Transforming the organization: the contribution of the information systems function

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This paper argues that transformation, which is a fundamental reshaping of an organization's behaviour, is an effective response to an uncertain and changing business environment. A critical element in developing a transformed organization is a process that coherently combines the design, development and exploitation of systems and their organizational context. The paper contends that information technology can be an important enabler and integrator in this process. However, for the technology to be properly exploited, the information systems function needs to be aligned with the business processes, and information systems specialists need additional knowledge and skills, and must adopt changed attitudes.

Keywords: organizational transformation, business reengineering, information systems, information technology

This paper focuses on identifying the characteristics of a transformed organization — which will allow it to be successful through the 1990s and beyond — and in particular to identify the contribution which information systems (IS) can make to such an organization

Organizing for efficiency

Over the past 100 years there have been considerable improvements in the organization of production that, for example, yielded a 10-fold increase in industrial productivity in the USA. At the core of these advances was Frederick Taylor's (1947) concept of 'scientific management' which advocated the systematic investigation of work methods, the separation of routine tasks from planning and control, and the substitution of machine power for manpower. Although this concept was originally aimed at 'factory floor' practice, its application progressively spread first to most aspects of the material flow system and then into managerial activities.

This approach to the organization of work was based on a number of premises
and objectives that were both valid and laudable at the time. Two key premises were that making work more routine and separating management from it would have no negative impact — indeed the substitution of machinery was expected to have the reverse effect, and that customers' needs could be met by the provision of standardized products that could be produced much more efficiently because of the economies of scale. Thus, the strategic objective of manufacturing and commercial activity became internal efficiency, and this was pursued by the application of rigorous planning and work study. A consequence of this approach and the associated capital and intellectual investments was a loss of business flexibility — both in terms of productive capability and in terms of culture and employee relations.

Towards the later stages of this era, information technology (IT) became a commercial reality and fitted well into the framework of scientific management. It provided a means of replacing repetitive clerical work with (high cost) capital equipment, with the consequence that for many years office work was arranged around the computer. Moreover, the approach to justifying and designing computer-based systems was derived directly from the principles of work study that had been refined over the previous 50 years.

**Transformation is a fundamental reshaping of the organization’s behaviour**

The purpose of organizational transformation, or business reengineering, is to change radically the way in which businesses (and institutions and other public bodies) behave (see, amongst others, Weber and Kelly, 1993; Hammer and Champy, 1993). Organizational transformation requires the fundamental reappraisal and redesign of business processes to achieve dramatic improvements in organizational performance.

The desire to make such a fundamental change is driven by three aims:

- To develop an inbuilt capability to detect and respond to changing circumstances. The reasons for wanting such a capability are reviewed below.
- To gain immediate and direct economic benefits, particularly as a result of much higher levels of customer satisfaction and more streamlined operations.
- To achieve positive employee benefits, such as increased job satisfaction and personal development, that make a direct contribution to achieving the other two aims.

Transformation involves a change from a functional organization of the business to one that is centred on the main business processes. As Hammer (1990) so forcibly argues, these processes cut across the conventional functional boundaries of an organization. For example, a business process might be concerned with satisfying a customer requirement which would entail receiving a request from the customer, fulfilling the request, billing the customer and accepting payment. Such a process would normally involve several functions, including sales, order processing and accounting.

Transformation also refocuses the business on its customers. This involves the reshaping of management style and culture, and of organization structure, combined with considerable delegation of authority and an emphasis on the continuous development of staff. A natural consequence of this change will be the flattening of organizational structures. Indeed Drucker (1988) asserts that the typical large organization 20 years hence will have fewer than half the levels of management of its equivalent today, and no more than a third of the managers.
With this will come a considerable shift in organizational culture, which, Drucker suggests, will mean that organizations of the future will 'resemble organizations to which neither the practising manager nor the management scholar pays much attention today: the hospital, the university, and the symphony orchestra!'

