

Competing Against Time with IT

The Union Bank of Switzerland Case

This case was prepared by Claudia Loebbecke, Research Assistant, and Tawfik Jelassi, Associate Professor at INSEAD. It is intended to be used as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

Introduction

Undoubtedly, major investment in information technology (IT) has leveraged time to become a factor in today's financial industry. Timeliness has become crucial for success, necessitating quick-response machines, shortened decision windows, the timely coordination of global activities, and the fast development of new market applications. With the above IT support in mind, Juergen Liedel, Senior Vice-President at the Union Bank of Switzerland, in charge of the development of trading and information systems for UBS worldwide, looks at UBS's achievements in developing computerized dealer support systems . . .

The Union Bank of Switzerland (UBS)

Company Overview

UBS is Switzerland's largest bank with a presence in all the major world financial centres. Its assets amounted to SFR 249.3 billion (at December 31, 1991) and its net income to SFR 1,216 million in 1991. The bank's current major business objectives are, first, to maintain its position as the leading

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bank in Switzerland; and second, to become one of the world's leading international financial institutions, by the end of the 1990s. The first objective implies a competitive stance, especially in retail banking. Economies of scale, a high degree of standardization, automation of banking operations and a strong market orientation are seen as the key success factors. The second objective demands a strong presence in every major world financial centre, as a universal wholesale bank.

UBS's business situation has changed considerably over the last few years. The growth of international markets and the build-up of a strong wholesale banking force have affected its organizational structure as well as the supporting information and communication technologies.

'In the domestic market we focus on the retail business. In this rather saturated segment, IT support is nowadays focussed on improving efficiency by reducing labor and thus by cutting cost. In the international market, on the other hand, the saturation level has not yet been reached. There, we expect IT to have expanding effects and to support us in our effort to become a strong wholesale force.'

*Dave Morgan, Vice-President
Union Bank of Switzerland*

In July 1991, recognizing the need for globalization and an emphasis on the wholesale business, UBS completed a major organizational restructuring, resulting in the decentralization of IT responsibilities.

'We were initially a Swiss bank; then we became a Swiss bank with an international interest; now we are a globally active Swiss bank . . . Information and communication systems have been of utmost importance in allowing us to meet diverse market needs.'

Dave Morgan

The Importance of IT for UBS

Of the bank's 27,000 employees worldwide, 2,500 work in electronic data processing (EDP). IT expenditures have been dramatically increased since the 1970s. Currently UBS maintains a high level of investment outlays in both information and telecommunication technologies. In 1990, capital spending for computer hardware and software as well as telecommunication facilities amounted to SFR 275 million, while total expenditure on applications development and maintenance reached SFR 300 million. About 27% of hardware/software investments were supplemented by organizational, application-oriented and technological measures to boost operational efficiency.

Regarding future development of IT applications, UBS sees its corporate strategy and long-term business objectives as the driving force in defining and implementing an IT master plan. Two overall IT requirements have been defined, namely a high degree of flexibility and geographic differentiation, according to local or regional market needs; and a certain degree of standardization and integration providing in the management of global business risks, a global approach for international customers.

With respect to most of its systems, UBS faced the standard trade-off between centralization and decentralization as encountered by similar globally-minded firms. UBS aimed to achieve a balance between the two, emphasizing 'customer orientation' (as opposed to product orientation) as the key driver behind its future structure. As in other banks, IT nowadays plays an important role in all of UBS's business lines. However, there are still different degrees of automation and support across services. A specific example of the innovative use of IT at UBS is the recent development of a computerized dealing system, one that supports dealers' activities not only throughout Switzerland but also in London and New York.

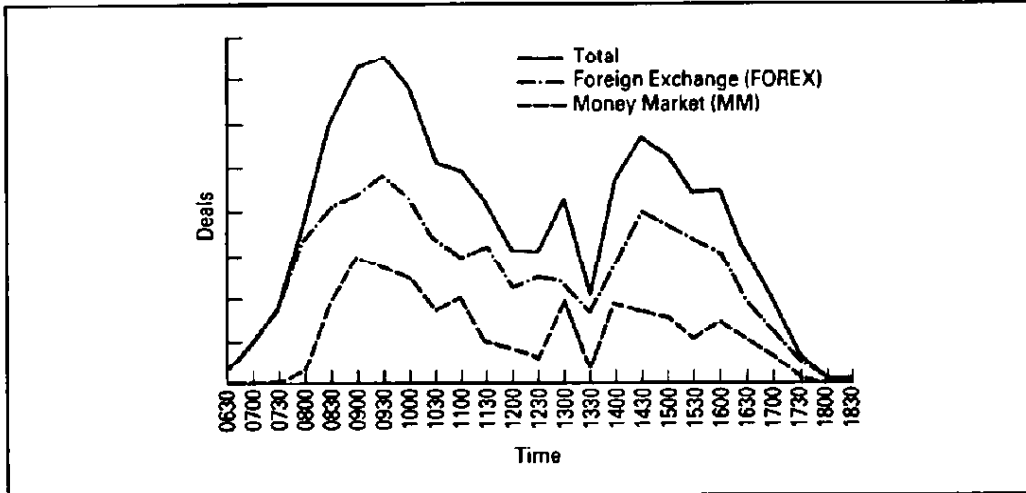
Foreign Exchange and Money Market Operations

Overview

Foreign exchange (FOREX) is today one of the most critical operations for any major bank, supporting industry and other customers in the buying or selling of foreign currencies. It has a worldwide inter-bank market of financial assets, to be traded in one or more currencies simultaneously and is closely related to both the money markets, where short-term money is traded, and the capital markets, where long-term money is traded. As in other markets, trade in the foreign exchange market is determined by prices: in this case, foreign exchange rates. As with prices in other markets, exchange rates are determined by the interplay of supply and demand for the respective currencies. Today, the foreign exchange market is truly global, and continues round the clock, 24 hours a day. An important part of FOREX dealing is arbitrage. Earnings can be large, but the risks are substantial and the market has to be watched carefully. Usually, a deal is agreed verbally, and invariably followed by a written confirmation of the transaction (Exhibit 1 gives an overview of the average distribution of deals per hour in Zürich).

