BUTLER COX REPORT SERIES

Information Technology and the Customer



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Management Summary

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A Management Summary of the full report entitled Information Technology and the Customer. Copies of the Management Summary are distributed with the main report.

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The falling costs and improved performance of computers and the software to run them has led to many more users of information technology (IT) being directly involved with computer applications. Most of these users, however, belong within one organisation. The customer rarely uses IT directly, relying instead on the assistance of an employee. This situation is now changing, and more and more examples are appearing of the direct use of IT systems by customers. The benefits of these applications are usually clear-cut. In many cases, the benefits are not simply those of reducing costs but enable the organisation to serve its customers better. In some cases, they may even change the nature of the business and the market within which it operates. They can give the organisation an advantage over its competitors.

The difficulties lie in both identifying and successfully implementing suitable applications. There is a widely held belief that these applications are 'accidental', that they are opportunistic in nature, and that they have evolved from systems already in place for other, routine business purposes. There is some truth in these perceptions, but it is possible to combine a systematic business-led planning process with a preparedness to recognise and exploit these opportunistic situations where and when they arise. Adopting the customer viewpoint to the organisation's systems is the key to making this happen.

Having identified the opportunity, extra care is needed in the design and implementation of the application. Poorly designed and implemented systems always cost money. Those in the sales and marketing area can cost you the business.

### There is a major opportunity to exploit information technology at the customer interface

ICI Holland provides customers for its fluoropolymer plastics with a software package called 'Engineering Plastics on Screen'. This package runs on a standard personal computer and assists the customer's design staff in the selection of suitable ICI products for their design. The system is an 'electronic service representative' in that it can substitute to some extent for a human expert. The kinds of information that the system can deal with include the purpose of the design (for example, designing a gasket), the physical and chemical properties of the available plastics, the processing methods to be used for producing the finished product, and the overall suitability of the plastic for the purpose the designer has in mind.

Some of the benefits of this application are readily apparent: the system can be used directly by the customer and therefore differentiates ICI's products from its competitors' products; the choice of a standard personal computer means that it is readily accessible to a wide range of customers; and it provides an easy means for ICI Holland to keep technical data and prices consistent and up to date. For the customer, it simplifies and speeds up the design process, and provides access to specialised knowledge about plastics design. However, it also provides another, more strategic benefit.

When a buyer specifies the constituents of industrial goods, the purchasing process can stretch over a long period, as a range of possible suppliers is considered and shortlisted, specifications are issued (and adjusted), tenders are called for, and so on. When the supplier specifies the item, the purchasing process becomes much simpler and shorter, similar to that for a standard commodity. The Engineering Plastics on Screen system transforms the purchasing process, because, while the designer is specifying the constituent product, he or she is doing so from a list of ICI-defined possibilities. Thus the purchasing process is transformed from a process dominated by a search for a product that meets specifications defined by the buyer, to a process of matching the 'standard' products to the design purpose. The net effect on both time and number of people involved is shown in Figure 1. The Engineering Plastics on Screen application gives ICI Holland an edge over its

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competitors as well as speeding up and simplifying the buying process.

There are examples of such 'customer' applications in all sectors of business and government. Typical examples are:

- An automobile manufacturer has installed IBM PCs (personal computers) across its entire dealer chain, to provide an ordering facility. Dealers can inquire about vehicle availability, chase orders, and allow their customers to change details on their orders as late as one week before production of the vehicle.
- A manufacturer of household appliances uses a computer system to improve the service provided by its maintenance engineers to customers in their own homes. The system enables the manufacturer to arrange service appointments at a convenient time for the customer, the time of the job can be estimated beforehand, stock in the fleet of vans is controlled, and the overall efficiency of the operation is greatly improved.
- An air charter company provides travel agents with direct access to its seat booking system using the public videotex network. This saves time for the agents and helps ensure a high level of seat utilisation for the charter company.
- A supermarket chain uses bar-code scanners at the check-out to improve the service to customers by ensuring accurate and detailed pricing. The data gathered by the scanners can also be used to analyse purchasing habits and to control stock in the supermarket.

