Leveraging Cloud - Based Information Technologies for Organizational Agility: A Conceptual Model

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Abstract

Chief Information Officers have always struggled to implement right Information Technology (IT) solutions aligned with business strategy, with speed. The challenges of doing the same include upfront costs and skills required to implement the project. The organizations which are able to do the same stay one step ahead of their competition. Hence, IT organizations are always engaged in understanding and addressing the needs of employees and providing solutions for the same. The ubiquitous Internet has helped them to address the need of reach and availability of such systems. The emergence of cloud-based services in the form of Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS) has added to the panoply of new options for deriving cost-effective benefits from technology in a flexible and faster way. Adoption of cloud-based services provides IT resources agility to an organization which is further defined in terms of pricing, scalability, availability, security and on-demand provisioning of services, etc. This research paper develops a theoretical model for understanding various factors influencing the decision to adopt cloud-based services. Further, this paper explores whether adoption of cloud-based services helps in achieving organizational agility measured through service agility, market capitalizing agility, and customer agility.

Key words: Cloud Computing, Organizational Agility, Adoption

Introduction

The business environment today is characterized as Volatile, Uncertain, Complex and Ambiguous (VUCA). In such an environment, the capability to sense and respond to market threats and opportunities with speed and surprise has become essential for survival of organizations(Pan, Pan, Chen, & Hsieh, 2007). In such a fast-paced and often changing business environment, firms achieve sustainable competitive advantage by engaging in rapid and relentless innovation for seizing market opportunities. Therefore, continuous innovations in products and services and vigilance to emerging opportunities and threats are vital for superior performance. Organizations which have developed ability to detect opportunities for innovation and seize those competitive market opportunities by assembling requisite assets, knowledge and relationships with speed and surprise, would be ahead of other organizations which have not been able to develop such capabilities. Such organizations with sensing and responding capabilities are the ones that have understood the role of agility in addressing the opportunities and threats with speed and surprise. Agility has increasingly become indispensable for survival and prosperity for organizations. Given its significant role in a turbulent business environment, agility has garnered considerable research attention over the past few years(Huang, Ouyang, Pan, & Chou, 2012).

The ubiquitous nature of Information and Communication Technology (ICT) and leveraging information technology (IT) to derive competitive advantage is emerging as a top priority for firms as they often enable an organization to be a marketplace differentiator Huang, Ouyang, Pan, & Chou, 2012(; Liu, Ke, Wei, & Hua, 2013). Further, it is the IT vendors who have made it their key strategy to help organizations achieve agility (e.g. IBM's 'On-Demand' vision and HP's 'Adaptive Enterprise' strategy). These vendors provide a variety of organizational and technical solutions that would help achieve the proper level of agility to handle unexpected waves of change.

Use and deployment of emerging and new-age technologies like cloud-based services to scale and optimize operations is now de rigueur in today's competitive business and globalised environment. Cloud computing is becoming an adoptable technology for many of the organizations with its dynamic scalability and usage of virtualized resources as a service through the Internet (Ercan, 2010).Cloud-based services enable organizations to hire any software application only when there is a requirement of such a utility. The licensing for using this kind of application may be with a single user or it can be shared with multiple users, and offers a simple and economic way to have proper software facilities with a minimum of expenses(Limbăşan & Rusu, 2011).

A key differentiating element of cloud-based service is its ability to become a true, valuable, and economical contributor to organizational agility. Cloud-based services provide agility in terms of faster adoption of IT services, in terms of reduced information technology overhead for the organization, greater pricing flexibility, on-demand services, scalability etc. (Vouk, 2008). Thus, adoption of cloud-based services results in achieving organizational agility in terms of reaching out to customers and providing them services within no time.

