Decision points for adoption Cloud Computing in SMEs

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Abstract
This study is on adoption of cloud computing by small and medium enterprises (SMEs) in India. With advent of cloud computing technologies, firms are able to concentrate on their core activities while outsourcing the entire technology related supporting processes. This approach has been adopted by many firms which have resulted in lowering operational cost without losing focus on customer needs. However, the adoption has not been high among small and medium enterprises. This paper, through primary survey, finds out different situations for adopting cloud computing services. It was found that SMEs can benefit the most if they adopt cloud services for computation intensive jobs like Data Mining, Optimization, risk modeling and simulation. The other advantages for SMEs are lowered investment in hardware, more efficient use of computing systems in existing data centers, easier scale-up of the applications and services and cost saving on technology infrastructure and faster software upgrades without much expense. The results can be used by SMEs as decision point for adopting cloud services.

Keywords: Small and medium enterprises, SME, cloud computing, adoption of cloud computing.

Introduction
SMEs are defined as businesses that employ fewer than 250 people and are independent from other organizations. However, SMEs are diverse: some are dynamic and flexible, with a

great Power to innovate and a vast range of diversity, others traditional, based on family involvement, embedded in local business environments, and others are start-ups, fragile organizations striving for life and subsistence. Based on MSME Act, 2006, in India, SMEs are classified broadly into:

(a) Manufacturing SMEs engaged in the manufacture / production of goods pertaining to any industry.

(b) Service industry SMEs, which ave been defined in terms of their investment in equipment (excluding land & buildings) and further classified into small Enterprises with investment above Rs .10 lakh (USD 45 million) & up to Rs.2 crore(USD 900 million) and medium Enterprises- investment above Rs.2 crore (USD 45 million) & up to Rs. 5 crore (2250 million USD).

The use of Information Technology has become almost inevitable in business. The small and medium enterprises (SMEs) lag far behind in terms of applications of information technology (IT) through the World. The proposed study focuses on examining the levels of IT interventions in SMEs and the fruits there of. It will also address the issues like what benefit the firm is going to get by investing in IT and its impact on productivity, profitability and customer surplus of the firm. It is to be considered as a source of strategic value of the firm in terms of operational support, managerial productivity and strategic decision aids in the state of Odisha in India.

Information Technology (IT) adoption has been defined in several ways depending on the context and objectives. (Joseph (2009) suggests that IT provides many benefits to the business. Napier et al (2001) pointed out that by implementing and using IT sellers can access narrow markets segments that arc widely distributed while buyers can benefit by accessing global markets with larger product availability from a variety of sellers at reduced costs. Improvement in product quality and the creation of new methods of selling existing products are also benefits. The benefits of IT are not only for large firms, small and medium sized enterprises can also benefit from technology investment. In addition, it can "level the playing field'' with big business, provide location and time independence, and ease communication. However, in spite of the many potential advantages of technology, its adoption by business houses remains limited. For example, a survey conducted by Verizon in 2009 found that 36% of small businesses implemented technology primarily to advertise and promote their business, compared to 9% who established one to enable their business

processes. Similarly, in a survey of 444 SMEs during 2002, Pratt (2002) found that many SMEs were reluctant to invest in IT, more than 80% were only using the internet to communicate (via e-mail) and gather business information. Does this mean that top managers/ owners of SMEs do not realize the strategic value of IT to their business or does this mean that they encounter significant barriers to implementing it? Ballantine et al. (1998) identified unique characteristics of SMEs as lack of business and IT strategy, limited access to capital resources, greater emphasis on using IT and IS to automate rather than collecting information, influence of major customers, and limited information skills. The scenario is still worse in India. This study tries to find the factors that influence decisions related to usage of IT specifically cloud computing in India.

The proposed study will represent a fusion of two independent research streams, viz. the perceived strategic value of certain information technologies to top managers including cloud computing and factors that influence the adoption of cloud computing.

Many studies have focused on the relationship between IT investment and firm's performance in large corporations. For example, Hitt and Brynjolfsson (2000) investigated how IT affects productivity, profitability, and consumer surplus. They found that IT increases productivity and consumer surplus but not necessarily business profits. Barua, Kriebel and Mukhopadhya (1995) concluded that the productivity gains from IT investments have generally been neutral or negative, while Tallon and Kraemer (2003) measured IT payoffs through perceptual measures and argued that executives rely on their perceptions in determining whether a particular IT investment creates value for the firm.

The majority of the research has proposed a direct causal link between IT investment and firm performance. However, Li and Ye (1999) empirically tested the moderating effects of environmental dynamism, firm strategy, and CEO relationship on the effect of IT investment on firm performance and found that IT investment appears to have a stronger positive impact on financial performance. When there are greater environmental changes, the strategy of the company is more proactive, and closer CEO ties. In a similar line of inquiry, Lee (2001) created a multi-level value model that connects the use of IT to a firm's profit; she pointed out that the effect of incorporating IT should not be considered alone and argued that there arc other variables that can influence the relationship. Her IT business value model incorporated other variables, such as origination cost, cycle time, loan

officer retention, control over external partners, and marketing effort and she found that IT can reduce cycle time and cost, and change the way business is run. She concluded that “one has to know what other variables to manage and how to manage them in order to make IT investments profitable."

