IT strategy in retailing: organizational change and future direction

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IT is having a tremendous impact on most forms of business and the literature suggests large benefits from innovative applications. One major sector of the UK economy, retailing, is undergoing vast technological changes with the introduction of EPOS equipment and the associated developments in banking and financial services. However, the broader conceptual importance of IT in retailing is less apparent. In order to redress this imbalance, we present some field research from a range of retailing businesses. A stages of growth model is proposed which shows the interdependency between IT and business strategy, and depicts the critical role of organizational change in successful strategy implementation. The results indicate that although efficiency benefits are being obtained, most of the organizations are not at the leading edge of IT and its use as a strategic weapon cannot yet be realized because of the lack of an IT infrastructure. Finally, some possible future directions are outlined with reference to leading companies from retail and other sectors.

Keywords: strategy, retailing, organization

Retailing is an important sector of the UK economy, and contemporary research in this area suggests that IT is a critical aspect of retailing strategy1,2. This view is also supported by senior retail management. For example, Lord Rayner3 of Marks and Spencer states: 'Our growth will be respectable. But it will stem essentially from better control of our stock and cost savings from IT.' However, there is little research that attempts to link management theory to the implementation of IT in retailing. The aim of the paper is to address this deficiency and structure some important strategy and organization concepts from the general management literature and apply them to the implementation of IT in retailing companies. The primary research method is detailed case study and a series of examples are in the main body of this paper. An earlier paper by the authors4 based on the same case-study material discusses the use of IT for competitive advantage. A short review of business strategy, IT strategy and organizational change is presented before the ideas from the literature are used to analyse the case data.

Business strategy

The concept of strategy as a means of analysing and planning the purpose and goals of an organization and how it could achieve them is an intuitively appealing and simple idea, and one that has been adopted by different management disciplines which include organizational behaviour, competitive strategy and marketing. It is beyond the scope of this research to review the whole of the strategy literature but instead, the contrasting views of Porter5 and Mintzberg6 will be used to form the basis for subsequent discussion and analysis. The interested reader is referred to Ansoff7 and Quinn et al.8 for a fuller discussion of the subject.

Porter's model5 proposed a microeconomic analysis of strategy which focuses on the competitive environment of a firm and industry characteristics. It is argued that strategy formulation is about understanding competition, which in turn depends on five forces: the threat of new entrants, the bargaining power of customers and suppliers, the threat of substitute products and the rivalry between existing competitors. This view represents the planning aspect of strategy, that is, it focuses on a rational analysis of markets to produce a formal business plan. A different view of strategy is given by Mintzberg6 who uses a crafting metaphor to describe strategy formation in which managers are craftsmen working on the strategy of their organizations. He asserts that creative strategies evolve through a learning process in which managers should understand the corporate histories of their organizations as well as considering future opportunities. Using this metaphor, planning and implementation merge together, so it is no longer sufficient to consider planning in isolation. To describe some of Mintzberg's ideas on strategy, some quotes from his
study are used: 'Strategies are both plans for the future and patterns from the past'. Mintzberg argues that to represent strategy formation accurately, it is artificial to separate an organization's history and its plans for the future because it would be an oversimplification of how strategy works in practice. The concept of emergent strategies is also introduced. These are patterns of behaviour from the past that were not deliberate. Whilst the role of formal planning is recognized, the crafting metaphor brings out other aspects of strategy formation: 'To manage strategy is to craft thought and action, control and learning, stability and change'. This quote conveys the active involvement of individuals and groups of managers in the strategy process which involves control and learning elements. Successful strategies are capable of evolving through periods of stability and recognize discontinuous changes in the environment.

The two different views on strategy are not dichotomous but do represent contrasting opinions of a subject that continues to change and develop in many directions. An early emphasis on planning is now balanced by research on process and implementation.

**IT strategy**

A quote from Scott-Morton on strategy formulation methodologies and IT is relevant before trying to link information with strategy:

"This topic is complex. Concepts that help with strategy formulation are continually evolving and information technology itself is changing, so the impact of one on the other is indeed complex."