Given its crucial role in enabling business success, the concept of agility has garnered considerable research attention (Huang et al., 2012). Over the years, many dimensions of agility (e.g. manufacturing agility,

operational agility, customer agility) have been identified and researched (e.g., Braunscheidel & Suresh, 2009;Huang et al., 2012; Ngai, Chau, & Chan, 2011;Raschke, 2010; Sambamurthy, Bharadwaj, & Grover, 2003). Past research generally has asserted that IT can enable agility by speeding up decision making, facilitating communication, and responding quickly to changing conditions (Lu & Ramamurthy, 2011). IT improves operational and management competencies in enterprise systems (Ngai et al., 2011)and helps in achieving competitive advantage by improving interaction with customers (Roberts & Grover, 2012). However, past research has also suggested that IT may obstruct and at times even delay organizational agility (Lucas Jr. & Olson, 1994; Lu & Ramamurthy, 2011; Overby, Bharadwaj, & Sambamurthy, 2006).

The emergence of the phenomenon commonly known as cloud computing represents a fundamental change in the way information technology (IT) services are invented, developed, deployed, scaled, updated, maintained and paid for (Böhm, Leimeister, Riedl, & Krcmar, 2010).Cloud computing is viewed as one of the most promising technologies in computing today, inherently able to address a number of issues such as scalability of IT resources where a service can easily be scaled up or ramped down for optimum utilization giving customers an option to pay only for services they have used (Leavitt, 2009; Lin & Chen, 2012; Vaquero, Rodero-Merino, Caceres, & Lindner, 2008). Yet, despite the growing body of research on cloud-based services adoption and organizational agility, how to achieve agility through cloud-based services is still not answered by previous research. Given the indispensable role of agility in VUCA business environments, it is imperative to investigate how cloud-based services can help organizations in achieving agility.

The objective of this research is -
1) To identify the factors that impact adoption of cloud-based services.
2) To study the impact of adoption of cloud-based services on organizational agility.

The remaining sections of this paper discuss the theoretical underpinnings of cloud-based services, agility and understanding of how cloud-based services provide a transformational platform to enable business processes (Raschke, 2010). This is followed by a discussion of the theoretical model and propositions.

Literature Review

Agility

The business environment today is dominated by change and uncertainty. Agility is the capability and the capacity to anticipate market dynamics, adapt to them and accelerate the changes faster than the rate in the rest of the market to create economic value and help the organization in performance (Gray, 2010; Goodhue, Chen, Claude, Davis, & Cochran, 2009; Overby et al., 2006). Goldman et al. (1995) represented four dimensions of agility which are enriching the customer, co-operation to enhance competitiveness, organizing to master change and uncertainty, and leveraging the impact of people and information. Agility is defined as the comprehensive response to business challenges resulting from rapidly changing and continually fragmenting markets to achieve high quality and high performing customer- configured goods and services (Goldman, Nagel, & Preiss, 1995). According to Advanced Research Programs Agency (ARPA), "agility is the ability to thrive in an environment of continuous and often unanticipated change" (Sarkis, 2001). It also facilitates the

identification of innovative responses by coalescing requisite assets and knowledge capabilities to deal with unexpected changes resulting in growth and prosperity.

The origin of agility as a business concept lies in flexible manufacturing paradigm and it is further adopted by IT organizations for agile software development. Flexibility is usually hardwired into an organization's processes and IT systems in order to address changes that are largely predictable with a predetermined response. It helps an organization to handle unstructured changes and encompasses searching and leveraging of opportunities for market arbitrage. Changing the parameters in an ERP package to accommodate for the occurrence of a predictable change is a good example of this. Volberda (1996) addresses flexibility as the ability to activate and control the variety of actual and potential capabilities of an organization thereby improving the controllability of the organization.

Agility is needed when the required changes were not envisioned at the time of establishing organizational processes and systems (van Oosterhout et al., 2006). As a result, more radical and innovative change is required such as modularizing or re-engineering existing processes and systems, and the ability to design new processes and implement them through the existing systems. Business agility implies being able to swiftly change business and business processes beyond the normal level of flexibility to effectively manage unpredictable external and internal changes. Agility encompasses a firm's capabilities related to interactions with customers, orchestration of internal operations, and utilization of its ecosystem of external business partners. Further, agility underlines a firm's success in continually enhancing and redefining its value creation, and competitive performance through innovations in products, services, channels, and market segmentation (Sambamurthy et al., 2003).