Today, IT forms the backbone of business communication, transaction processing and decision-making systems. By and large these technology-based systems have been developed rather independently of other aspects of the organization. A critical element in developing a transformed organization to meet the three aims set out above is a process that coherently combines the design, development and exploitation of systems and the organization. Figure 1 illustrates the way in which such a design process can be successfully established, with IS design included as part of a larger activity incorporating business process and organization design. Equally, this larger design process has to be successfully translated into operational practice, which requires critical aspects of organization behaviour to be recognized and addressed, and must be clearly related to the organization's strategic vision and developments in the external environment.

**Transformation is an effective response to an uncertain and changing business environment**

There is widespread — perhaps universal — belief that the next decade and beyond will be a period of sustained and hard-to-predict change. Certainly all of the ingredients are present:

- numerous marketplace changes and in particular globalization;
- shorter product life cycles;
- more highly tailored products and services;
- fundamental changes in political geography: changing social values and demographic patterns;
- improved methods of business management that among other things bring together the best elements of Eastern and Western practice.

These changes call for major competitive responses from companies in all industrial sectors. As Rajan (1990) states, 'Unless these responses are there, even the giants of today can turn into the dinosaurs of tomorrow'. Against this background, successful companies must undertake the task of repositioning themselves strategically, as well as creating efficient capacity — that is, transforming the business! To achieve this, organizations must develop a set of well-defined
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strategies for all aspects of the business, including products and services, marketing, distribution, and finance and investment. Underpinning this development will be an innovative management which places a major emphasis on positive industrial relations, skills, development and technological adaptability. For successful companies, there will be a two-way relationship between people and the business (Brown and Watts, 1992).

In these circumstances, Taylor's approach of scientific management has further shortcomings. The essence of this approach to organizing work is that it separates routine and structured components from the decision-making components. The former tasks are given either to machines or (less skilled) employees and the latter tasks are given to ‘management’. One premise behind this model is that the products of the work and the circumstances in which they are carried out are stable and predictable. Another premise is that the deskilling of operative’s work, and the likely effect of this on their motivation, will have little or no adverse impact on the quality of the work done or on the products produced. Such an organizational model is not appropriate in times of change nor for the aims that were ascribed earlier to transformation. An alternative is needed that values and fosters learning, understanding and responsiveness, and which is flexible and delegates authority to meet and exploit new opportunities. We refer to such an organizational type as the ‘organic’ model, after Slevin and Covin (1990).

Table 1 summarizes the characteristics of organizations as they move from the traditional Taylor-inspired model to the organic model. The emphasis within the organic organization is on change and loose informal control, with a culture of cooperation, participation and consensus. Such a structure requires flexible behaviour patterns which are shaped by individuals and teams to meet the needs of particular situations. Each of the characteristics identified in Table 1, in turn, define

<table>
<thead>
<tr>
<th>Table 1 Organic versus mechanistic organization structures</th>
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<tr>
<td><strong>Element</strong></td>
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<tr>
<td>Channels of communication</td>
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<tr>
<td>Operating style</td>
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<tr>
<td>Authority for decisions</td>
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<td>Adaptivity</td>
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<td>Work emphasis</td>
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<tr>
<td>Control</td>
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<tr>
<td>Behaviour</td>
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<td>Participation</td>
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*Source: Slevin and Covin (1990) Sloan Management Review Winter*
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the criteria for success in the 1990s.

One other aspect of transformation needs to be introduced at this point. Many of the recent trends in business already mentioned have goals that relate to external requirements. In particular, customer satisfaction is a priority and the organization of the business and its behaviour are largely determined by this objective. This requirement has led to a different way of arranging the activities of the business that is based upon the flow of the main processes in the 'value chain' (Porter, 1989) rather than on functional specialism.

Hence, successful operation, and indeed survival, will be not just a matter of focusing on a set of limited responses to short term pressures, but will also require a fuller programme of responses, designed to harness the total organizational capability over the longer term.

