & Åkesson, 2015). Thus, although the usage of cloud-based applications in principle can potentially provide a wide spectrum of opportunities to bank customers (Huang et al., 2011), in practical reality, the majority of bank customers do not actively adopt these technologies, sometimes preferring the traditional client-server solutions delivered by the banks (D. Benton, 2010). Catteddu and Hogben (Catteddu, 2010) note that the two major challenges that were holding back SaaS services include issues with data privacy and security. Banks, which are highly sensitive institutions that are also very careful and prone to risks (Jain et al., 2010), find themselves struggling to move their clients to the use of cloud services due to such issues (Wu et al., 2011). This pattern resembles the early days of Internet banking most of the clients perceived the Internet as an insecure environment for financial operations and avoided it (Yousafzai & Yani-de-Soriano, 2012).

Although there were several disadvantages of online banking, the numerous advantages finally persuaded the customers to use it and make it more popular (Kesharwani & Singh Bisht, 2012). Likewise, cloud-based banking applications are still emerging and it will be another 10 to 15 years before customers can be fully convinced to use these applications (D. a. N. Benton, W., 2010). There is little research done on the decision-making process of cloud applications in banking and there is no clear framework for customers to follow in the adoption of cloud-based applications (Low et al., 2011). Most of the previous studies have concentrated on banks while paying less

attention to customers as the consumers of cloud services in this field (Huang et al., 2011; A. Jaworski, 2009). Hence, the attitudes and perceptions of customers towards cloud applications should be of interest to banks to enable them to understand their perception of adoption.

Considering that banks rely on IT and are constantly in the process of its transformation, it is rather paradoxical that the banks themselves do not fully adapt to cloud computing at the rate the industry demands. It is against this backdrop that this paper aims to establish the factors that make the banking sector reluctant to adopt cloud computing. Thus, the following research question becomes critical: Thus, the following research question becomes critical:

Which factors exist in the banking industry that affect the use of cloud solutions and how does it affect the implementation of cloud solutions?

The structure of this paper is as follows: Section II gives the background and related work. In section III, the author proposes the framework for cloud adoption in the banking sector. Section IV presents the research model and hypotheses about cloud adoption while Section V presents the results The last Section VI presents the conclusion and future research direction concerning cloud adoption in the banking industry.

2. Literature review

Cloud computing has in recent years attracted a lot of attention from authors, business executives, and IT experts who have all defined it according to their understanding and its uses (Neto, 2011). Cloud computing is a new technology that can minimize the IT costs and make the information available anywhere and anytime. It also provides the real-time scalability of resources, data, and information over the internet. Moreover, they introduced a usage-based model, which is based on Service Level Agreements (SLAs), where the users can dynamically adapt and make changes to the service requests as well as the time when they use the selected services paying only for the time of their usage (Xiong & Perros, 2009). This technology decentralizes computation from local to distributed and virtual-based resources and transforms the way they are used (Sun et al., 2011).

1.1. Cloud computing

The term, "cloud computing" only came into shape in late 2007 with the courtesy of IBM and Google in collaboration (A Vouk & technology, 2008). NIST on cloud computing describes it as "a type of computing where the shared pool of configurable computing resources which are the networks, servers, storage, applications and other service is provided to you through a convenient and on-demand provisioning of the network without much intervention from the service provider" (Mell, 2011). The key service attributes include online, self-service, broad network access, resource pooling, fungibility with definite elasticity as well as metered use which are responsive to business requirements (Mell, 2011). Buyya et al (Buyya et al., 2009). describe cloud computing as "a parallel and distributed computing system composed of interconnected and virtualized computers, dynamically provisioned and unified as one or more

computing resources, based on service-level agreements (SLAs) established between providers and consumers. " Despite the variety of definitions, cloud computing consistently exhibits several core features: Basically, cloud computing has four characteristics, namely: (1) service self-provisioning, (2) resource deceptiveness that posits a situation where or resources are almost inexhaustible, (3) billing based on usage and without fixed commitments, and (4) resource virtualization or hiding (Avram, 2014).