Few studies have focused on the perceptions of top management regarding the strategic value of e-commerce Amit and Zott (2001) is one of the few that has tried to deal with this and even though they focused on e-business, their results can be generalized to e-commerce. They developed a value-drivers model, which included four factors found to be sources of value creation: transaction efficiency, complementarities, lock-in, and novelty.

Through an empirical study, Subramanian and Nosek (1992) identified three factors that were found to create strategic value in IS: operational support, managerial productivity, and strategic decision aid. In each of these factors they utilized different items that were found to have high convergent validity and reliability. Their factors seem to be applicable to e-commerce.

Literature Review

Davis proposed Technology Adoption Model (TAM), a model that has been tested in many studies. Lederer, Maupin and Zhuang (2000) summarized sixteen articles that tested TAM model for different technologies (e.g. ATM, e-mail, 'Netscape, Access, Internet, Word, and Excel). In their model, they considered beliefs about ease of use and perceived usefulness as the major factors influencing attitudes toward use, which, in turn, affected intentions to use.

Many other studies have attempted to describe the factors influencing IT adoption in SMEs. For example, Iacovou, Benbasat and Dexter (1995) studied factors influencing the adoption of electronic data interchange (EDI) by SMEs in different industries; they included perceived benefits, organizational readiness, and external pressure. To measure perceived benefits they used awareness of both direct and indirect benefits. Variables measuring organizational readiness were the financial and technological resources. In order to measure external pressure, they considered competitive pressure and its imposition by partners. The results suggested that a major reason that small firms become EDl-capable is due to external pressure (trading partners). As in the case of Iacovou, Benbasat and Dexter (1995), external pressure was the most important factor contributing to intent to adopt EDI. Chau (1996) determined the factors influencing the adoption of EDI in small businesses using a

technology, organization, and environment framework. The technology factor incorporated perceived direct and indirect benefits of EDI. The organization factor consisted of perceived financial cost and perceived technical competence. The environment factor was similar to external pressure in Iacovou, Benbasat and Dexter (1995)'s study but included a new variable perceived government pressure. There, perceived indirect benefits were not found to be a significant factor. Igbaria, Guimaraes and Davis (1995) determined the factors affecting personal computer acceptance in small businesses. Among the factors that directly influence personal Computer acceptance were perceived ease of use and perceived usefulness. The intra-organizational (internal computing support and training, and management support) and, extra-organizational (external computing support and training) variables were hypothesized to influence adoption through perceived usefulness and ease of use. Inconsistent with research in large firms, relatively little support was found for the influence of internal support and training on perceived ease of use and usefulness. However, perceived ease of use turned out to be an important factor in explaining perceived usefulness and system usage. It was also found that perceived usefulness is a strong antecedent of system usage.

Based on the literature, Premkumar and Roberts (1999) identified the use of various communication technologies and the factors that influence their adoption in small businesses located in rural areas. The technological studies included EDI, online data access, e-mail, and the Internet. The factors studied as potential discriminators between adopters and non-adopters of communication technologies were grouped into three broad categories innovation, organizational, and environment characteristics. Within the innovation factor, they included relative advantage, cost, complexity, and compatibility. Organizational characteristics included top management support, and IT expertise. Finally, within the environmental characteristics variable, competitive pressure, external support, and vertical linkages were considered. The results suggested that relative advantage, top management support, and competitive pressure were factors influencing the three communication technologies. Compatibility, complexity, external pressure, and organizational size were found to be significant discriminators between adopters and non-adopters of online data access technology. Cost was found to be an important discriminant factor only for the adoption of the Internet. IT expertise was not found to be an important factor that

discriminates between adopters and non-adopters. Finally, vertical linkage was found to be an important discriminant factor for online data access and the Internet adoption.

The adoption of the Internet was also studied by Mehrtens, Cragg and Mills (2001). In order to develop a model of Internet adoption, they conducted a case study on seven SMEs. First, they considered four SMEs that had adopted the Internet. Based on Iacovou, Benbasat and Dexter (1995)'s work and the results of the preliminary analysis, they devised their model using perceived benefits, organizational readiness, and external pressure as determinant factors. Then, to provide theoretical replication they considered three non-IT SMEs, of which two had adopted the Internet and one had not. All the factors were found to affect Internet adoption by the small firms. Chang and Cheung (2001) also determined factors that influence internet adoption with similar results.

In a more recent study and following a similar line of inquiry, Riemenschneider and McKinney (1999) studied the factors that influence web site adoption by SMEs. They proposed a combined model using the theory of planned behaviour (TPB) and TAM. They tested individual models, partially integrated models, and fully integrated models by using structural equation modeling. They found that the combined model provided a better fit.

The emerging field of cloud computing has not been ignored in the analysis of adoption. Mirchandani and Motwani (2001) investigated the factors that differentiate adopters from non-adopters of new technology in small businesses. The relevant factors included enthusiasm of top management, compatibility of cloud computing with the work of the company, relative advantage perceived from e-commerce, and knowledge of the company's employees about computers. The degree of dependence of the company on information, managerial time required to plan and implement different applications, the nature of the company's competition, as well as the financial cost of implementing and operating the application were not influencing factors. Similarly, Riemenschneider and McKinney (1999) analyzed the beliefs of small business executives on the adoption of new technology. They found that all the component items of the normative and control beliefs differentiated between adopters and non-adopters. In the behavioral beliefs (attitude) group, however, only some items such as distribution of information, improving information accessibility, communication, and the speed with which things get done were found to differentiate adopters from non-adopters.

