



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 5, May 2016

Green Computing – A Cloud Based Architecture for Green Banking

Meenakshi Srivastava

Assistant Professor, Amity Institute of Information Technology, Amity University, Lucknow, India

ABSTRACT: Global Warming and its impact on climate change use to be a most discussed topic in environmental forums few years back, is being faced by the society today. Since people are facing the consequences of increased usage of technology there has been increased awareness about taking steps which reduces the negative impact of technology. Increased usage of computing in banking has left its carbon foot print on environment. Banking a Financial Institutions plays a pivotal role in economy of a country and thereby it becomes more important for Banks and Financial Institutions to adopt strategies which focus on greener aspects. The present article aims at discussing the initiatives taken by Bank to improve the quality of services and reduce the carbon footprint. Cloud computing is expected to be one of the fastest-growing technologies in the coming years. Cloud Computing is providing a platform to business organizations for taking initiatives in green aspects of services with a gradual transition on-premise to cloud-based services especially for general business applications like customer relationship management (CRM) and enterprise resource planning (ERP). In the present paper we have explored the requirement of indulgence of green computing through cloud architecture in Banking Sector.

KEYWORDS: Green Banking, Cloud Architecture, Green Initiatives, Process enhancing Green Banking, Environment

I. INTRODUCTION

Introduction: Computing was initially deployed to solve complex problems at a faster speed and provide a meaningful interpretation and analysis of the provided data pertaining to the problem. As time progressed emphasis continued to be on development computer of technology which bettered the speed, results and analysis as compared to the previous available technology. But in recent past it has been realized that development of the technology and more importantly its deployment had its hidden cost. Reckless growth is endangering the planet and is highly priced if we equate it with environmental degradation, resulting in irreversible effects of inconsistent and changing weather, floods, droughts, climate change, global warming, occurrences of natural disasters etc. Environmental risk can be defined as risk of causing pollution or destruction of the natural environment (land, water, air, natural habitats, animals and plant species), either through accidental or deliberate actions. Although there is an increasing trend of awareness and commitment to address environmental issues that we are facing. Organizations are adopting environment-friendly practices[1]. But the biggest challenge for an organization which makes an attempt to be eco friendly is to understand first what that really means and develop designs and processes which not only add value but are also sustainable over a period of time. Bank being a financial entity acts as an intermediary to accept deposits and then extend those deposits for lending using various channels like Branch, Net Banking, Automated Teller Machine (ATM), Mobile Banking. Green Banking focuses on four major aspects through which they try to control the effects of computing technology on environment, these aspects are – products, services, processes and strategy. With the evolution of technology Banks have also adopted ICT not only to manage customer base which has increased many folds due to increase in awareness among people about banking practices but also to scale up the level of services being offered to customers. Increased usage of Computers in banks has made them also a contributor of the unwanted outcomes of computing technology on environment. Importance of emission reduction has been realized by the banks and many have incorporated an exhaustive strategy to counter the same. Furthermore banks are developing environment-friendly strategies which are to be adopted in daily procedures and practices, data centre, internal processes and also educating customers on technology based transactions, saving energy, etc. 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.



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 5, May 2016

Cloud computing can offer financial institutions a number of advantages, including: Cost savings, Usage-based billing, Business continuity, Business agility, Green IT. But before moving to the cloud, banks must consider issues around data confidentiality, security, regulatory compliance, interoperability of standards, and quality of services [2].

