# Nov 06 - Jan 07 / Vol 01 / Issue 08 A C L CONZECT

## CONNECTING THE BANKING WORLD



## **Interview**



Luis Fernando Montoya Cusso Jorge Iván Toro Villegas **Bancolombia** 

**Cover Story** 

**Industry Round Table: Online Security** 

# Feature

**Information Technology and Post-Merger Integration** 

**A Quarterly Journal From** 





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To view The Forrester Wave <sup>™</sup> : Retail Banking Platforms Q4 2006, Forrester Research Inc. (November 2006), visit www.infosys.com/finacle



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## Voice from the Desk



## Phish it Out!!

As we approach the end of another exciting year, we bring another stimulating issue of FinacleConnect packed with the latest topics that concern the banking industry, from online security to the role of technology in mergers and acquisitions and challenges of banking in Latin America. There is a lot to digest in this issue, so let me start off by giving you a flavour of what's there to come.

The cover story (Industry Roundtable) dwells on one of the key challenges facing banks today - Online Security. Some of the critical challenges banks face in the online space, as pointed out by the roundtable panelists, are the lack of security awareness among customers and the ability to strike the right balance between security and convenience. Though customers state security as their key concern, they will reject a very secure solution if they don't feel it convenient to use. The Roundtable included panelists like Naushad Kermalli, Head of Group Systems Development at Emirates Bank International in UAE and Ricardo Campos, Director, Electronic Banking at Bank Millennium in Poland.

"Mergers and Acquisitions is another reality in the banking industry today. Ensuring that the merger of two or more organizations goes through smoothly is a not an easy task by any measure. This issue's Feature article argues that effective management of IT risks rather than cost reduction or revenue enhancement should be the primary focus of merger teams, especially in large scale mergers. In Inside Talk we get to hear first hand about the key driver for acquisitions from Bancolombia, the largest bank in Colombia which completed its merger with mortgage bank Conavi and investment bank Corfinsura in 2005. "Through these acquisitions our strategy has been to maintain uniform functionality for our clients, providing stability and confidence in our services portfolio. Technology has been adapted in order to respond to the needs of the business areas, and we have implemented systems integrating the different platforms," says Jorge Iván Toro Villegas, Vice President of Information Technology at Bancolombia. Villegas along with Luis Fernando Montoya Cusso, Vice President of Operations at Bancolombia, discuss the main trends in the Latin American banking industry, the challenges faced by the banks in the region and the role of technology. These issues are also discussed in depth in Kaleidoscope where our coverage of banking trends in different parts of the world takes us to Latin America.

From the Latin American growth story to a review of Joseph DiVanna's latest book, '*Understanding Islamic Banking*', and finally an analysis of Distributed Transactions, the eighth issue of FinacleConnect traverses vast distances and covers several topical subjects. We are sure you will enjoy this issue. Before signing off I would like to thank all our readers for their support and especially those who send in their invaluable feedback.

From all of us at FinacleConnect, hope you have a great Christmas and a Very Happy New Year.

See you in 2007!

Merwin Fernandes Vice President and Business Head - Finacle Infosys Technologies Ltd.





## Information Technology and Post - Merger Integration

Experience suggests that effective management of IT risks rather than cost reduction or revenue enhancement should be the primary focus of merger teams, especially in large scale mergers.

Depending on the form of a merger, IT should be viewed as an enabling mechanism for achieving merger goals. This implies reducing costs or increasing revenues while minimizing risks. It is important to recognize that IT itself does not make a significant contribution to cost reduction during mergers and that revenue enhancement through IT is a longer-term objective.

During mergers, poorly implemented IT integration can significantly disrupt operations with potential negative implications for customer retention and regulatory compliance.

In high-overlap mergers, the emphasis is on cost reduction. Market analysts expect to see tangible actions being taken early in the merger program. For synergistic mergers, timescales to achieve benefits are longer, and IT can operate within a longer planning horizon to support revenue enhancement. The common factor with mergers is the need for a smooth integration process that eliminates the risk of customer or employee defection.

A key pre-requisite for successful post merger integration including IT integration is that bank's should adopt a comprehensive, integrated approach to IT risk management – see Fig 1 on the next page.







The contribution to IT related cost savings during the initial periods of merger integration is often found to be insignificant relative to the anticipated overall merger cost savings. For example, the anticipated IT cost reductions\*\* from the merger of RBC and BMO were a mere 3% of the projected merger savings. Similarly, the merger of BankAmerica and Nations Bank in the US pegged the IT cost reductions from the transaction at a lowly 2% of the projected merger savings. Another case in point is the combined Bank One and First Chicago that posted an expected IT cost reduction of just under 10% relative to the overall merger savings. Surveys indicate that on average, an acquirer Bank could expect to save 45-50% of the acquired bank's pre-merger IT budget. The major sources of savings from IT consolidation fall into two categories of 'Direct' and 'Indirect" savings - see Figure 2 below.

On the revenue growth side, we believe that in most instances, the likelihood that IT can contribute significantly to revenue enhancement through cross-selling in the immediate post-merger timeframe is remote. For example, driven by such factors as poor credit experiences,

high cost of customer acquisition, customer churn, increased customer service costs and greater threshold to achieve customer satisfaction, it is very likely that the acquirer and the acquired banks would have in the pre-acquisition state invested in CRM solutions. The poor level of CRM da-

\*\*SDC Data

tabase penetration together with siloed organization structures and a lack of tools for mitigation against it make the integration of disparate customer centric solutions to realize leveraged value in immediate post merger situations very unlikely.

The effect on regulatory compliance and customer issues cannot be underplayed when post merger IT integrations are botched. For example, as the result of a faulty general ledger system conversion, a bank chronically filed late and inaccurate regulatory reports, resulting in civil money penalties being assessed.

In another case, as the result of a faulty check processing system conversion, a bank was forced to charge for unresolved book keeping differences equivalent to one year's net income. In practical terms, the real effects of a botched integration would be:

- Increased exposure: The risks of not knowing the bank's actual position may leave the bank liable.
- Customer defection: Failures in customer service, such as account balances, direct debit instructions, ATM or website failures may prompt customers to move to competitors.

In large scale mergers, there is a greater likelihood of having to deal with merging, integration, replacement and interfacing with old, complex proprietary systems. This in itself adds a significant risk element to the equation. In such instances it is essential to focus on the 'actual integration' of two separate systems. Risks should be considered under the broad headings of:

### **Technical Risks**

• Delivery Risk – The risk that the integration will not be completed in time.

Category	Specific Area	% of Total IT Savings
Direct	Closing of redundant data centers	45%
	<ul> <li>Reduction of programming staff</li> </ul>	25%
Indirect	Streamlining back office operations	15%
	IT related branch closing savings	15%
BancScope, OneSource, Tower Group		





- **Performance Risk** The risk that the system will not run at the desired speed or cope with the desired traffic.
- **Complexity Risk** The risk that the system is not supportable in everyday operation.
- **Functionality Risk** The risk that the final system does not have key functions.

### **Managerial and Operational Risks**

This is a "superset" of technical risk, which considers the processes and mechanisms employed with the IT department itself and the four main categories of risk are related to:

- Systems Management
- Programming
- Computer Operations
- Audit

I would like to suggest that a key pre-requisite for successful IT integration is a comprehensive approach to IT risk management. Figure 3 provides a structured approach to this issue.

STEP Validate IT Project Master	Train Staff and Initiate	Track and Manage
Plan/ Conform Approaches	Risk Reporting	Transition Risks
Create a consolidated inventory of merger and non-merger IT projects     Prioritize projects in line with oper- ational and economic objectives     Identify interrelationship and produce resourcing plan	<ul> <li>Produce first-pass project risk inventory</li> <li>Train staff in risk management methodology</li> <li>Agree on approaches to risk reduction</li> <li>Revise project plans</li> <li>Feed metrics to merger integration dashboard</li> </ul>	<ul> <li>Perform ongoing risk review with weekly conference calls</li> <li>Monitor effect of actions taken to mitigate risks</li> <li>Review the nature of risks as process continues</li> <li>Recast risk metrics into "steady state" and exceptions formats</li> <li>Consider opportunities to automate the process</li> </ul>

It is important that the merged entity decides on its approach to systems integration as quickly as possible. During mergers, banks are faced with several alternatives for system integration – see Figure 4.