- Treasury management systems enable banks to provide a new range of services for their customers, based on a combination of computer systems and telecommunications services. These systems provide the customer's treasurer with direct access to the organisation's bank accounts. Balances can be verified and transfers and payments initiated from the customer's computer terminal.
- The Direct Trader Input system allows freight forwarders to send import and export documentation electronically to the UK Custom's computer systems. The delays and costs associated with the traditional paperwork are both reduced. Seventy per cent of import declarations are now made this way in the UK's largest airports and ports.

A focus on the wants, needs, and demands of customers was the key factor in this range of successful applications of IT. We identified a whole range of such applications in the course of our research for this report. These applications deliver benefits to customers as well as to the supplier organisation. The customer benefits can include reduced costs, improved productivity, faster transaction processing, less paperwork, better control over financial resources, and so on. The supplier organisation can gain all the traditional benefits associated with IT, as well as gaining significant strategic benefits, often leading to reshaping the marketplace to the organisation's advantage.

Customer systems are not the prerogative of the private sector of the economy. The public sector and other not-for-profit organisations can also gain benefits from the use of IT at their interface with their 'customers' — the general public or businesses to whom they deliver services. While the benefits from such systems may primarily be in improving the cost effectiveness of the services provided rather than in gaining competitive advantage, the guiding principles for identifying the opportunities and implementing them are much the same. And, in some areas such as health or education, the public sector is increasingly in competition with privatelyrun services.

# The next wave of IT users are the customers

The growth and spread of customer systems is a natural step forward in the application of IT in business. The development of IT over the past 30 years has progressed in a series of waves, each of these waves bringing computing facilities to a new group of users. In the late 1960s time-sharing systems first put direct computer access in the hands of users in business. So-called online systems followed, providing clerical staff with access to accounting systems, airline reservations systems, and so on. Word processors extended text processing to secretarial staff in the late 1970s. The personal computer has extended IT facilities to other office staff and at the same time is superseding the special-purpose word processor. The current wave extends computer access to customers. Looking ahead, we can visualise a picture where IT is in almost universal use by organisations in serving their customers.

A Butler Cox report, *Information Technology: Its Impact on Marketing and Selling* (published in 1985), correctly predicted that there would be a rapid growth in the application of IT in marketing and sales. In particular there has also been rapid growth since then in the direct application of IT at the customer interface; for example, in bank automation, in point-of-sale equipment in retail stores, and in electronic transfer of purchase orders, invoices, and consignment notes. IT has also given rise to new information-based services. In some countries (notably France) millions of residential consumers already have a computer terminal in their homes, and hence access to a multiplicity of new consumer services.

This growth in customer applications represents a shift in the way IT is used and the way IT is deployed. Our survey of 250 European organisations for this report revealed the present state of development in this area and their plans for the immediate future. Figure 2 on page 4 shows that whilst the most popular applications today are systems supporting the sales staff, the fastest growth in the immediate future will be in those applications where the customer is more directly involved.

However, not all the customers of these organisations are seeing the benefits of these applications. In practice the number of customers affected varies from organisation to organisation. Figure 3 on page 5 shows the average proportion of customers who are served by these applications. Again, in general, the more mature the kind of application, the greater the proportion of customers that is served. But these figures hide a wide disparity between organisations - in some cases in our sample, the IT applications serve all of the organisation's customers; in others (the majority) the customer applications have been installed on a trial basis and, as yet, only reach a small proportion of customers. Nevertheless, the evidence is that there is a shift taking place and that over the next few years these applications will gradually become accessible to more and more customers.

### IT can be used to reshape markets — not just to improve marketing and selling

Using IT to improve marketing and selling, and service to customers is a well-established way to apply the technology in business. In this way IT helps the organisation succeed against its traditional competitors, enhances productivity, and achieves cost savings in its marketing, selling, and customer support operations. However, there are other sources of competition (for example, new entrants, and suppliers and customers who want to encroach on the organisation's business). IT can be used to protect the business from such competition and can also be applied to expand existing markets, and to address new markets. Our own research for this report revealed that IT does contribute to both improving sales effectiveness in existing markets and to expanding or changing the market in which the business operates. We identified seven different kinds of application (see Figure 4 on page 6).

The first four kinds of application are mainly concerned with improving business performance in existing markets.

## Automating communication with customers — EDI

Electronic data interchange (usually referred to as EDI) uses computer-to-computer exchange of business documents to replace the paperwork associated with ordering, shipping, invoicing, and so on. It can reduce the costs of customer paperwork and eliminate unnecessary delays. Communications with customers are improved, data preparation costs are externalised, and there is less administration involved in dealing with queries and correcting errors.