II. GREEN COMPUTING

Green Banking can be defined as a term which collectively refers to routine contributes in economic, social dimensions and more importantly without compromising on the environment aspect. Objective of Green Banking is to ensure optimal utilization of IT and physical resources which would provide effective results without compromising on environmental factors and would have minimum negative impact on environment. Banks are aiming at evolving operation processes, banking products and banking services which are more environments friendly. Banks have realized the importance of technology and its impact on environment. Banks are continuously working on developing and upgrading products and services that are in line with the growing needs and expectation of the customers and are environment friendly also. Banks facilitate paperless transactions and are encouraging usage of electronic means, wherever possible, efforts are made to maintain contact with and correspond with customers with minimized paper-based correspondence[1][3]. Banks have developed channels like E Lobby, Net Banking and Tele banking which facilitate customers to carry out their banking requirement anytime and from any place of their convenience. Automated Teller Machines (ATM), NEFT, RTGS have eliminated the requirement of making the payments through cheques and encourage paperless transactions. Going in line with the Green banking concepts banks have developed Electronic Statements, Products Information and Manuals which can be sent or seen online. Paperless communication is emphasized and communication to customers is done via emails, SMS or ATM display (unless regulatory mandate). All internal memos, process notes and records have been developed in electronic form. Internal communications are done through emails and dedicated Email Ids are provided to all the employees. Banks are implementing green banking channel in bank lobby which encourages the customer to use green channel and thus significantly eliminates paper usage in form of pay in slips, deposit slips, vouchers, challans and transactions are done on paperless mode. Banks are making an effort to ensure that all the customers have a debit card. Debit card users are provided with the facility of transacting by swiping debit cards due to which customer are able to skip queue and save time. Debit Card initiated transactions are verified by ATM pins. Furthermore transactions done through debit card are posted faster in comparison to the one done manually through teller counter. Green Banking Channel facilitates Cash Deposit, Cash Withdrawal and Fund Transfer to same bank account or other bank account also. Banks have not only adopted measures at customer facing end but have also made changes in internal processes by centralizing them. Account opening and servicing, overseas account opening and trade finance have been centralized which helps to manage the account from any place or any channel (E Lobby, ATM, Net Banking, Tele Banking etc). In order to track the automated process at every step Document Management System has been incorporated which has an integral workflow capability. Document Management System is an important tool which eliminates the usage of paper to a significant level. Documents pertaining to Account Opening, Loans Application etc are scanning is done at the branch level just after document verification and the images are stored centrally through Document Management System for retrieval when required. While being stored in Document Management Services these documents are categorized using Intelligent Character Recognition or Optical Character Recognition Technology which helps in easy retrieval of the documents. Document Management System is linked with Processing Center for processing and are integrated to be used for Account Servicing, Core Banking Solution, Lending Services, Mail Messaging and Balance Inquiry through Miss Call. This process not only reduces the turnaround time by fast processing but also reduces the cost and eliminates requirement of storing multiple physical copies of same documents for various purposes and departments. Adoption of Document Management System has significantly reduced requirement of paper usage and storage and is playing a important role in reducing carbon footprints by the banks.

III. CLOUD BASED ARCHITECTURE FOR BUSINESS ORGANISATIONS

Cloud services adoption by financial services institutions is expected to increase with an IT spending of US\$21.9 billion in coming years [5]. Cloud service models offer financial institutions the option to move from a capital intensive approach to a more flexible business model that lowers operational costs. The key to success lies in selecting the right

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 5, May 2016

cloud services model to match business needs. In this section we review a model for cloud computing services and operations [5].

BPaaS Cloud Business Process Layer
SaaS Cloud Application Layer
PaaS Cloud Platform Layer
IaaS Cloud Infrastructure Layer

Fig 1. Cloud Architecture for Business Organizations[5]

1. **Business Process-as-a-Service (BPaaS):** The cloud is used for standard business processes such as billing, payroll, or human resources. BPaaS combines all the other service models with process expertise.
2. **Software-as-a-Service (SaaS).** A cloud service provider houses the business software and related data, and users access the software and data via their web browser.
3. **Platform-as-a-Service (PaaS).** A cloud service provider offers a complete platform for application, interface, and database development, storage, and testing. This allows businesses to streamline the development, maintenance and support of custom applications, lowering IT costs and minimizing the need for hardware, software, and hosting environments.
4. **Infrastructure-as-a-Service (IaaS).** Rather than purchasing servers, software, data center space or network equipment, this cloud model allows businesses to buy those resources as a fully outsourced service.

