

IDRBT to be Sub-CERT for Indian Banking and Financial Sector

The Department of Information Technology, Ministry of Communications and Information Technology (MCIT), Government of India, has established the Indian Computer Emergency Response Team (CERT-In), to serve as a Nodal Agency for the Security and Protection of the Critical Infrastructure of the Nation.

As part of the CERT-In, each sector needs to set up a Sub-CERT and IDRBT would be the Sub-CERT for the Indian Banking and Financial Sector. The Institute is now in the process of establishing the Indian Financial Computer Emergency Response Team (INFICERT), the Sub-CERT for the Indian Banking and Financial Sector.

The Background

Keeping organisational information assets secure in today's inter-connected computing environment is a challenge, and that becomes more difficult with each new e-product and each new intruder tool. There is no single solution for securing information assets, and instead a multi-layered security strategy is required.

One of the layers that many organisations are including in their strategy these days is Computer Emergency Response Team (CERT). The formation of CERTs at the organisational, national and regional levels is essential for the effective and efficient response to computer security incidents, widespread security vulnerabilities and incident coordination throughout the region.

At the worldwide level, the Forum of Incident Response and Security Teams (FIRST) exists as a cooperative international body of Computer Security Incident Response Teams. At the regional level, the CERTs are

established across globe. In the Asia Pacific Region, they are known as APCERT and in the European region as European CERT.

All these teams coordinate their efforts when responding to large-scale incidents; provide training to incident response professionals and research the causes of security vulnerabilities, prevention of vulnerabilities, system security improvements, and survivability of large-scale networks. Another important role of CERTs is education and training to increase the awareness levels and encourage best practices.

The Cert-In

The Indian Computer Emergency Response Team (CERT-In) was established by the Department of Information Technology, MCIT, Government of India, to be part of the international CERT community. The CERT-In's mandate is to protect India's critical IT assets, assist in implementing proactive measures to reduce the risks of computer security incidents, and become the nation's most trusted referral agency for responding to computer security incidents.

The CERT-In provides both proactive and reactive services for enhancing cyber security and creates awareness on various aspects of IT Security. The launch of the CERT-In comes in the wake of billions of dollars spent across the globe to retrieve systems corrupted by virus attacks or defaced by hackers. The CERT-In team protects the Indian computer networks, particularly those representing the acupuncture points of the economy, against all potential threats.

The CERT-In is involved in developing security guidelines for operating systems, web servers, mail servers, firewalls, intrusion detection systems as well as advisories, alerts, vulnerability and incident notes, based on worldwide practices. It also serves as a central point to respond to computer security incidents, and facilitates in solving computer emergencies.

Cert-IN objectives

- ◆ Serve as a central point, responding to computer security incidents and provide a reliable, trusted, 24-hour referral contact for emergencies
- ◆ Disseminate best practices among System Administrators and Service Providers
- ◆ Initiate proactive measures to increase the awareness and understanding of information security and computer security issues among the Indian cyber community
- ◆ Alert the community regarding the latest security threats in the form of advisories, vulnerability notes and incident notes
- ◆ Facilitate communication among experts working to solve computer security problems
- ◆ Create trust in electronic environment
- ◆ Create a team of suitably qualified and empowered personnel to advance the mission of cyber security
- ◆ Establish linkages with similar organisations in the international arena
- ◆ Perform R&D activities in collaboration with premier research and educational organisations regarding the



The INFINET User Group meeting on INFICERT in progress at the Institute on March 11, 2005

security of existing systems and evolving cyber security problems

The INFICERT Agenda

Reporting & Response

- ◆ 24*7 contact centre to react to the incident reports from members
- ◆ Respond with solution/recommendations to the members
- ◆ Maintain feedback on the status for future references
- ◆ Telephonic support to System Administrators/IT Managers

Reactive Measures

- ◆ Provide single point of contact for reporting security issues of Banks and FIs
- ◆ Evaluate the Impact of the Incidents
- ◆ Provide recommendations to overcome the issues
- ◆ Documenting incidents for future reference

Proactive Measures

- ◆ Monitoring Security related developments in global scenario
- ◆ Sending advisory information to INFICERT members
- ◆ Conducting training programmes / workshops
- ◆ Carry out Vulnerability & Risk Analysis on Security and share the outcomes with INFICERT members
- ◆ Carry out evaluation of Security products and publish the results
- ◆ Interact with various product developers/ manufacturers for better understanding of their products.

The Institute conducted a meeting of the INFINET User Group on March 11, 2005, to initiate the process of setting up the INFICERT and also share its views on various issues requiring co-operation and co-ordination among the members.

