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Information Technology in Government -- Management Challenges

Administrative reforms in OECD Member countries stress improving cost-effectiveness and increasing the quality and responsiveness of public services. Information Technology (IT) can facilitate and support these aims. Improving productivity and achieving cost savings have been the principal aims of traditional IT systems. More recent developments, including the convergence of computing and communications technologies and the networking of distributed computing, offer possibilities to address other objectives. IT is now being used increasingly to help improve service quality and responsiveness and support other reform initiatives such as delegation of authority, improved policy analysis and better management of information.

Senior managers in the public sector must nevertheless still experience a certain unease about IT. Investments have been high and demands continue to grow. They see their organisations becoming dependent on IT. Despite success stories, they have seen many large projects exceed their budget, suffer major delays, and fail to achieve objectives. IT brings no guarantees of improving cost-effectiveness and it can easily work against other reform objectives. They are suspicious of the claims made for the technology - the rhetoric about IT has outstretched reality in the past. At the same time there is a sense that the potential of IT to support change is not being fully exploited to provide the efficient and effective public management that is vital to national competitiveness and economic and social development.

Are public sector organisations getting the maximum return on their investment in IT? How can it be improved? How can the potential of IT be used to meet the public management challenges of today and tomorrow? The Public Management Committee and its predecessor the Technical Co-operation Committee have for several years carried out work which examines the use and impact of IT in public administration. Member countries have supported this activity by providing case studies and by participating in OECD meetings on selected aspects. These exchanges have helped to clarify the main themes and issues in this area and draw conclusions as to policy and practice.

Reflecting the overall remit of the Committee, the work has been directed at examining the role and utility of IT in supporting administrative modernisation and improved public management. It also examined changes in administrative practice and culture which are required to ensure effective exploitation of the potential of IT. The longer-term aim of the work was to clarify the importance of IT for the performance and organisation of government, and to set the management of information and IT in the wider framework of public management.

This report covers work during the period 1989-1992. During this time, there were five meetings of senior officials responsible for IT policy in government at which more than sixty case studies were presented. The themes of these meetings focused on selected aspects of IT use in government. The main findings are set out in this report.

The Public Management Committee reviewed the report at its meeting in October 1992 and recommended its derestriction and publication as an Occasional Paper. It is published on the responsibility of the Secretary-General.

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Summary

There is increasing recognition that the full potential of IT will only be realised if its introduction is linked to organisational change - changes in procedures, structures, attitudes, etc. IT must support the organisation's mission and strategic objectives and priorities. It must be firmly placed in the context of overall modernisation programmes. Evaluation of IT and follow-up on the achievement of benefits are also vital.

Changes in procedures are required in order to do things better and to do new things, rather than simply automate current routines. Structural change is possible since the precise location of information no longer has to be a constraint on organisational design. Traditional organisational boundaries are becoming less relevant. Changes in attitudes are a key objective of administrative reforms and can be assisted by IT.

Top management involvement is crucial in many ways. To begin with, they must communicate organisational objectives and provide overall leadership and vision. They need to support project managers in a visible way and take key decisions promptly as required. They also need to understand the potential and limitations of IT so as to seize opportunities as well as control it. They cannot abdicate responsibility for IT. They must ensure that it is being used to pursue the organisation's objectives and that negative impacts are minimised. They alone are in a position to ensure that organisational change and IT are mutually supportive.

The improvement of service quality is an important objective in the introduction of IT in administrations. There is pressure however to take the benefits of IT in efficiency gains rather than higher quality, to seek staff reductions or to handle higher workloads with existing staff levels. A firm commitment to service quality is required by all staff from senior management to front-line staff and system developers. Greater attention needs to be given to the impact of IT on the interface between the citizen and the administration.

The integration of information systems can improve service by improving the comprehensiveness of information (e.g. allowing cases to be processed in one-stop-shops) and in reducing the administrative burden (e.g. information provided once only and used by various parts of the administration). Issues of data privacy, system security, systems compatibility and standards have not yet been fully resolved. Countries are increasingly concerned to promote open systems and standards for improved cost-effectiveness.

Client participation in the design, implementation and review of systems is generally seen as important but a fully satisfactory means of citizen involvement has proved elusive.

Knowledge-based systems, which perform functions similar to human experts, have potentially wide application in public management. They are already providing tangible benefits in facilitating wider access to expertise. They are seen as decision support systems rather than expert replacements.

IT was widely expected to result in reductions in middle management numbers, mainly due to new patterns of communications. This has not yet happened in the public sector but their role is changing. They are seen as critical to the implementation of change. The impact on lower-level staff varies. IT can provide an opportunity for a more satisfying work environment with greater access to information facilitating a more comprehensive service to customers, opportunities to improve skills, etc. On the other hand it can lead to less interesting, routinised tasks and introduce pressure to adapt to changing work methods. Adequate user training is vital, but frequently neglected.
The way in which IT is introduced and implemented is paramount. Staff uncertainty is a cause of unnecessary difficulty which needs to be dealt with early and openly. Evolutionary change is seen as likely to be more successful than major "reforms" imposed from time to time.