Cloud-Based Services and Their Role in Achieving Organizational Agility

Cloud computing, with the revolutionary promise of computing as a utility, has the potential to transform how IT services are delivered and managed. Cloud-based services can be categorized on the basis of applications they provide. We can have Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS). Software-as-a-Service (SaaS) is a software deployment model where applications are remotely hosted by the application or service provider and made available to customers on demand, over the internet (e.g. Salesforce.com). Platform-as-a-Service (PaaS) allows for the creation and deployment of applications and services, and includes the infrastructure to host the built applications. PaaS level provides a higher level of abstraction that allows developers to build applications without worrying about computer processes. It facilitates the quick roll-out and/or modification of operating system features (e.g. Google AppEngine, Force.com, and Microsoft's Azure). Infrastructure-as-a-Service (IaaS) refers to hardware for hire, in terms of servers, storage capacity, and network bandwidth, with the application and maintenance of that application layer remaining the responsibility of the customer (e.g. Amazon EC2, GoGrid, and Flexiscale).

Considering the way adoption of cloud-based services can revolutionize the business scenario, some research work has been done in this field. The literature suggests several factors that play an important role in using cloud-based services in an

organization. Some surveys related to cloud-based services have enhanced our understanding of the factors involved in adoption of cloud computing. Misra & Mondal (2011) viewed adoption of cloud-based services from the perspective of cost, and developed the ROI model taking into consideration various intangible impacts. There are a few studies such as Kondo, Javadi, Malecot, Cappello, & Anderson (2009) which discuss cloud computing versus desktop computing and identify that start-up cost of cloud computing may be higher but the pay-per-use cost model reduces monthly expenses by at least an order of magnitude. Trust, top management support, firm size, technology readiness, competitive pressure and trading partner pressure are some of the factors affecting the adoption of cloud based services (Low, Chen, & Wu, 2011; Wu, Lan, & Lee, 2011). On the other hand, concern about data security is the factor most frequently cited as discouraging the use of cloud-based services. Subashini & Kavitha (2011) pointed out that some key security elements should be considered, including data security, network security, data locality, data integrity, data segregation, data access, authentication and authorization, data confidentiality, web application security, data breaches, virtualization vulnerability, availability, backup as well as identity management and sign in process. Studies suggest benefits of cloud-based services outweigh these concerns.

Cloud-based services result in improving organizational flexibility and agility (Sultan, 2010). First, it helps in adoption agility of the IT resources including infrastructure, services and access to tools. It helps IT managers to access all these at a click and many times, experience the same through free trials thereby allowing managers to access and use the right IT resources. Thus, sensing and responding to business changes and facilitating the same through seizing and using cloud-based services provide flexibility to managers to respond with speed and surprise.

The salient characteristics of cloud computing based on the definitions provided by the National Institute of Standards and Terminology (NIST) are on-demand unlimited variety of self-service, broad network access, resource pooling, rapid elasticity, and measured services (Mell & Grance, 2011). These characteristics of cloud-based services help organizations in improving business agility. With the help of cloud-based services, an organization can reduce lead time for introduction of new products or services resulting in market capitalization agility. On the other hand, operational agility can be achieved through cloud-based services as they can be easily scaled up or down for meeting the fluctuating demand of customer workload. The servers are virtualized to provide agility and flexibility. Cloud computing completely changes the way developers deploy their applications. Instead of spending big with their own data centres or managed hosting companies or co-location services and then hiring operations staff to get it going, enterprises can just go to Amazon Web Services or one of the other cloud service providers, get a virtual server running in minutes and pay only for the resources they use. This dynamic allocation enabled by cloud also reduces the cost as organizations can select flexible payment models.