1.2. Cloud computing in the banking sector

Taking this into consideration, cloud computing can be identified as one of the IT developments, which has increasingly become popular among banks for multiple requirements. Thus, cloud solutions help banks build a more innovative and flexible environment, which quickly reacts to the shifts in business requirements. This also works out to be cheap and efficient for financial institutions as they are only charged according to the services and functions that they employ (Patani et al., 2014).

While many large banks are optimistic about adopting cloud technology, others remain cautious, waiting for security and regulatory challenges to be addressed before fully committing. A 2010 survey conducted by Bank Systems Technology and InformationWeek Analytics on customer interest in 186 banking technologies revealed that the majority (73%) of respondents were drawn to cloud services for their ability to rapidly meet customer demands and provide scalable solutions. Despite this, banks are expected to lead the way in cloud adoption and champion Software as a Service (SaaS) solutions. Given the tight monetary constraints, a mature financial software market, and ever-evolving regulations, banks must pursue innovative solutions to meet business needs in today's complex server environments (Apostu et al., 2012).

Still, there are a number of issues associated with its application in the banking sector and connected with cloud technologies. The most important of them are security, privacy, location of data, integrity, confidentiality, availability, and, most of all, users' trust (Rani & Gangal, 2012).

Security, trust, and privacy remain key issues for organizations that embark on the use of cloud computing (Li & Chang, 2016). All these elements are very central in the existing formation of cloud computing and banking services as noted by Bose et al (Bose et al., 2013). In some extent, cloud security seems to mimic the online banking service security scenario. Both call for the utilization of such measures as firewalls, intrusion detection and prevention systems, anti-virus programs, identity management, security rights, and encryption to safeguard business information in different environments. Kramer, people's trust depends on the level of trust that they are willing to take a certain level of risk that one individual will act in a certain way or else have certain intent towards them, and; Trust is accepting vulnerability based on positive expectations of another's behavior (Rousseau et al., 1998). Trust in a cloud also relies on the privacy security measures adopted by the chosen deployment model in the cloud. However, trust is built when cloud service providers conform to secure and privacy standard measures which enhance the customers' confidence to embrace

these services (Arpaci, 2016). The present work aims to establish the extent to which perceived security and perceived privacy influence trust in cloud storage and to what extent this influence influences cloud users' behavioral intentions towards using cloud computing.

Since the majority of cloud services are executed on virtual machines, service providers must focus on securing a comprehensive virtual environment and maintaining multiple layers of protection to enhance customer trust in cloud computing. Key security and trust concerns include access control, confidentiality, integrity, reliability, availability, recoverability, accountability, and long-term viability. Addressing these areas is crucial for building a secure cloud infrastructure that fosters greater confidence among users (Bose et al., 2013).

Clients have to rely on the cloud providers as they rely on banks with their funds. Similarly cloud providers need to build their credibility and assure the customers about their dependability. According to the author, for cloud computing to become mainstream customers today must have as much confidence in storing their information in the cloud as they do in storing their money in a bank today.

The bank is safe and thus assures/commitment in any of its business transactions and dealings. The depositing, accessing, transfer and withdrawal of the money are also convenient as needed by the users. However, users are assured that in case the bank experiences the threats it will return their monies. Consequently, the amount of faith placed in the cloud is considerably lower than with local servers because the cloud has not sufficiently offered users the necessary safety and guarantees. For example, with the help of the cloud, some of the complexities of a bank's operations can be concealed from end consumers; this might help attract more customers. Since the complexity is not apparent to the customer, more product and/or service enhancement by the banks can take place without correlating with a corresponding increase in end-user understanding essential in utilizing and/or managing the product or service. For instance, an upgrade and other activities such as maintenance work can be performed behind the scenes where the customer does not require his or her input (IBM, 2013).

Cloud users usually have no say as to where their data is stored and are often uncertain of the location causing considerable security issues and lack of trust. There, customers still bear the responsibility for protecting their own data even though service providers are hired to accomplish this objective (Rani & Gangal, 2012). In other words, to develop trust, cloud providers need to increase the level of clarity and enable users to have more authority over the data and processes (Bose et al., 2013).

