

## A Giant Leap for the Banking and Financial Sector

The 27<sup>th</sup> of August 2004 will go down the annals of the Indian Banking and Financial Sector as a Red Letter Day. On this day, the IDRBT made three very significant contributions, which are now playing a pivotal role in realising the Institute's mission of making the sector techno-savvy.

Dr. Y. V. Reddy, Hon'ble Governor, Reserve Bank of India and Visitor, IDRBT; Shri G. N. Bajpai, Chairman, Securities and Exchange Board of India; and Shri C. S. Rao, Chairman, Insurance Regulatory and Development Authority; dedicated the IDRBT's National Financial Switch to the Nation, in the presence of a galaxy of dignitaries, including the top-management of various banks in the country.

This National Switch is now facilitating inter-connectivity between the Banks' Switches and their ATMs, thereby heralding a new era of opportunity for our citizens. Now the customers' dream of walking

across to the nearest ATM of any bank has become a reality.

Dr. Reddy also presented Diplomas to the inaugural batch of the IDRBT's flagship Programme – the Post Graduate Programme in Banking Technology Management (PGP-BTM). Twenty-two students received their diplomas and have joined in the service of the sector.

In fact, the PGP-BTM is specifically designed to meet the demand of the

from Design and Development to Technology Planning and Project Management.

The dignitaries also gave away the IDRBT Banking Technology Excellence Awards 2003. These Awards, instituted in the year 2001, are meant to act as catalysts by infusing a spirit of healthy competition among the banks in Technology Absorption. The winners for the year 2003 include Corporation Bank, Punjab National Bank, State Bank of Patiala,

Syndicate Bank, State Bank of India, and Union Bank of India.

Speaking on the occasion, Dr. Reddy appreciated the efforts of the Institute in heralding the IT revolution in the sector and stressed on the need to work towards achieving a synergy between research, training, and services provided by the

Institute. He urged the IDRBT to focus on the quality of services in each of these areas and innovate constantly.

Shri C. S. Rao, Chairman, IRDA, expressed his views on "Emergence



**Dr. Y. V. Reddy with (left to right) Shri Vepa Kamesam, Shri G. N. Bajpai, Shri C. S. Rao and Dr. V. P. Gulati**

Indian Banking and Financial Sector for techno-management savvy talent. The programme grooms the candidates in every aspect of Banking Technology and Management, right

of Bancassurance in India” and Shri G. N. Bajpai, Chairman, SEBI, delivered the special address on “Role of IT in Stock Market Regulation and Linkages with the Banking Sector.”

Earlier, Shri. Vepa Kamesam, Chairman, IDRBT, Governing Council, initiated the proceedings with the “Welcome Address”, wherein he exhorted the banks to make

demands from the IDRBT so that the Institute can make more contributions to the Sector. Dr. V. P. Gulati, Director, IDRBT, then presented “IDRBT’s Activity Report”, in which he charted out achievements of the Institute and also spelt out his plans for the road ahead. The top-management of most of the Banks and FIs were present on this very special occasion.

## National Financial Switch is On

In a major step towards ushering in convenience-banking for the citizens of the country, the Institute has set up the National Financial Switch (NFS). Dr. Y. V. Reddy, Shri G. N. Bajpai, and Shri C. S. Rao, dedicated this National Financial Switch to the Nation on August 27, 2004.

Speaking at the inauguration, Dr. Reddy heralded the customer-centric National Switch for ATMs and looked forward to a scenario where access to a large number of ATMs of different banks would become a reality for the citizens of the country. The NFS comprises a National Switch to facilitate inter-connectivity between the Banks’ Switches, and Inter-Bank Payment Gateway for authentication & routing the payment details of various e-commerce transactions, e-government activities etc.

Presently, the banks that are already connected to the NFS include the Bank of Baroda, Corporation Bank, and ICICI Bank. All other banks are in various stages of getting connected to the NFS. Seven banks, namely, Andhra Bank, Punjab National Bank, IDBI Bank, Jammu and Kashmir Bank Ltd, United Western Bank Ltd, Lakshmi Vilas Bank Ltd and the Karnataka Bank Ltd, are expected to get connected shortly.

The installed base of ATMs in the country is estimated to be over 15,000 units, which is expected to go up to 30,000 ATMs by December 2005. New Private Banks have been deploying a large number of ATMs and more recently Public Sector Banks

and old Private Banks have announced aggressive plans to install ATMs.

There is a default inter-change switching fee between the banks, if the banks do not have their own mutual agreements. The infrastructure allows connecting directly to the individual bank’s switch or through their shared ATM Network Switches. It is a win-win situation for all the banks and more importantly, for the customers.

The Clearing Corporation of India Limited (CCIL) is the clearing and settlement agency for the switch, which also facilitates the NFS Disaster Recovery Site from its premises at Mumbai.

An NFS User Group has been set up to deliberate various issues related with the procedures, fee etc., and a Steering Committee consisting of the banks’ top management resolves various issues related to the National Financial Switch and reviews charging policy from time to time.



Shri G. N. Bajpai, Dr. Y. V. Reddy and Shri C. S. Rao declaring the National Financial Switch open

## Banking Technology Awards 2003

Dr. Y. V. Reddy, Shri C.S. Rao, and Shri G.N. Bajpai, gave away the prestigious IDRBT Annual Banking Technology Excellence Awards, for the year 2003, on August 27. Instituted in the year 2001, these Awards are meant to act as catalysts by recognising and rewarding the efforts of banks aimed at better use of technology, greater levels of Technology Absorption, improved levels of customer service and satisfaction. The IDRBT Awards are the best indicators of the rate of technology implementation and absorption in the Public Sector Banks.

The Bank Award for Techno-Savvy and Customer-Friendly Services, this time went to three Bank Branches.

### BEST BANK AWARD

#### Delivery Channels

- Corporation Bank



Shri K. Cherian Varghese, CMD, Corporation Bank with his GM Shri K. R. Kamath receiving the Award from Dr. Y. V. Reddy

#### Back Office Applications

- State Bank of India



Shri G. N. Bajpai presenting the Award to Shri A. K. Purwar, Chairman, State Bank of India

#### Business Computerisation

- State Bank of Patiala



Shri Asok Kumar Das, MD, State Bank of Patiala, receiving the Award from Shri C. S. Rao

### BANK AWARD FOR TECHNO-SAVVY & CUSTOMER-FRIENDLY SERVICES

#### Union Bank of India, Juhu Tara Road Branch, Mumbai

Shri K. Ratnakar Hegde, ED, Union Bank of India and Shri B. A. Patil, Chief Manager, Juhu Tara Road Branch, Mumbai; receiving the Award from Shri G.N. Bajpai



#### Punjab National Bank, ECE House Branch, New Delhi

Dr Y. V. Reddy presenting the Award to Shri Surinder Singh Kohli, CMD, Punjab National Bank and Shri Ashok K. Gupta, AGM, ECE House, New Delhi.



