Adoption of Emerging Technologies by Major Enterprise Data Storage Organizations - Factors, Strategies, and Benefits

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Abstract
Modern problems require modern solutions. The global Enterprise Data Storage organizations are constantly innovating, redefining, and re-engineering their strategies to sustain, survive, and succeed. The key to success lies in consistent performance. This study is aimed to understand the influencing factors to tackle the technological challenges leading to the adoption of emerging technologies to remain viable in the market for continuous customer success. The study is primarily focused on 5-6 organizations constantly featured as “Leaders” in Gartner Magic Quadrant for Primary Storage Arrays in 3-5 years. A conceptual framework will be constructed to establish and ascertain the relationship between the Technology Adoption Drivers (TAD), Technology Variables (TV), and Resultant Variables (RV) to indicate the impacts of strategic adoption of emerging technologies.

Keywords: Enterprise Data Storage, Adoption, Strategies, Emerging Technology, TAD

Introduction
The global enterprise data storage organizations are constantly innovating, redefining, and re-engineering their strategies to sustain, survive, and succeed. To understand the driving factors and strategies influencing the adoption of emerging technologies in enterprise data storage organizations to maximize the customer experience and business value. The primary focus is to identify the exogenous and endogenous factors that induce the adoption of new technologies through certain variables or a combination of variables and impact the consumer.

To illustrate, the term “Enterprise Data Storage” is usually used to define an advanced form of storage repository capable of handling, managing, storing, protecting, and sharing an enormous volume of business-critical data rapidly in a cost-effective way. In other words, enterprise data storage is a centralized repository for information, which commonly offers data management, protection, and sharing functions (Hanna, 2021).

The popularity of the data storage market in recent years has increased manifolds recent years due to the amount of information...
being generated by individuals through search engines, social networking interactions, emails, sharing of pictures and videos, usage of various applications, and by various organizations is growing astoundingly which require petabytes and terabytes of storage capacity (IndustryARC, 2021). Therefore, this explosion of data has now compelled the data storage industry to rethink and strategize to meet the ever-growing demand through “scale-out” which refers to capacity expansion across multiple physical resources (Speciale, 2021).

As a result of this, it is estimated that by 2026 the market for data storage will attain $4.2 billion due to the high rate of consumption and processing of data (IndustryARC, 2021), 20% of the physical storage for backup and recovery will be virtualized through the integration with cloud storage management applications by 2023 and around 50% of enterprises will shift to OPEX based storage consumption model as opposed to less than 10% today by 2025 (Rao, Cox, Unsworth, & Vogel, 2020).

**Objective**

The key objective of the study is to understand the influencing factors that regulate the leading global enterprise data storage organizations to select and acquire emerging technologies to cover their competitive landscape, capacity, and latest strategies like mergers, acquisitions, investments, and expansions of capacity.

In a quest to find the answers to the research questions and to assess the impact of the strategies adopted by the Enterprise Storage organizations through the acquisition of emerging technologies to develop industry-leading solution platforms or applications in-house or in collaboration with partners to sustain, remain relevant, and grow in the competitive market. The approach for the study is to understand the dynamics of the technology adoption process by the global Enterprise Storage organizations leveraging the existing literature, market research reports, trend analysis, and industry expert analysis. The research study will be subjected to empirical analysis in addition to the theoretical evidence for further analysis in the future.

**Scope**

To maintain the sanctity and relevance of the study, the scope of the study is limited to the top 5-6 companies constantly featured as “Leaders” in the Gartner magic quadrant for primary storage arrays in 3-5 years and identifying the primary drivers for the adoption of emerging technologies by the enterprise storage solutions to maintain consistent performance over the years as market leaders.
Gartner Magic Quadrant
The Gartner Magic Quadrant is a graphical representation to depict the competitive landscape of technology providers in a market categorized into four distinct groups viz.
- Leaders are positioned securely in the market to execute their vision and are well equipped for the future.
- Visionaries possess awareness about the market trend but are yet to execute the vision properly.
- Niche Players cater to a small market segment and do not aspire to out-compete or out-perform others.
- Challengers have shown remarkable performance and have the potential to gain a sizeable piece of the market share but still require a considerable understanding of the market trend (Gartner, n.d.).

