



## TECHNOLOGY IN BANKING

### PNB's IT-enabling journey

*Punjab National Bank used a two-pronged strategy to IT-enable itself and support present and future business needs. And along the way it picked up valuable information and experience.*

Punjab National Bank's (PNB's) come a long way since March 2000, when IT systems were deployed only at 500-odd branches, and was very disparate. Only 35 percent of the bank's business was computerized and a number of small software packages ran on standalone PCs.

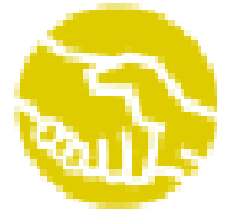
Now in 2003, PNB has 101 branches on a WAN, deployed a core banking infrastructure, and runs 175 networked ATMs. It has also deployed a reliable security infrastructure that helps it conduct transactions within its branches without worry. The journey doesn't end here, but along the way the bank's picked up valuable knowledge and experience.

### The beginning

In March 2000, the penetration and use of IT was not very high at PNB. The bank used seven different software, which ran on 13 different flavors of Unix, on standalone PCs. The 500-odd branches were not networked and only 35 percent of the bank's business was computerized. The overall expertise in IT among users was low.

The Central Vigilance Commission (CVC) issued a directive to the bank to computerize at least 70 percent of its business by December 2000. This prompted the bank to work out a strategy to tackle the daunting task in the short period of time.





## **Analysis**

A SWOT analysis was performed and it produced the following results:

### **Strengths:**

- The bank personnel would be able to readily embrace the use of IT.
- An existing pool of qualified knowledge-based personnel would contribute largely to the IT initiatives.
- The financial position of the bank was very sound. There would not be any constraint of funds to facilitate IT initiatives.
- The bank wasn't bound to too much legacy systems and equipment.

### **Weaknesses:**

- Different Unix OS flavors in different branches.
- Different standalone financial applications on PCs at different branches.
- Lack of interoperability due to disparity in systems.
- Limited expertise on the software packages currently deployed. This increased dependence on vendors.
- Systems audits were pending.
- Most branches did not have a proper LAN in place.
- There was almost no WAN connectivity.

The bank realized that there was a lot of opportunity to create a stable IT infrastructure which would fuel future growth. But there was also the need to honor the CVC deadline to computerize at least 70 percent of its business within December 2000.

The bank now has around 4,000 branches.

## **Action**

PNB hired a consultant and devised a two-pronged plan of action. The plan comprised:

1. A short term goal - To meet the CVC deadline of 70 percent computerization.
2. A long term goal - To create a dependable core banking infrastructure and build a nationwide network to connect different branches to the core infrastructure.



### **Meeting the CVC deadline**

In order to meet the CVC deadline the bank decided to deploy simple IT infrastructure so that it could computerize 70 percent of its business within the deadline. The IT team decided to implement an application, which could run on standalone PCs across its nationwide branches. The application vendor would have to provide nationwide support since the in-house IT team could not provide support at all branches.

PNB chose a product from a company called Nelito. It was a DOS-based, 'Partial Branch Automation' application. Standalone versions were chosen since there weren't LANs in place, and deployment of LANs at branches would take so long that the CVC deadline couldn't be met. The interface was simple in design, and thus easy for the bank personnel to use.

### **Hardware and Training**

The bank selected two hardware vendors and the application software was embedded into the hardware to make them 'plug-and-play' capable. Nelito's package was deployed at one branch at a time. And after each successful implementation at a branch, it was replicated at a newer branch.

Internal training sessions for the bank personnel were conducted with the help of 14 training institutes. The source code of the product was tweaked to facilitate deployment. The IT team was specially trained to re-architect the source code, and make any modifications, improvements, value additions, and enhancements. Deployment at the selected branches was over by December 2000.

The bank requested CVC for an extension of the deadline and was granted time till March 2001. By March 2001, 70.60 percent of the bank's business was computerized.

### **Long-term strategy**

In the long-term, PNB wanted a technology that would consolidate all its business resources and sustain the bank's future growth. It also wanted to create its own network, which would play a vital role in its success. Three consultants were appointed to review technology options for long-term adoption. The verdict of the consultants was to deploy a centralized core banking architecture.

### **Core banking architecture**

On 30 March 2001, the bank used the services of Infosys for the deployment of Finnacle. A core team was selected, which would be the heart of the project. Infosys trained 200-odd personnel from a core team over six months. The core team modified and customized the package according to its specific needs.



It was then time to procure hardware. K.S. Bajwa, Deputy General Manager, Information Technology Division, PNB, said, "It's a standard international practice to procure hardware based on the type of software applications that an enterprise has selected. This helps to match the specific computing needs required by the software." PNB purchased servers, security infrastructure, and storage equipment and decided to house it in its own central data center in New Delhi. A lot of infrastructure from Cisco has been used to build the data center.

In April 2002 the bank rolled-out Finnacle in seven branches as a pilot venture. This was done because the bank had seven different application packages, and it wanted to ensure smooth migration of the data into Finnacle. By mid May 2002, all data from other software was successfully migrated into Finnacle.

### **Culture and technology issues**

Issues were mostly cultural. Most staffers were used to working in a manual environment, and some had worked in standalone environments. In the new networked environment, personnel at the node/counter didn't actually 'see' the transactions updating in the various account books.

