

# Bank of America, Asia Division Hong Kong

## *Asian Excellence Award: Imaging, Silver*

### Executive Summary

This entry describes the successful implementation of a major workflow system in Bank of America's Asia Division. The system was implemented in a series of phases beginning in 1993 and today plays a major role in holding the line on transaction processing costs. Equally important, the workflow application has allowed Bank of America-Asia Division to continue to improve its tradition of excellent customer service.

### **1. Describe the system application. What is the system used for, who are the users and what does the job entail? How often or how many hours is the system in use on a daily basis?**

At the end of 1995, Asia Division provided \$1.6 billion (eight percent) of Bank-America Corporation's gross income. The Division had \$20.0 billion in assets and 4,300 employees. The Division had local operations in more than a dozen Asian countries.

The project began when the Division Executive Officer and the Head of Operations commissioned a task force to find ways to reduce operating costs while holding the line on customer service. The project was commissioned as the Asia Operations Center Project or, more familiarly, the AOC project.

During the 1993 planning phase of the AOC project, the project team identified two core services that could be reengineered resulting in better customer service and much lower costs. These services were very important to the success of the division and were well understood by the project team. The services were letters of credit and foreign exchange processing. Letters of credit are commercial banking documents used to transact foreign trade. They are complex legal documents and are time-critical. As would be expected, the process was paper intensive. Foreign exchange trading is at the heart of international trade, particularly in Asia.

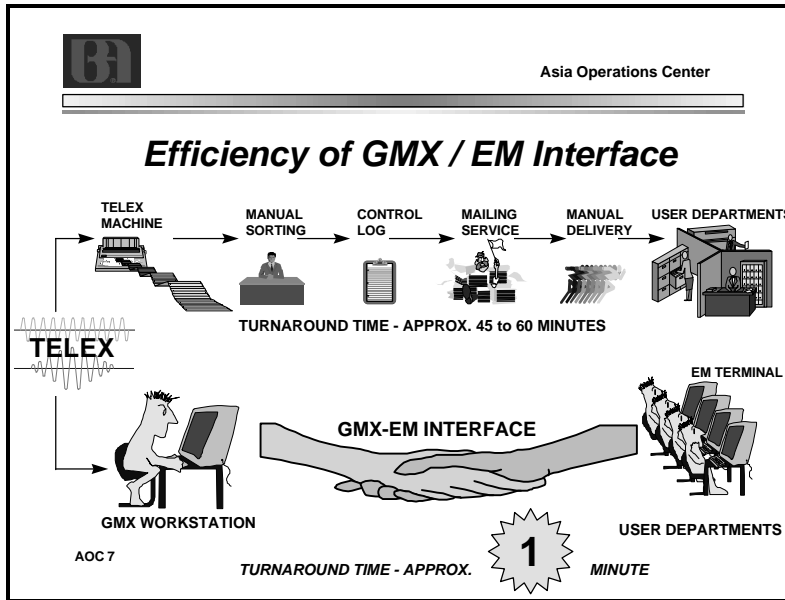
Additionally, the project team identified one core process that was a bottleneck. This process was the delivery of messages from the central message room to the various processing departments. The message room in Hong Kong was receiving more than 3,000 messages per day. These messages had to be separated, sorted, and delivered to more than 125 workers.

When the electronic mailroom team started, their process was multi-step. As much as an hour was required to move an electronic message from the message room to user departments.

As seen on slide 1, the messages were sorted manually, entered on a control log, processed by Mail Services, and hand delivered to each user department.

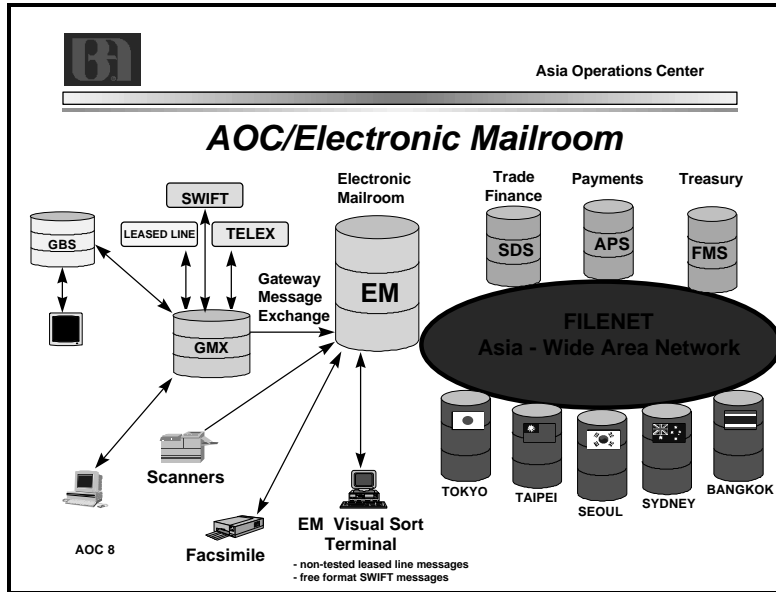
Once in the department, supervisors typically resorted the messages according to work assignments. The multi-discipline team's revised process was totally electronic and now requires less than a minute. More importantly, the messages are processed in "real time" so that delivery is constant throughout the day. Messages can now be delivered directly to the worker and can be monitored centrally by the supervisor. Us-