One of the major issues affecting the adoption of clouds especially for banking applications is the security of users' data. Further importance should be accorded the question of commitment, which is the foundation for long-term customer relationships (Morgan, 1994; Venetis & Ghauri, 2000). Building up customer loyalty has thus emerged as one of the major strategic goals of managers to establish long-term,

structured, and symbiotic ties with the clients already in the business (Bauer et al., 2002).

1.3. Related works on cloud adoption

From the literature, it is clear that while a large number of research studies have investigated cloud computing adoption in various contexts, there is evidence that most of the efforts are directed at the adoption of cloud at the organizational level and on the technical use of cloud (Brohi et al., 2011). Indeed, as described in the literature by Khajeh-Hosseini et al. (Khajeh-Hosseini et al., 2010) many factors exist that can affect the diffusion of new technologies and include both the technology factors and the user factors and their attitudes.

Haider (Haider, 2014) emphasized the crucial role of customer adoption decisions in cloud computing. Consumers are key stakeholders in cloud solutions, as many popular services like Microsoft SkyDrive (hosting Office Web App) and Google Drive (formerly Google Docs) cater not only to organizations but also to individual users. This user base is a critical factor in the success and widespread adoption of these services. Therefore, it is essential to deepen the understanding of this group and identify the factors that influence their adoption decisions (Haider, 2014). As Park and Ryoo (Park & Ryoo, 2013) claimed, there are a limited number of studies that explored their adoption behavior when moving from previous IS services to cloud computing, thus, there is a knowledge gap in how people adopt cloud computing for personal use (Lin & Chen, 2012). Other similar empirical studies in this field have only examined a few factors that might influence the adoption decision at the individual level such as perceived usefulness of the technology, perceived ease of use, perceived security issues, and accessibility to software (Li & Chang, 2016). However, many other variables that can influence the rate of adoption among each segment have not been studied to the optimum. In addition, majority of the cloud adoption literature targeted security, privacy and cost this as the main determinants of cloud computing adoption. Both Benton and Negr (D. a. N. Benton, W., 2010) assert that other than the fact that cloud computing has a rapid deployment, it is relatively cheaper. For example, Accenture revealed that by moving most of the company's existing applications to cloud infrastructure, the IT companies could slash their hosting cost to about 50% per year. Of the notable features that Wu et al (Wu et al., 2011) highlighted they included the fact that with cloud computing services are provided on-demand at a lower cost, and are scalable to a greater extent. Rani and Gangal (Rani & Gangal, 2012) also explained that thanks to the enormous architecture of cloud computing it is possible to store and access data backups in one or multiple locations, which in turn results in data duplication and unauthorized data manipulation. This means that there are certain possibilities to lose valuable information which is why the issues of privacy and security are so significant in cloud computing applications especially the usage of them in the field of banking. Security as being the most difficult aspect when it comes to the adoption of cloud computing to their organizations Pearson (Pearson, 2013). This security challenge has been highlighted by most CIOs in large organizations as the main reason why most users have not embraced cloud computing hence depriving them of the chances offered by cloud

computing. Additionally, Misra and Mondal (Misra et al., 2011) pointed out that another self-evident problem of cloud computing that stops it from being a phenomenal success is the issue of security of data governance in cloud platforms. According to Marston et al. (Marston et al., 2011), cloud computing has brought about new privacy challenges; especially when the government makes a request for access to such data, it complicates, the privacy policies that those who receive such information must adhere to (Pearson, 2013).

From the discussion in the review above, this study reveals three key factors for the uptake of cloud computing. This also came out clearly in the literature since security emerged as one of the critical success factors for the adoption of cloud services (Lian, 2015). The security features of the cloud have a major impact on the way users select products and services in addition to how they are charged for the same. All these advantages and opportunities of cloud computing are revealed in a larger scale especially in today's huge competitive market environment, making the need for higher levels of security from cloud providers all the more important (Marston et al., 2011). Each of the above studies seeks to look at the most crucial factors that determine the choice of cloud computing technology. Over eight studies have identified four key factors: privacy, cost, security, and trust in the order of their significance. But, essential is the examination of the available body of work on cloud computing adoption in order to comprehend the cloud application deployment and discover the core factors and theories employed in these works.