The INFICERT may be contacted at: **The Coordinator,** INFICERT, IDRBT, Castle Hills, Road No.1, Masab Tank, Hyderabad – 500 057; e-mail: inficert@idrbt.ac.in; Fax: 040-23536371.

Anywhere, Any ATM, Anytime Banking

ATMs are more popularly known by the punch line – [Anywhere, Anytime Banking](#). But with the popularity of IDRBT's National Financial Switch (NFS) on the rise, this punch line is being redefined to – [Anywhere, Any ATM, Anytime Banking](#).

National Financial Switch

Many ATMs of different banks crowding at a single place is a common sight. But with the NFS, an *apex* switch that aims to endow seamless integration of all the banking switches in the country so as to provide the flexibility of making financial and non-financial transactions from across any ATMs of any bank, this scenario is undergoing a change. In the process, the NFS is also facilitating better resource utilisation for the banks.

Though banks with a large ATM infrastructure make considerable revenue by leveraging their ATM infrastructure to other member banks, it would be a daunting task to put up ATMs to reach out to all the customers. Moreover, small banks find it difficult to meet the huge investments required to put up ATMs.

A Winning Situation

It's in this scenario that the NFS provides a win-win situation both for big and small banks. Both big and small banks can leverage each other's ATM infrastructure and

reach out to the customers. Further, the NFS also widens the scope for customers, who can make use of any NFS-ATM, rather than limiting himself to the ATMs of only his bank.

The cost/fee associated in using the services of the NFS Network is nominal, and it has generated tremendous interest among banks to join the NFS. Further, NFS charges only for successful transactions and the charges are much less in comparison to other shared networks.

The settlement process too is very simplified and it works on (T+1) basis. The Clearing Corporation of India Limited acts as the settlement agency and the settlement mechanism is done through Real Time Gross Settlement.

Current Status

Currently, the NFS is live with Andhra Bank, Bank of Baroda, Corporation Bank, Punjab National Bank, ICICI Bank, IDBI Bank, United Western Bank and Dhanalakshmi Bank. There has been an overwhelming response from many banks across the country and they have expressed their in-principle approval to join the NFS Network.

The NFS went live on August 27, 2004 and within a span of six months, the NFS Network has 4078 ATMs, which is the largest number of ATMs under a single network in the country.

Indian Financial Network

The INFINET VSAT Network is now operational with over 2300 TDM/TDMA and 24 SCPC VSATs. At present, 39 organisations are using the VSAT services being provided by the Institute.

Further, the INFINET Leased Line network is operational with 96 backbone links of 2 Mbps and there are over 450 CUG member connections at various INFINET nodes across the country. Around 160 CUG members are currently utilising the Leased Line Network for various Inter/Intra-bank communication/application requirements.

The Institute has maintained the network uptime of 100% right from the inception of network operations.

INFINET Network Audit

The Institute conducted a Network Vulnerability & Performance Assessment Audit with the assistance of M/s HCL Comnet to ascertain the vulnerabilities and the shortcomings in the performance of the INFINET. The Institute has implemented all the audit recommendations successfully.

IDRBT Certifying Authority

The IDRBT Certifying Authority has issued more than 20,000 Digital Certificates out of about 30,000 certificates issued in India as per IT Act by all the licensed Certifying Authorities put together.

The Banks and Financial Institutions are using the Certificates issued by IDRBT CA for Corporate E-mail, RTGS, SFMS, Web Servers used for Internet Banking, CFMS, EFT/ECS, and CCIL Settlement Applications. Further, IDRBT CA Certification services have been extended to NSDL's Online Tax Assessment System (OLTAS) and SBI's Electronic Payment System (STEPS).

IDRBT CA has also started issuing digital certificates to customers of Banks and Financial Institutions through Offline Certification Process. These customers are

availing the facility for online filing of Income Tax returns, E-Governance Applications, etc.

The same certificates can be used for online banking applications and other e-commerce applications including PKI enabled e-mail. They can use the simple utility (available as free download in <http://idrbtca.org.in/>) for generating certificate request and obtain the certificate by e-mail, thus reducing the connectivity bottlenecks. The utility can also be obtained by sending a request e-mail to cahelp@idrbt.ac.in.

This offline certification process can also be used for issuing digital certificates to bank employees, servers and bank applications, wherever there is a connectivity problem while accessing the IDRBT CA website.

IDRBT CA's Disaster Recovery Site (DRS) is now operational at Mumbai.