Transformation can bring long-term and short-term benefits

The longer term benefits of organizational transformation that result from an ability to adapt rapidly to changed business circumstances can only be observed and measured in the fullness of time. Perhaps survival and prosperity will be the prize for early and successful adopters — as many of the pioneering businesses believe. For an increasing number of organizations, transformation is a strategic imperative if they are to compete in global markets throughout the 1990s.

In addition to such strategic positioning, pioneering organizations have also been seeking shorter term financial benefits — that, as well as improving short term profitability, also provide the best possible basis for sustained support for the difficult and expensive task of transformation. The Appendix 2 summarizes the benefits claimed by two such businesses — the General Motors engine plant at Livonia, Michigan and Mutual Benefit Life, a major US insurance company.

Information is more critical as uncertainty and change increase

Organization design studies — both theoretical and empirical — have examined the effect of uncertainty and change on information processing. Jay R Galbraith, of the Centre for Effective Organizations, University of Southern California, has done considerable research on the relationship between IS and organizations. One of his main findings (Galbraith, 1977) is that the information needed to carry out any task increases as the goal becomes more diverse or changes in its nature, as the level of task performance becomes more demanding, and as the overall task is divided between more people.

In a stable environment, with a well-understood task, much can be planned in advance. One of the underlying effects of uncertainty and change is a limitation on the business's ability for advanced planning. Consequentially, as the level of uncertainty or change increases, a greater amount of information must be communicated and processed by decision makers during its execution.

Galbraith argues that there are are only a limited number of responses in coping with (or exploiting) a need to process more information. These responses fall into two general categories: limiting the amount of information to be processed or increasing the businesses ability to process information. Figure 2 sets out the various options that Galbraith identified and, as we have indicated in Figure 2, all but one of these are within the scope of the transformation process. These factors, as might be expected, show a high level of corelation with the characteristics of the organic organization as defined by Slevin and Covin (1990).
Uncertainty and change creates a need to cope with more information

Create slack resources
- allow more time
- allow more resource

Environmental management
- vertical integration
- marketing
- cooperation

Create self-contained tasks
- change from functional task design to group with all necessary resources

Invest in vertical information systems
- plan much more frequently

Create lateral relations
- move decision making down and across functional boundaries

Reduce need for information processing

Increase capacity to process information

The scope of transformation

**Figure 2** Responding to uncertainty — the organization design options

Information technology is often underexploited but can be an important enabler and integrator

We have noted that the past decade has been one of change on an unprecedented scale, and that there is every sign of this trend continuing for the foreseeable future. Probably the single most important enabler of this change is information technology. This is a view expressed by the OECD in a recent report on socio-technical strategies for the 1990s (OECD, 1989). This report assessed the potential impact of a number of generic (that is potentially pervasive) technologies over the next decade. The findings are summarized in Table 2. For all the six factors, IT is rated highest, and for four of the factors its relative importance is regarded as being at least double that of any of the other four technologies evaluated.

The contribution of IT has been, and will be, made through public and private businesses and institutions. Evidence of this is the growing share of industry's capital assets that IT represents. In the USA, in the mid-1960s IT assets

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**Table 2 The relative importance of new generic technologies during the 1990s**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Information</th>
<th>Highest score by another technology*</th>
</tr>
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<tbody>
<tr>
<td>Impact on the range of new products</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Improvements in cost of process</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Ease of social acceptance</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Strength of private industry interest</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Breadth of application</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Probable positive employment impact</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

*Higher values represent higher ranking. Other technologies: bio-technology, materials, space and nuclear.

Basis: Ranking by OECD High-Level Experts Group.

represented 3.7 per cent of all business assets. By the mid-1980s this percentage had risen to 12.5 per cent.

