

Automation

-ASX does it better



Build a better mousetrap and the world

will beat a path to your door, says the adage.

The Australian Stock Exchange, according to Ronald Coppel, has proved it with the development of automated systems which are attracting worldwide interest.

The recent sale by the Australian Stock Exchange of its equities trading and associated message-switching computer systems to the Swiss stock exchanges, and serious interest in the programs expressed by other exchanges in Europe and North America, demonstrate that Australia has become a world leader in the automation of stockmarket systems.

This achievement must be regarded as one of the highlights of ASX's first five years, particularly since the starting point in 1987 was a tangled web of different hardware platforms and interconnected programs, a web so complex that a change to one program often required consequential changes to some 160 others.

The system was simply not capable of development to support the heavy processing demands and extremely high reliability required of an automated stockmarket. However, its replacement by a suitable system would require capital expenditure of the order of \$50 million.

ASX decided that the task of providing an efficient, internationally competitive market in equities and associated derivatives, with a guarantee of equal access by stockbrokers throughout Australia, dictated the automation road. A screen-based trading system would offer considerable advantages over trading floors, as well as overcoming Australia's geographic problems.

The advantages include:

- provision of live, "real-time" market quotations;
- immediate and full disclosure of all trades;
- visibility of the depth of the market;
- instantaneous matching of bids and offers;
- no need for trade confirmation between brokers;
- immediate dissemination of information on traded securities;
- a robust and detailed audit trail;
- capacity to handle large trading volumes without stress;
- elimination of many error opportunities that exist in the manual processes of a trading floor.

Screen trading also promised economic advantages (which have since been realised), including reduced transaction costs and the release of the trading floors for other uses.

The computer system developed for automating equities trading is SEATS (Stock Exchange Automated Trading System). The system links dedicated personal computers in brokers' offices to the ASX mainframe computer. The brokers' PCs display full information about the market, and buying and selling orders are entered through the keyboard.

A sophisticated communications network is necessary to support a national electronic market. This is based on primary microwave and fibre-optic links backed up by direct

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satellite connections between the rooftops of ASX premises in each capital city. Switching from one to the other is automatic and virtually instantaneous.

A considerable number of business rules control dealing on SEATS, but in the system itself the rule of central significance is that of *price-time priority*. The highest bid and the lowest offer have priority, and if more than one bid or offer is made at the same price, then the one entered first has priority. This rule ensures equal treatment for large and small orders, wherever they might originate.

The system takes account of market realities, however, such as the practical differences between large and small orders. For small transactions, it is important to know not just what price is being bid or offered but what volume is available at that price. There is therefore a rule requiring order volumes to be disclosed. But this rule does not apply to orders of \$10,000 or more, because disclosure of the size of large-volume orders would interfere with normal dealing strategies at the high end of the retail market and in the wholesale market.

There is also a best execution rule. This requires brokers who have both a buying order and a selling order in the same security to satisfy all better buyers and sellers in the market before being free to cross the remainder of the transaction between the broker's own two clients.

The realities of large-volume trading are again acknowledged by permitting special trades, giving brokers the right to do a block trade with selling orders of more than \$1 million in the one security, provided the deal is immediately reported.

Screen-based trading was first introduced in October 1987, covering just 20 securities. As it proved itself and more securities were added, the exchange experimented with dual trading, using both SEATS and the trading floors. This was not successful, and the trading floors were closed at the end of September 1990.

The closure caused some regrets among floor brokers, who missed the atmosphere and camaraderie of the trading floors, but these regrets were soon overwhelmed by the manifest advantages of screen-based trading.

While automation has taken over completely in the order-driven equities market, it has made less progress in the quote-driven Australian Options Market. This is not for want of technology: the options equivalent of SEATS, known as OATS (Options Automated Trading System), could achieve full automation easily and quickly.

At present, however, participants in this market prefer a semi-automated system; they find it more efficient in carrying out back-to-back deals involving options and equities, especially where a registered trader has to be involved.

OATS is being developed as quickly as developments are accepted. The latest addition is a small-order execution system.

Reliability of technology becomes a key issue when an exchange opts for a fully automated market.

ASX is also pursuing automation of clearance and settlement in the equities market, but this has proved to be much more difficult than automation of trading because of the number of participants with a stake in the process: the exchange, stockbrokers, banks, custodians, registries, institutions and issuers.

Australia's settlement system was notoriously bad in the 1980s—delays of several weeks between trade and settlement were not uncommon, adding unacceptable systemic risk to the market.

ASX decided on full automation, but with interim improvements that would permit a fixed settlement discipline of five days after trade (T+5). This was achieved earlier this year, facilitated by the introduction of optional uncertificated shareholdings and electronic transfer of settlement documentation between states (the

Flexible Accelerated Security Transfer or FAST system).

At the same time, in consultation with other market participants, a unanimously acceptable framework for a fully automated transfer and settlement system was being developed. The first stage of this system, known as CHESS (Clearing House Electronic Subregister System), will be implemented in 1994 at a capital cost of about \$35 million.

CHESS will first provide an electronic subregister of uncertificated shareholdings and electronic transfer of securities from seller to buyer. The second stage, with a target of early 1995, will introduce electronic settlement, with brokers' net cash positions being settled by computer interaction between the ASX and the banking system.

This will be one of the most advanced transfer and settlement systems in the world, and will enable ASX to improve settlement time further to T+3, which is the goal of worldwide markets.

Reliability of technology becomes a key issue when an exchange opts for a fully-automated market, in the central computer system as well as its communications links. This has led to most systems being duplicated or even triplicated; for example, computers capable of running the market are in two widely-spaced locations in case of disaster.

But there is a limit beyond which additional redundancy or back-up cannot be cost-justified. Going to that limit but not beyond is a matter of fine judgment. ASX is reasonably pleased with the performance of its electronic market without, we believe, going overboard with expenditure. Over the past five years, the cumulative availability has been 99.7 per cent—close to perfection.

ASX's decision to move to full automation of the stock market was ultimately driven by a desire for survival, which in turn depends on the provision of efficient service to customers. ASX identifies four main customer groups: brokers, investors, listed companies and government regulators. In each case ASX's goal is to deliver a quality product, which might be defined as the standard of service the customers require at prices they are prepared to pay. ■