SOCIAL EUROPE

The Computerization of Public Administration

SUPPLEMENT 4/88

COMMISSION OF THE EUROPEAN COMMUNITIES

DIRECTORATE GENERAL FOR EMPLOYMENT, SOCIAL AFFAIRS AND EDUCATION

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This publication is also available in the following languages:

DE ISBN 92-825-8545-X
FR ISBN 92-825-8547-6

Luxembourg, Office for Official Publications of the European Communities, 1988

Catalogue number: CE-NC-88-004-EN-C

ISBN 92-825-8546-8

Printed in Belgium

C O N T E N T S

EDITORIAL

So far, the Social Europe Supplements on the social implications of technological change have focused on production and information technologies as applied to industrial processes or services.

This issue deals, by contrast, with a rather unexplored and special area, namely the computerization of public administration. In many respects, public administration typifies the computerization needs and problems of complex organizations. It has to contend with the same problems of filing and retrieving data and information, and the same communication problems, as any other field of office work, but with the added complexity caused by the existence of a set of rigid and formalized procedures, statutory requirements and an organizational structure which is, in overall terms, far less flexible in adapting to change than that of the private sector . On the other hand, public administration provides services to the general public, so that product innovation in the form of the provision of new and better services may be just as important as innovation in processes and the computerization of routine tasks.

The computerization of public administration started in many countries in the 1960s and went through all the developments of information technology: from large mainframes to distributed computing. Given the fact that, in several countries, a process of decentralization occurred simultaneously in the public sector, the most recent technological developments as regards equipment and systems should be particularly appropriate to a structure in which local units acquire greater autonomy and power. However, this creates a number of problems concerning not only the compatibility and interconnection of equipment but also the balance of power between departments and between central and local administration.

As far as social effects are concerned, the particular status of civil servants, who in several countries enjoy a system of employment for life, is certainly an important factor in explaining why technological change has had less dramatic effects in the public sector than in private industry.

Nevertheless, as emerges from the reports presented below, even in countries where employment for life is not the rule, employment has not decreased but rather the workload has been redistributed by computerizing routine tasks and releasing resources for other jobs. However, most reports conclude that, in view of the substantial increase in the volume of work, the 'negative' employment effect should be measured by estimating how many additional employees would have been needed, had information technology not been introduced into public administration. In other words, technological change and organizational restructuring enabled the administration to carry out a much greater workload with the same number of people.

Research findings on the use of information technology to provide new and better services to the citizen are rather disapppointing: what emerges from all reports is that information technology has been used primarily to rationalize, and that little attention has been paid to the range and quality of end products. However, the innovative potential of IT in the latter field is great, and some experiments with enlarged and improved public services are presented in the reports.

Although innovation is moving fast and some of the data presented in this survey will soon be outdated, this Supplement is meant to provide a general appraisal and some comparative data on a sector on which no international studies exist in Europe and official data are often lacking or incomplete. Since the Commission of the European Communities is itself a public administration, having sometimes more complex problems than the national administrative bodies, we shall, before moving on to the national reports, provide an overview of programmes, problems and socio-organizational implications of IT as perceived at Commission level.[1]

J. DEGIMBE
Director General

1 Spain and Portugal are not included in this Supplement. Some information on the computerization of their public administration can be found in Supplement No 1/1987 "Information Technology and Social Change in Spain and Portugal".

COMPUTERIZING THE COMMISSION OF THE EUROPEAN COMMUNITIES

I. INTRODUCTION

Information processing in the Commission gradually cast off its conventional punch-card legacy during the 1960s.

The Computer Centre was set up in Luxembourg and a team of pioneers set to work designing and implementing the earliest applications in the administrative and statistical fields.

The early 1980s proved a watershed in the development of the Commission's in-house data processing facilities, as in manyu other public and private organizations. From being highly centralized, the Commission's DP facilities steadily became more distributed as technology advanced and computer systems fell in price.

Information technology systems, traditionally described as data processing, acquired a broader dimension reflected in their newly-defined status as "the progressive integration of data, text, images and speech, including office equipment (office automation) backed up by a telecommunications network (data communications)" (1). The Informatics Directorate was soon to find itself assigned responsibility for telecommunications and office equipment.

This reorganization was the launching pad for an explosion in in-house information processing, with the number of workstations (2) rising from 443 in 1980 to 3095 by 1985, with a tenfold increase in computing power. The number and range of applications has expanded to the point where a hundred or so projects are now at various stages of development in realms as varied as administration, accounting, financial administration, economic modelling, statistics, documentary and terminology databases, production monitoring systems in the iron and steel industry and import control (textiles, etc...).

(1) Guidelines for distributed computing in the Commission, 1981-1986 - Report approved by the Commission, 20 May 1981.

(2) Workstation means terminals, word processing equipment and microcomputers.

How can such growth be kept in hand? And what impact will it have on work organization, the work environment and jobs? This article endeavours to address those problems.

II. THE COMMISSION'S INFORMATION PROCESSING STRUCTURE

The professional data processing needs of a single user may be many and various: production of texts, tables or graphics on a desktop computer, use of a local application or database (i.e., particular to his administrative unit), retrieval of information from a central database, transmission/reception of messages over an electronic messaging system (E-mail), ...

In the majority of cases he is faced, as the above examples show, with the need to communicate (over a data communications network). From his own workstation, terminal or microcomputer, the user needs to be able to link into an information processing system which may be spread out between different computers - preferably without the need for specialist computer expertise.

The problem becomes especially complex when the steadily rising number of users reaches the thousands spread over a number of sites. And it will become hopelessly entagled without a coherent hardware/software purchasing policy and failing a proper long term strategy.

The broad lines of the Commission's in-house IT policy are laid down in the distributed information processing structure evolved in 1984, the main planks of which are (3):

- Opting for a multivendor environment to prevent overreliance on one or two suppliers. The problems involved in a possible change of supplier can become acute when lead times and conversion costs are taken into account.
- Observance of common standards in compliance with the industrial policy guidelines laid down by the Commission to facilitate systems portability.

(3) Annual Report on Data Processing at the Commission - 1984 (Report of the Commission to the Council and European Parliament).

- Maximum software portability.

These guidelines make the Commission a precursor, but it is clear that equipment interoperability is in the joint interests of customers and manufacturers alike: Free competition and a common market for information is possible only if suppliers produce compatible equipment based on international standards and if the same software can run on different computers. (4).

The Commission's choices have been vindicated by developments in the strategies of manufacturers and leading multinationals, whose policies are beginning to converge. It would like to see its example followed by other public and international administrative bodies. (5).

III. A FRESH PERSPECTIVE ON ORGANIZATION

The Commission's organizational development plan aims for one computerized workstation to every two officials by 1990, with two-thirds of the computing power located in the individual office or nearby on a local computer for the Department or Directorate General.

Put another way, the idea is for terminals and microcomputers to become as standard an office feature as the telephone in the short term.

Such a development must have an impact on work organization and management methods. And where the computing structure of a firm or administration used to be designed as top-down from the EDP manager, the bottom-up view now seems more appropriate.

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(4) Dr W. DE BACKER - "Information Technology: methods and management".

(5) Without becoming too technical, the options include and go beyond the principle of Open Systems Interconnection (OSI) to propose practical forms of cooperation in implementing applications systems to assure interoperability between users rather than hardware (Annual Report, Appendix 1).

In such an environment, the "local user group" becomes the basic organizational unit, characterized by the close intermeshing of its members' professional relations and their highly specialized information processing needs. What differentiates users from data processing staff is the nature of their relation with IT - it is a tool they use to simplify, enhance or increase the productivity of their work.

User functions vary at every step in the chain of command: a user may be a project manager involved in the development of data processing applications, or a database administrator. He/she may be an applications manager, data or text generator or retriever, ...

Not being a computer specialist, however, the user must have access to data processing expertise.
His first line source of data processing prowess will be the local data processing unit of his immediate work environment within his Directorate General or Department. The local data processing unit has wide range of tasks, notably the following technical functions:
- local systems management;
- local data processing security;
- development, maintenance, documentation, training and support for "local" applications.

The overriding principle is to devolve the maximum responsibility and activities to local data processing units, to the extent that is leads to overall cost-effective solutions for the Commission. Hence, Directorates General are being asked to build up their local teams, and new functions - such as local system manager - are emerging.

Within this type of organizational structure, the Informatics Directorate acts as custodian of technical and operating choerence and overall economic logic. It manages the data processing budget, monitors market trends, and selects hardware, software and services with a constant eye to compatibility and inter-operability.

Without going into the nuts and bolts of its duties, two facets of its activity stand out as increasingly important as the expansion of distributed procesing forces data processing experts to become management- and communication-oriented.

- One stems from the need for rigorous management of information processing resources and the setting of priorities to cope with the explosion in departmental demand. That is why the Informatics Directorate is equipping itself with a state-of-the-art resource administration system comprising resource planning and cost appraisal instruments (machine time, storage capacity, data transfer, etc., ...).

- Secondly, users have a growing need for assistance, training and support, and data processing must offer the highest quality, usedr-friendly, reliable service to a growing number of increasingly demanding users whose occupational efficiency and effectiveness is directly dependent on information processing.

To accomplish its new duties, the Informatics Directorate needs to review its management methods placing emphasis on the "front line" personnel (6), i.e., data processing staff in daily contact with the "customers" (users). The "public image" of computer processing is conditioned by the quality of their service and their ability to interface with users. An infrastructure, called "Data Processing FORUM", has also been established to foster contacts and as a clearing house for information and expertise between data processing professionals and users.

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(6) The "front line" concept was developed by J. CAHLZON, President and Chief Executive of the SAS Group - "The role of a manager in a competitive climate - the SAS story" - at the Commission of the European Communities' Seminar on Management and Modernization - WEPION - April 25-26, 1986.

IV. INTEGRATING INFORMATION STSTEMS IN THE WORK ENVIRONMENT

The capital deepening investments made in industry and agriculture in recent decades have gradually changed working methods. By contrast, the world of "white collar" work has remained fairly unchanged, with a low level of investment in reorganization.

The situation has now changed, and the automation of office work has been a growing reality for years throughout the service sector. If, as Karl Popper says, distress is bred of the unknown, then past, and to some extent continuing, resitance to data processing becomes understandable. What was perceived as an immutble world is crumbling before our eyes, and the talk is all of modernization, change, mobility, innovation, new technologies, ...

This approach may admittedly seem on the excessive side, but the fear is, as F. GAUSSEN wrote (7), that "the more we are urged to go forward, the greater the desire to seek refuge in the past". At the same time, however, refusal to change is not expressed point-blank, but in a veriety of different ways: unwillingness to cooperate, inaction, exaggeration of obestacles, stressing the failings of technical innovations, scepticism, ... making it harder to counter. These attitudes are found in all types of organization faced with innovations, be they technical or organizational.

The only way to overcome them is to create a climate of confidence, and to attenuate distress by eradicating, so far as possible, the "unknown" through training and information. Information, dialogue, transfer of knowledge and proven successes are the preconditions for the successful integration and acceptance of new technologies in the work environment. Computerization may help modernize administration, but at the same time it will become fully effective only in an environment where both management and working methods are themselves modern.

(7) Extract from an article by F. GAUSSEN - Le Monde - 6.12.1985

The Commission is gearing its measures to ease the integration of new technologies in the work environment around three policy lines:

i) consultation with staff and their representatives;

ii) a major training and information drive;

iii) a reasonable and realistic pace of automation of departmental acitivities.

Staff consultation is high on the list of Informatics Directorate priorities, carried out through meetings of the Consultative Committee on Staff and New Information Technologies, bringing together representatives of trade unions and professional associations, and the Staff Committee. The Committee considers the present and future implications of introducing new technologies in all areas of staff concern, chiefly employment, working conditions, training, changing duties, etc. Amongst the concrete achievements of the Committee is the implementation of rules and recommendations on work with VDUs.

The existence of the Staff and New Information Technologies Committee offers an assurance to staff that their fears and complaints will be brought to management's attention. Conversely, the Informatics Directorate finds it a source of information enabling it to modulate its positions or directions should the need be felt.

Training is another sine qua non to the successful integration of computing as a tool for users. The training effort incomputer processing has been steadily rising and is now expanding even further. From 1983 tot 1984, total training grew by 57%. That is not, however, to deny the need for further advances if computer workstations are to become as routine as telephones. New training methods (video-based courses, computer assisted training, ...) should enable a substantial percentage of employees to be trained. A long-term training plan has been evolved, defining and quantifying the requisite training programme for each job description.

The Commission's experiments show either that employee resistance to computer technology should not be exaggerated, or at least, that it seems largely a thing of the past. The time has gone when computing was of interest only to a few impatient innovators. The extraordinary expansion of the microcomputing market in recent years and the activities of the mass media, helped on by a few in-house success stories, have helpedj "popularize" electronic information processing. It is no longer a daunting prospect - on the contrary, user demand for services is booming.

The same attitudes can be observed at an individual level, where the possession of computer expertise and the ability to deploy data processing in a routine manner are emerging as positive rungs up the career ladder.

Nonetheless, the pace of automation of departmental activities must be kept in perspective and controlled in the light of human, organizational and technical constraints; nor should we abandon ourselves to a "total computerization - now" attitude. Only through a rational, gradual approach based on cost-benefit analysis will we achieve optimum exploitation in the long term of the richly rewarding potentials of data processing in public an international administrative organizations.

J.N. DURVY

TECHNOLOGICAL DEVELOPMENTS AND THE PUBLIC SERVICE:

AN EIGHT-NATION STUDY BY THE EUROPEAN FOUNDATION FOR THE IMPROVEMENT OF LIVING AND WORKING CONDITIONS, DUBLIN

I. BACKGROUND

In October 1983, the European Foundation for the Improvement of Living and Working Conditions initiated a study on technological developments and the public services as part of its overall research programme into social changes associated with the use of electronic technology. Eight countries participated in the research: Belgium, Denmark, France, Federal Republic of Germany, Ireland, Luxembourg, the Netherlands and the United Kingdom, each of which submitted a national report. This brief note is based on the comparative analysis of these national studies.

The research objectives were to examine the effects of the introduction of technology on:

a) The public service agencies themselves i.e. impact on work organization, work environment and quality of work life of employees; and

b) the quality of service rendered to the public i.e. speed, equitability, reliability and effectiveness.

