Case Study On

Commex Technology

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Module: Utility Computing

Date: 20-11-2015

Introduction:

- **Objective:**
  The objective behind this report is to identify how Commex Technology can use cloud resources and services to enhance their businesses.
- **Background:**

Commex Technology Limited is located in Mumbai, India. It was established on 24th Jan 2000. Currently the number of employees are 1400 and the capital of the company is 10 million euros.

Core Businesses and Services:

1) Custom Application Development: Commex Technology designs, develops and deploys customised software solutions and applications for customers. They also include Reengineering, customisation and migration of legacy applications.
2) Application Management: Commex Technology also provides range of services like Application Integration, Data Integration, Maintenance, Application Security and Enhancements.
3) Package Implementation: Commex Technology offers comprehensive package implementation services for customers which starts from Business Analysis and Consulting, to Deployment and Maintenance. Their implementation framework consists of Process Design, Application Identification, Application Configuration, Application Readiness and Deployment.
4) Onsite IT Consultancy: Commex Technology also provides turnkey IT consultancy. They provide onsite consultancy to customers on their complex e-commerce businesses, telecom and wireless solutions, CRM solutions, database solutions and networking solutions.
5) Offshore Outsourcing: Commex Technology provides services to customers all over the world with their Offshore development facilities at Mumbai, India.

Commex Technology business model can be summarised as below:

fig: Commex Technology Onsite and Offshore business model

On Premise It State:

A. It Infrastructure:

1) Hardware: Currently the company uses Physical Servers. There are 250 servers in the company. Each server has 2 processors and the number of cores in each processor is 4. The RAM is 64GB. Currently they use Dell Power Edge Rack Servers. The number of racks is 18. The Rack size is 19 inch and it consists of 42 rack units. Every Rack has 2 Power Distribution Units (PDU) For High Availability (HA). Every Rack has 2 Top of Rack switches (TOR).
2) Software: Currently company is using windows licensed software on the Desktop.
3) Storage: The Storage type used is Network Attached Storage (NAS). The raw capacity of storage is 300 TB. The number of racks used for storage is 1. They use RAID 10 configuration for storage. They use Fiber Channel Adapter and Cables.

B. **Access:**
Client server architecture is established for employees and employees work using Terminal Server and Citrix.

C. **Operating System**:
- Linux glibc 2.4
- Windows 2003 Server SP2

D. Databases
- MY SQL 5.0
- Oracle 10g
- Microsoft SQL Server 2005 SP1

E. Web Servers
- Apache 2.0
- IIS 6.0

Financial Analysis:

Financial Analysis	Profit (in Euros)
a) Profit for Year 2014-15	300,000
b) Profit for Year 2013-14	500,000
c) Profit for Year 2012-13	350,000
d) Profit for Year 2011-12	180,000
e) Profit for Year 2010-11	500,000

Proposed Cloud Solution:

Introduction:

Considering the current financial position of company it is best that company should move to amazon cloud services. Using AWS cloud services it will be easy for them to implement and run their offshore outsourcing project. Also customer trust with company will increase, as they know that

their investment is indirectly with established firm like amazon web services. To overcome the current financial state they should close there on premise establishment and move all the servers and storage to AWS. They can use Amazon EC2 service as a replacement for their physical servers and EBS storage as replacement to their NAS Storage.

Amazon Elastic Compute Cloud (EC2):

"Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud." Amazon EC2 uses virtual servers so it can be accessed anywhere, at any time and place. So Security, Networking and Storage are automatically managed. It creates a virtual environment called as instances. An instance can be defined as a complete package consisting of OS, CPU, and Memory. They are various types of instances like On-Demand Instances, Reserved Instances and Spot Instances.

Reserve Instances is best for Commex Technology to invest in as the company is an established one and it is looking at long-term investment. As the company sells software's so it will be using services 24/7 and reserve instances provides significant discount as compared to the other instances. The company should use R3 instances as they have high memory intensive applications. Also there are large deployments of applications with huge databases, the model suitable is r3.2x large. IT has 8 vCPU and each has SSD storage of 160 GB. The processor used is a High Frequency Intel Xeon processor. Also they should use partial upfront Reserve Instances.

Elastic Block Store (EBS):

"Amazon Elastic Block Store (Amazon EBS) provides persistent block level storage volumes for use with Amazon EC2 instances in the AWS Cloud ". Commex Technology should use EBS storage, as it is equivalent to NAS storage. Automatic Replication is an important feature of EBS that helps during the component failure. It provides high availability at any time. It has Access control plus encryption that provides security to data. It works with the same database that company was using like MySQL, oracle 10g and Microsoft SQL server. It can run any enterprise web applications on it. It supports distributed file sharing. The storage of EBS needed is 142,848 GB. The numbers of EBS volumes required are 143. EBS volumes are backed using point in time Snapshots. Snapshots use incremental backup means lot of space is not needed.

Total Cost Of Ownership (TCO) model:

Introduction: TCO model is used to understand all the finances incurred while doing a particular business. In My Case Study, I am using TCO model to decide whether on premise IT state is best for the company or the company should move to cloud services.