Structured Financial Messaging System

- RTGS-compliant Version 3.0 of SFMS is installed in all Public Sector Banks, Reserve Bank of India and Catholic Syrian Bank.
- 12 Public Sector Banks are using SFMS for RTGS operations and two more are set to go live shortly.
- Banks are being assisted in integration of Core Banking, SFMS and RTGS.
- User Acceptance by the RBI is completed in respect of National Electronic Funds Transfer and RBI would roll it out after a pilot run in six select banks.
- Customer Terminal has been rolled out and SFMS on Internet is being rolled out.
- A website for SFMS is now operational @ <http://infinet.org.in/>
- A new set of Currency Chest Messages are being developed, fully supporting ICCOMS - an application of the Department of Currency Management, Reserve Bank of India
- Integration of Forex module is completed and the setting up of Service Bureau for SWIFT connectivity is being explored.
- As the majority of SFMS Gateways are located at Mumbai, Helpdesk facility has been made available at Mumbai also.

Best Dissertation Award

Shri Manik Lal Das, who is pursuing the Institute's collaborative Research Fellow (Ph.D.) Programme with the K. R. School of Information Technology, IIT, Bombay, has won the [Best Dissertation Award](#) at the International Doctoral Symposium in "Computer and Information Science Engineering," organised at the Amrita Vishwa

Vidyapeetham, Tamil Nadu, on 18-19 December, 2004.

This scholarly gathering saw the participation of over 80 research scholars from various premier engineering institutions, including the IITs. The organisational committee had selected the work towards six dissertations for presentation at the symposium.

Protocols and Security Framework for Mobile Payment System

This is a sponsored project of the Ministry of Communication and Information Technology, Govt. of India, being carried out by IDRBT. The objective of this project is to study mobile payment systems and analyse them with a view to explore the practicability of a mobile-to-mobile payment system, which relies on Public Key Infrastructure and takes into account the Security domains inherent in the GSM and CDMA wireless standards.

The Project

Recent advances in technology enable portable computers and electronic devices to be equipped with wireless interfaces, allowing networked communication while being mobile. It offers a new paradigm of computing, in which users carrying portable devices can access a shared infrastructure independent of their geographical location.

The last couple of years has seen a big push by the telecom industry to accelerate the use of wireless technology (e.g., WAP, J2ME, VoiceXML, GPRS) in providing distributed computing and Internet facilities. Various mobile devices are now designed to widen the consumers' reach to the servers of service providers to process tasks like stock trading, product purchasing, product information collecting, etc.

This project proposes to use wireless communication and facilitate a mobile phone owner to pay any merchants or consumers, who have mobile phones or on-line EMV capable terminals. With this payment network, mobile-to-mobile debit and/or credit transactions through the intended phone owner's bank account can be done securely without any terminal infrastructure. This saves huge operational load and deployment cost as compared to the traditional ATM payment infrastructure.

This requires that the service provider, scheme provider,

and customers must ascertain the end-to-end authorisation, data integrity and non-repudiation aspects. The mobile phone must have the capability of a universally usable digital certificate (X.509 certificate) for signing the transaction. The SIM of the phone needs to support GSM 03.48 Security, and additionally, PKI has to provide authorisation and non-repudiation properties.

With this payment framework, multiple GSM/CDMA operators and multiple issuers and acquiring banks can operate their financial transactions securely over-the-air. The entire funds flow would be handled through the banking system using EMV Security with the added layer of GSM/CDMA Security and PKI.

The Specifics

- ◆ Survey, analyse and adopt the standards and security requirements for a mobile payment system
- ◆ Conduct feasibility study for a mobile payment framework that works at the retail as well as the enterprise level with plug-in capability for multiple applications
- ◆ Frame a comprehensive security architecture to counter possible threats
- ◆ Devise the protocol/security framework for mobile payment system based on PKI, taking into account the security domains inherent in the GSM and CDMA wireless standards
- ◆ Devise integration methodology of mobile payment protocols with smart card based payment back-end system
- ◆ Formulate the key management and terminal management procedures for the framework
- ◆ A pilot for proof-of-concept with the help of industry partners

The foundation for a world-class Institution is ready: V. P. Gulati

Dr. V. P. Gulati held the office of Director, IDRBT, from Nov 26, 1997 to Nov 25, 2004. An ardent believer in the power of technology, at every opportunity he would drive in the point that 'Technology must get absorbed in the Indian Banking and Financial Sector.' His approach was all about 'getting it done' and he always made it clear that the priority 'has to be to achieve the goals'. "If there is a problem, solve it and solve it fast," he stressed.

