

The impact of Cloud Computing in the banking industry resources

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ABSTRACT

Today, one of the biggest problems that gripped the banking sphere, the high cost of implementing advanced technologies and the efficient use of the hardware. Cloud computing is the use of shared services on the Internet provides a large role in developing the banking system, without the need for operating expenses including staffing, equipment, hardware and software. Reducing the cost of implementation of advanced information technology and efficient use of hardware banking industry is one of the biggest goals require and the main problem is widespread and practical application of cloud computing solutions in the banks, it is a good proposal. In this research, information was collected from the IT department of an Iranian bank on the basis of statistical analysis on reducing energy consumption and costs in the current structure and the structure offered by cloud computing platform.

Keywords

Information technology management, cloud computing, banking, infrastructures, cost reduction, the development of banking services, energy consumption.

1. INTRODUCTION

The use of cloud computing that the most advanced technology in the field of IT infrastructure, is a dynamic of its own capabilities, the most common way to share and manage IT resources in developed countries world, developing its infrastructure and cloud-based services with the speed, is growing. With the increasing proliferation of cloud-based services, banks and financial institutions due to their structural nature, tend not to take advantage of the benefits of this technology have found. According to this trend, creating a safe environment in the context of cloud banking approved bank experts as well as IT security professionals, it is more than ever before. According to the Banking cloudy, especially in the perspective of comprehensive digital electronic

banking services to improve safety, quality of service and reduce the cost of banking is essential.

2. Literature review

Cloud computing requires an infrastructure and facilities that are currently operating in the country's infrastructure is largely in the making. Therefore, the development planned in the context of providing telecommunications and broadband and fixed speed limits and unlimited data transfer, in accordance with the country enjoying the technology of cloud computing for business advantage required. Bank to gain market share and customer service that has the speed and accuracy of their selection criteria, they need to refocus on the methods and models used in order to change it or invent review new approaches. In the meantime, such as lack of flexibility and agility in existing systems due to the high volume of information, confidentiality of data, computational and processing needs as well as the high cost of change or development of information technology, includes the problems facing the industry. With regard to this topic, cloud computing technology is having features such as "flexibility," "scalability" and "high availability" and "cost-effectiveness" of many activists using its IT Banking industry focused.

2.1. About Cloud Computing

Cloud computing is expected to be one of the fastest-growing technologies in the coming years. Business applications will be the largest market for cloud services spending, with a gradual transition from on premise to cloud-based services especially for general business applications like customer relationship management (CRM) and enterprise resource planning (ERP).

Banks are expected to enter the cloud computing arena cautiously, with no single cloud services delivery model being a silver bullet for best meeting their demanding business needs.

2.2. Benefits/Value of Cloud Computing

Faced with rising costs of technology and hardware used, banks increasingly to cloud computing as a means of improving efficiency will lead to their look. Banks can charge without adding to the scale of their work in human resources, hardware and software increase. Cloud computing delivers computing power as a virtual service a product which benefits, software and computers and other devices as a utility on a shared network. Since the hardware and software are available on request, the user is only allowed to pay for the massive investment needed to set up there. But with cloud banks have increased their scale and will reduce costs. According to experts, if there is a national service provider, which can be in terms of security, performance, privacy and trust, and a bank customer data to these servers have a strong SLA, increase service quality and diversify services Bank, strongly reinforces the bank's competitive advantage. According to research done, the index is following the results of the implementation of this technology in the context of their bank.

- Reduce Costs

One of the most important advantages, a significant reduction in IT costs with the use of cloud computing, banks can take out your new hardware requirements and costs of its outsourcing model "pay rate "pay. In this case, banks need to buy, set-up and maintenance of hardware resources, and thus reduce costs. A Web browser and a weak interface to use all available resources in the cloud is enough.

- Business process improvement

Cloud computing and storage resources and allocate resources to users when needed, to prevent the waste of resources. The technology workload between the servers and processors, as well as additional source application, resulting in a waste of resources is minimized.

- Business continuity
- Business Process Improvement
- Used-based billing

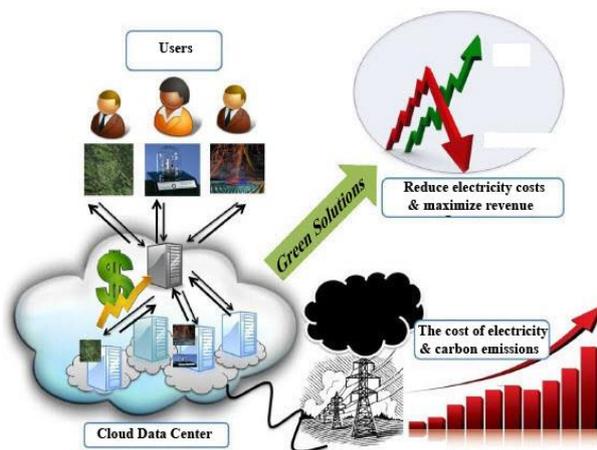


Figure 1. Green IT.