The difference between the strategic use of IT and IT strategy should be identified. The strategic use of IT is the application of computer and telecommunications technologies that affect the competitive position of the firm. There is no agreed definition of IT strategy, but taking one concept of strategy from Mintzberg, an IT strategy is a pattern in the stream of decisions from the past and the future plans concerned with IT. An IT strategy may therefore contain the strategic use of IT.

There is a proliferation of papers and books in this area but one that has received little attention is the Organizational implications of IT which are critical in the process of IT implementation.

**Organizational change**

There is an extensive literature on technology and organizational structure from the field of organizational behaviour (technology is used here in its broadest sense to mean the knowledge, tools, techniques and actions used to transform organizational inputs into outputs. The Tavistock Institute studies and the Aston studies have already established the link between technology and structure, but IT is different from other technologies such as machinery or work procedures, and therefore may require new models to help us understand how it interacts with organizations.

Networked computers process and transfer information, and are therefore bound up with the communication and decision-making processes in organizations. For example, Kiesler distinguishes between isolated and networked computers and emphasizes that it is not just individual tasks that are affected but the way in which work is organized when computers are connected together to form a network: 'As computers become a shared technology, they influence the organization of work as well as work itself and enter the domain of management'.

Computer networks are different from other information conduits because large volumes of information can be transferred over long distances almost instantaneously. Once it is accepted that networked computers enable and support new designs of organizations, it then becomes necessary to consider organizational change in the implementation process of large, networked information systems. This is not a novel idea, but one that has received little attention.

**Retailing**

The concepts of strategy and organizational change associated with the implementation of IT in organizations need to be placed in a retailing context before presenting the case-study research. The retailing industry has its own particular characteristics which make it different from other sectors such as commerce and manufacturing and present some unique managerial problems. Retail organizations typically offer a wide variety of products to a large number of individual customers which involves managing a high number of relatively low-cost transactions compared to business markets. It is therefore important to keep the cost of each transaction to a minimum and have a management information system that can cope with the huge volume of information that is inherent in operating such a business. Organization of large retailing companies is also different; the chains of small shops and the major multiples have a spatially disaggregated establishment network. Compare this with a large manufacturing company where the establishment network will be much more concentrated in terms of plant, people and information on a smaller number of individual sites. Coordination, control and communication throughout a retailing organization are all affected by this spatial disaggregation which also has implications on where the economies of scale can be achieved. For a wider discussion on how the particular characteristics of the industry affect retailing strategy, see Knee and Walters and Wrigley.

In the retailing cycle of planning, purchasing, receiving, warehousing, allocation and replenishment and branch support activities, huge volumes of information need to be managed because of the number and variety of products. Developments such as Kimball tags and hand-held terminals to collect data from around the store have all been welcomed by retailers because it helps to manage this volume of data by making its collection easier. The development of electronic-point-of-sale (EPOS) means that it is now becoming possible to have accurate and timely data for immediate use by managers based anywhere in the...
company, and many of the old constraints on information are disappearing.

Research framework

The potential for retailing organizations to use IT appears to be enormous. It is proposed that IT strategy is linked to business strategy and that successful implementation of IT projects in general requires organizational change. The research framework is shown in Figure 1. To explore the relationships between business strategy, IT strategy and implementation and organizational change, case research has been conducted in over 20 UK firms and the data are presented in the next section.

Case studies

This paper presents research into IT strategy from a sample of 20 companies in the UK retailing sector covering a wide range of businesses. The research is based on structured interviews with executives or directors specifically responsible for information systems. Other members of the organization were interviewed to corroborate information and obtain more detail on particular subjects. Documents describing the computer systems, large projects, planning reports and organization charts were also collected. A sample of four cases are presented in tabular form to best illustrate the main concepts and ideas, and provide an insight into IT strategies in retailing (see Table 1). The sample cases were chosen to illustrate the current situation and are representative of the whole group. Names have been changed for the sake of confidentiality, but in all other respects the details are as found in practice.