- Remain separate for the foreseeable future delay the integration.
- Choose all of Bank 'A's systems instead of Bank 'B's.
- Choose best of breed hardware and software suites.
- Replace both systems with a new software solution.
- Outsource the decision making and integration responsibilities to a 3rd party.

Of course the most appropriate choice depends upon a number of criteria including – see Fig 5 on the next page.

- The relative size of the merging institutions.
- The anticipated benefits of the merger and the speed with which they must be achieved.
- The natures of the systems to be combined.

The mechanism for selecting the best approach, especially in "merger of equals" situations must be transparent and broadly accepted. The emphasis here is to decide the "high level" integration approach early in the merger. Detailed planning should follow this direction-setting activity. Without this process, and in the absence of any

## Fig. 3

INTEGRATION ALTERNATIVES	ADVANTAGES	DISADVANTAGES
Remain separate for foreseeable future	<ul> <li>Integration decisions can be more carefully considered in the context of the overall merger</li> <li>Staffing concerns can be stabilized in the immediate short-term</li> </ul>	<ul> <li>In high overlap mergers, the direct and indirect savings from systems consolidation are delayed</li> <li>Customers cannot use all of the merged entities distribution channels on an equal footing</li> <li>Delays in taking advantages of cross-selling opportunities in synergestic mergers may mean the loss of a first mover advantage</li> </ul>
<ul> <li>Choose all of Bank "A"s systems instead of Bank "B"s</li> </ul>	<ul> <li>Overlap savings are realized as quickly as possible</li> <li>Non-IT conversions (e.g., process) can proceed once systems conversions are complete. HR, Finance and Back-office functions can be consolidated</li> <li>Conversion is restricted mainly to data rather than having to rewrite code</li> </ul>	<ul> <li>Some key features may end up not being incorporated in to the merged entities systems</li> <li>Retention of critical IT staff is likely to be a concern</li> <li>Penalty clauses from terminated bureau arrangements may be severe</li> </ul>
<ul> <li>Choose "best of breed" hardware/ software suites</li> </ul>	<ul> <li>Best solutions chosen</li> <li>Decisions appear more "equitable" to IT staff</li> </ul>	<ul> <li>Strategy is disruptive to both institutions</li> <li>Risks of failure increase significantly</li> <li>Politically complex, leading to turf wars that may overwhelm the selection process. It is difficult to objectively evaluate systems at different stages of development</li> </ul>
<ul> <li>Replace both systems with new "software" solution</li> </ul>	Improved functionality     Reduced support costs     Receives support from IT departments-neutral, skills-enhancing choice	<ul> <li>High-risk approach because of unfamiliarity and interfacing issues</li> <li>Packages tend not to support the high volumes found in the larger banks- point or product-specific implementations are common</li> </ul>
<ul> <li>Outsource the decision-making and integration responsibilities to a third-party</li> </ul>	<ul> <li>Works well if the skill sets in the merging banks are inadequate</li> <li>Has been utilized by large/medium-sized banks making multiple purchases of smaller banks- can focus on merger</li> </ul>	<ul> <li>Difficult to cost accurately</li> <li>Assumes that oursourcer has deep knowledge of banks, existing systems (likely in small/medium institutions where packages prevalent) or that existing IT staff will transfer to third-party</li> </ul>



strong guidance from senior management, the temptation is to "horse-trade" solutions between IT departments.

Merging two IT systems into one involves making changes on a number of dimensions:

- **Systems:** Apart from the obvious issues of buying package solutions or developing new bespoke applications, migrating data and so forth, the procedures for managing IT projects, for e.g., project initiation, must be agreed upon. Architectural standards, like security and software tools selection must also be decided.
- Human Resources: IT personnel in banks are a prized commodity. There is a risk that decisions on software selection may result in the departure of key individuals whose specialized knowledge of systems is essential for maintaining "business as usual".
- Skills: Selecting a particular IT solution may sometimes "devalue" the skill sets of the whole department. Planning for training and "re-skilling" is therefore a critical activity.
- **Structure:** The merging institutions may have organized their IT departments in different ways. For example, decentralized vs. centralized. Resolving this is a complex challenging task and may complicate the overall IT integration process.
- **Relationships:** Aside from the third-party contractors employed in the IT departments, there are usually outsourcing agreements in place (with penalty clauses) for activities such as data centre management. The potential for

one of the competing vendors to get all of the income creates an incentive to threaten maximum exit/cancellation charges. However, the winning vendor may waive charges as an incentive to gain the business. If there are large differences in the sizes of the merging institutions, it is likely that the larger institutions systems will be chosen. If it is a merger of equals, negotiations may become very important as compromises may be made. Additionally, the complexity of the integrated solution requires quick and thorough planning. These issues need to be tackled at the very beginning.

### Conclusion

Whilst the first 100 days of post merger integration are crucial, many banks have found that cost and performance improvement opportunities promised from mergers are not fully realized during initial post-merger integration efforts. A "second-wave" effort, 1-3 years after a merger or acquisition has closed may be necessary, according to a study by Mercer Management Consultants, to unlock those additional benefits and reduce costs by up to 20 percent by:

- · Consolidating support and back-office functions
- Streamlining organization structures
- Improve productivity and streamline process and other operational improvements
- Elimination of duplicative licenses

### **Gopal Sondur**

Group Head - Product & Strategy Finacle, Infosys Technologies Ltd.

INTEGRATION ALTERNATIVE	RELATIVE SIZE	MERGER TIMING	NATURE OF SYSTEMS (Proprietary vs Packaged)
<ul> <li>Remain separate for the foreseeable future.</li> </ul>		Viable alternative only if over- whelming industry issues exist	
Choose all of Bank "A"s systems instead of Bank "B"s	Works best if large discrepancy in sizes-A acquiring B	Fastest method of reducing costs	<ul> <li>May mean a larger bank's proprietary systems replacing better packaged solutions</li> </ul>
Choose "best of breed" hardware     /software suites	Best approach if a large-scale     "merger of equals "	Time consuming but functional- better for synergistic mergers	May reduce dependence on older, proprietary systems
Replace both systems with new software solution	<ul> <li>Applicable only where point -specific solution are poor in both banks and new software is easily integrated</li> </ul>	Time consuming in selection and implementation	New software solution is invariably     a package
Outsource problem to a third- party	Advantageous if large size discrepancy, repeated acquisitions and poor internal IT skills	First acquisition is time consuming after 4 or 5, timings reduce	• Systems issues fall to third-party who may be obliged to recommend their own 'branded' solution

Fig. 5

## **Online Security**

## **Expert's View Point**

**Cover Story** 

Online security is one of the key requirements by financial customers today as they increasingly use the Internet to not only manage their financial transactions online but also to buy financial products. According to a 2005 consumer attitude study by JupiterResearch, banks that invest in and promote the security of their online Web sites stand to differentiate themselves from their competitors and win customers. This, combined with the rapid growth in online phishing and identity scams and increasing regulatory pressure has ensured that online security is a critical concern among banks today. In this FinacleConnect Virtual Roundtable we bring together experts from across the world to discuss the challenges of ensuring online security and the solutions and strategies for the same.



**Ricardo Campos** 

### **ROUNDTABLE PARTICIPANTS:**

Ricardo Campos Director, Electronic Banking, Bank Millennium, Poland

#### Kari Oksanen

Head of Risk Management for Payments & e-services, Nordea, Nordics

### Deji Oguntonade

Divisional Head, Information Technology, First Inland Bank Plc, Nigeria

#### Naushad Kermalli

Head of Group Systems Development IT, Emirates Bank International, UAE

#### Sanat Rao

Associate Vice President & Global Head - Sales, Finacle, Infosys Technologies Limited Kari Qksanen





Deji Oguntonade

Sanat Rao

What are the main types of online security threats that banks need to safeguard against?

**Deji Oguntonade:** It is a combination of factors ranging from malicious hackers and inexperienced customers to unskilled bank officials and virus attacks.

