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ADAPTATION AND EFFECTS OF CLOUD COMPUTING ON FINANCIAL SERVICE SECTORS

TREO Paper

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Abstract

With the development of information and communication technology, cloud computing has become a key force in the digital transformation of the financial industry. Its flexibility, scalability, cost optimization, innovation and agility can allow financial institutions to remain flexible in the ever-changing financial environment competitiveness. The main purpose of this study is to understand the current status of cloud computing in the financial service sectors by using text mining with Technology-Organization-Environment perspective to analyze the related use cases from the top three cloud computing service providers. This study summarized five main categories including organizational innovation and collaboration, benefits of cloud computing, system development and information security, data analysis and data drive, and partnership. The findings not only demonstrate that cloud computing services can provide organizations with flexible and adaptable operational adjustments but also achieve data analysis and machine learning capabilities, and foster regional expansion and partnerships in financial technology collaborations.

Keywords: Financial Technology, Cloud Computing and Services, Text Mining, Technology-Organization-Environment Framework.

1 Introduction

In today's digital era, Information and Communication Technology (ICT) has become a vital driver of economic growth and efficiency in the banking industry. The rise of FinTech and the digital transformation of traditional financial institutions highlight the strong integration of finance and technology. Rapid technological advancements, including the adoption of cloud computing, are fundamentally reshaping the financial landscape. Governments worldwide recognize the importance of FinTech in shaping the future of finance. However, the innovation spurred by FinTech has also posed challenges to traditional banks, prompting them to adapt to disruptive changes. Cloud computing offers flexibility, scalability, and cost optimization, enabling quick responses to market demands. Recognizing the strategic importance of cloud computing, FinTech firms are embracing it to enhance organizational dynamics and competitiveness. As they transition operations to the cloud, they ensure resilience and adaptability in the dynamic financial landscape.

2 Methodology

This study counted the customer success stories of the top three cloud service (AWS, Azure, and GCP) providers, the five industries with the largest number accounted for 37.39% of the total, followed by Internet & Software (8.2%), Technology (7.8%), Financial Services (7.65%), Retail (7.1%), and Media & Entertainment (6.64%). In AWS, the three industries with the largest number accounted for 49.72% of the total AWS Customer Success Stories, followed by Internet & Software (18.39%), Financial Services (9.92%), and Media & Entertainment (8.78%); the top three industries with the largest number

of GCPs are Technology (28.02%), Financial Services (11.56%), and Retail (11.56%), occupying 63.87% of GCP Customer Stories as a whole; in Azure, the three industries with the largest number accounted for 44.55% of the total Azure Customer Stories, followed by Personal Services (11.18%), Manufacturing (10.51%), and Partner Professional Services (8.43%).

3 Data Collection and Analysis

This study utilized SAS Text Miner for the analysis of unstructured data. After the filtering process based on data types, text language, and industry types, a total of 77 text cases that meet the conditions of this study were collected. The text classification node employed the built-in Singular Value Decomposition (SVD) algorithm to generate a term-document frequency matrix for parsing the content of the text. The text was classified into several topics based on its content, and an article could be classified into multiple topics simultaneously. After the text mining analysis process, results were obtained for the topic threshold values, document threshold values, the number of terms, and the number of documents. The top 5 terms with the highest weights in each topic were identified. The term threshold value represented the minimum weight (absolute value) to support the classification of a term in each topic. The document threshold value represented the minimum weight to support the classification of a document in each topic. The number of terms and the number of documents represented the count of terms or documents in each topic. In the selection of the number of topics, this study tested with 5~25 topics, and the model's effectiveness was lowest at 5 topics. Therefore, based on the identification of the text data, 5 topics were ultimately chosen. The top 5 terms for each topic are as follows: Topic 1 – employee + colleague + communication + team + dynamics, Topic 2 - cc2 + compute + workload + instance + run, Topic3 device + teams + endpoint + employee + security, Topic 4 – data + power + ai + bi + analytics, Topic 5 – apis + api + api + gce + app + partner A total of 47 text cases were classified into 5 topics, with 17 cases predominantly from Asia (33.3%) and the next most from Europe (31.4%). Companies established for over 50 years had the highest percentage (54.9%), followed by those established for 11~50 years (37.3%). The establishment year of companies was predominantly before 2006, with 45 cases (88.2%), and 6 cases (11.8%) were established in 2006 or later. The employee count was highest in the 10,000+ range, followed by the 1,000-9,999 range, accounting for 47.1% and 35.3%, respectively Additionally, 30 text cases were left unclassified."

4 Research Findings and Implications

The research findings from text mining analysis reveal the demand for and application of cloud computing services in the banking-related industry through thematic clusters. Five major thematic types are identified based on word combinations within these clusters: Innovation and Collaboration in Organizations, Cloud Computing, System Development and Information Security, Data Analysis and Data-Driven, and Partnership. Text cases under the Innovation and Collaboration in Organizations theme primarily involve banks established before 2006, with a workforce of over 1000 employees opting for Microsoft Azure services. These cases emphasize team communication, seeking cloud solutions for cross-regional communication among organizational members. Cloud computing facilitates flexible operational adjustments, enabling open and dynamic communication, real-time information exchange, and effective decision-making; In the Cloud Computing theme, banks established before 2006 predominantly rely on Amazon Web Services, emphasizing terms like EC2, compute, workload, instance, and run. Cloud computing offers scalable capacity, reducing upfront hardware investment. Banks leverage cloud infrastructure to enhance app speed and customer experience, aligning with environmental friendliness and easy management; Text cases under System Development and Information Security primarily involve banks established before 2006, opting for Microsoft Azure services. These cases prioritize cross-regional communication and stability, necessitating cybersecurity layers and authentication mechanisms. Azure's integration with the .NET framework supports seamless integration with banking systems; The Data Analysis and Data-Driven theme primarily involves banks choosing services from Microsoft Azure and Google Cloud, focusing on data analysis and machine

learning. Integration of cross-departmental data enables quick market insights and predictive modeling for sales trends and customer behavior analysis; In the Partnership theme involves banks established pre-cloud services predominantly opt for Google Cloud, emphasizing financial technology partnerships and regional expansion. Cloud solutions facilitate reaching underserved areas and offering flexible services to meet consumer market demands and SME needs.

5 Conclusion

In this study, we can find out that the integration of cloud computing services, particularly within the banking industry, has emerged as a critical enabler of digital innovation and new business models. The rapid evolution of financial technology (FinTech) and the digital transformation of traditional financial institutions underscore the significance of cloud computing in reshaping the financial landscape. Governments worldwide recognize the pivotal role of FinTech in shaping the future of finance, although it also presents challenges to traditional banks, necessitating adaptation to disruptive changes. Through text mining analysis, this study identified thematic clusters that shed light on the demand for and application of cloud computing services in the banking-related industry. Key thematic types, including Innovation and Collaboration in Organizations, Cloud Computing, System Development and Information Security, Data Analysis and Data-Driven, and Partnership, elucidate the multifaceted impact of cloud technology across various facets of banking operations. Furthermore, the findings highlight how different banks leverage cloud computing services to enhance operational efficiency, facilitate cross-regional communication, bolster cybersecurity measures, enable data analysis and machine learning capabilities, and foster partnerships for regional expansion and financial technology collaborations. Overall, the adoption of cloud computing services within the banking industry represents a strategic imperative for organizations seeking to navigate the complexities of the digital age effectively. By embracing cloud technology, banks can enhance their agility, resilience, and competitiveness in an increasingly dynamic and competitive financial landscape.

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