Case conclusions

These cases are typical examples of our primary study of 20 retailers. Although not the largest companies in the UK, they are all well known and successful businesses. Our study covers a wide range of products and different types of organization, but even so some common themes clearly emerge. All 20 cases appear to be trying to cope with IT without fully realizing its true importance and potential. It would be better for them if they had a clearer understanding of the real problems and benefits associated with the introduction of IT. Although it is a sample its breadth of coverage suggests that it is representative of best practice for the majority of successful retailers. There are a few examples of highly innovative approaches but these are a small minority.

Critical issues which emerge from the case data as a whole are scale of IT resources, dependency on information systems, high software maintenance costs, the implementation of IT plans and management of IT activities. The IT spend on computer equipment and human resources is large and increasing. Companies are also dependent on information systems to carry out basic operations such as accounts, stock replenishment and purchasing, so IT spend is an essential overhead. Of immediate concern is the high software maintenance costs. In some cases this exceeded 50% of the IT budget and was a contributory reason for building a new information system, e.g. Clothes and Car Spares.

Incremental changes and additions to a large group of interconnected computer programs over a long period of time cause high complexity and low reliability in software. The Cooperative is continuing to maintain old software and has no plans to change. This delays confronting the issue and will eventually result in no new systems development and all resources being used up in software maintenance. Clothes, Pottery and Car Spares are implementing a low-risk strategy of rewriting the existing software onto new technology. They are seeking to reduce the technical and organizational problems by limiting the scale and scope of the changes to the information systems, although it has still proved to be very difficult.

A further choice which none of the case samples has attempted is to establish a senior project/strategy group to review, plan and implement new information systems that are integrated with the business strategy of the firm. Of the whole sample, 20% are in the very early stages of building simple isolated information systems, 40% are maintaining old established systems and have no immediate plans for change, and 40% are attempting to make the transition to new technology by rewriting their old software in new languages and using new computers. None of them are trying to integrate IT and business strategies together and embrace the potential of this new technology.

Innovative IT applications such as space management are not receiving much attention. One of the reasons for this is the immediate requirement to establish a basic IT infrastructure (Clothes, Pottery and Car Spares) which uses up a lot of IT resources. Another, more tentative explanation, is the use of similar IT management structures. A simple, hierarchical structure organized around the technology as opposed to the business is common in all the sample cases. For example, Clothes has one branch of IT management for IS development, another for technical services and one for computer operations and communications. Different aspects of the technology dominate the structure of the IT departments. There are many different ways of managing IT, but an organization structure to manage across functions is the matrix structure. Applied to IT management, teams of IT staff possibly including hybrid managers who are equally competent in business and technology, would be assigned directly to different business functions and projects.