In drawing up guidelines for the research, a decision was made to focus on those areas of the public service which render a personal service to the public - principally social security/financial compensation and population registration offices. The following is a list of the case studies undertaken in each participating country:

Belgium:

a) Population registration:
   (i) at national level via a study of the National register;
   (ii) a before-after comparison at the local level of two local authority population registers - one computerized and linked to the National Register; the other a manual system not linked to the National Register.

b) Occupational Diseases Fund: a national organization with responsibility for the prevention of occupational diseases and for the payment of industrial compensation to workers with specific occupationally-contracted illnesses.

Denmark:

a) Employment Services: computer system for supporting the filling of job vacancies in two local employment offices;
b) Sickness benefit administration in a large municipality;
c) Pensions administration in a large municipality.

France:

Unemployment benefits and employment services:
The GIDE project: computerization as an aid to cooperation between agencies in the unemployment/employment field.

Federal Republic of Germany:

a) Rent allowances administration in a local office;
b) Social assistance administration in a local office;
c) Population registration in a large town.

Ireland:

a) Unemployment assistance administration in a local office of a central government department;
b) Disability/sickness benefit administration in a central government department;
c) Allocation of public housing in a large local authority.

Luxembourg:

Social security administration at national level:
a) Administration of family allowances;
b) Administration of sickness benefits.

Netherlands:

a) Population registration: comparison of two local population registers:
one manual, the other computerized;
b) Social assistance administration in two municipal offices.

United Kingdom:

a) Employment services: computerized vacancy circulation system in two local employment offices: experienced user vs. inexperienced user;
b) Housing benefits administration in two local authorities: contrast of two different computer systems in use.

II. SOME MAJOR FINDINGS

There has been remarkably little research into technological change in the public service - in spite of the fact that the public service is probably the largest user of information technology in the service sector of most countries. As the research findings of this project are based on a limited number of case studies, the conclusions should be viewed as indicative rather than conclusive or representative of the total reality.

A further limitation on research of this nature is the pace of technological change itself. What is true today will almost certainly not hold true tomorrow, given developments in advanced information technologies (IT) and the rate at which the public service is increasingly adopting these new technologies. In this regard, the European Foundation is conscious of the fact that the emphasis in most of the case studies is on traditional DP applications (viz. centralized batch processing). But these types of applications are currently the most important in the public service computerization portfolios of most countries, and insofar the reports give a picture of reality of the day.

The main findings arising from the case studies are:

a) Design and Planning of Computer-based systems:

- Efficiency and cost-cutting are primary objectives in computerization programmes. In almost all case studies, the prime, if not sole, objective in introducing technology was to improve administrative efficiency, although improvements in client service also occured, both directly and indirectly.
- Inadequate planning for information systems at organizational and project level in many countries is leading, in many cases, to problems which could have been anticipated. It was stressed,

however, that planning in an unstable, recessionary environment with its concomitant economic, social and political pressures is particularly difficult. Many of the reports identified the need for some form of strategic planning at national or governmental level to highlight the problems and issues raised by the increasing use of technology in the public service.

- Lack of coordination and standardization of computer systems is leading to problems of duplication of effort or incompatibility in some countries.
- Trend towards decentralization of computing facilities in most countries.
- Relatively little attention is paid to non-computer factors in systems design and implementation e.g. little emphasis in most cases on physical work environment apart from basic hardware ergonomic factors.

b) Impact at the Organizational Level:

- Changes in organizational structures accompanying or succeeding the process of computerization are minor.
- Marginal impact on employment levels: No staff were made compulsorily redundant. However, staff savings were achieved in many instances in that computerization made it possible to cope with increasing volumes of work (especially in the social security area) without a corresponding increase in the number of staff.
- Little impact on careers and grading structures of administrative/ clerical staff. Few instances of up-grading were reported. However, difficulties in retaining qualified specialist staff were identified in many reports - the private sector offering more attractive and lucrative career prospects to such staff.
- There tend to be low levels of employee and trade union involvement in systems design and implementation in most countries (Denmark excepted). In most cases, staff involvement could be characterized as passive consultation rather than active participation.
- There is inadequate user training for computer systems at clerical, administrative and higher management levels in many countries.
- The levels of acceptance of computer systems by employees is high.

c) Impact at the Individual Employee Level:

- Changes in job content and quality of work of staff. Higher level "knowledge workers" i.e. professional and managerial staff felt that computerization benefited them greatly in their jobs, enabling them to concentrate on the more interesting aspects of their work by eliminating tedious, time-consuming tasks. Lower level "information workers", on the other hand, often had the opposite perception. In particular, those allocated to data entry work felt that their jobs had become more boring, fragmented, fatiguing and pressurized. In almost all cases, computerization was implemented in such a way as to reinforce existing organizational patterns and arrangements. Pre-existing management practices and organizational structures, therefore, were the main determinants of job content and design - not the technology itself.
- Changes in supervisory practices. There was a trend away from controlling people to controlling and planning the work process. To a very large extent, impersonal controls replaced personal supervision.

d) Impact on the General Public:

- Changes in nature and quality of service to the public.
  Both obvious and subtle changes in the delivery of client services were indentified. Among the obvious changes were: a movement away from cash payment to payment by cheque or electronic funds transfer, decrease in frequency of attendance of clients at public offices and improvements in information services brought about by the introduction of on-line enquiry systems. Some of the less obvious changes were disimprovement in service to non-routine clients, greater difficulty in tracing errors and understanding forms and a more formalized, business-like service (usually welcomed by members of the public). In most instances, the public were not very aware of these changes in service - many being unaware that the service had been computerized. Where perceived, the changes were usually thought of as marginal.
- Low level of knowledge of data protection laws and issues among public servants dealing with the public in most countries (Denmark and Belgium excepted). The need for strict organizational controls and administrative measures, in addition to statutory legislation,

was identified in some reports - including Germany where stringent laws already exist. Concern with the use of technology as a mechanism of social control was also expressed in some national reports.

III. ISSUES AND PROPOSALS

The case studies show that computerization in the public service may bring with it either improvements or disimprovements for employees and the public depending on (a) how the automation process itself (i.e. planning - design - implementation) is handled and (b) the nature of the pre-existing organization, its structures and management practices. The greatest benefits were achieved in cases where there was an informed and committed management, active, positive user participation at all levels, flexibility in relation to organizational change possibilities and a professional and systematic approach to systems design and implementation.

The relative low level of staff involvement evident in many of the case studies is an issue deserving greater attention by management and staff representatives. Even where structures existed to facilitate such involvement, lack of familiarity with computer concepts and systems sometimes prevented users from contributing to the discussion in any meaningful way. This lack of knowledge may only be a generational problem. In future years, users are likely to be more informed and confident in their dealings with specialist staff. However, in the interim, it is clear that more comprehensive preparation and training for automation is needed, at both end-user and user management levels.

Deficiencies also exist in our current understanding of the organizational effects of automation. Comparatively little empirical research exists on the extent to which technology has an impact on internal organizational practices and structures, particularly in relation to public service organizations which have to operate within a strict legal and politico-administrative framework.

Current information technology applications in the public service are very much oriented to internal management and administrative functions. These process-type applications have not, as yet, had much impact on organizational structures and employment levels because they have not (according to many of the reports) been very thorough or well-coordinated, or because their employment impact has been hidden by the large increase in the demand for public services, particularly in the health, housing and social security areas. In many ways, the public service is only at the beginning of the technological revolution. As computerization becomes more pervasive, public service managers become more skilled at managing technological change and as new types of public services develop, significant changes can be expected in organizational structures, functions and processes and in the type and quality of services offered to the public.

Eberhard Köhler, European Foundation, Dublin
Evelyn Blennerhassett, Institute of Public Administration, Dublin

COMPUTERIZATION OF PUBLIC ADMINISTRATION AND SOCIAL CHANGE: AN OVERVIEW

INTRODUCTION

Given its size in many member states, it is not surprising that the public sector is often the largest single user of Information Technology. One would expect governments to take advantage of this large potential base to assist in the development of policies to encourage the diffusion of Information Technology in general or to provide an opportunity for the domestic manufacturers of Information Technology equipment as part of some industrial policy. We shall see later that this has not necessarily been the case, although there are some examples of government inititatives and public procurement policies which have attempted to promote the diffusion of Information Technology or assist domestic industry.

Since much of the work of public administration, - especially at the local level - is to provide services to the public, there are also opportunities within public administration to use Information Technology much more broadly than might be the case in private industry.

Unfortunately, in common with the situation in many large private sector organizations, the real potential of Information Technology has yet to be realized in public administration. Until recently, its introduction has often been piecemeal - a parallel to the islands of automation found in manufacturing industry. It is also evident that the computerization of public administration has resulted in many of the problems faced by large organizations in their attempts to introduce new technology - skill shortages, lack of adequate planning, insufficient consultation with the workforce, lack of adequate training etc.

Other parallels can be drawn between manufacturing automation and the computerization of public administration. In manufacturing, microelectronics have mostly been utilized in process innovations to automate tasks previously carried out manually. It is far rarer for microelectronics to be used in the form of product innovations, despite the huge potential to create new and exciting products. One can consider much of the use of Information Technology in the public sector as a form of process innovation, and many of the tasks previously carried out manually have been automated by the use of

computers. There is also the potential to use Information Technology for product innovation in the public sector - Information Technology can open up opportunities to provide new services to the public rather than merely automating the existing ones by means of process innovation. This second use of Information Technology is far less common than the first, but it is this type of innovation which may have more implication for the general public.

In considering the social implications of the use of Information Technology in public administration, we must not only take into account the implications for those employed within the public services but also the implications for the users of public services - the general public.

But before these implications are examined in more detail, it is necessary to define which parts of the public sector are under consideration and what is meant by computerization in this context.

THE PUBLIC SECTOR

The Public Sector consists of central government administration, local government administration, public sector enterprises (such as nationalized industries and the Post Offices) and a number of institutions and organizations falling under state or local government control.

Central administration generally consists of government departments and ministries which are responsible for carrying out policy decisions made by the executive and for administering legislation put through parliament.

Local administration usually involves more than one tier of local government, with most member states having a combination of some or all of regional, provincial and municipal government. Regional or provincial authorities are usually responsible for the administration of larger scale services such as education, roads and transportation, the police force, fire and strategic planning services.

Municipal authorities generally administer the more local services such as housing, refuse collection, local planning and development control, and amenity and recreation facilities.

In this overview, and the various national reports which follow it, we are considering the use of Information Technology in administrative and legislative tasks in both central and local government administration. The public sector enterprises (nationalized industries), national health services and the education sectors in the various member states are excluded from the analysis.

COMPUTERIZATION

For the purposes of this overview we shall take computerization to mean the use of Information Technology in carrying out the administrative and legislative tasks required of public administration in the provision of public sector services. We are concerned with the convergence of computing and telecommunications technologies in a broad sense. Thus we shall be considering mainframe, mini and micro computer systems, word processing systems, electronic mail, facsimile, local area networks etc. used to support the work of the many central and local government administration offices. We shall also take account of the use of viewdata services which can be used to provide new public services and enhance existing ones.

THE DIFFUSION OF INFORMATION TECHNOLOGY IN PUBLIC ADMINISTRATION

The nature of diffusion

The scale of computerization of public administration varies considerably across the member states. Up to now Information Technology has mostly been used to automate existing services with the aim of increasing efficiency rather than to provide new services. In most states, there is increasing pressure to reduce public expenditure. Computerization is seen as one way in which economies can be made - the same level of services can be maintained with fewer people and hence at lower cost, so goes the argument.

In such an environment it is not surprising that much of the Information Technology introduced in public administration has been aimed at supporting internal management functions. Indeed, potential cost-savings are often high on the list of needs in justification of computerization projects.

Certain states have initiated modernization or automation programmes for the public sector. In Denmark, the modernization programme was initiated in the spring of 1984 with the aim of increasing the general efficiency of public administration by the optimal use of new technology. And in Belgium, a similar programme was initiated in 1985 following the recommendations of the Bodart report which was the result of a government-commissioned study to appraise the situation.

In common with the development of computerization in many large organizations in the private sector, Information Technology was first used in public administration in the form of large mainframe systems to support central management functions. The technology was ideal for the creation of large central databases and encouraged the trend towards centralizing certain tasks. Batch processing was the dominant process. The advent of mini computers heralded the use of Information Technology within departments to facilitate internal departmental functions. More recently, the introduction of microcomputers and wordprocessors has further extended the use of Information Technology and the emphasis has begun to shift away from large data-processing departments to individual users. Improved technology has led to the development of "on-line" systems providing public services with new opportunities for information retrieval.

These trends towards the use of departmental mini and micro computers are particularly apparent in local administration. At central government administration level, there has also been a shift towards departmental computing but, in addition, there are several ambitious and large-scale computerization programmes in progress involving large data-processing operations similar to the original applications of Information Technology in public administration. Some involve the linking of local and regional systems to central databases via networks. In the UK, for example, there is a major programme to automate the Department of Social Security's payment schemes - 10,000 terminals are to be installed in the automation of the National Unemployment Benefits payment system while a further 20,000 terminals are planned over the next decade in local offices of the Social Security Service rising to 30,000 in the long term.

Quantitative estimates of diffusion

Estimating the diffusion of Information Technology in public administration in quantitative terms is not easy because of the wide range of types and sizes of computer systems, and in some cases data are not collected centrally. However, in some states, some data about the numbers of computers in central administration is available. This is presented in Table I. Direct comparison between the states is impossible because of the different years in which the data has been collected and differences in definition of the terms.

Table I: Diffusion of Information Technology in Central Public Administration

Member State	Year	Large Computers	Terminals/ Workstations	Wordprocessors	Micros
France	1983	4712	22880	2609	na
	1985	6860	29060	6680	8000
Denmark	1986	na	6000	9000 (1984)	na
Holland	1983	na	17800	na	1050
	1986(est)	na	39100	na	5100
Italy	1984	765	13596	na	49
UK	1983	700+900	10000	na	na

Sources:

France - Ministère de l'Industrie

Denmark - Interview with Mr BOSMIDT, Administrationsdepartementet

Holland - Centraal Bureau voor Statistiek, Automatiseringsenquete 1983: Automatisering bij de overheid, Statistisch Bulletin, 8 September 1986.

Italy - Provveditorato Generale Dello Stato: L'automazione nella amministrazione dello Stato, Istituto Poligrafico, Roma, 1985.