There is a need for new skills and a multi-disciplinary team in introducing and managing IT, including skills from the behavioural sciences and in organisation design. Users at all levels of an organisation, especially at the operator level, need to be involved from beginning to end of the process. This will help bridge the by-now classical communications gap between users and technologists. System development methodologies in use do not provide enough flexibility in this respect. Additional steps include efforts to improve users' awareness of the potential and limitations of IT and technologists' understanding of the business of the organisation. Prototyping is also being adopted as a partial response.

Large-scale projects bring into sharp focus many of the problems of introducing IT. Inadequate project management has been identified as the most frequent cause of failure. Critical to success is the need for a strong project leader and project management team from day one. The personal characteristics of project managers seem to be more important than their previous function in the organisation. They must also have clear authority. Continuity of leadership and of team membership are important, as are verifiable achievement milestones and mechanisms for reporting to top management. Clear responsibility for seeing that benefits are achieved after system implementation is also seen as critical.

Inability to incorporate changes in specifications is a notable cause of problems. Difficulties arise in reconciling the desirability of clear, fixed specifications for system developers and contractors with the need for flexibility to adapt to evolving requirements in the line managers' environment or to avail of new technological opportunities. Down-sizing large projects into more easily managed parts, using modular or incrementalist approaches, is increasingly cited as a way to overcome problems and provide adequate flexibility. The need for a strategic planning framework is seen as all the more important if down-sizing approaches are to be effective.

Many administrations are looking increasingly to outside contractors to provide their IT services, both current and new. This is seen as offering ways to achieve three key objectives simultaneously: reduce costs, improve service and promote indigenous industry. A number of countries have adopted specific policies which require market testing and provision of IT services by the private sector where it is cost effective to do so. Of course, in many instances organisations have to contract out for pragmatic reasons such as lack of adequately skilled staff and tight political deadlines for implementation of new policies and schemes. Contracting out is not always appropriate, for example, where an under-developed market offers inadequate choice of contractor (with risk of capture by a dominant supplier) or where control of strategic systems might be compromised. Mechanisms for fair cost comparison are critical to the contracting out decision. The full costs of both internal and external provision, calculated on the equivalent basis, must be taken into account.

Successful contracting out requires a good working relationship with the contractor, underpinned by an adequate contract. The challenge is to achieve an effective partnership while protecting the longer-term and overall public interest. An arms-length, contract-based relationship with predetermined hand-over procedures, can help ensure ability to change partners. There is growing interest in many countries in developing new partnership arrangements with private sector suppliers, but experience is limited. The contracting out environment has obvious implications for IT staff. IT managers, for example, must ensure they have the necessary skills in contract and project management while at the same time keeping up with the latest developments in technology. Particular difficulties will arise if staff transfers and redundancies are involved. The impact on staff needs to be carefully managed if the full benefits of contracting out are to be realised.
Broad context of the Public Management Committee’s work

Three broad series of events have set the context for the Committee’s work on IT. They also provided the unifying thread of the discussions at the meetings of senior officials. These are: programmes to modernise public administration; the growth of the "information economy", and the continuing development of IT.

Modernisation programmes

Reform programmes in Member countries are aimed at transforming the organisation, operation, culture and working environment of the public service. This comprehensive challenge to the established conventions of public administration has been embodied in a succession of themes. All have been made possible by IT or have exploited it.

To begin with, a prolonged period of financial restraint generated an effort to achieve greater economy and efficiency in public expenditure through a sharper understanding and control of costs and by improved financial management. A second phase of reform stressed a reconsideration of the role of the public sector, and placed greater emphasis on effectiveness in the use of public sector resources. Economy measures were linked to institutional change, and attention was focused not only on controlling inputs, but also on achieving cost-effective outputs and outcomes of policies and programmes. A major feature of this aspect of reform has been the efforts to decentralise responsibilities for the executive functions of public administration, especially the delivery of public services.

A third theme is responsiveness, which focused attention on improving the quality of public services through the identification and satisfaction of the needs of the clients for them. Most countries are shifting from the uniform delivery of centrally determined administrative products to giving delivery agents greater scope to respond flexibly to clients within a framework set by political authorities. Achieving responsiveness is dependent on improving the supply of information to the point of contact between the administration and the clients of public services. This puts major responsibility in the hands of front-line staff.

The "Information Economy"

At the same time, the broad contextual effect of IT on society and the economy has added its contribution to administrative modernisation and fostered the greater use of IT in public administration. Computer technology is credited with creating a new era -- the information age. The move away from mass-production industries to information-intensive industries has led to the concept of the information economy, in which information is regarded as an economic resource and a tradeable commodity with value and costs of production. Public administration, being highly information-intensive, has to be pro-active in managing this dominant resource. In addition, the public sector has to match the private sector’s investment in transferring information electronically if it is to avoid imposing undue costs and acting as a brake on economic development.