#### Syndicate Bank, Homiji Street Branch, Mumbai

Shri C. S. Rao presenting the Award to Shri S. R. Vijay Kumar, GM, IT, Syndicate Bank and Shri Anil Kumar Argal, AGM, Homiji Street Branch, Mumbai



## Ready to Serve the Banking Sector

The Institute started the fast-track Post Graduate Programme in Banking Technology Management in the year 2003 to meet the pressing demand for techno-management savvy talent in the Banking and Financial Sector. The programme is designed to impart technology expertise as well as managerial excellence, to enable the candidates to strongly support and lead the technology deployment initiatives of the sector.

The inaugural batch, consisting of 22 students, graduated on August 27, 2004 with Dr. Y. V. Reddy, Hon'ble Governor, presenting them the Diplomas. These students are trained in every aspect of Banking Technology and Management, right from Design and Development, Technology Planning, Implementation and Integration to Project Management.

Shri Samaroha Das topped the batch to win the IDRBT Gold Medal. Shri C. S. Rao, Chairman, IRDA, presented him the Gold Medal and Certificate.

The Institute facilitated Placements for all the students and they are now placed at organisations such as :

- ❖ **Indian Bank**
- ❖ **Bank of India**
- ❖ **Bank of Baroda**
- ❖ **ICICI Infotech**
- ❖ **Clearing Corporation of India Limited**
- ❖ **Infosys Technologies Limited**
- ❖ **Tata Consultancy Services, etc.**

The IDRBT Gold Medal was also presented to the topper of the IDRBT's collaborative M. Tech programme with the University of Hyderabad. Shri G. Srinivas, scored the highest marks in the M.Tech Programme and received the Gold Medal and Certificate from Shri G. N. Bajpai, Chairman, SEBI.

**New Batch :** The classes for the second batch of the PGPBTM commenced on July 05, 2004. Students were selected on the basis of their scores in the Common Admission Test (CAT) and All Indian Management Association Test for Management Aptitude (ATMA). Thirty-one students have joined the course and currently, the second term is in progress.

Meanwhile, the fourth batch of the M.Tech in Information Technology (with specialisation in Banking Technology and Information Security), conducted in collaboration with the University of Hyderabad, commenced on August 09, 2004. The batch has 16 students.

### The Inaugural Batch

**Alok Kumar**

**Amit Gupta**

**Ashutosh Goyal**

**B. S. Kiran**

**Barsa Nayak**

**Bhale Sujeet  
Vishwanath**

**Harsh Agarwal**

**Jagdish Nair**

**Jayshree Dixit**

**Manish Gupta**

**Preeti Sinha**

**Priyadarshini**

**Radhika**

**Ramanathan**

**Rajesh Jain**

**Samaroha Das**

**Satyam Chaturvedi**

**Shrijith Arjun**

**Siddhartha  
Mahapatra**

**Siva Kumar Reddy V**

**Soumya Das**

**Tushar Vishesh  
Srivastava**

**Vikram Suri**

The PGP-BTM students get-together with the dignitaries for that special moment



## Welcome Address

Shri Vepa Kamesam, Chairman, Governing Council, IDRBT

I deem it a great privilege to welcome you all to this important function for the launch of the National Financial Switch, Presentation of Banking Technology Excellence Awards for the year 2003 and the Graduation Ceremony of the Post Graduate Programme in Banking Technology Management (PGPBTM) students.

It is an important day for us as we have here three of India's important Regulators dealing with banking, money and finance, capital markets and insurance, which touches the lives of every individual in the country. I am extremely grateful to all of them for having readily responded to my request that they share with the audience their perceptions of how technology can bring about better controls and provide the Regulators with necessary inputs and information based on which they can take informed decisions.

I would not like to take much of your time in this welcome address except highlighting the three basic pillars on which this Institute stands.

- Firstly, to provide research towards improvement of technology in the Banking sector.
- Secondly, to provide services such as the INFINET backbone, products like EnDeSign, which is an Encryption, Decryption, Signature Software and in its capacity as a Certifying Authority, issuing Digital Certificates, which has crossed 16,000 so far, and is the highest issued by a single authority.
- Thirdly, opportunities exist for doing Post Graduate courses in Banking Technology at various levels.



Shri Vepa Kamesam welcoming the dignitaries

Today's function touches upon all these three together with the dedication of the National Financial Switch to the Banking community which falls under Category II of services, keeping in mind ultimately the convenience of customers in going to ATM of any Bank. Technology ensures both speed and accuracy in delivering the service to the customers.

All the Banks have computerised, perhaps 100% of the operations using centralised or distributed solutions. I would like to flag my concerns that the rapid computerisation in the Banking system, correspondingly, imposes a high level of internal controls and supervision, which calls for concurrent in-depth IS Audits, framework for providing disaster recovery management centres and upgrading skills of the staff. This awareness must percolate to all tiers of the staff of the Bank so that no one is left out and the systems do not become vulnerable or exposed to any misuses.

I request Governor, Reserve Bank of India, to ensure that the Information System Audit Certification and consequential operational risk, a bank carries needs to be crystallised and disclosed in a Bank's Balance Sheet for the benefit of all stakeholders. I appeal to the Chairmen of the Banking Institutions to continue to place demands on the IDRBT for any specific issues on which they would

like research to be focused and solutions found, which could be shared with the entire Banking system.

With these words, I once again extend my hearty welcome to all of you to this function.

## IDRBT's Activity Report

Dr. V. P. Gulati, Director, IDRBT

### A Perfect Synergy

It gives me immense happiness in saying that we have been able to develop a very unique Institute. This is perhaps the only Institute where a perfect synergy of Services, Research and Education is at work. Our services such as the INFINET, Certifying Authority, Mail Messaging and the SFMS, help us interact with the Banking Industry on a day-to-day basis, and this provides us an in-depth understanding of the requirements of the sector. And it's this unique industry interaction that feeds our research and educational initiatives. **It's my vision to make IDRBT the benchmark for the world.**

Our main focus is on anticipating the requirements of the sector, providing innovative services and also on improving our existing services. In fact, we have offered a new service or product to the industry almost every year.

### Quality Services

In a major step towards making the Banking and Financial Sector Technology Enabled, we have set up and are managing the country's largest Financial Network – the INFINET, the premier communication backbone for the sector. It now has over 2,300 VSATs located in 300 cities of the country and is integrated with a Leased Line Network with bandwidth ranging from 2Mbps to 8 Mbps. Various inter-bank and intra-bank applications ranging from Simple Messaging to RTGS are ported on it.

