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"Hardware, software Implementation in Internet Banking Technology"

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ABSTRACT:-

The banking sector in India has come upon a speedy transformation. The actual primary purpose behind this change is the result of the enhanced security and encryption routines created on the Internet. The second reason is banks would be unwilling to lose a potential market share to banks that are willing to offer their services on the Internet. Banking Industry is a piece of the economy in the world. Today we are placed in the time of globalization around the world. Worldwide acquaintances have acknowledged globalization as their first vital decision. Improvement in technology has encouraged globalization also. E-commerce, e-marketing, e-banking are today's buzzwords. Banks have transformed them and are offering services through the Internet. The banking sector is growing rapidly to adopt the Internet banking technology with a variety of services. The specific objective of research study was to know the hardware and software requirement of Internet banking. Knowing this hardware requirement researcher has been selected private and public banks in Satara district as a sample for the study.

Keyword: -Ecommerce, IT (Information Technology), Internet banking, Data center,Hardware

1. INTRODUCTION

According to C. N. Ram, the future is integration as people will have less time for banking. People will want to process more transactions on the internet. Geography will not be a matter for doing the internet banking transaction. Banks are using updated technology as per the need of the banking system. In the planning and development of e-banking services, software developers give attention to ease of use of the systems(Muneer Abbad, J. M. (2012)).Internet banking is defined as the automated delivery of new and traditional banking products and services provided directly to customers through electronic media. Internet banking incorporates frameworks that empower monetary organization clients, persons or industries, to access accounts, perform a business, or acquire data on financial products and services through a network.

2. PRIVATE AND PUBLIC BANKS IN SATARA DISTRICT

The main objective of research study was to know details about central data storage of Internet banking. The detail study of hardware and software requirement of data center storage was depicted in above research study. For this, researcher has been selected private and public banks as a sample for the study. During the study data was collected from 17 private bank branches and 57 public bank branches for the analysis.The related sample details are described below.

Table 2.1 Demographic profile of selected samples for study.

Sr. No	Name of bank type	Population	Sample units
1	Private banks	46	17
2	Public banks	181	57
	Total	227	74

(Source: - Secondary data)

The table 2.1 shows the details of the private bank branches and public bank branches existing in Satara district. There are total 46 private bank branches in Satara district from which the researcher has taken 17 bank branches as a sample for the study and from 181 public bank branches 57 as a sample for study.

Table 2.2 Demographic profile of private banks

Sr No.	Private bank names	Population	Sample units
1	ICICI Bank	20	7
2	HDFC Bank	12	2
3	Axis Bank	5	1
4	Catholic Syrian Bank	1	1
5	Karnataka Bank	1	1
6	Federal bank	2	1
7	ING Vysya Bank	2	1
8	Ratnakar bank	1	1
9	Indusind bank Ltd.	1	1
10	Yes bank	1	1
	Total	46	17

(Source: - Secondary data)

The table 2.2 shows the private bank branches in the Satara district. Out of 46 private bank branches researchers selected 17 bank branches for the study. In which ICICI bank has the maximum number of branches in Satara from which researcher has taken 7 branches for the study, on the other hand HDFC bank has 12 branches from which researcher has selected 2 branches, same way going ahead, researcher has chosen 1 branch of Axis bank, Catholic Syrian bank, Karnataka bank, Federal bank, ING Vysya bank, Ratnakar bank, Indusind bank Ltd., Yes bank for this research study.

Table 2.3 Demographic profile of public banks

Sr No.	Public bank names	Population	Sample units
1	State Bank Of India	31	12
2	Canara Bank	8	1
3	Syndicate Bank	5	1
4	Bank Of Maharashtra	57	17
5	Dena Bank	2	1
6	Oriental Bank of Commerce	1	1
7	UCO Bank	2	1
8	IDBI Bank	24	4
9	Bank Of India	19	6
10	Bank of Baroda	14	4
11	Central bank of India	5	1
12	Corporation bank	2	1
13	Indian Overseas bank	1	1
14	Union Bank of India	4	1
15	Vijaya Bank	2	1
16	Allahabad Bank	1	1
17	Indian Bank	1	1
18	Punjab National Bank	1	1
19	United bank of India	1	1
	Total	181	57

(Source: - Secondary data)