Not least, people and businesses are becoming accustomed to services supported by IT, such as those offered by banks or insurance companies, and public services are faced with increasing competition from other sources of production. The public sector has to offer corresponding innovation, speed of response, ease of access and use, and flexibility to adapt to individual cases, using the same technology as other economic actors.
Developments in IT

The far-reaching changes affecting public administration have been paralleled by the continuing development of IT, and its ever-wider use in the public sector. Recent developments in the technology have been labelled as a "second wave" of IT, with characteristics quite different from the mainframe phase of computing. Data storage and computing costs have been reduced by several orders of magnitude. Computers, shrinking remarkably in size, have moved from climate-controlled sanctuaries into the the normal office environment. Networks have been created which link computers together and support real-time and interactive computing. Progress in developing industry-wide standards has enabled a reasonable degree of portability of software and data.

This second wave has much more radical implications for change in the organisation and operations of public administration. It has opened up the possibility of an ever-growing range of applications while facilitating extensive decentralisation within and between organisations.

The role of IT in modernising public administration

The relationship between IT and administrative change is an interactive one. Changes in the administrative environment create a demand for IT solutions. IT itself provides opportunities for administrative reform. The challenge is to exploit this symbiotic relationship. Managers have been accused of introducing IT to automate existing tasks, without regard to the possibility of organisational change, reinforcing the existing administrative structure and culture. Awareness has been increasing, on the part of both line managers and technologists, that the real benefits of IT can only be achieved if its introduction is linked to organisational change and it is used to support strategic mission and reform objectives.

Efficiency

The traditional focus of IT investment in public administration was on internal efficiency, on increasing productivity within the organisation. Most IT projects had to be justified in terms of staff reductions or dealing with increased workloads without corresponding staff increases. In this respect, it fitted in with the general concern with reducing public expenditure. It is commonly believed that significant efficiency gains were made. In the event, the extent of the return on investment was often not evaluated post facto, the major preoccupation being smooth implementation, followed by the next priority project in a long waiting line. A number of studies suggest that productivity gains in the services sector have in fact been greatly overstated.

Disappointing productivity gains may be partly due to taking benefits in the form of (un-measured) quality improvements. There is a choice to be made between pursuing economies through staff reductions or improving quality. The available evidence suggests however that the impact of IT on quality of service is quite variable. Other explanations are needed. The main one suggested is that, in the past, the benefits of automation were largely nullified by simply overlaying the technology on old ways of doing business, with the costs of the old ways still being incurred. Other factors also help to explain, such as offsetting costs of employing skilled IT staff and Parkinsonian expansion of work to take up the new capacity. This experience supports the view that the benefits from IT are not automatic and that organisational and managerial capabilities are more important than the technology itself in determining the pace of IT adoption and success.
Expected efficiency gains are still important today in project justification. There are still many opportunities where IT can make an important contribution to efficiency. But in many cases, the focus is changing. Project justification will increasingly have to rely on criteria other than financial rate of return in the individual organisation in question. At the very least the equation will become more complex and more subjective, encompassing a greater number of assumptions and value judgements. Criteria such as cost avoidance (where maintenance costs are creeping up) or gaining efficiency on a government-wide scale (e.g. through increased networking and sharing of resources) are becoming important. Contributions to organisational effectiveness and to the organisation's strategic objectives will be more preponderant. Senior management have a responsibility to articulate and communicate these objectives and ensure that IT projects contribute fully to achieving them. Only they can judge the value of IT investment against these new criteria. They also have a key role in identifying and pursuing opportunities for inter-organisation projects, especially where a "corporate" or government-wide perspective is required to achieve overall benefits, for example, where the incentive to individual organisations is low or where there is a reluctance to share information.

As regards external efficiency, IT can help by easing the administrative burden placed on the private sector and by improving service delivery. Of course, IT is but one instrument. The major opportunity to reduce passed-on costs occurs in the design of substantive policies and their implementation mechanisms, and in the reform of regulation. But IT can help at the implementation level through, for example, supporting the introduction of single points of information collection or distribution, use of preprinted forms requiring minimum input by clients, and maximum sharing of information in the administration (and with relevant outside organisations) compatible with privacy protection. There are already many examples of these kinds of improvement. Many governments are also active in developing possibilities of electronic data interchange with their clients, mindful of the contribution this can make to cost reduction in the private sector and enhancement of international competitiveness.

On the other hand, IT can also easily act to further increase the administrative burden. Governments can add to the costs of firms by not keeping up with private sector investments in IT or by imposing their own different technical and information standards. By developing particular IT systems, they may also give an advantage to those firms who are big enough or advanced enough to take advantage of IT, to the relative disadvantage of smaller firms or firms which are locked into a different system.

Policy-makers may be tempted to use the opportunity afforded by IT's capacity to handle huge volumes of information to introduce more and more complexity into schemes and regulations, making comprehension and compliance more difficult for the client. A balance must be found between, on the one hand, customising administrative acts to the needs of the individual client but thereby adding complexity and, on the other, maintaining uniformity and relative simplicity and transparency.

**Effectiveness and responsiveness**

IT's contribution to effectiveness can be seen at several levels. As regards policy-making, the introduction of IT in recent years has typically involved a strategic planning process in which objectives have been clarified and prioritised. This has been a useful contribution in its own right.