We, at the IDRBT, have strived to ensure that the INFINET provides the best services to the Industry and I am happy to declare that the Network has maintained 99.9% uptime right since its inception.

Another pioneering service for the Sector is the IDRBT

Certifying Authority Services. There are five Certifying Authorities in the country and I am happy to inform that the IDRBT CA has issued over 16,000 Digital Certificates, which is much above the number of Certificates issued by all the other Certifying Authorities put together.

And when technology was making its first forays into the Sector, it was IDRBT's Mail Messaging System that provided a virtual identity to most of the banks. Currently, mails of 23 organisations, both from within and outside, are being switched from the IDRBT gateway.

### Feedback

The Institute is convinced that feedback is an important component in charting out the road ahead. We recently collected feedback from IT Chiefs of various Banks on the services and contributions of the Institute and I am pleased to share with you that we have received 4.1 out of 5.

### Research for the Industry

Another critical area of focus of the Institute is Research and Development. "Applicability to the Banking and Financial Sector and meeting its requirements" – is the guiding spirit behind all the R&D activities of the Institute. Our aim is to create state-of-the-art services and products for the success of Banking Technology in the country through innovative R&D activities. It's the various R&D projects that we engage in, which feed and improve the

various services provided by the Institute to the Industry.

### National Projects

Recognising the quality research pursued at the IDRBT, the Ministry of Communications and Information Technology, Govt of India, is collaborating with us on nationally-important projects,



Dr. V. P. Gulati presenting the Institute's Activity Report

including the Protocols and Standards for Electronic Check Clearing and Settlements; and Protocols and Standards for SMART Card Based Payment Systems.

In order to ensure that the best is provided to the Sector, we have arrived at collaborative arrangements with the IIT Bombay; University of Hyderabad; SETS; etc. It's my pleasure to share with you that the Institute has completed 14 R&D Projects that will directly benefit the sector and is currently working on another 12 projects.

### **IDRBT Products**

We have also come out with two useful products for the sector - EnDeSign - an Encryption, Decryption, Signature Software and Mirror.Net - a Corporate Intranet Framework. The EnDeSign has been implemented at the RBI, SBI and Corporation Bank and the Mirror.Net, which we released recently is implemented at the College of Agricultural Banking, Pune, and is in the process of being implemented in other Institutions.

Our focused research has resulted in our publishing 67 papers in reputed national/ international journals and conferences. We have also published four books.

### **Advisory Services**

Apart from concentrating on Research and Development, we devote a considerable amount of time to providing Advisory Services to the sector. With IT becoming all-pervasive, Security is the prime concern, and so the area we are currently concentrating on is Security. We have drawn up the IT Security Policy for over 12 banks, and Secured Internet Banking Architecture for over six banks. In fact, we have completed over 30 advisory projects.

### **Competency Building**

With the Sector moving on to the technology bandwagon in a big way, the need of the hour is trained manpower to lead these technology initiatives and make a success of them. Responding to this huge demand of the Banking Industry, the Institute formulated a twin-pronged strategy to develop the competencies of the existing manpower through training initiatives and simultaneously develop fresh manpower for Banks and Financial Institutions.

We have conducted over 200 Executive Development Programmes, training over 6,000 Executives, in various areas of immediate relevance to the Industry.

The involvement and support of the top management is

necessary for the success of any initiative. In order to ensure that the push for technology absorption in the sector comes right from the top, we regularly conduct meets for the top management, and we have conducted over 22 such meetings so that technology absorption is accorded top priority in the sector.

### **Manpower Development**

We are also focussing on developing fresh manpower for the sector through long-term specialised programmes. Our Honourable Governor had inaugurated the Institute's unique M.Tech Programme in Information Technology, with specialisation in Banking Technology and Information Security, in collaboration with the University of Hyderabad.

The first batch of our Post Graduate Programme in Banking Technology Management is graduating today. This programme is designed specifically towards meeting the technology and management needs of banks and the fact that the students of both M. Tech and PGP, are already placed at reputed organisations speaks for itself.

We also have a Research Fellow Programme leading to a Ph.D in collaboration with the University of Hyderabad and IIT, Bombay. Currently, we have Five Research Fellows pursuing research with us.

I am convinced that all our students will contribute substantially towards realising the aim of the Institute of making the banking and financial sector techno-savvy. We look forward, to all of you students, to set the standards and help establish the Brand IDRBT.

### **The Road Ahead**

As I had said in the beginning, we have been able to create a very unique Institute through a synergy of services, research and education. But I believe that it only has been a good beginning and we need to build and develop upon it. There is no time to relax, for this Institute has been given a huge responsibility. We need to have a long-term vision and anticipate the requirements of Banking Tomorrow and work towards meeting them.

A good work environment, Space and the Right People with the Right Attitude are the three essential ingredients for building a great institution. We have been able to create a reasonably good setting in the Institute on all the three fronts. But there is still a long way to go and now it's time to develop this Institute into an Institution.

## Emergence of Bancassurance in India

Shri C. S. Rao, Chairman, Insurance Regulatory and Development Authority

The emergence and spread of bancassurance has been one of the most significant developments in the retail financial services sector in India. Many banking institutions and insurance companies have found bancassurance to be an attractive and often profitable complement to their core businesses. While less than two per cent of total premiums are generated through this channel, there are expectations that bancassurance will grow to register a dominant share during this decade.

World over, while both life and non-life companies seek to engage bank branches, non-life products have featured less prominently in bancassurance distribution. The major reason is the complementary nature of life insurance and banking products. Both are in the nature of savings accumulation, one short-term and the other long-term.

The enormous trust that the banks command in the minds of public is an important reason why insurance companies seek to enter into wide ranging banking partnerships. The banks, in turn, find that the customers appreciate the provision of integrated financial services at the bank's branches, which in turn builds better customer loyalty and retention levels. This collaboration at providing a package of financial services also maximises profits.

### Logical Route

In India, there are 75 bank branches per million inhabitants and banks have expertise on the financial needs, saving patterns and life stages of the customers they serve. Clearly, that's something insurance companies both private and state-owned would find nearly impossible to achieve on their own. Banks also have much lower distribution costs than insurance companies and thus are emerging as the ideal distribution channel. Tying up with banks is the logical route for

insurers to take for achieving extensive geographical spread and countrywide customer access at minimum cost.

Bancassurance has the potential to be an effective distribution channel in India, especially because of the extensive network, built over the years. Insurance companies have to take advantage of the customers' long-term trust and relationships with banks. The association is a mutually profitable one, where the bank can widen its range of products on offer to customers and earn more, while the insurance company gains by getting constant visibility at the bank branches, and also the security of receiving premium payments on time.