Foreign exchange markets have existed for as long as international trade in goods and services has taken place. Nowadays, in addition to this type of trade, which influences a country's current account, the holders of

Exhibit 1 Deals per hour in the UBS Zürich office
(source: company information)



financial assets in foreign currencies (including firms, pension funds, unit and investment trusts, commercial banks, and individuals) can also play a significant role, along with many speculative participants, in foreign exchange operations. The central banks also intervene heavily, either under their own names, or through an intermediary such as a commercial bank.¹

The term 'money market' refers to a group of large banks and other financial institutions in one or more countries which facilitates the channelling of short-term wholesale funds from lenders to borrowers. Among the most important money markets are those for bills, inter-bank deposits, and certificates of deposit, all of which involve the movement of very large quantities of institutional or wholesale funds. Individual money market deals often amount to many millions of dollars. They are agreed verbally between dealers over the telephone, with fast speed of reaction and at a low transaction cost.²

During the last two years structural adjustments in the foreign exchange and money markets, especially the emergence of selected European currencies as trading currencies at the expense of the previously dominant US dollar, coupled with major interest – and exchange – rate movements, have created a volatile market environment. These developments have led to a reduction in the number of market participants and an increased emphasis on quality and creditworthiness.

UBS's Position in the Foreign Exchange and Money Markets

UBS' leading position in the foreign exchange and money markets was generally consolidated in 1990/91 and even further expanded in several areas (e.g. bank-note and precious metal trading). In foreign exchange trading, UBS has been able to command a larger market share due to its excellent credit ranking (AAA). Various trading units in Switzerland and the Far East have reported excellent results. According to an independent market analysis, Swiss bank customers rate UBS as the market leader. In the money market, funds committed to inter-bank operations have been expanded on a limited scale only, since top priority has been attached to the commercial loan sector.

DESY: UBS's Computerized Dealing System

Major UBS branches worldwide trade in the foreign exchange and money markets. IT support is essential for their business activities. Up-to-date price information is required from external services such as Reuters and Telerate, and internal information is needed regarding exposure limits, the bank's currency positions, and counter parties. To meet these needs, and to support trading as well as deal settlements, UBS has developed DESY,³ an integrated computerized foreign exchange and money market dealing system.

Historical Development of Dealer Support at UBS

From the late 1970s until 1985, UBS provided 49 telephone lines for each FOREX desk, and employed about 45 dealers. Since 1985, with the inauguration of the new FOREX building in Zürich, there have been 96 lines per desk and the number of traders has almost tripled. To increase its dealers' productivity, UBS decided as early as the 1970s to invest heavily in information and communication technologies. In 1977, it introduced a system known as FOXI I, a rates provider, which was as yet unable to give direct, computer-based support. This was replaced in 1981 by FOXI II, which assured some additional assistance by automatic calculations of cross-rates and broker dates. FOXI III, also known in internal UBS jargon as B-FOXI, was introduced in 1985. Compared with its predecessor, it handles more currencies and offers more calculation capabilities. It covers all in-house facilities plus interfaces with external sources.

The steady development of the dealing system was accompanied by a change in the dealers' working procedure. Over the years it became necessary to spread the formerly centralized system (in Zürich) into the branches, to integrate different external financial services, to provide more detailed information as well as sophisticated financial applications, and to feed information into the back-office system.⁴ All these requirements led to the development of DESY, the dealing system currently employed at UBS.

DESY – Development Objectives and Concepts

'When introducing DESY, the overall objective was to support the dealers and the back-office and to have a large measure of integration between the two. However, we felt that, in the medium run, this overall objective could only be achieved by fulfilling a number of sub-goals, most of which can be summarized in the concept of a "modular approach". In such an approach components can be easily exchanged as the technology progresses or [as] the environment changes.'

*Juergen Liedel, Senior Vice-President
Union Bank of Switzerland*

Flexibility

The system had to be suitable for branches of different sizes (scale-ability) and flexible enough to cope with new technological developments or changing market conditions. The latter demand a fast response, in terms of either adapting existing applications or developing IT support for new financial instruments. Application changes should be able to be accommodated without any major redesign of the dealing system. UBS provides for this flexibility through its modular design approach,⁵ based on an open-system architecture.

Common User Interface

DESY had to integrate information coming from various sources and present them to the dealer in a coherent manner.

'All sources integrated into the system had to be accessible in a common way. This means that the same information had to be presented consistently, and certain commands and colours had to have the same meaning in all system components.'