More concretely perhaps, IT offers help as regards programme and regulatory reform. It can be used to manage the great mass of legislation and regulation that is typical in OECD countries, by pointing up redundancies, conflicts and inter-linkages. The compilation of lists of regulatory provisions can be an important first step in identifying and controlling their total impact. Access to regulatory databases can be made easier and more widely available. IT could be used to analyse regulations and assist in the task of reducing regulation and drafting new regulation which is compatible with existing provisions.
IT facilitates access by policy-makers to timely and integrated information, through better communication systems and through the generation of policy-relevant information from operations. Wider access to a common base of statistical and other information and to a co-ordinated stock of knowledge about existing policy instruments should also help bring about greater cohesiveness of policy. Policy debate for example can concentrate on policy issues rather than be side-tracked by differences over basic information, and new policies can take better account of existing policies in related areas. IT also facilitates the development of decision-support systems and wider access to modelling and simulation of policy outcomes and generation of policy alternatives.

There are technology-related factors which constrain the use of IT in the policy-making area. Systems have often not been very user-friendly. Users have found it necessary to invest considerable effort to get familiar with codes and routines, easily forgotten if not used regularly. In the first place, technologists and users have also not always been good at understanding each other. Non-IT factors also play their part, for example, the extent to which policy-relevant information is shared between organisations and how widely it is shared outside the administration. Realising the potential of IT to communicate information depends very much on the prior willingness to share the information.

As regards policy implementation and responsiveness, IT is clearly playing a key role in service delivery. IT offers many opportunities to improve service delivery through:

-- provision of information and services at local level (e.g. through distributed processing, national data communication networks) or through national videotext systems (e.g. the increasing volumes of public administration information on the French Minitel system);

-- provision of an integrated service based on the "whole person" concept rather than on administrative function (e.g. all tax matters dealt with by a single office rather than different aspects dealt with in different offices);

-- use of knowledge-based systems to facilitate wider access to expert advice, especially at the point of contact with the client, and to provide a more pro-active service;

-- more interactive and easier to use systems, enabling officials to provide the relevant information and service and eventually to customise the service to the needs of the client;

-- speedier responses, less form-filling, etc;

-- greater client involvement in identification of needs, design of systems and feedback on operations.

The quality and responsiveness of public services is a central element of cost-effectiveness. Evidence suggests that the quality of service delivery is just as likely to go down or up with the introduction of IT. This has arguably been because of the dominant focus on productivity and staff savings. IT is a double-edged sword and can swing either way. Much depends on the way in which IT is implemented. It is undoubtedly possible to make progress towards achieving several objectives simultaneously, including more efficient use of resources, greater control and reduction of fraud, better working conditions for staff, and improved quality of service. But the quality objective has sometimes been diluted along the way, with technological and financial considerations preoccupying project implementers. Demands from clients and increasing political commitment should help to ensure that the quality objective is not lost sight of in the implementation stages. Again commitment to quality is not only, or even most importantly, an IT-related matter.

Greater use of IT in service delivery raises a number of issues. For example, the provision of information to the public by electronic means may privilege those who have access to the necessary devices
or who are sufficiently IT-literate. At the same time, it may reduce the headings under which information is provided and the parameters of enquiry. It may even lead to the neglect of more traditional methods of providing information. The introduction of user charges for services may coincidentally accentuate this marginalising effect, but there may be budgetary pressures or IT project financing reasons for their introduction. The integration of information to provide a better service (and to reduce the burden of data collection costs) may put off some clients from applying for services to which they are entitled because they fear the use of information for purposes other than those for which it was originally collected despite the protection of legislation.

Information management is increasingly seen as a more appropriate focus than IT management, which is just one part of the wider issue. Information is seen as an asset of the state which should be managed for the benefit of the public. Information should therefore be shared across organisations: the creating or collecting agency is only a custodian. Large-scale integration of information systems has proved difficult and slow within organisations, let alone between organisations. Information holders have often been reluctant to share information for fear of compromising its confidentiality, integrity and control. Some commentators, taking the view that information is power, suggest that information holders may also fear giving away an advantage. Technical barriers also pose problems. There already exist many systems aimed at rationalisation of data collection and distribution across organisational boundaries. This kind of systems is expected to be a major feature of systems development in the future.

These systems have demonstrated sensitivity to the dangers that such sharing can compromise the privacy and security of the data. In view of the increasing dependency of organisations on IT systems, and the concomitant dangers of infiltration, sabotage, accidents, etc., countries are devoting increasing effort to strengthening the security of systems. While not examined in depth in the PUMA Committee’s work, security was highlighted as one of the key contemporary management issues in the IT area. The issue of privacy and protection of data was much studied several years ago and protective legislation was introduced in many countries. But new information technologies may be undermining the goals of first generation laws for protecting privacy. Desk-top computers complicate monitoring of the uses of personal information because they make it easier for individual users to create their own systems of records and serve as remote terminals to access centralised systems of records. The greater power and flexibility of networked IT, reinforced by the introduction of government-wide data networks, allows a vast increase in the exchange and manipulation of information, and in the number of people having access to it. Couple this capability with the objectives of economy and efficiency in data collection: the desire to provide a comprehensive service to the clients of public services; the insensitivity of some officials to the privacy issue and their ignorance of the legal requirements -- then all these factors acting together justify examining anew the benefits and risks of information sharing and the relevance and effectiveness of existing procedures, guidelines and legal powers.¹