The table 2.3 shows the details of the public bank branches in Satara district. There are total 181 public bank branches from which the researcher selected 57 branches for the research. In which SBI bank has maximum 31 branches from which researcher undertake 12 branches. Secondly Bank of Maharashtra is having 57 branches from which researcher selected 17 branches, and further for remaining banks researcher selected 4 branches of IDBI bank out of 24 branches in the district. Bank of India is having 19 branches in total over here from which researcher chosen 6 branches. Bank of Baroda is having 14 branches among them researcher has selected 4 branches. Remaining all other mentioned here by researcher selected one branch of each Canara bank, Syndicate bank, Central bank of India, Corporation bank, Indian overseas bank, Union bank of India, Vijaya bank, Allahabad bank, Indian bank, Punjab National bank, United bank of India for the study.

3. HARDWARE AND SOFTWARE REQUIREMENT OF DATA CENTER.

A data center is a facility that houses IT (Information Technology) equipment used to process, communicate, and store data for all our digital activities. The term 'data center' can range from a small server closet located in an office building to a one-million square-foot multi-storey building.

a) A general software requirement of the Internet banking software is as follows.
Front-end: GTK+ 2.8.20, GCC 4.0.0, PHP 5.20, and Glade 2.10.1
Back-end: MySQL 4.17
Web Server: Apache 2.2
Platform used: Fedora Core 4 Linux[1]

b) A general hardware requirement of the Internet banking software in client side is as follows.
Pentium IV 1.7 GHz classes or better processor
128MB or more RAM (256 recommended)
At least 500 MB Hardisk.[2]

Each bank branch provides Internet banking facility to his customers from central data centers available at different place. Data center is a dedicated space used by banking industry to keep and operate all banking transactions centrally. They keep servers and storage equipment that runs application software process, also store data and content. Operations performed in data center are categorized into several areas

- Infrastructure operations: - In this categories installation, maintenance, monitoring, patching server updates, managing, storage and network resources are performed.
- Security operations: - This operation provides logical and physical security to processes, tools and technologies executed in the datacentre premises.
- Power and cooling operations: - This operations concentrate on providing enough power to all processes and take care of cooling system is operational continuously.
- Management operation: - This operation focused on creation, enforcement and monitoring of policies and procedures executed in datacentre processes.

VSNL (Videsh Sanchar Nigam Limited) is one of the world's largest providers of submarine cable bandwidth.

The largest six data centers available in India is as follows

- Mumbai (Data center having 2 branches)
- New Delhi data center

[1]Rath, J. *Software Requirement Specifications of a Corebanking Solution with Ebanking.* Eguru10388.

- Chennai data center
- Bangalore (Data center having 2 branches)

This data center covers 80% Internet population within India. These are the best data centers in India. It create physical environment for servers to keep them running 24 X 7 X 365 days continuously. Following table shows data center wise available facility.

Table 3.1 List of data centers with available resources

Data Center	Area	UPS	Humidity	Temperature	Security	Network
Mumbai 1	40,000 square feet	N+N with 30 minutes backup	50 +/- 5% non condensing	22 Degree Celsius	24 x 7 x 365 onsite security and video surveillance Biometric access control and authentication control	TATA, Reliance, NIXI and local ISP
Mumbai 2	40,000 square feet	N+1 with 30 minutes backup	50 +/- 10% non condensing	22 +/- 2 Degree Celsius		TATA Communication global network
New Delhi	52,000 square feet	N+1 with 30 minutes backup	50 +/- 10% non condensing	22 +/- 1 Degree Celsius		TATA, Bharti, NIXI and local ISP (MTNL/BSNL)
Chennai	30,000 square feet	N+N with 30 minutes backup	50 +/- 5% non condensing	22 Degree Celsius		TATA, NIXI and local ISP
Bangalore 1	20,000 square feet	N+N with 30 minutes backup	50 +/- 5% non condensing	22 Degree Celsius		NIXI & local ISP like Bharti, Tulip and TATA
Bangalore 2	45,000 square feet	2 (N+1) with 30 minutes backup	50 +/- 5% non condensing	22 +/- 1 Degree Celsius		BSNL, TATA, Tulip, Local ISP and NIXI

(Source: -Bank websites)

Now a day's demand for data centers is increased in India and outside countries. It is increased due to business needs and emerging markets. It is mainly driven by five broad categories.

