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Patrick J. McGovern,  
Chairman of the Chairman's  
Committee  
Daniel Morrow,  
Executive Director  
Robert Carrigan,  
Publisher Computerworld

## HPLUS

### 2005 COMPUTERWORLD HONORS CASE STUDY

#### FINANCE, INSURANCE & REAL ESTATE

HABIB BANK'S HPLUS™ BANKING APPLICATION, BASED ON A TINY VIRTUAL MACHINE AND A SYBASE DATABASE, ALLOWED THE BANK TO SCALE ITS APPLICATIONS ON THIN CLIENTS. THE WORLD'S FIRST JAVA™ BANKING SYSTEM, HPLUS™ CURED THE BANK'S MOST FUNDAMENTAL ISSUES PLAGUING LEGACY SYSTEMS, REDUCING COSTS AND ENHANCING EFFICIENCY TO UNPRECEDENTED LEVELS. [20055324]

#### SUMMARY

In 1994 Habib Bank AG Zurich (HBZ) wrote and developed a unique language and banking application called hPLUS™. Based on a tiny virtual machine and a Sybase database, this powerful concept allowed the bank to scale its applications on thin clients. Six months after that, hPLUS™ became the world's first JAVA™ banking system. The hPLUS™ team believed that interoperability would become the single most important aspect of the architecture. "This bold new approach to transaction processing cured the most fundamental issues plaguing legacy systems, reducing costs and enhancing efficiency to unprecedented levels," stated Reza S. Habib, Joint-President, Habib Bank AG Zurich. As a result, today hPLUS™ allows HBZ to support all areas of the modern banking enterprise including seamlessly deploying new technologies as they emerge.

#### APPLICATION

HBZ incubated hPLUS™ from 1992 to 1994. The objective of the project was to replace multiple localized systems and integrate diverse retail and commercial banking operations whilst complying with the multi-regulatory environment the bank operates in.

The hPLUS™ team custom-built the solution believing that interoperability would become the single most important aspect of the architecture. This bold new approach to transaction-processing cured the most fundamental issues plaguing legacy systems: to reduce costs, improve deployment of new solutions and improve efficiency.

The solution utilizes a single secure global log-in that provides an extensive Web and mobile offering to corporations, small -medium enterprises (SMEs) and consumers. This, coupled with its event-based SMS messaging system, created a new push/pull business management methodology far ahead of the curve. The motto of 'service with security' is well demonstrated by the application's unique Web security log-in CRAM system, which was ported to run on cell phones, another first in the world.

With the Sybase database as the only commercially-licensed component, hPLUS™ is truly the most efficient enterprise solution for the banking vertical.

Most importantly, by using JAVA™ and open-source technologies, the solution has taken an institution with a 160-year banking tradition, along with its legacy systems, and catapulted the bank into the 21st century in terms of performance and the implementation of a leading technology, all in an extremely cost effective and streamlined manner.

This is a major vote of confidence for open source technology. The solution provides tremendous benefit for banks, particularly those banks whose clients demand first-class service. This not only holds true in the developing world, where resources are limited, but also in the developed world, such as the thousands of community banks in the US that also have limited resources.

Over the course of its life, hPLUS™ has won successive performance and service awards while simplifying IT and overall management operations. The application has helped HBZ earn #1 rankings in ROI and liquidity ratios for the last five successive years amongst all banks in United Arab Emirates.

## BENEFITS

Has your project helped those it was designed to help?

Tremendously. hPLUS™ is a tightly-integrated system that addresses multiple needs. It has dramatically reduced the time IT and management spend on monitoring and making sure the system operates properly, which is often not the case with banks that run disparate systems. Globally, HBZ has only 12 people in IT who support 50 branches in 10 different regulatory environments. This in itself is a tremendous human resources savings. As result, the majority of IT time is spent on development rather than monitoring the existing system.

The hPLUS™ solution has also led to significant reduction in total-cost-of-ownership through lower technology and operational costs in several areas:

- Client hardware
- Server hardware
- Software maintenance
- Software implementations due to seamlessly-integrated functionality
- Reduced the need for stand-alone third party modules
- Reduced operational costs
- Lower staff costs via a highly centralized solution

Other key benefits of hPLUS™ include enhanced security, rationalized traditional channel and product restrictions, easier reconciliation, the highest straight through processing (STP) rate possible, lowered operational risk, higher system performance, and the seamless integration of new products.