Literature Review

| Authors          | Country  | Synopsis                                                                                                                                                                                                 |
|------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hu et al. (2020) | China    | The paper investigates the adoption potential of emerging mobile technologies in the educational field in China. The majority of meta-analysis is based on the publications in China and the theoretical framework is constructed on the unified theory of acceptance and use of technology (UTAUT2). The methodology employed a survey questionnaire with 638 usable responses from 6 educational institutions. Furthermore, the data analysis was performed to assess the impact of mobile technology adoption in academics using SPSS-24 to conduct t-test and ANOVA. The result of the study indicates that both external (social influence, facilitating conditions, and price value) and internal factors (performance expectancy, effort expectancy, hedonic motivation, and habit) are impacted by the adoption of mobile technology for teaching practices. However, the research gap includes a single country, a small sample size, and is limited to the academic field (Sailong Hu, 2020). |
| Taiebat and Xu (2019) | Global  | The objective of the study is to discuss the interactions of the emerging technologies to the adoption of smart electric vehicles for the benefit of urban sustainability and unintentional environmental consequences. The manuscripts included four emerging technologies such as shared mobility, wireless charging, vehicle-to-grid, and connected automated vehicles for the enhanced sustainable urban mobility experience. The research was based on case studies and lacks a considerable level of analysis on environmental impacts. However, the study has stressed certain advantages related to the reduction of cost and improved efficiency with the adoption of smart automated technology-enabled vehicles (Morteza Taiebat, 2019). |
| Author(s)                        | Country  | Title                                                                 |
|---------------------------------|----------|----------------------------------------------------------------------|
| Nanggong and Rahmatia (2019)    | Indonesia| This paper aims to examine the sustainable customer behavior influenced by apperceived benefit and ecological concern in the adoption of e-ticketing technology. The study encompasses the literature review on various theories on technology adoption, sustainable customer behavior, perceived benefit, and ecological concerns. The research methodology is explanatory with an aggregate of 188 usable samples as consumers using the e-ticketing process through mobile devices. The data collection was performed using an online questionnaire and purposive sampling was employed. The result indicates the importance and the corresponding conformity between consumer gain benefit and environmental concern on sustainable consumer behavior during technology adoption. The research gap in the manuscript focuses on a single country, single technology, and single environmental concern variable (paperless) (Rahamatia, 2019). |
| Mustafa and Yaakub (2018)       | Malaysia | The objective of the paper is to study the challenges in the form of innovation and technology adoption to determine the impact on the performance of the small and medium enterprises (SMEs) in Malaysia. The literature review is based on SMEs in Malaysia, risk in innovation and technology adoption, and dynamic capabilities theory. The method applied was a questionnaire survey for data collection from which 225 usable responses were obtained for data analysis using SPSS 24. The prognosis suggested that the primary challenges of SMEs in adopting innovation and technology are insufficient funds to invest, lack of skilled resources resulting in inferior quality products, and poor performance for not adopting innovation and technology. The study has limitations due to the deficiency of time and funds and as a result, restricted to certain regions of Malaysia. Therefore, the inclusion of SMEs from other regions of the country can contribute significantly to the research (Hamidatun Khusna Mustafa, 2018). |
| Kempegowda and Chaczko (2018)   | Global   | The paper gauges the importance of the adoption of emerging technologies by the manufacturing organizations and developing a digital ecosystem in compliance with the enterprise architectural methodologies leading to effective and successful digital transformation. The study is based on the literature review on enterprise architecture models, methods, and industry practices. The paper discusses and defines various disruptive technologies such as cloud computing, mobile, social media, big data, internet of things (IoT), artificial intelligence, blockchain, and robotic process automation (RPA) and further explains the role and impact of enterprise architecture in the gradual evolution of industry towards platform 4.0 which is an amalgamation of disruptive technologies forming a digital ecosystem. The study can be further elevated by including a more elaborate research approach comprising qualitative and empirical methods (Sunil Mysore Kempegowda, 18-20 Dec. 2018). |
| Author(s) | Year | Global |
|-----------|------|--------|
| Maryam Salahshour Rad et al. | 2017 | This paper aims to study IT adoption research through various adoption theories and classification of reviews and technology variables (dependent and independent). The study scrutinized and classified 330 published articles by year of publication, IS adoption theories, research topics, dependent, and independent variables in IT adoption. Furthermore, the technology adoption theories are grouped into three categories viz. descriptive studies, relational studies, and comparative studies. The main theories considered for the study are the Technology acceptance model (TAM), Diffusion of innovations, Unified theory of acceptance and use of technology (UTAUT), Theory of planned behavior, Technology organization environment framework (TOE framework), Theory of reasoned action, Delone and McLean IS success model, Task technology fit model, Uses and gratifications theory, Big Five theory, Extended technology acceptance model (TAM2), Extended technology acceptance model (TAM3), Social cognitive theory, Trust model, Trust model, Unified theory of acceptance and use of technology (UTAUT2), Social capital theory, Inter-organizational relationship theory, Flow theory, and social identity theory. The analysis of the result depicts that most of the papers are confined to mobile technology with TAM being the most dominant theory. The limitation or the research gap identifies consideration of more theories used in other disciplines and requires greater focus on dependent variables (Maryam Salahshour Rad, 2017). |
| Lai | 2017 | The paper is based on concepts, theories, and applications of various technology adoption models focused on a single platform for e-payment. The theories discussed in the paper are the Theory of Diffusion of Innovations (DIT), the Theory of Reasonable Action (TRA), Theory of Planned Behavior (TPB), Decomposed Theory of Planned Behavior, Technology Acceptance Models (TAM, TAM2, TAM3). The method used in the paper is a comparative approach of the theoretical models and provided a Stimulus Theoretical Framework for the single platform e-payment system. The review of the literature provided a platform for future researchers to understand and conceptualize the technology models and theories for past, present, and future adoption of technology (Lai, 2017). |