But at the same time, Dr. Gulati came across as a very approachable person. He had a way about keeping his ears to the ground and every employee could interact directly with him. Many a time, he would go around the Institute and talk to each of the staff members.

Fast Forward wishes Dr. Gulati a warm farewell. Excerpts from his exit interview with the IDRBT Newsletter:

Let's begin with the beginning. What was your vision for the Institute when you took over as the Director of IDRBT?

I still vividly remember the day I stepped into this Institute. The very first sight convinced me that a huge task was awaiting me and we had to literally begin from the beginning. But it was a good challenge and I took it up.

My vision was to make IDRBT an Institution that the Indian Banking and Financial Sector can look up to with confidence and then develop it into an internationally respected organisation.

Do you believe you have achieved what you set out for?

Yes. Today, IDRBT is a brand in the country and we have made it happen through a series of innovative initiatives. In fact, after the first couple of years, which were focused on infrastructure building, we have offered the sector a new initiative almost every year.

The Indian Financial Network was launched in 1999 and in the same year, we began the Ph.D Programme in association with the University of Hyderabad. In 2000, came the Mail Messaging System and in 2001, Dr. Y. V. Reddy launched the Institute's M.Tech. Programme in Information Technology with specialisation

in Banking Technology and Information Security. His statement on the occasion that the course 'is the first-of-its-kind in India and perhaps in the world' was very inspiring. In the same year, we also launched the Banking Technology Excellence Awards and the EnDeSign Software.

The year 2002 saw us becoming the Certifying Authority for the Indian Banking and Financial Sector and in 2003; the Institute launched the Post Graduate Programme in Banking Technology Management. In 2004, we launched the National Financial Switch, a major step towards bringing in Convenience Banking in the country.

Did you enjoy leading IDRBT?

Most certainly. We have developed an open culture in the Institute and we always discussed and deliberated and then went ahead. The concept of teamwork was inculcated in every sphere of activity.



Moreover, I always got the support of the Top Management and the Department of Information Technology of the Reserve Bank of India. I must express my sincere gratitude especially to Dr. C. Rangarajan, Dr. Bimal Jalan and Dr. Y. V. Reddy.

What would you count as the high point of your tenure?

It will be difficult to pinpoint anything particular. But whenever a new initiative taken by us was launched, there was a sense of fulfilment and achievement. The fact that

the Institute could contribute so much to the Industry and especially to the Public Sector Banks, was immensely pleasing.

If I have to point to something that I would always cherish, then it would be the top management of the Reserve Bank of India and the entire Indian Banking and Financial Sector, coming together at IDRBT for the Chairmen's Conference and Banking Technology Awards.

Is there anything that you wanted to do but could not?

I would have loved to see the Institute make a mark in the international arena. We did take small steps with our association with the Bank of International Settlements, Queensland University of Technology, etc. But there is still a long way to go and I am sure the Institute has the capability to make it.

Were there occasions when you did not like your job?

No. There were occasions when things did get delayed but they did not dampen my enthusiasm. When I look back, I cannot recollect any occasion when I did not like the job. It was a pleasure leading the IDRBT.

What kind of support did you get from the IDRBT staff?

I have always believed that it's the commitment of the staff that makes an Institution. So, I focused on taking their views and moving ahead together. We conducted Faculty and Staff Meetings regularly.

I must record that I have got excellent support from all the Staff members of the Institute. The Faculty and Staff have

worked on various projects, developed courseware for our academic and executive development programmes and also for the e-learning programme. I take this opportunity to thank all of them.

What according to you is the strength of IDRBT?

IDRBT is a unique Institution. It's perhaps the only Institution where a unique blend of Technology Services, Research and Education is at work. In fact, each of these domains reinforces each other, and this is the strength of IDRBT. I do not think there are other Institutions, which provide such a great opportunity. We need to further strengthen this bond.

At every forum, you stressed that "Technology must be absorbed in the Banking Sector as an immediate priority." Are you satisfied with the current status of technology absorption in the Sector?

Yes. I remember those early days when technology was considered an option. But since then, the sector has made tremendous progress. The entire sector is now banking on technology and technology absorption is now an immediate priority for the sector.

The IDRBT has contributed immensely towards this technologisation process, more specifically in the Public Sector Banks, and that is very satisfying.

What according to you should now be the focus to accelerate technologisation of the Sector?

The current focus is on implementation of Centralised Banking Solution (CBS). We need to move on to centralisation of back office applications and then its integration with the CBS.