Ricardo Campos: Banks need to safeguard against attacks to their systems and to help customers safeguard against attacks to their computers. In fact, the challenge lies in being able to successfully safeguard both these fronts at the same time, with different tools and against different types of threats. From the customer front, threats come in the form of viruses, worms, trojan horses, phishing and man-in-themiddle. From the banks front, attacks come in the form of hacking and disruptive actions. Hacking involves the violation of the banks computer system with the intention to damage it or extract sensitive data such as customers account information and using it for malicious purposes. Disruptive attacks may come in the form of concerted actions that attempt to disable

or disrupt the functioning of the computer system. An example of such may be a program that attempts to overload the system with requests, thus reducing the system performance or possibly shutting it down.

Kari Oksanen: There are threats like phishing with e-mails and trojans. But it is important to understand that the sophistication of the attacks in general is growing. Banks should not concentrate on individual threats but create online strategies by understanding the big picture. When creating online strategies the whole business process with all elements should be covered, for which comprehensive and robust control architectures are needed.

Sanat Rao: Banks are increasingly getting introduced to a variety of online security threats with each passing day. The key ones would be phishing, keyboard logging and man-in-the-middle that have emerged as serious threats in the last 18 months. The interesting part of these threats is that these threats are something that the customer must protect themselves against and requires a





**Ricardo Campos** 

"Banks need to safeguard against attacks to their systems and to help customers safeguard against attacks to their computers. In fact, the challenge lies in being able to successfully safeguard both these fronts at the same time, with different tools and against different types of threats." lot of customer education. e.g. - By the time a bank realizes that there is a phising attack, there is a possibility that some of the customers would have already been affected. However, the good news is that there are solutions available today to prevent each of the above mentioned threats and it is important that the banks implement them as soon as possible. There are other kinds of disruptive threats such as spamming, virus infusion, trojans which have been there for a long time but cannot be ignored. Most of the offerings in the banks have solutions that protect them against these attacks. The spectrum of impacted areas may range from identity theft of bank's online customers to loss of transactional integrity for online transactions.

## What are the key challenges banks face in ensuring online security today?

Naushad Kermalli : Some of the critical challenges banks face is that hackers are a step ahead of banks while customers lack security awareness. Moreover we need a fine balance between ease-of-use of online banking versus tightening security levels and deploying authentication, verification and encryption solutions.

**Deji Oguntonade:** Other critical challenges are the high cost of security solutions, dearth of highly skilled security professionals and IT solutions that are built without due consideration for security.

**Ricardo Campos:** In all I would say that there are six critical challenges that banks face regarding online security. First is choice of technical security options. The technology environment in most banks today is a mosaic of different technologies, inconsistent systems, and a lack of a common technology security strategy. Changing this environment in a cost-effective manner is one of the biggest challenges banks face when trying to meet new regulations and implementing new security measures. The second challenge is achieving a centralized security organization. Most banks work in a decentralized structure with different business lines and product units. In order to implement security standards and achieve consistent results across the bank, it is vital to create a management structure that includes all interested parties and is responsible to determine security risks, implement best solutions, communicate and monitor.

Then, as has already been mentioned, one of the weakest links in the security chain is the customer who is not aware of how to defend himself from security attacks. Many customers still feel that online security is the sole responsibility of the bank, declining to take any actions to ensure proper security. Educating the customers to understand that it is also their responsibility to fight against security attacks is a key challenge for banks today. The fourth challenge, is rapidly changing security threats. As we have already heard, institutions seem to be always one step behind. Hackers are always trying to invent new ways of breaking into the bank's system. What prevents attacks today may not prevent a new type of attack tomorrow. Choosing flexible solutions that can adapt to new types of threats is a major challenge. New solutions can become obsolete very quickly, and costs are difficult to justify.

When customers are asked to rank their major concern when using online banking, security tops the list. Paradoxically, customers can reject a very secure solution if they feel it is not convenient to use. Being able to strike the right balance between security and convenience is the fifth challenge for the success of the usage of the online banking solution. Finally and equally important, costs are a challenge in the implementation of new security solutions. It affects the bottom line of the balance sheet and is an important variable in the equation. The challenge lies in selecting a cost-effective solution that is robust enough to handle all current security issues and is flexible enough to handle major new security threats.

Kari Oksanen: Many elements of the online services like devices, software and networks used by customers are not in the direct control of the banks or any online service provider. It





**Deji Oguntonade** "... there should be adequate se-

curity awareness programs for both bank staff and customers and there should be adequate policies to cater for areas that can not be handled technologically." is important to notice that in an information society new skills are needed. There must be consistent and objective information available for all citizens as regards the new "traffic rules" in the Net. Banks have been fore runners in promoting online services. Today there are many other online service providers, too. Ensuring online security is a joint effort, where telecoms, vendors of software and security tools and banks should co operate.

In Finland, Information Security Days have been arranged since February 2004. Citizens, school children and SMIs have been the main target groups. These campaigns have been supported by establishing a website, where updated security information is available for everyone in a format, which is easy to understand. This has been done in close co operation between authorities, banks, telecoms, security vendors and other organizations. Indeed, the results have been encouraging. The number of anti virus and personal firewalls in home PCs has increased significantly.

**Sanat Rao:** The following challenges are the key amongst a host of challenges:

Business case for preventing certain types of attacks - There a number of attacks which require large investments which may not be justifiable given the customer base of some banks. In fact, there are many banks who are willing to compensate for the fraud losses of the customers (In some countries, the banks are held accountable for the frauds that are committed on their customers) as that is more cost effective to putting up a solution to prevent the same.

Security policy - The security policy in the bank needs to be continuously monitored and updated as a result of the newer security threats. As a result of the same, these security policies will have to be implemented on a regular basis. This means that the bank has to continuously evaluate the risks, cost of the solutions, upgradations etc. It gets all the more challenging due to a variety of technological solutions available in the market, each addressing individual problems but none offering a one-stop-shop.

*Customer education* - A good number of online banking users are naïve to the types of threats they face online & precautions that they must take. Therefore, customer education becomes a key element to prevent the manifestation of a number of risks into frauds. The banks have to decide which is the best medium for the communication, message for the communication, frequency of communication and so on and so forth.

## Does the fear of Internet breaches impact the take-up of online banking?

**Naushad Kermalli:** Yes, but it depends on the maturity levels of different customer segments in different countries.

Kari Oksanen: I have seen some articles indicating that some Europeans, who have enrolled in online banking, have given up using it. In our market area we haven't seen such occurring.

**Ricardo Campos:** In my opinion, it does. There is a group of customers that are still not comfortable using the Internet and the fear of security issues inhibits the use of online banking. Research conducted by Forrester shows that customers first start surfing the Internet, then after a couple of years they start shopping online and finally after at least five years of Internet usage, customers feel comfortable enough to adopt online banking. Therefore, the adoption of online banking is directly linked to the comfort of online usage.

Sanat Rao: I agree. However, online banking usage also depends a great deal on the customer-targeted communication from the banks to alleviate such fears. Besides, the security threats are not perceived with the same level of maturity by each market segment. For instance, it is much easier for the experienced eyes of an internet-savvy user to detect potential phishing attempts when compared with a customer who has recently migrated from old school of banking to more recent modes. Studies have also shown that first time users or users who have started





Kari Oksanen

"Technology is needed (to mitigate the threat of online fraud), but I have not seen any single solution being able to solve all the problems. I see the most important thing is to have depth in defence - multiple sequential controls including business controls designed based on customer behaviour and payment limits." adopting online banking do not continue to use them if they are struck by a fraud or attempts of fraud as their confidence on such a channel is drastically reduced and fall back on the traditional modes of banking.

Would you have an estimate of the extent of loss that the banking industry is facing due to online security breaches?

**Naushad Kermalli:** No, I do not have an estimate, but the overall losses are huge if cards are included.

**Ricardo Campos:** I too don't have an estimate of possible losses due to online security breaches. But what is important to mention is that if we compare online security problems with security problems related with cards and to branches, I would dare say that online frauds are much smaller than frauds with cards and frauds at branches. Unfortunately, online frauds get very high media attention, which tends to disproportionate the problem.

Of course, the reason banks are giving a very high priority to online security is that the potential for disaster is very big as it may impact all of the bank's customers and may dramatically affect it's reputation, the brand loyalty and the consumer confidence in the institution.

**Sanat Rao:** I would not have estimates at this point. However, the problem is compounded considering frauds in the area of online acquisition of card-based transactions in the card-not-present scenario.