Juergen Liedel

In the beginning, UBS provided the dealer with a single keyboard system

and multiple video screens so that several information sources could be seen simultaneously (see Exhibit 2). Over time, this approach proved less suitable due to the drastically increased information volume. A more successful solution was reached with the introduction of one multi-task/windowing workstation to replace the multiple monitors at each desk (see Exhibit 3). Such a workstation provides the dealer with automatically updated and monitored information from a variety of different sources, on a single screen. As Juergen Liedel explains, 'we expanded to eight separate monitors, but have now chosen workstations with a multi-window system. Due to the client-server architecture, we had to change only the workstations for this important step towards technical integration.' To improve the user-friendliness of DESY, the system provides for screen composition. Individual layouts within the single screen can provide the dealer with simultaneous displays from windows, for example, Reuters, Telerate, UBS in-house information sources.

Direct and Unique Deal Entry

To accelerate the data availability, reduce labor costs and limit the potential for mistakes, the system had to eliminate multiple data inputs. DESY provides for direct deal entry by the dealer, and thus for instant information on global exposure and risk.

Exhibit 2 *Previous dealer workplace with multiple monitors*
(source: company information)

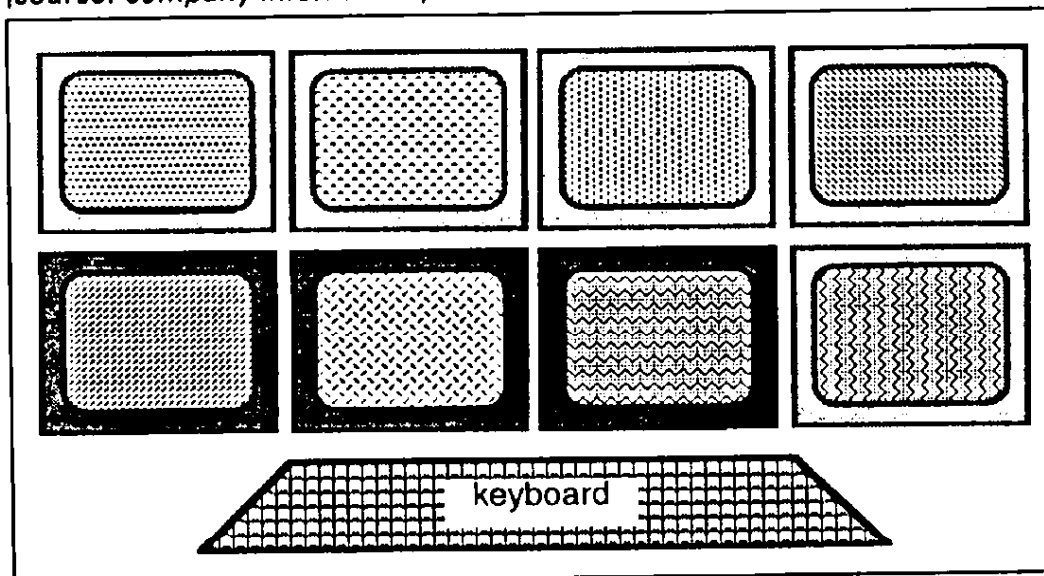
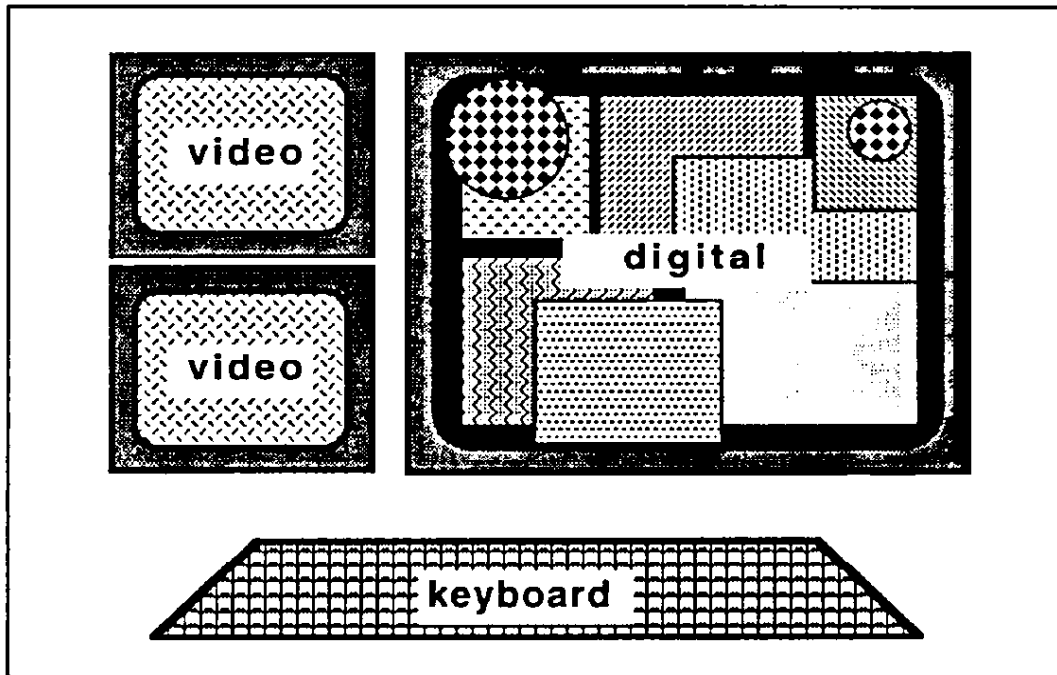


Exhibit 3 *Current dealer workplace with a workstation*
 (source: company information)



Response Time

The nature of the dealing business requires extremely short response times for the data exchange with external sources, as well as among system components.