| Bresnahan and Yin | 2017 | The paper establishes the impact of the adoption of information and communications technologies (ICTs) towards the economic and technical sphere in the modern workspace. According to this paper, the application of ICT provides two value addition classes viz. product quality improvements and organizational change leading to a long and sustained process of experimentation. The study portrays the importance of new technology introduction to bring comprehensive transformation or initiate ICT co-development. The influx of new applications is driven by factors such as innovation and research, organizational amendments, and improving product quality creates more demand and labor market outcomes (Timothy Bresnahan, 2017). |
| Authors                  | Country     | Summary                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mattos and Laurindo     | Brazil      | This paper analyzes the Information technology adoption and integration of suppliers’ portal, combination of supply chain, and performance determined by TOE (Technology, Organization, and Environment) model and inter-organizational systems (IOS). The theories discussed in this paper include IT assimilation, supply chain integration, and information technology, assimilation of supplier portal, supply chain integration, and perceived benefits. The research methodology utilized is the quantitative method and the statistical technique used is Structural Equation Model. The data collected from suppliers’ portals with 95 vendors as sample size and the data analysis indicated that the environment and technological characteristics have great effects on the assimilation of suppliers’ portals. The effective implementation of IT is not only related to technical complexity or cost issues but also related to social and organizational factors which have significant impacts on results. The study is conducted in Brazil and is based on the perception of the respondents (Claudia Aparecida Mattos, 2017). |
| Joseph M. Woodside et al.| USA         | This paper reviews the acceptance and adoption of blockchain technology with emphasis on the implementation of cryptocurrency. The paper has incorporated the theories on blockchain technology and various management issues to determine the adoption approach using environmental (PEST), text, and financial settings. The result of both qualitative and quantitative analysis demonstrates the disruptive potential of blockchain technology in several key areas of business and society. The study is constrained due to the use of secondary data for analysis on 50 large companies in the USA in terms of revenues as the sample size (Joseph M. Woodside, 2017). |
| Prinsloo and Deventer    | Global      | This paper evaluates the pattern of the “Gartner Hype Cycle” for the emerging technologies to understand the adoption behavior towards technology for higher education globally. The research method consists of quantitative meta-analysis subjected to statistical measures. The result of the study denotes that the affinity towards emerging technology among the educational institutions developed gradually when it reaches maturity. The behavior of caution can be attributed to budget constraints and apprehension towards the latest technologies (Tania Prinsloo, 2017). |
| Du Plessis and Mwalemba  | South Africa| The study focuses on the adoption and integration of emerging technologies to the existing infrastructure and the hurdles faced by organizations in a developing country. The paper discusses the harmonization of emerging technologies like cloud computing, big data, service-oriented architecture, and mobile technology to existing enterprise resource management (ERP) systems. The study was based on qualitative techniques through semi-structured interviews with representatives from 7 organizations using SAP and Oracle ERP systems. The result of the analysis provides a clear insight into the difficulties that have delayed the adoption process due to cost deficiency, inadequate skills, security concerns, and Government policies. The study was limited to organizations in South Africa with a small sample size restricted to ERP and therefore, requires a more comprehensive approach to understand the implication of the adoption of new technologies (Jean-Jacques Du Plessis, 2016). |
| Author(s)                  | Country   | Description |
|---------------------------|-----------|-------------|
| Ejiaku (2014)             | Nigeria   | The primary objective of the paper is to enhance awareness regarding the challenges associated with the adoption of information technology in developing countries. The study emphasizes literature reviews of previous research works and identifies the causes of challenges like Government policies, training, qualification, and infrastructure. The outcome of the study highlights the underlying difficulties in IT transfer and adoption in developing countries. However, the study is limited to African geography and further research on the future IT infrastructure with multiple countries will be beneficial for the developing countries vis-à-vis IT adoption (Ejiaku, 2014). |
| Sharma and Mishra (2014)  | Global    | This paper presents a gradual evolution of theories and models about the adoption of technology. The research methodology employed is a literature review of the papers with appropriate keywords downloaded from online databases like EBSCO, Google Scholar, Proquest, INFORMS, etc. The various technology adoption theories discussed are Diffusion of Innovation Theory, Theory of Reasoned Action, Theory of Planned Behavior, The Social Cognitive Theory, Technical Adoption Model, The Model of PC Utilization, The Motivation Model, Extended TAM2 model, Unified Theory of Acceptance and Use of Technology, and Model of Acceptance with Peer Support (MAPS). The research objectives are to provide an overview of technology adoption theories and models for future research purposes that were successfully achieved. The study however lacks adequate information on several new areas where the existing models proved to be insufficient and therefore, future research using the available models can be augmented to explore the adoption process of new technologies (Rajesh Sharma, 2014). |