ing the relational database behind the workflow system, each message can be tracked so manual logging is no longer necessary.



Electronic Mailroom is the heart of the AOC Workflow Application System, as seen on slide #2. Electronic messages are introduced into Electronic Mailroom via a Global Message Exchange or GMX application. GMX obtains the messages from public and private networks including Bank of America's mainframe host system - GBS. Electronic Mailroom also accepts scanned and facsimile messages.

Once in Electronic Mailroom, a program attempts to read the message. If successful, the message is committed to the optical jukebox and an entry is made on the appropriate work queue. This work queue can be anywhere on the wide area network. If the program cannot read the message, it is displayed on a "robot" personal computer referred to as Visual Sort. The Visual Sort operator is then able to add indexing information required to place the message on the appropriate work queue. Electronic messages are committed as Microsoft Word documents. Scanned and fax documents are committed as images. Because a large percentage of the traffic is electronic messages, optical storage requirements are minimal and traffic over the network is not a major issue.



The letters of credit multi-disciplined team was able to drastically reduce the cycle time required to issue a letter of credit by using imaging and workflow technology. The letter of credit application coming in from the customer is scanned into the system. After routing through the Electronic Mailroom, it arrives in the letters of credit department and is matched with the appropriate set of host system image server using an emulator. Letter of credit issuers then construct the actual letter of credit using a PC workstation with a 21" monitor. When all approvals are received, the letter of credit is transmitted through the host system using a paperless electronic message.

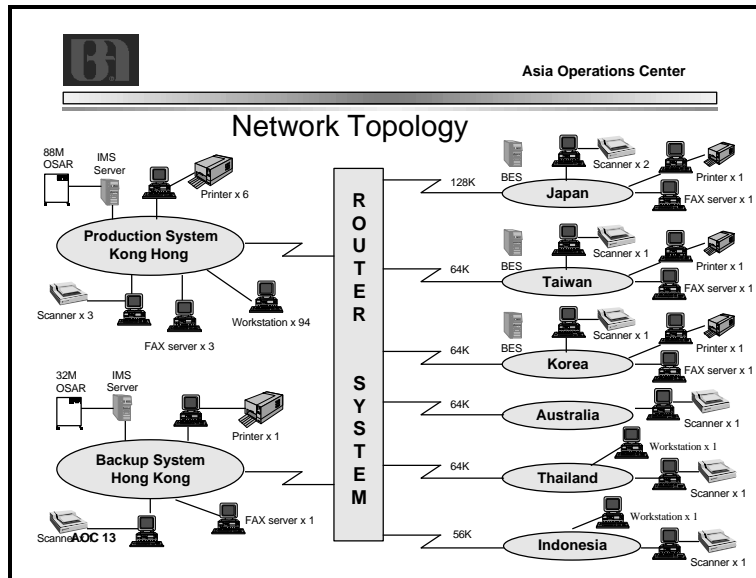
During late 1994 and early 1995, other key service areas were enabled with workflow and optical. The Payments (or Remittance) function was the first key area. This was followed by additional Letter of Credit functions including the payments and negotiation processes. The letters of credit service is very paper intensive and further automation of these key functions moved the Asia Operations Center closer to a paperless environment.

**2. What were the key motivations behind installing this system?**

Faced with an expense curve that was increasing faster than the revenue curve, Asia Division of Bank of America set out to redesign processes as a means of slowing expense growth, without having a negative impact on customers.

**3. Please describe the current system configuration: number of workstations, number and type of software, servers, scanners, printers, storage devices, number of locations involved?**

The AOC infrastructure is a series of local area network (LAN) client server applications which are interconnected over a wide area network (WAN), (slide 3).



The WAN connects eight sites spread over seven countries. (The seventh country is Singapore and is not shown in this slide. Due to local data secrecy regulations, the Singapore system is standalone.) The primary system is located in Quarry Bay, Hong Kong. This system is composed of Compaq workstations and a series of FileNet servers. The main server is an IBM RISC 6000 which functions as the Optical Storage and Retrieval device as well as the FileNet workflow server. FileNet's Image Management System (IMS) supports the management of work objects stored on the optical disk device jukebox. The jukebox is a Hewlett-Packard 88mm with on-line capacity for more than four million documents.