The advent of the e-economy has also radically challenged traditional principles of corporate strategy, including how value is created and the basis of competition. Today, creating value is about scale in the formation and management of strategic alliances. A bundled package of commercial financial services from a financial conglomerate, for example, is likely to benefit small and middle-market businesses most.

### Complementing each other

The products that are likely to sell through bancassurance are simple vanilla products. There is an element of complementarity in banking and insurance products.



Shri C. S. Rao delivering the talk on Emergence of Bancassurance in India

The various schemes for disbursing credit are likely to generate a demand for insurance cover, and availability of insurance cover in turn will facilitate disbursement of credit in risk-prone activities. The insurance companies need to introduce simple products that can be sold over-the-counter at the banks.

Both banks and insurance companies have rural and social obligations to meet and they can work together in this area. It is possible that the banks while meeting their obligations in terms of lending requirements to the rural and social sectors can complement the efforts of the insurers in meeting the latter's obligations too. Such relationships will also help in synergising the strengths and capabilities of both the insurer and the bank.

### A Network Business

Information Technology is changing the entire scenario. While the Banks and capital markets have adopted the changes, can insurance companies cope with this change? By and large, insurance companies have been conservative users, putting heavy emphasis on proven reliability and robustness of IT applications. While insurance companies accept the significance of information technology in their business, they remain ambivalent in their attitude toward it: is IT a tactical tool or strategic lever? Is it a core business? Does technology offer sustainable competitive advantage? Is it a means of differentiation between banks and insurance companies?

On the other hand, bancassurance is a network business, whose value increases with the number of users and wider reach, which implies at least some degree of interoperability. Hence the need for co-operative systems and networks: financial institutions have been remarkably successful in developing and managing such networks.

The emergence of banks as promoters of insurance companies and the distribution of insurance products through corporate agency model by the promoter banks also raises concerns about the potential concentration of economic power and the ability of the regulators to manage risk. A more ubiquitous concern in future is the potential for "systemic risk" in the economy. This is an area that requires constant monitoring by the regulators.

Social, environmental and ethical concerns are increasingly recognised as a source of both risk and opportunity. Clear procedures need to be established to include such concerns as part of the review process of the insurers while examining bancassurance partnerships. Banks also need to have clear and detailed procedures to protect the integrity of their customer's data and to give customers the choice as to the level of privacy they wish to enjoy.

### Coordinated Action

There are also a number of operational issues that has to be addressed for a successful experiment in bancassurance. While banking is a short-term business, life insurance is a long-term relationship with the client. The insurers and bankers have to understand and appreciate each other's perspective and work together to make a success of the business of selling insurance. Unless the operational details are worked out and the bank staff trained adequately, it would be difficult to ensure a coordinated action at the field level. It is not enough that there is commitment to the model at the higher management level. It should percolate to the lower levels.

The large untapped potential for insurance exists in the rural areas and the branch network in those areas is primarily under the public sector. The success of the model would, therefore, largely depend on the attitude of the employees of the public sector undertakings. Are they likely to look at it as an opportunity or as an imposition? What should be done to motivate them to sell insurance products? How do we devise a system of incentives for those who participate in this programme? The effectiveness of the programme will depend upon how successfully this issue is addressed.

The credibility of the model comes into question if there is mis-selling. A cordial banker-customer relationship that has developed over the years would turn hostile if due to ignorance or oversight the full implications of an insurance policy are not fully explained by the banker or understood by the customer. There is, therefore, need for great caution in selecting the products for sale through this medium. In addition, those in charge of sales should be trained adequately to avoid any miscommunication.

### Reaching Out

As indicated by me earlier, the number of policies sold through bancassurance model is modest as of now. I have no doubt that it has the potential to be an effective distribution channel because of the extensive network, vast customer base and the desire to maximise revenues from other sources to make up for soft interest regime. I am equally confident that bankers and insurers would together address and overcome the difficulties that arise in this partnership and serve the interests of their institutions while extending the benefits of insurance to the large sections of population, which need this facility but are presently outside its pale.



Dr. Y. V. Reddy gets a warm welcome on his arrival at the Institute from Dr. V. P. Gulati



Dr. V. P. Gulati in an informal chat with the dignitaries



Dr. Y. V. Reddy greeting the dignitaries



Shri Vepa Kamesam presenting the angavastram to Dr. Y. V. Reddy



Shri V. Visweswar receiving Shri A. K. Purwar, Chairman, State Bank of India



Shri C. S. Rao lights the lamp during inauguration of the function



Shri G. Srinivas receives the IDRBT Gold Medal from Shri G. N. Bajpai for securing the highest marks in the M. Tech Programme



Shri C. S. Rao awarding the IDRBT Gold Medal to the PGP-BTM topper Shri Samaroha Das



Dr. Y. V. Reddy and Shri G. N. Bajpai sharing a point



The Dignitaries inaugurating the National Financial Switch



A round of applause on the inauguration of the National Financial Switch



A view of the audience during the function



Dr. Y. V. Reddy fields questions from the Media



The Dignitaries proceeding to have a look at the infrastructure of the National Financial Switch



Shri Vepa Kamesam and Dr. V.P. Gulati accompanying the dignitaries as they leave after the function



Students of the PGP-BTM share their moment of joy

# Defining Moments

## Role of Information Technology in Stock Market Regulation and Linkages with Banking Sector

Shri G. N. Bajpai, Chairman, Securities and Exchange Board of India

The scientific breakthroughs in the finance theory have, in the second half of the 20<sup>th</sup> century, shaped and are shaping the extraordinary innovations in the financial world. Initially, technology was driven for most part by crisis or natural extensions of business. New financial products and changing market designs, improved computer and telecommunication technology, have led to dramatic and rapid changes in the structure of financial markets and institutions. Technology has since taken over the driver's seat and modulates not only the quality of infrastructure but even the product designs.

Joseph Grundfest of Stanford Law School had aptly said that, "The securities industry is, in many essential respects, an information processing industry." Beginning with the Trans-Atlantic cable that linked the London and New York market for foreign exchange, a series of technological innovations have led to titanic shifts in securities industries transforming not only patterns of financing but also the regulation and governance of all institutions that provide infrastructure for financial flows.

### The IT Impact

Securities markets and banking system are the two sides of a coin called "Financial System." The manifestation of the role of the Reserve Bank of India is vividly visible in the economic development and behind the events leading to development of, and apt management of, the financial system of the country.