Theoretical foundation
The choice of whether to adopt cloud-based services in an organization is similar to an IT outsourcing decision, with some variations related to additional concerns and benefits which makes the adoption decision a bit more complicated (Nuseibeh, 2011). We are looking at the adoption decision from two

perspectives, namely, adopting new technology and cloud computing as a service. Specifically, we draw on the literature of Technology Acceptance Model (TAM), Diffusion of Innovation (DOI), Technology Organization and Environment (TOE) framework, and Technology-Task Fit theory to investigate the drivers of adoption of cloud-based services.

Technology Acceptance Model

The original version of Technology Acceptance Model (TAM) was proposed by (Davis, 1985). TAM theorizes that an individual's behavioural intension to use a system is determined by two factors: perceived usefulness (PU), defined as the extent to which a person believes that using the system will enhance his or her performance, and perceived ease of use (PEOU), defined as the extent to which a person believes that using a system will be free from effort (Venkatesh & Davis, 2000). The decision to adopt cloud computing, which is basically a web-based service, depends a lot on technology acceptance by the user. The user in this case is the IT manager and not the end user who has to analyze the cloud based services in terms of their usefulness. Further, as these services have reliability and graphical user interface characteristics similar to IT products, IT managers also have to evaluate it from the point of view of perceived ease of use by the employees who would be using the same. Two constructs - PU and PEOU - play a very important role in shaping the user's attitude and intention to adopt new technology.

Diffusion of Innovation

Diffusion of Innovation theory (DOI) introduced by (Rogers, 1995) talks about five attributes which facilitate adoption of any innovative technological solution. They are relative advantage, compatibility, triability, observability, and complexity. For our study,

we investigated the relative advantage of cloud-based services vis-à-vis traditional IT services.

Technology Organization Environment (TOE) Framework

According to the TOE framework (Tornatzky & Fleischer, 1990) three aspects of an organization that influence the decision to adopt new technological innovation are Technological context, Organizational context and Environmental context. Technological context describes both the internal and external technologies relevant to the firm. Organizational context refers to descriptive measures about the organization such as scope, size and managerial structure while Environmental context is the arena in which a firm conducts its business-its industry, competitors, and dealings with the government (Oliveira, Martins, & Lisboa, 2011). Technological context is relevant in our study as internal technological capabilities of an organization will be the basis of the decision of whether to adopt cloud-based services or not.

Technology–Task Fit Theory

Technology–Task Fit (TTF) is the degree to which a technology assists an individual in performing his or her range of tasks. More specifically, TTF is the correspondence between task requirements, individual abilities, and the functionality of the technology (Goodhue & Thompson, 1995). More specifically, the TTF model suggests that technology adoption depends in part on how well the new technology fits with the requirement of a particular task (Klopping & McKinney, 2004). According to Goodhue & Thompson (1995),quality, authorization, compatibility, ease of use, training, production timeliness, systems reliability, and relationship with users are important characteristics of the TTF theory.

In case of cloud-based services, timeliness, system reliability, and relationship with users are important factors in the adoption decision.