2.3. Restriction of cloud computing in bank

Access, protection of privacy, culture, education, confidence in providers, standards of interaction with service providers, uncertainties about emerging technologies in cloud computing, cloud services integration with existing

infrastructure, support for clients, some of the challenges for banks to move to cloud platform are limitations to move clouds in banking industry.

2.4. Key indicators for development cloud computing applications

One of the major issues in the era of cloud experts to consider is that to locate and assess its readiness for use and application of cloud computing technologies should be the key feature of their business and IT resources and communications. Some key features of the organization under the authority of implementing cloud computing technology-based benchmark research in 2010 for use in the organization are: the size of different parts of the organization's IT resources, consumption patterns, use of IT resources in organizations, sensitivity data organization and the importance of the work that organizations do.

- The size of different parts of organizations IT resources

Great resources that already exist in the organization, the cost factor play a crucial role. The size of resource based on economies of scale the per capita cost of reduced performance. To determine the size of the organization, recommended the following indicators:

- The number of servers and network equipment Bank
- Members of the network monitoring
- Annual cost of energy and information technology

Estimates of the number of servers to support different areas of information and communication technology services as well as service to the users, you can calculate the size of IT resources as one of the factors to be considered. Members covered by the services citizens receive a good measure for estimating the size of the organization's internal resources for operations and maintenance of applications. This is a picture of internal resources as well as a data centers provider. Members cover a wide geographical distribution of the workload may indicate how well.

- Organization important data

One of the most important factors in the successful implementation of cloud computing that makes it hurt, concerns for data security in cloud environments there. Although much progress has been made in the security and safety there is no fundamental problem in the real world it is difficult to accept.

- The importance of work done by organizations

Things that are vital to the source, platform, and security applications require very precise. Things may be very sensitive to these things because they do not cloud deployment options for service level agreements require very tight and precise with their service provider. If the organization is not very large, cloud service providers may be interested in providing a service-oriented architecture is much localized. They may not also be able to provide quality service processes that require low latency and this may be due to lack of profitability or limitations of the system and whether or not the test is implemented in that sector.

▪ **Suitable areas for moving to the cloud in banking services**

The unique feature of cloud computing is the most important, the opportunity to share resources and infrastructure as well as access to them without the need for a platform is necessary for the client. Now banks to reduce the cost of investment in the development of infrastructure and become strategic capital expenditure costs and development services, trend to use cloud computing.

3. Research Structure

With the growing need for data processing and performing various calculations, computing has become one of the basic human concerns. In such circumstances, users and organizations trying to base on their needs and regardless of whether a service is delivered where it is or how to access it. The world of computing is going to develop services and applications that run on the computer rather than the individual, as a service available to millions of consumers to be placed. Books importance of saving and improving the efficiency of using web-based tools for project management, collaboration on documents, service management and scheduling were conceived in the bank.

Cloud computing will allow banks that do a lot of work with a limited budget and various cost reduction and saves power consumption and their energy. Moreover, the benefits of web application for mobile users are specified. This season, for the purposes of research, to gather information on various sectors related to information technology pay a bank. Then, based on the parameters and criteria obtained, a model of flexibility in the network in which different parts of the bank will pay and will also reduce the cost of banking.

In this study, the process of selecting a bank to implement information technology services described and criteria, parameters and standards for the selection of a bank to implement processes and technologies to explain cloud computing. The process of collecting materials is briefly as follows:

- Choose the bank, which processes and procedures and also show the bank selection criteria.
- gather information, which includes the following steps:
 - General information banks through public relations and obtained Bank.
 - Specialized technical information that was obtained through interviews and questionnaires.
 - Systems, databases, servers, software and information obtained through lay person responsible experts.

3.1. Adoption of cloud computing technology in the banking

One of the most important parameters for the use of new technologies in organizations and agencies, the acceptance and adoption of information technology and how to use it in the field of human resources and senior managers and decision-makers in any organization. So that if the new technology is not about trust in the staff and the support of senior managers to create and launch not have, probably it is a failure, however, documentation and scientific and technical reasons, be reasonable.

In this research, more than 70% of ICT experts and organizations agree with the implementation of the project for reasons such as increasing the efficiency of IT operations and

reducing capital and operating costs and optimize power consumption and energy and money save time and energy consumption of the main reasons for and advantages of the proposed technology. Also 30% of the population of 10 people the main reason for their opposition to the project, security issues and the lack of communication infrastructure and appropriate training and 70% of the reasons for his agreement to reduce cost, increase performance and reduce power consumption were considered.