The economic reforms in the securities market in India led to exponential growth in terms of number of stock exchanges, intermediaries, listed stocks,

amount raised, market capitalisation, trading volume, investor population and price indices. Information Technology led to a paradigm shift and revolutionised the structure and the functioning of the securities market:

- Clamped down the out-cry trading process
- Physical and 'T + anything' settlement has been replaced
- Online trading from 364 cities
- Execution of trades on price time priority
- Full novation by the Central counterparty
- 100% electronic settlement on T+2 Rolling cycle
- Accessibility through 10,000 terminals across the length and breadth of the subcontinent
- Investor accessing real-time price and execution
- Online display of subscription in book built IPOs

From the periodical disruptions of a market functioning from a hall where gesticulations were clear than the loudest of shout to uninterrupted uplinking on all trading hours by the duality of VSATs and leased lines is a marvel created by inventions in IT. The dynamic Value Added Risks margining system with real-time monitoring of

brokers' positions and emergence and automatic disablement of terminals with a view to ensure efficacious risk management could have been an impossible dream in the absence of interventions of IT.

### Leading the world

The Indian securities market could emerge unscathed out of the upheavals of May 14 and May 17, 2004,



Shri G. N. Bajpai dwells upon the Role of IT in Stock Market Regulation and Linkages with Banking Sector

substantially, and the credit for this must be accorded to the developments in the Indian securities market, which have been facilitated essentially by utilisation of IT. While issuers and investors have been benefited immensely by the dramatic reduction in cost of the transaction in the Indian securities market, the intermediaries have greatly benefited out of rising volumes. IT has enabled India to lead the world – NSE is today the world’s leading order driven system, NSE has the third largest number of transactions in the world (after NYSE and NASDAQ) and the Indian Securities market is the world’s largest Single Stock Futures Market by volume and value.

The securities markets are exquisitely sensitive to the evolution of technology for another fundamental reason. The efficiency of securities markets depends on the rapid incorporation of information into securities prices, as well as on the evolution of new mathematical techniques for calculating and implementing inter-market arbitrage relationships. Since rapid information incorporation and mathematical advances are both driven by technological progress, the means by which the markets will estimate the value of individual securities will change dramatically as technology evolves. For example, Black-Scholes (1972) option pricing model had helped the market to understand the way these products are priced in the market and resulted in higher volumes in derivatives market and hence better liquidity for these products in the market as a whole. The evolution of financial engineering is based on IT tools and these products meet the needs of each investor based on their own risk profile.

### Changing Systems

Market structure and trading systems are also in the midst of changes. Alternative trading systems and the rise of virtual exchanges challenge the position of traditional securities exchanges. Many securities exchanges started to consider or have already carried out such plans as mergers, alliances, demutualisation and public listings. These activities have accelerated the process of globalisation and are reshaping the international capital markets.

Alternative trading systems, such as electronic communication networks (ECNs), are integral to the modern securities markets, accounting for one-third of Nasdaq trading. ECNs provide investors with enhanced

flexibility and reduced trading costs, and introduce competition to the established securities exchanges and the Nasdaq Stock Market. ECNs, such as Instinet, Island, Bloomberg Tradebook, Archipelago, and Wolfex, bring buyers and sellers together for electronic execution of trades. In addition to offering additional sources of liquidity and low-price executions, ECNs have transformed the market structure. Functioning like exchanges, ECNs have fragmented the nation’s equities markets by disbursing the centres of liquidity from the two traditional sources—NYSE and Nasdaq - to Perspectives Trading 2000 by transforming the securities industry to multiple pools of trading activity.

### Regulating through Technology

The regulatory agencies tend to adopt one of the four approaches when confronted with the prospect of technological change. These approaches can be labelled as technology forcing, proactive, reactive or obstructionist. The SEBI’s attitude has all along been proactive. In fact, with the responsibility of developing the market and investor protection, the SEBI has been promoting the use of technology for enhancing the efficacy of the market and improving the quality of regulation.

Proactive regulatory responses describe a situation where regulators do not force the market to develop technology more quickly or in a different direction. Rather, proactive regulatory responses rapidly adopt new technologies, promote the evolution of technology in whatever direction the market determines, or quickly adjust their regulatory regimes to recognise the evolution of new technology.

In a market that virtually functions from over 10,000 terminals in all the geographical corners functioning at the speed of light with complete anonymity and churning out massive volumes, the only way to regulate is the use of technology. For cutting a diamond, we need the diamond itself. This underpinning has propelled us to build within the online trading system, the real time risk management system including the BASLE recommendations, eliminating physical interventions via comprehensive dematerialisation and STP, when the world has yet to begin the work, improving even the IPO process through book building.

The much publicised recent IPO process of Google through innovative Dutch auction model prompted a sharp reaction

from Francesco Guerrera expressed through the columns of Financial Times. He says “World’s Biggest Democracy can show Google how to conduct an online IPO” “.....in India you cannot apply on the web but investors can access one of the world’s largest financial networks with 7000 terminals scattered around 350 cities. And every step of the book building process is public. ....The Indian system is refreshing example of a transparent IPO market but it is also a rare one, especially in the insider-friendly Asian Markets.”

### The MAPIN

We propose to further the process through Market Participation Identification Number (MAPIN), a notable sophistication of capturing biometric unique identity of the intermediaries and issuers over a period of time and eventually the investors. The web enabling feature will help its real time activity with the Integrated Surveillance system functioning on the lines of warehouse of a classic IT structure, planned by the SEBI.

The integrated surveillance of stock exchange trading on the lines of warehouse planned by the regulator will absorb the latest IT architecture. This mechanism will capture the trading statistics of all the stock exchanges with all trade details moving to client level information associated with MAPIN identification. The captured data will be monitored by the inbuilt mining tools to identify any unusual or irregular pattern to capture participants who are indulging in such acts within a short duration.

The direct linkage of the securities market with the banking industry is in the areas of settlement system and risk management. The settlement system has two legs – securities and the monies. Whereas, the former is provided by the securities market either in physical form or in Demat-ed scrip, the other leg is put up by the banking system. Overall efficiency of the settlement system will depend on the level of development and progress that both the legs make.

In addition to management of risk of the market, the banking regulator has overall responsibility of managing the systemic risks in the financial system of the country with the boundaries between banking, insurance and securities market. The propensity of a spill over from one segment to another will have a serious repercussion on

the economy. Therefore, it befits establishment of an effective coordination between the various regulatory agencies. The initiative taken by Dr. Y.V Reddy for institutionalisation, monitoring of Systemically Important Financial Institutions (SIFIs) is praiseworthy. The success will harp on the level of usage of IT tools for the regulation of respective entities by different outfits.