However, the most significant impacts of EDI have not been generally recognised. The most common perception of the benefits to be gained from EDI are those of reduced costs and delays. The radical impacts that EDI can have on a business and its marketplace are not yet so well appreciated.

## Gaining leverage at the point of sale — EPoS and EFT-PoS

Technology at the point of sale can be the basis for additional services, and can differentiate the services or products provided from those of competitors. Point-of-sale systems can improve customer service in several ways, such as storing previous customer transactions for reference, tracking customer order patterns for major

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customers and forecasting future requirements, and providing electronic payments processing. Accumulated transaction data can give a clearer picture of revenues, and if it can be linked to customer data, can be used to support future marketing and sales activities. Data collected by EPoS systems can be used to track stock levels more closely and reduce staff required for pricing products and controlling stock.

These applications can also improve efficiency and productivity in the supplier's own sales operations. Other possible spin-offs include merchandising, and redistribution of warehousing and distribution centres as a consequence of better access to sales transaction data.

## Finding and keeping the customer — the use of database marketing

In our experience few organisations realise the full potential of their customer databases. Data held in existing systems (accounting, order processing, sales administration, shipping, mailing lists) can be integrated and coordinated to make a powerful marketing and sales tool. Specifically, database marketing involves exploiting available customer data to:

- Understand customers' needs and buying behaviour.
- Market and sell in a highly targeted way.

#### Figure 3 Proportion of customers served by the IT applications

Respondents were asked to estimate the proportion of their customers served by the IT applications. The average figures for all respondents who have already installed the applications are shown below. Note that these figures exclude organisations that have not yet installed the applications.

| Application  | Average<br>proportion of<br>customers<br>served<br>(%)* |
|--|---|
| IT support for sales administration.                                       | 66  |
| Sales and service personnel use IT to provide information to customer.     | 54  |
| Service staff use IT to help deliver service.                              | 33  |
| Customer uses IT to obtain service/<br>product information.                | 17  |
| Electronic transmission of customer accounts, other paperwork.             | 19  |
| IT at point of service.  | 16  |
| IT-based delivery of service.  | 16  |
| IT support for communication<br>between office and field support<br>staff. | 16  |
| Customer enters order elec-<br>tronically.                                 | 11  |
| Customer uses IT facility to track progress of order/shipment.             | 10  |

these applications

Source: Butler Cox Survey

- Generate additional business.
- Recognise common customers across business activities.
- Monitor the quality of services provided and manage after-sales service better.

## Adding information to the product or service

The product or service can be transformed, or substantially added to, by using information provided through IT facilities. Information about products and services is the most obvious possibility. This could be extended to include delivery dates, product characteristics, or even a software package with built-in rules to help the customer select the best product for particular requirements. (The ICI application quoted earlier is just such an application.)

Key groups of customers can be provided with access to the supplier's stock levels via computer terminals, or to engineering design software to help specify requirements. By giving a terminal to the customer, the work — and the costs — can be externalised. The customer then takes on the task of initiating enquiries from the supplier's computer.

The next three kinds of application are mainly concerned with extending or changing the market in which the business operates.

#### Establishing links to new customers or new links to existing customers — 'outreach' systems

Telecommunications systems can be used to reach new customers, serve remote markets, or to reconfigure marketing and distribution channels, and interbusiness relationships. Telecommunications can potentially extend the scope of the organisation's operations in several ways — either geographically, or in time, or relative to the other organisations in its marketing or distribution channel, or in terms of the sectors within which it operates. We refer to these applications as 'outreach' systems, to capture the notion of 'reaching out' to new customers. Such systems can offer the following types of benefit:

- Middlemen such as agents and distributors can increase their scope of operations through investment in effective systems.
- Middlemen can be bypassed by linking the organisation directly to its customers.
- Traditional links with customers can be streamlined and updated.
- Access limitations (such as limited operating hours) can be overcome.
- New customers can be reached by expanding the geographic scope of the business.