UK - Strategic Study of Administrative Telecommunications, Information Technology in The Civil Service No 5, HMSO 1984.

Although numbers are hard to find, annual expenditure on Information Technology within central administration has been estimated in several states. These estimates are presented in Table II. The cost of computer staff in the civil service is not included in these estimates, but they do include the cost of hiring consultants and maintenance costs in addition to expenditure on computer hardware and software.

Table II: Annual expenditure on Information Technology-related items in Central Administration

Member State	Expenditure
France	FF 13932 million in 1984
Belgium	BF 9070 million in 1983
Fed. Rep. Germany	DM 311 million in 1984
Holland	DFL 3 billion (DFL 500m on development)
Italy	Lire 1000.1 billion in 1984
UK	£ 750 million in 1984

Sources:

France - Ministère de l'Industrie

Belgium - Service d'Administration Générale

Fed. Rep. Germany - GMD-Studien (1983); and ÖVD/Online/adl.

Holland - General Accounting Chamber

Italy - Provveditorato Generale Dello Stato: L'automazione nell amministrazione dello Stato, Istituto Poligrafico, Roma, 1985.

UK - Central Computer and Telecommunications Agency: Progress Report, Information Technology and the Civil Service, IT Series No 11, HMSO 1985.

Data on the numbers of computers at the level of local administration is even harder to come by. Sometimes there are estimates of total numbers, sometimes of the penetration rate - i.e. the percentage of local authorities with computing facilities. The data is too fragmented and non comparable to present in tabular form but an idea of the use of Information Technology in the various member states may be gauged from the following information.

The rate of diffusion of EDP in the borough councils in Italy at the end of 1984 was estimated at 46% in one survey[1]. In Holland the total number of computers at the end of 1981 in provinces and communities was 1290, with another 440 expected to be installed in 1982-83[2]. In France, 87.4% of communes with more than 10,000 inhabitants had computerization; 57.1% of those with a population of 5000-10,000; 21% of those with a population of 2,000-5,000; 2.15% of those with a population of 500-2,000; and 0.5% of those with less than 500 inhabitants[3]. In Denmark, there were an estimated 1,500 generalized computer workplaces in the municipalities in 1983[4]. In the UK almost 90% of local authorities had computers by 1980 with a total installed value of some £ 150 million and an annual computer budget expenditure of about £ 130 million[5]. In Ireland, between thirty and forty mainframe computers were in place in local authorities in 1983[6]. In Greece the only local public administration with any computers is the Athens area.

GOVERNMENT POLICY

In some states a central body responsible for overseeing government policy on the use of computers has existed for a number of years - the CCTA in the UK, the Central Data Processing Service (CDPS) in Ireland, for example. Lately, the role of both the CCTA and the CDPS has been modified to give more autonomy in decision making to the individual departments, although they still retain some central responsibilities. There is no separate central body at the federal level in the Fed. Rep. Germany - coordination of procurement and some limited advice is given by a subdivision of the Ministry of the Interior.

But in recent years most states have tried to coordinate a central policy on the computerization of public administration by the establishment of special bodies. In Italy, a Commission for Computerization of Public Administration

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1 Honeywell: L'evoluzione del mercato EDP in Italia nel 1984, mimeo 1985
2 Centraal Bureau voor Statistiek: Automatiseringsenquete: Computer-installaties bij de overheid 1981, Staatsuitgeverij, 1983.
3 A.M.F.I., La Gazette/Le Moniteur.
4 I/S Datacentralen of 1959, Forvaltningens administrative arbeidsplads, 2 ed, Copenhagen, 1984.
5 Microcomputing in Local Government Element 2 "A Study of the Local Government Computer Environment", LAMSAC 1980.
6 Blennerhassett E. & Moran R. "Technological Developments and The Public Service: Impact on the General Public and on Employees in Ireland" in New Technology and the Public Service, Ireland. Dublin: European Foundation for the Improvement of Living and Working Conditions, 1984.

was established within the Department for Public Administration in the early 1980s. In Greece, a high level policy-making body - the Government Council on Informatics - was established in 1985, with the primary objective of developing a national strategy for the development of informatics in Greece and to control the government policy in this area. In Holland, a Central Government Information Facilities Committee was established in June 1986. The Comité Interministeriel de l'Information et de la Bureautique dans l'Administration (CIIBA) was created in 1984 to coordinate the Information Technology policies of the various Ministries in France. In Belgium, a new Secretary of State - the Secretary of State for the Modernization and Computerization of Public Administration - was created in 1985 to provide some new central guidance to the introduction of computers in public administration.

In the case of local administration, there are few central bodies responsible for coordinating policy for the use of Information Technology. Individual local authorities are largely left to their own devices although a few bodies have been established to assist them in some member states. The emphasis in most cases is to assist in the development of common software - the applications are often the same or very similar at the level of the smaller local authorities. In the UK for example, the Local Authorities Management Services and Computer Committee (LAMSAC) conducts research on the computerization of local applications which includes, among other things, a list of transferable software products for mainframe, mini and micro computers developed by individual authorities and a list of third-party general and application software for computers used by local authorities.

In some states this assistance goes further. For example, in Ireland, the Minister for Local Government established a Local Government Computer Services Board in 1975. This board is responsible for the systems development in most of the smaller local authorities, for giving advice on the purchase of hardware and software, and also offers a bureau service for batch processing. It has been responsible for developing fourteen major systems including payroll, water charges, housing allocation, electoral roster and traffic fines. In the Fed. Rep. Germany, the state governments established regional computer centres to provide a coordinated computer service for the smaller local authorities. And in Denmark there is a

computer service centre for the municipalities - Kommunedata - which is one of the largest computer services companies in the world (13th on the world ranking list with a turnover of $ 66.8 million in 1984).

INFORMATION TECHNOLOGY PROCUREMENT POLICIES

It was mentioned in the introduction that some states had pursued public procurement policies designed to assist domestic computer and Information Technology equipment suppliers. The effects of such policies are still visible in some countries with the central administration market being dominated by the domestic producers.

The UK used to give preferential treatment to ICL when purchasing large computers - this policy was pursued for 14 years from 1966 to 1980. By 1977 two out of three computers in the UK central administration were ICL computers. With the enforcement of GATT and EEC regulations in 1981 the preferential purchasing policy became illegal. ICL still holds 49% of the central administrations computers. Although there has been no public procurement policy at local authorities level there has been a preference to "buy British" and ICL still holds more than 50% of the local authority market for mainframes.

In Italy public procurement was most often concerned with the purchase of software. The IRI group of software companies known as Finsiel was afforded special preferential status by means of special bills in Parliament which enabled them to sign contracts with government departments without having to go through the normal tendering procedures.

In the FRG there has been much discussion about preferential treatment for domestic manufacturers but in reality there is a wide range of makes of equipment in use in public administration.

In France, there has been a considerable switch from overseas manufactured computers to French manufactured equipment. In the years 1970-1975 French manufacturers could boast an average of 27.2% of the park of equipment in central administration. By 1985, this had risen to 67.1%, with Bull enjoying 52.7% of the total. IBM's share of the market had fallen from 42.4% to 16.4% (source: Ministère de l'Industrie). In the departments Bull has 70% of the

market (IBM 11.5%). At the communes level Bull is still the largest supplier although foreign manufacturers - especially IBM - have a more significant presence. As the size of the commune gets smaller so too does the relative dominance of Bull as more micros become the dominant technology.

In Belgium the market is dominated by IBM and Siemens who shared over 53% of the market in 1983. In the early 1970s there had been attempts to encourage the growth of Philips and Siemens by preferential treatment but these largely failed.

The other states have little or no domestic manufacturer of computer equipment and so rely on imported equipment. In Ireland, the local government computer board recommended the purchase of ICL equipment to encourage standardization.

Greece is totally dominated by the multinational computer manufacturers and there are some complaints about being tied in to their range of products and solutions to the problems in Greece.

AGREEMENTS ON THE INTRODUCTION OF INFORMATION TECHNOLOGY IN PUBLIC ADMINISTRATION

Most of the trade unions whose members are concerned with the use of computers in public administration have established certain demands covering the introduction of Information Technology. There are variations in the precise demands in the different member states but the most important concerns are around questions of job security, quality of working life, health and safety issues, employee participation and training. New technology agreements between the unions and the various employing bodies in the public sector usually reflect these concerns. More broadly, the unions believe that new technology should be used to improve the quality of services, to allow the development of new services and to facilitate reductions in working time via early retirement etc.

Several states have witnessed agreements between public sector unions and management. At the end of 1985, an important agreement was signed in Italy. This agreement included an information clause saying that whenever new EDP systems are introduced or changed, trade unions will be informed in due time of the general characteristics of the new systems, they may express

suggestions and proposals and the creation of mixed commissions of trade union members and management may be considered. In return for this information clause, the agreement stated that to improve efficiency and productivity, special projects might be proposed by the administration, discussed with the unions and implemented.

In Denmark a technology agreement covering the public sector was signed in 1981. This agreement allowed for cooperation in the introduction of new technology or modification in existing systems on the basis of co-determination. This meant that employees could have some influence on the decision-making process and have a say in what personal work stations they should have. Special emphasis was laid on security of employment for workers. Management has to provide information about the new technology - its aims, functions, set-up and design and possible connections to other systems; and also how its introduction will affect working conditions, work organization and personnel requirements, job content, vocational training and education.

A similar agreement, at the level of the municipalities, was signed by the National Association of Municipalities (Kommunernes Landsferening) and the Association of Civil Servants in the Municipalities (KTV) in 1984.

In the UK, the largest civil service union, the Civil and Public Services Associations (CPSA) concluded an agreement with the UK government in May 1986. The agreement, which covered both clerical and data-processing staff, allowed for full cooperation in the introduction of new technology in return for special pay rises and the creation of new grades.

SOCIAL IMPLICATIONS OF COMPUTERIZATION IN PUBLIC ADMINISTRATION

We can distinguish two separate areas where the computerization of public administration could have social implications - firstly on employees in public administration, and secondly on the general public as recipients of public services. We shall deal with these in turn.

EFFECTS ON EMPLOYEES

Employment

Workers in public administration have built-in job security in many of the states. This makes it very difficult to sack public sector workers in Italy, Belgium, Ireland and the Fed. Rep. Germany and so the introduction of Information Technology has had little effect on employment in these countries.

Elsewhere we have to consider two groups of workers: the DP professionals - programmers, systems analysts, operators etc. - who are directly involved in running the computer systems, and the larger group of administrative workers who use computer systems in the course of their daily work. The employment of DP professionals in public administration has grown steadily in line with the diffusion of Information Technology in public administration. There may have been organizational shifts with the emphasis moving away from central computers to departmental computing and micro computers, but in general, this group of workers has not suffered any employment loss. In fact, there have been shortages of people with these skills (see next section) so that the growth in employment in this sector could have been even greater.

It is the users of new technology who have been more vulnerable to the effects on employment. We have to remember that many states pursue a policy of trying to reduce public spending and improve efficiency and productivity in public services. This has inevitably placed pressures on the number of people employed in the public services. In some states reduction of labour costs has been one of the prime motivations in introducing computerization in public administration (in the UK the proposals for two major computerization projects at the Department of Health and Social Services and the Inland Revenue both included provision for major job losses). In reality, the actual level of job losses turns out to be less than that put forward in the proposals once the implementation process is underway.

There are few direct reductions of employment attributable to new technology in those states where public sector employees enjoy security of employment. However, there are indirect staff savings in all countries resulting from the way in which the use of new Information Technology systems has allowed increasing workloads to be handled by the same number of employees and has

led to a reduction in overtime working. Furthermore, the policy of natural wastage whereby workers that leave or retire are not replaced, allows a long-term reduction in employment in public administration.

Skills, work organization, job content etc.

Several states suffer from the problem of skill shortage in relation to the introduction and use of Information Technology. This shortage is particularly acute where the large, ambitious, multi-terminal network systems are being introduced. This shortage mainly involves the higher level skills - programming, systems analysis, systems designers etc., but there are also shortages of expertise for project management. The situation is often exacerbated by the fact that well-trained DP professionals are able to double or treble their salaries by moving from public services to the private sector. This is particularly seen as a problem in the UK, Ireland and Italy.

Some studies have found evidence of increased supervision, loss of control over work, deskilling, fragmentation of work and increased time pressure in relation to clerical workers in public administration following the introduction of computerization. In contrast, at supervisory level, there is job-enrichment, task diversity, greater control, and higher levels of motivation and job interest.

Education and training

In relation to education and training we find that it is usually the DP professionals who are recipients rather than the users. The standard of training in the civil service in a number of states is considered to be extremely high, and this only increases the attraction of these people to private sector. There are new initiatives in some states to encourage more training in relation to Information Technology, most notably in Belgium and Italy where a new Institute for Computerization of Public Administration has been established and the Commission of Computerization in the Prime Minister's Office has begun a programme of initial training for top management in public administration.

EFFECTS ON THE GENERAL PUBLIC

So far, much of the use of new technology in public administration has been directed to meet the demands of an even increasing workload in the face of pressures, to increase efficiency and to cut costs of public services. In general terms one could say that the public has benefited by the increases in efficiency, but there are few specific examples of computerization or the use of Information Technology being of direct benefit to the public. These kinds of benefits are only likely to become evident when Information Technology allows the provision of new or better services to the general public.

The following list shows the vast potential for introducing new public services by using the medium of videotex.

Education	- extension to Open University, schools' broadcasting
	- interactive, home-based learning
Health	- information about local availability of medical and para-medical facilities
	- health advice and information
	- making appointments
	- "medical consumer advisory services"
Social Services	- alarms, messages, home-shopping for the sick and disabled
	- special entertainment services for the deaf and blind
	- welfare rights information
Library,information	- local information and news
	- bookings and arrangements for local events
Housing	- security services metering
	- heating management
	- public works activation
	- electronic funds transfer
Transport services	- traffic incidents and conditions reports
	- traffic management
	- public transport ordering (for example, "dial-a-ride")
Consumer services	- home shopping
	- consumer advisory services
	- leisure, tourist information
Political activity	- information on current policy or planning issues
	- "electronic" debates.

Source: Cable TV: A Briefing Paper, LAMSAC, 1983.