In summary, retail organizations are grappling with the new technology, but are not yet moving into the more strategic areas as posed by the literature. The ones that do have a stated business strategy are experiencing difficulties with implementing an IT strategy and the
<table>
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<tr>
<th>Company</th>
<th>Industry and background</th>
<th>Business and IT strategy</th>
<th>IT management</th>
<th>Position on model</th>
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<tbody>
<tr>
<td>Cooperative</td>
<td>Diverse business interests from food to car dealerships. Turnover £300 million.</td>
<td>Cooperative ethos which results in mixed objectives that sometimes cause conflicts. Basic information systems on one mainframe computer, e.g. personnel, finance, asset registries and warehouse control. Data collection from stores is from hand-held terminals only. Very high maintenance costs and new development slow. The IS plan is to centralize all data collection and decision making on product ordering using EPOS.</td>
<td>Simple hierarchical management split into business support, operations and technical services.</td>
<td>Isolation stage with no plans to overcome the problems of maintenance or new system development.</td>
</tr>
<tr>
<td>Pottery</td>
<td>Worldwide manufacturer and distributor of fine china. Established retail network in the UK which accounts for over half its turnover.</td>
<td>Strong emphasis on quality of design and manufacture. Stated plan is to develop new brands, expand the distribution network and improve operations. Manual collection of stock data only from stores. Mainframe application areas are warehousing, distribution, stock analysis, finance and production scheduling. IS plan is to implement EPOS to collect basic sales data for better control over cost of operations. Technology strategy is to move to new hardware and convert software to 4GL.</td>
<td>Strategic IT controlled by a computer policy committee. IT department consists of systems development and maintenance, operations and technical support, organized in a simple hierarchical structure.</td>
<td>Isolation stage attempting to move towards integration.</td>
</tr>
<tr>
<td>Clothes</td>
<td>Mens fashion and childrenswear company. Part of a much larger group.</td>
<td>Parent company has a strong influence but Clothes controls its own marketing strategy. Top-down planning process starting with a merchandise plan drives individual product buying decisions. IT systems have evolved over a period of 20 years to cover planning, purchasing, goods received, warehousing, allocation and replenishment. The software is very complex and therefore costly to maintain. New development is almost at a standstill. An IS project to implement bespoke software has begun with the objective of retaining the features of the old system but without the maintenance problems. A phased migration strategy involving interfacing to the old system has encountered many difficulties; long delays and escalating costs have resulted. Future plans include space management, EFTPOS, EDI and DSSs.</td>
<td>The new IS project is a joint venture with a major computer supplier which will market the retail software. It is managed through a pyramid structure containing executives, senior managers, team leaders, analysts and programmers from both companies.</td>
<td>Isolation stage and following a new lams for old strategy to move towards integration. Project progress is very slow. Innovative ideas cannot be pursued until a basic IT infrastructure is in place.</td>
</tr>
<tr>
<td>Car Spares</td>
<td>Specialist car repair and part replacement. Based in UK but expanding into continental Europe.</td>
<td>The stated business plan is to diversify the product range, enter business markets in addition to retailing and increase market share. Information systems have been developed over 10 years to provide centralized decision making. The software is very complex and difficult and expensive to maintain. The IS plan is to convert existing software onto new technology and retain the functionality of the old systems but without the maintenance costs. Cloning the UK software into other countries is being considered.</td>
<td>A small group consisting of the IT director and 10 staff are responsible for maintenance and operation of systems. All new development is done by contract programming staff.</td>
<td>Isolation stage with high maintenance and no new system development. Attempting a low-risk new lams for old, integration strategy.</td>
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associated organizational changes are not well understood.

Proposed model
Based on an analysis of the 20 companies in the study plus theories from business strategy, IT strategy and organizational change, an IT strategy model for retailing organizations is proposed. It consists of three sequential stages which companies move through over time: isolation, integration and innovation. Its detail is shown in Figure 2.

This is a 'stages of growth' model and is meant to be complementary to earlier work in this area. The names of each stage are used in some of the other models but they are not meant to correspond in any way. Many research studies have been carried out into stages of growth but only a small sample of them is discussed here to illustrate the critical issues and place the proposed model in context. The interested reader is referred to Galliers and Sutherland [26] for a fuller discussion.

Several theories have developed along similar lines. The status of the proposed model is discussed with reference to these earlier models. Nolan [27] characterized six stages of data processing (DP) with four growth processes: applications portfolio, DP organization, DP planning and control and user awareness. These growth processes are mainly introspective to the IT function and have now become less important relative to the more strategic issues. In a series of related articles McKenney and McFarlan [28], McFarlan et al. [29], McFarlan and McKenney [30] employed an island metaphor to describe IS assimilation within organizations focusing on the management of technology integration. Many of the predictions of technology convergence have now taken place and the main problems now appear to be organizational rather than technical.