#### Creating new electronic markets to match sellers to their prospective buyers — market-making systems

Market-making applications use an electronic marketplace to improve the efficiency of existing

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| Figure 4 The seven different kinds of customer applicati   | on identified by our research   |  |
|--|---|--|
| Kind of application  | Where the application contributes to the customer interface   |  |
| Using IT to innovate in existing markets   |   |  |
| Automating communication with customers - EDI  | The 'paperwork' which accompanies business transactions   |  |
| Gaining leverage at the point of sale - EPoS and EFT-PoS   | (invoices, payments, receipts)  |  |
| Finding (and keeping) the customer - the use of database marketing                                   | Customer records (who they are, what they purchase, how much they spend, and so on)                         |  |
| Adding information to the product or service   | Information which accompanies products and services (for example: service manuals, catalogues, price lists) |  |
| Using IT to alter and influence the marketplace  |   |  |
| Establishing links to new customers or new links to existing customers ('Outreach' systems)          | Establishing new links to existing customers<br>Establishing links to new customers                         |  |
| Creating new electronic markets to match sellers to their prospective buyers (market-making systems) | Creating new markets for suppliers and customers  |  |
| Delivering new information-based services  | Delivering new services based on information  |  |

markets, and to create new business relationships. Essentially IT is used to provide an automated or part-automated broking service between buyers and sellers. IT can not only improve the efficiency of existing marketplaces, it can also open these up to other participants, thus creating new opportunities. Of course in so doing it may create new competitors, too! Perhaps the most dramatic examples of this kind of application have arisen as a consequence of deregulation of the financial markets, such as the 'big bang' in the London stock market in late 1986.

This type of application has also provided the potential for the creation of new marketplaces — a capability which has been under-exploited up to now.

## Delivering new information-based services

Information can be used to create entirely new services or variants of existing services. Examples of new services of this type are treasury management and home banking, where IT is used to deliver entirely new services that can provide additional revenues. As yet, the take-up of services for the consumer has been limited, except in certain countries, such as France. Cost of the necessary terminal equipment in the home is still a major deterrent. Hence, elsewhere, the most popular information-based services for the customer are those using the ordinary telephone as the terminal. As mentioned earlier, customer applications are also very relevant in the public and not-for-profit sectors. Figure 5 shows examples of such applications in the public sector.

### Sales and marketing managers should lead the process of defining potential opportunities

Given that there is a wide range of potential applications for customer systems, the first task an organisation must address is that of identifying the opportunities to pursue.

There are four basic principles which govern the successful search for potential customer applications, two of which relate to the organisation and its business needs, and two to the development itself:

The successful application must be closely connected to the needs of the business, and it must solve some immediate problem or concern. In the past these applications have in fact been triggered by these immediate concerns – the methods described here, and in more detail in the main report, allow the organisation to look in the right place for the opportunities.

| Figure 5 How customer applications may be applied to public sector and not-for-profit organisations |  |
|---|--|
| Customer application  | Examples   |
| Innovation in established markets:  |  |
| Business-to-business<br>communications (EDI).   | <ul> <li>Purchasing systems<br/>of local authorities,<br/>universities, hospitals, and<br/>so on.</li> </ul>   |
| Database marketing.   | <ul> <li>Patient reminder systems.</li> <li>Donor/sponsor databases<br/>(for example charities,<br/>universities).</li> <li>Field project databases (for<br/>example overseas<br/>charities).</li> </ul>   |
| Gaining leverage at the point of sale.  | <ul> <li>Book checkouts/analyses<br/>of lending patterns for<br/>libraries.</li> <li>Use of member services (for<br/>example point-of-sale<br/>systems at national<br/>monuments, museums,<br/>and so on).</li> </ul>  |
| Adding information to the service or product.   | <ul> <li>Book catalogues available<br/>to the public, or to students.</li> <li>Performance parameters<br/>on local authority (for<br/>example national auditing<br/>office).</li> <li>Patient status, visiting<br/>hours, appointments for<br/>hospitals.</li> </ul> |
| Creating new markets:   |  |
| Outreach systems.   | <ul> <li>Distance learning for<br/>educational<br/>establishments.</li> <li>Waiting-list management<br/>for hospitals.</li> </ul>  |
| Market-making systems.  | <ul> <li>National exchange of council properties.</li> <li>Bloodbank exchanges.</li> <li>National adoption and fostering service.</li> </ul>   |
| Information-based<br>services.  | <ul> <li>Market research<br/>information for small<br/>businesses.</li> <li>Local chamber of<br/>commerce information on<br/>local facilities and events.</li> </ul>   |

- There must be a suitable climate for innovation in the areas of the organisation most familiar with the needs of the business.
- The basic concepts of the new application are best worked out in a systematic structured way.
- Ideas should be tested, or prototypes built, as soon as possible.