Clearly, should public services develop along these lines then there would be considerable implications for the general public. There are already some examples of these kinds of services being introduced in some states usually at the level of the local authorities. In the UK for example some 20 local authorities are using viewdata as a service medium with library services the most common application. And in the Fed. Rep. Germany, there are several experimental projects examining the provision of new services to the public such as a centralized service in the entrance hall of the city hall; the concept of decentralized dislocated services in the different neighbourhoods; and the use of videotex to provide citizens with up-to-date information on a wide range of topics.

The other main area of concern for the general public relates to problems of data privacy and data protection. Several states have data protection legislation or are in the process of developing it. Much of the debate revolves around the unauthorized use of personal information held on databases and the linking of databases in various different parts of public administration. The internal security forces - the police - are often extensive users of databases and there is much concern about possible abuses of these data.

T. BRADY

B E L G I U M*

I. INTRODUCTION

The mechanisms for decisions on matters of computerisation of the services of the State, and likewise the statistical data concerning computerisation, cover all the Ministries as well as those semi-public institutions which fall under the direct tutelage of a Minister; these Ministries and semi-public institutions under direct tutelage make up the Central Public Administration (the "Civil Service"). The principal semi-public institutions dependent on the Central Public Administration consist essentially of the organisations responsible for the social security system, public finance, public transport and telecommunications. In addition to this Central Public Administration there are the local and regional administrations, whose status in relation to the latter has been subject to several recent changes which have had an impact on the process of computerisation of these administrations. Structurally, they certainly form part of the Public Administration for the purposes of this report, but the bulk of the available statistical data covers only Central State administrations, to the exclusion of the communes, the provinces and the regions.

The most recent history of the computerisation of the Belgian Public Administration is marked by a lack of continuity in the processes of decision-making and planning. The first attempt at co-ordination dates back to 1968; it is the Minister for the Civil Service who has to prepare the Cabinet's resolutions concerning computerisation and who has to supervise their execution.

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* Summary of a report prepoared by Gérard VALENDUC and Claire HEINRICH of the Fondation Travail-Université, Brussels, 1986.

In 1970, the Belgian State signed a series of five five-year "progress contracts" with two manufacturers (SIEMENS and PHILIPS), under which these companies were to be allocated a large share of public procurements in the data-processing field and committed themselves to investment with a view to the creation of new jobs in Belgium; the latter commitment was not kept and the public authorities were accused of acquiring data-processing equipment without first studying their requirements; no more five-year contracts were signed after 1975. The decision-making mechanisms changed in 1976 with the setting up of a Ministerial Data Processing Committee (CMI) and the drawing up of a draft plan for 1976-1980; this plan was not implemented. The CMI was abolished in 1981 and responsibility for computerisation was transferred to the Ministerial Committee for Economic and Social Coordination (CMCES), with the logistic support of the staff of the Minister for the Civil Service; the CMCES simplified and standardised the public procurement procedure, but did not actually draw up a coherent plan. The wind changed direction in 1983. Given the urgent need for a general plan and following the failure of all previous initiatives, the Minister for the Civil Service commissioned a study by Professor F. Bodart of the Informatics Institute of the University of Namur. The "Bodart Report", published in 1984, is not sparing in its criticism of the policy followed up to then; it advocates a fundamental reform of previous computerisation methods, with a view to greater efficiency and better services for the public. A State Secretariat for the Modernisation and Computerisation of the Public Services was created in 1985, and the computerisation question is gradually emerging from the battlefield of administrative law and public procurement procedures, in which it had been confined for almost two decades.

II. INTRODUCTION OF THE N.I.Ts IN THE ADMINISTRATION

1. Degree of Computerisation of the Public Administrations

In 1983, the last year for which complete statistics are available, the State allocated 0.8% of its budget to central public data processing. Table I retraces the evolution of State computer costs from 1978 to 1983, with annual rates of growth and the share of these costs in the State budget; these figures include personnel costs. It will be noted that the share of the computer budget in the State budget remained relatively stable during the period 1978 - 1983.

Table I: Trend of Overall Computer Costs of the Central Public Administration (1978-1983) (in B FR millions)

	1978	1979	1980	1981	1982	1983
Total Cent. Pub.Admins.	7,471	8,083	8,962	9,906	8,895	9,070
Annual Growth Rate	--	8.2%	10.9%	10.5%	- 10.2%	2%
State budget %	0.78	0.79	0.84	0.82		0.80

Source : General Administration Service (SAG)

The degree of computerisation varies considerably from one administration to another (see Table II). Public data processing is heavily concentrated in four Ministries (Communications, Finance, Defence and Social Affairs : over 80% of the State's computer budget) and, still under their aegis, in the semi-public institutions dependent on them: post, telegraph and telephone services, public transport, financial semi-public institutions, the management bodies of the social security services; 46% of the total computer expenditure of the Central Public Administration is accounted for by five semi-public institutions alone.

Computer utilisation is still very conventional. According to the Bodart Report, 75% of the applications correspond to the specific operational aims of the various departments; general services - such as personnel management and accountancy - cover 14% of the applications; this, therefore, leaves only 11% of the resources for documentary systems, data banks, office automation and information exchange networks. There is, however, one well-known exception to this "traditional activity" of public computing: this is the BISTEL internal videotext system, which provides the Prime Minister's departments and certain other administrations with access to various documentary, financial, economic or legal data bases and a facility for exchanging documents by electronic mail.

In operation since 1984, and initially limited to the Prime Minister's departments, BISTEL is today available to 360 users distributed throughout the various Ministries.

According to a Ministerial circular of 12 July 1985 (1), it is the Government's intention to extend the BISTEL system so that it can be used as a communication system between all the public services.

Three quarters of the public computer market shares are held by four manufacturers: IBM, SIEMENS, BELL-ITT and OLIVETTI; in 1983, the public market in software and computer services accounted for only 12% of the Central Public Administration's computer expenditure, as against 44% for hardware and 41% for personnel (see Table II).

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(1) Quoted by F. Pichault in "La télématique dans le cadre institutonnel et réglemntaire en Belgique" (Telematics within the Belgian institutional and legal framework), Courrier Hebdomadaire du CRISP, No. 1101-1102 of 6.12.85, page 21.

Table II: Distribution of Computer Costs in 1983 (in BFR'000s)

	Hardware		Software		Services		Others (excl. pers.)		Personnel		TOTAL	
Prime Minister's Departments	118,951 3%	63.74	9,177 5.24%	4.93	807 0.09%	0.43	6,214 1.87%	3.34	51,244 1.39%	27.54	186,033 2.05%	=100%
Ministry of Economic Affairs	150,521 3.80%	31.82	36,733 20.98%	7.76	22,271 2.44%	4.71	48,463 14.55%	10.24	215,041 5.83%	45.46	473,029 5.21%	=100%
Ministry of Foreign Aff. & Development Co-operation	3,171 0.08%	9.15	158 0.09%	0.46	25,174 2.76%	72.70	1,817 0.55%	5.24	4,312 0.12%	12.45	34,632 0.38%	=100%
Ministry of Agriculture	40,329 1.02%	50.15	2,198 1.25%	2,73	5,554 0.61%	6.90	2,216 0.66%	2.75	30,114 0.82%	37.45	80,411 0.89%	=100%
Ministry of Small Firms and Traders	5,351 0.13%	5.36	240 0.14%	0.24	67,248 7.37%	67.38	2,231 0.67%	2.23	24,721 0.67%	24.77	99,791 1.10%	=100%
Ministry of Communications	1,427,424 36.02%	45,82	28,748 16.42%	0.92	122,853 13.47%	3.94	77,674 23.33%	2.50	1,358.622 36.84%	43.62	3,015.321 33.24%	=100%
Ministry of National Defence	363,939 9.18%	40.05	19,203 10.96%	2.11	169,948 18.64%	18.70	30,164 9.06%	3.32	325,297 8.82%	35.8	908,551 10.02%	=100%
Ministry of National Education and Culture	103,981 2.62%	40.33	8,028 4.58%	3.11	24,319 2.67%	9.43	25,818 7.75%	10.01	95,671 2.59%	37.11	257,817 2.84%	=100%
Ministry of Employment and Labour	50,904 1.28%	33.68	2,253 1.29%	1.49	32,627 3.58%	21.59	6,251 1.88%	4.13	59,074 1.60%	39.09	151,109 1.67%	=100%
Ministry of Finance	1,377,278 34.76%	50.51	43,859 25.04%	1.61	19,424 2.13%	0.71	81,884 24.59%	3	1,204,144 32.65%	44.16	2,726.589 30.06%	=100%
Ministry of Justice	49,347 1.24%	63.45	1,968 1.12%	2.53	5,217 0.57%	6.70	5,065 1.52%	6.51	16,170 0.44%	2.15	77,767 0.86%	=100%
Ministry of Social Affairs	135,990 3.43%	18.08	9,405 5.37%	1.25	406,868 44.62%	54.11	17,918 5.38%	2.38	181,741 4.93%	24.17	751,922 8.29%	=100%
Ministry of Public Health and the Family	24,407 0.62%	35.61	1,652 0.94%	2.41	4,927 0.54%	7.19	2,426 0.73%	3.54	35,132 0.95%	51.25	68,544 0.75%	=100%
Ministry of Public Works	105,733 2.67%	48.59	10,742 6.13%	4.94	2,578 0.28%	1.18	24,333 7.37%	11.27	74,001 2%	34	217,587 2.40%	=100%
Ministry of the Interior	5,340 0.13%	24.97	758 0.43%	3.54	2,071 0.23%	9.68	294 0.09%	1.37	12,923 0.35%	60.42	21,386 0.23%	=100%
TOTAL	3,926,306=43.68% 100%		175,122=1.93% 100%		911,886=10.05% 100%		332,968=3.67% 100%		3,688,207=40,66% 100%		9,070,489	

Source: Journal de Réflexion sur l'Informatique, No. 86/1 based on data from SAG.

Furthermore, the official statistics fail to illuminate an area of microcomputing the size of which it is difficult to estimate; more precisely expenditures below BFR 500000 may elude the control of the General Administration Service. This "parallel" microcomputing could be considerable in certain departments. For the same reasons - lack of reliable statistics - it is difficult to estimate the extent of computerisation in the local and regional administrations.

All these characteristics of public data processing demonstrate that it is difficult to speak of a structural impact of the information technologies on the Administration. It is, if anything, the reverse which is true: the Public Administration has modeled its computerisation and its networks according to its own form and image.

III. GOVERNMENT POLICY

Computerisation is currently taking place in a context of government policy which is on the whole not very favourable to the public services. The first proposal for a coherent computerisation programme is contained in the Bodart Report (1984) which pleads for a vast operation of "master plans" in all the public administrations, for the setting up of pilot experiments directly concerning those under their jurisdiction and for a more dynamic personnel policy, based on a more intensive training scheme. These are reference proposals, as there has not been any R & D programme in these areas; R & D initiatives dealing with the computerisation of the public administration have in actual fact been less concerned with the uses and needs than with the industrial aspects.

Up to now the mechanisms of decision have been held prisoner by a logic based purely on budget implementation, insofar as the criteria of public procurement are essentially of a financial, budgetary and economic nature.

The projects of the State Secretariat for Modernisation and Computerisation, set up in 1985, include only some of the proposals of the Bodart Report. In the main they cover standardisation of procedures for the exchange of administrative data and the setting up of a General Computerisation Commission.

The priority actions envisaged are eleven in number: five operational actions and six logistical actions. The operational actions consist in setting up for each public body a computerisation master plan, a management protocol defining the aims, duties and resources of the body concerned in a sort of "managerial charter", a budget for each programme and an inventory of reception practices; a fifth action deals with the restructuring of study tasks within the framework of "study poles", the duties and methods of which would be laid down in a "rule book"; improved access to networks, data bases and decision-aiding data-processing systems are also provided for. The logistical types of action are:

- setting up of a "modernisation group" in each administration;
- setting up of a General Computerisation Commission, the prerogatives of which would have to be precisely defined by the Government;
- installation of a national public sector data transmission network;
- use of new telematics services such as R.T.T.'s VIDEOTEX and the BISTEL service;
- training of State civil servants in the new technologies and optimum use of that training in the administrations;
- training of future management staff of the public sector in an Administration School to be set up by the Government.

The regulations on public procurement grant the Ministerial Economic and Social Co-ordination Committee (CMCES) the power of decision on all orders over BFR 20 million for purchases, or over BFR 5 million for leasing as well as for investments in office automation and software; decisions are prepared by a Public Contracts Steering and Co-ordination Commission. These regulations are a reflection of the budget implementation logic mentioned earlier. They do not lay down conditions for the observance of any computerisation plan or master plan which may exist.

The regulations concerning personal files are very recent: whereas the National Population Register has been in existence since 1968, the legislation governing it has only existed since 1983. It lays down what information the National Register may contain, how the communes must supply and use it, and under what conditions the identity number allocated to each citizen may be used by other administrations or by organisations of public interest. Right of access is also governed by the law.

A similar legislative device has been brought in to govern the data bank on public sector staff, set up in 1982 in order to give a better idea of the numbers and cost of personnel employed in the public service and to facilitate the rational management of personnel and the professional mobility of officials.

For this data bank as well as for the National Register, an Advisory Commission on the Protection of Private Life has been set up within the Department of Justice; its purpose is to decide on methods of application of the law and on any complaints submitted to it. A more general bill on the protection of private life was tabled in Parliament in 1982, but has still not been passed.

IV. POLICIES OF SOCIAL GROUPS

The State, as an employer, has not implemented any specific civil servant employment policy in relation to computerisation. A special policy exists on training, and has been followed since 1985 by the Directorate-general for Selection and Training (DGSF), based on the recommendations of the Bodart Report. This training programme concerns both managerial staff and end users; it is currently on trial in a few Ministerial departments before a decision is taken by the Government on its generalisation. From the point of view of computer personnel, the overall number is lower than that envisaged and the status of computer expert has not been fundamentally reviewed since 1969. This is causing many problems as regards the recruitment of high-level computer experts and the definition of the qualification grades of analysis, programming and systems management personnel.

The public service trade union organisations have since 1983 been highly militant with regard to the restrictive measures on jobs and public investment imposed by the Government. As far as they are concerned, computerisation is only one facet amongst others of government policy on the public sector. For instance, the Centrale Générale des Services Publics (FTGB) 'General Public Services Trade Union Group, is worried about recourse to the new technologies being stepped up as a cover for a gradual transformation of relations between public services and private interests, to the advantage of the latter; the socialist union attributes the chaotic character of computerisation of the Public Administration to socio-political factors such as increased work loads, bureaucratic "freezes", lack of prior training of end-users and general paucity of ideas on new labour organisation methods. The CGSP interprets the poor working conditions of many State civil servants as a factor which is not conducive to change. The Federation of Public Service Christian Unions (FSCSP) shares the general opinions of the CGSP.