One particular application of IT, Knowledge Based Systems (KBS), has evident potential in helping to improve responsiveness and the quality of public services. These systems are designed to process information for a particular application and perform functions in a manner similar to that of a human expert. They can be particularly useful in providing access to expertise by front-line staff, especially where they are charged to provide a comprehensive service offering interactive contact with a variety of public programmes, such as "one-stop-shops" or "single-window services". Considerable emphasis is placed

¹ The OECD’s Committee for Information, Computer and Communications Policy is currently carrying out work in the area of protection of personal data and privacy and on the development of guidelines for the security of information systems.
on the role of such systems as support for human experts, and not replacement of them, and on their role as a training tool. 2

Citizen participation is an important objective of public management reform. IT is relevant in two ways: in the design of systems aimed at improving service and in providing feedback to policy-makers. Involving citizens in system design and development is still the subject of debate, mainly on the questions of overall cost-effectiveness and appropriate methodologies. Some pioneering attempts have been made. A major difficulty concerns ensuring representativeness without cumbersome structures. Using IT to provide quality client feedback appears for the moment to be still largely at the conceptual stage. The ability to measure policy outcomes is crucial to the process of improving cost-effectiveness. Feedback from operations and clients can give valuable information on programme inputs and outputs, but in terms of measuring outcomes, IT can hardly play a significant role until appropriate measures of performance have been identified. This is something still to be achieved. A prerequisite to using IT for client involvement is of course a firm commitment to a policy of involvement, backed up by adequate resources. As is the case for other reform objectives, IT can provide the opportunity but is not itself sufficient to make it happen.

Without adequate delegation, responsiveness is meaningless. IT can facilitate delegation through the provision of adequate communications infrastructure and reporting systems. The centre (in centre-line relations) or top (in intra-organisation relations) may be sufficiently reassured to relinquish controls on the assumption that it can get information to see early-warning signs, that local control systems are adequate, and that it can access information for policy-making purposes. This could be seen as a very guarded and hesitant kind of delegation but it may nevertheless be a necessary condition initially. The fundamental question is about defining the information balance between the centre’s (or the top’s) need for control and the need for local autonomy.

On the other hand IT can just as easily be used to reinforce centralised control, with for example, the centre increasing its demands for regular information and micro-managing in the interests of co-ordinated and cohesive action. There may be a tendency in any event for increased delegation from one level to be followed immediately by greater centralisation at the next level. Managers may respond to greater personal responsibility by imposing greater local control, at least temporarily. The technology itself can be used to centralise or decentralise as the organisation concerned desires. The way that IT is used will be shaped by the culture of the organisation and the attitudes of its managers. If the organisation retains classic bureaucratic values, IT will be used as a support for centralising; if there is a strong commitment to decentralisation, IT can be used to support this change.

Impact on the IT function

Public management reforms, especially increased delegation, combined with the second wave of IT, have raised many questions about the way in which IT services are provided in an organisation. Centralised IT services are under increasing pressure. If line managers are to be held accountable for resource use and programme outputs (and even outcomes), they will demand quality services from IT units and will want to be able to go elsewhere for services if the standard is unsatisfactory or costs are too high. On the other hand, if common services are provided free or at below market rates, line managers will clamour for more. Some rationing system will be required and/or greater resources provided to the central unit. Outsourcing will be seen as more and more attractive.

2 On the basis of information provided by Member countries, over 100 KBS systems have been listed in the first two issues of the PUMA Register of KBS in Public Management in OECD Member countries [PUMA/MIT(91), PUMA/MIT(92)].
The trend is in fact towards greater decentralisation of responsibility for IT, both within organisations and between central and line agencies, mainly in response to demands from users. This raises interesting choices, e.g. about the allocation of costs for remaining central services (such as basic infrastructure) or for data collected by one authority but made available to others. Centralisation also provided some assurance of quality control, technical competence, and system compatibility. Under decentralisation a new community of users has the opportunity to make decisions about the procurement, development and use of IT. The shift of power to end-users heightens the difficulties of ensuring compliance with the organisation's technical or information standards or of ensuring use of open systems to facilitate information exchange. Broad-ranging transfers of authority also make the problems of ensuring the security and privacy of information more severe.

Changing culture

Changing public service attitudes and culture is both a condition for success of administrative reform efforts and a key objective. IT can help. Its effective use can help provide an attractive working environment and motivate staff. Better motivated staff, sure of their role and value, are more likely to accept change and also to look for opportunities for further change. This can be of particular importance in ensuring a more pro-active approach to the introduction and use of IT. The transformation of outlook and behaviour needed to support a more responsive public service may be easier if staff demand IT from an understanding of their role and purpose and of how IT can help them fulfil these, than if systems and training are imposed from above on officials who are possibly apprehensive about how IT might change their jobs.