In your opinion, how has it affected them?

The efficiencies of hPLUS™ have been phenomenal. The ROI in technology and for the bank as a whole is extremely high. HBZ employees have been freed from many onerous and time-consuming tasks due to STP. HBZ IT now focuses on innovative and new-product development while management focuses on growth and new business development. Clients benefit from increasingly better service. The hPLUS™ solution has:

- Increased customer service and service differentiation
- Expanded product offerings to customers; increased competitiveness
- Improved business and transaction-flow management
- Better decision making and execution capabilities
- Reduced overhead; lower total-cost- of-ownership
- Best-of-breed security

What new advantage or opportunity does your project provide to people?

For HBZ management: Better decision-making capabilities, which reduces risk and increases margins. Tools for risk rating, risk management and compliance have all won accolades from the Swiss Banking Commission.

For Employees: Improved real-time, transaction-flow management allows employees to work effectively and leave on time more often and spend more time with their families.

For IT: The infrastructure, as well as the application itself, provides flexibility, greater security and scalability. Due to its flexible object-oriented architecture, developers are able to create and rapidly deploy products and functionality utilizing emerging and new technologies seamlessly.

For Customer Service Personnel: Can spend more time and focus more on core client services.

For all HBZ stakeholders: Greater security in the whole system protects all parties involved in transacting HBZ business.

Especially For Customers: Customers benefit from highly competitive products and fees as well as extraordinary levels of security throughout the enterprise, particularly over the technology delivery channels.

The security feature is called challenge-response-authentication-mechanism (CRAM). CRAM eliminates the need for customers to carry specialized hardware encryption devices since the hPLUS™ HBZ CRAM program runs on any JAVATM-enabled mobile phone or PDA device. The basic CRAM system is an image-token presented on a screen that the user is asked to re-enter. This process is separate from the standard user-name and password and thus adds a third feature to enhance security.

The purpose of the token is to prevent computer programs from guessing passwords. HBZ CRAM takes security to a new level by accepting this token as an input and dynamically producing a new code in response. This new code is now entered on screen, and this unique combination of the code, user-name and password is then used to validate the user.

Key HBZcram enhanced security features:

- Since HBZ CRAM runs on a device not connected to the computer, it provides an unprecedented level of security for customers.
- The combination of code, user name and password keeps changing with each use so the possibility of somebody stealing the security features and using it in their favor is eliminated.
- The new security feature is in addition to its already existing hPLUS™ HBZsecure key product that creates a login security protocol.

Has your project fundamentally changed how tasks are performed?

Yes. It has fundamentally changed the way the bank, its staff and its clients interact with each other. Without affecting productivity, processes such as memo routing, online approvals, transaction authentication and risk management have been streamlined while compliance has increased. The technology has allowed the bank to essentially take the functionality available to the bank and give it to the client to use over secure Web and mobile platforms.

As a result HBZ is now in the forefront of electronic banking and has launched a security feature in order to rule out any possible security risk while logging onto the bank's electronic banking portals – HBZweb and HBZmobile.

HBZweb is the bank's highly secure, Internet-mobile banking service that allows everything from paying bills to transferring money worldwide. The launching of HBZweb made HBZ the first bank in the United Arab Emirates to offer e-letters of credit on-line. With HBZweb, the power of more than 80+ transactional and querying options are now in the hands of clients. Some of the more important features include:

- The opening of letters-of-credit online —normally a very arduous and manual-task driven process.
- Secure third-party fund transfers over the Web and Mobile platforms
- Rigorous automated compliance checks at a fraction of the cost.
- Authenticated SWIFT protocol message viewing.
- Ability to suspend lost or stolen ATM cards over the Web.
- Multiple log-in management controls.
- Downloadable account history in XML and Excel that goes back as far as 10 years.
- Event-driven short-message-service.
- CRAM (keystroke hacking prevention) and Secure-key security.

How might that change unfold?

We believe that the branch network will never disappear, however effective electronic banking solutions will rather help banks increase their radius of service. As our customers become increasingly mobile, they are demanding 24-hour management of their accounts wherever they may be worldwide. These new channels offer more than eighty user-driven options at the user's fingertips with the highest security in the region.

Additionally, if technology is used intelligently, it should decrease the overall operational costs and increase efficiencies. Banks then pass this savings on to their clients, and better service standards will develop overall.