IV. CLOUD BASED ARCHITECTURE FOR GREEN BANKING

Various softwares that work at the layers of cloud can be used for delivering the various services provided by any financial institution like bank. Services like accounting, customer relationship management, enterprise resource planning, invoicing, human resource management, content management, and service desk management can be handled in a better way through implementing cloud architecture[4][5][6].

Business Process Layer – Delivery channels, Retail Banking, Mutual Fund
Application Layer- Client Sales and Servicing, Customer Analysis and CRM
Platform Layer - IT Development and Application Infrastructure
Infrastructure Layer– Service Provider, Enterprise data

Fig. 2. Cloud Based Architecture for Green Banking

1. **Business Process Layer:** When considering cloud solutions for Business Process, banks should partner Cloud Service Provider to gain cloud expertise. Cloud services providers should have: A clearly defined cloud strategy, demonstrable return on investment, proven cloud service delivery capabilities, Customer analytics and customer relationship management. Vendors
2. **Application Layer:** Application layer’s job is to provide interfaces for various banking activities. Browser-based technologies such as enterprise content management can be used at this layer. IBM and EMC could be the suitable vendors for this Layer.
3. **Platform Layer:** The responsibility of this layer is IT development and application infrastructure development. Since these functions are highly outsourced, banks can achieve cost savings also through the cloud.



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 5, May 2016

- 4. Infrastructure Layer:** Understanding of data confidentiality and regulatory requirements are base of any financial institution. Banks need to keep sensitive data within firewalls to fulfill local regulations and client's confidentiality requirements [5].

V. IMPLEMENTATION

At first, financial institutions should move for non-core business applications to the cloud. Many software providers such as Oracle, IBM, and Pegasystems have cloud solutions available for their leading financial services applications. Customer's analytics and customer relationship management can be implemented through vendors providing CRM with cloud solutions like Salesforce.com and Pegasystems.

VI. CONCLUSION

Lot of initiatives have been taken by banks to control the impact of technology on environment but all the efforts until now have been majorly in products and services related to the Depository part of the banks. E Lobby, Mobile Banking, Net Banking, Tele Banking, TAB Account Opening are all related to the depository part of the banks. But while adopting cloud architecture for green banking banks should clearly define the ROI for cloud-based projects. Choose service providers with proven expertise in cloud services management. Sign outsourcing contracts that use pay-per-use cloud delivery models. Understand data confidentiality and regulatory requirements. Banks may need to keep sensitive data within firewalls to fulfill local regulations and client confidentiality requirements. Therefore, private cloud-based operating models are currently a better first choice than public or hybrid clouds. As public clouds gain trust and confidence among consumers, banks can gradually transition to these models. Banks ought to receive a steady transformative methodology towards distributed computing administrations, assessing every task in light of the kind of utilizations and nature of the information. Lower hazard ventures may incorporate client relationship administration and undertaking content administration. Higher danger ventures will include center business useful frameworks, for example, riches administration or center keeping money.

REFERENCES

- [1] Green Banking Practices – A Review Vikas Nathi, Nitin Nayak & Ankit Goel, Business Management (IMPACT: IJRBM), 2347-4572, Vol. 2, Issue 4, Apr 2014, 45-62.
- [2] Green banking: Going green, Raad Mozib Lalon, International Journal of Economics, Finance and Management Sciences, 2015; 3(1): 34-42.
- [3] Green Computing - New Horizon of Energy Efficiency and E-Waste Minimization – World Perspective vis-à-vis Indian Scenario, Sanghita Roy, Manigrib Bag.
- [4] "A study on Customer's Awareness on Green Banking Initiatives in selected public and private sector banks with special reference to Mumbai", Ms. Neetu Sharma, Ms. Sarika K, Dr. R. Gopal.
- [5] https://www.capgemini.com/resource-file/access/resource/pdf/Cloud_Computing_in_Banking.pdf
- [6] A Study of Green Banking Trends in India. Dr. Nishikant Jha1 and Shraddha Bhome.