Support for the causal link between perceptions of strategic value and adoption of IT and cloud computing comes from different studies that associate individual perceptions and behaviour. The theory of planned behaviour (TPB) is a well-established intention model that has been proven successful in predicting and explaining behavior across a wide variety of domains, including the use of information technology. In general terms, the TPB establishes that perceptions influence intentions, which in turn influence the actual behavior of the individual. By considering the intention to adopt cloud computing as the target behavior, the use of intention models theoretically justifies the causal link between perceptions and adoption.

This causal link has been studied and the results indicate that managers' perception and attitudes towards cloud computing are strongly associated with its perceived usefulness for enabling business processes. Factors that influence cloud computing adoption decisions are related to acceptability by clients and customers, degree of technical knowhow in implementing technology, concern about information and financial security, high cost of failure if the implementation fails, and time and effort required to implement it.

Research Question

Our research looks to investigate the perception and familiarity of Indian SMEs with cloud computing. The following research questions are addressed in this regard:

1. What is the level of awareness among SMEs regarding cloud computing?
2. What is the level of willingness among SMEs to invest in cloud computing?
3. What are the potential reasons behind possible engagement with cloud computing among the SMEs?
4. Which layer of cloud computing architecture is most likely to be used?
5. Which information technology services are most likely to be outsourced?
6. What are the main attributes behind choosing a cloud computing vendor?
7. What are the main concerns related to adoption of cloud computing services?

Methodology

Research Approach

The research presented in this paper uses survey design to investigate the research questions identified above. A web-based survey instrument was devised to collect responses from the potential study respondents (discussed later). The questions were based on various attributes of Cloud based apps and services.

There were a total of eleven questions in the survey. The survey was carried out in an eight week period between 1st May and 30th June, 2012. It took an average of 15 minutes for each to fill out the survey questionnaire.

We have used descriptive statistics to order to present the data collected from the survey. The reason behind using descriptive statistics is that the sample size is low (discussed later), which restricted use of statistical techniques in order to demonstrate significance of findings.

Measurement of Constructs

The constructs of this research include awareness of cloud computing, willingness to invest in cloud computing, and specific attributes of interest related to cloud computing.

The first construct attempts to capture the level of awareness among SMEs regarding cloud computing. The level of awareness has been measured as a 3-point scale with values signifying 'yes', 'may be', and 'no'.

The second construct assess the willingness of SMEs to invest in cloud computing. We have used the percentage of annual revenue allocation on cloud computing as a measure of proxy to assess the organizational willingness towards cloud computing. This has been captured using a 5-point ordinal representation indicating the following: 'Less than 50 Lakh', '50 Lakh – 1 Crore', '1 Crore – 5 Crores', '5 Crores – 10 Crores', 'More than 10 Crores'.

The other specific attributes of interest that the research have investigates are reasons behind using cloud computing, concerns related to adopting cloud computing services, etc (please refer to the Section: Research Question). The response options for each of these were derived from the literature.

Sample Description

In order to minimize guessing responses, the survey targeted to CEOs, or IT heads of the companies only.

A multi-stage cluster sampling technique was used in order to select the study sample. The geography of India was divided into 4 broad regions, viz, North, West, South and East respectively. Then within each of these regions, the following cities are chosen purposefully: Delhi/NCR (from north zone), Mumbai (from west zone), Hyderabad/Bangalore/Chennai (from south zone), and Bhubaneswar/Kolkata (from east zone). The reason for purposefully selecting these cities from the respective zones is that these cities are considered to be the main base of the IT division of the SMEs targeted in this study.

Now, in order to access potential study respondents from organizational divisions located in the above selected cities, the survey instrument was distributed using the online channel. The survey was created using the services offered by the portal http://www.instant.ly/ .

Then the survey link was forwarded to employees of some selected SMEs belonging to the preselected cities (please refer above). In order to contact these employees, a database was formed initally of vaious consultants, IT organizations, and existing clients of BATOI Systems Private Limited. This database was created by google search, information available on o various consultants/architects on portal like www.Odisha360.com/yellow-pages, information available on networking portals like LinkedIn, and supplemented by information provided by the sales & marketing department of BATOI Systems Private Limited. These employees were then further followed up via email/phone. The survey was made available online for eight weeks. The final sample size (i.e. the respondents who correctly responded to the online questionnaire) was 40. Factors like the time duration over which the survey was accessible (again driven by the time allocated for carrying out the study) was instrumental behind attaining the low sample size. Furthermore, many potential respondents refused to respond to the questionnaire as they were quite apprehensive sharing organizational information.

The SMEs to which the survey respondents belonged to 14 different Industries (Figure 1), the top four being Manufacturing (15%), Real Estate (13%), Services (Consulting) (10%), and IT (10%). The SMEs which belonged to industries that were not listed has been clubbed under the category Others (comprising of cateogies like Consumer Complaint Forum and HR Outsourcing).