TCO Cost Components: The Three Basic Cost Components Of TCO are:

1) Acquisition Costs: Acquisition costs include hardware and storage costs. It includes costs of server, racks.

2) Operating Costs: It includes all the operating costs like software, services, initial training costs.
3) Personal Costs: It includes facilities cost. Power Cost, labor to run facility is included in personal costs.

On premise TCO analysis:
TCO=Hardware Costs + Software Costs + Storage Costs + Network Costs + Facilities Costs+ IT Labor Costs

➢ Hardware Costs:

- Capital expenses (CAPEX):Hardware cost includes server hardware costs and rack infrastructure costs.

Description	Cost (in Euros)
a) Total Server Hardware Cost	1,000,000
b) Rack Chassis with PDU (€3500/rack) Cost	63,000
c) Power, dual 280 V (@€540/ rack,2/rack for HA)	19,440
d) Top of Rack Switch (€5000 each, 2/rack for HA)	180,000
e) Rack one time Deployment Cost	50,000
Total Hardware Cost	1,312,400

- Operational expenses (OPEX): Operational Cost will include:
  a) Server Maintenance Cost:
  According to AWS, Server Hardware maintenance cost is considered at 15% per year of total server cost. Hence,
  15% of 1,000,000 = 150,000
  Therefore, Server Maintenance Cost for 5 years = 150,000 * 5
  = 750,000 euros
  b) Spare servers cost:
  According to AWS, spare servers cost is considered at 5% per year of total server cost. Hence,
  5% of 1,000,000 = 50,000
  Therefore, spare servers cost for 5 years = 50,000 * 5
  = 250,000 euros

Description	Cost (in Euros)
a) Total Hardware Maintenance Cost for 5 years	750,000
b) Total Spare Server Cost for 5 years	250,000
Total Cost	1,000,000

To Hardware Cost = CAPEX+ OPEX = 1,312,400 + 1,000,000
= 2,312,400 euros

➢ Storage Costs:

- Capital expenses (CAPEX): Storage space is 300TB.

Storage Space in Giga Byte = 1024 * 300 = 307,200 GB
According to AWS, OS penalty (@ 7%) = 7% of 307200 = 21504 GB
Usable OS space (in GB) = 307200-21504 = 285696 GB
According To AWS, storage price (@ 1.45 / GB) = 285696 * 1.45
= 414,259 euros
So, Storage price is approximately is € 410,000 euros

- Operational expenses (OPEX): Operational Cost will include:
  a) Server Backup Cost: According to AWS, for Storage Backup tape drives are used. For 1-year backup approximately 25 tape drives are needed
  Therefore, for five years tape drives required = 25 * 5 =125
  Tape Drive Cost (@1600 each) = 125 * 1600
  = 200,000 euros
  b) Storage Rack Operation Cost:
  According to AWS, monthly cost to operate a rack is € 1320
  Therefore, Storage Rack operation Cost for 5 years = 60 * 1320
  = 79,200 euros

Description	Cost (in Euros)
a) Storage cost	410,000
b) Storage Backup Cost for Five Years	200,000
c) Storage Rack Operation Cost For Five Years	79,200
Total Storage Cost	689,200

➢ <u>Network Costs:</u>

Description	Cost (in Euros)
a) Network Overhead Software Cost(@20%) of total Hardware Cost	462,500
b) Network Maintenance Cost for 5 years (@60,550/Year)	302,750
Total Network Cost	765,250

- Network Cost = 20% of 2312400
  = 4,62,480
  = 4,62,5000 euros approximately
  - Network Maintenance Cost for 1 year = 15 % of Total Network Over Head Cost
    =15 % of 302,750
    = 60,550 euros

➢ Facilities Cost:

Description	Cost (in Euros)

a) Estimated power cost to run on premise facility (@300,000 per year) for 5 years	1,500,000
b) Estimated power cost to operate rack (€19000 each/year)	1,710,000
Total Facilities Cost	3,210,000

Cloud Based TCO Analysis:

➢ **EC2 Partial Reserve Instances Cost:**

E2 Partial Instance for 5 years is calculated by using formula:
Total costs = (upfront cost + hourly cost * 8,784 hours/yr.*5 years)
Hourly cost is 0.12 euros.
Also considered is a standard discount of 10%

Description	Cost (in Euros)
a) Partial Upfront Cost	4,600
b) Hourly Cost Calculated By AWS for Five Years	2,912,830
Total Partial Reserve Instance Cost	2,917,430