It preaches a policy of modernisation of the public services in which the planning and distribution of the impact of computerisation would be the subject of negotiation with the union organisations.

Collective Agreement No 39 on the information and consultation of workers on the introduction of new technologies does not apply to the public sector. No legal provisions for joint consultation on computerisation exist in the public sector. At the very outside, the new Public Service Union Statute, approved in 1985, mentions a procedure for consultation between the directorates concerned and the unions when a significant change in staff structure or the allocation of duties is envisaged within a particular administration.

In a memorandum addressed by the FSCSP to the Government on 9 October 1985, that Union set out a proposal for a framework agreement on computerisation, inspired by Collective Agreement No 39.

V. SOCIAL IMPLICATIONS

There has been little research in Belgium on the assessment of the impact of computerisation of the Public Administrations on the employment and working conditions of State civil servants, or on the quality of the services provided for the public. The few papers recorded are case studies concerning certain administrations.

From the point of view of numbers of staff employed, computer personnel account for only 0.65% of the staff of the central administrations. The data in the Bodart Report show that the number of personnel employed is even lower overall than the fixed limit. There is therefore a chronic shortage of computer personnel, especially in the higher categories.

The statute, governed by a Royal Decree of 3.12.1969, which has never undergone any fundamental revision, provides for four classes: the data entry grades at level 4, operator/console operator at level 3, various grades of programmers and analysts at level 2 and computer expert grades at level 1. The Bodart Report explains how this classification does not entirely meet the requirements (2): the data entry function is certain to disappear, the processing or analysis/programming functions both require classifications higher than levels 3 and 2 respectively; as for the computer expert occupations, today they demand special classifications such as, for example, "computer expert/project manager", "computer/systems expert" or "computer expert/manager", which are not provided for in the statute.

The most recent phase of computerisation is taking place against the background of a compression of the volume of public employment, whilst the previous phases (prior to 1981) had still occurred in a context of growth. The working conditions of the officials working with computers in the case studies were on the whole judged not very enviable.

The deterioration of working conditions is reflected in an increase in the work load in the computerised departments because the volume of work has increased more rapidly there than the volume of employment, even when the latter has not stagnated. The "transitional" periods of changeover of data processing methods are longer than planned and necessitate many parallel jobs. For reasons of short-term productivity, the environment of the work stations is frequently neglected; ergonomic requirements are rarely mentioned in the specifications submitted to the manufacturers (3).

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(2) F. Bodart (1984) op. cit. pp. 87-88.

(3) M. Lacomblez "Informatisation des services publics: conditions de travail et projets socio-politiques" ´The computerisation of the public services: working conditions and socio-political projects¸, in "Femmes et nouvelles technologies", Ed. Labor, Brussels, 1986.
M. Lacomblez, D. Liénard and A.S. Pollet "Développement technologique et service publics" ´Technological development and public services¸, IACT/IVA, Brussels, 1984.
C. Van Raemdonck, G. Vanhout, J. Geerts, V. Clerx, A. Mok and F. Van der Auwera "Automatisering in overheidsdiensten en ambtenarenwerk", UIA, Antwerp, 1982.

Improvement of working conditions would require better planning, with at the same time better training and better consultation. It is the training of users and designers which seems to receive the greatest priority with the present Government. It should be stressed again that the computerisation process reflects a certain attitude towards public service where a higher value is placed on operational tasks than on labour relations.

DENMARK *

I. INTRODUCTION [1]

The public sector in Denmark consists of the state, 14 county boroughs and 275 municipalities as well as a number of separate private and independent institutions and organizations falling under state or municipal control and/or financed largely by grants from another public authority. These institutions include the unemployment insurance funds, the labour market supplementary pensions scheme, ATP, children's institutions, vocational training institutions etc.

Since the early 1970's tasks of the individual public sector departments have been allocated in such a way as to maximize decentralization and to bring them as close as possible to the general population. Despite these decentralization efforts, the extent to which the state via legislation and circulars has established directions to guide the municipalities and county boroughs in executing their tasks varies greatly. In some areas statutory regulations have been issued (eg. the retirement pensions), while in others only a framework has been provided (eg. primary schools). Furthermore, there are areas in which local authorities have complete autonomy in carrying out their tasks (eg. roads).

As in many other Western European countries, Denmark has experienced a lively debate on the size of the public sector. Attempts to cut costs in almost all areas of the public sector have enjoyed strong political support and there have been several initiatives to increase the efficiency of the public administration. The "public sector modernization plan" is the most important Government initiative in this field.

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* Summary of a report prepared by Anders Joest HINGEL, Institute of Organization and Industrial Sociology, Copenhagen School of Economics and Social Science, Copenhagen, September 1986.

1 The following sub-section, which describes the Danish public sector, is taken from: Y. KAYSEN, T. NIELSEN, N. BJØRN-ANDERSEN: Impact of public-service EDP System on Employees and the General Public, Report prepared for the European Foundation for the Improvement of Living and Working Conditions, Dublin, 1984.

II. INTRODUCTION OF INFORMATION TECHNOLOGY INTO PUBLIC ADMINISTRATION

1. Diffusion of Information Technology

There are now estimated to be about 6,000 "terminals" in operation in the state sector, a figure which includes screens, keyboards and computer units with access to several facilities such as filing and data treatment, data transfer and printing. In the next 5-10 years some 35,000 personal computers, corresponding to an investment of DKr 6,600 million, will need to be introduced. The rise in the number of word processors has been particulary spectacular, increasing tenfold between 1981 and 1984 (900 in 1981, 9,000 in 1984). By the year 1990 an estimated 24,000 word processors will have been introduced. In the municipal sector there were 1,500 general-purpose computerized work stations in 1983, and, according to one estimate 5,000 such stations will be in place by 1990.[2]

The most publicized technological development project in public administration is the "KT 90" project (Office Technology 90). Its objective is to install the technology necessary to create "the administrative workplace of the future". Other important technological projects in the state administration include "the information system for personnel administration" (PAI) - a databank on personal data and employment and work and educational data on each individual employee in the sector - and a computerized system of daily records, JUNO.

The central field of "office automation" will not be the only field to experience the increasing diffusion of new technologies in the public sector. In the future CAD/CAM systems will be set up. Unlike Sweden, where the municipalities have created regional CAD/CAM centres, the Danish public sector has, as yet, no CAD/CAM centre in operation. The technicians union forecasts that CAD/CAM will be introduced in Denmark initially for the production, filing and reproduction of maps, architectural perspectives, plans, etc.[3]

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2 I/S Datacentralen af 1959, Forvaltningens administrative arbejdsplads, 2. ed., Copenhagen, 1984.

3 Teknisk Landsforbund: Teknologi 3 - Anvendelse af CAD/CAM, Copenhagen, 1982.

There has been discussion in the press about whether or not the Danish public sector is falling behind in the development and application of new technology compared with the private sector and with public sectors in other countries. In fact, the number of terminals in the state sector (6,000) compared with the total number of employees in the sector (200,000), gives an average of one terminal for every 33 employees. This is considered rather unimpressive by many observers. However, as Mr Niels Bjørn-Andersen of the Copenhagen School of Economics stated in a recent interview, one cannot reasonably claim that the Danish public sector is falling behind on the basis of the abovementioned figures. He considers it to be a myth presented by the computer industry and indirectly supported by the Government's "modernization plan".[4] "Modernization is only necessary if something has become 'outdated'", as one observer has put it [5]. The Danish municipal sector has certainly been slower to introduce new technologies than the state sector. However, the Danish public sector is one of the world's most largest consumers of computer services and software. It can boast two major computer service centres: Kommunedata, which serves the municipalities, which, with a turnover of $ 66.8 million (1984) holds thirteenth place on the world ranking list; and Datacentralen, which serves the state sector, with a turnover of $ 59.4 million (1984) making it the seventeenth largest service company in the world.[6]

III. GOVERNMENT POLICIES

1. Promotion of Information Technology in Public Administration

The "modernization" of the public sector was initiated by the Government during the spring of 1984. It involves a simplification of rules, regulations, administrative procedures etc. The aims of the plan are:[7]

- to offer the best possible service to companies and the public within the financial resources available for the public sector,
- to make efficient use of public sector resources,

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4 Weekendavisen, 14th-20th March 1986.
5 B. KOHL, "Moderniseringsprogrammet og teknologien" in Samfundsøkonomen, vol. 4/4, 1986.
6 OECD "Software: An emerging Industry", Paris, 1985.
7 "Redegørelse af 29/5 1985 til folketinget om moderniseringsprogrammet for den offentlige sektor (Redegørelse nr. R 16)" Fortryk af Folketingets Forhandlinger, n° 677, p. 10814-10826.

- to ensure interesting and challenging working places for public sector employees.

One of the most important aims of the modernization plan is to increase the efficiency of public administration by the optimum use of new technology. The yearly investments in new technology in the public sector are neither determined by statutory regulations nor decided upon centrally. Each institution decides autonomously how much it should invest. Consequently, no precise evaluation of the scale of new technology investment exists. However, according to the Minister of the Interior the amount is in the region of DKr. 1,000 million a year (this amount counts for investments by the state institutions, the municipalities and the public computer centres in computer equipment and software purchased from the private sector).[8]

Training is understood by all partners to be the cornerstone of all measures to improve efficiency. However, the vocational training capacity of the public sector is woefully insufficient compared with demand. An estimated 5000-6000 high-level employees (managerial) and some 50,000-60,000 middle level employees need training every year as a result of the "modernization" of the public sector. However, training capacity is at present only sufficient to train 64 high-level and 500 middle level employees each year.[9]

2. Government regulation

The public administration has made major efforts to regulate and help public institutions in the purchasing procedures for the introduction of new computer technology.

The directorate for public sector procurement (Direktoratet for Statens Indkøb) first presented general guidelines in 1982, and the Department of Civil Service (Administrationsdepartementet) issued a circular letter (31 March 1982) on the subject together with a "edp-guide" in March 1982.

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8 ibid.
9 Dagbladet Information, 24-25 March 1984.

Despite the existence of these guidelines, many public institutions experienced a number of problems with the introduction of new technology. Accordingly, in 1985, the Civil Service Department issued a new "guide on the procurement of edp-services".[10] One suggestion in the new guide was that each institution should devise a proper edp-strategy for the next 3-5 years.

During the first year of the campaign, five institutions carried out in-depth investigations concerning their future technological needs, and during 1986, 16 other institutions including the Ministry of the Environment and the Ministry of Ecclesiastical Affairs, carried out similar investigations.

In order to ensure sufficient financial means in the short term, the Government has set up a special investment pool which provides state institutions with loans for investment in new technology, which prove to be "profitable". The pool also finances costs related to the abovementioned investigations. In 1985, DKr 290 million was allocated to the investment pool for technological projects for the improvement of efficiency: of these DKr 50 million was specially allocated to projects involving "the application of information technology to administrative tasks". In 1986, DKr 253 million was allocated to the pool, and DKr 63 million to projects concerning administrative tasks.[11]

IV. POLICIES OF SOCIAL GROUPS

1. Policies of Trade Unions

Most public sector employees in Denmark are members of one of two major confederations - the Confederation of Danish Trade Unions, LO (Landsorganisationen) and the Central Organization of Salaried Employees and Civil Servants, FTF (Foreningen af Tjenestemænd og Funktionærer) while academics are represented by the Central Organizations of Academics, AC (Akademikernes Centralorganisation). Two major multi-union negotiation organizations, the "CO-I" and the "CO-II" - also

10 Administrationsdepartmentet, Vejledning om anskaffelse af edb-ydelser, 1985.

11 Finansministeriet/Administrationsdepartementet: Teknologisk modernisering i staten - Rapport om investeringspuljens anvendelse i 1985, Copenhagen, 1986.

referred to as the "silver-cords" and the "gold-cords" - are responsible for negotiations with employers. The CO-I was set up in 1909 and now consists of 33 trade union federations whose members (approx. 500,000) are workers and lower-level, "low-paid" employees in the public sector. Most of the CO-I member federations are affiliated to the LO. The CO-II, is composed of trade union organizations whose members are clerical employees and administrative civil servants. CO-II is affiliated to the FTF. It should also be mentioned that, of the roughly 700,000 employees in the public sector, only about half a million have the right to take part in industrial action.

The general policy of trade unions, as presented by the LO, for example, is that public service should be improved, not restricted, and that this must not be achieved by adversely affecting the pay and/or general working conditions of the employees in the sector.[12]

According to the CO-II, the public sector should, as a minimum, follow the improvements in the conditions of the wage earners in the private sector. To this end, CO-II has a long list of demands in connection with the introduction of new technology:[13]

- profits from rationalization programmes should be subject to negotiations;
- new fields of work in the public sector should be introduced;
- a genuine co-determination should be set up;
- the assessment of the consequences of the introduction of new technologies should be carried out by an impartial body;
- humanization of technology;
- no re-structuring of the labour force erase occupational demarcation lines, cause occupational dequalification or impoverish job-content;
- identification of tasks which could disappear through rationalization over the next few years;
- equality between sexes in vocational training;
- education and training that makes it possible to exert real influence on personal working conditions;
- no home-terminal-workstations (distance work);
- no observational control of individual workstations.

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12 See for ex. H. HEIE: "LO opstiller skarpe krav til moderniseringsplanen" in Information, 21 March 1984.

13 Statstjenestemændenes Centralorganisation II (CO II's): CO II's fagpolitiske krav til ny/ændret teknologi, (n.a.) (mimeo).

- combating centralization/bureaucratization by introducing computer systems according to the principles of "democratization by delegation of power".