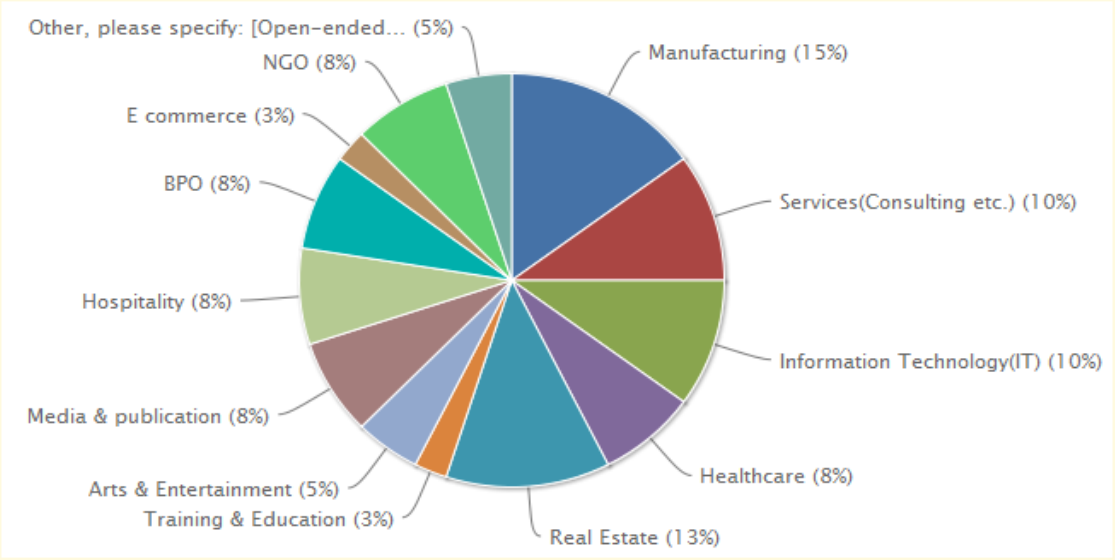

Figure 1:

In terms of number of employes in SMEs, a majority (40%) of the SMEs belonging to our study sample had less than 50 employees (Figure 2).

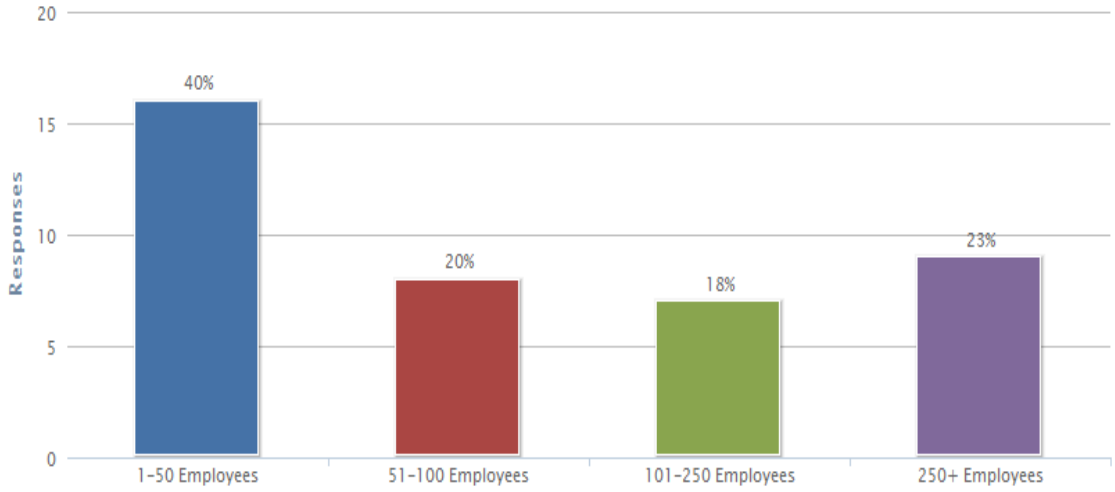

Figure 2

Finally, in turns of annual revenue, a majority (28%) of the respondent organizations belonged to the category 1 crore – 5 crore (Figure 3).