### A Global Alliance

Across the world, broadband wireless applications are enabling telecommunications companies to join the financial industry - with the capability to reach huge numbers of consumers in a meaningful way. It is not hard to imagine a global telecom-financial alliance providing a payment system/financial services portal all in one. Why to write checks or maintain a credit card if all our payments can be managed via a powerful chip attached to a wireless phone or other portable applications that can “talk” to your broker, bank, car, or home?

Thus, the winners in the financial space will envelop the customer like a hub and spoke, pulling in services and offering them to customers based on their needs and best-of-brand offerings. As customer needs change, the intermediary will replace one offering with another shaped by new efficiencies and demand. Technological innovation permits the financial intermediary to reach out into the marketplace and obtain these services at a lower price than building the offering themselves. As markets flourish, efficiencies of scale and price will be passed on to the ultimate customer.

No one seems to doubt that, in the long run, electronic finance will result in more efficient financial intermediation. Declining costs of information will reduce some of the uncertainty that gives rise to financial risks. New financial instruments and risk-management techniques will reduce the required rates of return for bearing the risks that remain by allowing them to be unbundled and shifted more effectively than has been possible.

The matrix of revolutionary changes in technologies, financial scheme quality and quantity of players, pronounces the onset of new challenges for the regulators. The main challenge is to beat the possible issues emerging out of the current day technology by utilising the frame of future technology.

## Current Concerns and Some Perspectives on Inflation

Dr. Y. V. Reddy, Governor, RBI & Visitor, IDRBT

At the outset, I am thankful to the Institute for inviting me to this function and giving me the pleasure of being with you all. I will, however, take the opportunity to make some comments on current concerns on inflation.

### Financial Regulation

Shri C. S. Rao, Chairman, IRDA, emphasised the synergy that is developing between Banking and Insurance. There are two elements here – one from the macro-side and the other from the operational side. India's contractual savings and long-term savings are rather low, which is why we are not able to invest heavily in infrastructure, and that is the macro-part, where Insurance has a critical role to play. The second part is that much of the business in our country is not really covered by Insurance.

Shri Rao's focus on the linking of the banking and insurance sectors, taking advantage of the penetration that banks already have in the rural areas, is a remarkable approach and, it is extremely useful to use technology in this process. We should work further on this and I am sure the banks have great business potential too in bancassurance.

Shri Bajpai, has covered in his address both the historical and cross-country perspective. As compared to most countries, the extent of progress that has been made by our Securities Regulator in terms of technology penetration and safety measures is absolutely world class. The SEBI should be proud of that.

There are two issues – one is at the operational level and the other is the overall stability issue with regard to the role of the financial regulators – and on both these counts, we have every reason to be proud of our achievements.

### IDRBT

As regards the activities of IDRBT, we are heralding a customer-centric national switch for ATMs. This, I believe,

facilitates access to a large number of ATMs of different banks. IDRBT has taken major steps to herald an IT revolution in the financial sector in a brief span of about eight years. Another excellent initiative is the University-Industry collaboration and both the M.Tech. Programme and the PGPBTM Programme are significant contributions. Undoubtedly, the IDRBT will have a proper balance between research, training and IT infrastructure provisioning for the benefit of the financial sector.

India boasts of excellence in the development of computer software, and the entire world's financial sector sources its software from Bangalore, Hyderabad, Pune, etc. Perhaps, there is some merit in our trying to get advantage of this expertise and IDRBT can play a role by creating a forum in which the software industry and the hardware industry that are setting global standards are able to serve the financial sector domestically also. And whatever we try to do, we have to be very careful about the quality of services and it is hoped that IDRBT will introduce, if it has not already introduced, and also upgrade the mechanisms by which there is an assessment of the quality of services IDRBT is providing.

### RBI and Technology

An important contribution of the RBI to the development of technology is indeed the establishment of this Institute. The major achievement in the last one-year is the Real Time Gross Settlement (RTGS). Between the timetable and making sure that it works right, we gave preference

to making sure that it works right, which resulted in some delay but by and large, we are on track. Within three months of the introduction of the RTGS, the system has been able to settle almost 90% of the inter-bank funds transfer, which were being earlier routed through the net-settlement based inter-bank clearing at Mumbai.



Dr. Y. V. Reddy addressing some of the Current Concerns

The year also witnessed the introduction of what is called the Special Electronic Funds Transfer (SEFT), which provides for transfer of funds in the electronic mode on the same day basis with multiple daily settlements. The RTGS and SEFT are together able to cover about 2500 branches of banks in around 200 cities. No doubt, there is still lot of scope for further improvement.

It is appropriate here to mention the items on the RBI's agenda on technology matters. One of course is the expansion of the reach of the RTGS and what is most important is to make sure that it not only increases its reach but also works well. Secondly, the National Electronic Funds Transfer needs to connect almost all branches in the country using the SFMS and the INFINET. The third is enhancing the level of Security in the Payment and Settlement System. We should accord the highest priority to Security in all IT-related matters, particularly in the financial sector, because they are all inter-related and if security is breached at one place, it is quite possible that this spreads into the other areas. The fourth relates to the conduct of Clearing and Settlement at the national level through a National Settlement System. Introduction of cheque truncation system on a pilot basis in the National Capital Region is an important task.

There are also some proposals related to the risk mitigation schemes for deferred net settlements system. In this regard, we are also pursuing the idea of having a semi-autonomous Board for Payments and Settlements.

To provide a roadmap to attain these goals, the RBI has decided to prepare a new vision document on Technology. The new vision document will encompass the consolidation of progress made and also show the way forward. As soon as the preliminary draft is prepared, we will be able to submit it to a group of multi-disciplinary professionals, both from the user-side and the technology-side and it will invite your advice and guidance.

### Current Macroeconomic Situation

A few weeks ago, I had made a brief statement on the concerns relating to inflation. At that stage, it was submitted that there were both global and domestic factors working, predominantly global but some domestic factors – which are driving the current inflation. I had also mentioned about both the supply and demand factors and that the rise in inflation was predominantly a result of supply-shock. But there are certain developments since then, and it is my duty to place them before you.

First, a number of fiscal actions have been taken in

particular relating to oil. You may not find the impact of these actions today or tomorrow, but it is very clear that there is a determined fiscal response which has been initiated and which will be continued. This should help contain inflationary expectations.

Second, there is a new development in the Indian situation. It is that the corporate houses have taken upon themselves the importance of maintaining certain amount of price stability. The industry and trade have taken initiatives in terms of looking at what may be called the broader interest. In terms of pricing power, there are occasions when the corporate sector may not use the full pricing power in the short-run to gain immediate advantage keeping in view a longer-term perspective. This realisation is evident among our corporates and I am sure it is happening among the larger trading community also. These attitudes and actions do contribute to moderating inflationary outcomes, and, more importantly, expectations.