| Naim Ahmed et al. (2014)  | India     | The paper focuses on the adoption reasons or motivations of enterprise systems such as ERP for small, medium, and large manufacturing organizations. The design and methodology include content analysis of 12 research papers comprising of 288 Indian cases. The exhaustive literature review yielded 12 major factors viz. operational improvements (cost, employee, duration time reductions), legacy system replacement or IT architectural improvements, business growth or extensions, data or information issues, regulatory and compliance issues, organizational change, integration of systems or processes, standardization and best practices, globalization support, competition, customer and supplier intimacy, and other external forces. The motivation factors are ranked, Cohen’s K index used to assess the reliability of the coding, and Pearson’s X2 test of statistical significance employed to understand the association of adoption purpose with the size of the organization. The result shows no significant relationship between 12 factors except the size of the organizations. The limitation or research gap in the research manuscript is restricted to Indian organizations, presence of bias as the majority of cases collected from the ES vendor’s websites and use of secondary data may be limited in relevancy and accuracy. The scope of the study can be elevated using questionnaires for primary data collection (Naim Ahmad, 2014). |
| Authors                  | Country                  | Methodology                                                                 | Findings                                                                 | Limitations and Future Research |
|-------------------------|--------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------|
| Sang-Gun Lee et al. (2013) | South Korea and few selected places Globally | The paper involves an investigation of the temporal dimension of Information and communication technology (ICT) and non-Information and communication technology (automobile industry) adoption over life cycles. The study assesses the limitations of previous studies and establishes a more concrete approach through a mathematical model. The theories and models featured in the paper are Innovation and imitation constructs in the TAM, Diffusion of innovation theory, the Bass diffusion model (External influence model - the Coleman model, Internal influence model, Mixed influence model - the Bass model, Mixed influence model - the Bass model and Usefulness of the Bass diffusion model), and Product life cycle. The adoption factors identified are innovation and imitation form the basis of the hypothesis under Innovation and imitation effects over the adoption life cycle, differences in innovation and imitation effects on ICT and non-ICT products, innovation, and imitation effects on a new popular product. The methodology used is a mathematical diffusion model applied to officially verified time-series data of the number of adopters and the data is collected primarily in South Korea. The result depicts the importance of continuous innovation as a competitive strategy for organizations where the innovation effect diminishes and to counteract new product launch balances the equilibrium. The research gap and limitations include mobile phones as the representation of ICT and for non-ICT, it is automobiles with the study limited to Korea, and external factors like the formation of the industry, brand value, and market share are not taken into consideration, requires further elevation in future research studies (Sang-Gun Lee, 2013). | This paper explores the influencing factors for the adoption of cloud storage services in China and proposed a model based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The research model proposes 7 external variables (perceived risk, perceived cost, personal innovativeness, performance expectancy, effort expectancy, social influence, and facilitating conditions), 2 internal variables (adoption intention and adoption behavior), and 3 moderators (gender, age, and experience). The study introduced a questionnaire survey for data collection where 225 valid questionnaires were obtained. For data analysis, confirmatory factor analysis, correlation analysis, and hypothesis tests were performed. The result indicates that perceived cost does not affect the adoption of cloud storage services whereas perceived risk, personal innovativeness, performance expectancy, effort expectancy, and social influence affect the adoption of cloud storage services quite significantly. However, the study is limited to a single country and single technology (Yue Cao, 2013). |
| Yue Cao et al. (2013)    | China                    | This paper explores the influencing factors for the adoption of cloud storage services in China and proposed a model based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The research model proposes 7 external variables (perceived risk, perceived cost, personal innovativeness, performance expectancy, effort expectancy, social influence, and facilitating conditions), 2 internal variables (adoption intention and adoption behavior), and 3 moderators (gender, age, and experience). The study introduced a questionnaire survey for data collection where 225 valid questionnaires were obtained. For data analysis, confirmatory factor analysis, correlation analysis, and hypothesis tests were performed. The result indicates that perceived cost does not affect the adoption of cloud storage services whereas perceived risk, personal innovativeness, performance expectancy, effort expectancy, and social influence affect the adoption of cloud storage services quite significantly. However, the study is limited to a single country and single technology (Yue Cao, 2013). |
| Authors                  | Location | Abstract |
|-------------------------|----------|----------|
| Michael Newby et al. (2013) | USA      | The paper attempts to elevate the understanding and knowledge on the adoption of customer relationship management (CRM) technology by small- and medium-sized enterprises (SMEs) through an empirical study in the USA. The study developed hypotheses on the adoption of CRM technology based on management characteristics, organizational characteristics, and management’s perception of CRM technology and method composed of a questionnaire survey of 126 usable datasets. The data analysis using one-way ANOVA (analysis of variance) indicated no significant difference between industry and firm size in terms of perception towards adoption of CRM technology. However, regression analysis showed management characteristics contribute to the adoption perception. The research gap includes geographical limitations specific to southern California with small a sample size and focused on a few industries viz. retail, manufacturing, and services (Michael Newby, 2014). |
| Liu (2013)              | Global   | The paper presents the recurrent challenges and issues faced by large enterprise companies in the adoption and integration of cloud computing with the existing infrastructure. The literature provides valuable insights about the concerns and constraints related to migration to cloud computing while designing products and services targeted at enterprise customers, and in enabling further cloud adoption. The paper elaborates persistent hurdles such as justification on cost savings, cost calculation, migration cost, training constraints, security concern, and regulatory compliance and elucidates the cloud adoption motivators viz. rapid provisioning, reduced overhead, and service diversity. The research gap identified is a lack of appropriate sampling and empirical analysis (Liu, 2013). |