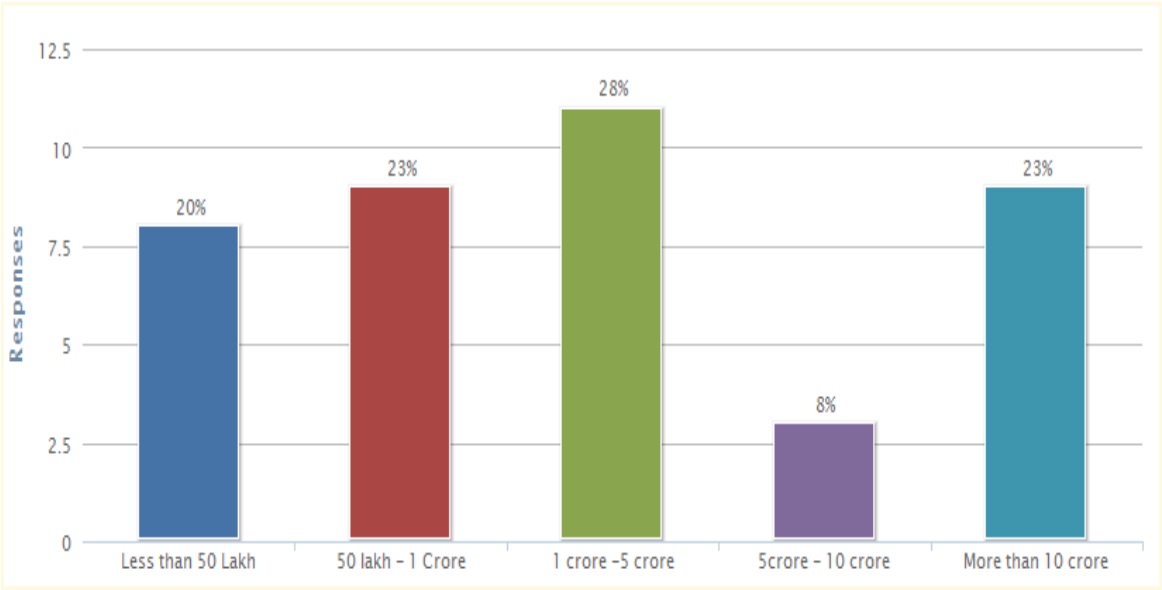

Figure 3

Validation of Research Methods

Our sample represented a broad inclusion of industry categories to which the respondent SMEs belonged to. This extensive representation is likely to reduce concerns of bias in the sample. However there can be non response bias having implications on the study findings.

The results of the research should be interpreted with some caution. Bias due to mis-interpretation of questions is possible in the survey. The results were not also not validated against the actual data and hence is susceptible to information bias.

The major limitation of the study is the low number of respondents to the survey questionnaire. This presents us to establish statistical significance of results reported in the next section. However the focus of our work is more of understanding of the phenomena from the SME context. Patterns uncovered in the research are early insights, and is expected to provide basis for further work in this area.

Results

Here we address the findings that emerged based on the survey data, and in the process answer the research questions that we have posed earlier.

1. *What is the level of awareness among SMEs regarding cloud computing?*

   Most (93%) of the respondents belonging to the different SMEs already knew about cloud computing and its benefits even though a number of them were not using cloud based services (data not shown). Though many of them have still not started using cloud based services, the level of awareness was there. Only 3% of the respondents (N: 40) accepted that they were not aware of cloud computing. The rest (4%) had heard of cloud computing but did not know what was it.

2. *What is the level of willingness among SMEs to invest in cloud computing?*

   In terms of willingness to invest in cloud computing services measures as a percentage of annual revenue, data of 28% respondents indicated that their SMEs had invested in the range of 1 crore – 5 crore on cloud computing services. Further data indicated, that more than 50% respondents belonged to SMEs having greater than 1 crore annual investment on cloud computing, which was a promising figure. The breakup of the respondents in the previously identified investment categories (please refer to the 'Measurement of Constructs' section) is shown in Figure 4.

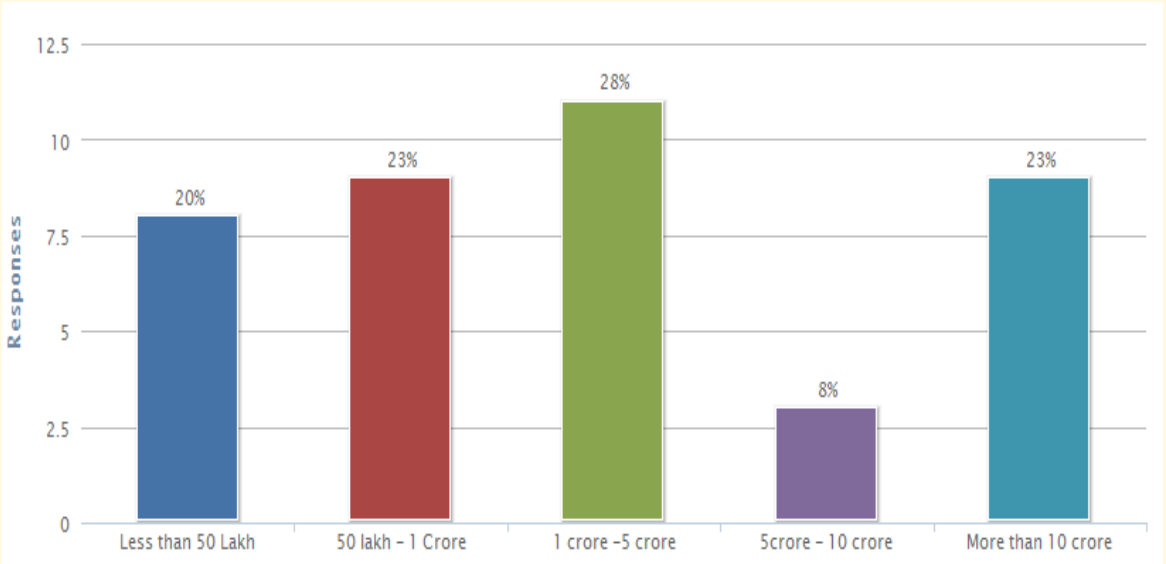

Figure 4

3. *What are the potential reasons behind possible engagement with cloud computing among the SMEs?*

   The respondents were asked on the most important factors, which was instrumental behind driving their SMEs to invest in cloud computing. Data based on 40 responses indicated cost savings (i.e. avoiding capital expenditures) to be the most important factor (19%), while controlling marginal profit emerged as the second most important factor (18%). The findings were expected as these are identified to be the two main reasons why organizations prefer to outsource some of their services (Norton Rose, 2011). A percentage breakup of the responses is shown in Figure 5.