The traditional approach to systems development (a process involving a sequential step-by-step approach which defines the system in terms of more and more detail) will not work. Instead we recommend the 'management decision workshop' as a means to progress from the initial concepts of an application to a decision to go ahead with a specific full-scale implementation. We have used this approach with considerable success in our own consultancy practice. This approach:

- Introduces the business and marketing managers to this new perspective on systems development, and solicits their support, and
- Creates a mechanism for generating and evaluating proposed IT applications.

Figure 6 outlines the steps involved.

The decision workshop meetings (there are often several meetings) bring together senior decision makers in an intensive, interactive environment that focuses on business requirements and relevant information technologies. The workshops can vary in terms of format and in terms of the time required (for example, the time could be as little as one halfday, or as much as two full days, involving daytime and evening working). A typical agenda is shown in Figure 6.

| Day 1  |   |
|--|---|
| Introduction.<br>Review of current market position.<br>Assessment of market development<br>and likely future business needs. | Presentation<br>and discussion<br>led by<br>marketing<br>function.              |
| Review of information technologies<br>and applications:<br>- Technology evaluation.<br>- Application case studies.           | Presentation<br>and discussion<br>led by<br>information<br>systems<br>function. |
| Development of business scenarios.   | Syndicate work  |
| Day 2  |   |
| Development of application ideas.<br>Matching of technology/application<br>opportunities.                                    | Syndicate work  |
| Analysis of business systems implications.   | Group activities  |
| Identification of the next steps.  |   |

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Unlike a simple 'talking session', planning and running a structured workshop is a systematic process. Figure 7 outlines the steps involved.

There are four main steps:

- Preliminary fact finding. This is an essential prerequisite for both establishing the business requirements and for conducting the technology assessment. Likely business requirements need to be explored in advance, to be later agreed and prioritised at the workshop.
- Preparing the workshop. Decision workshops require careful planning and organisation. This includes selecting the participants, planning the agenda, preparing the workshop documentation, and selecting the choice of venue. To be productive, workshops must be intensive, participative, and they must concentrate on

high-level concerns rather than on everyday problems and office politics. Participants should be business decision-makers, at both middle management and senior management levels.

 Delivering the workshop. The session examining business requirements is likely to be not only the longest, but also the most controversial and the most important. It should be highly participative and concentrate on the customer and on customer-related issues.

In the session covering technology assessment brief descriptions of each of the shortlisted technologies are delivered, focusing on the business needs and problems these technologies can resolve.



After the assessment of the business of the organisation and the potential of the technology, the workshop proceeds to its climax — matching the two. One way of doing this is by running syndicate group exercises, and using alternative scenarios as a vehicle.

Following the matching, and whether or not a group exercise is used, the technological opportunities are prioritised in terms of potential impact on the organisation. If the type of participant and time permit, the session can then go on to consider the implications for systems development, such as to prepare a preliminary information system 'roadmap' (that is a representation of how any new applications would fit in with today's systems and a possible order of development), an implementation timetable, and an initial cost assessment.

- *Post-workshop activities.* Post-workshop activities include the production of documentation to summarise the decisions made and actions to be taken, and to merge the results of multiple workshops into an amalgamated document.

### Customer applications pose special problems in their development and implementation

The development and implementation of customer systems has many similarities to other kinds of IT applications. The same problems of design, specification, programming, and testing confront the organisation, and the same difficulties of schedule and budget overruns, technical faults, and so on are likely to be encountered. But there are differences of emphasis which do exist and which are significant, however:

The system must be right first time. The direct involvement of the customer complicates the development and implementation of a customer system. Since the direct impact of any problems will be on customers, the organisation cannot afford to make mistakes or to get it wrong. Such problems can negate any advantage from the new application, and may result in customers being lost rather than gained. This need to be right first time raises the question of how we can be sure that the potential concerns of customers are fully understood, and that the systems are fully reliable and meet customer needs when they are first put into operation.