How can technology help in mitigating the threat of online fraud? What in your opinion is the most optimum kind of technology solution?

Naushad Kermalli: Two-factor authentication is an effective option plus the use of technology tools that enables customers to know that they are being contacted by 'phishers'. It is also important to prevent phishers - after they have gained access to customer IDs and passwords - to access the accounts through a process of re-authentication and re-validation.

**Ricardo Campos:** Based on the FFIEC guidance on electronic banking security, the optimum kind of technology solution is the one that can protect customer's data as well as their assets, does not rely on passwords as the only control, and is able to accommodate different types of authentication modes dependent on the risk of each activity (risk based segmentation). Technology can help mitigate the online fraud threat by improving the institution-to-customer and customer-to-institution authentication process. Different technologies are available and already applied in various banks, such as stronger cryptography, biometrics, hardware tokens, SMS, and other forms of multi-factor authentication. It is important to note that such technology should be deployed across multiple channels in order to avoid voids in the system and be customer friendly to ensure successful adoption.

Kari Oksanen: Technology is needed, but I have not seen any single solution being able to solve all the problems. I see the most important thing is to have depth in defence - multiple sequential controls including business controls designed based on customer behaviour and payment limits.

Sanat Rao: There are now multi-factor modes of authentication that are a step further from the standard two-factor modes available in the market. The two-factor league is about the user presenting a response to 'what you know' (say, a PIN/password) and 'what you have' (e.g. a Secure Token), while accessing an online application. The multi-factor modes go to the level of 'who you are' (e.g. a bio-proof, like fingerprint). Now having said that, I would tend to believe that there is no single solution available that will secure various interaction points in a typical online banking model. Other solutions such as exchange of personalised digital images between customer and bank website in advance of password entry prevents phising.

What other strategies can banks adopt to ensure online security?



## Naushad Kermalli

"Some of the critical challenges banks face is that hackers are a step ahead of banks while customers lack security awareness. Moreover we need a fine balance between ease-of-use of online banking versus tightening security levels and deploying authentication, verification and encryption solutions." **Naushad Kermalli:** A massive customer awareness program is important and along with there needs to be a regulatory review of individual banks controls.

Kari Oksanen: Indeed, customer education should remain as a key issue in online strategies. Banks and other online service providers as well should regularly update the threat picture extending up to two years from now. We have to be prepared for tomorrow's threats today, because implementation and roll out takes time.

**Deji Oguntonade:** In fact there should be adequate security awareness programs for both bank staff and customers and there should be adequate policies to cater for areas that can not be handled technologically.

Ricardo Campos: Banks need to realize that strong authentication by itself will not solve the problem of online frauds. Real-time monitoring of transactions and activities is fundamental for early detection and action taking against largescale frauds. Further, industry wide information sharing would also greatly benefit all parties involved. Unfortunately, most institutions are reluctant to share their misfortunes with others, fearing that information might leak to the market affecting customer confidence. Thus, banking regulators, law enforcement agencies, amongst others, should take the initiative to establish repositories for collecting information about fraud activities. Finally, as has already been stated, staff and customer education are also an important front line defense. Staff education can increase employee vigilance and reduce the effectiveness of fraud attempts. Customer education about the different online threats and how to avoid them helps understand the important role customers have in the defense of online frauds. Only the combination and coordination of such tools and activities can create a robust defense against online fraud.

**Sanat Rao:** Digital signing of online transactions must become a norm, especially in the economies that are relatively new to online banking. This will ensure transactional integrity, non-repudiation as well as offers protection against fraudulent intercepts. Regulators must enforce this basic mode of security regime for all online transactions and not restrict it to just online banking transactions.

A lot has to be communicated to customers. The onus of 'real online-enablement' of banking customers is usually left to the printed matter. The existing delivery channels (like ATMs, Kiosks, Online Banking, POS) should be used to push this information to the customers in innovative ways. Wherever technological controls are not feasible, procedural controls should be implemented to check fraudulent occurrences. As indicated before, solutions such as exchange of personalised digital images between customer and bank Website in advance of password entry prevents phising. One time password through SMS, virtual keyboard, software version of two factor solutions are other strategies that banks can adopt to ensure better security in online banking.

Do you think a government regulation such as the US government's Federal Financial Institutions Examination Council's (FFIEC) Guidance on electronic banking security is necessary to ensure the security of bank customers?

**Deji Oguntonade:** Yes, Nigeria's CBN guideline on Electronic Banking has established a minimum security standard to be complied to before any bank can run electronic banking solution. This to a very large extent has mandated banks to conform to security standards thus minimizing the banks exposure to security threats

**Ricardo Campos:** The FFIEC October guidance on authentication in electronic banking is a very important piece of regulation as it calls on financial institutions, by the end of 2006, to implement strong controls on electronic banking services and access to sensitive information. The security measures referred in this guidance are known in the market and have been adopted by financial institutions in different ways. The added value of such a regulation is, apart from the fact that it sets a date for institutions to upgrade





Sanat Rao

"A lot has to be communicated to customers. The onus of 'real onlineenablement' of banking customers is usually left to the printed matter. The existing delivery channels (like ATMs, Kiosks, Online Banking, POS) should be used to push this information to the customers in innovative ways. " from simple password authentication solutions, it creates an opportunity for some institutions to differentiate themselves as an outstanding security practitioner from both the operational, and customers point of view.

Financial institutions should address this regulation by clearly identifying the levels of risk involved in all operations that access customers data and allows for the movement of funds. Mitigating the risks associated with those operations can be dealt with by implementing One Time Passwords (OTP) delivered through Short Message Service (SMS) or tokens, and the use of digital certificates in specific transactions. Smart cards and forensic devices may also be considered. Additionally, active fraud detection and behavior analysis coupled with outgoing phone calls for verification can enhance the level of security of electronic banking and act as a front line defense against new forms of attacks.

Finally, the FFIEC guidance provides a third challenge – customer education as a defense against fraud and identity theft. Several banks are already providing online security education to their customers. Millennium Group for example, has teamed up with Microsoft to publish a security newsletter helping educate customers to defend themselves from "phishing" and other forms of fraud.

Kari Oksanen: I think confidence is the most important issue in banking. Thus all bankers should understand the importance of safeguarding online banking. I can also understand regulators. They have to show that they take care of bank customers. When talking about online banking, we have to notice that debiting and crediting are done quickly. Existing legislation and other related rules are from the age before Internet. Law enforcement bodies are not familiar with handling cases, where complicated technologies are involved and international cooperation is therefore needed.

Sanat Rao: Active involvement of regulatory bodies like FFIEC (in US), MAS (in Singapore), FSA (in UK), RBI (in India) coupled with implementation of electronic banking recommendations from the Basel Committee, is surely a step towards ensuring safer online banking experience for customers.

As much as the benefits drawn from online banking and information centralization, the effects of online banking frauds can be equally traumatizing on the opposite scale. It is therefore upon these regulatory bodies to enforce online security norms, thereby rewarding initiative and innovation from the banking and IT communities. Just like how there are global standards such as SWIFT, J2EE etc, there should be a central standard body that prescribes guidelines for banks to adopt with respect to security and also encourage banks to adopt these standards•

# BANCOLOMBIA

## Interview with Bancolombia S.

Inside

One of Latin America's oldest banks, Bancolombia is the largest bank in Colombia in terms of equity and assets, and is also the only company in Colombia to be listed at the New York Stock Exchange. The bank, which provides commercial and consumer banking from some 700 branches in nearly 150 municipalities throughout the country, has grown rapidly through mergers and acquisitions. It was formed by the 1998 merger of Banco Industrial Colombiano and Banco de Colombia, and in 2005 completed its merger with mortgage bank Conavi and investment bank Corfinsura.



Extending regional operations, improving operational efficiency and bankarization are some of the key challenges facing banks in Latin America.

Finacle Connect's Research and Contributing Editor, Rekha Menon, speaks to Luis Fernando Montoya Cusso, Vice President of Operations at Bancolombia, and Jorge Iván Toro Villegas, Vice President of Information Technology at Bancolombia, about the main trends in the Latin American banking industry, the challenges faced by the banks in the region and the role of technology. They also discuss how the bank is preparing for the future. Mr. Montoya Cusso has more than 33 years of experience in the financial services industry in business, management and operational areas. Mr. Toro Villegas on the other hand, has worked at Conavi for the last 30 years and was appointed as the Vice President of Information Technology for Bancolombia in July 2005 following the merger of Bancolombia with Conavi and Corfinsura.