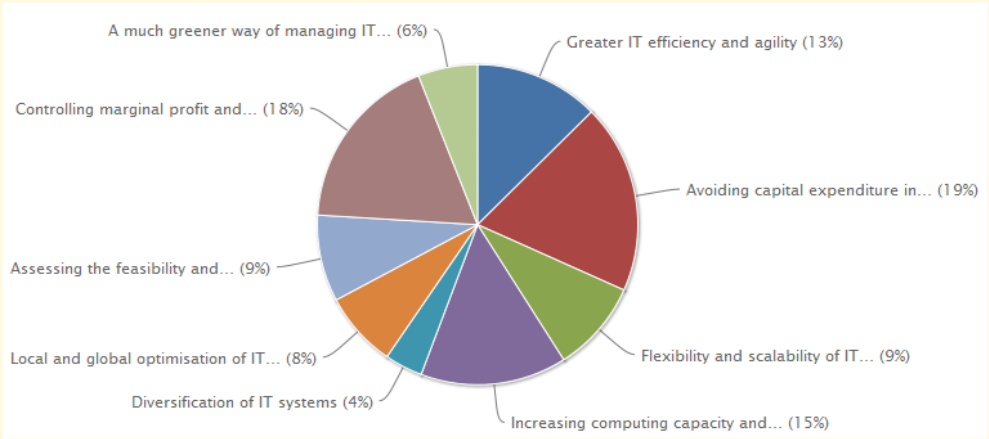

Figure 5

4. *Which layer of cloud computing architecture is most likely to be used?*

   Data based on 40 responses suggested that the respondents were more willing (45%) to use individual software packages (Software as a Service or SaaS), while 43% respondents preferred to use the complete operating system (Platform as a Service or PaaS). 10% respondents preferred to use just the infrastructure services (Infrastructure as a Service or IaaS, and the remaining (2%) opted for only the security services.

5. *Which information technology services are most likely to be outsourced?*

   It terms of IT services that were more likely to be outsourced, data based on the survey responses indicated CRM sales management to be the most preferred (18%). No significant percentage difference could be observed between the most preferred service to be outsourced and the least preferred service to be outsourced i.e. accounting and finance (11%, refer to Figure 6).

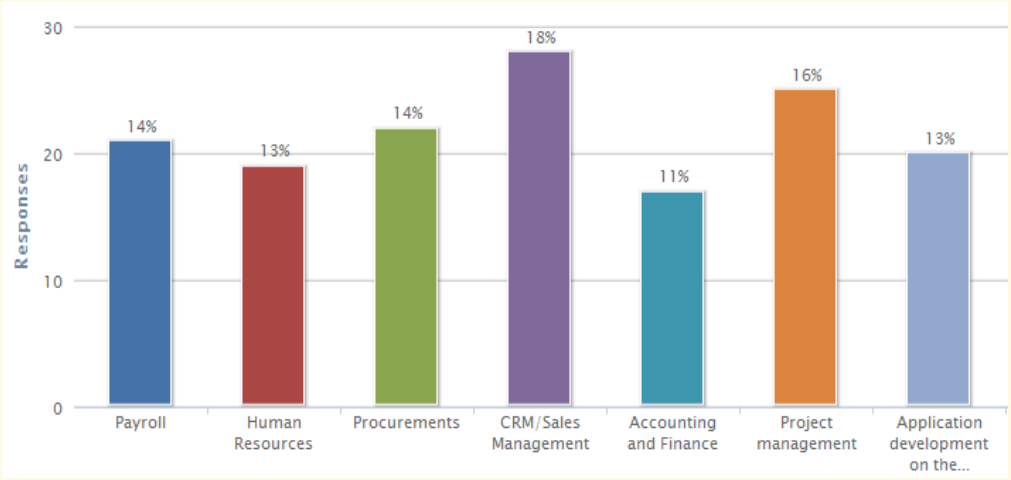

Figure 6

6. *What are the main attributes behind choosing a cloud computing vendor?*

The different attributes (along with their interpretation) that a cloud computing vendor should possess is listed in Table 1.

Table 1: Attributes and their Interpretation

Attributes	**Interpretation**
Provider Reputation	This refers to the attitude, belief, and trust the customers have on the solution provider.
Solution Competency	This refers to the ability to generate solutions related to some problem domain.
Pricing Tariff	Pricing Tariff can be of the following three types: • Pay per use: Metered services (also called pay-per-use) is any type of payment structure in which a customer has access to potentially unlimited resources but only pays for what they actually use. • Flat rate: A flat fee, also referred to as a flat rate or a linear rate, refers to a pricing structure that charges a single fixed fee for a service, regardless of usage. • One time purchase: The customer has to pay once for the services chosen by him.
Migration Effectiveness	This refers to the effectiveness of handling relocation of application(s) from on-premises to the cloud
Cost Effectiveness	This refers to the potential cost benefits achievable by adopting a cloud based solution in place of a traditional solution
Customer Support	This refers to the services provided by the vendor to its customers before, during, and after a purchase

The survey results indicate that the choice of cloud computing provider is mostly driven by pricing tariff (24%), while the least preferred attribute is migration effectiveness (7%) (Please refer to Figure 7). The results seems to suggest that the solution quality of the vendor is not as important as the pricing of the service. This seems counter-intuitive and an interesting research question as a followup of this study could

be investiagte the difference in perceptions of service quality provided by reputed cloud computing providers. This difference, if low, might provide a tentative explanation to the fact that given perceptably low differce in soluton quality, the vendor charging the least price is likely to be the most preferred.