Earl [31] built on these ideas to produce a stage model which stressed the changes in IS planning which occurred as an organization moved from one stage to the next. The strategic theme and the importance of business planning related to IS development is emphasized but the issues of implementation are neglected. Galliers and Sutherland [26] proposed an extended and revised stages of growth model which was much wider in its scope than previous ones. This represents a move towards more holistic models. For example, it included general organizational elements (in addition to computer ones) which were designed to help organizations move through the IT growth stages. In summary, although these models include wider aspects of the organization, e.g. user awareness [32], business characteristics [33], strategic planning [31] and organizational elements [26], they do not address the interdependency of IT and business strategy and the processes of IT and organizational change between stages.

<table>
<thead>
<tr>
<th>ISOLATION</th>
<th>IT strategy</th>
<th>Business strategy</th>
<th>Time</th>
</tr>
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<tbody>
<tr>
<td>Larger, complex systems</td>
<td>Traditional data processing</td>
<td>Strategy group needed to have major influence on design of new system</td>
<td></td>
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<tr>
<td>High maintenance costs</td>
<td>Structure</td>
<td>New systems designed which need project management and implementation skills to make them work</td>
<td></td>
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<tr>
<td>Many upgrades to hardware and software</td>
<td>Importance of information</td>
<td>IT and organization of work become intertwined</td>
<td></td>
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<tr>
<td>Heavy reliance on technical staff</td>
<td>Technology increases</td>
<td>Matrix structure for IT management</td>
<td></td>
</tr>
<tr>
<td>Continuous change and improvement of existing practices</td>
<td>Eventual collapse of system</td>
<td></td>
<td></td>
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<tr>
<td>Eventual collapse of system</td>
<td>IT change</td>
<td>Organizational change</td>
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<tr>
<th>INTEGRATION</th>
<th>IT change</th>
<th>Organizational change</th>
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<tbody>
<tr>
<td>Use of new technologies</td>
<td>Strategy group needed to have major influence on design of new system</td>
<td></td>
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<tr>
<td>e.g. fourth generation languages</td>
<td>New systems designed which need project management and implementation skills to make them work</td>
<td></td>
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<tr>
<td>Use of development tools</td>
<td>IT and organization of work become intertwined</td>
<td></td>
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<tr>
<td>Common data shared between different applications and stored on advanced database</td>
<td>Matrix structure for IT management</td>
<td></td>
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<tr>
<td>IT infrastructure connecting different parts of the organization together</td>
<td></td>
<td></td>
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<tr>
<td>Integration of business functions</td>
<td>Innovation change</td>
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<tr>
<th>INNOVATION</th>
<th>IT change</th>
<th>Organizational change</th>
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<tbody>
<tr>
<td>Information systems extend outside the organization</td>
<td>Experimentation and creativity</td>
<td></td>
</tr>
<tr>
<td>Information as a product</td>
<td>to create new products and organizations</td>
<td></td>
</tr>
<tr>
<td>Novel applications:</td>
<td>New skills to support innovative business</td>
<td></td>
</tr>
<tr>
<td>DSS, EDI, EIS, EFTPOS, database marketing, electronic mail</td>
<td>and technical activities</td>
<td></td>
</tr>
<tr>
<td>New products and markets</td>
<td>Disintegration of organizational boundaries</td>
<td></td>
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<tr>
<td>Novel delivery mechanisms</td>
<td>Common European market</td>
<td></td>
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<tr>
<td>Globalization</td>
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Figure 2. IT strategy model
The model proposed here extends many of the themes of earlier models but attempts to integrate the wider issues of business strategy, IT strategy and implementation and organizational change. It therefore addresses both the possible future directions (business and IT strategies) and the mechanisms and characteristics of change (technical and organizational discontinuity and organizational change). It is therefore different but complementary to other stages of growth models.

Each stage illustrates the interdependency between IT strategy and business strategy and is characterized by distinct patterns in decisions concerning information systems and management. For example, Clothes, Car Spares and Pottery are attempting to move through the model, from isolation to integration, and are facing organizational problems in addition to technology issues. The Cooperative is still in the isolation stage and does not have a clear vision of where it wants to go in the future. A key part of the model is that changes in the information systems must be accompanied by organizational change to be successful.

