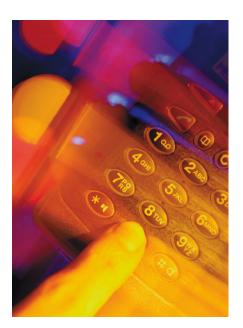IBM

Mobile stock trades: a first in Singapore

Over a hundred years ago, Mr. John Fraser of Singapore established the republic's first stock trading organization. Fraser & Company set the pace and established the standards for financial services, and served as Singapore's unofficial stock exchange for nearly ninety years. Today, Fraser Securities Pte. Ltd. continues to define the leading edge of trading practices in the region. Its latest innovation: an online trading service that makes the most of pervasive computing technology.

Fraser's *Mobile e-Trading* service allows its clients to use mobile phones to place buy/sell orders, retrieve live stock quotes, receive alerts when a price reaches a preset threshold, and carry out the full spectrum of normal trading activities.

It was the first mobile online share-trading system in the region, and exemplifies Fraser's mission statement: "Through constant innovation, we aim to always add value to our clients' investment decisions."

An alliance of trendsetters and market-makers

The groundbreaking mobile e-business application is the result of quick and decisive action by an alliance of partners. In October 1998, the Singapore Exchange (SGX) introduced its Internet-based trading system, which was developed by IBM Singapore in collaboration with Singapore Exchange IT Solutions Pte. Ltd., the technology arm of the SGX. It was said to be the first exchange in Asia to operate with a fully electronic trading and settlement system.

The door was then open for online trading, and within four months, Fraser Securities went live with FraserDirect, a sophisticated Website "cyber shopfront" for PC-based trading. It, too, was implemented by IBM.

At the same time, Fraser solicited competitive bids for the development of its mobile service. IBM won the contract based on the proven success of its e-business solutions. By March 1999, the collaboration between IBM and SGX IT Solutions was back at work. Ericsson Mobile Communications contributed to the development of the wireless gateway. In April, SingTel Mobile, the cellular operating arm of Singapore Telecommunications Ltd., signed on to provide linkage through its GSM mobile phone network.

Application	Mobile online stock trading
Software	IBM SecureWay™ Firewall IBM DB2® Universal Database™ Lotus Notes® Lotus Domino™ Web Server
Hardware	IBM RS/6000® IBM AS/400® IBM Netfinity® Servers
Services	IBM Global Services software integration

Fraser Mobile e-Trading went online in June 1999, after a whirlwind development cycle of less than four months. Ng Quek Peng, Fraser's Managing Director, summed it up: "Mobile e-Trading adds to our existing range of online trading services. We are confident that this new service will address the needs of a new class of investors who need access to the stock market while on the move."

An IBM solution, end-to-end

Virtually every layer of the FraserDirect Web presence and Mobile e-Trading service is built on IBM architecture. The backbone is an array of IBM hardware, running software from IBM and its partners, integrated by IBM Global Services.

The back-end system runs on an IBM AS/400e staging server, which also provides the link to the electronic trading system

of the Singapore Exchange. Stock prices are delivered to an IBM DB2 Universal Database, which responds to price requests from mobile subscribers.

The Website is supported by an IBM Netfinity M20 server, running Netscape Web server software.

Investment research data is housed in a Lotus Notes database on one Netfinity 3000, using Domino Web server software to distribute the information.

Price feeds are delivered by another Netfinity 3000, transmitting directly to the database server.

Security is provided on three levels. A dedicated Netfinity 3000 manages the 3DES (Triple Data Encryption Standard) keys on customers' mobile phones, encrypting passwords and other sensitive information. The perimeter is guarded by an RS/6000 server running IBM SecureWay Firewall software. Another layer of encryption takes place within the SingTel Mobile GSM network, protecting the integrity of data during transmission.

The mobile-phone service is a showcase example of the utility of Wireless Application Protocol (WAP) applications. Its wireless gateway extends the existing FraserDirect infrastructure by converting the Web application to Wireless Markup Language (WML) for the mobile system. The WML format makes data suitable for display on the small screens of the mobile phones.

"Pervasive devices like mobile phones will be the next big wave after the Internet," notes Daniel Tan, Executive Vice President of the Singapore Exchange. "Singapore Exchange IT Solutions, together with IBM, is proud to have been Fraser's partner in both the Internet and Mobile e-Trading systems."

Timing is everything
To take advantage of the mobile service, customers log in via the SingTel GSM network, which is linked to the Internet. Because GSM is a widely-used wireless standard, customers can also access the service and make trades from other Asia-Pacific countries and Europe. The service allows them to:

• Place Buy/Sell orders
• Get real-time stock quotes
• Get market information and research
• Check order status
• Set personalized alerts
• Query for account balance

Initially, Fraser customers can use the e-trading service only through Motorola V Series and Motorola L Series mobile phones, which are equipped with next-generation SIM (Subscriber Identification Module) cards. Future iterations will extend the service to other WAP-enabled phones, PDAs, and other mobile devices. Managing Director Ng Quek Peng states that, "FraserDirect, our e-trading unit, will continue to explore and invest in technology to deliver more value-added services to our customers."

Fraser's success as the oldest brokerage in Singapore has been attributed to its unwavering focus on customer service. Mobile e-Trading continues the tradition. Its benefits go beyond mere convenience: the fast pace of both lifestyle and market events make mobile access a virtual necessity for many of the firm's customers.

In addition, the benefits realized by Fraser Securities include not only the powerful marketing advantage of having been first to market, but also projected savings through reduced transaction processing costs.

A global trend
There are compelling reasons for financial institutions to extend services to mobile customers. The enhanced convenience not only attracts high-value customers, but also reinforces customer loyalty. Ease-of-access stimulates increased transaction volumes. At the bottom line, these innovations bring the simultaneous advantages of improved cost structure and growth in fee-based income for the institution.

Mobile stock trading is becoming a tidal wave, sweeping across Asia-Pacific, Europe, and the U.S. Dozens of announcements of mobile trading service rollouts validate the worldwide importance of this new capability. It marks a profound change in the way business is done. Fraser Securities is in the vanguard, and the rest of the world is quickly following their lead.

For more information:
For more information, please visit the IBM Pervasive Computing website at *www.ibm.com/pvc* or contact your IBM sales representative