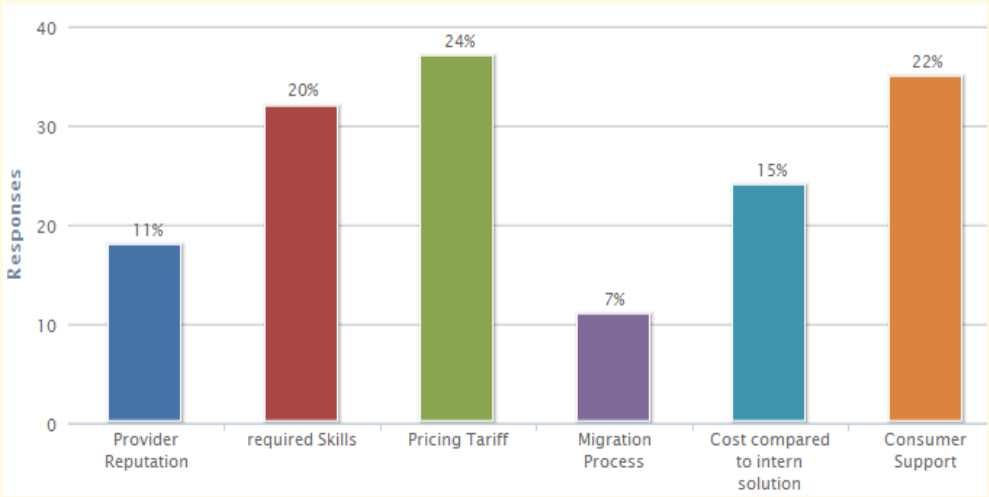

Figure 7

7. *What are the main concerns related to adoption of cloud computing services?*

With respect to the last question, privacy (security) and confidentiality of corporate data is the top barriers behind adoption of cloud computing services in organizations (Figure 8). The cost and difficulty to migrate to the cloud, and integrity of services and data were the other significant concerns expressed by the respondents.

	Not Important	Medium Important	Very Important	Total
Privacy	0 0%	10 25%	30 75%	40
Availability of service and/or data	0 0%	24 60%	16 40%	40
Integrity of service and/or data	0 0%	28 70%	12 30%	40
Confidentiality of corporate data	0 0%	7 18%	33 83%	40
Forced use of apps	7 18%	28 70%	5 13%	40
Loss of control of services and/or data	1 3%	24 60%	15 38%	40
Unclear scheme in the pay per use approach	2 5%	13 33%	25 63%	40
Uncontrolled variable cost	0 0%	19 48%	21 53%	40
Cost and difficulty of migration to the cloud	1 3%	31 78%	8 20%	40
Total	**11**	**184**	**165**	

Figure 8

A general acceptance on the benefits of cloud based applications could be observed from the survey data. Visual classificayion of the data indicated that small-sized organizations (with number of employees: 1 to 100) preferred the range of services

offered by ther cloud computing vendors. However elasticity and solution efficeincy mattered most to the organizations having greater than 100 employees in their payroll. These are early patterns and future research could do well to probe further in order to establish significance of the findings.

Discussion

Understanding consumer preferences is most important for achieving success with cloud computing which is still at its early stages (Leavitt, 2009). Even though several large organizations have invested in cloud solution, the trend among SMEs is comparatively slow (Sharma et al., 2010). The study based on a survey design looked at the perception and familiarity of Indian SMEs with cloud computing. The results indicate a heightened awareness of cloud computing solutions among respondents belonging to various SMEs across India. Respondent's perception on several attributes related to cloud computing could also be investigated, for example reasons behind engaging in cloud computing, likely usage of cloud computing layers, services that are more likely to be on cloud, concerns behind adoption of cloud computing solutions, etc. By focusing on the SMEs, the results are likely to contribute to better understanding of their choices and needs.
The results from the survey indicated that the most important reason behind engagement in cloud computing is cost savings. This can be justified from the fact that the organizations (SMEs) might not have astronomical profit figures given the nature of scale of operation. Hence the preferred strategy to compete with similar organizations could be attainment of cost leadership (Porter, 1985). Since cloud computing offers a way to cut down operational costs to some extent, the organizations which have already invested in cloud computing is likely to get an upper hand over its peers. Thus cloud computing can act as a source of achieving competitive advantage for organizations operating in the SME section. Other benefits from resorting to cloud computing solutions like high speed of deployment and wider availability of services also prompted enough interest among the respondents.

In terms of services that are likely to be outsourced, the survey results indicate 'CRM Sales Management' to be topping the list. The results suggest that organizations might be preferring to buy specific applications only and not the entire software. Like for example, Microsoft's products are offered as a service now with different pricing for different segments (i.e. $6 a month for each user of its Office 365 suite for small businesses; $24 a month for large organizations, etc). Microsoft believes that users are likely to go for applications that suit their specific needs only and they might not be interested in the complete software. The results from the survey provides evidences in favour of the belief with the SMEs also indicating preference for certain applications over others. Further, there is no justification for these SMEs to opt of services that would not be useful to them.

The prominent reason behind choosing a cloud computing vendor came out to be the pricing tariff. This again goes contrary to the acceptable notions. Intuitively it appears that trustworthy vendors or vendors providing excellent service quality are likely to be the most preferred. Similar beliefs are also echoed by Dillon et al. (2010) . Future research should look to investigate this interesting outcome in greater depth.

