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Cloud Computing: An Unutilised Resource for Enhancing the Performance of Medium and Small Scale Industry

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Abstract: ***Cloud services characterize all variety of IT capability that is offered by the cloud service hosting to cloud service consumers. Cloud Computing networks access to a shared pool of configurable networks, servers, storage, applications, services, and other computing resources that can be rapidly provisioned and released with least management effort or service provider interaction. In modern era of Information Technology, the accesses to all information related to a business activity in large scale manufacturing units can be made available at threshold, by certain checks and balances. The maximum population of Indian manufacturing not only comes from small and medium scale industry but also such companies contributes maximum share to Indian GDP. Large scale industries and O.E.Ms are in a position to spend as well are spending the required budget on IT(Information Technology) and control various costs and inventories on day–to-day basis by incorporating latest system software (For example ERP's ,SAP, Sales Force)etc. The small and medium scale industries lacks in using such software because it's of high fixed, operating costs and its privacy. Cloud computing is an emerging technology where serve is maintained by parent software company and domains are to be shared. In case parent host company charges reasonably affordable cost and encrypts the confidential data and stores it such that only authenticated users can access the data and ensures the security, safety and confidentiality of data, it can revolutionize the Medium and small scale industry users in enhancing the overall business performance. This research paper has been aimed at exploring the possibilities for implementing the cloud computing technology for improving the overall business performance for medium and small scale industries in India.***

Keywords: IT; Business Performance; O.E.M; ERP; Cloud Computing; GDP.

I. INTRODUCTION

Industry experts have long known that, once information technology got to be fast and reliable enough; the world's computing infrastructure would come to resemble the electricity infrastructure. In organizational terms, the requirement for IT is now predominantly driven by business advantage rather than technical novelty. The process of skirting unwanted expenses form business for improving the bottom-line has been the main agenda of companies but not at the cost of quality. Many business managers are always occupied in cost reduction programs for improving the efficiency in operation more efficiently. The Information Technology sector contributed 7.5 percent to the Indian GDP in 2012 and remained underutilized. Indian manufacturing Industry, maximum population comes from medium and small scale industries. Thought, O.E.M's and Tier-1 companies, being financially sound, have adopted ICT to a considerable extent yet it is not predominant in Medium and small scale industries due to lack of resources for its implementation and subsequent maintenance.

The revolution in information systems are redefining the business strategies and redesigning the new scientific methods contributing in improving the organisational performance by fast transfer of decisive information. Having being played a significant role in enhancing the bottom-line, still there exist big gaps between IT and its usage for better economics in

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manufacturing industry. Till recent past, IT was in the hands of vertically integrated firm using microprocessor for provisioning the solutions like IBM.

In present era post 2000, many smaller firms have positioned itself for providing IT solutions to manufacturing industries which not only lessen the workloads but also contributes to cost reduction and enhancing business performance. The prime benefits are being realised by large scale industries and the IT is yet to enter the densely populated medium and small scale manufacturing units. Cloud computing where server is at host company can be used by small scale manufacturing units the performance of MSI(Medium Scale Industries)and SSI(Small Scale Industries), has to play a pivotal role in improvement. It (cloud computing) represents a shift away from computing as a product that is purchased, to computing as a service that is delivered

Faced with one of the worst economic downturns in recent times, MSI's and SSI's are concentrating on cost reductions for being into the market. The Credit Crunch is also affecting day today working for some time now. Organizational budgets are being frozen and for making the liquidity available which is still a problem. Almost all organizations have cost reduction programs in place to control their spending. For doing these, average manufacturers are shifting to lean manufacturing exploiting the advantages of R&D, putting spot solutions in place, and last, implementing product lifecycle management, all duly supported by Information Technology can further make it irreversible. The days of the dedicated machines are gone and bottom-line has to be created not made. Optimal usage of cost reduced IT (cloud computing) can bring about the cultural changes and benefit the organisation in retracing ongoing business performances.