However, this increasing investment in IT was not reflected in a commensurate increase in added value or labour productivity — for which the rates of improvement fell over the same period. Two reasons are cited for this apparent contradiction: that IT has, for the most part, been introduced using Taylor's organizational model; and that the usual approach to designing and implementing systems has focused entirely on information processing without proper consideration of related aspects of organizational development. The OECD conclusion was that we have yet to realize the true potential of IT. This failure to exploit the potential of IT is underlined by Stonehouse et al (1994). They note that 'Exceptional performance depends to a large extent on the ability of the organization to achieve optimum configuration of its activities, and to show the necessary responsiveness and flexibility to reconfigure activities'. They conclude that the key to coordination and responsiveness is information and that IT is the tool which can make available the information to underpin 'continuing superior performance'.

In the process of transformation, the use of information and IT is focused on enabling the improvements and changes needed to achieve the three overall aims set out earlier.

The first of these aims is an ability to change and respond. For most businesses, experience to date of exploiting IT is probably negative in this context — in that systems often prove to limit management's options and are difficult, time consuming and expensive to change. But IT does have the potential to support and enable this aim, since it provides an unparalleled method of processing, analysing and communicating the information, from both within and outside the business, that is needed to detect and understand the patterns and pace of change.

The second aim is to achieve immediate and direct economic benefit. Again, IT has the potential to help enormously — by supporting the drive for increased customer satisfaction: by enabling the streamlining of business processes (including links to suppliers and customers); and by enabling the business to benefit, simultaneously, from the advantages of decentralization, scope and scale.

Sustained achievement of these first two aims can only be brought about with the support and commitment of employees at all levels. IT can also make an important contribution to this aim. Used and managed appropriately, IT can reduce the mundane elements of many jobs, allowing time and opportunity for improved performance and learning, and can also enable work to be organized differently with self-contained and more satisfying roles (see, for instance, Zuboff, 1988).

As well as enabling the individual changes and improvements noted above, IT has the potential to make an additional and important contribution. Because IT is a potentially pervasive business technology it can simultaneously enable each of the three goals of transformation, and simultaneously contribute to several or all of the improvements. The cases of MBL, above, and Eastman-Kodak illustrate how this can be achieved. By focusing on its critical information needs, Kodak identified three distinct needs which were not being addressed: namely, control information for management decision-making, information to support management analysis and evaluation, and information to boost company-wide communications. Using prototype developments, two critical IS were created: a capacity management system and an executive IS. The latter system provided information on inventory management, product availability, plant loading, product quality and manufacturing costs — information which Kodak used to cut costs and boost
product quality. Through IT, the eight worldwide Kodak factories can exchange production performance data on a 24-hour basis. They can also perform what-if production scenarios, allowing appropriate business decisions to be made in a timely manner.

It is particularly important that senior and influential management understand this aspect of its potential (as well as the detailed contributions that IT can make) so that the business vision and consequent plans and investments exploit it. In Figure 3, derived from Butera et al (1990), we have illustrated the potential of IT to act as an integrator, by simultaneously linking the means of achieving the economic and other goals, and in particular the main processes of the business, the organizational system, and the social system.

From the examples cited so far, it is possible to identify a number of policies that transforming businesses adopt:

- Recruit 'better than average' people who will accept delegated responsibility and authority, and who have positive attitudes to self-development.
- Provide all of the necessary training and development, with a commitment to provide learning opportunities, and opportunities for personal development. Some businesses achieve this through 'institutionalized' continuous learning, others through 'payment for knowledge' schemes.
- Provide continuous feedback on performance and link this to coaching and counselling.
- Make constant efforts to achieve excellent two-way communication — both laterally and vertically.
- Involve people in all decisions that affect them and to which they can contribute and encourage them to look constantly for better ways of doing things.
Design jobs to make the best use of people's skills, abilities, and experience as these develop.

Seek to provide high levels of employee security. Walton (1990) among others, cites this as the most important factor in gaining support and commitment to new technology.

Shell (UK) has a long tradition of using organization development (OD) personnel to solve its organizational problems. The OD group is deeply involved in the implementation of the change processes, primarily in the role of facilitating new ways of thinking about the implementation of solutions to the problems facing the company. A major change arena has been that of altering managerial attitudes to adapt to the new business demands, and the new more flexible approaches to work that changes in these demands have brought.