The way in which IT is introduced and implemented is crucial. IT can also bring about uncertainty and de-skilling. It can eliminate the interesting parts of some jobs and it may simply replace old procedures with new, more complex ones. It can serve to reinforce bureaucratic culture through, for example, its ability to make rules more complex and the value it places on detail, accuracy, and adherence to procedures and rules. The information available on shared databases may be quite limited, dashing hopes of better service to clients. Office automation systems may not make decision-making more transparent in the way hoped for or may not improve communications significantly if they are simply by-passed. Careful planning and management are required, with strong commitment to reform objectives, if this negative scenario is not to become reality.

Changing organisational structures

Structural change of organisations may also be a necessary part of administrative reform both for greater cost-effectiveness and for symbolic, catalytic purposes. IT can help achieve change in organisation structures. Essentially because of communication networks, it can offer options of organisational design which were not previously available. It can facilitate, for example, the set-up of task-oriented groups of finite duration. It allows a greater geographical spread of offices. It can enable different parts of different organisations to interact in new ways, based on common functions and objectives. In short it can allow greater organisational flexibility.

A key challenge to management will be to ensure that IT does not in fact impose barriers to organisational change. One organisation's systems may constrain development of another's because of a need to make progress in tandem. Several private sector mergers have been called off ostensibly at least because of incompatible systems. IT fixes may in fact be used to perpetuate out-dated models of organisation, when more radical change is required.
Impact on middle managers

As regards productivity gains through employment displacement, one widely heralded impact of the new wave of IT is that it could take over the traditional functions of layers of middle managers by providing the information linkage between front-line staff and senior management, and enabling the routine sharing of information between departments. Peter Drucker pointed out that once IT is centred on producing information rather than used for control, organisational structure is affected. In his view whole layers of middle managers, "the human boosters for the faint, unfocused signals that pass for communication in the traditional pre-information organisation", can be eliminated. This potential impact fits well with the efforts being made in public administration in several countries to achieve "flatter structures" in the management hierarchy. Evidence from OECD countries suggested however that middle managers, at least until now, are not disappearing so much as changing their function. Their traditional role as information broker and communications link is indeed being dramatically affected. But other roles are opening, in particular a staff leadership role in helping their organisations adjust to the changes and challenges offered by administrative reform. For this purpose, they must provide themselves with new skills and have a clear vision of the organisation's aims.

Relationship with the private sector

A major task of public sector reformers is to redefine the relationship between the public and private sectors. One part of this is the external efficiency question discussed earlier. Another is the question of increased use of the private sector for production and delivery of publicly provided goods and services.

IT considerations will be important in how the public and private sectors interact in their day-to-day business and in contract management. This will include provision of information for planning purposes and for monitoring functions that are carried out on behalf of the State, especially to ensure that stipulated public sector values have been observed. A number of thorny questions need to be answered. To what extent, for example, should private sector providers of public services be required to have IT systems which are compatible with public service systems and standards? Could IT be a selection criterion and if it is, what would be the likely repercussions on individual companies? If companies make IT investments to become compatible with public service systems, is future system development in the public sector constrained unless companies are compensated in some way?

Public accountability

The agreed goal of public management reform is to raise cost-effectiveness in the framework of public law and political accountability. This too raises fundamental questions, perhaps brought into sharper focus in the context of greater use of the private sector in service provision.

IT, especially Knowledge Based Systems (KBS), can help make rules and procedures more visible to service providers, receivers and overseers. Making information available is a necessary first step. KBS can perhaps help enshrine public sector values in the systems available at the point of contact between service provider and client. Easy access to information on legislation and regulation is also a way to help ensure compliance. Adequate access points need to be provided (public terminals, electronic interfaces with other systems, etc.). Any such system also needs to be easy to use, with adequate guidance, explanations and updating.

Another emerging question is the extent to which information and IT aspects of legislative changes need to be included in the legislation. For example, if a new citizen or land registration system or a new entitlements scheme is to be set up, do the information requirements and essential elements of the
supporting IT system need to be spelled out in the legislation in the interests of delimiting rights and powers and providing necessary authorisations? To what extent can IT systems be developed in tandem with legislation, so that operating support systems can be put in place with least delay and to meet tight deadlines, without prejudging final parliamentary choices? Interest in this kind of approach is heightening not only because of the need to accelerate implementation of systems once legislation is passed or policy is decided, but also because it improves the mutual understanding of those framing legislation and those implementing it. It can help increase clarity of the law and avoid unnecessary interpretation by system developers.

Other aspects of political accountability and control concern the role of IT in relationships with parliament and with constitutional audit and control bodies. IT can potentially increase transparency, giving parliamentarians access to more information, perhaps the same aggregate information as public servants. One could go further and make it available to the general public.

Interesting developments are taking place regarding the audit of IT systems and the use of IT tools to assist in the audit task. The concern has been with control and regularity but there is also a need to examine IT systems to ensure that there are no major divergences between legislation and implementing systems, especially important because errors in computer systems can often be difficult to find later. A related set of issues concerns the legal standing of electronic documents and the rights and obligations involved in electronic transactions.

Managing the change

There is a need for new skills and a multi-disciplinary team in introducing and managing IT, including skills from the behavioural sciences and in organisation design. Users at all levels of an organisation, especially at the operator level, need to be involved from beginning to end of the process. This will help bridge the by-now classical communications gap between users and technologists, as will developments in system development methodologies. Additional steps include improvement of users' awareness of the potential and limitations of IT and technologists' understanding of the business of the organisation. Prototyping has been widely adopted as a partial response.

