

dividual as affordable and as general as possible with respect to substantial (i.e. banking) requirements. An advice how to determine contents with respect to customer groups could only be given if the psychographic customer groups (sovereigns, cools, insouciant) were clustered according to their needs concerning financial services. Furthermore, the use of different online systems (e-mail, newsgroups) implicates different customer retention strategies, because the integration of recipients into the communication process between bank and customer varies.

1. *Subscribing to Mailing Lists (News-Services)*

The easiest way to obtain regular information on desired topics is subscribing to a mailing list (listserver). For example, users may subscribe to a list of stock recommendations. Subscribers only have to add their e-mail address to the distribution list and receive changes in recommendation in specified intervals (daily, weekly, monthly or on demand).

2. *Subscribing to News Groups*

Some institutes (mainly unit banks in USA) have established specific

newsgroups for their customers. In Germany, a similar board is run by the discount broker Consors, where user-groups discuss about different types of shares and stocks (e.g. domestic and foreign, blue chips and small caps, technology, a.s.o.). Customers may post any question of public interest on the board, bank experts give answers accessible by every net user as well. Frequently Asked Questions (FAQ) are clustered, summarized and saved to a downloadable file to be read offline.

3. *Multicasting (e.g. Channels, Netscape LiveWire, PointCast)*

A recent development in internet technology, invented by press agencies, is called push-technology. Customers who are permanently connected to the internet may receive push information. Technology is delivered along with newer browser releases (by Microsoft or Netscape) or available as separate software application. Users are informed real time by popping up windows containing the message sent by the initiator. A common application at present is posting stock quotes via push-technology (e.g. EASDAQ-Site http://www.easdaq.be/pb/enb_00.asp).

Push-technology provider deliver contents without charging the recipient. Instead of this, they achieve refinancing by space broking (advertising) or by charging the information offering company.

CONCLUSION

Regarding the financial power of the described target groups users of electronic banking are of higher interest for banking institutes. So banks should not dampen expenses to perform research work on customers communication needs and demands. An electronic communication strategy based on these research results makes the customer feel the banks market focus and causes satisfaction, because customer orientated communication saves time and (customers) money. The retention potential resulting therefrom may be strengthened by asynchronous communication, if the impression of mass advertising can be avoided. To succeed in doing so banks will have to personalize and individualize messages stronger than they do this at present. Only then electronic communication like electronic banking will increase customer retention remarkably.

IMPROVING PERFORMANCE OF FINANCIAL SECURITIES TRANSACTIONS PROCESSES

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1. INTRODUCTION

In the last two decades there has been an enormous growth in the number and volume of transactions in financial securities (stocks, bonds and derivatives), currently well over 15,000 billion US\$ in the US alone (Federal Reserve, 1996). The financial securities sector is characterised by a variety of stakeholders, such as, brokers, custodians, and regulators (Dale, 1996). Increased competition has led to consolidations and diversifications in organisations, differentiation in services offered, and the increased importance of risk man-

agement (Federal Reserve, 1996; Weber, 1995). Developments in information technology create opportunities for organisations to communicate electronically, thus improving the speed and quality of information exchange (Venkatraman, 1990; Dale, 1996) and supporting the globalisation of the industry and the emergence of electronic markets.

The time needed to process an inter-organisational securities transaction has been reduced significantly over the last few years. In 1991, it used to take about

15-30 days to settle a transaction after it was executed on the exchange. In 1997, it took on average no more than 3 days. In the UK, the transaction throughput time was reduced from 10 days to 5 days in June 1994. In Hong Kong, it was changed back from 1 day to 2 days in order to be more in accordance with the industry standard of 3 days. In the US, it changed from 5 to 3 days in June 1995. Within the next few years, the industry standard of 3 days is expected to be reduced further to 1 day or a few hours (Group of Thirty, 1993).

Reduction of transaction times is important for organisations to remain competitive and to avoid or limit the high risks for the various stakeholders. For instance, the risk of non-payment or non-delivery was reduced from 15 to 3 days. But, along with this reduction of processing time, a

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phases in the Securities Transaction Process

Stakeholders	1 investment manage- ment	2 portfolio analysis	3 trade execution	4 trade matching	5 matched trade report	6 positioning assets	7 clearance and settlement	8 settlement position reporting	9 cash and securities management
Investor	♦	♦			♦				♦
Investment Management Organisation	♦	♦		♦	♦	♦		♦	♦
Broker			♦	♦	♦	♦	♦	♦	♦
Exchange			♦				♦		
Custodian						♦	♦	♦	♦
Central Securities Depository						♦	♦	♦	♦
Regulatory Organisations			♦				♦		

Table 1 Involvement of stakeholders in the nine phases of the Securities Transaction Process

high level of security and controllability of the inter-organisational processes must also be guaranteed (Group of Thirty, 1993). The question is how inter-organisational processes can be (re)designed, given requirements such as adequate internal control measures that might tend to lengthen the processing time.