- What have been the main developments in the Latin America banking industry in recent years?
- Luis Fernando Montoya Cusso: Three key changes have impacted the banking industry in Latin America in recent years. The first big change was the globalization of the banking sector. During the last 10 years many international competitors arrived in this region, bringing along new technologies, operating models and business strategies. This influenced local banks to seek strength and capacity to face the competition, which is why mergers, acquisitions and alliances are so frequent. From many small banks, the banking sector is being restructured to comprise only a few large banks. The second change has been regarding risk. As a result of international financial accounting scandals, and through the adoption of regulation frameworks around Basel II and Sarbanes Oxley, banks in the region have become aware of the importance of market, credit and operating risk management within their processes.

The final change is around bankarization, access to banking services. Latin America is characterized by a low level of bankarization. Only 30-35 percent of the population has access to banking services. This is a key challenge for banks who have implemented a number of strategies to increase access to financial services to the remaining population, such as use of non-banking correspondents, non-traditional channels and micro-credit schemes.

## In your opinion, what are the main challenges facing banks in Latin America?

Luis Fernando Montoya Cusso: Most of the local banks face the challenge of extending their operations in the region while abandoning the national operational framework that has characterized them thus far. The main reason is that as a consequence of the globalization of the Latin American trade, there is a trend among multinational companies to centralize their treasury management in one country to coordinate their capital flows in the other countries where they operate. This is where banks can find significant business opportunities if they establish operations outside their country of origin.

Another challenge is improving operational efficiency. The Latin American banking sector operates with high intermediation margins which, added to high operation costs, generate an efficiency level below the international average. The challenge is to optimize and reduce the costs structures of our business entities to put us on par with our international competitors and to face the margin reduction trend, which will require an additional effort to build processes and implement state of the art technology to support efficient management of resources. Finally, as mentioned earlier, bankarization is a critical challenge. Increasing the customer base will always be a challenge for the banking industry in our countries.

**Q** How can banks face these challenges?

A

Luis Fernando Montoya Cusso: Through the use of technology. Banks must leverage information technology that will allow them to reach a higher number of users at a lower cost through several channels, to achieve efficiency in operation's processing and, to extend their products and services' portfolio. Support from Central Governments is also essential since the complex local legislation in different countries



and the lack of political will may prevent the implementation of development strategies for the sector to progress. Finally, industry standards can help. Financial entities currently develop isolated solutions aiming to be the first to reach the market. Better results can be achieved with organization and teamwork at a regional level which will promote the achievement of industry standards to generate economies of scale.



What is the role of technology for banks today?

Luis Fernando Montoya Cusso: Technology plays a key role in banks, since technological enhancements are increasingly facilitating new business lines besides helping banks to be closer to their clients through different channels such as the Internet, mobile and so on. It is helping us increase the efficiency indexes through cost reduction in operations and information processing. The importance of technology in banking is continually increasing and is deemed critical when it comes to growth and survival.

What is Bancolombia's technology strategy?

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**Jorge Iván Toro Villegas:** Bancolombia's technology strategy consists of a total alignment with the business making technology a natural ally for the development of new products and services. Innovation is key to help meet the challenges of consolidation in the financial sector.

### What has been the main driver for Bancolombia's acquisitions in recent years?

Jorge Iván Toro Villegas: The acquisitions have focused on meeting the clients' needs and positioning the bank as an innovator in the services and technology areas. We have acquired broader transactional capacity to face the growing demand of new clients, we have implemented more communication channels to provide a more agile service and we have acquired new mobile devices to reach the most remote areas of the country.

Through these acquisitions our strategy has been to maintain uniform functionality for our clients, providing stability and confidence in our services portfolio. Technology has been adapted in order to respond to the needs of the business areas, and we have implemented systems integrating the different platforms.

Are there any strategic/innovative business or technological initiatives for Bancolombia that you would like to highlight?

Jorge Iván Toro Villegas: There is research going on about mobility and virtualization; the expansion of the network through non-banking correspondents that could allow us to reach remote areas. We expect to develop alliances with other banks through the efinancial services utility, Todo1, to achieve economies of scale for our technology systems.

Further we are also working on an assessment project for a possible renewal of our application architecture to create a robust infrastructure to help us meet future requirments•



Latin America has undergone a profound transformation in recent decades. Unlike earlier when authoritarian regimes were evident in the region, liberal democracies govern most Latin American countries, and inward looking economic policies have given way to free market oriented reforms. Currently, the region is enjoying a period of growth. In 2006, the GDP growth rate for the region is expected to be over 4 percent. While the growth rate by itself might not be outstanding, what is quite remarkable is that this is the third consecutive year that the average GDP growth rate is well above 2.4 percent which was the average for the previous decade between 1993-2003. Moreover, industry experts expect this pace of growth to be sustained, signaling that Latin America has finally recovered from the financial crisis\* and the subsequent turmoil that had gripped the region in the1990s and early 2000s.

The impact that this economic upturn has on Latin America's banking industry is clearly reflected in the banking sector's profit levels (see Fig.1). According to the International Monetary Fund (IMF), the industry's average return on assets, which dropped to -1.3 percent in 2002, driven down partly by Argentina's financial collapse, had recovered to 1.6 percent by 2004 and has remained at approximately the same level since then.

As such, Latin America is a vast and dispersed region comprising 20 countries of similar ethnic origin. Analyst firm, TowerGroup estimates that 92 percent of the region's GDP is concentrated in the seven larger economies: Argentina,

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## Bank Return on Assets (%)

	2002	2003	2004
Latin America	-1.3	1.3	1.6
Argentina	-8.9	-2.9	-0.5
Brazil	1.9	1.5	1.8
Chile		1.3	1.2
Colombia	2.7	3.5	4.1
Ecuador	1.5	1.5	1.6
Mexico	-1,1	1.7	1.5
Peru	0.8	1.1	1.2
Venezuela	5.3	6.2	5.9
Emerging Asia	0.8	0.9	1.3
Emerging Europe	0.9	1.5	1.5
Western Europe	0.7	0.8	1.0

Source: International Monetary Fund (IMF)

### Fig.1

Brazil, Colombia, Chile, Mexico, Peru, and Venezuela (see Fig.2). Most references in this article are therefore to these countries. Despite their common heritage, there exist significant differences between the banking industries in



## Latin American Population and Political Status by Country (2006)

Fig.2

each country both in terms of banking industry performance and structure.

The largest economy in the region is Brazil which with over 160 banks and around 63,000 bank branches, also has the largest banking market. The biggest banks by assets in Brazil are the state-owned enterprises such as Banco do Brasil and Caixa Economica Federal. This is quite unlike the situation in Mexico where foreign banks control much of the market and there are hardly any large state run institutions among the leading banks. Chile boasts the most efficient banking system in Latin America although the size of the industry is smaller than countries like Mexico and Brazil. Much of the credit for this goes to the reforms that were instituted in the country after the financial crisis faced by the country in the 1980s. Out of the larger economies, the banking system that is still not on a solid financial footing is Argentina which has still not recovered from the negative effects of the financial crisis that it underwent in 2001 and 2002.