System Availability

Permanent availability of the system was imperative, even at the cost of redundant installations of components. The essential components of DESY are installed in two separate rooms so that, in event of a local fire, operations can continue with a reduced capacity.

Complementary Development of the Back-Office System

The design of DESY had to ensure that the back-office support could keep up with dealers' activities. The settlement system had to be able to process as many deals as the dealers could produce.

DESY – New Challenges and Requirements

The worldwide use of computerized support systems, and the globalization

of the dealing business leading to 24-hour trading, have created new challenges and requirements for the successful development and use of dealing systems. For Juergen Liedel, 'the new overall challenges for the operation of a dealing system are higher transaction volumes and lower margins. The increasing information load and shorter decision times lead to increasingly complex systems. Fast response, high system uptime, integrity and security are essential.' Any major dealing system must therefore incorporate an efficient interpretation of market information based on a migration to digital information services and intelligent information filters; and global links between dealing support systems allowing for 24-hour dealing and limit-order monitoring.

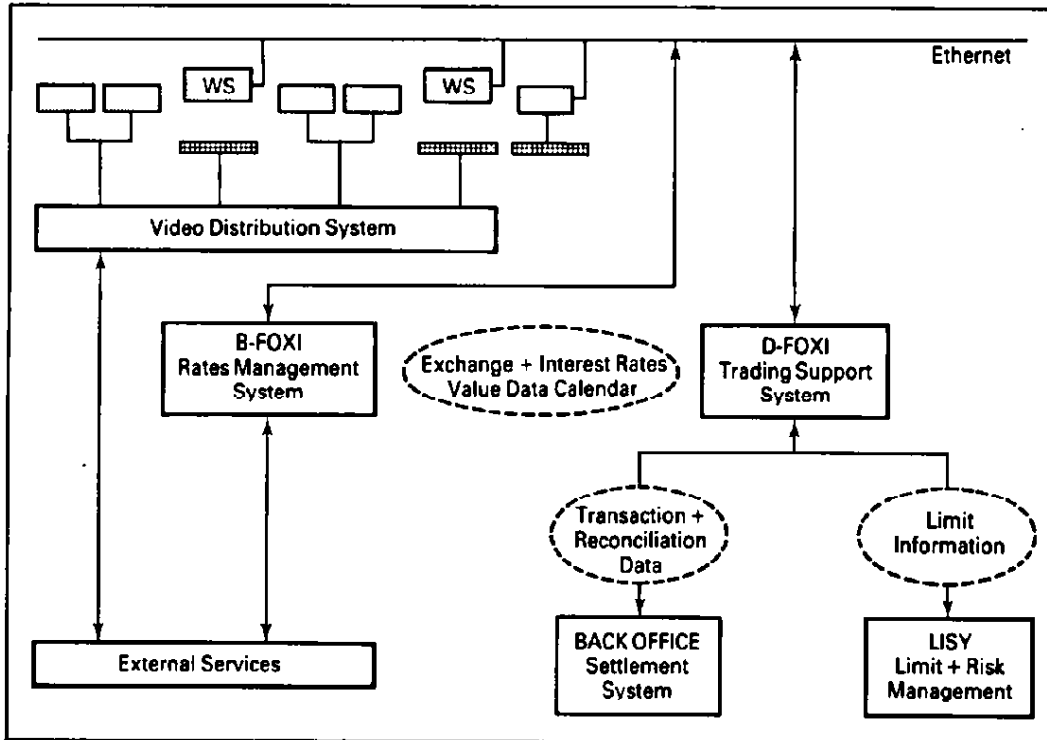
DESY – Features, Components and Functions

UBS's Zürich dealing facility supports more than 120 dealers; each of them is equipped with telephones, a keyboard, a workstation, and several screens. The equipment provides for automatic voice recording of all deals. Different companies' dealer support systems give priority to various different features, depending on their requirements. However, it is possible, says Juergen Liedel, to define five universally-acknowledged essential features:

- fast and controlled communication between dealers;
- uniform front- and back-office applications;
- interfaces to host accounting or back-office, as well as to digital rate and deal feeds;
- extensive real-time dealing support;
- and last but not least, on-line credit and trading limits control.

Today, DESY consists of three major components, which can be split into front-end and back-office support (see Exhibit 4 for a system overview):

- D-FOXI performs the banking functions necessary to trade, recording and maintenance of the bank's currency positions, exposures and limits;
- B-FOXI communicates with a wide range of internal and external services to provide actual market rates and individual calculation pages for foreign currencies;
- the DESY host system for back-office support settles deals and maintains deal databases as well as accounting information.

Exhibit 4 *DESY system overview (source: company information)*

D-FOXI and B-FOXI together form the front-end system dedicated to foreign exchange.

D-FOXI is the DESY component that supports dealing and position-keeping for all basic foreign exchange and money market transactions. Each transaction is processed on-line and updates the affected position information, including the arbitrage profit and loss. Overall currency positions are recalculated immediately. Revaluations, based on market information and interest rates, are carried out after the close of business each day. To assist the dealer during trading hours, a revaluation can be calculated on-line as a simulation. Finally, at the end of a day, D-FOXI produces a large number of financial reports to provide summarized information over the trading day.