The goal of the present study was to analyse the processes related to financial securities transactions and to identify factors affecting the logistic process performance. Ultimately, the aim is to provide guidelines for the design of inter-organisational systems in information intensive markets and networks.

2. THE FINANCIAL SECURITIES TRANSACTION PROCESS

Basically, the Securities Transaction Process (STP) is a combination of a trading process and a settlement process (Morgan, 1994) and consists of nine phases, with various stakeholders involved (Table 1).

The STP starts with the decision by the investor or investment management organisation to either buy or sell a specific security (phases 1 and 2). The order is given to a broker who executes the order (phase 3) on the exchange where the security is listed. Phase 4 is for matching the confirmation of the transaction details with the order, to check the execution of the deal, and to initiate the settlement of the transaction. When the

transaction information matches, a matched trade report is provided (phase 5) to update portfolios. If securities are held at different locations it may be necessary to move them to a central place (phase 6). Before a transaction is settled, the delivery and payment of the securities are checked. A (global) custodian takes care of the settlement and clearing of the transaction based on the instructions it receives (phase 7). The payment will not be made, unless, simultaneously, the corresponding securities are exchanged. It is also possible to separate the payment from the delivery, but this means taking the risk of non-payment or non-delivery. When the settlement process has been completed successfully, the controlling departments receive statements, which are the basis for keeping the administration of payments and holdings up to date. The final phase of the STP consists of various internal cash and

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securities management in each organisation involved.

It must be realised that because of the many different stakeholders involved, different methods of communication with different information and communication systems are used in each phase in the STP (Morgan, 1994).

The risks in the securities business are high, and several financial disasters have been reported (Toppen et al, 1998). Barings Futures Singapore is a good example of high risks in securities transactions. It can be concluded that the 827 million GBP loss incurred by Barings was due to insufficient internal controls at Barings Futures Singapore and Barings Bank in general. Furthermore, there was insufficient external control by the regulatory authorities at the Singapore, Tokyo, and Osaka exchanges, and the clearing organisations involved (Brown and Freedman, 1995).

3. STAKEHOLDERS INTERESTS

Several stakeholders are involved in several phases of the STP and depend on each other in various ways (Table 1). The seven main stakeholders and their interests in the securities business are:

- 1) Investors. Individuals or organisations that buy or sell securities. Investors are interested in getting the shares at the best possible price with the lowest costs (commissions), as soon as possible after the order has been placed.

- 2) Investment Management Organisations. Organisations (e.g., mutual fund companies, insurance companies or pension funds) that professionally manage assets on behalf of investors. To serve their clients, investment management organisations are interested in getting the best return on their investments at the lowest costs and risks possible.
- 3) Brokers. Organisations that are licensed to execute trades ordered by investors or investment management organisations on the securities exchange. The primary interest of brokers is to get as high a volume of transactions as possible because of the commissions.
- 4) Exchanges. Places (physical or electronic) where transaction orders of various investors are executed (except over-the-counter transactions). Exchanges are primarily interested in facilitating the market (issue and monitor licenses, new securities issues), providing systems for efficient and effective trading and providing administrative services.
- 5) Custodians. Organisations that take care of settling the transactions executed (exchange traded and over-the-counter transactions). Custodians keep the securities on behalf of the client and take care of, among other things, administering dividends or coupon payments.
- 6) Central Security Depositories (Clearing Organisations). These organisations are responsible for tracking every transaction executed on the exchange and for checking whether it is cleared on time. Their primary responsibility is to facilitate transaction execution at the exchange.
- 7) Regulatory Organisations. Organisations in the financial sector are subject to regulatory control by the central banks. The regulatory organisations issue licenses to the organisations involved, and control their activities. The primary interest of these organisations is to protect against organisations that do not act professionally or mislead clients.