1.4. Challenges of Cloud Adoption for the Banking Industry

Banking service is delivered in a very professional setting under extreme legal scrutiny due to its competitiveness and legal framework which dictates most of the service provision factors. These factors affect the adoption of cloud computing as the services offered by cloud computing seek to meet the enterprise's operational, technological, and functional requirements to boost performance (Brohi et al., 2011).

This means that adopting cloud services alone can never be the magic bullet for success. In order for an organization to have a positive outcome on cloud computing it has to create a competitive edge. Therefore, there are numerous success and failure factors with regard to cloud adoption and other significant issues that need to be tackled before such choices are made (Almubarak & Applications, 2017). The major challenges that have contributed to the slow rating of the cloud computing infrastructure in the banking industry are shown in Fig. 1 below (Bitta, 2015).

- Regulatory authorities may not approve the migration of financial services institutions' operations to the cloud.
- Data transmission and storage may not be adequately secured in cloud computing environments.
- Organizations may be unable to identify the location of their data storage within the cloud.

- Cloud service providers may lack transparency or control over operational, security, procedural, and privacy aspects for users.
- The process of migrating to the cloud may be overly complex.
- Issues related to termination and exit from cloud services can be problematic.



Fig. 1. Challenges of cloud adoption for the banking industry

1.5. Proposed Framework for Cloud Adoption In Banking Industry

The major concerns that are pursued in cloud computing adoption and potential solutions are discussed with the help of a framework based on Technological, Organizational, and Environmental (TOE) construction (Li et al., 2015). Despite the fact that M. Fleischer introduced the TOE framework (Fu & Chang, 2016), it was initially designed and particularly applied to analyze the business organizations' adoption of information systems. As for the IT adoption of the technology, the TOE framework has theoretical support (Singh et al., 2017).

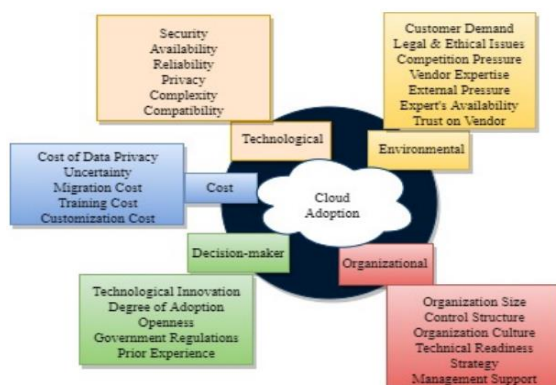


Fig. 2. Proposed Framework for Cloud Adoption in Banking Industry

As a result, the current research requires a theoretical model that will help explain cloud adoption in the banking sector to be adjusted. Our proposed framework includes five

components: These include with Cost, Organizational, Technological and Environmental factors as well as Decision-maker (COTED). Fig. 2 of this paper presents this framework, which synthesizes and extends particular factors considered appropriate for cloud computing implementation within the context of the banking industry.

3. Research Methodology

The main research question used in this study is to analyze the role played by the COTED entities in the adaptation of cloud computing technology and services in the banking sector. The subject matter of the study is designed to test the readiness of this sector in the adoption of cloud computing. This study will also extend the analyses of how changes in the dependent variable 'Likelihood of cloud computing adoption' are affected by the COTED factors. The research factors used in this work are presented in Table 1 below.

Based on the research objectives and the proposed framework, the following hypotheses are established and tested: Based on the research objectives and the proposed framework, the following hypotheses are established and tested:

- H1: Cost factor is hypothesized as the independent variable that has a direct relationship with the probability of cloud computing adoption, so the first hypothesis will be:
 - H2: The Organizational factor positively and significantly influences the level of cloud adoption probability.
 - H3: Technological factors play a role in the probability of adoption of cloud computing.
 - H4: The Environmental factor is directly related to the probability of adopting cloud computing.
 - H5: This may be explained by the fact that the Decision-maker factor has a direct influence on the probability of cloud computing adoption as indicated in the following hypothesis.
- The study instrument to measure the research hypotheses comprised of the following study variables operationalized on the Likert type scale with the responses stem: Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly agree = 5. The major beneficiaries of this research shall be the employees, customers, and decision-makers in the banks. Possible informants include branch and sub-branches, zonal and circle offices, IT divisions, and head offices of the various banks. Usability questionnaires were administered during such overtures, opinions having been solicited from members of staff of the banks, as well as customers as they were around. The sample included 208 branches ranging from rural areas to urban ones including zonal and head offices with 3,254 survey participants. Quantitative data collected were analyzed with the statistical analysis tool, IBM SPSS.