This gave rise to a number of queries and suggestions from personnel. The bank consulted IDRBT and RBI to verify the implementation success and it was reported that the deployment was absolutely correct. Around six months later, the personnel felt that the environment 'change' had done them good, and was used to working on the systems.

"There were a few integration issues when migrating to Finnacle, but the in-house IT team was able to resolve them all. The pilot for the initial seven branches was a test-bed for us. The knowledge we gained from the pilot deployments helped us overcome the future issues," explained Bajwa.

### **Systems**

Before deploying the core banking architecture, PNB used servers which were NT-based, from IBM, and from other vendors. The bank conducted benchmarking tests for Finnacle on various server platforms. And it was satisfied with the performance of Sun's hardware on Solaris. Sun's Fire servers, Solaris OS, and Oracle's RDBMS are now in use.

### **Network design**

Cisco has tied up with PNB to evolve the network design and implement a nationwide network backbone to connect all its offices. Cisco will assist the bank in understanding and implementing the various technologies associated with the project. The converged network infrastructure will allow PNB to standardize the applications and software needed to provide the banking services.

The network infrastructure will have a three-tier architecture. The network hub will be in its data center. The various branches would be connected to the data center using new-world routing and switching technologies.



### **Moving to Internet banking**

PNB got a license from RBI to offer Internet banking services. Some of the RBI preconditions were that the systems should be audited by an independent auditor, and an independent and authentic agency must carry out penetration testing. The bank has already had its systems audited by an external agency, and the penetration testing process is still going on. In the process, PNB has developed the skills of its own personnel to take charge of security on their own at a later stage. The bank will also recruit technically trained staff to provide the necessary knowledge pool. With the Internet banking launch, the bank will also strengthen its security policy.

### **Storage systems**

The bank has followed RBI's storage requirement guidelines. Provisions have been made to store transaction data for around 10 years. In some cases, data is stored permanently. Around 164 Sun enterprise class servers are used in a DAS architecture. The total capacity is of multiple TBs.

The Sun hardware uses an in-built storage management tool. Bajwa feels that the bank doesn't need a third-party storage management tool right now since the database is not too large. However the bank is considering a storage management application from Veritas.

### **WAN and connectivity**

101 branches of the bank are on a WAN. The bank plans to put 500-odd branches on the WAN this year, and in three years the WAN will have 2000-odd branches.

The bank tried a number of connectivity options. 802.11b wireless connectivity was installed in five branches to begin with.

"It was a comfortable experience, but suffered the inability to interchange between the wired medium. Changing between mediums had to be performed manually," said Bajwa.

The bank then explored the option of leased lines and used connectivity from MTNL and BSNL. It also used Bharti's leased line between Mumbai and Delhi. The bank now uses Reliance Infocomm's fiber optic backbone along with the leased lines in locations where the optic fiber does not reach. However, the use of Reliance Infocomm's infrastructure may be temporary. Bajwa says that his experience with BSNL's service is very commendable.



## **Network management**

PNB has appointed HCL Com-net to carry out 24x7 monitoring of the countrywide network. There's a live link between HCL Comnet's NOC and PNB's IT head office. The network is monitored remotely and can also be viewed at the bank's IT facility, where a separate monitoring system is used for the Base24 Switch. Reliance has set up a NOC at PNB's premise to monitor its optic fiber network.

## **The future**

These are some initiatives the bank wants to take in future:

- Set up a data warehouse and a data mart soon. It will take six months to achieve. IDRBT has been involved as a consultant.
- It may need to set up a NAS and SAN to consolidate its storage.
- Disaster Recovery site may be built at Mumbai to create a replica of its data center. It will take around six months to be functional.
- A call center will be set up as a CRM initiative, which uses information from the data warehouse with the help of the Base24 switch.

## **Keeping it secure**

Security was especially important because the bank could afford no compromise. The security architecture had to be robust, reliable, and scalable to meet current and future needs. Cisco was chosen as the service provider who could meet these stringent requirements. The bank uses a range of security products like Firewalls and IDSs from Cisco for its security needs in its LANs and WAN. All data transactions between its routers and switches are encrypted. It has appointed Ramco Systems as the security integrator. The security integrator is responsible for the complete security infrastructure and is answerable for any security breach or lapse. The bank will also appoint a security administrator. Verisign will provide the necessary Public Key Infrastructure (PKI) to the bank for secure transactions.



### **Advantage ATMs**

PNB feels that ATMs offer many advantages over conventional branch-based banking like low cost per transaction and customer convenience. To encourage this, the bank has installed over 250 ATMs, out of which 175 are networked. A Base24 switch controls the ATMs. The ATMs are connected essentially through VSAT links from Comsat Max. VSAT links were chosen over leased lines because the bank felt that leased lines did not provide 100 percent uptime, and VSATs were closer to that mark. "If a customer uses an ATM and the line is not up, he/she will not be able to complete the transaction. The bank can't take a chance with connectivity," said Bajwa. Comsat Max has signed an SLA of maximum guaranteed uptime and dedicated bandwidth, to be increased whenever required. PNB has formed a consortium of seven banks and has principally agreed to share the ATM facilities amongst themselves. It will be available for public use soon.

**Appeared in Network Magazine, May 2003**