Given the unique, robust and cost-effective architecture of our technology platform, we believe that these types of efficiencies and customer service levels can now be deployed in banks across the world, regardless of their size and budgets.

Internal requirements and customer demands are increasing in a rapidly competitive world. We therefore believe and have proven that rapid development and deployment is possible. See development timeline below.

Does your work define new challenges for society? If so, please describe what you believe they may be.

We believe the current challenges faced by banking enterprises include:

The existence of many segregated solutions  
Poorly-built customer databases that lead to lost cross-selling opportunities.  
Operational sub-systems with costly generic enhancements.  
Decision support systems expensive to manage.  
Redundancy, insurance and manpower costs that increase exponentially.  
Existing solutions are technology and middle-ware dependent and too costly for middle tier banks.  
Decentralized solutions that allow multi entity processing, but limit aggregated and consolidated information flows.  
Fat clients lead to high server overheads.  
Regional modifications become difficult in segregated and decentralized environments.  
Operational risk and support costs are disproportionately high  
STP obstacles are high while success returns are low.

These current challenges translate into increased costs, but HBZ has bucked the trend and succeeded. hPLUS™ has helped HBZ to deploy one of the most efficient IT operation models in the banking sector. HBZ adopted JAVATM at its inception and uses open-source technologies in one of the most sensitive enterprise verticals. This proves that organizations do not have to rely solely on large IT vendors and their expensive solutions. Our Return On Investment for IT and the Return On Equity for the bank is tremendous. We are at the cutting edge of technology, not only for this sector, but also for other industries as well, since our architecture allows for this technology to be deployed in a number of verticals. The challenge is that businesses must always be willing to look at new ideas and have the courage to explore.

## **IMPORTANCE**

- How did information technology contribute to this project?

IT has been critical to its success. In fact, the intelligent use of IT has brought about a "humanistic" change in a streamlined manner. HBZ can better serve customers with personalized solutions while improving efficiencies and decreasing operational costs.

- Why was information technology particularly important to it?

It transformed archaic systems and helped the bank modernize and scale in a smooth manner, resulting in numerous accolades, awards, and greater profitability.

- In your opinion, have you developed a technology that may lead to new ways of communicating or processing information?

• Absolutely. HBZ operates in all five continents. Some countries have great technology infrastructures (Switzerland, Greater Europe, North America) whereas others are in the nascent stages (Kenya, Pakistan). The communication technology is designed with these challenges in mind. The hPLUS™ application can be tuned so that greater efficiencies can be attained. Local communication infrastructures can use a combination of satellite/radio linking, poor PTC networks to leased lines, while still allowing for massive amounts of straight-through-processing. This innovative and accepting architecture leads to efficiencies and customer satisfaction. Institutions in developing nations have the opportunity to operate robust, secure, cost-effective world class banking systems compliant with the Swiss Banking Commission, Bank Of England, OFSI, and the central banks of several countries.

- Describe any new technologies used and/or cite innovative uses of existing technology. For example, did you find new ways to use existing technology to create new benefits for society? Or, did you define a problem and develop new technology to solve it?

We used JAVA™ from the inception and adopted an open source approach, using a combination of new technology and existing technology (TCP/IP, Sun and Sybase). As far as new technology, the architecture was revolutionary and created by HBZ in order to reduce costs. This combination helps meet the demanding requirements of the banking industry.

From its inception, hPLUS™™ has been recognized by the banking and technology industries and won the 2001 Banker ME excellence award and two other regional quality awards in 2002 and 2003. In 2004 HBZ was recognized by Banker ME for the best Linux implementation in the Financial Sector.

## ORIGINALITY

- What are the exceptional aspects of your project?

"The future holds exciting new possibilities like heuristical analysis of credit, PDA and smart phone banking support."  
JAVATM Computing Means Business 1997

By using hPLUS™ - HBZ has executed that vision 100% and in fact extended the heuristical analysis not only to credit but also to compliance technologies!

The hPLUS™ solution provides:

- Real-time inter-branch reconciliation
- Extremely high data retention capabilities
- Transaction-chaining to allow complex work flow execution
- Scalable middle layer with off-the-shelf hardware (MIMs)
- Seamless multi-channel delivery
- High level of STP
- Integrated security and access control management
- Unified global log-in for multiple channel access
- Basel II compliant - ready for upcoming reporting standards
- Multi-regulatory compliant - tightly integrated reporting to international monetary authorities
- Seamless integration and true ROI

- Is it original? How? Is it the first, the only, the best or the most effective application of its kind?