In this section, each stage in the model and the change processes are discussed with reference to the case vignettes. The innovation stage is illustrated with a travel example because none of the research sample had embraced ideas such as novel applications, information systems that extend across organizational boundaries and new delivery mechanisms.

Isolation
In the isolation stage, DP departments are responsible for the computer systems, and are mainly concerned with technology issues. As computing spreads throughout the organization (normally from the accounting department), liaison with other functions becomes necessary. The main thrust of IT is to improve efficiency by reducing costs. Although no strategic benefits are gained, the business becomes dependent on its information systems for routine decision making.

Through the addition of more and more software and upgrades of existing hardware very sophisticated systems have been built over long periods of time (10 or more years in some cases). However, these systems become unstable, that is, they do not function in a predictable and controlled manner. Constant attention from large teams of programmers, analysts and operators is needed just to keep them going. In most organizations, the main IT cost (over 50%) is current systems maintenance. They are often written in out-of-date languages and have had many fixes, that is, short-term solutions. These may have made the systems inefficient and cumbersome, and increasingly costly to maintain. In functional terms, these systems can be acceptable but further development is almost impossible. Clothes, Car Spares and Pottery are in this stage and are attempting to implement integration strategies. The Cooperative organization plans to continue with an isolation strategy because it is more predictable and controlled. Constant attention is needed just to keep them going. In most organizations, the main IT cost (over 50%) is current systems maintenance. They are often written in out-of-date languages and have had many fixes, that is, short-term solutions. These may have made the systems inefficient and cumbersome, and increasingly costly to maintain. In functional terms, these systems can be acceptable but further development is almost impossible. Clothes, Car Spares and Pottery are in this stage and are attempting to implement integration strategies. The Cooperative organization plans to continue with an isolation strategy because it is more predictable and controlled.

Integration
To overcome the breakdown of current systems, a new infrastructure must be built (integration stage). The business and IT systems can no longer be considered to be separate entities but are inextricably linked, so a strategy group should consider the business and IT strategies together. There is also a need for good project management skills to organize the development of new information systems. There is an opportunity here to integrate the internal information systems of a company, take advantage of new technology and prepare for innovative IT developments in the future.

One approach to the problem of computer programs becoming interlinked and too complicated to understand is to design modular systems that only share data. For example, the purchasing module is kept separate from the warehousing one, but the benefits of integration are gained by sharing data between them. By this method it is intended that the present predicament is not experienced to the same extent in the future.

Large retailing organizations who have realized that their computer systems are becoming or are already unviable are in the process of replacing them. It is an important strategic decision, because it lays the foundation for the use of IT for at least the next five to ten years. Even though low risk strategies have been chosen (Clothes, Pottery and Car Spares), the scale and extent of the organizational and technological changes seem to have been underestimated. Whether the approach of straight replacement which tries to retain all the features of the old system will provide a flexible, skeletal framework for the future is questionable.

Innovation
This stage is characterized by innovative business strategies which are critically dependent on the successful deployment of IT. None of the organizations in this sample have reached this stage although there were a small number of innovative IT applications. Car Spares used EDI with its suppliers to reduce administrative costs and reduce delivery lead-times. Results from other industries suggest that innovative uses of IT exploit existing resources and strengths in a way that it is made possible by IT. For example, Merrill Lynch combined the strengths of its banking and brokerage businesses by linking them together with telecommunications to offer a new and unique product. American Hospital Supply exploited its customer base which was spread over a large geographic area and also its wide product line.

A good example of an innovative business strategy which relies on IT for it to be viable is Rosenbluth International Alliance. In response to increased globalisation of its customers and suppliers, Rosenbluth Travel have implemented a strategy of international cooperative alliances. This has been achieved through...
the innovative application of IT to coordinate services between national travel companies. This has resulted in what Clemons and Row call a 'global virtual corporation'—a global presence combined with local responsiveness. For other views of what the future might look like, the interested reader is referred to the information organization\(^{36}\), the information-based organization\(^{37}\) and the federated organization structure\(^{38}\).