D-FOXI provides the dealer with a convenient 'free-form' means to enter deals. The deal entry service is a data input window which integrates search features, intelligent data inheritance, automatic rate completion, standard swap types, and configurable rate and data representation. Deals must be entered completely in terms of data used for position-keeping, and should have a customer identification. If a customer identification is not

available to the dealer, he/she can enter limited information in free-form filed for later enhancement. An intermediate ticket with the incomplete deal data can be created and passed on to the back-office operator, who will interpret the instruction text and complete the deal.

In the foreign exchange market, the deal entry service currently supports three types of deals, namely 'SPOT',⁶ 'OUTRIGHT',⁷ and 'SWAP'.⁸ In the money market, it supports 'FIXED LOAN'⁹ and 'FIXED DEPOSIT'¹⁰ as well as 'CALL LOAN' and 'CALL DEPOSIT'. Other D-FOXI services include the 'deal blotter', which displays a log of recent deals affecting a certain position, and an exposure window which shows the current exposure and limits of a specific customer or bank group.

B-FOXI is a real-time rate information system, which displays the current exchange and interest rates as well as calculation pages for foreign currencies, notes, precious metal, and fiduciary transactions. Only the foreign currencies are useful to the DESY dealer. Additionally, the system provides a value date calendar of holidays and working days in different countries as well as an international news service. B-FOXI is based on a central system to which dealers and information systems such as Reuters, Telerate, and Telekurs send and receive information on exchange rates, news, and holidays in other countries. The information is transferred through the system and displayed on the DESY workstation in a FOXI page window.

DESY – Supplier Selection Criteria

At UBS, four major criteria have emerged for evaluating and selecting suppliers: a stable system platform and vendor continuity; systems continuity and compatibility; interfacing standards (a commitment to open systems and possibility of multivendor integration); and, increasingly importantly, worldwide support. Says Liedel, 'in setting up our system we have learned that turnkey is not the way to go. Thus, UBS has more than twelve suppliers; system integration is performed by UBS's system engineering teams. We build strategic applications in-house and make or buy complementary systems as needed.'

DESY – Computer Environment

UBS's computing environment consists of heterogeneous systems from a wide variety of suppliers; it has evolved from inter-operable systems, to portable applications, to distributed processing.¹¹ B-FOXI and D-FOXI both run

on a cluster of VAX/VMS machines, which are connected via DECnet (Ethernet). The outputs of the services provided by B-FOXI, D-FOXI, etc. are simultaneously displayed via windows on the workstation screen; real-time information distribution is based on DECtrade. Central accounting and data management at UBS's Swiss branches are supported by the ABACUS integrated banking system which runs on a UNISYS system; while London and New York use an ABS system operating on an IBM computer. Global interconnections are based on UBS's worldwide proprietary packet switching network UBINET/X.25.

DESY – Control Aspects

In order to achieve high system availability, UBS has decided to monitor its hardware and software resources automatically, to which end it has developed COSY,¹² a monitoring and control system currently working in a VAX/VMS computing environment. COSY is intended to help overcome difficulties with current dealing systems, which have become so complex that operators are no longer able to react optimally in each abnormal situation. Moreover, current systems suffer from a lack of coordination between different operator tools. COSY's main applications with respect to DESY are firstly, unattended operation of the system,¹³ providing operators with a tool to help supervise the VAX/VMS computing environment, and secondly, building an Expert Systems platform for banking applications.

Currently, COSY monitors DESY worldwide by checking processes, files and the CPU use of critical processes. More specifically, it can be employed to:

- increase the system up-time by checking all important parts continuously;
- issue, when appropriate, clear error messages;
- react automatically by performing some dedicated actions (configured by the user);
- monitor all systems on the network from a single station;
- continuously display the state of connected systems and supply detailed information upon request;
- exchange some information with software applications.

'Many more functions could be configured', says Markus Meier, COSY Project Manager. 'For instance, if something goes wrong, COSY could restart the system. In the future, a number of preemptive measures will also

be integrated in the system.' Regarding other COSY extensions, he states that 'the next development step will make COSY available on UNIX/ULTRIX systems'.

From Development to Integration

One lesson learned at UBS during the development of DESY is the importance of shifting the design effort 'from development to integration'. Integration is considered as an important concept for the provision of timely dealer support; it should be accomplished at various levels, both domestically and globally.

System and Application Integration

Due to its open system architecture, UBS has accomplished a high level of system and application integration. Information can be exchanged between hardware from several suppliers running under a variety of operating systems (see Exhibit 5). Moreover, application portability has been widely achieved. Old and new applications 'can communicate with each other' (see Exhibit 6).