Yes, hPLUS™ is one of a kind: The world's only fully-integrated JAVATM banking system. HBZ believes this is also the world's only integrated JAVATM based ATM switch. HBZ has deployed a have also developed MIMS (multiple inexpensive machines) approach by essentially using off-the-shelf PCs, a modified Linux Virtual Server for secure session management and the power of grid computing for internal applications. This has had a tremendous impact for small to medium banks across the globe as it is affordable and allows tremendous scalability.

- How did your project evolve? What is its background?

HBZ spent almost two years evaluating all the technologies available and did not find a solution that catered to the unique needs and was cost-effective. At that point, HBZ embarked on this development path. In 1994 Habib Bank AG Zurich (HBZ) wrote and developed a unique language and banking application called hPLUS™. Based on a tiny virtual machine and a Sybase database, this powerful concept allowed the bank to scale its applications on thin clients. Six months after that, hPLUS™ became the world's first JAVA™ banking system.

## SUCCESS

- Has your project achieved or exceeded its goals?

Yes. It is running globally and the bank is extremely profitable as a result — deploying new products rapidly and reaching out to many more customers.

- Is it fully operational?

Yes. It has been implemented since 1996 with new releases and versions being continuously deployed. The bank now has a robust base transaction platform and the ability to develop changes rapidly. The bank also has an integrated functional and technical development core that reduces the layers of complexity. The thin client and integrated channels reduce the costs of multiple channels.

From the customer's viewpoint, hPLUS™ has given them integrated account information and the convenience of being able to access and control their personal and business accounts anywhere, anytime – from mobile or at-home devices. hPLUS™ also broadcasts financial information to customers on a timely basis. Teller time for customers has reduced dramatically – HBZ's average turnaround time is 4.5 minutes versus the UAE national average of 9 minutes.

- How many people benefit from it? If possible, include an example of how the project has benefited a specific individual, enterprise or organization. Please include personal quotes from individuals who have directly benefited from your work.

For employees and customers that range in excess of 100,000, the system has been particularly beneficial. While other banks have retrenched massively, HBZ has not had to hire additional staff during aggressive growth because the system has been able to handle the extra workload, and employees have been able to focus on other areas to support growth.

Because hPLUS™ is completely designed and implemented in JAVATM means that it provides for platform-independence and facilitates multi-tier architectures. This allows for more options and flexibility in designing the physical infrastructure, so the infrastructure becomes more cost-efficient and inherently has greater security.

- How quickly has your targeted audience of users embraced your innovation? Or, how rapidly do you predict they will?

64.3-percent of credit and 71.4-percent of deposit clients now use hPLUS™ for e-banking. We expect even further growth in these numbers as Internet and mobile-penetration increases. HBZ itself is posting robust growth where as human resources growth remains rather stagnant thereby providing greater job security and for HBZ employees.

- Describe future plans for the project.

HBZ is developing a new version, which we expect to complete in 2005. Its flexibility, modularization and inherently-greater analytical tools will increase its contribution even further. Ease-of-deployment will also be increased and cost savings will be even higher.

## DIFFICULTY

- What were the most important obstacles that had to be overcome in order for your work to be successful? Technical problems? Resources? Expertise? Organizational problems?

Given this was a new project using new software and hardware combinations, the IT team expectedly ran into some problems. However, the flexibility of the overall solution combined with a deep understanding of the banking sector and the united commitment to succeed allowed for an overall smooth development.

- Often the most innovative projects encounter the greatest resistance when they are originally proposed. If you had to fight for approval and/or funding, it would be useful to include a summary of the objections you faced and how you overcame them.

As with any change, there was some opposition. However, there were important members of the management team that were tech-savvy and played an important role in the development of the application. As a result, they acted as the key project champions from the beginning, thereby helping to dissipate a number of pressures. Funding was not so much an issue because one of the most salient features about this product is its cost-effectiveness particularly as open-source technologies were used.

- Did you encounter any unanticipated challenges?
- Describe future plans for the project.

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- Did you encounter any unanticipated challenges?

Any applications has costs associated with manpower, software, hardware, development and management time. Communication costs are also generally a component of this. In this case, when we embarked on development, global communications costs were extremely high and in fact were more than the actual cost of the whole development. This was a challenge undoubtedly, however because all the other critical components were less than the total communication costs, we were able to successfully develop the application in an economic fashion.