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4. CASE DESCRIPTION

The Robeco Group is one of Europe's largest asset management organisations, managing around 140 billion Dutch Guilders (US\$ 70 billion) of assets. In managing mutual funds, the Robeco Group executes hundreds of thousands of financial securities transactions all over the world (Robeco Group, 1998). Until 1994, the entire transaction process was mainly paper-based. Various information systems were used to support the process. The systems were hardly or not integrated. Communication with stakeholders was based on telex and facsimile; information had to be re-keyed into different systems and instructions to stakeholders had to be generated manually several times. Needless to say, there was a need for tight and extensive checks and control measures because the entire process was prone to errors.

Analysis of the transaction processes showed that problems occurred in 23% of all transactions. There were internal problems consisting of incorrect or not timely information related to the transactions. Communication with external stakeholders was also analysed. It became obvious that electronic integration – e.g., using standard SWIFT messages (Swift, 1995), and integrating messaging systems with existing information systems – would make human intervention superfluous and would lead to more efficient processing. The securities transaction process in Robeco shows many interactions with other organisations. About 15 processes cross the organisational boundaries (inter-organisational processes). The exchange of information in these processes used to be mainly paper-based. The existence of backtrack points also increased the process throughput time. Backtrack points are points where emerging problems are solved, before the process can continue.

More efficient processing was necessary to meet the challenge of increased competition from ABN-AMRO, Fidelity, Fleming, and others. To keep up with actual market requirements, in May 1996 Robeco Group decided to re-engineer its

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processes, by making use of the SWIFT network for all settlement instructions. around 300,000 per year. First, the project focused on substitution of the instructions sent by telex, which used to be the majority. The project also analysed the straight through processing concept, defined as 'immediate transaction processing, without manual intervention, processing information by the receiving organisation' (Swift, 1995; Institutional Investor, 1996). By the end of 1996 over 95% of the settlement instructions were sent by SWIFT. The straight through processing rate is determined by (i) the correct reading of the instructions (syntax) by the receiving organisations, and (ii) the correct processing of the instructions (content) without delays. Analysis shows that the first component more or less equals the number of instructions that are sent through the SWIFT network. The second component depends on whether the instruction can be carried out without manual intervention. For instance, manual intervention is required, when there is not enough credit to pay for securities to be bought (in case of a buy) or when there are not enough securities to be delivered (in case of a sell).

Implementation of the Swift system resulted in a significant 25% reduction of the error rate (for instance, due to wrong account numbers or wrong payment amounts, probably because of no more re-keying), leading to the situation that about 97% of all instructions are error free. As a result, the cost of the processing of settlement instructions was reduced from around 60 to 20 US\$. Two thirds of these cost savings relate to fewer manual activities, thus saving employee costs. The other costs were saved because of reduced expenses for repairs (the receiving organisations must add or must ask for additional information; repair costs have to be refunded to them).

The internal information system played a crucial role in achieving the improved performance of the STP processes. By integrating the entire transaction process in one system, it became possible to pro-

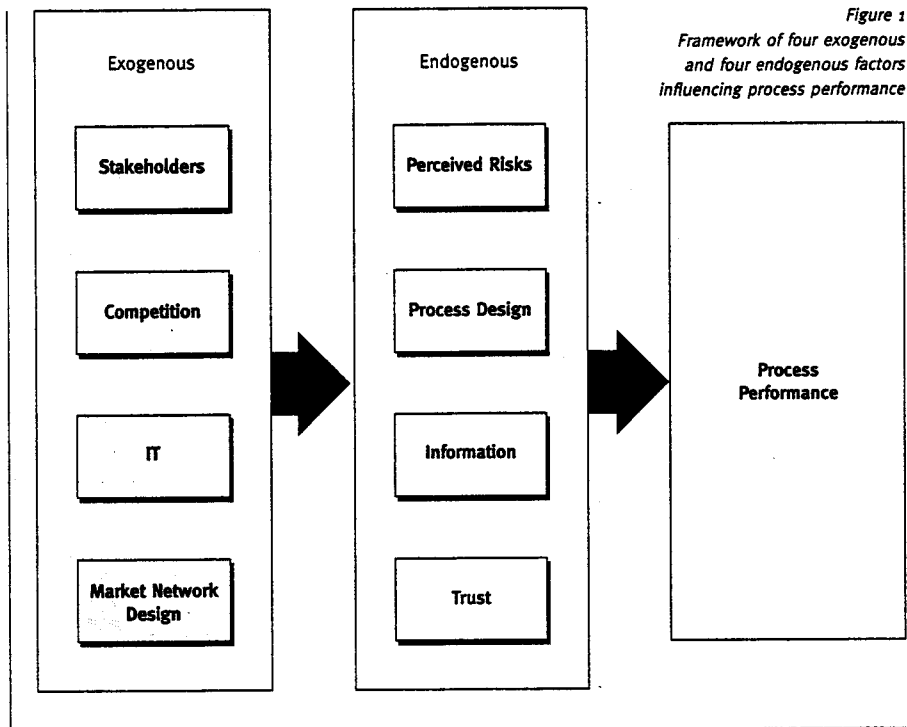


Figure 1
Framework of four exogenous and four endogenous factors influencing process performance

SWIFT (1997) *annual report*.