Large-scale projects bring into sharp relief many of the problems of introducing IT. They have a mixed record. There have been some noteworthy successes but overall they have a poor reputation for being over-budget, behind schedule and disappointing in terms of achieving their objectives. The problems associated with them are not confined to the public sector, but there are particular factors which exacerbate the situation in the public sector. Principal among these are public procurement policies and the requirements of oversight bodies. Others, such as the ability to act quickly and relationships with partners, are more problematic in the public sector. Several countries have carried out reviews of their approach to developing large projects, analysing reasons for failure and identifying success and risk factors.

Inadequate project management is the most frequent cause of failure. Critical to success is the need for a strong project leader and project management team from the outset. Various case studies illustrated different successful options for project management, including a project manager from the functional area to be automated, a person with an established track record in the management of civil engineering projects, and a dual leadership approach bringing together IT expert and functional area manager. The personal characteristics of project managers seem to be more important than where they come from in the organisation. They must have clear authority from top management and ready access to them for purposes of reporting progress and key decision-making. Continuity of project leadership and of team membership are important, but can be difficult to achieve in a large project. In addition, many of the issues raised by contracting out (see below) are also particularly relevant to large-scale projects.
Down-sizing large projects into more easily managed parts, using modular or incrementalist approaches is seen in some countries as a way to overcome problems regarding flexibility to adapt to changing needs and technology, project management, control of partners, early benefits and pay-back, etc. The danger is that projects become fragmented. Down-sizing thus needs to be employed in a strategic planning framework if it is to be effective.

Project conditions which involve increased risk include choice of technology which is un-proved or is likely to change substantially during a phase of the project, more than six months elapsed time before demonstration of some functional capability, and replacement of more than one existing system at the same time. These and other risk factors signal the need for caution, and perhaps adoption of a down-sized approach. Paradoxically, they can also be seen as opportunities and challenges which motivate staff.

Practitioners have repeatedly pointed up other success factors which have general application but are particularly relevant to large-scale projects. These include sustained, visible commitment from top management; strong support for end-user training; high quality IT staff with skills also in communications and knowledge of the organisation and its products; development of an appropriate technical and information architecture.

Contracting out

Improved cost-effectiveness is an important objective of contracting out in all countries. Contracting out can exploit economies of scale of specialised private sector suppliers and reduce overhead. While few countries are in a position to say "contracting out typically achieves savings of X per cent", there is evidence of significant cost savings in individual organisations. Contracting out has to be justified on a business case basis in any event - it clearly must not cost more if approval is to be given. The evaluation and comparison process itself can lead to improved cost effectiveness, partly through greater cost awareness. US experience suggests savings of 20-30 per cent even where the service is retained in-house.

Government is increasingly looking towards IT as a means of meeting demands for new and improved services. But resources are limited. Contracting out can tap the resources of the private sector in a mutually beneficial way. To achieve this, a number of countries are also exploring possibilities for new kinds of partnership with the private sector, sometimes necessitating innovative financing and institutional arrangements.

Transferring government business to the private sector can be an important stimulus to industrial development and international competitiveness, particularly important to small and medium sized enterprises. It can also provide opportunities for expansion abroad through development of new products and through being able to claim experience of working with government.

Contracting out takes place for other reasons too. It allows an organisation to focus on its core business, concentrating on its strengths. It can also improve accountability and reliability of IT systems, provide access to disinterested expert advice and the latest technology, and enhance ability to adapt to a changing environment.

A more obvious and frequent reason is because the organisation has no option. Simply put, without contracting out, priority systems would not be put in place by the due dates. Contracting out helps overcome skill shortages, either technical or managerial, or to supplement staff numbers, to meet workload

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3 More detailed information on contracting out is presented in Occasional Paper No. 5 in the Market-Type Mechanisms series. This includes the report of the PUMA Panel on Contracting Out IT Services in Public Administration as well as selected papers prepared for the Panel.
peaks or strict deadlines. It can by-pass rigidities in public sector human resource management such as long lead times for recruitment and inability to retain skilled staff who are better remunerated in the private sector.

There are limitations to contracting out. It is not always appropriate. Market under-development may limit the number of alternative suppliers, with consequential danger of getting locked-in to one supplier. The particular circumstances of individual organisations may also prevent contracting out, at least temporarily, for example, because of threatened industrial action or a strong tradition and capacity of in-house provision of IT services.

Most importantly, organisations are reluctant to contract out their strategic systems, which are critical to their mission or which include sensitive information. They frequently equate contracting out with reduced control. This is not necessarily the case. Various precautions can be taken, including contractual requirements about hand-over procedures and data security. Sometimes too the risks associated with in-house production are under-estimated. Sensitivities about strategic systems can be expected to diminish as countries gain experience themselves and gain from the experience of others, including business.

Cost measurement often has the effect of a barrier to contracting out. Cost comparisons must be on an equivalent basis. Government agencies need to take their full costs into account, including overhead, accommodation and capital costs. Private sector costs may also need adjustment, to include for example, incremental costs of contract management. Several countries have developed cost guidelines.