| Khanagha et al. (2013)  | Global   | This paper scrutinizes the influence of administrative role on innovation to negate the effect of obstacles in the quest of emerging technology adoption by Telcos. The basis of the study is based on the migration of Telcos towards cloud computing to gain business efficiency, flexibility, and sustainability. To understand the relationship between management innovation and technology adoption, an inductive case study approach was introduced. The data analysis was based on the focus groups method and the result of the analysis reveals that management intervention to create an innovative complementary environment leads to sustainable adoption of novel technology whereas continued conventional route casts obstacles to growth and success (Saeed Khanagha, 2013). |
| Authors | Location | Details |
|---------|----------|---------|
| Bharadwaj and Lal (2012) | India | The paper focuses on cloud computing adoption drivers and organizational flexibility. The theoretical foundations based on adoption decision from three perspectives viz adopting new technology, outsourcing IT, and cloud computing as service is Diffusion of Innovation, Technology Acceptance Model, Dynamic Capabilities Theory and Contingency Theory. A conceptual framework was developed using 5 constructs i.e Relative Advantage (RA), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Vendor Credibility (VC), and Attitude towards Using Technology (ATUT). The research methodology is founded on case study methodology where 10 IT professionals from 25 companies with 15-20 years of professional experience are interviewed. The data analysis is performed by identifying drivers of cloud computing adoption and understanding its impact on organizational flexibility. The result suggests that the above-mentioned constructs are the decision drivers to adopt cloud computing along with four categories of organization flexibility viz. Economic Flexibility (EF), Process Flexibility (PF), Performance Flexibility (PRF), and Market Flexibility (MF) (Sangeeta Shah Bharadwaj, 2012). |
| Siti Maliza Salleh et al. (2012) | Global | The paper focuses on the adoption of the Cloud Enterprise System (Cloud ES) by small enterprises (SME). The research method used is the synthesis of prior research through literature review on the related domain such as Current ES deployment, Conceptualization of Cloud ES, Advantages and Challenges of Cloud ES Adoption, and Cloud ES and SMEs. The study provided a depth understanding of Cloud ES definition, along with service model typology, advantages, and challenges of Cloud ES adoption. Furthermore, the scope of the research in the field of Cloud ES and its adoption can be further elevated by understanding the deployment methods used in various organizations, influencing factors, benefits, and challenges (Siti Maliza Salleh, 2012). |
| Darbanhosseinamirkhiz and Ismail (2012) | Global | This paper is designed to examine the factors influencing the adoption of Advanced Manufacturing Technologies (AMT) and identify the hurdles faced by small and medium enterprises (SMEs) during the adoption process. The research study is based on a systematic review of existing pieces of literature of prior studies. The area of concern is focused on environmental, organizational, and technological. The framework constructed may assist in managerial decision-making regarding the purpose, obligation towards effective adoption, favorable market, and the overall benefits derived from the AMT adoption. The study lacks the proper characterization of the size of the industry in terms of workforce and/or revenue (Mirmahdi Darbanhosseinamirkhiz, 2012). |
| Authors                          | Location/Region         | Focus |
|---------------------------------|-------------------------|-------|
| Marinos Themistocleous et al. (2011) | UK and Poland           | This paper focuses on the adoption of Enterprise System (ES) lifecycles and a key player in transition economies in contrast to developed economies. The major differences between the transition economies and developed economies concerning ICT are diffusion, strategy, planning and design, implementation, services, management, security, economics, users and organizations, and sourcing. The research design used in the research is an amalgamation of qualitative and quantitative approaches. The Somers and Nelson model is considered for the empirical data and analysis that depicts Routinization and Infusion, which represent post-adoption behavior. Different adoption lifecycle phases defined by respondents belonging from Poland and UK are carefully tabulated, compared, and analyzed. The main players of ES adoption identified viz. Sponsor/project champion, Steering committee, Project leader, Top management, Implementation team, IT staff, Key users, Users, Provider’s supervisor, Provider’s project manager, Provider’s solution manager, Consultants, Provider’s developers, and Auditors. The study on comparative analysis of ES adoption in Poland vs the UK suggests a different emphasis on adoption lifecycles and cooperation between the technology adopter and the provider. The study is limited to Poland and UK with a small sample size (Marinos Themistocleous, 2011). |
| Chinyao Low et al. (2011)       | Taiwan, Republic of China | The paper aims to investigate the factors affecting the adoption of cloud computing high-tech organizations in Taiwan. The methodology included a questionnaire survey sent to collect data from 111 reputed organizations across Taiwan. Furthermore, relevant hypotheses were derived and tested using regression analysis based on the context of technology, organization, and environment required for the adoption of cloud computing. The result identified and delivered 5 distinct variables viz. relative advantage, top management support, firm size, competitive pressure, and trading partner pressure that affects the deployment of cloud computing. The research gap in the research paper is constrained to high-tech industries with a single relationship between the independent and dependent variables and in the future more comprehensive research to deal with complex technology adoption in other industries to elaborate the feasibility of the technology-organization-environment (TOE) framework (Chinyao Low, 2011). |
| Morteza Gobakhloo et al. (2011)  | Global                   | This study elucidates the process of Information Technology (IT) adoption by Small to medium-sized enterprises (SMEs) to analyze and contrast internal and external issues in both developed and developing countries. The basis of the research study is on review of the existing literature to evaluate both internal (top management, resources, end-users, IT solution - computer application, organizational characteristics) and external (external and competitive pressure, external IT consultant and vendors, government) factors. The paper provides a critical assessment of failures and dissatisfactions on IT adoption in SMEs and recommends categorization of influencing factors based on different adoption concepts along with empirical testing for comprehensive study (Morteza Gobakhloo, 2011). |
| Authors                        | Location       | Summary                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mariel L. Bernstein et al.    | Global         | This paper focuses on five constants that influence the integration of information technology (IT) in healthcare. The five constants identified are budget, supportive leadership, project management, implementation, and end-user involvement. The study also provides recommendations for the future of IT in healthcare to improve the quality of service and reduction of errors using IT. The research paper lacks substantial use of primary data and empirical evidence (Mariel L. Bernstein, 2010). |