4. Results And Discussions

Moreover, for the validity test, Convergent validity was evaluated by Factor loadings, Cronbach Alpha coefficients, Composite reliability, and Average variance inflation factor (AVIF). Composite reflects the degree to which the measures of a construct is an accurate assessment of the said construct while the AVIF depicts the proportion of variance in factors due to the constructs. As for convergent validity, both factor loadings, as well as AVIF values, should be more than 0.5,

Therefore the Cronbach alpha must be higher than 0.6 and the estimate of composite reliability should be higher than 0.7. Table 2 shows the result for convergent validity of all the factors for this study to indicate that all the measures in this study have achieved the required validity.

2.	Organizational	6
3.	Technological	6
4.	Environmental	7
5.	Decision-maker	4

Table 1. Research factors

Serial No.	Variables	No of Factors
1.	Cost	5

Table 2. Convergent validity of research factors

SI. No.	Variables	Avg. Loading	Cronbach's Alpha	Composite Reliability	Avg Variance Inflation Factor
1.	Cost	0.835	0.789	0.868	0.821
2.	Organizational	0.855	0.823	0.892	0.845
3.	Technological	0.892	0.905	0.905	0.786
4.	Environmental	0.903	0.827	0.862	0.830
5.	Decision-maker	0.901	0.959	0.956	0.772

In hypothesis testing of this research, the structural model applied t-tests to analyze the results. The Multiple Correlation coefficient R is approximately equal to 0.512, this suggested moderate association while the R² value was 0.262. The F-value of 22.986 is statistically significant which means that the regression model built has a rather good capacity to predict the dependent variable. Based on the seven hypotheses formulated, the findings of the respective likelihood of cloud computing adoption are presented in Table 3 below.

For other constant predictors, regression analysis provides β (beta) coefficient meaning the relative contribution of a given predictor to the model. The coefficients table indicates that all the β values are positive and hence support all the hypotheses postulated. The β value depicts the extent of the impact of each variable on cloud adoption. The dependent variable is affected

to a higher degree by independent variables in which β has a higher value. From the β values, technological factors have a higher influence the cloud adoption in the banking industry than environmental factors.

The purpose of this study was to evaluate the potential and challenges of cloud computing in the banking industry. Analysis of the results revealed the importance of the five factors mentioned in the framework's formulation in decision-making on the use of cloud computing in the banking industry. Out of all these factors technological factors have the greatest impact on the adoption of cloud solutions. After analyzing these factors, cloud service providers need to give priority to technological factors in order to enable the adoption and integration of technologies in the banking industry.

Table 3. Convergent validity of research factor

Hypothesis	β	t	Decision
H1: Cost	0.139	1.828	Supported
H2: Organizational	0.270	2.920	Supported
H3: Technological	0.424	4.596	Supported
H4: Environmental	0.406	4.198	Supported
H5: Decision-maker	0.119	1.454	Supported

5. Conclusions And Future Directives

Cloud computing is nothing but a change in the banking industry. Companies in many fields such as banking are nowadays adopting cloud computing. In fact, when cloud computing is integrated with mobility and analytics technology, the transformation is very much significant. In this paper we have identified trends,

issues and opportunities in Cloud computing, as revealed through the case evidence, and how improved cloud operations can lead to an increase of business performance. Further, we outlined the forces that compel banking organizations to embrace clouds and presented the COTED framework to adoption. Our evaluation studies suggest that the COTED factors are

determinants of cloud adoption in the banking sector with technology factors being dominant.