CIT 2004 - 7th International Conference on Information Technology

The Institute, in association with the University of Hyderabad (UoH) and the International Institute of Information Technology, Hyderabad (IIIT), hosted the CIT 2004 - the 7th International Conference on Information Technology, to provide a high quality forum for scientists, researchers, and academicians from various disciplines to present their latest research findings on various topics in the area of Information Technology and its Applications.

The CIT, organised by the Orissa Information Technology Society (OITS), is fast emerging as the premier forum for presentation of the latest research and development in the critical area of Information Technology.

Although the natural focus of the conference, held from December 20-24, 2004, was on Computer Science, research contributes from management, business and other disciplines also formed an integral part. Papers were

presented in the areas of Computational Intelligence, Neural Networks, Communication Networks, Security, Databases, Software Engineering, Signal and Image Processing, Internet & WWW-Based Computing, etc.

Awards

The conference received over 250 contributes and the programme committee, consisting of eminent researchers, academicians and practitioners, finally selected 43 full papers and 47 poster papers. While the full papers were published in the Lecture Notes in Computer Science (LNCS 3356) Series by Springer, the poster papers were published by the Universities Press.

Mr. Young Gook Ra, Department of Electrical and Computer Engineering, University of Seoul, South Korea, won the Prof. Amiya K. Pujari Award for his paper entitled, 'Relational Schema Evolution for Program Independency' and Ms. Anita Das, Department of Mathematics, IIT, Delhi, bagged the Prof. Narayan Misra IT Award for her paper, 'A Linear Time Algorithm for constructing Tree 4-Spanner in 2-Trees'. Over 165 delegates from about 27 countries including the United States of America, South Korea, Spain, Australia, and Canada participated in the conference. The content and management of the conference were highly appreciated.

Executive Development Programmes

Since October 2004, the Institute has conducted Executive Development Programmes in the areas of Information Systems Risk Management, Asset Liability Management, Information System Audit, Network and Security, Structured Financial Messaging System, and Technology Audit for Banks, training over 180 participants from various banks and financial institutions.

A customised Executive Development Programme on Technology Induction was organised for Canara Bank. The programme provided exposure in the areas of Corporate Networks, Cyber Laws, PKI, Security in Banking, ATMs, Internet Banking, Electronic Payment Systems, Centralised Banking Solution, Business Intelligence, BCP & DRP, and Intrusion Detection Systems, etc. Dr. Ashutosh Saxena and Dr. M.V.N.K Prasad, Faculty, coordinated this programme, which was attended by 28 participants.

Faculty Shri D. P. Dube coordinated the programmes on Information Systems Risk Management and Technology Audit for Banks. While the first programme was organised from November 22-24, 2004, the second was held from February 14-19, 2005.

A programme on Asset Liability Management was conducted from December 06-11, 2004, covering the various areas of Asset Liability and NPA Management, Interest Rate Risk Analysis, Bond Valuation Analysis,

Neural Networks and its application to Portfolio Management, Forex Risk Management, Forecasting Techniques and Investment Models, etc. This programme was co-ordinated by Dr. V.N. Sastry, Faculty.

The programme on Network and Security was conducted from January 03-08, 2005. Twenty-Nine participants from various banks participated in this programme, which provided exposure in the areas of Communication Networks, Network Devices, Configuration of Routers, Network Management, Network Troubleshooting, Configuration of RIP, OSPF, Internet Protocols, Information Security, Security Issues in Internet Banking, Cryptography, Protocols for Network Security, etc. Shri N. Rajendran, DGM, co-ordinated the programme.

A workshop for SFMS Gateway Administrators was held on January 24, and a three-day workshop on SFMS was organised from March 28-30, 2005. Both the workshops were co-ordinated by Shri R. Mani, DGM.

The Institute also conducted a programme on Information System Audit, from March 21-26, 2005. Co-ordinated by Shri M. V. Sivakumaran, Faculty, the programme focussed on training the participants in Regulatory Concerns in IS Audit, Management Control Review & COBIT, DBMS Security, Networking Risks & Controls, Application Control, Internet Banking - Risks & Controls, Basel II - Information Requirements & Challenges, CAATs, Evidence Evaluation and IT Governance in Banks etc.

Data Warehousing: The next logical step after Core Banking

- Ravi Kumar, P. Radha Krishna, Arijit Laha

The opening up of the Indian Economy has exposed the Banking and Financial Sector in the country to a new set of risks and challenges. In order to survive and succeed in the changing scenario, adoption of technology has become a necessity for the country's Banking and Financial Institutions.