Exhibit 5 *System and application integration (source: company information)*

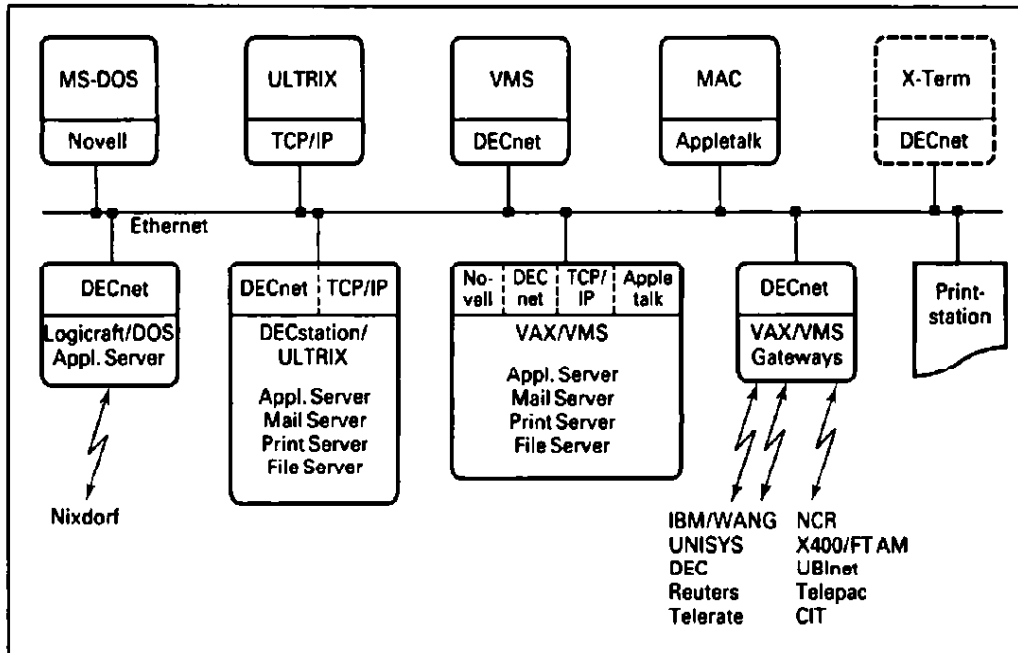
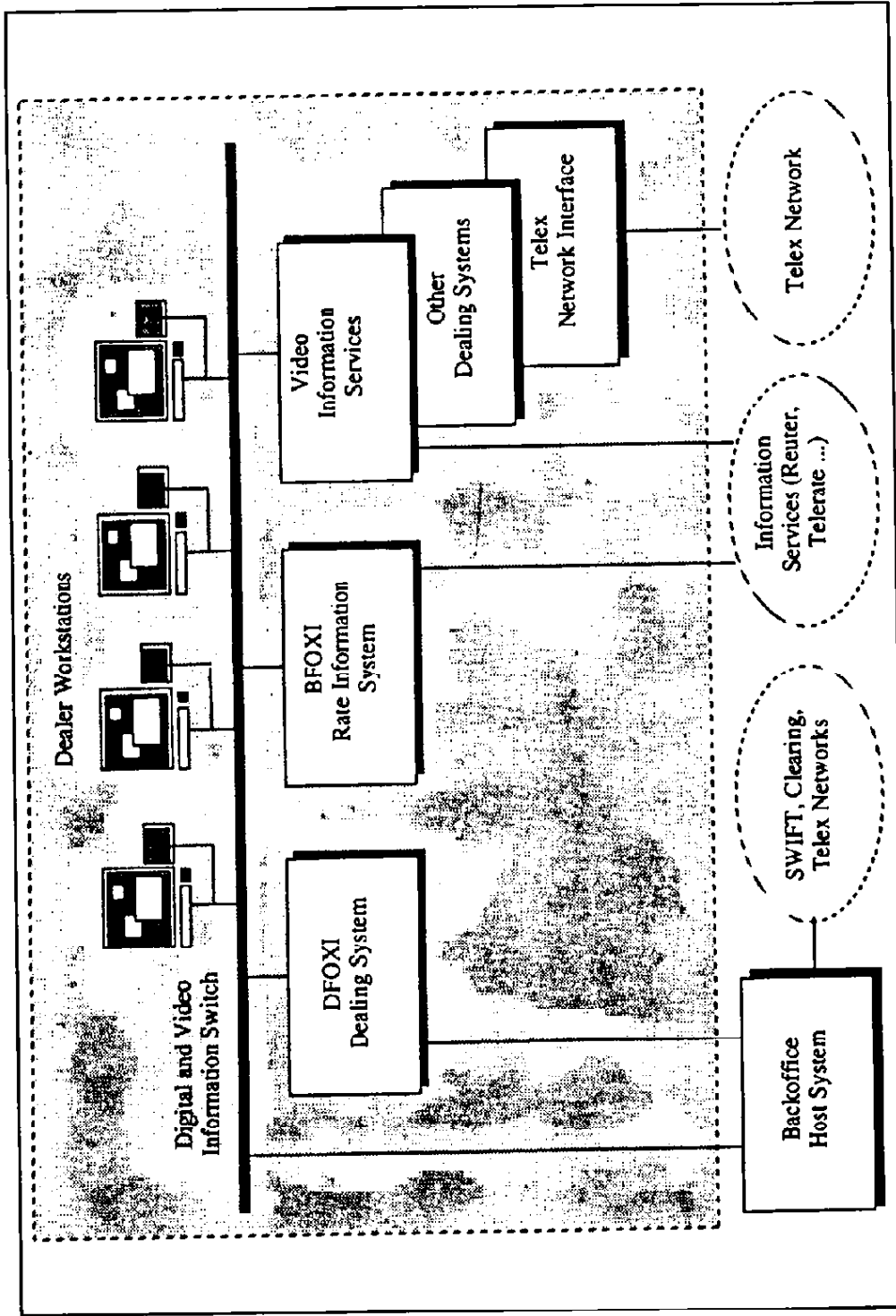


Exhibit 6 Application portability at UBS (source: company information)



Integration of Different Information Sources and Types

DESY integrates several external sources, such as Reuters or Telerate, as well as internal data from log files, simulation, etc. Information obtained from these sources is presented through a variety of information types including text, graphics, and voice (telephone). Although the current status is satisfactory, Juergen Liedel expects an even higher integration of information types for the near future, based on a more extensive use of multimedia.