A second configuration is housed in another building in Hong Kong about 25 minutes by subway from the primary site. This system serves as a hot backup to the system in Quarry Bay.

A series of routers connects the two Hong Kong systems with systems in Japan, Taiwan, Korea, Australia, Thailand, and Indonesia. The network is a shared network and telecommunications line capacities range from 56K to 128K.

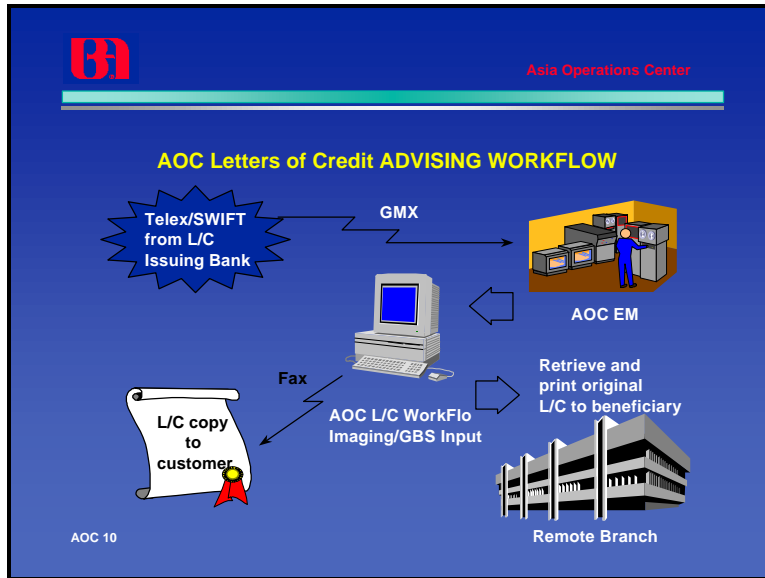
Slide #4 provides an indication of the backup facilities of the Workflow Application System. The primary site is in Devon House, Quarry Bay, Hong Kong and the backup site in BA Tower, Central, Hong Kong. The two systems are connected via the wide area network so that the LANs can be redirected with a minimum of intervention.

The AOC workflow network is processing 5,500 transactions on a daily basis. The largest volumes are in Hong Kong, Singapore, Taipei, and Tokyo. These 5,500 images are processed on a total of 134 personal computer workstations supported by 37 servers. The servers include fax servers, scan servers, and print servers. The typical PC workstation is a Compaq 486/33 or better with 12 mb of RAM. The workstations typically have a 21" color monitor. Printing is accomplished via FileNet print servers and Hewlett-Packard LAN laser printers.

***How is this system integrated with the company's other information processing systems?***

An important element of the AOC system is connectivity to the host or legacy system. All of Bank of America's International branches use a single system called the Global Banking Systems or GBS. The data center for GBS is located in Croydon, out-

side London in England. The international units are connected via a proprietary telecommunications network. Newbridge equipment is used to connect the GBS host in Croydon to SAA gateways in Hong Kong. The gateways are, in turn, connected to the Local Area Network and can be accessed from the workstations using an emulation program.



**5. What stage of development is each part at; what has been installed? What is up and running? What is still in the planning stage?**


The project was formally approved April 1, 1993, and the first application was implemented in August of 1993. Today, most of the workflow system's work is completed but the reengineering and consolidations continue. The Asia Operations Center has a state of the art security system driven by user profiles which determine what transactions a person can process. The Electronic Mailroom is full of efficiency features. The Foreign Exchange and Time Deposit system is maturing and operates with a minimum of interference. The Letters of Credit system is an industry leader. The newest of the systems, used to process payments, was added as part of Phase 11 of the AOC project and is also maturing.

**6. Describe how the company has been impacted by this system such as:**

**a. What cost savings or increased revenues have been realized since the system was first installed?**

The first phase of the AOC project contributed to a reduction of \$1.7 million in annual operating expense. This is per annum and ongoing. Phase II resulted in a reduction of \$1.3 million per annum on top of the \$1.7 million saved during Phase I. Thus, the total savings per annum is currently more than \$3 million.

Additionally, the project required significantly less capital expenditure and completed well under the budgeted plan. During the implementation phase, there were constant decreases in expenses related to client server technology and the project was able to capitalize on improved price performance of hardware. For example, when the jukebox was actually purchased, the cost was nearly 50 percent less than the funded amount and performance was significantly better.