The Reserve Bank of India has introduced many technology initiatives such as MICR, Electronic Funds Transfer and Real-Time Gross Settlement System, etc. Further, Banks in the country also need to set up systems that are completely Basel II compliant.

The Solution

In today's highly competitive scenario, a Core Banking Solution (CBS), also known as Centralised Banking Solution, can provide the much-needed winning edge for a Bank. This is especially true of the retail segment, wherein a CBS package would allow the Banks to facilitate implementation of a range of technology driven delivery channels such as ATMs Internet Banking and Mobile Banking.

In a CBS, the data from the branches is transmitted to a centralised place, to cater to the requirements of various departments at the head office and also to provide complete MIS for the Bank. The various packages at head office include the Financial Management System, Treasury Management System, and Human Resource Management System, etc. The successful implementation of CBS is not just about implementing a new system but also about effectively integrating it with the existing legacy systems.

A CBS package helps in providing the Bank with a single window interface of the customer. Thus, a Bank implementing a CBS package would be in a better position to provide quality customer services, thereby not just retaining but also increasing its customer base.

A centralised Banking solution offers Banks a multitude of customer-centric services on a 24*7 basis, and from a single location. The solution offers support to both retail and corporate Banking activities. A CBS makes the deployment of new products and services across all delivery channels faster, easier and less cumbersome, courtesy its integrated framework.

Many CBS packages customised to the Indian Banking environment and compliant with the Reserve Bank of India regulations are now available. The CBS, being an integrated

solution, is provided by a single vendor and so the risks associated are considerably reduced.

Features of CBS

The key features of a CBS include a centralised server, which stores data pertaining to retail and corporate Banking at transaction level, which is linked via high speed, secure and redundant networks to the various branches of the Banks. The main server is a common point of contact to the various delivery channels like ATMs, Internet Banking, Branches, Mobile Banking, etc.

The central database server and associated servers like Mail Servers, Application Servers, Authentication Servers, and Storage Servers, etc., are hosted at a data centre, which is at the core of the entire architecture. Adequate Security is provided to the IT infrastructure by means of firewalls, network intrusion detection systems, anti-virus software at the system and application levels, proxy servers, etc.

A disaster recovery site (DRS), which simply put is a redundant data centre, is also an integral part of the IT infrastructure. There also needs to be a well-documented set of procedures to be followed, in the case of a disaster striking the data centre.

After CBS

While a CBS package is the need of the hour for Banks in India, it is best suited to meet the needs at the operational level of the organisation. The requirements at the middle and top management are not completely met by a CBS. Their needs are aligned more towards taking sound business decisions to run the organisation in an effective manner.

Some of these needs include analysis of the trends in the country's financial markets, ad-hoc reporting requirements, deciding upon the best strategy to be adopted to enhance profitability margins, cost-benefit analysis of new products and services, etc. It's to assist the management in such needs that the implementation of a Data Warehouse becomes a necessity.

Data Warehousing

The next logical step after implementation of a CBS is bringing in Data Warehousing. A Data Warehousing solution includes sophisticated tools to measure and forecast risk, anti-money laundering solutions, and enables

an integrated approach towards analytical Customer Relationship Management.

The primary issue a Bank management faces is proper analysis of transactional data to determine their potential business needs. Technologies such as Data Warehousing and Data Mining come into play here. If an operational CRM streamlines delivery channels, a CRM backed with a Data Warehouse solution, not only streamlines the channels, but also tells the Bank where to move, which customer to focus on and whether this customer will turn out to be profitable or not.

A Data Warehouse is a central repository of data. This data is mostly historical, subject-oriented and time variant in nature. Choosing appropriate computer architecture for a Data Warehouse is one of the most crucial infrastructure decisions a Banking organisation can make when building and deploying Business Intelligence applications.

Data Warehousing workloads are by far the largest and most computationally intense business applications. Consisting of huge historical and current data spanning hundreds of gigabytes to multiple terabytes of disk storage, Data Warehouses stretch typical information system architectures to their limits.

The data from various legacy and current systems is first extracted from branch, regional and zonal offices across a Bank's network, and then cleaned and transformed into a common format and finally loaded onto the warehouse server. A central RDBMS system manages the data in the server.

Ad-hoc query capability and MIS/DSS reporting capabilities are provided by a host of OLAP (on-line analytical processing) packages. Comprehensive implementations of analytical applications for Assets and Liability Management, Anti-money Laundering, Analytical CRM applications, etc., are possible with Data Warehousing. Moreover, all these applications can be made compliant with Basel II recommendations. Another major area of focus of Data Warehousing is Risk Management.