| Daniel Boothby et al.         | Canada         | The paper is based on the understanding that the firms adopting new technologies invested in skills can reap a greater benefit in terms of productivity. The data was collected using a survey from Advanced Technology in Canadian Manufacturing with a sample size of 4200 manufacturing firms adopting 26 latest technologies. Multivariate analysis and econometric analysis model were employed to estimate and ascertain the relationship between the effect, impact, and training on productivity. The result of the analysis demonstrated that judicious investment in training along with technology adoption enhances productivity. However, the study has not taken into consideration the consequence of Government policies and incentives associated with technology adoption and training (Daniel Boothby, 2010). |
| Mladen Cudanov et al.         | Global         | This paper aims to ascertain the interrelationship between the size of an organization and the adoption of information and communication technologies (ICT). The data involved was collected from a sample size of 68 organizations. The method used enterprise size indicators i.e., a total number of employees, total assets, enterprise income, and the composite index of ICT adoption. The result of the analysis shows that the size of the organization and ICT implementation are linked. The study can be further elevated with the inclusion of factors like cost reduction through globalization and decrease of labor involvement by automation (Mladen Cudanov, 2010). |
| Won Kim et al.                | Global         | This paper stresses on the other side of the coin that even though the adoption of cloud computing offers cost-benefit by pay-per-use, better accessibility, enhanced storage capacity, robust security, and ownership flexibility (software and hardware) to the users. On the other hand, it also carries the burden of risk and challenges which are the major impediments to the adoption of cloud computing. The paper discusses the various facets of challenges in detail related to the adoption of cloud computing like performance, security and compliance, outage, private cloud restriction, integration cost, and environment. However, most of these issues can be addressed with the advancement of technology. The study is restricted to the meta-analysis of existing literature and can be further elevated through empirical methods and requires comprehensive evidence to tackle the challenges (Won Kim, 2009). |
| Authors               | Location | Description |
|----------------------|----------|-------------|
| Suebsin and Gerdsri  | Thailand | The paper concentrates on the process and key determinants impacting the adoption of Enterprise Resource Planning (ERP) by organizations in Thailand. The systematic review discusses the theories and case studies on the adoption process and key variables such as performance, cost of acquisition, operating cost, ease-of-use, reliability, compatibility, and serviceability under Technology Adoption-Diffusion and specifically ERP adoption. The outcome of the study recognized the factors like customization, quality of human resources, inadequate support, project leader’s skills, project scope, and value recognition. As the study is limited to a single geographic location, the paper recommends deeper exploration to examine the factors that contribute to or hinder the success of technology adoption (Chonyacha Suebsin, 2009). |
| Antonio Trigo et al. | Portugal | The paper addresses the diverse aspects of information technology and information system adoption with the focus on Enterprise Resource Planning (ERP) by the large Portuguese companies. The methodology included a questionnaire prepared and shared with 500 Chief Information Officers (CIOs) where 54 usable responses were received for further data analysis. The result of the data analysis showed a significant percentage of companies adopted ERP with low adoption of other systems like Customer Relationship Management (CRM), Supply Chain Management (SCM), Business Intelligence (BI), Collaboration and Workflow management, and Groupware. However, the inference of the result is restricted to large organizations. The study also predicts the growth of ERP adoption getting accelerated in other European countries as opposed to other IT/IS systems (António Trigo, 2007). |
| Chan and Ngai (2007) | Hong Kong | This paper presents a qualitative approach to understand the factors responsible for the adoption of Information technology (IT) in the implementation of web-based training (WBT). The study is devised on the factors leading to the IT adoption decision viz. perceived benefits-costs, organizational readiness, and external pressure. The research method uses a qualitative field study based on replication logic (literal replication) with a sample size of 10 organizations in Hong Kong. The data analysis was performed to detect similarities and differences among the organizations. The study provided a clear understanding of the effect of the above-stated factors on WBT adoption, and the findings are found to be significant for the HRM field regarding WBT adoption. There are several limitations observed in the study conducted with small sample size and in specific geography may contain a source of bias (Simon C H Chan, 2007). |
| Zhu and Weyant (2003) | Global   | The paper aims to explore and realize that asymmetric information affects the strategic decision-making to adopt the technology. The study constructs a two-stage game-theoretic model where in the first stage investment is made by an organization to develop a product through the adoption of new technology to gain a competitive advantage over its rival in the market. The research also focuses on the impact of asymmetric information on the adoption decision. The investigation further states that both the organization under equilibrium strategies experiences contrasting result for asymmetric and symmetric information where information asymmetry results in different incentives and strategic behaviors similarly conventional way produces aggressive approach towards adoption. The paper endorses extensive study to include how firms can mislead competitors through misinformation and other benefits of higher quality, faster delivery, and better customer services (Kevin Zhu, 2003). |
The study was conducted to compare and assess the adoption of manufacturing technologies by small to medium enterprises (SMEs) and large firms in terms of past use, payoffs, and expected future use. The method for the research consists of a mail survey using a questionnaire to 23 countries across America, Europe, and the Asia Pacific with a sample size of 632 usable responses from firms from both OECD (Organization for Economic Co-operation and Development) and non-OECD countries. The analysis based on the size of the organization, categorized according to the number of employees (SMEs <100 and large >100 employees) suggested that large organizations invested more in advanced technologies than SMEs and received a higher payoff (Jessica Kennedy, 2003).