We argue that by redefining the reach of cloud computing to MSI and SSI can prove to be a transformation driver for the performance, growth, efficiency and competitiveness of such firms contributing maximum to the GDP of Indian Economy. Finally, as the developments in IT itself, ambitious strategic agenda in terms of technology, clouding, agility, usages and standards together with cultural change have created new opportunities for Medium and Small Scale manufacturing companies. We place this study selected for cloud computing within this context. . This paper is aimed at drawing the initiatives to be taken so as to make cloud computing as friendly tool for improving the performances of manufacturing units in MSI and SSI.

II. Review of Literature

For business decisions, availability of prompt and relevant information has always been the most desirable. In this context, Jensen (1992), informational variables are pivotal for the structure of organizations because the quality of decisions is determined by the quality of information available to the decision maker Lewis (1996) argues: "professional and personal survival in modern society clearly depends on our ability to take on board vast amounts of new information. Yet that information is growing at an exponential rate". Following Brynjyolfsson et al. (1994), coordination costs can be further differentiated in to internal and external coordination costs. The former is generated by the need to support the coordination mechanism in the hierarchical structure. Cloud computing predominantly provides information economically.

Cloud computing, as concluded by (Zhang, 2010) has recently emerged as a new paradigm for hosting and delivering services over the Internet. Cloud computing is attractive to business owners as it eliminates the requirement for users to plan ahead for provisioning, and allows enterprises to start from the small and increase resources only when there is a rise in service demand.

The recent evolution of cloud computing has borrowed its basics from several other computing areas and systems engineering concepts. Cluster and Grid Computing on one hand, and virtualization on the other hand are perhaps the most obvious predecessor technologies that enabled the inception of cloud computing (Androutsellis, 2004)

The cloud application layer is the most visible layer to the end-users of the cloud. Normally, the users access the services provided by this layer through web-portals, and are sometimes required to pay fees to use them is normally referred to as

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Software as a Service (SaaS).Sales force Customer Relationships Management (CRM) system and Google Apps are two examples of SaaS.

Information Technology automates and dramatically reduces the cost of inventory management of IT assets such as computers, servers and data tapes enables highly cost-effective and automated real-time IT asset tracking with a full audit trail from 'cradle to grave'. Large enterprise data centers can easily contain thousands of servers and tens of thousands of data tapes in geographically dispersed locations. The advancement of mature RFID platforms paves the way for highly scalable RFID applications that can virtually automate IT asset management tracking, dramatically reducing IT time and costs as well as providing the real-time IT asset visibility required to ensure security and compliance."Hasbe (2004)

Companies can slash costs by improving the design process at its beginning. Design for manufacturing and assembly (DFMA) software includes a design-for manufacture module, with which engineers obtain early cost estimates on parts or products, and a design-for-assembly module, which they employ to determine the best methods to manufacture products. During this process, the software draws from its large database, containing thousands of manufacturing processes, materials, and machinery, which was developed over many years in conjunction with companies such as GM and Ford. The improved inspection process accuracy and efficiency supports lean manufacturing, thereby lowering programming labor and cutting costs, Kluserner (2004).As per (Antonio, 2001), Emerging technologies, such as agents and ERP, can provide the technical support for realizing the strategy proposed in this paper, such as the support for new instantiations of traditional activities, such as managing incoming information to reduce the amount of information processed.

There are several trends in Information Technology, but few tend to impact the overall business as significantly as virtualization. Virtualization optimizes the use of the existing resources; simplifies the area of infrastructure and software administration, maintenance, and deployment; and reduces hardware needs, resulting in less power consumption, less space required, and lower cooling costs. Such a technology may be brought in the reach of manufacturing units in MSI and SSI Sectors for profit-realization and getting organized.

III. Research Methodology

A sample of thirty manufacturing companies was selected in the domain of NCR-Faridabad and Gurgaon and a survey was conducted.Questionare was design for collected primary data.Questionaire was mailed as well as personal contact programs were conducted. Out of thirty companies, three companies in MSI and three companies in SSI did not responded satisfactorily and the study was made limited to twenty four companies only. This research is based on primary data. Primary data collected has been arranged in tabular form for analyzing and drawing conclusions.