This is partly a matter of all concerned understanding what is practical and achievable, and partly to do with access to, and use of, prototypes or comparable systems already in place, that provide a tangible basis for assessment and learning. Shell (UK) has learned from its mainstream business experience the value of an incremental approach to change, building on foundations and processes that have already been established. New working practices stress employee flexibility and cooperation and emphasize the nature of teamwork. This is something managers have to foster too, at all levels of the organization.

The organization of the IS function should be aligned with the business processes

In a transformed business the whole organization is arranged to serve the main business processes. In eight businesses that we interviewed during research for this paper, functional departments remain and have responsibility for resource provision and allocation, and for the relevant professional and operational standards. Typically a small, highly expert staff group represents and develops the functional viewpoint, and provides relevant planning, and perhaps operation, of those elements of the business infrastructure that are in its domain. We believe that this is an organizational model that applies to IS as much as any other functional department.

Fokker BV can be cited as an example of a company with an IS function that is adopting this approach. The company is retaining a central group that has responsibility for technical and information architecture, methodologies and standards, but development and support staff are being dispersed into the business.

Where Fokker have gone further is in setting up what they are calling 'business engineering units' (although this terminology may have the wrong connotations). These units include specialists in organization development and human resource management as well as IS so that each business has a multi-discipline team that is equipped to develop systems, organization structures, and jobs that are in harmony and identify the appropriate staff development requirements.

This systems-definition role is highly specialized, and is one that many business-unit managers are ill-equipped to carry out on their own. IS specialists responsible for this planning activity should be part of the management team in the business units. This means that they can work in close association with their business colleagues in the kind of joint development team advocated in the next section.

The final organization issue arises from the need to support systems throughout their life cycle. Situating the systems staff in the business does much to foster such
support, because the staff and application or maintenance teams work on those
tasks that the business regards as the priority. One potential problem with this is an
excessively short term planning horizon that limits the scope and resources for
strategic developments. This is one reason why IS management need to ensure that
they understand the way in which the business vision is developing, and are
working to keep IT plans in alignment.

**IS management and staff need additional knowledge and skills and changed
attitudes**

In *Table 3* we have identified a number of key aims for the IS function. Most of
these aims arise from, and are associated with other objectives proposed in that
figure and which relate to the Board, middle management, or users in general. Each of
these aims is reviewed below.

In terms of organizational alignment, ensuring that the business vision and the
information strategy are aligned is not just a matter of educating and increasing the
awareness of the Board so that they recognize the potential role and value of IT. It
is equally a matter of IS management acquiring a deeper understanding of the
business, appreciating what business and environmental factors are driving the
business strategy, and relating them to technology issues. Similarly, IS managers
need to understand the organization strategy of the business (or if no strategy exists

<table>
<thead>
<tr>
<th>Transformation factor</th>
<th>For senior business managers</th>
<th>With middle managers</th>
<th>For all users systems</th>
<th>Within information systems</th>
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<tbody>
<tr>
<td><strong>Alignment</strong></td>
<td>IT strategy and plans continuously aligned with business vision and agreed priorities</td>
<td>IT projects in harmony with desired organization objectives</td>
<td>Participation in the design of jobs so that they reflect the business vision</td>
<td>The business strategy and the organization strategy both understood</td>
</tr>
<tr>
<td><strong>Commitment and support</strong></td>
<td>IS perceived as integral part of the business that delivers the systems and infrastructure to enable the vision</td>
<td>Credible joint projects delivering systems that enable the organization objectives</td>
<td>Emphasis on listening to requirements and collaborative design</td>
<td>IS organization aligned with business processes</td>
</tr>
<tr>
<td><strong>Competence and mastery</strong></td>
<td>The potential contribution of IT fully understood</td>
<td>The scope of implementation support widened</td>
<td>Systems assist mastery of jobs</td>
<td>Principles of organization and job design understood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Principles and practice of change management understood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skills of building adaptable systems mastered</td>
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urge its formulation), and be clear on the systems policies and approaches that are needed to enable the achievement of its aims.