Some of the key trends and characteristics evident within the Latin American banking system are as below:

• Foreign invasion. As has been mentioned earlier, Latin America is characterized by a very large presence of foreign banks in the market, probably among the highest globally. Citigroup is among the oldest foreign players with operations in 15 countries in the region, but in recent years it is Spanish banks Santander and BBVA that have led the foreign invasion. In July this year, European banking giant HSBC, which already owns Mexico's fourth-largest bank and one of Brazil's top ten, announced the takeover of Panama's Grupo Banistmo, the biggest banking group in Central America. Canadian bank Scotiabank which also has a long term presence in Latin America too announced in June that it would acquire the largest private bank in Costa Rica, Corporacion Interfin. As such Brazil has the lowest presence of foreign institutions who have, suggest industry experts, probably been deterred by the strength of existing players. Mexico however leads the trend. The three largest banks - BBVA Bancomer, Citigroup's Banamex and Santander Serfin - are all foreign controlled. According to estimates by S&P, foreign banks control approximately 85



Selected International FSIs' Revenue in Latin America (2003-05)				
	Revenue in Latin America (USD in Millions)			CAGR
Financial Services Institution	2003	2004	2005	(2003-05)
Citigroup	\$10,739	\$11,945	\$12,546	8.1%
BBVA	5,499	6,047	7,766	18.8%
Credit Suisse	3,909	4,444	4,877	11.7%
ABN AMRO	2,720	2,863	4,066	22,3%
UBS	2,599	3,350	4,018	24,3%
HSBC	1,318	2,578	3,859	71.1%
Santander	1,.898	2,234	3,151	28.9%
Societe Generale	1,589	1,832	2,145	16.2%
Bank of America	124	903	1,393	NM
Scociabank	1,264	1,239	1,283	0.7%
Subtotal	\$31,660	\$37,436	\$45,104	19.4%
Note: NM= Not meaningful	Exhibit #. 48:24	Exhibit #. 48:24B-E2 Source: Annual reports, TowerGroup		

Fig.3

percent of all banking assets in the country.

The preponderance of foreign banks in the region is attributed to the economic policies followed after the financial crises when the authorities dismantled entry barriers to facilitate foreign investment. And while there are certain concerns about foreign banks not focusing on the economic growth of the country they operate in, on the whole foreign players have played an extremely important role in developing the Latin American banking industry, by injecting capital into the banking system and introducing new products, technologies and management expertise in the region. For these foreign institutions themselves, the

Latin American operations have been highly profitable (see Fig.3).

• Consolidation. The banking crises in the region are also responsible for triggering the M&A trend within the Latin American banking industry. The governments in the various countries have also encouraged both local and

foreign banks to acquire weaker institutions, in order to improve the overall health of the banking industry. According to estimates by S&P, in Brazil the number of banks dropped from 253 in 1996 to 163 in 2005 while there are 90 banks in Argentina from 117 in 1996. Peru and Colombia too have experienced a similar consolidation trend. Consolidation is also occurring at a rapid pace in smaller countries like Panama and Guatemala.

Consolidation has led to increased concentration, in the banking industry. Brazil's top 10 banks now control roughly 70 percent of all assets in the banking system, suggests S&P estimates, while in Argentina, the top 10 banks account for roughly 71 percent of total assets. According to estimates by BNamericas, a news and intelligence service provider, in 2005, the top three banks in Mexico accounted for 61 percent of the industry's total assets and in Chile the figure was 54 percent.

• Un-banked population. One of the biggest challenges facing banks in Latin America today is that of low bank penetration. According to figures from the World Bank, there are only 1.4 bank branches per 1,000 square kilometers in Argentina, 3.1 in Brazil, 2 in Chile, 3.7 in Colombia, and 4.1 in Mexico. In the United States, there are 9.8 bank branches, while in Spain there are 78.9. The ATM penetration in Latin America too is much lower compared to developed economies. This problem primar-



BANK PENETRATION IN LATIN AMERICA, 2005





ily impacts the lower income strata of the population and the rural and remote areas where maintaining a branch network is not profitable. Moreover, many of the un-banked population are traditionally mistrustful of banks. To overcome the problems caused by

income disparities, attitudes and geographic access, some banks have adopted innovative schemes. For instance, in Brazil where till very recently over 60 percent of the labour population was un-banked, Banco do Brasil set up a micro-credit subsidiary called Banco Popular do Brasil which distributes banking services through non-bank distributors such as retail and drug stores.

• The challenge of increasing lending. Banks in Latin America have traditionally not focused on lending, depending instead on commission income, inflationary gains or investments in government securities. The number of loans and deposits are very low compared to developed countries. As can be seen from Figure 4, domestic credit (lending to the private sector) totaled 11 percent of



GDP in Argentina, 16 percent in Mexico, 24 percent in Colombia and 35 percent in Brazil. Chilean banks in the region are the most active lenders. Many banks complain that it is the lack of proper credit registries and efficient judicial procedures that deters them from giving loans. However, the region is witnessing a growth in consumer finance and mortgages and credit cards in recent years, which is in turn driving loan growth among consumers. Banks are also looking beyond large corporates to lend to the SME (small to medium scale enterprises) segment.

• Opportunities in the remittances market. Latin America accounts for nearly a quarter of the USD 232 billion global migrant worker remittances market which in turn significantly contributes to the GDP of the respective countries. It is estimated that for smaller countries such as El Salvador and Honduras, remittances can add up to one percentage point to economic growth. Banks traditionally have had no play in the remittances arena which is dominated by non-bank intermediaries, but this is changing. International banks such as Citigroup, Wells Fargo, HSBC and Bank of America are very actively offering remittance services and others are following suit. This market is not only highly profitable but also presents an opportunity to get the un-banked population to use banking services.

## **Banking Technology in Latin America**

As can be expected, there are several forces that are influencing technology strategies at banks in Latin America. On an average automation levels are high among banks in Latin America but most banks have legacy infrastructures in place. These systems are based on antiquated technology and are often unable to meet the performance and service levels required. Banks in Latin America require modern flexible solutions that help them provide sophisticated banking services to customers that are due to migrant economics, exposed to service levels



### Latin American FSIs' IT Spending by Selected Country (2006) BRAZIL **MEXICO** 4% CHILE 6% COLOMBIA ARGENTINA 57% VENEZUELA 18% PERU OTHER Exhibit #4824B-ES Source: TowerGroup estimates Total = \$10.6 Billon (USD)



available in mature economies. They also require systems that can help them rapidly develop and launch innovative and new products. This is extremely important since banks are increasingly developing innovative strategies to attract the non-banking population. Moreover, not only do banks need to attract new customers, in the face of increasing competition, they need to retain existing customers by offering them cutting edge products. With the increasing focus on anti-money laundering and the upcoming Basel II requirements, banks are also realizing the importance of solutions that have strong risk management and compliance modules. Another important requirement for banks today is multi-channel capability. Banks are rapidly expanding their ATM networks and along with that looking at upgrading their Internet banking offerings. "Coping with unfavorable topologies, many countries in Latin America have leveraged wireless technologies to meet their telephony demands. Internet access has reached only 14% of the people in this region, which is a rate about four times lower than the adoption levels in the United States and Europe. Demand has been growing swiftly, but it has been constrained by socioeconomic factors," states Gullermo Kopp, vice president at TowerGroup. He believes that as broadband wireless introduces premium content and value-added services globally, Latin America has a window of opportunity to bridge its Internet access gap and connect to the world.

According to estimates by TowerGroup, the total IT spending in Latin America will reach USD 10.6 billion in 2006 and will increase at 1.9% CAGR through 2009. TowerGroup says that this trend reflects a balance between organic business drivers for innovative products and services and the offsetting savings through technology consolidation. As the region struggles to find its economic future, TowerGroup suggests that the following technology imperatives may enable and even spur further growth:

- Risk management and compliance (e.g., antimoney laundering, Basel II)
- · Fraud management and information security
- · Core systems modernization
- · Self-directed delivery channels
- Streamlined business process flows (e.g., business process management, e-commerce)

A few leading banks in Latin America too have taken the lead in upgrading their technology systems. For instance, Banco Continental de Panama (BCP), among the top 10 banks in the country, recently decided to replace their AS400 based solution with Finacle, the universal banking solution from Infosys to power its operations across Central America. Stanley Motta, Chairman, BCP said "We have initiated a process to modernize and redefine our operational system as well as the way we do business and serve our customers. The purpose is to increase our efficiency and strengthen our leadership position in the competitive global and local banking industry." With the rollout of Finacle, the bank will be able to consolidate its technology and operations platforms across the region. The bank will leverage Finacle's integrated CRM functionality to empower its relationship managers and call center agents to streamline service requests and cross-sell its products and services to its customers.



In a massive transformation exercise, Brazil's largest private sector bank, Banco Bradesco, which has over 16 million account holders is spending USD 350 million in overhauling its entire IT infrastructure. In a media report, Laercio Albino Cezar, executive vice president at Bradesco and the bank's top technology executive said that this five year project would transform everything the bank had built over the past 40 years. One of their key requirements was for the system to be flexible and dynamic enough to allow the bank to create and roll out products quickly, Cezar said. The bank's goal was to be able to provide a much faster and more efficient system for both bank staff and customers by 2009. On an average he said, Bradesco spends 3.5 percent of its revenues on IT. In 2005, the bank spent USD 711 million on technology.