Data Mining

Data Mining involves predicting the consequences of a decision based on the patterns and relationships of the data elements in the warehouse. Visualisation of these results is presented in an understandable form to the end-users.

Data Mining can be applied in Banking functions like approval of mortgages, NPA analysis, anti-money laundering, risk management, etc. Data Mining can also be used to predict the characteristics of ATM/Credit Card users, who use the cards at the point of sale terminals. Data Mining tools are highly analytical in nature and thus help Bank managements in taking correct business decisions.

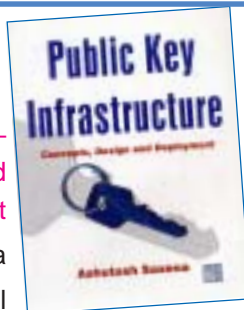
With Business Intelligence solutions, Banks and Financial Institutions can manage their large data volumes better, beat global competition and propel India's Banking and Financial sector to new heights.

Book Point

**Public Key Infrastructure –
Concepts, Design and
Development**

Author: Ashutosh Saxena

Published by : Tata McGraw Hill



Public Key Infrastructures (PKIs) can speed up and simplify delivery of products and services by providing electronic approaches to processes that historically have been paper based. It provides encryption capabilities to ensure privacy.

Introducing PKI into an organisation requires careful planning and a thorough understanding of its relationship to other automated systems. It is in this scenario that

the book – Public Key Infrastructure – Concepts, Design and Development, comes in handy.

Further, the deployment of PKI brings in new issues. Vendors' PKI implementations may not always support PKI in a standard and interoperable fashion. As the application needs for PKI support grow, so do the incentives for a general-purpose scalable and interoperable PKI solution.

This book provides an overview of issues related to the emerging Public Key Infrastructure and its implementation within agencies. It also reviews the risks and benefits of various PKI components, and some of the tradeoffs that are possible in the implementation and operation of PKIs. The book avoids mathematical jargon.

Every aspect of PKI deployment, right from making a Certificate Policy, selection of PKI products/service

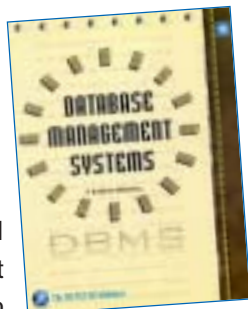
providers, test run and applying for a license is dealt with. There is a chapter on Key Management that covers the life-cycle of the key from its generation to archival.

The book also explains PKI operation risks, managing digital certificates and PKI ancillary services. Moreover, there are detailed case studies that make using PKI for banking transaction, voting over the Internet and medical records etc., easy.

Database Management Systems

Author : P. Radha Krishna

Published by : The Hi-Tech Publishers



Understanding the concepts behind the various Database Management Systems and how to leverage them is an essential skill required in the present technology-driven scenario.

Beginning with the basics of database management systems and their components, the book provides an in-depth insight into Database Management Systems. It discusses the various data models, including data modelling using the Entity-Relationship approach, and provides the basic techniques for the development of relational databases from E-R diagrams. The relational model concepts that are essential to design a relational database are dealt with.

Essentials of the two query languages — SQL and QBE are illustrated with examples. Normalisation, an essential part of database design, is also explained. Another area of focus of the book is the various concepts of sequential and index file organisation. It specifies the different types of storage management devices and concepts of buffer management for databases. Query optimisation and cost effectiveness too are addressed in detail.

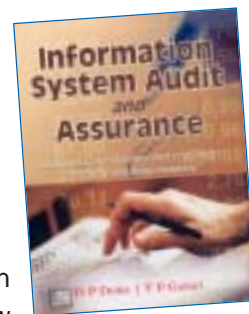
Understanding the concepts of transactions, and how DBMS implements them is crucial for keeping the data clean and consistent. The various concepts of transaction processing, ways to maintain transaction integrity and concurrency control are presented. The protocols to achieve concurrency control are elucidated through examples.

The causes of crash and the types of failure, the techniques used to recover data from database failures or system crashes, and techniques for guarding the system from misuse, too form part of the book.

Information System Audit & Assurance

Authors : D. P. Dube & V. P. Gulati

Published by : Tata McGraw Hill



No organisation functions in isolation in today's networked economy. New things, of course, come with new opportunities, but not without new problems! Now there are new vulnerabilities, controls for which are either inadequate or non-existent. In such a scenario, there is a lot of apprehension among the stakeholders as to whether the Information System (IS), safeguards assets, maintains data integrity, fulfils the organisational goals effectively and consumes resources efficiently.