International Integration

A certain degree of international integration has been achieved through the global communication network 'UBINET' and the installation of the DESY front-end in London and New York. However, the drive for implementing the dealing system in additional international branches demands an even more thorough integration of international applications. As UBS Vice-President Hans Meier explains, 'the aim is to have the same applications everywhere, even if some local adaptations will be necessary in terms of training or special enhancements regarding the local infrastructure'. From a technical point of view, UBS could easily install its system in locations outside Switzerland. The electronic equivalent of a Dealing Ticket would serve as linkage between the dealing system and the local back-office system.

Integration of Different Business Lines

Although integration has been recognized as one of the major issues for the near future, its application across different business lines has still to be achieved. As Hans Meier puts it:

The idea is to have one multi-purpose dealing room infrastructure that fits all needs, regardless of whether you trade FOREX, equities, or bonds. All these business lines have similar needs regarding the prediction and calculation of rates. If these needs can be served from a joint source, they could be complemented with special applications for each trading area. Of course, some hardware constraints will have to be resolved. Due to the huge need for information exchange, improved telecommunication, for example through the use of fibre optics, will also be needed to hook up the equity dealers into the current system.

Outlook***Foreseeable Trends Regarding Future Dealing Systems***

Developing a dealing system based on leading-edge technology, for a

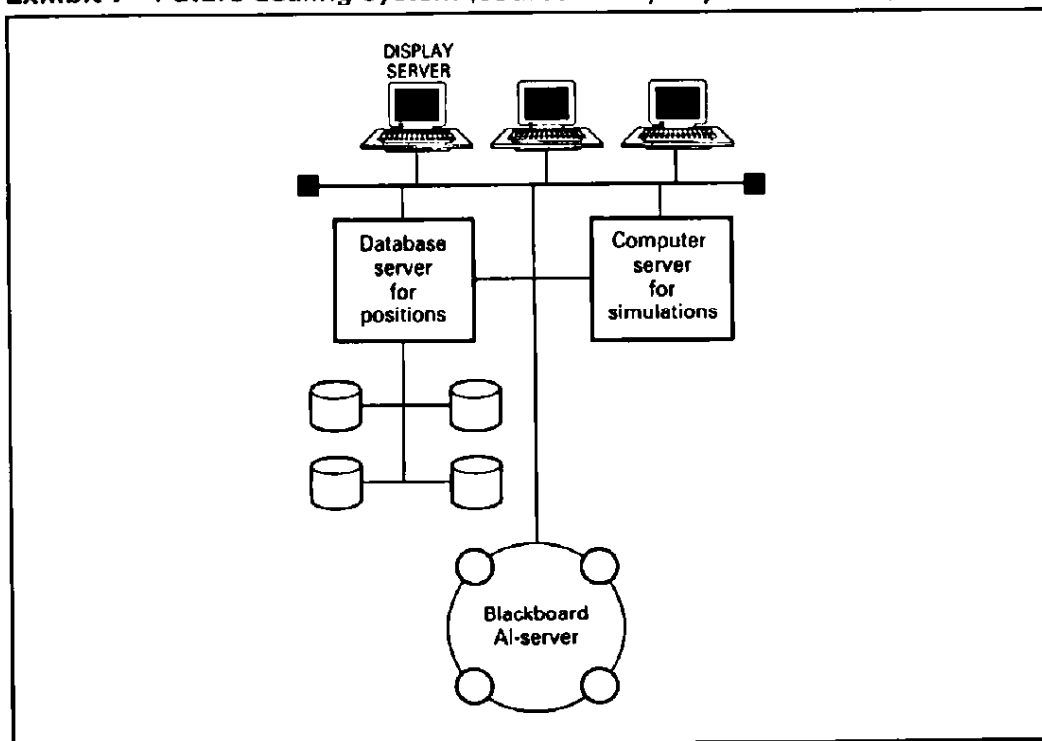
dynamic market, is a never-ending task. DESY+, the next generation of dealing systems at UBS, is already in the testing stage. Since it also follows the modular approach, it can be gradually implemented over the next two years. DESY+ offers several distinctive features – full operation around the clock, more intelligence in the workstations (e.g. expert systems to filter information), and an accounting technique known as 'trading line accounting' (allowing all calculations to be based on Net Present Values). It will also be more closely linked to COSY, making extensive use of the latter's functions.

However, Liedel and his team have already started thinking beyond DESY+. What potential developments in the dealing business, and hence in its support systems, will they have to face? Over the next three to five years, they expect important developments in the use of interfaces, with a heavy emphasis on multimedia and high-resolution input/output devices. Telecommunications will become faster, and pattern recognition might reach a level of technological maturity such that it becomes practically applicable.