There is now evidence of the huge potential of information systems in service industries. Retailing organizations should re-assess their business strategies and consider the many opportunities now made possible by IT. They need to have a vision of the future.

**IT implementation and organizational change**

Theories on how information systems affect organizations are at an early stage of development\(^{39}\). There is disagreement about the form of new organizations arising from the implementation of IT and what are the best implementation strategies. However, given that new organizational forms are emerging which rely on information systems for their effective performance, most authors agree that organizational change is an embedded part of successful IT implementation\(^{31,40-42}\). However, this is not the approach taken by Clothes or Car Spares.

Clothes and Car Spares have reviewed their IT strategies and have chosen to replace their existing information systems with similar applications based on better technology. Neither of them acknowledges that changes in their information systems may also require organizational change and both companies are experiencing difficulties in implementing their chosen strategies.

Building new, large information systems is difficult from a project management and implementation perspective. Both companies have strong similarities in the way that the projects have been managed and have experienced similar problems. In both cases, the IT manager/director (with overall responsibility for IT) played a major part in the design of both the old system and the new one. Both companies also relied heavily on the computer manufacturer supplying the hardware to provide expertise and staff in programming, analysis and project management. The most interesting similarity is that both companies consider the IT project to be a software development problem and not an organizational one, and consequently leave the management of IT to a specialist computer group.

Several different implementation strategies are suggested in the literature. These vary from a project-centred approach\(^{40}\) to an elite strategy\(^{41}\) who are able to oversee and balance interdependencies for the whole of the organization\(^{31,44}\). Based on extensive experiential knowledge, Kaye\(^{41}\) thinks that an elite group is needed to carry out information systems projects: 'IT is becoming too important to leave to IT experts'; 'The IT revolution is changing top management's job of formulating business and organisational strategy'.

Similarly, Whistle\(^{41}\) argues that the introduction of IT requires the effective management of organizational change. He proposes one strategy of using a 'think tank, a planning elite', to manage the change process. Although these theories on organizational change and its management are only partial, they help explain some of the difficulties that Clothes and Car Spares have experienced. They only appear to be considering the technical dimension of IT implementation and have mostly ignored the organizational issues.

**Discussion of model**

The companies in the case-studies are at different stages of development with their information systems. Clothes, Pottery and Car Spares are implementing new systems to replace existing ones which have become essential in supporting routine operations. It must be emphasized that these projects have a *new lamps for old* philosophy and do not consider the possibilities of organizational change and building for innovation. An analogy is that of replacing the old telephone exchange system. In these and other cases, the old computer systems are becoming unmanageable because of continuous change and enhancement over a long period of time. Replacing them with similar systems (albeit more reliable and robust) is a consolidation move, rather than a leap forward. This may be a necessary step to keep their systems functioning, but on its own will lead to the same problems reappearing in a short time, unless the organizations see this as just the initial stage of change.

Information systems in retailing are obviously moving on through the development of existing systems or the building of completely new ones in an attempt to establish a new infrastructure. However, none of the cases studied is thinking beyond today's problems. A fashion retailer and the cooperative organization in the study are caught up in stage one of developing existing systems and will eventually reach a point where it will be impossible to continue. The best ones have got medium-term information systems strategies to replace existing systems with new ones but this is not thinking beyond the second stage. It is a *new lamps for old* approach and a strategy which does not take into account the long-term opportunities.

For the organizations that get it wrong now, it may not be possible to embrace the innovation stage. Will the technical systems being implemented now be able to accommodate future changes in the business? For example, how easy will it be to connect to other organizations such as banks and suppliers, will the networks that connect the stores with the head office support two way flows of information for applications such as electronic mail, and will it be possible to adapt or add to the infrastructure for events such as takeovers, mergers and going into new business areas? The model structures many of the technological and business issues associated with the implementation of IT strategy in retailing, and proposes that changes in the IT need to be accompanied with organizational change to be successful.