Successful contracting out requires a good working relationship with the contractor, underpinned by an adequate contract. The benefits are not automatic and require strong project management and regular performance monitoring. Performance requirements and responsibilities of both sides have to be clearly specified and understood. Requirements should be specified in terms of functional needs leaving contractors maximum flexibility to decide how to provide the service, thus facilitating innovative solutions. Acceptance criteria and testing are vital to provide an opportunity to terminate the contract early if necessary. Performance criteria are necessary to provide a basis for judging performance, allied to rights to compensation for failure to meet agreed performance levels. This is typically the most difficult part of negotiations. Contracts also need to specify the basis for charging for services provided and grounds for cost increases. A change control procedure is also essential.

At the same time, not everything can be specified in the contract. Water-tight contracts are costly and as a practical matter, sometimes impossible to implement. The aim is a working system, not compensation. An overly-legalistic approach may undermine efforts to establish a good working relationship. A price may also be paid in terms of lost flexibility, reduced innovativeness, and, in the end, less contracting out than is economically viable because contractors are unwilling to carry all the risks.

The impact on staff is a vital element in contracting out. The challenge for management is to make it a positive experience for them. This begins with early consultation to prevent rumours and uncertainty. A number of countries and organisations are bound by specific agreements with staff and their representatives. For systems development and maintenance, skills transfer is an important benefit. It rarely happens without specific mechanisms in place, including allocation of time for formal training. Contracting out routine or low-level operations can release internal staff for more interesting jobs. Morale can also be boosted where comparison shows staff and procedures as effective and up-to-date. On the other hand, staff may be de-motivated by perceived pay differences and tensions arising in the work environment.

Contracting out facilities management, where the contractor takes over full responsibility for the operation of a government-owned or leased facility, can result in major staff dislocation. Options for staff include transfer to the contractor company, with possible guarantees of reinstatement and provision of severance compensation, or transfer within the parent agency, with appropriate re-training. The maximum degree of freedom is sought for staff but in some cases early retirement and redundancy may be necessary.
Long-term statistics in the US show that 94 per cent of affected employees are placed in alternative jobs in government or with the contractor or take early retirement. In Canada, the Workforce Adjustment Policy sets out stringent requirements to protect staff.

Overall, countries report that the benefits from contracting out are significant, although the extent to which formal evaluations have been carried out is disappointing and merits a more rigorous approach. They expect continued growth according as the market capacity develops and experience is gained, against a public expenditure background which demands doing more with less for some time to come.

Member country administrations are increasingly concerned to get maximum value from IT investments. Contracting out and partnerships offer possibilities in this connection. Countries are active in several other areas too, including the promotion of common systems. A major current concern is the development of Open Systems. The question of Open systems was not examined in depth in the PUMA Committee's work, but the topic was signalled as one of strategic importance in attempts to maximise the cost-effectiveness of IT investment. Open Systems is a concept based on IT standards and is aimed at achieving uniformity and supplier-independence.  

Investing in Open Systems, instead of proprietary systems, offers numerous benefits:

-- a uniform environment for the development and operation of a system (portability);
-- a uniform environment enabling different systems to work together (inter-operability);
-- a uniform environment for systems of different sizes (scalability);
-- a common systems development environment;
-- a common information environment;
-- a common view on security.

Costs savings can be achieved at the product acquisition stage, mainly because of greater competition and choice, and by reduced running costs, due to lower upgrade costs, less need for training, and greater opportunities for sharing. The benefits are potentially significant but several difficulties remain to be overcome. Transition from existing systems poses difficulties of knowing whether, when and how to make the change. The existing proprietary system may function perfectly well in all respects. At the same time, technical choices are not always clear because of the uneven development of standards, be they formal or de facto, or because products which conform to the standards have not yet been developed or have not been verified by independent testers. Most Member countries are committed to the Open Systems concept in their administrations and are actively pursuing its introduction. Governments as major IT users have a key role in shaping the standards process.

Conclusion

IT is vitally relevant to administrative modernisation. It has already contributed greatly to the process, but mistakes have been acknowledged and the full potential of IT remains to be realised. IT needs to be used more for radical reform, not merely doing the same things more quickly, but doing new things.

From "Open Systems - a Handbook", Statkontoret (the Swedish Agency for Administrative Development), 1992

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The rhetoric of IT has often been ahead of reality. Current products and systems do not always live up to expectations. Solutions to today's problems always seem to be just around the corner. Public managers need to recognise the limitations of current technology and learn from implementation experiences. At the same time, they need to be aware of technological directions, in order to take advantage of emerging opportunities to meet the needs of tomorrow's public service, by fully exploiting the synergy to be obtained from the managed interaction of IT developments and organisational change.

Top management are vitally involved. They must set the strategic direction and provide appropriate structures and capacity for implementation. Only they can bring about the conditions for the organisational change necessary to capitalise on the IT investment. Only they can ensure that inter-organisational co-operation takes place. Much has been made of the potential of IT to produce positive or negative impacts, the "double-edged sword" effect. It is the responsibility of IT and general managers to manage the change, but they must be guided by top management. In the end, only they can ensure that the impact of IT is positive.