Asia Operations Center

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- Metrics

Country	Images	PCWS	SVRS	Total
Hong Kong	1,700	94	15	109
Taipei	890	1	3	4
Tokyo	960	1	4	5
Seoul	240	1	3	4
Sydney	220	0	1	1
Bangkok	370	1	1	2
Jakarta	68	0	1	1
Singapore	995	36	9	45
<b>Total</b>	<b>5,443</b>	<b>134</b>	<b>37</b>	<b>171</b>

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**b. What productivity improvements have been realized?**

According to detailed records kept during the project, the net improvement in productivity for issuing letters of credit was 15.35 percent. The improvement for letters of credit advising was 15.45 percent. Most astounding, however, was the improvement in foreign exchange and money market processing which realized a 46.27 percent improvement in productivity.

During Phase II, when payments were added to the workflow system, the productivity improvement in this area was 32.66 percent.

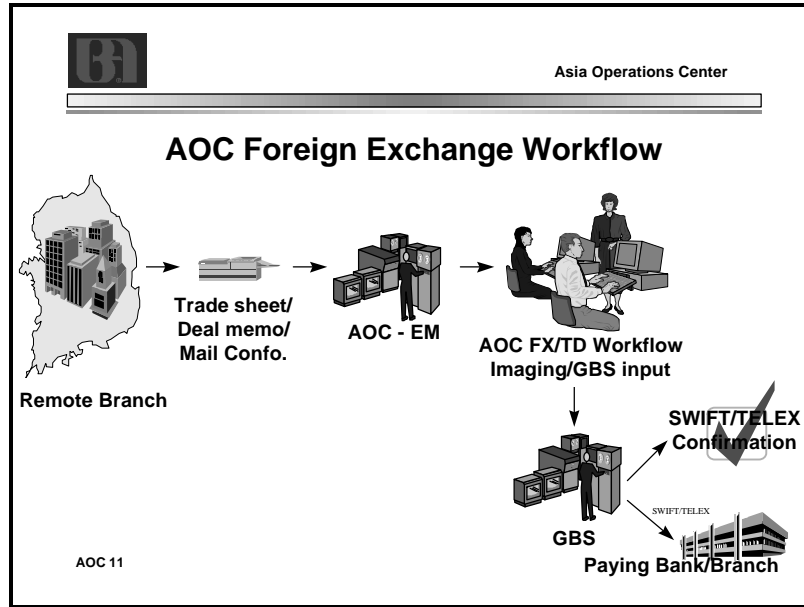
Reduced cycle times came hand-in-hand with the improved productivity. Having the customer records on-line greatly improved control of folders and this was particularly important for letters of credit where misplaced, out of file or lost folders used to be a major effort. The customer always seemed to call about the folder that could not be found.

The ability to send faxes to customers with the click of a mouse has also been an important benefit. Customers appreciate the very fast visual responses to their questions.

Finally, although the system was supposed to eliminate paper, of course, it did not. Items that are sent to customers now, however, appear very professional as they are printed on laser printers.

**c. How has the business workflow been affected (compared to before system implementation)?**

Second in importance to improved customer service was improved service to the Bank of America employees. Their work environment improved significantly. Automatic logging on the PC eliminated the wide use of log books and registers required to track transactions.



A wide variety of windows software tools can be used throughout the day to aid the daily processing which makes the Bank Americans' daily work easier and more interesting. Communication between branches is enhanced and clearer with document images used to answer questions. The offices are approaching a paperless environment and the need for manual filing is greatly reduced. With quick time to market in systems development using microcomputer tools, Bank Americans enjoy more rapid response to requests for system modifications. Some items that would have previously been changed on the mainframe system and would have taken many months are now completed in record time on the client/server system.

**7. Describe the implementation process and methodology, the project team and any change in management and business process re-engineering issues addressed.**

The AOC planning and development process began at the AIIM show in Chicago during April 1993. Two of the team members charged with managing the expense reduction project read Michael Hammer's book on reengineering and developed a concept that is today known as the Asia Operations Center.

The AOC project was characterized by a great deal of end-user involvement. Working with the primary software vendor, a two-week long technology concepts and reengineering principles class was developed. The curricula included workflow principles, client/server technology concepts, optical technology concepts, and reengineering principles. About two dozen employees were recruited from six Asian countries and put through the course. (The course was later tailored for different audiences and reduced to five days. More than 300 members of Asia Division management have attended this course.)

As the project moved along, considerable use was made of prototypes and pilots. One multi-disciplined team decided to centralize processing and then reengineer. Another group deemed it wiser to redefine processes, develop workflow programs, and then consolidate processing.

The Foreign Exchange multi-discipline team decided to centralize operations before streamlining the workflow so they were able to front-load a considerable amount

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of benefit. They realized a significant reduction in the cost of processing a transaction by using economies of scale. This was subsequently reduced even more when they reengineered processes and added workflow controls.