It is claimed that cloud computing is going to transform the banking sector by making it one of the key pillars of its transition to the digital environment. In the future, the banking sector is poised to benefit from cloud computing in several ways: In the future, the banking sector is poised to benefit from cloud computing in several ways:

- Redefining Customer Relationships: Through cloud computing, the banks will be able to reinvent and improve the ways through which they engage customers.
- Progressing Cloud Technologies: It will become advanced in more levels of the stack and hence provide even higher sophistication.
- Leading Innovation in Emerging Markets: Top emerging markets will be the center for cloud-based innovations according to the banks.
- Offering Collaborative Services: Banks have the opportunity to use cooperative systems, that help to provide cloud-based shared services to their customers for enhanced satisfaction.
- Competing with Non-Banking Providers: Banks will be able to reduce competitive threats occasioned by non-banking cloud-based services thanks to cloud computing.

References

- A Vouk, M. J. J. o. c., & technology, i. (2008). Cloud computing—issues, research and implementations. *16*(4), 235-246.
- Almubarak, S. S. J. I. J. o. A. C. S., & Applications. (2017). Factors influencing the adoption of cloud computing by Saudi university hospitals. *8*(1).
- Apostu, A., Rednic, E., Puican, F. J. P. e., & finance. (2012). Modeling cloud architecture in banking systems. *3*, 543-548.
- Arpaci, I. J. C. i. H. B. (2016). Understanding and predicting students' intention to use mobile cloud storage services. *58*, 150-157.
- Avram, M.-G. J. P. T. (2014). Advantages and challenges of adopting cloud computing from an enterprise perspective. *12*, 529-534.
- Awadallah, N. J. I. J. o. C. S. I. (2016). Usage of cloud computing in banking system. *13*(1), 49.
- Bauer, H. H., Grether, M., & Leach, M. J. I. M. M. (2002). Building customer relations over the Internet. *31*(2), 155-163.
- Benton, D. (2010). *How cloud computing will influence banking strategies in the future*. Retrieved 07-09-2024 from <http://www.accenture.com/banking>
- Benton, D. a. N., W. (2010). *Banking on the Cloud* [Technical report]. http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture_Banking_Cloud_Computing.pdf
- Bitta, M. N. (2015). *A Framework to guide companies on adopting cloud computing technologies*
- Bose, R., Luo, X. R., Liu, Y. J. P.-S., & Sciences, B. (2013). The roles of security and trust: Comparing cloud computing and banking. *73*, 30-34.
- Brohi, S. N., Bamiah, M. A. J. I. J. o. A. E. S., & Technologies. (2011). Challenges and benefits for adopting the paradigm of cloud computing. *8*(2), 286-290.
- Buyya, R., Yeo, C. S., Venugopal, S., Broberg, J., & Brandic, I. J. F. G. c. s. (2009). Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility. *25*(6), 599-616.
- Catteddu, D. (2010). Cloud Computing: benefits, risks and recommendations for information security. Web Application Security: Iberic Web Application Security Conference, IBWAS 2009, Madrid, Spain, December 10-11, 2009. Revised Selected Papers,
- Foster, I., Zhao, Y., Raicu, I., & Lu, S. (2008). Cloud computing and grid computing 360-degree compared. 2008 grid computing environments workshop,
- Fu, H.-P., & Chang, T.-S. J. I. D. (2016). An analysis of the factors affecting the adoption of cloud consumer relationship management in the machinery industry in Taiwan. *32*(5), 1741-1756.
- Haider, A. (2014). *Business technologies in contemporary organizations: adoption, assimilation, and institutionalization: adoption, assimilation, and institutionalization*. IGI Global.
- Huang, Z. Q., Zhang, J. L., Zhou, H. Z. J. A. M., & Materials. (2011). Preliminary discussion on the applications of cloud computing in the bank system. *50*, 273-277.
- IBM. (2013). *Cloud computing for banking*. http://www-935.ibm.com/services/multimedia/Cloud_Computing_for_Banking_Janvier_2013.pdf
- Jain, L., Bhardwaj, S. J. I. J. o. E., & Technology, I. (2010). Enterprise cloud computing: key considerations for adoption. *2*(2), 113-117.
- Jaworski, A. (2009). *Survey: banks slow to adopt cloud computing*. http://www.informationmanagement.com/news/cloud_computing_financial_services_bank10015811-1.html
- Jaworski, A. J. I. M. O. (2009). Survey: banks slow to adopt cloud computing.
- Kesharwani, A., & Singh Bisht, S. J. I. j. o. b. m. (2012). The impact of trust and perceived risk on internet banking adoption in India: An extension of technology acceptance model. *30*(4), 303-322.
- Khajeh-Hosseini, A., Greenwood, D., & Sommerville, I. (2010). Cloud migration: A case study of