Third, we had a series of discussions in the recent past with the financial industry associations and the leading bankers. We had extremely fruitful discussions and the major advice that came forward from the financial community is to try and reduce volatility. All of them agreed that it is in the interest of everybody that we minimise volatility in the financial markets and minimise knee-jerk reactions, while focussing on price stability and the underlying inflation.

### Getting More Positive

But in all this, while it is true that we should be concerned about the current rise in headline inflation, we should not forget the positive side, and in my view, the positive side seems to be getting a bit more positive in the last two-to-three weeks. How is that so?

First and foremost, there is virtually a national consensus that high inflation is not good and that it should be brought down. Whether it is political leadership, economic agents, bankers, or the regulators – among everybody there is a national consensus that it is not good to have persistent highs in prices and that everybody should consider the common long-term interests in maintaining price stability.

Second, there is good news, in the sense that generally in India the democratic pressures ensure that the inflation doesn't go above the two-digit mark. But now, we find that inflation tolerance has come down. The society, the economic agents and the market participants are now reacting to a lower headline inflation, which is a good

thing because if we want a sustained strong growth, it is necessary to rein in inflationary expectations. It is necessary to ensure price stability and what is the best way to ensure price stability? Everybody should work towards the same goal including the RBI and that is possible when there is a consensus in this regard.

Third, the changing scenario on interest rates is also good news. For long, we had planned systems and we had administered interest rates with some amount of comfort for everyone. In the last five to six years, we had reduction in the interest rates. As the interest rates went down and down over the recent years, we were not fully sensitive to the fact that there is something known as interest rate cycles. So, for the first time, the market participants have got a feel of this interest rate cycle.

But the reality of the reform process is that there will be interest rate cycles even within an overall stable situation and consistent with overall macro-stability. That cycle is being experienced by the market participants for the first time, with the result that the market participants are now able to input these uncertainties more consciously and factor the type of risk they have to face in their conduct of business. So from the central bank's point of view, it is our endeavour to facilitate – it is not our endeavour to say we told you so – the new environment by working together to see that the appropriate systems to withstand interest rate cycles are more consciously built.

Fourth, in the current fiscal, in terms of the numbers, the investment activity is picking up whether one talks of capital goods imports, or of capital goods production. The off-take in the non-food credit in this fiscal has been very impressive. These developments mean that the output should in the normal course grow. So, the output is likely to grow in the next few months and that is in many ways the time-frame which we have to look at in regard to the price levels. One should recognise that ultimately inflation is the result of interplay between the supply side such as productivity, quantum of output and investment activities, and the demand side. So, I would consider the supply side domestically being more positive.

Fifth, as a positive, our exports are growing impressively. We are usually worried that the oil bill is going up but the exports are also going up and so, at least the impact on balance of payments is not as much as we would have apprehended.

### **Analytics for Policy Response**

As between the international and domestic factors that

influence the current tendency for a rise in the headline inflation in our country, the international factors continue to be dominant. The international factors relate primarily to oil but also, to some extent, other commodities and financial markets, including interest rates and exchange rates. At the same time, there have been positive developments on the domestic front. These relate to improved outlook on monsoon and pick up in the investment activity. Clearly, therefore, the dominance of international factors in the current price rise and the importance of stability governing domestic economy continue to warrant a measured response to ensure price stability and contain inflationary expectations.

As between supply and demand factors, the evidence clearly continues to be that the increase in inflation is largely on account of supply shock. As regards demand factors, the growth in broad money as well as the reserve money has moderated. There is evidence of gradual unwinding of overhang of liquidity. On balance, therefore, while the situation has to be watched carefully in terms of the balance between supply and demand factors, the current situation seems to be not much different than what it was diagnosed to be some time ago, viz., significantly a supply side shock.

As regards inflationary expectations, there is a new dimension to the understanding of inflation. Analysts have pointed out that the wholesale price index (WPI) of India is similar to producers' price index in other countries and that in other countries; the headline inflation is usually the consumer price index (CPI). More important, internationally, empirical evidence shows that wholesale price or producers' index tends to be more volatile. It may be necessary to capture these nuances and their relationship with policy response in the context of inflationary expectations.

In view of the linkages between domestic and international economy, the monetary policy responses of other countries, particularly the developed ones, have also to be carefully watched.

The fiscal authorities, monetary policy, the financial markets and corporates are committed to the objective of price stability and minimising volatility. In this background, therefore, RBI will continue its dialogue with market participants to fine tune its response to minimise volatility while emphasising the importance of Reserve Bank's credibility in maintaining price stability consistent with the compulsions of the growth dynamics in our country.

## Executive Development Programmes

The Institute, through its various Executive Development Programmes, endeavours to prepare the Indian Banking and Financial Sector for Technology Banking. These programmes not only bring to the participants the best that is being thought and said in the country, but also provide valuable inputs on the best in Banking Technology internationally.

Since May 2004, the Institute has conducted 18 programmes training 488 participants from various banks and financial institutions in the country. Eight of these were customised programmes on Structured Financial Messaging System and Digital Certificates for Syndicate Bank, Indian Bank, Bank of Maharashtra, United Bank of India and Punjab National Bank, and were co-ordinated by Shri R.Mani, DGM. The Institute also conducted a three-day programme on Digital Certificates exclusively for the Reserve Bank of India from May 10-12, 2004, which was co-ordinated by Dr. N. P. Dhavale, DGM.

The other customised programmes conducted include Information System Audit for Canara Bank, and two programmes on Technology Induction for IT Officers of Dena Bank. While Shri D. P Dube co-ordinated the programme for Canara Bank, the Dena Bank programmes were co-ordinated by Shri R. Mani, DGM, and Shri M.V. Sivakumaran, Faculty.

A meeting of the IT Chiefs of various banks was held on June 07, 2004 at the IDRBT to update all the participating banks about the latest on the National Financial Switch. The meeting also deliberated the current initiatives and services of the IDRBT including VSAT and Leased Line Network, PKI-CA, Mail Messaging & SFMS etc. This meeting co-ordinated by Shri. V. Visweswar, DGM, had 39 delegates.

The Institute also conducted focussed programmes in the areas of Data Warehousing and Data Mining, Internet Banking, Business Continuity and Disaster Recovery Plan, Software Engineering for Banking and Financial Institutions, and Information System Audit. These programmes were co-ordinated by Dr. P. Radha Krishna and Shri Arijit Laha, Shri D. P. Dube, Shri A. R. Dani & Dr. Mahil Carr, and Shri M. V. Sivakumaran respectively.