In a booklet, the FTF called upon all trade union organizations to debate the modernization plan for the public sector when it was presented in 1984.[14] The AC expects that the modernization of the public sector and the introduction of new technology will result in the "erosion of demarcation lines" and considers that "it is reasonable to believe that parts of working tasks which are characterized by routine and are carried out on the basis of computerized knowledge, can in future be carried out by (low skilled) clerical workers", resulting in a decline in the demand for academic qualifications.[15] One of the AC member organizations, the organization of economists and lawyers, DJØF, does not seem to agree on the latter point. This organization considers that in the long run there will be an increasing demand for its members' qualifications in the state sector.[16]

3. Collective Agreements and Labour Disputes

Under the 1981 Technology Agreement covering the public sector (Framework Agreement on Guidelines for Co-operation on the Introduction and Use of New Technology in State Undertakings and Institutions (Rammeaftale vedrørende indførelse og brug af ny teknologi) the partners agreed on the need to introduce and use new technology on the basis of co-operation. § 1.1 and 1.2 state that :

S.1 "The aim of the agreement is to clearly establish that co-operation on the introduction and use of new technology as well as on changes in previously introduced technology, must be conducted in such a manner as to enable employees to co-determine how their personal work is organized by influencing the decision making processes.

S.2 ... special emphasis is placed on the security of employment of employees."

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14 FTF "Focus på Modernisering", Copenhagen, 1984.
15 Information, 21 September 1984.
16 Interview with Mr John Bæk Sørensen, DJØF-Bladet N° 16, 1986.

The co-operation activities concerning the introduction, use or change of technology take place within the co-operation committee or, if one of the partners so wishes, in a special technology committee (§ 3.2). Where neither of these committees exists the management and the employees have to decide how to organize co-operation in the matter of the introduction, use and change of technology. The practical arrangements for co-operation, information, education etc. must then be discussed further in the Central Council of the Co-operation Committees (Centralrådet for Statens Samarbejdsudvalg) (§ 1.4).

The management of the company/institution must provide written details concerning the introduction, use and change of technology (§ 2.2). These details should be provided at an early stage, so that serious discussions can take place and the viewpoints of the employees can be taken into account when the management finally takes decisions (§ 2.3).

The details provided by the management are not the only source of information available to employees (co-operation committee, technology committee). According to § 2.5, both the management and the employees can call on "external expertise in order to evaluate concrete projects".

§ 4 of the Technology Agreement contains the provisions concerning the impact of the introduction of new technology on employment levels. According to this section:

> "... it is the responsibility of the management to make sure that, where the introduction and use of new technology necessitate a reorganization of work, the co-operation committee and/or the technology committee consider every possibility for offering the employee another skilled job, as far as possible in the same locality.

V. SOCIAL IMPLICATIONS

1. Implications for Public Administration Employees

The consequences of introducing new technology in the public sector will depend on the practical arrangements made for the organization and division of labour in each institution. The general expectation is that new technology potentially provides the basis for radical social changes, but that:

> "... these opportunities for basic changes will only be exploited to a limited degree. The most important changes in the coming years will be in the distribution of work between various occupational groups and thus changes in the job demarcation lines we know today. Nevertheless these changes will mainly take place within the present organizational set up."[17]

New technology in the public sector provides the "technological" grounds for a decentralization of the sector. As in most other countries, state administration is largely situated in the central part of the capital city, i.e. in Copenhagen. By applying the already available modern means of data transmission a number of public institutions could be transferred to the provinces. The abovementioned report refers here to the Swedish decision to "decentralize" 10% of the jobs in the central administration during the period 1985-1990, but the authors do not believe that such a strategy will be applied in the case of Denmark. The needs and demands of the ministries and the parliament as well as the negative attitudes of the employees will limit any dispersal of the public institutions.

However, new technology provides the means not only for decentralization of the public sector institutions, but also for the decentralization of workplaces: distance working. The authors of the abovementioned report are also sceptical in this connection : it will be difficult to arrange tasks in such a way that some isolated tasks (typing) can be carried out from a distance. Furthermore, in Denmark, there are no eco-regional reasons, or reasons on grounds of distance, for setting up "home-workplaces". The report concludes on this point: "All in all the

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17 Adminstrationsdepartementet: Kontorteknologi i staten - en læreproces, 1986.

use of new technology for introducing geographical changes, or major changes in organizational structures in general"[18] will be of only limited relevance to the Danish state administration.

The Danish central administration contains two major groups of employees: the "administrative" staff with a clerical training and the "general" staff who have an academic background in social sciences. These two groups number about 100,000 employees each. The major question in the debate on qualification demands, and thus on education, training and employment, is how work tasks will be distributed between these two groups of employees in the future. On the one hand, the importance of traditional clerical skills e.g. typewriting, will decrease due to the introduction of new technology. On the other hand, new technology will mean that clerical staff will become involved in planning, computation work, information searches, etc. to a much higher degree than previously.

Overall, the report rejects the view that the distribution of tasks between the two main groups of employees is a zero-sum-game.

As to health and safety in connection with the introduction of new technologies, no specific public sector policies have been presented by the social partners. Fear of possible health and safety hazards in connection with prolonged work with VDU terminals has been expressed by all trade unions. Recently the trade union of salaried employees, the HK, claimed that all new introductions of VDU terminals in the public sector should be halted until it is made clear which types of terminals can considered as dangerous to the health of employees.[19]

2. Implications for the public

Some of the criticisms that have been set out regarding public sector modernization programme have concerned mainly its consequences as regards the quality of public services. "Modernization" and "rationalization" of the public sector are often identified with a type of service management where the fringe elements of the service are in focus, whereas the quality of the "core product" is taken for granted.

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18 ibid
19 Weekendavisen, 5-11 September 1986.

However, "Bad services do not increase in quality because they are offered with a smile".[20] Two basic principles can, according to a recent report, be found to underlie the ideology of the present type of service management in the public sector, VIZ.:

- the public sector should not be expanded.
- public sector employees have dormant qualities (competences, qualifications...).

The Danish Minister of the Interior clearly set out these principles at a conference on the modernization programme organized by the trade union confederation FTF, when he said :

"We have to get more for the same money. Moreover, this can be done because I believe that there exists so much more talent, knowledge, commitment and interest among all employees of the public sector that a significant qualitative growth can be achieved without higher spending".[21]

20 J.C.RY NIELSEN, M. RY HELKIÆR: Når det offentlige skal modernisere, Nyt fra Samfundsvidenskaberne, Institute of Organization and Industrial Sociology, Copenhagen School of Economics and Social Science, Copenhagen, 1986. The following is taken mainly from this "preliminary" research report. See also Administrationdepartementet: "Bedre Service", Copenhagen, 1984.

21 ibid.

FEDERAL REPUBLIC OF GERMANY *

I. INTRODUCTION

Being a federation the Federal Republic of Germany has a system of public administration which is more complex than that of other countries. The system is multi-layered with three main levels of administration: the federal administration, the Länder and the local authorities.

The federal administration consists of the federal ministries, separate bodies which are subordinate to the ministries and relatively autonomous agencies which are formally controlled by the ministries. The administration of the Länder also consists of ministries and subordinate bodies. At the local authority level, the administration is broken up into divisions. The implementation and administration of federal laws takes place mainly at the level of the Länder and the local authorities. Consequently, most of the administrative work is performed by the Länder and the local authorities.

This report examines the development of computerization at all three levels of the public administration. However, the availability and reliability of data varies between the three levels. Consequently it is impossible to present aggregate data and generally valid information. In particular areas there is an abundance of data and information - for example on the positions of individual politicians or special agreements at local authority level. It would be impractical to list and discuss all such data and information.

* Summary of a report prepared by Prof. Jürgen REESE, Kassel.

II. INTRODUCTION OF INFORMATION TECHNOLOGY INTO PUBLIC ADMINISTRATION

1. Diffusion of Information Technology

The diffusion of Information Technology in public administration began during the 1950s with the introduction of invoice machines, punch-card machines and computers into areas of "mass administration" such as social affairs and tax. The public insurance area was another early pace-setter in the use of new technology.

Large mainframe computers were ideally suited to these areas of "mass administration" where large amounts of data needed to be processed according to a formal system. However, by the end of the 1960s problems with computerization had emerged in the fiscal administration in that its implementation was complicated by the federal structure. Although the tax laws were identical for all the Länder, the tax administrations were organized differently from one Land to another, which meant that the processing regulations were different in each Land. There were strong political and financial incentives for organizing the computerization of tax administration centrally in order to limit the high development costs and to test the systems. However, the Länder feared that such centralization would reduce their autonomy and the coordination of the computerization of tax administration took many years.

Other mass administration tasks at the local level - staff and population administration - were also ideal for computerization and soon followed the example of the tax administration. By the beginning of the 1970s, all local authority administrations had begun to use Information Technology. With the decrease in the cost of hardware and the availability of standard software, there was a growth in the diffusion of mini and micro computers and also the use of "on-line" systems using large computers.

Another early application of computers other than for "mass administration" was for planning. The federal administration had high expectations for computer models, hoping that they would create a more rational process of government planning with more coordination of efforts. Massive investment in such models took place with considerable

organizational effects. The experiences of the 1970s dashed the hopes and expectations of the 1960s that computers would solve planning problems. The high expectations were replaced by a scepticism towards planning systems. The only successful examples of computer planning are the simulation models used for calculating the fiscal impact of social laws, demographic changes etc.

Quantitative data on the degree of computerization are not available for all levels and all administrations. The most recent report [1] which attempted to collect relevant and comparable data at all three levels contained the following information:

Federal level

The 1984 budget for hardware and software expenditure was estimated by the Federal administration at DM 311 million. Expenditure in this field had grown by 211% in 1970-1975, by 54% in 1975-1980, and by 20% in 1980-1985. Since these figures do not take inflation into account, expenditure on data-processing at federal level would appear to have remained at roughly the same level. In 1985, the largest shares of the budget for computerization went to the Ministry of Defence (DM 125 million), the Ministry of the Interior (police, and security services) (DM 70 million) and the Ministry of Transport (DM 30 million).

In 1977, the federal administration employed 6,824 people in electronic data processing (EDP) jobs. By 1982, this figure had only grown to 6,903. During the period 1970-1982 there had been a rise in the number of better-paid jobs and a decrease in low-level jobs in EDP. The average level of qualification in EDP jobs rose during this period.

Länder level

There is only a limited amount of data available relating to the Länder and that which is available is aggregated in different ways from Land to Land. It is not even possible to present reliable figures for the number of people employed in EDP. The largest users of computers in the Land ministries include the Ministry of the Interior, the Ministry

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1 Informations- und Kommunikationstechnologien in der öffentlichen Verwaltung, 4 issues, ed. by the Gesellschaft für Mathematik und Datenverarbeitung, Bonn-Birlinghoven, October 1983. More information about specific applications of computer systems in public administration and about their impacts can be found in the Journal ÖVD/Online/adl.

of Finance, and the Ministries of Science, Social Affairs and the Economy. Assuming that expenditure on personnel equals expenditure on hardware and software, it is possible to make some rough estimates about the level of expenditure in the Länder. Extrapolation of data according to this assumption suggests that the annual Land budget for computerization is roughly DM 400 million and that about 10,000 EDP specialists are employed in Land administration.

Local authority level
No aggregate data are available at local authority level. The different sizes of the nearly 9,000 local authorities make even extrapolation impossible. A rough estimate of DM 400 million for resources devoted to computerization gives 10,000 people employed in EDP, which should be reasonably close to the real figures.

Taken together, the estimates suggest that about DM 1,000 million per year is expended on EDP equipment whilst between 25,000 and 30,000 people could be directly involved in EDP (excluding users) in public administration in the Federal Republic of Germany.

2. Structural changes resulting from the use of Information Technology

The structural changes vary on four levels:

There is no centralized computer service at the federal level. However, there is a subdivision within the Ministry of the Interior which coordinates procurement and offers some advice, but coordination has proved to be extremely difficult since the decisions about organization, computers and peripherals have in most cases not been passed on by the ministers and their EDP chiefs.

At the Länder level, all governments have installed joint computer centres. However, in recent times the availability of micro-computers at low costs has led increasingly to an erosion of the centralization principle. Nonetheless, experts do not expect that the computer centres will be closed down in the future. There will probably be an organizational mix of centralized and decentralized computer capacities.

The most serious changes in administrative structure have resulted from the adoption of computers at local authority level. This is particularly true of all the smaller local governments which were unable to finance their own computer service in the early 1970s. Since their tasks are identical or similar in nature a joint development of software seemed to be as advantageous as a coordinated joint computer service. To accelerate the introduction the governments of the Länder offered these services by installing regional computer centres. Nearly all small and medium sized local governments are now linked to these regional service centres.

But there were also disadvantages: organization and regulations lost their local characteristics and the autonomy of the local governments declined. Another effect of the regional service centres concerned the canalization of data from the local administration to the centre and back. All orders ("jobs") were collected by the main division within the local administration and ranked for priorities. The other divisions felt - and still feel - patronized by that division.[2]

III. GOVERNMENT POLICIES

1. Promotion of Information Technology in Public Administration

Computerization in Public Administration is promoted in four different ways:

- institutional promotion by public R&D organizations which develop new applications of information technology;
- promotion through public programmes which allow scientists to develop specialized software in cooperation with the public administration;
- the centralization of software development for standardized administrative tasks at Land and local government level. All the Länder have centralized programming services;
- information transfer and advice, particularly for the local governments, offered by a joint board of all local governments in the Federal Republic of Germany.

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2 OSTERMANN Jürgen, Das Konzept der gemeinsamen kommunalen Datenverarbeitung. Gemeinsamkeit als Chance und Risiko, KGSt-Mitteilungen, Köln, Juni 1977. Ibidem: Auf dem Weg in die kommunale Informationsverwaltung?, in: Die Verwaltung, page 297-327.

Thus the Federal Republic of Germany now has a relatively well-developed infrastructure for the promotion of computers and telecommunications in public administration. But the use of computers in public administration is not greatly publicized. This is partly due to public scepticism regarding computerization caused by the failures of the 1960s and 1970s. The audit courts, which have recruited EDP specialists of their own have been very critical of some of the computerization projects in public administration. This has resulted in a more realistic attitude on the part of the public administration towards computerization. The computer euphoria of the early 1970s has been replaced by a more rational and economic assessment of the costs and benefits of proposed computer applications.

2. Government regulation

The most extensive regulations refer to privacy protection. The federal law on data protection was recently amended. All the Länder have their own privacy protection laws, which include regulations for local governments in the Land concerned. The very sensitive nature of the privacy issue has led to a third wave of amendments in the laws of the Länder, led by the Land of Hessen, which recently passed a new bill which also includes regulations for non-computerized data files. On the other hand, owing to the threat of terrorism, the security laws have also been amended, with the consequent legalization of controversial data collection and transfer between various police agencies and security services.