- migrating an enterprise it system to iaas. 2010 IEEE 3rd International Conference on cloud computing,
- Lee, J. U., Seo, K. J., & Kim, H.-W. J. A. p. j. o. i. s. (2014). An exploratory study on the cloud computing services: issues and suggestion for the success. *24*(4), 473-491.
- Li, M., Zhao, D., Yu, Y. J. A. P. J. o. M., & Logistics. (2015). TOE drivers for cloud transformation: direct or trust-mediated? , *27*(2), 226-248.
- Li, Y., & Chang, K.-C. (2016). Antecedents to individual adoption of cloud computing. In *Web-Based Services: Concepts, Methodologies, Tools, and Applications* (pp. 1088-1110). IGI Global.
- Lian, J.-W. J. I. J. o. I. M. (2015). Critical factors for cloud based e-invoice service adoption in Taiwan: An empirical study. *35*(1), 98-109.
- Lin, A., & Chen, N.-C. J. I. j. o. i. m. (2012). Cloud computing as an innovation: Percepation, attitude, and adoption. *32*(6), 533-540.
- Low, C., Chen, Y., Wu, M. J. I. m., & systems, d. (2011). Understanding the determinants of cloud computing adoption. *111*(7), 1006-1023.
- Lundberg, E., & Åkesson, C. (2015). Cloud Computing-Factors that affect an adoption of cloud computing in traditional Swedish banks. In.
- Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. J. D. s. s. (2011). Cloud computing—The business perspective. *51*(1), 176-189.
- Mell, P. J. N. S. P. (2011). The NIST Definition of Cloud Computing. 800-145.
- Misra, S. C., Mondal, A. J. M., & modelling, C. (2011). Identification of a company's suitability for the adoption of cloud computing and modelling its corresponding Return on Investment. *53*(3-4), 504-521.
- Morgan, R. J. J. o. M. (1994). The commitment-trust theory of relationship marketing.
- Neto, P. (2011). Demystifying cloud computing. Proceeding of doctoral symposium on informatics engineering,
- Park, S. C., & Ryoo, S. Y. J. C. i. H. B. (2013). An empirical investigation of end-users' switching toward cloud computing: A two factor theory perspective. *29*(1), 160-170.
- Patani, S., Kadam, S., Jain, P. V. J. I. J. o. A. R. i. C., & Engineering, C. (2014). Cloud computing in the banking sector: a survey. *3*(2), 5640-5643.
- Pearson, S. (2013). *Privacy, security and trust in cloud computing*. Springer.
- Rani, S., & Gangal, A. J. I. J. o. I. T. (2012). Security issues of banking adopting the application of cloud computing. *5*(2), 243-246.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. J. A. o. m. r. (1998). Not so different after all: A cross-discipline view of trust. *23*(3), 393-404.
- Singh, M., Gupta, P., & Srivastava, V. M. (2017). Key challenges in implementing cloud computing in Indian healthcare industry. 2017 pattern recognition association of South Africa and robotics and mechatronics (PRASA-RobMech),
- Sun, Y., White, J., Gray, J., & Gokhale, A. (2011). Model-driven automated error recovery in cloud computing. In *Model-Driven Domain Analysis and Software Development: Architectures and Functions* (pp. 136-155). IGI global.
- Venetis, K., & Ghauri, P. (2000). The importance of service quality on customer retention: an empirical study of business service relationships. Proceedings of the marketing in a global economy conference, Buenos Aires, June,
- Wu, W.-W., Lan, L. W., & Lee, Y.-T. J. I. J. o. I. M. (2011). Exploring decisive factors affecting an organization's SaaS adoption: A case study. *31*(6), 556-563.
- Xiong, K., & Perros, H. (2009). Service performance and analysis in cloud computing. 2009 Congress on Services-I,
- Yousafzai, S., & Yani-de-Soriano, M. J. I. j. o. b. m. (2012). Understanding customer-specific factors underpinning internet banking adoption. *30*(1), 60-81.