Proposed Conceptual Model and Propositions
In this study, we have developed a conceptual model from the organization's point of view which needs to make a decision regarding adoption of cloud-based services for achieving agility. The proposed theoretical model for our study is shown in Figure 1. The proposed theoretical model has two parts. The first part discusses the drivers of cloud-based service adoption which can help the organization in making decisions. On the other hand, the second part talks about different types of agilities an organization can achieve through cloud-based service adoption.
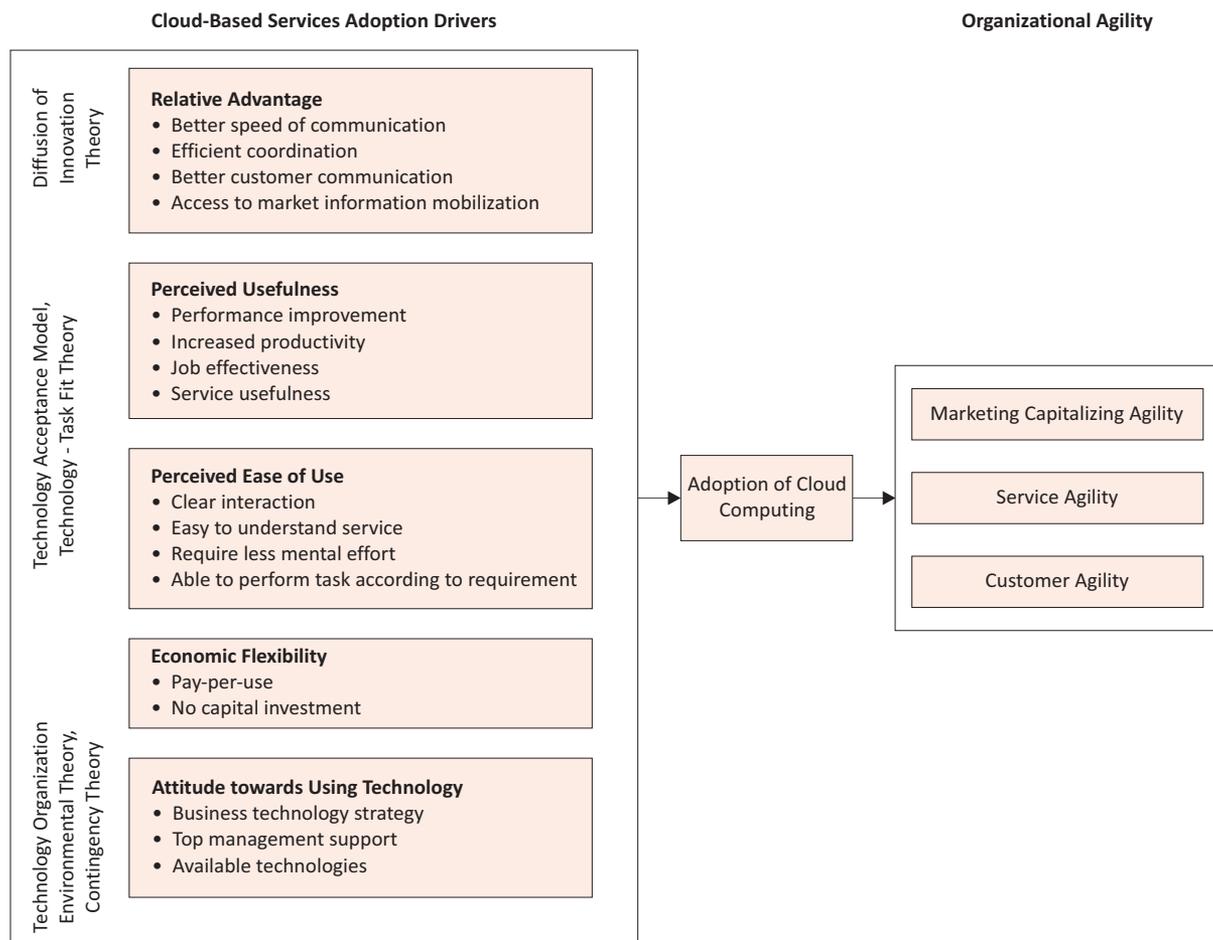
Cloud-Based Services Adoption Drivers   Organizational Agility

Diffusion of Innovation Theory

Relative Advantage
- Better speed of communication
- Efficient coordination
- Better customer communication
- Access to market information mobilization

Technology Acceptance Model, Technology - Task Fit Theory

Perceived Usefulness
- Performance improvement
- Increased productivity
- Job effectiveness
- Service usefulness

Perceived Ease of Use
- Clear interaction
- Easy to understand service
- Require less mental effort
- Able to perform task according to requirement

Technology Organization Environmental Theory, Contingency Theory

Economic Flexibility
- Pay-per-use
- No capital investment

Attitude towards Using Technology
- Business technology strategy
- Top management support
- Available technologies

Adoption of Cloud Computing

Marketing Capitalizing Agility

Service Agility

Customer Agility

Figure 1: Proposed Conceptual Model

Cloud-Based Service Adoption Drivers
In the current economic climate where the expectations of efficiencies and cost savings are growing from IT organizations, adoption of cloud-based services provides a good opportunity to get started with cloud computing and reap the associated benefits of agility, cost savings and on-demand services while meeting the stringent enterprise security, performance and reliability requirements. The decision to adopt cloud-based services depends

on a number of factors and will be different for different organizations. Based on literature review and theoretical background, we have identified six constructs namely Relative Advantage (RA), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Economic Flexibility (EF), and Attitude towards Using Technology (ATUT) as factors influencing the adoption of cloud-based services.