**Future of IT in retailing**

The best retailers should be thinking about a number of issues which can be influenced by IT. Globalization of competition is already happening and an important part of this are the European Commission directives which have the aim of making member countries into a
single European market for the free movement of people, products and services throughout member states. The economic logic is that in order to compete with Japan and the USA, European countries need to cooperate with each other to form a trading bloc that is capable of competing in a global market. Following this logic, it is therefore appropriate to discuss the influence of information systems from the perspective of a UK company that is following a European marketing strategy.

Some UK-based retailers already have some experience of the European market or are taking steps to move into it. The Corporate Intelligence Group gives examples in each of the major sectors which include Throstons, Laura Ashley, Mothercare, Sears, Gillow, Boots, Marks and Spencer, Great Universal Stores and John Menzies among others. The results of a research project on the evolution of European retailing suggest a fragmentation of individual markets within individual countries. It is asserted that local marketing will therefore be necessary to accommodate different consumer styles, tastes and behaviour in particular countries and regions because of social and cultural differences across Europe. One particular development in IT which may be relevant here is geographic information systems (GIS), which have been used to collect and analyse data on physical, cultural and demographic attributes in the US. The possible marketing applications are site location, targeted direct marketing and market analysis. However, an initial problem for European GISs might be the source and quality of data.

The marketing of products and services on a European scale requires a transport and distribution infrastructure. Large retailing organizations in the UK currently control many parts of the upstream supply chain because of their relative size advantage over manufacturers. In the UK grocery supply chain the top seven multiples enjoy a market share of over 70% and of this, 70% is delivered through consolidation warehouses that are managed by retailers. It is unlikely that the supply chain control can be retained by these companies in Europe because their European market share is smaller and manufacturers will be looking for ways to redress the balance of power.

Physical, technical and fiscal barriers now enforce boundaries between countries. Once these have fallen, then manufacturers will also consider Europe as one market and the logistics of manufacturing site location and distribution will change significantly. Manufacturers will try to seize the opportunity of using centralized warehousing and advanced distribution techniques such as dynamic sourcing and channel selection. Electronic data interchange (EDI) may provide the opportunity for retaining close relationships with manufacturers and sharing the increased benefits. (EDI is the exchange of information through the use of IT across organizational boundaries.) The importance of EDI in US retailing has already become evident and many UK retailers already have experience of it.

Conclusion

Computer systems have a limited useful life and many retailing organizations have realized this and are in the process of replacing old systems. The most common strategy is 'new lamps for old', where the strategic significance of these new systems is not to the fore. It is accepted that they are needed to improve efficiency and reduce costs but little effort is being put in to explore the possibilities of other, more strategic benefits. The business and IT strategies need to be considered together, and this is not possible if IT development is controlled by a specialist computer group. This research proposes that the implementation of IT systems requires organizational change so that technology expertise alone is insufficient.

Opportunities for innovative use of IT in the future will rely on the business and IT framework that exists at the time. Many opportunities may lie outside what is now considered to be the scope of a retailer's traditional activities. The travel industry serves as a good example here. Retailers should now be thinking about the sort of infrastructure that will be needed for the next five to ten years to exploit such opportunities. Good innovations cannot be copied overnight because they rely upon an infrastructure which can take years to build.

Trading in other organizations is tending towards globalization and retailing will follow this pattern. The common European market is perhaps the most important development here because it will fundamentally affect competition for UK retailers. Other trends include the possibility of new products/markets (financial services) and an increase in the use of EDI for electronic markets and closed links with suppliers and other organizations such as competitors and banks. The strategic IT model illustrates that IT has implications beyond increased efficiency and productivity (isolation stage) and can affect both the organization of work (integration stage) and enable competitive strategies that are only possible through the use of an IT infrastructure and innovation (innovation stage).

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