IV. Analysis and Interpretation

Table-1, describes the sample of manufacturing unit in medium and small scale industry. Twenty six respondent companies have been classified as per its business activity like Engineering units, Forging units, Metal Casting units and sheet metal units.

TABLE-1: SAMPLE OF MANUFACTURING UNITS

S.No.	MANUFACTURING ACTIVITY OF UNIT	MSI	SSI	TOTAL
1	Engineering Units	2	5	7(30)†
2	Forging Shops	3	2	5(21) †
3	Metal Casting Units and Foundries	5	3	8(33) †
4	Sheet Metal Units	2	2	4(6) †
	TOTAL	12	12	24(100)†

(MSI stands for Medium Scale Industry and SSI stands for Small Scale Industry and ( ) † stands for percentage)

Table-1 shows that 30% units are engineering goods manufacture, 21% are forged component manufacturers, 33% are metal component castings manufacturers and six percent population belongs to sheet metal component manufacturing units.

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Table-2, highlights the comments given by the respondent companies regarding understanding the concept of cloud computing for benefit of the company.

TABLE-2: UNDERSTANDING OF CLOUD COMPUTING BY RESPONDANTS

S.No.	UNDERSTANDING OF CLOUD COMPUTING	MSI		SSI		TOTAL	
		Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)
1	Familiarity with cloud computing	20	80	0	100	10	90
2	Company uses cloud computing	0	100	0	100	0	100
3	Familiarity with ERP software	80	20	50	50	65	35
4	Usage of ERP only	40	60	15	85	22	88
5	Cost of in-house ERP is more than Cloud computing	70	30	100	0	90	10
6	IT Companies visit you for product selling	80	20	40	60	60	40
7	Does your customer press you for IT-Usage	90	10	40	60	65	35
8	Are you connected with customer online	15	85	0	100	8	92
9	Your customer is a large scale industry	60	40	30	70	45	55
10	IT can improve your company's performance	80	20	30	70	55	45
11	Fixed cost of IT solutions is more	70	30	90	10	80	20
	OVERALL(PERCENTAGE)	55	45	36	64	45	55

The above Table-2 exhibits that usage and familiarity to cloud computing is very low in both types of industries. Eighty percent of MSI respondents are familiar with ERPs and 40% really use it compared to that of 50% familiarity in case of SSI's and 15% are using it.90% of MSI customers asks the suppliers to go for IT-Solution as 60% customers are large scale industries while in case of SSI, the asking rate is 40% and 30% customers are large scale industries. Eighty percent of MSI believes that usage of IT-Solution increases performance but this concept is 30% effective in case of SSI's.Regarding the fixed investment, both types of companies have similar opinion but 20% of SSI assess this cost still higher.

Overall, it can be said that sum total of all respondents is favorable by 55% which is slightly above the mean while in case of MSI, it is falling very short of simple average by 14%.

An attempt was made to check what the users think about the confidentiality of their data being stored beyond the physical boundaries of the manufacturing company. The responses on this have been summarized in Table-3.

TABLE-3: RESPONSES REGARDING COFIDENTIALITY AND SECURITY

Sr.No.	PARAMETER FOR CONFIDENTIALITY AND SECURITY	MSI		SSI		TOTAL	
		Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)
1	Data in server at distant place is unsecure	50	50	80	20	60	40
2	Confidentiality of data in cloud computing is at stake	70	30	80	20	78	22
3	Privacy of data in cloud computing is doubtful	60	40	80	20	70	30
4	Data storage in other servers can hit your business	85	15	80	20	83	17
5	Does Cloud computing companies offer penalty clause	0	100	0	100	0	100
	OVERALL AVERAGE	53	47	64	36	59	41

(MSI stands for Medium Scale Industry and SSI stands for Small Scale Industry)

It is surprising to note that both types of industries resemble in thinking negative about the confidentiality of data in server at a distant place. Comparatively, SSI's are more afraid of data storage at different location. Overall, 59% of MSI doubts the confidentiality of data stored in cloud computing while this negative faith is of the tune up to 64% in case of SSI's.Average negative voting about confidentiality and security of data has been reported at 59% by both types of industries.