Relative Advantage (RA). Relative advantage is the degree to which a technological factor is perceived as providing greater benefit for organizations. Cloud-based services, which allow operations to be generalized and mobilized through internet transactions, can substitute for or complement any IT application in an organization.(Rogers, 1995).Thus, Cloud-based services provide relative advantage in terms of availability of services throughout the world at a click resulting in faster alignment of solutions with the organization's requirement. Further, they can be deployed for use in the organization very fast thus further enabling the organization to deliver business services with speed and surprise. Cloud-based services include speed of business communication, efficient coordination among firms, better customer communications, and access to market information mobilization (Low et al., 2011). Thus, the portfolio of cloud-based services provides adoption agility as well as a huge portfolio of services. This is perceived as providing relative advantage over traditional IT services. Thus:

Proposition 1: Relative advantage will positively affect the likelihood of adopting cloud-based service by an organization.

Perceived Usefulness (PU). Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance(Davis, 1989). Perceived usefulness of a web-based service can be judged based on improvement in performance, productivity, job effectiveness and service usefulness. Cloud-based services improve the performance, productivity of IT managers who decide to adopt them because you can deploy these services with speed and surprise which in the earlier context were taking anywhere between three to nine months. As cloud-based services are web-based, organizations can have 24/7 access to various business processes anytime, anywhere through laptop, mobile, etc. Thus, the decision makers who perceive that cloud-based services will help them in achieving all these benefits are more likely to adopt cloud-based services. Thus:

Proposition 2: Perceived Usefulness will positively affect the likelihood of cloud-based service adoption by an organization.

Perceived Ease of Use (PEOU). Perceived Ease of Use refers to the degree to which a person believes that using a particular system would be free of effort (Davis, 1985). Extensive research in the past provides evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly (Hernandez & Mazzon, 2007; Guriting & Ndubisi , 2006; Eriksson, Kerem, & Nilsson, 2005). According to Venkatesh & Davis (2000), constructs related to control, intrinsic motivation, and emotions are anchors for the formation of perceived ease of use regarding a new system. These behaviours are desired from IT managers who take a decision to adopt cloud based services. In terms of cloud-based services, perceived ease of use will mean whether the IT managers find clear interaction and easy to understand service, less mental effort in using the

service and ability to perform tasks according to an organization's requirement. Further, since these services can be provided on a trial basis, it does not limit the IT manager and users to perceive the use but they can experience the use of these services and provide the feedback. Hence, this construct can be further modified as ease of use rather than perceived ease of use. Further, since these services will be delivered through cloud, they would be designed with more product-like features and easy access as compared to customized IT services. Also, it is in the interest of cloud service providers to make the interface easy, provide 24/7 helpdesk, etc. as against in-house services by the IT department. Thus:

Proposition 3: Perceived Ease of Use will positively affect the likelihood of cloud-based service adoption by an organization.

Economic Flexibility (EF). The biggest advantage of cloud-based services is that capital expenditure on hardware, software, and services can be avoided. Customers of cloud service providers typically pay a subscriber's fee, essentially "renting" their desired services and using them only when they are needed. Factors that impact the scale of any potential cost savings include the efficiency of a company's on-premise data centre as compared to the cloud vendor's, the company's existing operating cost, the level of adoption of cloud based services, and the type of functionality being hosted in the cloud. Thus, economic flexibility in cloud-based services can be analyzed in way of payment methods, duration and functionality of service hosted (Assunção & Costanzo, 2009; Kondo et al., 2009). Flexibility to choose payment and service according to an organization's requirement for a specific time period attracts organizations to select cloud-based services. Thus:

Proposition 4: Economic Flexibility will positively affect the likelihood of cloud-based service adoption by an organization.