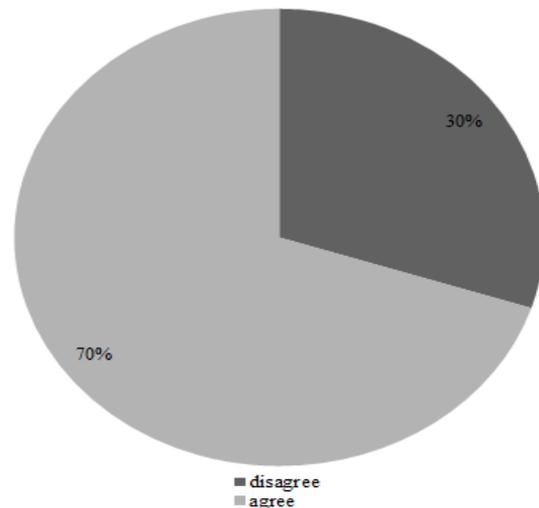


Figure2. Statistics pros and cons of implementing cloud computing.

4. Models in old and new structure

In this part, old and new models of bank have introduced and then analyzed and compared the statistical results and performance.

▪ **Old Organizational Model**

The old organizational model the Bank already uses a model that is discrete servers located in different places. The volume of data and consequently the amount of processing time varies, a large amount of processing power and potential service providers unused and wasted. In addition, the volume of data to be processed and a lot of energy is wasted by the service providers and the current model database server with 250.

▪ **New Organizational Model**

The new organizational model that uses cloud computing model, a set of service providers that are connected and integrated as one or multiple compute resources based on service level agreements are provided. It offers services to service providers and service users to services and applications with the flexibility and provides lower cost and save more. The new organizational model is shown. In addition to the above benefits of cloud computing technology to reduce energy consumption and reduce the costs associated with the purchase of hardware, the cost of maintenance and staffing. This new model after review and analysis of the IT department on the basis of data, forms, charts, and received undergraduate studies and meetings with experts from the relevant units to achieve the lowest cost, most reliable, fast, secure and easy, taking into account all administrative and banking and legal restrictions suggested.

5. Analytics results

5.1. Current data center costs

The cost of data center hardware costs, maintenance and support and power consumption, software packages and control systems which allow for ease of comparison with the new model as well as the readability and Statistics and the figures in table 1 are shown.

Table. 1. The total cost server platform

Row	parameters	Costs
1	The total cost racks	2.970.000.000
2	The total cost of switches	1.000.000.000
3	The total cost routers	600.000.000
4	The total cost of the monitoring system	3.600.000.000
5	The total cost of UPS's	12.000.000.000
6	The total cost software	500.000.000

5.2. New data center costs

All costs related to the data center with the necessary explanations and statistics in table 1 were presented for the current model. In this section, with the benefit of new technology, cloud computing and data center costs in Table 2 are available. Terms and explanations on each of the tables presented in the previous section, this section is also included but not rewritten to avoid duplicate content.

Table. 2. The total cost server.

Row	Parameters	Costs
1	The total cost racks	1.100.000.000
2	The total cost of switches	500.000.000
3	The total cost routers	360.000.000
4	The total cost of the monitoring system	1.000.000.000
5	The total cost of UPS's	8.000.000.000
6	The total cost software	500.000.000

5.3. Compare the cost of two models

Figure 3 compares the energy consumption of servers, racks and internal equipment is displayed in server energy consumption by 74% and 70% reduction in energy consumption of servers that bed. These results indicate that total energy consumption in the new models declined 73% compared to the old model.

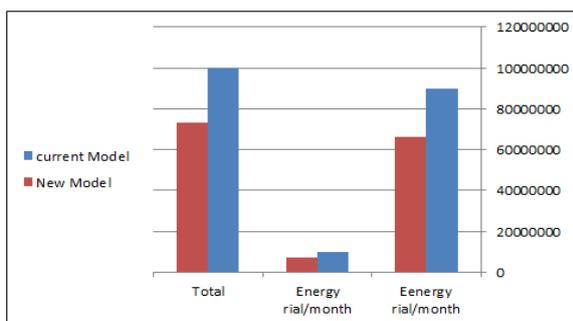


Figure3. Compare Energy.

Figure 4 is a comparison between the cost of capital, including servers, racks, switches, routers, and UPS monitoring is done. According to the results, 74% of the cost of servers, racks cost 37%, 50% in the cost of switches, 67% and 28% in the cost of UPS monitoring cost savings, but the cost has not changed the router. In total 70% of all capital expenditures in the new version of the old model dropped.