The paper assesses the existing theories and models on technology adoption to identify and establish the influences of perceptions in adoption decisions and the effect of moderating variable personal innovativeness. The research model is conceptualized on the diffusion of innovations to understand perceptions and their consequents and the antecedents of perceptions. The context of the study was based on Beta, a Fortune 500 manufacturing company for knowledge-based system “CONFIGURATOR” to support the configuration and ordering of its products. The model included three key perceptions - relative advantage, ease of use, and compatibility examined on a 7-point Likert-type scale and Personal innovativeness was assessed using a three-item scale. The factor analysis was unable to confirm the validity of scales due to the limitation of sample size relative to the total number of items in the scales. The result of the analysis shows the presence of moderating variable i.e., the personal innovativeness of an adopter. However, further investigation on other variables is recommended for future researchers (Ritu Agarwal, 1998).

Based on the exhaustive literature review several components that appeared frequently are classified into two categories under the adoption of technology - Promoters and Barriers.

| Promoters                              | Barriers                                      |
|----------------------------------------|-----------------------------------------------|
| Performance and Productivity           | Budget or Fund Availability                   |
| Product and Service Quality            | Lack of Skilled Labor, Inadequate Skill       |
| Relative Advantage                     | Inferior Quality Products                     |
| Customization                          | Time Deficiency                               |
| Investment                             | Social Factor                                 |
| Competitive Pressure                   | Organizational Factor                         |
| Process, Business, Market Flexibility  | Technical Complexity                          |
| Effort and Ease of Implementation      | Apprehension about Technology                 |
| Social Influence                       | Security Concern                               |
| Facilitating Condition                 | Government Policies                           |
| Innovation, Motivation, Training, and Habit | Regulatory Compliance                      |
| Price Value and Cost Reduction         | Training Constraints                          |
| Improved Efficiency                    | Poor Infrastructure                           |
| Consumer Gain                          | Incomplete or inadequate Information          |
The Concentration of Research on Technology Adoption across the Globe

The study on the adoption of technology in the last 20 years has gained a considerable amount of momentum with global participation. However, the advent of emerging technologies like ERP, Cloud Computing, Mobile Technology, Business Intelligence, Enterprise Systems, Blockchain, Internet of Things (IoT), Social Media, etc. in the last decade has accelerated and contributed immensely to kindle the thought leadership of the researchers and business strategists worldwide.

Global Distribution of Study on Technology Adoption

Research Gap

Most of the studies related to the adoption of technology revolve around the identification and establishment of influencing factors, challenges, and benefits or are limited to a certain geography or constrained to specific industry or technology but not enough effort has been put across to ascertain the technological impulse or drivers towards emerging technologies that leads to the adoption of technology in the form of an advanced platform or application in leading enterprise storage organizations. Furthermore, none of the earlier work has tried to understand and determine the causal relationship between technology adoption with the leadership position in the enterprise storage market.

Research Problem Statement

Modern problems require modern solutions. The class-leading enterprise storage organizations are able to outclass, outperform and outcompete the challengers and the new entrants consistently
over the years by strategically evaluating the market conditions, technological awareness, and customer needs by embracing the novel technologies to strengthen their arsenal. Maintaining a leadership position for a long period in the enterprise storage domain cannot happen by mere chance but through conscious and deliberate effort. This study is an attempt to establish the relationship between the technical and strategic driving factors to adopt emerging technologies with the leadership position in the enterprise storage market (featuring as “Leaders” in Gartner Magic Quadrant) and the result of such association.

In our study, we will examine the impact and relationship among various technical and strategic components categorized under three variables for the major enterprise storage organizations.

- **Technology Adoption Drivers (TAD)** - TAD is the amalgamation of strategies or stimulatory factors responsible for the identification of technology variable(s) that leads to the adoption of new technologies. Example - Digital Transformation, Future Ready Robust Ecosystem, Automation, Improved Solutioning/Pricing Tool, Process Simplification, Cost and Subscription-Based Services, Technology/Product/System/Tool End of Life.

- **Technology Variables (TV)** - Analysis of each TV variable may provide insights into the implications to the resultant variables and the TAD factors responsible for their adoption in major Enterprise Storage organizations. Example - Artificial Intelligence, Cloud Computing, Internet of Thing (IoT), Data Analytics, Content Management System, Robotic Process Automation (RPA), End Point Security.

- **Resultant Variables (RV)** - Analysis of RV should indicate success or failure of the technology adoption and precise identification of appropriate TV. Example – Market Competition/Competitive Advantage, Management Decision, Financial Strength, Diversification, Differentiation, Scalability, Security, Cost Advantage, Skill Development, Customer Satisfaction, Performance Enhancement, Reduction in Time for Market Availability.

In this study, we will focus on developing a conceptual model based on the outcome and relationship among the variables based on theoretical and empirical approaches.

**Research Methodology**

The concept paper is based on the literature review of previous studies on technology adoption, emerging technology, and adoption frameworks. The study will be further enhanced and refined by identifying and selecting the appropriate variables and subjecting them to appropriate empirical methodologies.