Various attempts have been made to regulate the procurement of hardware and software. At the federal level a debate has taken place concerning the paradox of carrying out a policy of public promotion of the national EDP industry whilst at the same time following a free market ideology. It can be assumed that not all purchases of computers in the public sector - particularly large computers - have been carried out under the principle of the best cost-benefit evaluation. However, a great variety of manufacturers have supplied equipment for the public administration in the Federal Republic of Germany.

IV. POLICIES OF SOCIAL GROUPS

1. Policies of employers' organizations

The public employers have no coordinated strategy for handling wage disputes arising from computerization. However, in July 1981 the association of public employers published principles for the regulation of working conditions for computer-assisted work stations. These principles include recommendations for work-station equipment, staff training and medical investigations. Breaks of up to 10 minutes per hour can be allowed if the employee works continuously for four hours at the screen. The paper also presents recommendations for the installation of mixed work places.

2. Policies of trade unions

The trade union ÖTV takes the lead in most of the wage disputes in the public sector. In 1984, at its 10th convention, the union agreed on the following principle demands:

Legal rules
- reduction of the retirement age and the working week
- extension of co-determination
- protective labour law
- data protection
- guarantees for advanced training
- application of all labour laws to electronic home work

Wage contracts
- guarantee of jobs and earnings
- improvement of vocational qualifications
- non-taylorism
- prohibition of systems to intensify the work
- reduction of the working week.[3]

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3 Beschlüsse des 10. Gewerkschaftstags, München/Karlsruhe 1984, ed. by Hauptvorstand der Gewerkschaft Öffentliche Dienste, Transport und Verkehr, Stuttgart 1984.

3. Collective agreements and labour disputes

The co-determination law for the Land Hessen satisfied almost all the demands of the labour unions. This law provided for extensive consultations of employers and employees in respect of all organizational and technical changes in the public administration. It gave a power of veto to the employees on some relevant issues. The bill was passed but then cancelled by the Land judicial court. The labour unions regard this as a serious set-back in their fight to secure co-determination. Below the level of legal regulations and wage contracts there are many agreements at the level of individual administrations ("Betriebsvereinbarungen"). They guarantee protection against certain impacts of technical change and frequently include regulations about breaks, medical investigations and internal co-determination.

V. SOCIAL IMPLICATIONS

1. Implications for employees within Public Administration

Owing to legislation and political considerations it is very unlikely that technological rationalization could lead to redundancies in the public administration. Moving workers from one ministry to another is also unlikely without the agreement of the person in question. However, at local authority level there has been some reorganization necessitating displacement of labour and training programmes. However, the job security enjoyed by workers in public administration has generally meant that changes have been accepted even though individual workers may be negatively affected by the introduction of new technology.

The expansion of public tasks together with the increasing administrative complexity of the work (a consequence of growing legal complexity) has meant that the government has been unable to reduce overall employment in public administration even though computerization can lead to a reduction of personnel in one specific area.

The batch method used in the computerization of the rigorously standardized areas of mass administration (tax, social security, etc.) in the seventies led to a polarization of qualifications. Today the trend is in the opposite direction. In many cases, working conditions have been improved with the introduction of computerized work stations. But this is only true for the ergonomic conditions. Impact in terms of stress or intensified control by the employer have not been taken into account. Little is known about the human and social impacts of more modern, decentralized work stations. Today, however, workers themselves feel less threatened by new technology than they did in the past.

2. Implications for the public

Much of the distrust felt by the public towards public administration as a result of early problems with computerization has dissipated in recent years. The public attitude is much more positive. The public administration has initiated several pilot projects attempting to develop new technical-institutional arrangements more in accordance to the special communication, information and decision-making needs of the public. Several trials are still in the experimental stage which include:

- the idea of a centralized service in the entrance to the city hall;
- the concept of a decentralized, separate service in the various districts;
- the provision of up-to-date information for the public via videotex.

The most contentious issue concerning the computerization of the public administration is still that of privacy.

G R E E C E *

I. INTRODUCTION

Structure of Public Administration

Greek Public Administration is characterized by variability in its structure and invariability in its organization and procedure. In the last twenty years the cabinet has been restructured a number of times and authority has been transferred from one ministry to another; new ministries have been set up, other ministries have been abolished.

The position of undersecretary has been subject to great instability, as in every reshuffling of the cabinet the number of undersecretaries and their authority is subject to change.

These changes at the top echelon of public administration have not brought about any changes in the organization and procedures, which date back to the founding of the Greek state.

Today there are twenty ministries with each overseeing a number of institutes, organizations, public enterprises etc. All these entities have administrative structures which satisfy certain legal requirements.

Most of the institutes (including research), organizations etc. overseen by the ministries fall under the jurisdiction of public law. The administrative systems and procedures which also have to meet legal requirements and administrative rules do not readily lend themselves to computerization.

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* Summary of a report prepared by M. NIKOLINAKOS, IMEO, Institute for the Study of the Greek Economy, Athens, September 1986.

II. INTRODUCTION OF INFORMATION TECHNOLOGY INTO PUBLIC ADMINISTRATION

1. Diffusion of Information Technology

The state-controlled banks were the earliest users of computers in the Greek public sector. The National Bank of Greece installed an IBM-650 in 1959 and in 1962 this bank and the Commercial Bank of Greece installed IBM 1401 computers.

The 1960s saw a more general diffusion of Information Technology throughout the public sector although there was no central government policy on its introduction.

In 1975 the public sector accounted for 27% of all computer capacity in Greece. This fell to 23% in 1980 but rose dramatically to 52.3% by 1985. Interestingly, all computers used by Public Administration are located in Athens and the surrounding area.

According to plans for the period 1986-1992, a number of new computer applications will be introduced in the following ministries:

- Ministry of Education - introduction of informatics courses in 120 vocational training schools. This will require the acquisition of new computer equipment;
- Ministry of Health, Welfare and Social Insurance - development of information systems as back-up for the National Health System, and social insurance funds;
- Ministry of the Interior - computerization of local administration, and the replacement of the current identity cards with computerized cards;
- Ministry of Public Security - the computerization of passport checks at all entrance points to the country;
- Ministry of Agriculture - development of an agricultural information system;
- Ministry of Finance - computerization of all custom-houses, and of the 300 inland revenue offices;
- Ministry of Culture - computerization of museums;
- Ministry of the Presidency - computerization of all files and support for the Directorate for the Development of Informatics;

- Ministry of Transport - computerization of files such as drivers' licences, etc.

2. Structural changes resulting from the use of Information Technology

The inability of the legal system to adjust to the new technological conditions has been a major factor in delaying the computerization of administrative tasks. Because of this, Information Technology has not displaced manual procedures in many areas of the public administration and there has been no significant change in the organizational and employment structure of public administration.

In many cases the introduction of Information Technology has been remote and has not been supported by the introduction of such technology in all interrelated areas and/or the introduction of new procedures. A characteristic example is the introduction of Information Technology in banking which did not result in significant changes in the composition of money supply. To a large extent, payments continue to be made in cash rather than by cheques, which are not universally accepted as a means of payment. Although it controls the major part of the banking system, the state did not make the adjustments necessary to gain the full benefits of Information Technology.

III. GOVERNMENT POLICIES

1. Promotion of Information Technologies in Public Administration

Whilst being fully aware of the legal, structural and procedural difficulties the Government deliberately tries to promote Information Technology in Public Administration. It is with this goal in mind that the Government has established the Government Council on Informatics, the General Secretariat for Research and Technology and the Directorate for the Development of Informatics.

The General Secretariat for Research and Technology was first established as the Office for Research and Development in 1972. The objectives of this Office included the implementation of a documentation programme with the assistance of UNDP for the storage of all studies

carried out by the public sector, the preparation of a union catalogue and other data banks to assist the planning and coordination of scientific policy in the public sector.

This Office was later named Office for Research and Technology. It kept this status for about eight years and was then upgraded to a ministry. After less than two years it was downgraded to a General Secretariat. Despite all these changes the scope of this entity remained essentially the same.

In 1975 the Government set up the Directorate for Research and Computerization under the Ministry of the Presidency, which is responsible for public administration. After ten years, the scope of the Directorate was narrowed to deal exclusively with informatics.

The new Directorate is supposed to have a more active role in the development of informatics in Public Administration. The Directorate is under the authority of the Public Administration Branch of the Ministry of the Presidency. The objectives of this Directorate are:

- the implementation of government policy for the development of informatics and computer technology in the public sector;
- the setting up of plans and the coordination of activities of the various units of the public sector;
- better utilization of the existing computer systems;
- the introduction of modern information technology;
- the planning and control of the application of informatics;
- establishment of preliminary conditions for the development of software and systems support in cooperation with the General Secretariat for Research and Technology;
- establishment of preliminary conditions for the recruitment, training and continuous training of the computer personnel needed to staff Public Administration;
- the working out of studies and plans for the development of informatics in the public sector.

In 1985 the cabinet decided to establish a high level policy-making body on informatics. To emphasize the significance the government attaches to informatics it adopted the proposal of the Minister of the Presidency and set up the Government Informatics Council.

The Council is chaired by the Prime Minister and its members are the Ministers of Defence, Presidency, Finance, Economy, Education, Transport and Communications, and Industry, Energy and Technology.

The Council is assisted by the Directorate for the Development of Informatics, which is responsible for implementing the decisions of the Council and acting as its secretariat. It is also assisted by a Technical Council on Informatics which acts as an advisory board and is composed of nine members - seven computer scientists, a representative of the Hellenic Computer Scientists Association and the Head of the Directorate for the Development of Informatics.

The primary objective of the Council is to become the focal point for determining the national strategy for the development of informatics in Greece, as well as for controlling the implementation of government decisions on informatics.

On 31 July 1986, the first meeting of the Government Council on Informatics Council was held at the Prime Minister's residence. The Prime Minister concluded that to catch up in the area of informatics the following requirements had to be met :

a) full knowledge of developments in the field of informatics worldwide;
b) the selective application of informatics in education, information, production, administration;
c) the formulation of rules, incentives and prerequisites for the utilization of existing technological potential;
d) division of labour among the various sectors of the economy so as to economize on resources;
e) initiatives by the state to transfer and acquire technology;
f) promotion of the necessary measures and institutions to overcome the negative effects of the introduction of informatics;
g) public awareness of the structural changes expected to result from technological development.

The ministers who attended the meeting were directed to prepare reports on the following areas:

a) Sectoral policy for the informatics industry;
b) Development programme for informatics in the public sector;

c) Programme for the support of informatics in the field of telecommunications;
d) Orientation policy on research and development in informatics;
e) Investment policy in informatics;
f) Planning and coordination of international relations in informatics and of participation in EEC informatics programmes;
g) Creation of the legal framework for the development of informatics;
h) Connection of educational policy in informatics with the national informatics development strategy.

In its effort to promote information technology in Local Administration, the Ministry of the Interior commissioned the Greek Productivity Centre to carry out a study for the computerization of municipalities and local communities. The study was submitted to the Ministry and it covers the possibility of computerizing all public administration units. Today there are 276 municipalities and 5 760 local communities in Greece. The study divides the administrative units into ten groups according to population size and provides for the computerization of the following functions:

- registrar
- municipal roll
- cemetery administration
- municipal (community) works
- water supply
- drainage
- general accounting
- procurement
- disbursements
- receipts
- warehousing
- payroll
- administrative services.

So far the only municipality which has began to computerize its services is the Municipality of Athens. However, the system is not in full operation.

On 22 July 1985 a one-day conference was organized by the Ministry of the Presidency. The subject of the conference was "Objectives and Plans for the Introduction, Application and Development of Informatics in the Public Sector".

The main features of the policy of the Minister of the Presidency are:
- full utilization of existing manpower and computer equipment potential;
- qualitative upgrading of the public sector and greater effectiveness and efficiency in the integrated introduction and development of informatics;
- support for development programmes for the national informatics industry;
- development of standard rules for the introduction and use of informatics with the objectives of economizing on national resources;
- development of information systems in support of new institutional and social programmes;
- creation of the necessary infrastructure to support the re-organization of public administration and its decentralization and regional development;
- utilization of European and international informatics programmes with the aim of transferring know-how;
- protection of citizens from the introduction of informatics;
- development of standards, rules and specifications in the use and development of informatics.

2. Government Regulation

There have been no serious attempts to standardize procurement policies and promote the national interest in this area. It is only in the last three years or so that the Government became aware of this issue. However, nothing has been done to alter this situation.

The multinational supplier of hardware and/or software is still in a position to dictate his terms. Contracts proposed by multinational firms include very restrictive clauses.

A working group of the Greek Productivity Centre and the Computer Scientists Association worked out a guide for the purchase of computer equipment. The working group was formed under a mandate from the Minister of the Presidency. Much of the work is based on the work of CECUA. The Greek Productivity Centre has already translated and published the CECUA work "Model Conditions of Contract for the Purchase of Computer Equipment".

Following the signing of the relevant Council of Europe agreement, the Ministries of the Presidency and Justice have drawn up a bill of law on the protection of citizens from "electronic detection". Personal information is classified as "strictly personal" and "personal". In the first category we find information relating to race, ethnic origin, political and party affiliation, religion, health, etc. Under "personal" information we have the storage of information which relates to personal data that cannot be classified. The draft law specifies the ways and means by which such personal information can be collected and stored and is an attempt to ensure data privacy for the individual citizen. However, this bill has given rise to considerable controversy, with opponents claiming that it will act as a deterrent to the introduction of new information technology.

IV. POLICIES OF SOCIAL GROUPS

1. Policies of Employers' Organizations

Recognizing the importance of informatics, the Government has introduced incentives for the recruitment of computer personnel of all levels. These incentives are:

a) special allowances for computer personnel over and above their regular salaries;
b) a shorter (by 1/2 hour) working day for computer personnel working with screens.

According to a study by the Centre of Planning and Economic Research,[1]

1 A proposal for a National Strategy for the Development of Information in Greece. Athens, Centre of Planning and Economic Research, 1983 (unpublished)

one of the most serious problems for the future growth of informatics in Greece is the acute shortage of properly trained and experienced computer personnel. This will be a constraint on growth for some time to come.

To cope with the situation the Government has taken the following measures:

a) recruited Greek computer scientists from abroad;
b) established a computer science department at the University of Patras;
c) established a department of computer science and informatics at the University of Crete;
d) added computer science courses at the Athens School of Economics and Business, the National Technical University, the University of Athens and the University of Thessaloniki;
e) established a department of informatics at the Athens Technological Education Institute;
f) organized through the Greek Productivity Centre a number of training programmes in computer science with the financial support of the European Community Social Fund.