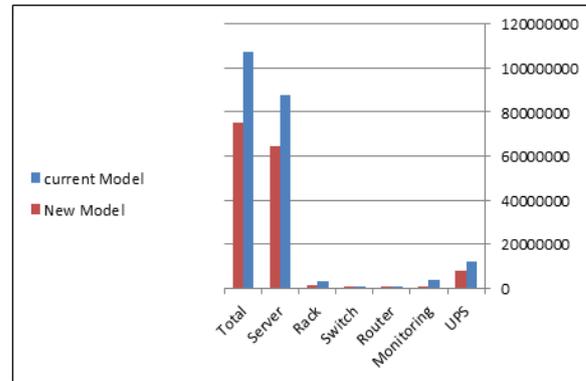


Figure4. Compare the cost of capital.

In Figure 5, the comparison has been made between the cost of repair and maintenance. These costs include legal experts and periodic service charge. According to the results, 50% of the cost of experts (maintenance) and 74% service charge for a period of saving. In total, about 65% of all costs of repair and maintenance of the new version of the old model dropped.

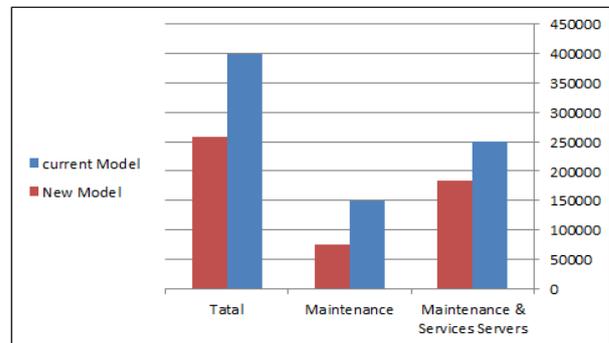


Figure5. Compare the cost of service and maintenance.

In Figure 6, the comparison has been made between the monthly fees. These costs include the cost of servicing and maintenance and energy consumption is approximately 67% of all monthly fees in the new version of the old model dropped.

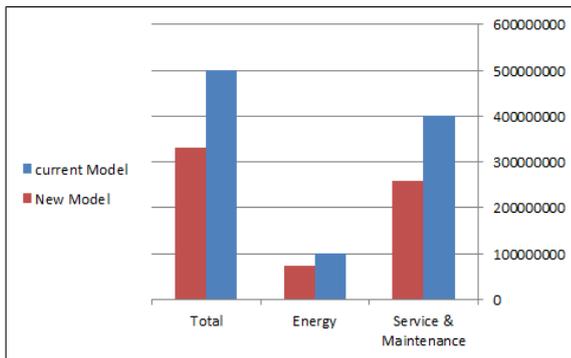


Figure6. Compare the cost of service and maintenance.

In Figure 7, the comparison has been made between fixed costs. These costs include capital expenditures and software that bundles with a fixed cost in total around 70% of all fixed costs declined in the new model compared to the old model.

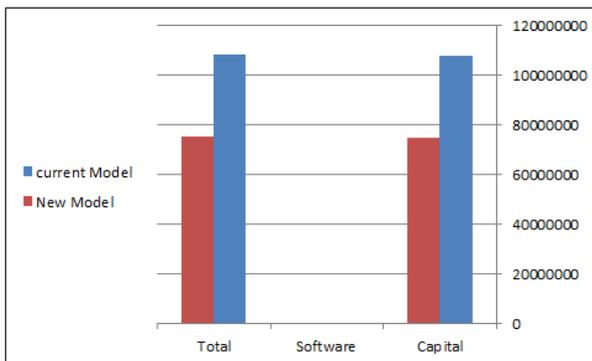


Figure7. Compare fixed costs.

6. Conclusion

The research conducted on cloud computing in a one of bank in Iran was based on existing theory which were collected by an in depth literature review specifically around the definition of cloud computing, the service and deployment models and the benefits and obstacles of cloud computing. The main characteristic of the end of the project to save energy, reduce costs and increase performance and energy efficiency in the new model over the old model.

As well as to implement the proposed model, in addition to field studies and collected data through interviews and questionnaires required and the use of conventional statistical software, is based on results. Finally, after the final statistics with the help of statistical software, it was determined that the monthly fees by 66% in capital costs by 70%, maintenance costs by 65% and fixed costs 70% of costs in the new model than the current model is reduced. Thus, the finding of appropriate technologies applicable to cloud computing to reduce costs in the banking industry shows.

Due to restrictions on access to financial information of the cost of cloud services platform and calculate these costs on a monthly basis, the cost will be effective on results and about the risks of implementing this technology in the banking industry. One of the problems, rules and regulations on how to calculate the financial cost of the support services that offer cloud services for IT projects is its cloud computing.

The future work will focus on set rules on how to calculate the financial cost of the support services that should be spent on IT cloud services cloud computing to be addressed. Type of contract with the cloud service providers need to be addressed in the future how these contracts are expected to be in service with standard contracts set to preserve the rights of the consumer cloud.

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