Further investigation was done on type of IT-Solution used and its preferred brand and its method of its implementation. Views about legality of cloud computing was also explored.Table-4 highlights the responses on various aspects of branding.

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TABLE-4: RESPONSES WITH REGARD TO BRAND OF IT-SOLUTIONS

S.No.	PARAMETERS	MSI		SSI		TOTAL	
		Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)
1	Branded ERP Solutions are preferred over local	40	60	20	80	30	70
2	You hire consultant for selective use of ERP	60	40	80	20	70	30
3	Legal Contracts will improve cloud computing	90	10	100	0	95	5
4	Companywide IT-Solution is preferred over selective one	50	50	30	70	40	60
5	Cloud computing and ERP increases cost	50	50	80	20	65	55
6	Economics of cloud computing is undisputed	70	30	70	30	70	30
7	Cloud computing Service is qualitative than in-house IT	70	30	70	30	70	30
	OVERALL PERCENTAGE	61	39	64	36	62	48

(MSI stands for Medium Scale Industry and SSI stands for Small Scale Industry)

Table-4 summarises that 40% MSI preferred branded ERP's compared to cloud computing while this concept has been negatively reported at 20% by SSI.The aspect of legality in implementing cloud computing has been demanded at very high rate by both companies, almost cent percent.50% of MSI respondents feel that ERP and cloud computing increase cost while 80% of SSIs have opined the same. Both types of industries identically resembles in thinking that cloud computing is preferred v type of quality service at better economics. Overall, both companies' views cloud computing superior at 62%.

V. SUGGESTION

Cloud computing being low cost revolutionary concept for enriching the business performances of medium and small scale industry; its introduction, penetration, implementation need to be strengthened for growth of National GDP.Followings suggestions may further act in positive direction for increasing the effectiveness of Clousteer-IT.

- Companies in cloud computing need to make the concept properly understood by medium and small scale industries. Formal training sessions to industry clusters will popularize the plurality of this concept.
- Host companies have to guarantee all types of safety, security and legality about misuse of client company's data.
- Government and Industrial Departments need to float certain incentive schemes for making Information Technology within the reach of small scale industry.
- Large scale companies to whom Medium and small scale industries are linked, need to bargain the cloud hosts for its clients as well arrange certain training sessions by experts for its implementation.

VI. FUTURE SCOPE OF THE STUDY

Present study was limited to a small geographical region and further sample was also limited to manufacturing units. Wider scope, especially for smaller businesses, can bring about amazing potential in enhancing the performance of small scale industries. In parallel studies on cloud computing providers may also be done for removing barriers and making a bridge between service providers and end-users for mutual growth and benefit.

VII. CONCLUSION

Based upon the discussion of responses received by respondent companies, following conclusions can be drawn as under:

- It can be inferred that the companies are not well aware of usage of cloud computing but some of the companies do use local and branded ERP's .The concept of cloud computing being new for India has not gained momentum so far.
- Server of Cloud Company being at different location, confidentiality and securities of data are taken as big threat by both types of manufacturing industries.
- Legal action on leakages of data by host Company and its uninterrupted accesses are grey areas to be addressed by the cloud steers.

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- It has been accepted by manufacturing companies that cloud applications are cheaper than ERP's installed at works and quality of service by cloud steers are understood superior. Surprisingly, SSI have interpreted that the implementation of IT-Solutions increases the cost.
- Majority of Medium scale industry has voted in favour of Clousteer-IT does improve the overall business performance and enrich the bottom-line while Small scale industry respondents have opposed this revolutionary step.

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