### FORTHCOMING PROGRAMMES

Duration	Programme
Nov. 01-06, 04	Payment Systems & Security Technologies
Nov. 22-24, 04	Information Systems Risk Management
Dec. 06-11, 04	Asset Liability Management
Dec. 13-15, 04	Advanced Security Trends for Banks
Dec. 20-23, 04	7th International Conference on Information Technology
Jan. 03-08, 05	Networking Technologies
Jan. 10-15, 05	Network Security Audit
Jan. 24-29, 05	Technology Audit for Banks
Feb. 07-08, 05	Smart Card & Security Mechanisms
Feb. 14-15, 05	COBIT
Feb. 28 - Mar 5, 05	Software Engineering for Banking & Financial Applications
Mar. 14-19, 05	Business Intelligence
Mar. 21-26, 05	Information System Audit for Banks
Apr 04-09, 05	Decision Support Systems and ALM for Banks

### PGP-BTM 2005-06

The Institute will shortly be beginning the admission process for the third batch of PGP-BTM (2005-06). Since very few seats are available under the Sponsored Category, Banks and FIs are requested to initiate the process of shortlisting the candidates. The details of the programme will shortly be available on our website @ [www.idrbt.ac.in](http://www.idrbt.ac.in).

## Protocols and Standards for E-Check Clearing and Settlement

### Background

The World Wide Web is rapidly changing the way business is carried out. Electronic Payment Systems have become necessary to enable this e-Commerce and new Payment Instruments like the e-Check are being introduced. These new Instruments need a well developed Electronic Inter-bank Clearing and Settlement System.

This project, carried out by the Institute in collaboration with the Ministry of Communication and Information Technology, Govt of India, aimed at developing a secure model for Clearing & Settlement System in the country with e-Check as the main Payment Instrument.

### The e-Check

e-Check is an electronic substitute for traditional paper cheques and can be used in the same way as paper cheques. A paper cheque carries the handwritten signature or the thumb impression of the holder and at the time of the payment, the bank verifies the signature. The e-Check too carries the Digital Signature of the holder, which can be automatically verified for authenticity. The holder of e-Check need not carry it physically anywhere and all the operations including withdrawal, depositing, and payment etc., is performed electronically.

### Advantages of e-Check

- ◆ Facilitates Secure Electronic Payment Transaction on Internet.
- ◆ Additional information carrying capability.
- ◆ Automatic verification of content and validity.
- ◆ Validates at each stage of processing, thus reduces fraud
- ◆ Fast check processing and minimal transaction costs.
- ◆ Rapid and secure settlement of financial obligations
- ◆ Can be integrated with existing Electronic Payment Mechanism

### e-Check Clearing and Settlement System Model

1. Payee deposits e-Check on the web server of the collecting bank

2. Collecting bank's web server sends the e-Check to collecting bank's e-Check gateway
3. Collecting bank's gateway verifies the digital signature of the payee and determines whether the e-Check is drawn on itself or on another bank. If the e-Check is drawn on itself, step 6 is performed. If not, steps 4 and 5 are performed.
4. Collecting bank's gateway sends e-Check to the e-Check Clearing House.
5. e-Check Clearing House identifies the issuing bank and sends the e-Check to it.
6. Issuing bank's e-Check gateway sends the e-Check to the core banking system / TBA.
7. Payer's account is debited and confirmation sent to the gateway. In case of insufficient funds or other reasons like failure of verification of Digital Signature or e-Check validation, the instrument is returned with appropriate error message.
8. Issuing bank's gateway sends the confirmation/failure message to the e-Check Clearing House.
9. At periodical intervals during the day, the e-Check Clearing House creates a batch of e-Checks for which payment has been confirmed, does netting and sends the net-settlement file to RTGS.
10. RTGS sends confirmation of settlement to the e-Check Clearing House.
11. e-Check Clearing House sends confirmation to collecting bank's e-Check gateway.
12. Collecting bank's e-Check gateway sends confirmation to the core banking system / TBA for credit to payee's account.
13. If the e-Check has been rejected, collecting bank sends an e-mail intimation to depositor.

**The Result:** This project enabled development of a framework for e-Check Clearing and Settlement system. The necessary protocols, model and security aspects for this system were conceived, developed, tested and finalised. This framework ensures efficient, secure and faster electronic payments, which can be used to build an effective and trustworthy e-Commerce environment in the country.

## Multi-Application Smart Card Based Payment System

### The Project

This is a sponsored project of the Ministry of Communication and Information Technology, Govt. of India, being carried out by the IDRBT in association with the Indian Institute of Technology, Bombay (IITB). Researching on Multi-Application Smart Card (MASC) Standards, the project aims at developing standards and specifications for Multi-Application Smart Card Based Payment System in India.

### The Targets

- Preparation of operational procedure for a Multi-Application Smart Card Based Payment System including personalisation, delivery, management, and smart card applications covering:
  - Interoperable on-line debit
  - On-line and off-line credit
  - Inter-operable Preloaded Card/e-Purse
  - Smart card payments over Open Network
- Implementation of Common Electronic Purse Specifications (CEPS) to suit the specific needs of the country by removing unwanted features from CEPS and building-in additional functionality if required
- Provide guidelines for designing new Application Programme Interfaces for MASCs
- Develop and Deploy Security Architecture and Key Management procedures
- Design Compliance Testing Procedures for certifying MASC based products and software
- Develop Multi-Application framework for Indian context
- Supervisory role for the Pilot

### Present Status

- The compliance testing of the pilot has been carried out along with the industrial consortium and IITB.
- An agreement between Key Management Agency (KMA) and the banks participating in the pilot has been circulated

- Updation of Key Management is in progress.
- The key ceremony and signing of the agreement between KMA and five participating banks (Punjab National Bank, IndusInd Bank, ICICI Bank (in process), Bank of Baroda, Jammu and Kashmir Bank Ltd) is completed.

### Tasks Ahead

- A complete testing of EMV payment, E-purse system and Mobile payment will be done shortly in cooperation with IIT-Bombay, STQC, ZERO-MASS Consortium
- Key management procedure, user manual and multi-application smart card based payment system are under preparation.



Shri D. P. Dube, Faculty on duty to the Institute from the Reserve Bank of India has been selected for the Diamond Jubilee Overseas Banking Research Fellowship Award for the year 2004. Dr. Dalbir Singh, President, Indian Institute of Banking and Finance (IIBF) and CMD, Central Bank of India presented him the Award on August 27, 2004.

This Award is given every year to one banker for conducting a study in the emerging areas relevant to the Indian Banking and Financial Sector. With this fellowship, Shri Dube will be conducting a study on "Evolving an Information Assurance Framework for Indian Banking Sector" in the United States and Britain.

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