Security is no more a simple plug and play tool and it has organisation-wide repercussions and more importantly, involves all strata of people and employees. However, not all those involved are principled! The quest for assurance from a third party is very perceptible. Security is not a product, it covers an entire gamut of activities, and primary among them are governance, audit and assurance.

There are broadly two approaches of learning assurance - the top down and the bottom up. The former involves understanding the IT control technology philosophy and then developing the assessment methodology, while the latter first provides the checklist or the assessment methodology and then the control philosophy and technology. This book follows the top-down approach, with the premise that once the control philosophy is clear, the methodologies required to assess these controls can be safely appreciated.

The book spreads over ten chapters and three appendices. Beginning with an overview on Information System Audit and Assurance, the book moves on to focus on areas such as Internal Control and Information System Audit, Conducting Information System Audit, IS Audit scenario for the Auditee and Auditor, Management Control Review, Application Control Review, Network Security and Control, Internet Banking Security and Control, Operating System Risks and Control, Operation Control Review, Operational Risk from the perspective of Banking and Financial Sector and Business Continuity and Disaster Recovery Planning Control.

The RBI checklist for Audit, ISACA Standards and a Generic Checklist for Information System Audit constitute the appendices. Each chapter also brings along a checklist for conducting audit and four levels of questions.

IDRBT welcomes Shri V. Leeladhar

Shri V. Leeladhar, Deputy Governor, Reserve Bank of India, took over as the Chairman of IDRBT's Governing Council on January 01, 2005. The Institute extends him a whole-hearted welcome and expects to benefit greatly from his valuable guidance and leadership.



Shri V. Leeladhar and Dr. R. B. Barman at the Institute

On February 11, 2005, Shri Leeladhar visited the Institute. He was accompanied by Dr. R.B. Barman, Executive Director, RBI and Member, IDRBT's Governing Council.

They had a brief discussion with Shri Sankara Subramanian, CGM, who apprised them of the various activities of the Institute including the current status. The Chairman also visited various facilities/services such as INFINET, NFS, SFMS, CA, and Research Labs. During his meeting with the Faculty & Staff of IDRBT, the Chairman assured support to the Institute's efforts in making technology more beneficial for the Banking and Financial Sector.

Programme Calendar (April 2005 - September 2005)

Duration	Programme / Workshop
April 18-20, 2005	Workshop on SFMS
April 25-30, 2005	Financial Risks & Asset Liability Management
May 16-18, 2005	Workshop on SFMS
June 06, 2005	Workshop on National Financial Switch
June 13-16, 2005	Software Engineering for Banking & Financial Applications
June 20-25, 2005	Network & Security
June 27-29, 2005	Workshop on SFMS
July 11-13, 2005	Workshop on Digital Certificates
July 18-23, 2005	Enterprise Security
July 25-27, 2005	Workshop on SFMS
Aug 01-06, 2005	Internet Banking
Aug 08-10, 2005	Mobile Banking
Aug 16-18, 2005	Workshop on Digital Certificates
Aug 22-24, 2005	Workshop on SFMS
Aug 29 - Sep 03, 2005	Business Continuity & Disaster Recovery Plans
Sept 08-10, 2005	Workshop on SFMS
Sept 12-17, 2005	New Payment Technologies & Trends
Sept 19-24, 2005	Information Systems Audit
Sept 26-28, 2005	Advanced Security Trends

Governing Council of IDRBT

Dr. Y. V. Reddy	Visitor	Governor, Reserve Bank of India
Shri V. Leeladhar	Chairman	Deputy Governor, Reserve Bank of India
Shri A. K. Purwar	Member	Chairman, State Bank of India
	Member	Chairman, Indian Banks' Association
Dr. R. B. Barman	Member	Executive Director, Reserve Bank of India
Shri V. K. Sharma	Member	Executive Director, Reserve Bank of India
Prof. M. Rammohan Rao	Member	Dean, Indian School of Business, Hyderabad
Prof. G. Sivakumar	Member	Professor, Indian Institute of Technology, Bombay
Prof. Ashok Jhunjunwala	Member	Professor, Indian Institute of Technology, Madras
Prof. B. H. Jajoo	Member	Professor, Indian Institute of Management, Ahmedabad
Shri R Gandhi	Member Secretary	In-charge Director, IDRBT & Regional Director for Andhra Pradesh, Reserve Bank of India

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