Attitude towards using Technology (ATUT). The decision to adopt new technology is significantly influenced by organizational, technical and environmental factors. An organization's attitude towards adoption of new technology plays an important role in this decision. Business technology strategies, top management support, and pool of available technologies in the organization are some of the factors which can help in identifying an organization's attitude towards using new technology. If the top management is willing to invest and encourages innovation in technology, then adoption of new technology becomes easy. Cloud-based services allow exploring innovative technology without investing much upfront. This flexibility helps to change the attitude of managers towards cloud-based services because the risk of adoption of technology is not very high. Thus:

Proposition 5: Positive attitude towards using technology will positively affect the likelihood of cloud-based service adoption by an organization.

Organizational Agility

The second part of our theoretical model talks about different forms of agility an organization can achieve for different functions. In this study, we have identified three types of agility, namely: market capitalizing agility, operational agility and customer agility.

Market capitalizing agility. Market capitalizing agility is the ability to quickly improve products or services according to the change of customers' preferences. It is an externally-focused agility, achieved by continuously

monitoring the market status and trends and communicating with customers (Sambamurthy et al., 2003). Raw data captured from the market can be converted into meaningful information which can help senior executives to make decisions about the improvement of products or services. Market capitalizing agility can precisely and rapidly sense the change of market and transfer this signal to a firm.

Market capitalizing agility represents a firm's ability to quickly respond to and capitalize on changes through continuously monitoring and quickly improving product/service to address customers' needs. Cloud-based service implementation not only lowers the barrier to innovation but also helps an organization to introduce new business models and new ways to deliver web-based services to customers which are easily accessible from anywhere in the world (Marston, Li, Bandyopadhyay, & Ghalsasi, 2011). Implementation of cloud-based services takes no time as they are web based services and anyone can start using these services as soon as they make the decision to adopt them. This helps organizations to avoid time in planning and implementing IT infrastructure in an organization and reduces time to market their product or service. This agility emphasizes a dynamic, aggressively change-embracing, and growth-oriented entrepreneurial mind set about strategic direction, decision making, and judgment in uncertain conditions (Sambamurthy et al., 2003; Volberda, 1996). Thus:

Proposition 6: Adoption of cloud-based services will positively impact the market capitalization agility in an organization.

Operational agility. Operational agility refers to a firm's ability in its internal business processes to physically and rapidly cope with market or demand changes (Dove, 2001;Sambamurthy et al., 2003). For example, operational agility can integrate internal resources quickly to undertake the modification of a product or service scheme, and thereby improving productivity. This agility highlights flexible and rapidly responding operations as a critical foundation for enabling fast and fluid translation of innovative initiatives in the face of changes(Lu & Ramamurthy, 2011). This ability would help executives to make the right decision to produce or service the right things which can be sold out smoothly.

Operational agility in the service sector is defined as the capabilities that are associated with exemplar services. Organizations use these competitive capabilities to excel in service quality, delivery, flexibility and provide their services at a competitive cost. For example, in the 1990's, McDonald's needed more operational agility in operations to compete. The operational agility adopted by McDonald's in its services along with flexible production processes, helped it in gaining sustainable competitive advantage. It not only improved its customer service but also invested in training and building technical skills. The investment in Information Technology in the service-based processes has helped it leverage its quality in terms of customer service.

Due to a rapidly changing business environment and the pressure to become more cost-effective in the face of huge competition, many organizations do not have the requisite time or resources for improvement of internal processes. Cloud-based services help strengthen the internal processes and enhance the quality of business processes. Cloud-based services reduce the task of implementing hardware, applications configuration changes which results in

improving the efficiency of processes. It also helps in enforcing and maintaining internal security and auditing polices as well as compliance documentation.

Based on the above discussions, we can say that the decision to adopt cloud-based services will have a huge impact on operational agility resulting in internal process improvement and which in turn, will lead to better financial performance, which means improved organization performance. Thus:

Proposition 7: Adoption of cloud-based services will positively impact the operational agility in an organization.