### Conclusion

Leaving behind the instabilities that have historically plagued the region, the Latin American banking industry is moving ahead at a steady pace. In this environment of high economic growth and strong international and domestic demand, the banking industry too is performing extremely well. The consolidation trend is expected to continue as foreign banks from Europe and US expand their presence in the region and local banks reinforce their market positions. Additionally, banks will continue to diversify their product offerings in an attempt to reach the under-served Latin American consumer and small business banking markets. Technology upgradation is therefore imperative for banks as they try to compete in the increasingly cutthroat banking environment where they need to both attract the un-banked population and retain existing clients•

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\*A string of financial crises has been the hallmark of Latin American financial systems over the past 20 years. Major disruptions struck Mexico, Brazil, Ecuador and Argentina in the 1990s and early 2000s, setting the stage for reform and the recovery underway today. Other Latin American economies suffered problems as well: Venezuela and Bolivia both experienced banking crises in 1994. Disruptions struck Paraguay in 1996, Uruguay in 2002, and the Dominican Republic in 2003. (source: Standard & Poors)

# tECH WATCH

## DISTRIBUTED TRANSACTIONS SOA in Banking

One of the most commonly faced problems in application integration in banking is the collaboration of services to process transactions distributed across multiple systems. A majority of banks have multiple core processing systems such as CASA (current account and savings accounts), credit card, loans, trade finance, treasury and investments systems. And banking transactions often span across multiple systems. For instance, a credit card payment involves debiting an account within the CASA system and crediting the account within the credit card system. Issuing of traveler cheques too involves more than one system where the account within the CASA system is debited and inventory system updated. This article discusses how a Services Oriented Architecture (SOA) can help implement transactions that span across multiple systems. After a brief introduction to the options that have traditionally been used, the article describes in detail the new standards for Web services, namely, WS-Coordination, WS-Atomic Transaction and WS-Business Activity. To ensure clarity and brevity, the article avoids getting into a detailed analysis of product features and maintains the discussion at a conceptual level.

Before getting into details, let us define a few terms. *What is a service?* Service is a re-usable business function. It could be cash withdrawal, sale of a traveler cheque, balance inquiry and so on. *What is service oriented architecture?* It is an architecture framework which allows delivering business requirements of an enterprise by reusing functions within individual core systems. This requires the framework to be agnostic of technology platforms. Web services can work across multiple technologies and is a promising mechanism to implement service oriented architecture.

### **Traditional solutions**

Traditionally banks have combined functions across multiple systems using implementation specific mechanisms. In the example of credit card payment, that was mentioned earlier, the sequence of operations performed would be as described below:

- Post entries to CASA system DR Customer account CR Credit Card Payee (VISA/MAS-TERCARD/AMEX) account
- Increase unused limit for customer within credit card system.

If a middleware is implemented, transformation logic can be included in the middleware to split the credit card payment request into messages for CASA and credit card systems. The responses from these systems are then assembled to be sent back to the requestor. If a middleware is not implemented, the front-end or multi-channel application carries the logic of sending two messages and collating the replies received. In either case, a reconciliation mechanism needs to be implemented. While the option of a two phase commit protocol to implement distributed transaction across multiple databases is theoretically available, in most cases, individual systems tend to have transaction logic hard-wired within the code leaving little flexibility on that count.

### Using web services

Let us explore the options available using Web services since application vendors are increasingly wrapping business functionality within Web services. The two Web services considered for this article are:

- (a) Debit account service exposed by the CASA system and
- (b) Credit card payment service exposed by the credit card system

Web services specifications have addressed the issue of interoperability by defining three standards: WS-Coordination for coordination of multiple web services, WS-Atomic Transaction for implementation of short lived transactions using two phase commit protocols and WS-Business Activity for implementation of long lived transactions using traditional reconciliation mechanisms like compensating transactions.

**WS-Coordination** framework contains an "activation service" to create a business activity (in our example, credit card payment) that spans across multiple services. It provides a "registration service" which allows core systems to register themselves with the coordina-

tor. While registering, applications state how they will interact with the coordinator (called as the protocols used). Finally, it has "protocol services" for each supported coordination type. Protocol service is responsible for completion of the business activity, for which it contacts the individual services using the contact information provided during registration process.

WS-Atomic Transaction has mechanisms for implementation of transactions which work on the basis of two phase commit. These transactions need to adhere to ACID properties. This means that resources from multiple core systems get locked for the duration of transaction and hence the transactions must be short lived. Mechanisms (protocols) that core systems use to interact with the coordinator are: (a) Completion protocol - this is used by the application which triggers the completion of transaction by asking coordinator to either commit or rollback the changes. (b) 2 Phase protocol - this involves coordinator sending "prepare", "rollback" or "commit" messages to the core systems. It needs to be noted that there are other protocols for interactions between coordinator and the core systems, which we have not mentioned here.

WS-Business Activity has mechanisms for implementing long lived transactions. Even if the transactions are not long lived, we might need to use this standard if locking up of resources across multiple processing systems is not acceptable during the course of transaction. A typical way to implement a business activity is to define independent business tasks which constitute the activity and a business task is carried out by one participating application. Unlike atomic transactions, we do not commit or rollback a transaction across multiple systems and hence compensating transactions are required for maintaining consistency. One mechanism (protocol) for interaction between coordinator and the core systems is "Business Agreement with Participant Completion Protocol". In this protocol, participating application sends coordinator "fault" or "completed" messages to indicate the outcome of the business task. If all core systems send "completed" messages, coordinator sends "close" messages to them to end their business tasks. If any application sends "fault" message, coordinator sends "compensate" messages to core systems that completed their business tasks to get the impact of the tasks reversed.

To illustrate the two mechanisms for implementing distributed transactions, let us see the implementation of the credit card payment using different standards. "Integrator" is the front-end application which invokes the credit card payment function.

### Implementation using Atomic transaction:

- 1. Integrator sends Create Coordinator Context request to coordinator ("Activation Service") to create business activity.
- 2. Coordinator (Activation Service) generates and returns back coordination context which contains transaction identifier.
- Integrator component registers usage of "completion" protocol.
  - Coordinator returns back a reference which

tells integrator about where to contact it to invoke "completion".

5. Integrator component invokes Web services implemented by CASA and credit card modules. It passes coordination context within SOAP header to indicate that service is part of an "atomic transaction".

6. On encountering coordination context within SOAP header, CASA and credit card modules registers with coordinator for 2 Phase Commit protocol.

7. Coordinator returns back a reference to be used subsequently to return a fault if required.

8. CASA and credit card moules perform

actual database up date using XA compliant API and return result to Integrator (In the error scenario, CASA module return a negative result).

- Integrator sends a "Commit" message to coordinator. (In the error scenario, integrator sends "rollback" message to coordinator).
- Coordinator sends "Prepare to commit" message to CASA and credit card modules. (In the error scenario integrator sends roll back messages to these).
- CASA and credit card modules vote positively by sending "prepared" response. (In the error scenario, these modules respond to rollback message with "aborted").
- 12. Coordinator sends "commit" messages to CASA and credit card modules.
- 13. CASA and credit card modules acknowledge by sending "committed".
- Coordinator sends "committed" reply to the completion request. (In error scenario, it sends "Aborted" reply).

## Implementation using Business Activity:

- 1. Integrator contacts coordinator (activation service) to get coordination context for overall business activity.
- 2. Coordinator returns coordination context.
- 3. Integrator contacts coordinator (activation service) to get coordination context for the first business task i.e. debit account.
- Coordinator returns coordination context for the business task which is a part of business activity.
- Integrator contacts coordinator to get coordination context for the second task i.e. credit card.
- Coordinator returns coordination context for the business task which is part of business activity.
- 7. Integrator sends messages to CASA and Credit card modules putting coordination context in SOAP headers.
- CASA and credit card modules register themselves with coordinator for protocol "business agreement with participant completion".