➢ **AWS Storage Costs (EBS Storage):**

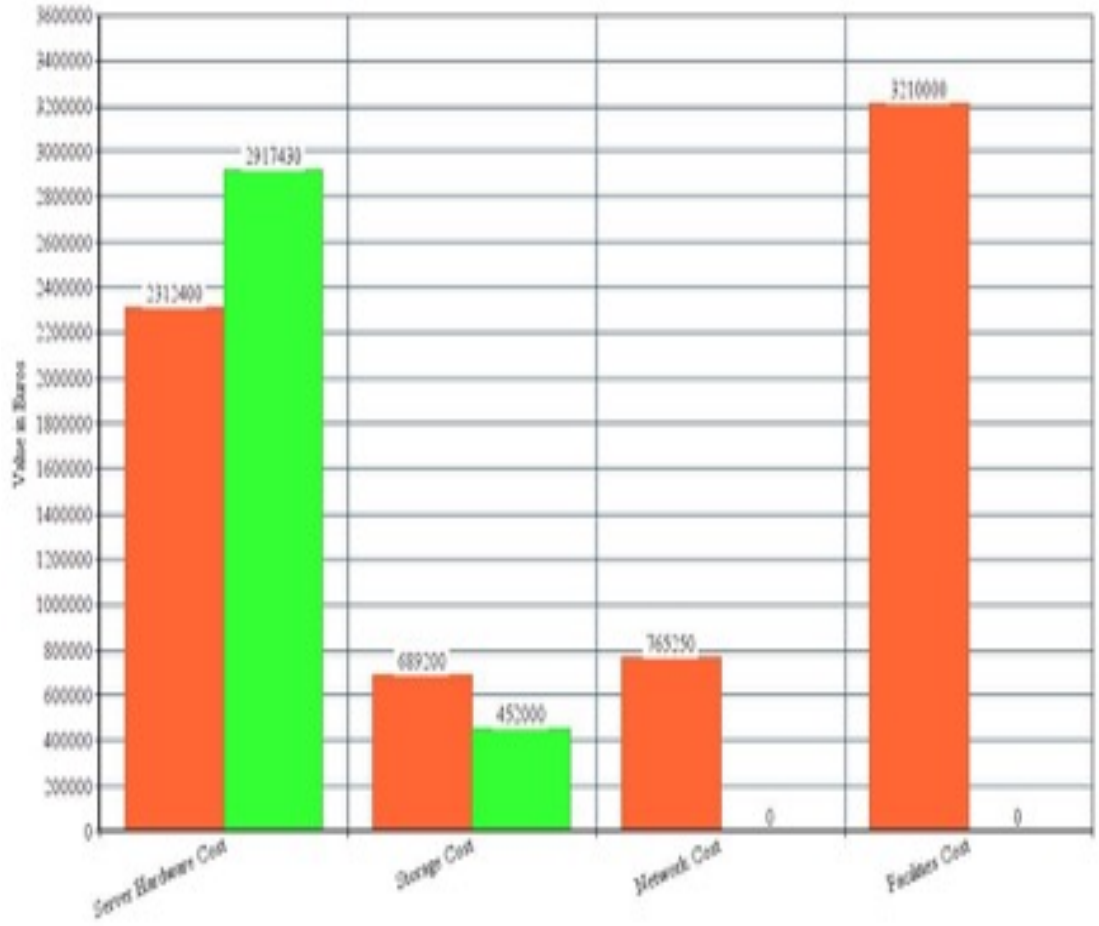
Description	Cost (in Euros)
a) EBS volume cost (@7000/month) for five years	420,000
b) Initial snapshot cost one time	12,000
c) AWS business support	20,000
Total AWS Storage Cost	452,000

Total On Premise Cost = Hardware Cost + Software Cost + Network Cost + Facilities Cost = 2,312,400 + 689,200 + 765,250 + 3,210,000
=7,976,850 euros

So total on premise cost is 8 million euros.

Total AWS Cloud Cost = **EC2 Partial Reserve Instances Cost +** AWS Storage Costs (EBS Storage)
= 2,917,430 + 452,000
= 3,369,430 euros

So AWS Cloud Service cost is 3.4 million euros.



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y axis: cost in euros
red color block denote on premise
green color block denote AWS cloud services

Recommendations:

I. Company should take care of all risks factors associated with data before migrating the data to cloud. After migration its Company duty to check that all their data has been successfully migrated.
II. If Company has any special security concerns then they should discuss their terms with AWS and ask them if it is possible to provide security. For example a company can ask AWS to provide a different data encryption code to protect sensitive data.

III. Company should make a thorough study of all the services guarantee's made by AWS. Also confidentiality clause Of AWS should be examined and company should know in which datacenter is their data stored and what are the various backup measures are provided to protect the data.
IV. Company should carefully check all the clauses mentioned in service level agreements (SLA's). Company should check if penalty clause is mentioned in case contracts are not fulfilled.
V. Company should monitor changes in AWS environment. Change in the storage location, administration changes should be checked. Company should keep an eye on change in services provided by AWS. Company should take into consideration that company is paying for services they subscribed and AWS is not charging them for unnecessary services that they are not using.

Conclusion:

Thus for TCO Analysis, Commex Technology can save 58 % a year by moving their infrastructure to AWS cloud. They can save a million euros per year by using AWS cloud resources.

By using AWS cloud they don't have to worry about creating and managing their own infrastructure. They can keep their whole concentration on their core services. Offshore Outsourcing project can be easily established by using Amazon Web Services.

In addition to these benefits, They come to know about latest technologies ,current marked trends, new software products, latest security principles and encryptions which they can use to improve their own businesses.

Thus moving into AWS Cloud Services will increase their buisness flexibility, scalability, integrity and efficiency.

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