Customer Agility. Customer agility is defined as the degree to which a firm is able to sense and respond quickly to customer-based opportunities for innovation and competitive action. Today, customers act as co-creators and contribute to product design and development instead of being merely receivers of the products and services. To be agile at this step, an enterprise should have the ability to co-opt with customers in exploring and exploiting the opportunities for innovation and competitive action. This is called customer agility (Roberts & Grover, 2012; Sambamurthy et al., 2003).

Understanding customer perspective is very important for achieving customer agility. Cloud-based services can help in creating the environment for customers to interact with the organization and be part of innovative implementations. Performance of an IT application or service can be judged on parameters like availability, trustworthiness, reliability and speed. Cloud-based services are available to customers anytime, anywhere and can be accessed using any device (PC, laptop, mobile, smartphones, etc.). The

best customer experience lies in a combination of customer service, support and functionalities. Cloud-based services offer balanced offerings to customers to achieve this experience. There should be a strong match between customer sensing and responding capabilities for greater customer agility. Cloud-based IT infrastructure reach and richness enhance customer agility by providing 24/7 access to the customer through portals and use of virtual communities (Sambamurthy et al., 2003). For example, the marketing and sales department aims to attain the exact customer demands through the forecasting process. In such a case, using a cloud-based sales force management solution can ease the issue because the information can directly be exchanged between the sales department at the headquarters and the local market anytime and through any media. Thus:

Proposition 8: Adoption of cloud-based services will positively impact the customer agility in an organization.

Discussion

This research model presents the adoption of cloud-based services and ability to achieve organizational agility. Any kind of agility is defined as the ability to sense and respond with speed and surprise.. Those organizations which developed robust processes and knowledge reach and richness marched ahead of the others. It required long-term strategic IT planning and considerable investment by organizations. However, there has been a paradigm shift today due to availability of these services on cloud. Thus, long-term planning and higher investment no longer provides competitive advantage. On the contrary, smaller investment in innovative services helps organizations to open new challenges for others in the market. Thus, we as researchers, feel that cloud computing will

definitely help organizations achieve customer agility, operations agility and market capitalizing agility. Thus, it would force IT managers to explore cloud-based services while vendors would enhance the scope of services in the cloud platform. Further, we propose that this adoption would be much higher in the SME sector providing these players greater agility in managing IT infrastructure.

These findings have significant implications and great value to managers and cloud-based service providers in terms of understating the role of cloud-based services adoption in achieving organizational agility. Cloud-based service providers can use this model to understand why some organizations choose to adopt cloud-based IT services and others don't. They can use this information to improve their interaction with customers and acquire new ones. On the other hand, managers or decision makers can use this model to access cloud-based services and enhance their role in achieving organizational agility.

Future Research Directions

Cloud-based technologies have already affected the business environment. By offering a conceptual model of adoption of cloud-based solutions and their impact on organizational agility, we have offered some basic guidelines to managers for decision making regarding implementation of cloud services in an organization. Our research also opens up several avenues for future research. There is an opportunity to further investigate the impact of each driver of adoption of cloud-based services on different types of agility associated with various organizational processes such as manufacturing agility, supply chain agility, etc. The theoretical model can be tested through empirical research and new constructors can be added. Further, a comparative study can be conducted between those organizations using traditional IT services vis-à-vis organizations using cloud-based services for achieving agility. Future studies can also examine adoption of cloud-based services by different sectors in both qualitative as well as quantitative way.

Conclusion

While the approach to achieve agility remains elusive to many firms, findings from our study emphasize the essential role played by cloud-based services in achieving agility, which has not been examined by previous research. We hope that this study will provide some practical implications to attain agility, which is especially significant for firms competing in today's turbulent business environment. Both businesses and IT managers benefit from the model developed in this study in understanding not only the drivers of adoption of emerging cloud-based technologies but also the impact of these emerging technologies on achieving market capitalization agility, service agility and customer agility.

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