- Growing business needs
- Growing connectivity globally
- Updated technology
- Customer awareness
- Emerging geographies

Hence use of data centers is increased in Internet banking system due to globalisation. Dedicated servers are used to handle the storage carefully.

Table: - 3.2 Dedicated server hardware configuration available in data center

Sr. No	Name of Resource	Hardware Configuration plans of dedicated server used in data centers			
1	Dedicated Server Hardware	1U Rackmount	1U Rackmount	1U Rackmount	Blade Server
2	CPU (Processor type)	Intel Xeon 3060	Intel Xeon 3220	Intel Xeon 3220	Intel Xeon E3 1230
3	CPU (Core & Speed)	1 CPU x Dual core Xeon (2.40 GHz)	1 CPU x Quad core Xeon (2.40 GHz)	1 CPU x Quad core Xeon (2.4 GHz)	1 CPU x Quad core Xeon (3.3 GHz)
4	Server RAM (ECC reg.)	4 GB	4 GB	8 GB	8 GB
5	Dedicated IP address	1 IP address	1 IP address	1 IP address	1 IP address
6	Hard disk Drive	2 x 250 GB	2 x 250 GB	2 x 320 GB	2 x 500 GB
7	Hardware RAID Configuration	RAID 1	RAID 1	RAID 1	RAID 1
8	Operating System	Microsoft Windows 2008 R2 Web Edition or Linux Cent OS			
9	Monthly Data Transfer	300 GB	500 GB	1000 GB	-

(Source: - Bank Website)

Data center infrastructure may achieve above important criteria for higher performance.

- Asset Management: - Easier, Accurate tracking, visualisation of data center asset.
- Capacity Management:-Management of data center capacity.
- Change Management:-Manage moves, Insertion and change in data center easily.
- Energy management:-Management of intelligently energy cost.
- Environment management:-Intelligently monitor, maintain health of data center.
- Power Management:-Accurate and detailed information of power in data center.

During the study researcher selected 10 Private Banks and 19 Public Banks from Satara district. All banks hardware configuration of Internet banking is not available. Only ICICI bank, Federal bank, Yes bank, HDFC bank, IDBI bank, Bank of Maharashtra, State bank of India, Bank of India, Oriental bank of commerce, UCO bank, Bank of Baroda, Dena bank, Canara Bank, Syndicate Bank, Union Bank of India, Allahabad Bank, Punjab National bank, United bank of India hardware and software configuration is available. These banks are codified from B1, B2, B3, ---B18.

Table: - 3.3 Bank wise available hardware configuration used for Internet banking.

Bank	Processor	Memory	Hard Disk	Switch
B1	4th Gen Intel® Core™ i5-3470 Processor (Quad Core)	4GB, NON-ECC, 1600MHZ DDR3 RAM with at least 1 DIMM Slots free	500GB 7.2K RPM SATA Hard disk	CISCO WS-C3560G-24TS,24 10/100/1000+4 SFP
B2	Core i3-4130, Intel Dual Core D2500 1.86 GHz, AMD A8 – 5500, AMD Geode 1 GHz	8 GB DDR2 RAM	500 GB Ultra ATA or SATA (7200 RPM)	SAN Switch
B3	2 x Intel® Xeon® Processor E5649 Processor	32 GB PC3 ECC DDR3 RAM using 8GB DDR3 scalable to 192GB	500 GB Ultra ATA or SATA	SAN Switch
B4	8 added servers in cluster 1-4 CPU- Hexcore	256 GB RAM	SATA internal disks on which ESX server software	CISCO WS-C3560G-24TS,24 10/100/1000+4
B5	HP Superdome	8 GB DDR2 RAM	HP XP24K SAN, 320 TB	Cisco catalyst 2960-X series switch
B6	Intel Xeon 3060	8 GB DDR2 RAM	RAID 1	Cisco catalyst 2960-X series
B7	Intel Xeon E3 1230	8 GB DDR2 RAM	2 X 2.5” HDD	SAN Switch
B8	Intel Xeon (X64) 2xHex-Core Processors 3.0 GHz	On board L1,L2 Cache 64 GB RAM 4x300 GB SAS/Fiber 15K RPM Drives with Hardware RAID	2 X 2.5” HDD	CISCO WS-C3560G-24TS,24 10/100/1000+4
B9	1/2 Intel based Server, 1 Novell Netware 4.2/Sco Unix with SFT II/III, Min of 2 Pentium PC, 6 Pentium PC Diskless	8 GB DDR2 RAM	2 X 2.5” HDD	SAN Switch
B10	Intel Xeon (X64) 2xHex-Core Processors 3.0 GHz	On board L1,L2 Cache 64 GB RAM 4x300 GB SAS/Fiber 15K RPM Drives with Hardware RAID	2 X 2.5” HDD	CISCO WS-C3560G-24TS,24 10/100/1000+4 SFP Standard Images
B11	4 X Intel Xeon Twelve Core CPU @ 3.5 GHz	256 GB(1600 MHz or higher) DDR3	4x600GB/SAS Drive	CISCO WS-C3560G-24TS,24 10/100/1000+4 SFP Standard Images
B12	2 X Intel Xeon X5570 2.93GHz, 2 X Intel 5600 Quad Core	8 GB DDR2 RAM	300 GB X5, = 3 X 450 GB SAS	IMPS Switch
B13	Intel® i3 Processor	2 GB DDR2 RAM	2x 500 GB IDE/SATA HDD	IMPS Switch
B14	362 servers with Microsoft Windows, HPbUnix	8 GB DDR2 RAM	2x 500 GB IDE/SATA	CISCO WS-C3560G-24TS,24