Moreover, Liedel and his group expect the expanded integration of current technology concepts in more advanced applications (Exhibit 7 provides a conceptual schema of a future dealing system). Expert System techniques have already been built into DESY. Operational systems include UBIchart, which supports exchange rate predictions, and COSY. Most likely Expert Systems will play an even more important role in future dealing system generations. Artificial Intelligence (AI)-based intelligent filters will be used to avoid information overload caused by the immense increase in information availability. Neural networks and fuzzy sets, possible components of an expert system, are currently under development in a joint research effort with a leading European supplier. Research results are promising, especially for interest rate forecasting. However, in the foreseeable future, even such advanced AI applications will not solve the core problem of dealing: 'Neural Networks and/or fuzzy sets might be able to provide good predictions regarding interest rates, but they cannot as yet do the same for exchange rates', says Assistant Vice-President Jean Lequarré.

However, other technologies, such as voice recognition, look much less promising. 'We have experimented with voice recognition as a method of deal entry', explains Liedel. But

not only is the technology not yet sufficiently developed, we have also found a major conceptual drawback. Since dealers close their deals over the phone, deal entry via voice recognition would require a sequencing of steps [only one channel would be available]. The keyboard as deal input device, on the other hand, provides them with a second channel which can be used simultaneously

Exhibit 7 *Future dealing system (source: company information)*

during the deal negotiation over the phone, and which therefore proved to be more efficient.

Foreseeable Trends in the Dealing Business Environment

Although Liedel is heavily involved in the development and steady improvement of UBS's dealing system, he is also considering the framework in which the dealing system operates. In what way might the business environment change within the next five years? What impact may UBS internal circumstances have on the development of new generations of dealing systems? What skills will be needed in the future to use the dealing support system successfully and hence be successful in dealing?

I am sure a number of things will change in the near future. Some trends have already started. However, if I tell you now some of my expectations for the future, that list will of course be incomplete. For example, with the introduction of the ECU, the cross-currency arbitrage between European

currencies will go away, but the money and the securities market will stay.

Another issue is the open stock exchange which might fade away and be replaced by electronic markets. It might not be necessary any more to have dealer workstations grouped in specific rooms in big cities. Dealers might have their workstations at home, or install them in big multinationals [at the premises of large customers]. By providing such a value-added service to our client, we could bind the customer and at the same time shift the effort of entering deals to him.

There is also the controversy between analytically and intuitively focussed dealers. In the past about half of our dealers based a large part of their work on intuition. They were successful by having a good feeling for the markets and a strong willingness to take 'calculated' risks. In the future however, these people will most likely play a less important role. With the market-driven shift to more complex deals, the analytical dealer will be needed. No successful deals will be done any more without appropriate analytical, i.e. computerized, support.

Another issue is the question of how innovative UBS should be. How much should the bank invest in advanced IT research? 'At the moment we are very selective as far as new technologies are concerned', says Liedel. 'It is only worth being a pioneer if you can be about two years ahead of the competition. Only then will your efforts be transferred into a sustainable competitive advantage.'

Management Issues

After a meeting over lunch with his colleagues in charge of the dealing business, Juergen Liedel runs into Dave Morgan: 'You know Dave, it's really striking how much attention our "bankers" pay to the issue of time these days', says Liedel.

They told me that they are satisfied with our current dealer support and they feel certain that we provide them with leading-edge technology. They talk about the short response times of our machines, and the on-line integration of external and internal information sources. To them that's crucial, since they see that the more the time window for action on some deals shortens, the more computerized dealer support becomes. Furthermore they realize that many financial instruments come on the market, lead to decreased margins due to better information, and then fade away. It is absolutely crucial for them that we are able to adapt quickly to changing market needs. They also see substantial progress in our support for global dealing, although they mentioned a need for improvement as far as the international telecommunication aspects are concerned.

Morgan pauses for a minute and says: 'They are certainly right, we have already talked about this. The ideal for global support would be to have shared screen manipulation around the world, i.e. several people working on the "same" screen/document simultaneously. But this depends on the affordable availability of wide communications band-width.'

Walking to his office, Dave Morgan is pondering about what he has just heard:

DESY is obviously working well, but how could UBS cope with the rapid change in technology and customer requirements in a highly volatile, global, 24-hour market characterized by low margins, complex deals information overload, higher risks and increasingly short-lived complex products? Shouldn't UBS already be far ahead in the product and/or application development for three years from now? What are the needs? What should be the guidelines?

Notes

1. This often depends on how far they wish their presence to be detected; in times of currency crisis for example, when they aim to protect parities. Of course, the European Monetary System requires that central banks intervene at predetermined limits.
2. See Honeygold, Derek, *International financial markets*, Woodhead-Faulkner Limited, Cambridge, UK, 1989.
3. 'Dealing System'.
4. UBS host system: ABACUS in Switzerland.
5. This approach implies the concept of host-independent operations.
6. In FOREX trading this refers to a transaction with settlement generally two bank working days from the trade day.
7. Synonym for 'Forward'. In FOREX trading, this usually refers to the buying or selling of a foreign currency with a settlement date beyond the value date spot.
8. A FOREX swap is an agreement with a customer to sell/buy an amount of one currency at a rate 1 per maturity 1, and to re-buy/re-sell the same amount at a rate 2 at a later maturity 2.
9. A fixed money market loan is an agreement to lend an amount of a currency to a customer at a defined interest rate and for a defined period.
10. A fixed money market deposit is an agreement to take an amount of a currency to a customer at a defined interest rate and for a defined period.
11. With regard to underlying standards UBS follows a policy of 'late binding', based on X/OPEN, OSF, MIA, etc. developments.
12. Worldwide, COSY has been installed on more than 150 systems.
13. COSY is an open system which can be used by everybody. It is by no means restricted to DESY.