4



- 9. Coordinator returns back reference which can be used by CASA and credit card modules to report status.
- CASA and credit card applications complete their updates and report status "Completed" to Coordinator. (In error scenario, CASA sends "fault" status and credit card module sends "completed status).
- Integrator, by communicating with coordinator, sends "close" message to CASA and Credit card applications. (In error scenario, coordinator sends "Faulted" message to CASA and "Compensate" message to credit card module to get the credit card leg of transaction reversed).
- 12. Applications acknowledge using "closed" message. (In error scenario, CASA module does not respond back whereas credit card application acknowledges using "compensated" message).

### Conclusion

Business Activity is suitable for implementation of loosely coupled business tasks whereas Atomic Transaction is suitable for tightly coupled business tasks. Exception handling technique in case of the former involves compensating transactions, while the latter uses roll back. Compensating transactions do leave a trace of original transactions behind whereas rollback leaves no trace behind. Another disadvantage of compensating transactions is that we need to write a compensating transaction for each transaction whereas no such effort is required in case of Atomic Transactions. On the other hand, Atomic Transactions may not be a viable option for integration of applications from multiple vendors if the applications are not amenable to changes in transaction creation logic•

## **Deepak N. Hoshing** Head – Architecture Finacle, Infosys Technologies Ltd.

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# **Infosys in the news**

# Hallmark

## Infosys second quarter revenues up 42.4%

Infosys Technologies Limited announced financial results for its second quarter ended September 30, 2006. Revenues for the quarter aggregated \$ 746 million, up 42.4% from \$ 524 million for the quarter ended September 30, 2005. Net income was \$199 million (\$ 138 million for the quarter ended September 30, 2005). 45 new clients and 10,795 new employees were added during the quarter.

## Infosys ranked #1 in Business Today's Best Companies to Work for in India 2006 Survey

Business Today and knowledge partner Mercer Human Resource Consulting came up with a methodology built around four quadrants relating to HR metrics, employee satisfaction, perceptions of key stakeholders, and HR processes and policies. The 'Best Companies To Work For In India 2006' was arrived at on the basis of a process that involved an understanding of the HR processes of the companies, a survey of their employees, and a survey of their external stakeholders such as B-schools, placement firms, and alumni. Infosys has been ranked #1 (overall) for the 2nd successive year.

## Finacle – The Universal Banking Solution from Infosys

## **New Customers**

- Zurich Financial Services, one of the leading financial services organizations in Europe, is implementing Finacle Universal Banking Solution. The Zurich Banking Business Unit is replacing its existing legacy systems with Finacle core banking and CRM solutions and standardizing its processes and systems across its three banking brands Zurich Bank, Dunbar Bank and Zurich Bank International. The replacement process will happen across UK, Ireland and the Isle of Man. Finacle will provide Zurich Banking with a powerful new generation technology platform to enable it to expand its business further by attracting new customers and maximizing cross-selling and up-selling opportunities with existing clients.
- Hrvatska Poštanska Banka (HPB), Croatia has selected Finacle to drive its technology-led transformation initiative. Finacle core banking solution will replace the bank's legacy system and help strengthen the bank's competitive position by enabling innovation, greater process efficiencies as well as by meeting the new regulatory requirements, including Basel II. HPB will also deploy the Finacle e-banking and treasury solutions.

## **Finacle Value Partner Meet**

After a successful launch in August 2005, the Finacle Value Partner Meet 2006 was held in the city of Mysore, famed for its Maharajah's palaces and rich traditions, and fast emerging as one of India's knowledge centers in the new economy from **Oct 16-18, 2006**. Over 57 delegates from 14 countries, across 31 partner organizations attended the conference. The theme for the event – **Knowledge Xchange** provided the perfect backdrop for all the delegates to discuss and share their ideas on various issues impacting the solution and partner's challenges across different geographies and customer segments.



## **Customer Speak:**

"We realized the benefits of choosing Finacle Universal Banking Solution as our core technology platform, as it offers great flexibility, seamless real time integration and powerful Straight Through Processing (STP) capabilities leading to greater differentiation in the marketplace and efficiency in our operations. We are delighted to partner with Infosys, an organization with a proven delivery track record and chose Finacle, a solution which is seeing great demand and acceptance from the market place."

## Mr. Sasa Stankovic,

Senior Executive Director - Project Management Office HPB, Croatia

## Hallmark

## FINACLE EMERGES AS A LEADER IN RETAIL BANKING PLATFORM STUDY, Q4 2006

Finacle from Infosys earns the top slot in the Forrester Wave of retail banking platforms. According to Forrester, "Finacle stands out for its overall strategy and provides one of the strongest current offerings. Finacle is a good choice for banks that: need a banking platform with comprehensive functionality; want a very strong multi-channel solution as part of the banking platform; or are seeking an agile banking platform that is able to cope with changing business needs".

Finacle earned the top score in Strategy, Multi-channel Enablement, Architecture, Development and Systems Integrator. Finacle is also one of the two banking platform vendors that score high on platform agility.







Joseph A. DiVanna

## UNDERSTANDING ISLAMIC BANKING

The Value Proposition That Transcends Culture

Islamic banking or the provision of banking services that follow Islamic law (Shariah) is regarded as one of the biggest growth sectors for financial institutions globally. Not only are banks offering Islamic banking services in Muslim dominated countries, it is increasingly being offered in Western Europe and North America as well where the population of over 25 million Muslims have until recently tended not to participate in the existing banking system, or do so reluctantly. Understandably, given this heightened interest, there is a growing body of literature seeking to understand this subject. Banking strategist, Joseph DiVanna's latest book, Understanding Islamic Banking - the value proposition that transcends cultures, is however, more than a mere discussion of the core tenets of Islamic banking. The book examines the underlying principles of Islamic banking, suggesting that the value proposition is identifiable by retail consumers of all faiths, before going on to suggest various strategies Islamic banks need to adopt to be successful in the long term.

DiVanna briefly touches upon the history of Islamic banking and shows how the basic concept of interest-free economics was similar to the principle that guided Christian economies in the middle ages. He defines Islamic banking and finance as the activities, transactions and interactions initiated by financial institutions whose intentions, goals, objectives and operations are based on principles prescribed by the Holy Qur'an and the Sunnah (the secondary source of Islamic law after the Qur'an). While one of the most distinctive characteristic of Islamic banking is that the payment or receipt of interest, called riba, is disallowed unlike in Western contemporary banking, DiVanna explains that Islamic institutions are set apart from other financial institutions in two ways. They need to review their intentions against a moral and ethical lens before they take action, and products and services they bring to the market must reflect the direct values of their customers. Interestingly, as DiVanna points out, this aspect of social responsibility in Islamic banking

## FIRST**LOOK**



is in many ways similar to the concerns that people have regarding ethical investing. "The key similarity between Western socially responsible investing and the rules of investing under Islamic Shariah principles is that in each case investors' concerns center on how, where and in what their money is invested. Islamic investors are prohibited from providing capital to corporations that deal in products such as tobacco, alcohol and military hardware, while western ethical investors focus on corporations that meet the criteria of environmental sustainability, or do not produce products such as pornography and

other investments similar to those prohibited by Shariah principles." The underlying principles of Islamic banking, suggests DiVanna, provides a framework for contemporary retail banks to enable investors of any faith to develop a sense of higher purpose.

To further enhance their value proposition, DiVanna says that Islamic institutions need to collaborate, innovate and focus on talent management. Additionally, to compete globally, Islamic banks need to embrace technology, focus on reducing costs and react proactively to macroeconomic factors such as the Islamic monetary and economic union, the rising use of electronic money, regulatory issues and the development of Shariah standards.

Understanding Islamic Banking is a very interesting book. DiVanna covers pertinent principles of Islamic banking without dwelling at length on its history, something that has been covered in depth by other authors. Rather, he chooses to focus on one of the key strengths of Islamic banking - the ethical and community building aspects – because of which he suggests, its appeal may resonate with a much wider group of consumers than is apparently obvious. "The overarching principle to be more than a bank – to take an active part in providing services that have a direct value to the community – is clearly an element of value that is only resident in a minute number of conventional banks." The challenge as DiVanna points out is for firms to execute competitive strategies in the global arena without compromising their Islamic principles, showcasing in the process **•** 

### **Rekha Menon**

Research and Contributing Editor FinacleConnect

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