**Conclusion**

Technological advancements occur rapidly, and the adoption of emerging technologies has become a compulsion for the enterprise storage organizations to provide clinical and consistent performance to the customers and to maintain the leadership position in the market. The consistent players in the market always strive to introduce disruptive and class-leading ideas through constant introspection and innovation. The level of awareness about the emerging technology trends, competitors’ strategies, core strengths, weaknesses, and pulse of the customer aids the enterprise-level companies to reap benefits for, a long time which eventually contributes to their longevity. This study focuses on the driving factors that help in the migration and implementation of advanced platforms or solutions in enterprise storage organizations through the adoption of emerging technologies. A model will be proposed and constructed after thorough testing and validation of variables through empirical research in the future. Moreover, both the variables (TV and RV) will be subjected to analysis pre-and post-adoption to establish and ascertain the potency of value addition and end-user experience.
| Promoters                                               | Annexure                                                                 |
|--------------------------------------------------------|--------------------------------------------------------------------------|
| Performance and Productivity                          | (Sangeeta Shah Bharadwaj, 2012), (Siti Maliza Salleh, 2012), (Daniel Boothby, 2010), (Sailong Hu, 2020) |
| Product and Service Quality                           | (Timothy Bresnahan, 2017), (Mariel L. Bernstein, 2010), (Kevin Zhu, 2003), (Joseph M. Woodside, 2017), (Sunil Mysore Kempegowda, 18-20 Dec. 2018) |
| Relative Advantage                                    | (Chinyao Low, 2011), (Ritu Agarwal, 1998), (Sangeeta Shah Bharadwaj, 2012) |
| Customization                                          | (Chonyacha Suebsin, 2009)                                                |
| Investment                                             | (Mirmahdi Darbanhosseiniamirkhiz, 2012), (Jessica Kennedy, 2003)          |
| Competitive Pressure                                   | (Chinyao Low, 2011), (Morteza Ghobakhloo, 2011), (Mirmahdi Darbanhosseiniamirkhiz, 2012) |
| Process, Business, Market Flexibility                  | (Sangeeta Shah Bharadwaj, 2012), (Siti Maliza Salleh, 2012), (Mirmahdi Darbanhosseiniamirkhiz, 2012) |
| Effort and Ease of Implementation                     | (Siti Maliza Salleh, 2012), (Yue Cao, 2013), (Morteza Ghobakhloo, 2011), (Chonyacha Suebsin, 2009), (Sailong Hu, 2020) |
| Social Influence                                       | (Claudia Aparecidade Mattos, 2017), (Yue Cao, 2013), (Sailong Hu, 2020), (Joseph M. Woodside, 2017), (Chonyacha Suebsin, 2009), (Sunil Mysore Kempegowda, 18-20 Dec. 2018) |
| Facilitating Condition                                | (Yue Cao, 2013), (Sailong Hu, 2020)                                       |
| Innovation, Motivation, Training, and Habit           | (Sang-Gun Lee, 2013), (Timothy Bresnahan, 2017), (Daniel Boothby, 2010), (Sailong Hu, 2020), (Yue Cao, 2013), (Sunil Mysore Kempegowda, 18-20 Dec. 2018) |
| Price Value and Cost Reduction                        | (Sangeeta Shah Bharadwaj, 2012), (Siti Maliza Salleh, 2012), (Daniel Boothby, 2010), (Simon C H Chan, 2007), (Chonyacha Suebsin, 2009), (Joseph M. Woodside, 2017), (Liu, 2013), (Morteza Taiebat, 2019), (Sailong Hu, 2020), (Sunil Mysore Kempegowda, 18-20 Dec. 2018) |
| Improved Efficiency                                   | (Morteza Taiebat, 2019)                                                  |
| Consumer Gain                                          | (Rahamatia, 2019)                                                        |
| Sustainability                                         | (Rahamatia, 2019), (Morteza Taiebat, 2019)                                |
| Organization Adaptation                                | (Timothy Bresnahan, 2017), (Claudia Aparecidade Mattos, 2017), (Simon C H Chan, 2007), (Morteza Ghobakhloo, 2011) |
| Size of Organization                                   | (Naim Ahmad, 2014), (Mladen Cudanov, 2010), (Chinyao Low, 2011)           |
| Management Support or Characteristics                  | (Marinos Themistocleous, 2011), (Chinyao Low, 2011), (Morteza Ghobakhloo, 2011), (Mirmahdi Darbanhosseiniamirkhiz, 2012), (Chonyacha Suebsin, 2009), (Michael Newby, 2014) |
| Rapid Provisioning and Reduced Overhead                | (Liu, 2013)                                                              |
| Product and Service Diversity                          | (Liu, 2013)                                                              |
| Infrastructure Upgrade | (Siti Maliza Salleh, 2012) |
|------------------------|-----------------------------|
| Government Support and Political Stability | (Morteza Ghobakhloo, 2011), (Joseph M. Woodside, 2017), (Sunil Mysore Kempegowda, 18-20 Dec. 2018) |

| Barriers |
|-----------------------------|
| Budget or Fund Availability | (Siti Maliza Salleh, 2012), (Morteza Ghobakhloo, 2011), (Won Kim, 2009), (Hamidatun Khusna Mustafa, 2018), (Jean-Jacques Du Plessis, 2016), (Tania Prinsloo, 2017) |
| Lack of Skilled Labor, Inadequate Skill | (Morteza Ghobakhloo, 2011), (Hamidatun Khusna Mustafa, 2018), (Jean-Jacques Du Plessis, 2016) |
| Inferior Quality Products | (Hamidatun Khusna Mustafa, 2018) |
| Time Deficiency | (Hamidatun Khusna Mustafa, 2018) |
| Social Factor | (Joseph M. Woodside, 2017) |
| Organizational Factor | (Siti Maliza Salleh, 2012) |
| Technical Complexity | (Joseph M. Woodside, 2017) |
| Apprehension about Technology | (Tania Prinsloo, 2017), (Siti Maliza Salleh, 2012) |
| Security Concern | (Siti Maliza Salleh, 2012), (Won Kim, 2009), (Joseph M. Woodside, 2017), (Jean-Jacques Du Plessis, 2016) |
| Government Policies | (Ejiaku, 2014), (Morteza Ghobakhloo, 2011), (Chonyacha Suebsin, 2009), (Jean-Jacques Du Plessis, 2016) |
| Regulatory Compliance | (Won Kim, 2009), (Joseph M. Woodside, 2017) |
| Training Constraints | (Ejiaku, 2014) |
| Poor Infrastructure | (Ejiaku, 2014) |
| Incomplete or inadequate Information | (Morteza Ghobakhloo, 2011) |
| Perceived Risk | (Yue Cao, 2013) |
| Cost Saving Justification | (Liu, 2013) |
| Cost Calculation | (Liu, 2013) |
| Outage | (Won Kim, 2009) |
| Management Skill | (Morteza Ghobakhloo, 2011), (Hamidatun Khusna Mustafa, 2018), (Joseph M. Woodside, 2017) |
| Environmental Concerns | (Won Kim, 2009) |
| Poor Performance | (Won Kim, 2009), (Hamidatun Khusna Mustafa, 2018) |

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