To ensure commitment and support, there is an implication that IS management must maintain effective communication with senior management, and that all aspects of the business vision — and the ways in which its components fit together and interact — need to be fully understood. Commitment and support may be demonstrated, for instance, by investment in methods and tools such as 4GLs, CASE and object oriented technology (OOT) that promote, support and manage change by enabling prototyping and rapid application development (CSC-Index, 1993).

If this appreciation of the way in which the transformed business works is confined only to IS management there will be limited ability to deliver and support the systems that are needed for transformation to take place. It follows that additional skills and changed attitudes are needed throughout the IS function if staff are to become competent at — and to subsequently master — their new role and the demands it will make of them.

To support the key aims of the IS function identified in Table 3, they are likely to need development in four skill areas.

(1) **Collaborative working** (arising from the investment in methods and tools to promote change), which requires the integration of IS staff with business staff for applications development. Hence systems staff must possess appropriate interpersonal skills, ability to work in teams, and skills in the use of tools (4GL, CASE, OOT) for prototyping and rapid application development. Joint development teams work best when they consist of a small number of staff who are dedicated to a task or project until it is complete. Research suggests (CSC-Index, 1988) that the optimum size is about six; a compromise between cohesion, which favours a smaller number, and the range of experience represented, which generally favours a larger number. As a general rule, there are significant differences between the personality characteristics of IS staff and those of the population at large (Couger and Zawacki, 1980). IS staff are, typically, more introverted, less communicative and have less need for social contact. The selection of team members should take account of individuals' personality characteristics as well as their technical or systems design experience. The aim is to ensure that, in total, the team members represent the full range of personality characteristics.

(2) **The application of organization and job design principles**, which involve specification of the human computer interface and socio-technical systems, development of job enrichment programmes, and opportunities for adaptive learning through job experience.

(3) **Change management**, which requires an understanding of social processes in organizations. As business environments become less stable, a key requirement is to achieve forms of organizing which permit rapidity and flexibility of response within a stable culture. Consequently systems staff need to be adept at handling the 'political' climate in which these changes will be introduced. The ability of any organization to exploit IT is determined by the pace at which change can be absorbed, this is often dictated by the speed and effect with which staff can be educated in the proper use and potential of available technology.

(4) **Building adaptable systems**, which permit a continuous evaluation of needs. The utilization of appropriate methods is one aspect, but the adoption of business drivers rather than technology drivers is another. On the one hand, systems staff need technical skills to utilize 4GLs and CASE tools, while on the other a
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cooperative and progressive attitude is required.

Finally there is need for a changed attitude and approach to systems work. In the extreme case, IS departments are often a specialist and elitist group that does not communicate well with the business (or it with them), designing and delivering information processing solutions. Such groups usually seek to terminate involvement as soon after initial implementation as possible — partly for personal motivational and career reasons, partly because of pressure on scarce and expensive resources.

These characteristics are very much at odds with those needed to help create a transformed business — namely collaboration, communication, a desire to design and deliver holistic solutions that enable all three aims of transformation to be realized, and an enthusiasm to 'stay on' and help users to exploit, master and then extend IS and the use of information.

According to many researchers, the most important of the many skills needed by systems analysts for the successful outcome of a project are those to do with people. Interestingly, this finding seems to be at variance with what systems analysts actually concern themselves with in practice. According to Vitalari (1985), they place more importance on systems matters than either people or organizational matters. In an extension to his study, Vitalari found several common characteristics for high-rated analysts. They were more aware of the interplay between the development process and the characteristics of the business; more concerned with systems outputs than systems inputs and processes; more interested in gaining user participation in the development process; and more focused from the outset on the later stages of systems development. IS staff perform better when they possess strong people and business skills, as well as technical skills (White and Leifer, 1986). It is these skills which must be developed and exploited by the transforming organization.