In terms of which cloud layer is likely to be used most, SaaS and PaaS were the most obvious choices eliciated by the respondents. The evolution of PaaS should allow "citizen developers" to create applications that they need and then run them on the cloud.

The major concern behind adoption of cloud computing services was found to be related to maintaining confidentiality of corporate data. Cloud computing involves the storage and sharing of information of different organization entities at remote servers owned or operated by others and accessed through internet or other connections. A properly planned user access control is needed for securing the data and information stored on the cloud. Providing training to organizational employees on security best practices is also desirable. The second major concern behind adoption of cloud computing services was related to data security and privacy. Since the core business of many organization thrives on securing customer data, cloud computing providers are providing increasing emphasis on these aspects (Chen et al., 2010). Major tie up of financial firms like Citi bank and Deutsche Bank with cloud computing vendors provide testimony to the fact that there is some acceptable level of security related to the services lying on the cloud (Stone and Vance, 2010). The third major concern was the unclarity of the pay per usage schedme. Even though per per usage appears to be attractive, the SMEs expressed concern related to this. As per the per per usage scheme, the individual users need to use their personal payment cards in order to avail desired services. The SMEs are finding this inconvenient as they might need the services for a group (and not for individual users), but the provision for the same is not existing.

The rate of internet penetration is increasing in India. Recent data indicates that about 57% of the Indian SMEs use the internet as a sales channel and to get direct business leads (The Financial Express, 2011) However, accessing emails remains still the main purpose for using the internet for these SMEs. The survey findings suggest that this might be the best time for the SMEs to resort to cloud computing and leverage on its benefits to grow and prosper in their business.

Conclusions

Salesforce.com CFO Graham Smith said at a recent investment conference that there will be multiple vendors thriving in the new world order. Some software will be used under the traditional license and maintenance revenue model, with various services added, he predicted. "I think we're going to continue in this heterogeneous environment for many years." "Cloud Computing" promises countless benefits. For SMEs the two biggest benefits are – Cost saving on technology infrastructure and faster software upgrades without much expense. The other advantages for SMEs are lowered investment in hardware, more efficient use of computing systems in existing data centers, easier scale-up of the applications and services.

However to start with, the users can take the below 3 steps to take advantage of the cloud-

1) Use the cloud for the right job – Cloud can be used with ease for computation intensive jobs like Data Mining, Optimization, risk modeling and Simulation.

2) Target the right users for cloud applications. Clouds can increase the worker's productivity.

3) Take small steps towards going cloud. Use cloud for one purpose and then start using it for all other processes.

Our study shows that Many organizations are still unclear of the implications of cloud computing and are increasing their efforts to better understand the impact and the risks. Cloud computing is often perceived to be "borderless," but compliance is not. For cloud users it is often not clear where data resides, which creates challenges for legal compliance or privacy. The SMEs were happy to know that unlike traditional boxed software models, cloud models are based on monthly fees, and customers can leave at any time.

Indian SMEs are ready to get the benefit and to leverage on the benefits of Cloud Computing. In India, sine the bandwidth has become cheap and readily available and transmission speed is no longer an impediment, it's possible to store data and run software anywhere for users to access from wherever they want. The Success of Google Docs- online version of word processor and spreadsheet applications, software that traditionally runs on users' PCs is in itself signifies the benefit of Cloud Computing. These convenient online tools have helped to fuel the market for notebooks – lightweight portable computers which contain minimal data storage and computing capacity, and carry price tags usually under Rs. 4000-5000. By taking advantage of online applications and storage, users have the option to spend less money on hardware.

BATOI Systems Private Limited can gain useful insight from this study. They could understand the Cloud Computing from a consumer's perspective and can get the idea as what consumers are looking for in a cloud computing service and vendors. Moreover they could also know how consumer preference influence cloud based service design and pricing strategies.

Limitations

The first limitation is the number of respondents for the survey. However, the qualitative trends that have started emerging are interesting and are worth mentioning. Moreover, the effort to reach out more SMEs is still on, and we expect to receive more than 100 responses to our survey in the next couple of months.

While it is noteworthy to mention about the minimum awareness among the respondents, it may not be right to assume the maturity among them about making decisions with respect to particular technologies. On the other hand, the parameters are based on eagerness and intention rather than actual decisions by the respondents.

The survey questions are limited to 11 only to encourage faster response and easy access to prospective respondents. This approach has eliminated the scope to aggregate detailed feedback on adoption of cloud at different tiers (IaaS, PaaS, SaaS) and/or of different types

(public, private, hybrid). The survey does not provide access to SMEs' intent on using different types of software (CRM, ERP, etc.). These detailed studies may be the part of our future study.

Scope for future research

Adoption of cloud computing depends on major factors like overall cost, quality of service and business agility. The current effort points in the direction of evaluation about the performance of vendor, and economic considerations. As we pointed about different limitations of cloud computing in the earlier section, these form a clear scope for further research. Delving into further, we must note that the adoption of cloud computing is not uniform across enterprises even within the same industry verticals. So, one-solution-fit-for-all will not be suitable. Rather, separate studies must be performed for industry vertical along with forming a clear set of patterns of enterprises based on limited number of parameters would be the best path forward. Apart from these, the other factors influencing the cloud adoption such as standard requirements based on respective government norms must be investigated.

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