				10/100/1000+4
B15	Intel /Pentium/ATOM/ AMD @ 1.66 GHz	8 GB DDR RAM	2x 500 GB IDE/SATA	8 Cisco MDS 9148 Fabric Switch
B16	IBM System Storage DS8800 ,64 GB Processor memory (4- core only)	8 GB DDR2 RAM	5 600 GB 10,000 rpm FDE disk drive set	8 Cisco MDS 9148 Fabric Switch
B17	Intel Xeon (X64) 2xHex-Core Processors 3.0 GHz	8 GB DDR2 RAM	RAID 1 + 0	IMPS Switch
B18	Intel Core TM i3-3220 Processor (3.0 GHz, 3 MB Catch) 3rd generation or AMD A8 5500 Processor (3.2 GHz, 4MB Cache)	8 GB DDR2 RAM	320 GB SATA III 3.0Gbps with 4 SATA Port pre failure alerts	8 Cisco MDS 9148 Fabric Switch

(Source: - Bank website)

Table: - 3.4 Bank wise available software configuration used for Internet banking.

Bank	Internet banking software	DBMS	Operating system System
B1	Finacle	Web sphere, Pramati and Oracle	Windows 8 professional 64 bit licensed version
B2	FedNet	DB2	Windows Pro, Windows XP
B3	FLEXCUBE	Oracle	Windows Pro, Windows XP
B4	Finacle	Oracle	Windows Pro, Windows XP
B5	FNS(Finware)	DB2	HP UNIX
B6	BaNCS	SQL Server 2008	Windows Pro, Windows XP
B7	BaNCS2000	DB2	Microsoft Windows 2008 or Linux
B8	BOSS(DDE_ORG)	DB2	Microsoft Windows 2008 R2 Web Edition or Linux Cent OS
B9	Laser-soft	DB2	Microsoft Windows 2008 or Linux
B10	Finacle	Oracle	Microsoft Windows
B11	Finacle	Oracle	Windows server 2003, Windows server 2008 R2,
B12	Finacle	Oracle	Windows server 2003, Windows server 2008 R2,
B13	Finacle	Oracle	Microsoft Windows 7, Windows server 2008
B14	Finacle	Oracle	Red hat Linux platform, Windows server 2008
B15	Finacle	Oracle	Microsoft Windows 7, Windows server 2008
B16	Finacle	SQL Server 2008,DB2	Microsoft Windows 7, Windows server 2008
B17	BaNCS	SQL Server 2008	Microsoft Windows 7
B18	Finacle	Oracle	Windows 8 Professional 64 bit license

(Source: - Bank Website)

4. CONCLUSION

In recent years, Internet banking will not only be appropriate approach of banking, but will be the idealapproach of banking.One of the primary objectives of this research was to gain an understanding hardware and software requirement of Centralised data centers used in Satara district private and public banks.The Indian banking industryquickly adopts the technology development and providesInternet banking services to the bank customer. According to available information it is realized thathundred percent of private sector banks and public sector banks provideInternet banking services to their client in Satara district.The bank using those data centers had adequate hardware and software configuration for managing Internet banking technology.

5. REFERENCES

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