One organization which has carried out studies across its business to identify the skills and knowledge its staff will need in the 1990s is Aetna Life & Casualty, a major US insurance company. It found, for instance, that in 1985 systems professionals needed 34 skills to do their jobs effectively. By 1988, the number had risen to 91 skills, and in the 1990s, the number of skills required is expected to rise to more than 100. Aetna Life & Casualty concluded that systems staff should be trained first as generalists and then as specialists. The company believes that general skills should be provided by a core training programme, covering such topics as reasoning, logical thinking, and how to use the technology — personal computers, database technology, telecommunications, online systems, mainframes, expert systems, and so on. In-depth specialist training, the company believes, can follow later once individuals have been assigned to specific areas of work. The company has developed 45 training 'events' within its overall programme.

Much of the process of transformation is complex and, as we explained earlier, it takes considerable time to agree and gain commitment to change on this scale. From an IS perspective it is likely also to require investment in new methods, result in changed priorities, and lead to a new form of organization culture and structure.

Whatever the underlying attitudes, some of the additional knowledge outlined above, such as improved communication and a more collaborative approach do not need to wait for a momentous business decision to proceed. The necessary learning can be rapidly implemented at a functional team and, above all, individual level — starting now.
Summary

In this paper we have argued that organizational transformation requires a fundamental change in terms of management structures, business process design and employee attitudes. A critical element in developing a transformed organization is a process that coherently combines the design, development and exploitation of systems and their organizational context. We have attempted to illustrate ways in which IT can support the reengineered organization by combining the benefits of a functional organization with those of a process-oriented approach. For the IS function to make a positive contribution to this process, its organization must be aligned with the business processes. The role of the systems function is to develop IS and to aim for structural changes compatible with them; this will require additional knowledge and skills, and changed attitudes for both IS management and staff. In this way, the IS function, as a whole, will be able to make an effective contribution to the process of transformation, and the transformed organization.

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Appendix

Illustrative benefits from transformation

General Motors
The Livonia engine plant, a facility of Cadillac Motor Car Division, General Motors Corporation, is located in Wayne County, Michigan. The original plant was built in 1971 as a satellite to the main machining operations in Detroit. During the 1980s the original Livonia operation was phased out to make way for a state-of-the-art plant. In conjunction with this physical redevelopment, the plant underwent a complete workplace transformation. This involved a comprehensive and integrated change in business philosophy, expectations, responsibilities, structure, employee development, compensation systems, communications, teamwork, trust, the working environment, operating systems, work rules and all industrial relationships.

The transformation has generated the hoped for results: significant improvement in product quality, productivity and quality of work life:

- productivity up by over 100 per cent;
- production costs down by 50 per cent;
- cost savings from employee suggestions were around $1,400,000 (over a five-year period);
- customer complaints have been radically reduced;
- warranty claims have been reduced to virtually nil;
- machine uptime is up 33 per cent;
- absenteeism is down by 50 per cent;
- a consequence has been a 350 per cent increase in job opportunities because of increased demand.

Livonia's experience can be cited as an application of the transformation process. Since its inception, improvements in the approach have continued to be made and with refinements the basic approach will continue. However, it is not the specific changes that are important, but rather it is the process by which changes were planned and implemented that holds the key to success.


Mutual Benefit Life
Mutual Benefit Life (MBL) is a long-established US insurance company. To improve its competitive position, MBL has introduced some sweeping changes in the way that it handles applications for insurance policies. It has replaced a sequential operation spanning five functional departments by a process that puts full responsibility into the hands of a few individuals called case managers. Prior to the change, an application would have had to pass through as many as 30 discrete steps, each a fixed and repetitive clerical task undertaken under the close inspection of a supervisor.

As a result, MBL can handle more than twice the volume of new applications than it could before, and has eliminated 100 field office positions. The average turnaround is now only a few days, instead of two to three weeks.

Case managers receive strong systems support from powerful PC-based...
workstations that are connected to a range of automated systems on a mainframe. A change as extensive as this demanded strong vision from the top, and a radical overhaul of the company's culture.