- The system must be implemented quickly. The customer system is always urgently required. The organisation installing a customer system is in a hurry to catch up with the competition, or to get ahead, and stay ahead of them. This causes problems because of the lengthy timescales typical of large-scale systems development, and will pose particular problems for IT departments with a large applications development backlog.
- The technology must be carefully chosen and managed properly. The customer application is intended to give a business advantage. Satisfying this requirement usually, but not always, means that it involves different technical and operational concepts than other applications already in place in the organisation. In some instances, the technology itself is the source of the business advantage and this may mean that a leading-edge technology is involved. This can conflict with the requirement to make sure the system is right first time, since implementing technology which is new to the organisation can involve substantial risks.

The steps which can be adopted to deal with these differences are straightforward, but the system development manager needs to be conscious of these differences. He or she should assess development plans and monitor the ongoing implementation on the basis of these critical factors for successful customer system implementation. The main report contains more detailed guidance on the steps to be followed in the implementation of applications involving customers. They are based on a special survey of the experience of 40 IT managers who claimed to have successfully implemented such systems.

### The choice of technology is important — and so is the timing

By its very nature, the application of IT at the customer interface is dominated by developments in communications technology.

Our experience over the past 30 years shows that the applications of IT have always been stimulated by the technology, and will likely continue that way for some years yet. IT at the customer interface is at the intersection of some of the most promising developments in IT at the present time, and therefore offers an opportunity to exploit these advances. The dominant developments in IT

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for customer systems are those enabling better communications between suppliers and customers — that is development in telecommunications and network services, and in the terminal devices and systems at the ends of the communication links.

In the main report we consider in detail the future trends and implications of those technologies we believe are having, or will have, most impact on customer systems. They are:

- Telecommunications technology.
- Integrated digital services networks.
- Value-added network services.
- EDI.
- The workstation of the future.
- Speech recognition and voice response.
- The smart card.
- Expert systems.

Caution is needed in choosing the role for technology in the business. The customer application is intended to give a business advantage. Satisfying this requirement usually, but not always, means that it involves different technical and operational concepts than other applications already in place in the organisation. In some instances, the technology itself is the source of the business advantage and this may mean that a leading-edge technology is involved. This can conflict with the requirement to minimise risks in customer systems, since implementing technology which is new to the organisation can involve substantial risks.

In practice, few organisations have used leadingedge technology in customer systems, but they have used certain technologies which are new to them when they implement customer systems. Without this technology the key business idea, which generated the business advantage, would not have been possible in the first place. Thus the technology plays an important role in customer systems, but it is an enabling role, not a driving role.

The conclusion to be drawn here is that any choice of technology must be conservative. Organisations need to limit the impact of any inexperience on the organisation, either by using a third-party service or by seeking outside advice. If this is not feasible, then a trial system should be set up to prove the technology under actual operating conditions. These steps are typical of the tactics adopted by many of the organisations we interviewed. In our survey of IT managers, we asked respondents to indicate their approach in some specific areas. The results are shown in Figure 8. Clearly there is considerable variation in approach, but the most common feature is the use of pilot systems prior to full implementation. The use of such trials, and also market research on customer reactions, fulfill the need to make certain that the proposed system will be acceptable and useful to customers.

The technology of choice should also be at the right stage in its development. Timing is important. An unproven technology leads to risks that the technology will not live up to its promise, or worse still, that it will remain underdeveloped and unsupported just at the point when the organisation becomes most dependent on it.

By systematically looking for customer system applications, choosing the appropriate technologies to apply, and managing their implementation in the ways we have described, organisations can take real advantage of IT to grow and thrive in their marketplaces.

| and the second se | Porcontago of       |
|---|---------------------|
| Aspects of implementation method  | respondents<br>(%)* |
| Used pilot trials as part of implementation.  | 83                  |
| Standard hardware used at customer interface.   | 67                  |
| Carried out research into likely customer reaction before imple-<br>mentation.  | 50                  |
| Standard software package used.   | 50                  |
| External services used to provide support or facilities.  | 40                  |
| Sources of help available to customers:   |                     |
| - Telephone help desk   | 45                  |
| - Document/printed instructions.  | 5                   |
| <ul> <li>Access to supplier staff<br/>member.</li> </ul>  | 35                  |
| - Other   | 15                  |

40 European IT managers (UK,France,Germany)

Source: Butler Cox survey

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