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cess certain parts of the STP processes in a parallel way instead of sequentially. For instance, the moment the transaction details (after execution) are entered into the system, the settlement department can already generate the instructions to the appropriate stakeholders. When a transaction would generate a problem, the settlement department would be informed about two days sooner than before the system was used.

5. CASE DISCUSSION

The Robeco case shows that many factors influence the securities transaction process, especially when operating on a worldwide scale. We note four endogenous and four exogenous factors, as given in Figure 1. We give three examples of relations between the factors in figure 1.

PERCEIVED RISKS INFLUENCES
PROCESS DESIGN, TRUST,
AND PROCESS PERFORMANCE.

The case shows that a high number of stakeholders lead to risk diversification. This means that organisations reduce risks by dealing with many stakeholders (many brokers and custodians). On the other hand, a high number of stakeholders and

the fact that each stakeholder has a different process lead to increased risk perception and to increased demand for risk controlling measures. Adding control activities to the process means adding extra steps, thus changing the process design and lowering the process performance. It is not clear whether risk perception directly affects the process performance (e.g., by selecting other stakeholders), or indirectly through process design or trust. High-risk perception places more demands on process design and requires more trust in stakeholders.

PROCESS DESIGN INFLUENCES PERCEIVED RISKS, INFORMATION, TRUST, AND PROCESS PERFORMANCE.

The case shows that redesign efforts in the form of integration of systems and providing on-line and real-time information can have contrasting consequences. On the one hand, the perceived risks are reduced and the process performance is improved because integration of systems leads to fewer errors (fewer re-keying), more efficient processes, faster responses (e.g., transaction confirmations), and improved quality of the standardised (SWIFT) messages. On the other hand, integration of systems leads to less segregation of functions, fewer opportunities for internal control procedures, thus leading to a lower reliability of the process and lower quality of management information about the process. Countering the negative effects by adding control procedures may again lead to negative effects on process performance

TRUST INFLUENCES PERCEIVED RISKS, PROCESS DESIGN, INFORMATION, AND PROCESS PERFORMANCE.

Buyers and sellers may be confronted with opportunistic behaviours of their counterparts. Trust is the belief, or willingness to believe that one can rely on fairness, goodness, strength, and ability of somebody (e.g., the seller, the buyer). The concept of trust has recently received considerable attention in the literature. Sanner (1997) defined three bases of trust. Trust can be person-based, tied to the characteristics of

a person; Enterprise-based, where trust is tied to the enterprise as an entity; and institution-based, where trust is tied to formal mechanisms based on law and norms in a society. Enterprise-based and institution-based trust need special attention, especially in global electronic markets where the only contact between buyers and sellers may be the contact through databases and the telecommunication network. As Fukuyama argues: 'people who do not trust one another will end up cooperating only under a system of formal rules and regulations, which have to be negotiated, agreed to, litigated, and enforced, sometimes by coercive means'. This legal apparatus, serving as substitute for trust, entails what economists call transaction costs (Williamson, 1993; Fukuyama, 1995; Williamson, 1979).

Trust is determined by many factors and trust has many aspects. One aspect is the trust between the stakeholders involved. The redesign efforts of intra- and inter-organisational processes in this case made it clear that the willingness to work together increases trust and positively affects process performance.

6. CONCLUSION

The aim of this study was to develop a better understanding of the intra- and inter-organisational processes related to financial securities transactions, and, ultimately, to provide guidelines for the design of inter-organisational systems in information intensive markets and networks. The Robeco case shows how organisations involved in securities transactions can respond to competitive challenges. Robeco responded through IT enabled re-engineering of intra- and inter-organisational business processes, aiming for improvements of the process performance. The case shows that redesigning the ST Process is influenced by complex interactions between process design, stakeholders' perceptions of risk, the availability of reliable and timely information, and trust. Further research is needed to identify the implications of the proposed framework in other industries. We also suggest fur-

ther development of the framework. The exogenous factors, for instance, market network design, were beyond the scope of this paper, but should be included in further research.