2. Trade Union Policies

Computer personnel are organized in three associations. Two of these, the Hellenic Computer Scientists Association and the Greek Association of Informatics are scholarly and professional associations.

Lower level personnel i.e. programmers, operators and data entry personnel have founded the Panhellenic Association of Computer Personnel. This association is purely a trade union. However, as the demand for computer personnel is high there have not been any serious disputes over pay and working conditions. Consequently, the activities of the association in this area have been minimal.

At its 25th Convention the Supreme Administration of Public Employees Unions declared its position on the computerization of public administration. This position can be summarized as follows, "the Supreme Administration is not against computerization as long as it does not displace people from their jobs".

IV. SOCIAL IMPLICATIONS

1. Implications for Employees within Public Administration

There are no studies of the impact of the introduction of information technology on employment. Since 1983, employment in public administration has grown from 110 827 to 127 528 suggesting that information technology has not adversely affected employment.

There is no general requirement for newly appointed employees to have knowledge or skills in information technology. The Continuous Training Institute of the National Centre of Public Administration has not set up an informatics branch, although it offers a number of seminars for top and medium level public officials. These seminars are held in Athens, Thessaloniki, Heraklion, Patras and Ioannina.

This does not mean that young appointees are not qualified in the area of informatics. Many young people attend courses at their own expense. Non-profit institutions such as the Greek Productivity Centre and the Greek Management Association have trained hundreds of young people including public employees.

2. Implications for the Public

Effects on services offered to the public:

- information technology has made itself felt in a mumber of services offered to the public;
- the Ministry of Education processes grade point averages for admission to higher education through computers and the results are mailed to candidates on computer printouts;
- the Ministry of the Presidency has initiated a new hiring policy for public administration. Each qualification a candidate is given a weighting. The computer processes the information and prints out the list of appointees;
- through its Computer Centre the Ministry of Finance pays out old-age, survivors, and disability insurance benefits by means of computer print-out cheques. All tax forms are processed by computer and taxpayers receive statements from computer print-outs;

- the Ministry has plans for the computerization of all custom-houses. The implementation of the project has already started;
- the Ministry of the Interior has computerized electoral rolls.

In the near future computerization of public administration will grow very rapidly because the citizen has been educated to accept new applications more readily.

Data privacy:
Data privacy is protected by existing legislation and there is as yet no special legislation for data stored in computers.

F R A N C E*

I. INTRODUCTION

French Public Administration has a two-tier structure: the Central Administration and the external services operating under its aegis; and the local authorities, which cover the regions, the départements and the communes.

Since 1982, the decentralisation law no longer affords the State more than a power of control a posteriori over the automatically enforceable acts of the local authorities. The new distribution of powers between the Central Administration, the regions, the départements and the communes has required a transfer of resources to the local authorities whose autonomy as regards the allocation of expenditure is ensured by the lump transfer of budgetary sums: in 1985, 80% of the sums transferred were for non-specified uses.

The growth of the local authorities'tasks is restricted by processing capacities. The large-scale proliferation of data processing, plays a primordial role in this connection. This is facilitated by the development of data processing products in two directions:

- greater vulgarization, resulting from the gradual emergence of data-processing from a nebulous sphere, known as the "New Information Technologies", and from the increasingly less specific character of computer languages ("natural" languages, advanced software);
- miniaturisation, reflecting a greater mastery of technology, and resulting in a reduction in prices.

Telematics, and above all microcomputing, stand out as the main vectors of this propagation. In the case of telematics, this results from the backing given by the Telecommunications Board to the general public videotext network designed to cover the entire country.

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* Summary of a report drawn up by Dominique Namur, Researcher at the C.R.E.I., University of Paris-Nord, September 1986.

The development of microcomputing appears to be determined entirely by its own technological developments. By reducing the threshold of the cost of access to the automatic processing of information, microcomputers occupy a unique field of action in the communes. For instance, they constitute the main computer equipment for an average of 88% of the communes, a figure which rises to 95% for communes with less than 5000 inhabitants.

II. INTRODUCTION OF NIT's IN THE ADMINISTRATIONS

1. The computer stock of the Administrations

From 1981 to 1985, the growth in the Administration's computer stock attained an annual average of 8.5% in value as against 12% in number, reflecting a 19% reduction in the average value of equipment in 4 years. In 1985 the stock consisted of 6800 computers at over FF 250,000, 29,060 linked terminals, 6680 word processors and over 8000 microcomputers. Its profile is marked by a perceptible increase in small and medium-sized machines (FF 7 million), as well as increases in stand-alone equipment.

Four large Ministries (PTT ´Post, Telephone & Telegraph,, Finance, Defence, Social Affairs) accounted for over 50% of the Administration's computer stock in 1979. In 1985 they accounted for 75%. This concentration of the stock has increased significantly. The greatest relative increases occurred in the PTT and the Ministry of Finance.

As regards the communes, recourse to data-processing is a function of their size. The smallest communes (less than 2000 inhabitants) have no data-processing equipment, whilst 90% of the large communes (over 10,000 inhabitants) do possess data-processing equipment. Table I depicts the situation in greater detail.

Table I: Recourse to Data Processing by size of Commune Size

Inhabitants	No Recourse	Professional Services	Computer Equipment	Microcomputer Equipment
500	94.65	4.95	0.5	n.a.
500/2000	78.25	19.6	2.15	1.91
2000/5000	50	29	21	19.32
5000/10,000	18.4	24.5	57.1	44.54
10,000	6.34	6.3	87.4	52.44

Source: AMFI, La Gazette/Le Moniteur

2. Expenditure allocated to data-processing

a) Total Administration Expenditure

After slowing down during the period 1980-1982, the growth rate of expenditure reached an annual average of 13% in 1983-1984, i.e. an increase in volume of some 7 to 10%. Data-processing services are the main item of growth, with software packages (+25% p.a.) and programs (+19% p.a.). This reflects a gradual opening up of internal services to the market, which is starting to offer softwares suitable for public administration.

Maintenance of the computer stock has since 1982 absorbed approximately 20% of hardware expenditure.

In the communes, data processing expenditure accounts for 1% of the total budget in areas with less than 5000 inhabitants, and only 0.7% in the case of the large towns.

b) Age of computer stock by commune size

Data processing resources have become increasingly less centralised over the last 5 years, the effect of which can be perceived in even the smallest communes. For instance, 2/3 of the installations recorded in communes with less than 5000 inhabitants date back to 1984. On the other hand, for communes of 5,000 to 10,000 inhabitants, 1/4 of the early installations date back to 1980 or earlier (half of installations relate to communes with over 10,000 inhabitants).

Table II: Growth of Data-Processing Expenditure

in millions of current francs	70/75	76	77	78	79	80 (1)	81	82	84
TOTAL	2234	4419	5261	6247	6658	8267	9828	10909	13932
AAGR	23.4	27.2	19	18.7	6.6	24.2	19	12	13
of which:									
-External DP Services:	126.5	195	223	348	381	620	776	1059	1458
of which:									
Software	77.5	135	214	229	250	350	400	450	637
DP	49	60	99	119	131	270	376	478	616
Software Packages (2)	-	-	-	-	-	-	-	131	205
-Hardware	999	1810	2173	2614	2580	3154	3600	3972	4997
of which:									
Hardware	898	1625	1940	2334	2580	3154	3600	3972	4997
Linked equipment	101	195	233	280	-	-	-	-	-
-Misc.	276.5	601	694	821	924	1159	1462	1607	2109
of which:									
Environment(3)	276.5	601	694	821	924	1111	1330	1467	1760
Data transmission (4)	-	-	-	-	-	-	-	136	184
Other	-	-	-	-	-	-	-	4	160

Source: Ministry of Industry

AAGR: Annual Average Growth Rate

DP: Data Processing

(1): As the methods of evaluating the annual cost have been modified, the figures for 1980 are not directly comparable.

(2): Included from 1982 on.

(3): Computer supplies (cards, tapes, disks), electricity, stock and special fixtures.

(4): Includes the item "Other" (misc.) for 1981.

This development is largely the result of the spread of microcomputers, providing access to less costly equipment. Bearing in mind past and stated intentions, the average life of the computer systems presently installed can be estimated at 4 or 5 years.

3. Applications of the Computer stock

Technical and scientific applications (mainly scientific calculation) are gradually being displaced by administrative management and data entry applications. This is the result of the spread of data-processing to the small communes which are now going over to management at communal level and telematics, which, for the Administration, requires a different type of data collection from that used in scientific research.

For the départements, the computerisation of which is ahead of the regions, accountancy applications are the most extensive, with a growing trend towards collective uses (social assistance, applications for grants).

The regions show a lower ponderation of accountancy activities and a high emphasis on vocational training.

For the communes it appears to be the top priority, regardless of population size, to computerise the commune's accounting systems. For communes with less than 2000 inhabitants, this is followed in priority by the two applications "Electoral Roll" and "Administrative Budget Account". From 2000 inhabitants upwards, the introduction of data-processing is also justified by the "Staff Wages" application.

However, consultation of data banks and invoicing are never priorities, whilst Civil Records and Town Planning and the management of services (social assistance, canteens...) are only seen as worthwhile where there are over 5000 inhabitants.

III. GOVERNMENT POLICIES

1. Programmes for Introduction of the N.I.T.'s into the Administrations

In 1986 the Ministry of Finance introduced a plan for the installation of Communications Systems and Data Processing and Evolutive Office Automation Systems (SCRIBE). A preliminary model, developed between 1982 and 1985, defined the conditions of use of the system and led to the adoption of ISO standards.

SCRIBE covers 4 areas:

- Sagittaire aims at equipping staff with microcomputers and secretaries with advanced word processors;
- Sésam is intended to permit the rapid exchange of information by the linking of Minitels to the Ministries' own telematics servers;
- Arcade covers a collective electronic filing system and an integrated system of filing and consultation of documents;
- Scribe is a versatile local office automation system permitting the exchange of all documents between different work stations of different makes and types and between the latter and the servers.

The State Interministerial Telematics System, developed by the Interministerial Committee on Data Processing and Office Automation in the Administrations (CIIBA), provides a link between the different services drawing up legislative and statutory texts. In December 1986 a master plan was drawn up for all interministerial communication purposes and covering all the requirements for transmission of data and messages.

2. Government Organisations for the Control and Promotion of the N.I.T's.

There are three categories of organisations responsible for the promotion of the N.I.T's in the Administrations:

- those dealing with territorial matters: the Data-Processing Section attached to the Ministry of the Interior studies the conditions of development and exchange of data between local authorities. The "Caisse des Dépôts et Consignations" (Deposits and Consignment Office) acts, through its branches, as provider of services (Société Centrale pour l'Equipement du Territoire - SCET ´Central Company for National Supplies´, Société d'Economie Mixte - SEM ´Mixed Economy Company´, Centre d'Automatisation pour le Management - G-CAM ´Management Automation Centre´) or financial intermediary (Caisse d'Aide à l'Equipement des Collectivités locales - CAECL ´Assistance Fund for the Equipment of Local Authorities´);
- The State agencies responsible for general data processing matters: those in charge of development and information concerning the equipment programmes within the Administrations (Agence de l'Informatique - ADI ´Data Processing Agency´, Centre d'Etude des Systèmes et Technologies Avancées - CESTA ´Centre for the Study of Systems and Advanced Technologies´, Centre d'Experimentation des Systèmes Informatiques pour l'Administration - CESIA

´Experimental Centre for Data-Processing Systems for the Administration¸, Institut National des Recherches en Informatique Automatique - INRIA (National Research Institute for Automatic Data-Processing), Centre Mondial Informatique et Ressources Humaines - CMIRH ´World Data Processing and Human Resources Centre¸, the Commission Nationale Informatique et Libertés ´National Commission on Data-Processing and Civil Liberties¸), which is independent of the ministerial structures, and the DGT. The latter organisation is developing several equipment plans at national level (the Câble ´Cable¸ Plan, TRANSPAC, Telecom 1);

- Other State organisations such as the Institut National de Statistique INSEE ´National Statistics Institute¸, the Direction Générale des Impôts - DGI ´Inland Revenue Department¸, seek compatibility of equipment and procedures with their respective local offices.
  The Comité Interministériel de l'Informatique et de Bureautique dans l'Administration - CIIBA ´Interministerial Committee for Data-Processing and Office Automation in the Administration¸, established in 1984, is responsible for co-ordinating the policies of the different Ministries. Its work on the harmonisation of purchasing procedures and financing makes the Administrations more flexible, whilst at the same time providing information on the comparative profitability of the equipment in the various departments.

This increased autonomy in relation to the Ministry of Industry does not appear to affect the policy of preferring national manufacturers.

Table III: Breakdown, by manufacturer, of the Administration's computer stock (in %)

	1976	1980	1985	AAGR
BULL (1)	37	41.8	52.7	+4%
Other European	4	18	18.7	+ 18.7%
IBM	34	23.3	16.4	- 7.8%
Other American	25	16.9	12.2	- 7.7%

Source: Ministry of Industry
AAGR: Annual Average Growth Rate, in %
(1): CII from 1970 to 1976, CIIMB from 1977 to 1983, BULL in 1985, including SEMS and TRANSAC.

The other tasks of the CIIBA are the co-ordination of pilot projects and interministerial systems, assistance to the data processing commissions (COMI), or relations with the public and with industrial and commercial data-processing organisations.

3. Decentralisation

Over the last 5 years the medium-sized local authorities experienced an acceleration of their rate of acquisition of equipment: by 1985, 73% of the regions and 90% of the départements had been computerised.

A breakdown of the computer stock by manufacturer shows a high presence of BULL, but IBM is prominent in the large towns. The small local authorities form a far more homogeneous market, due to use of SSII's (software houses) and local manufacturers.

To develop co-operation between local authorities the SAUMADE Report proposes to grant increased autonomy to the Data-Processing Section and to set up an Experimental Centre for Data-Processing Systems for Local Authorities. The aims of this structure would be documentation concerning markets and relations with the professional circles as well as back-up for pilot experiments and advice on data-processing and communications techniques.

IV. GOVERNMENT POLICY AND RELATIONS WITH SOCIAL PARTNERS

In November 1984 the Secretary of State for the Civil Service formed a planning group on the introduction of the N.I.T's into the Administration, consisting of representatives of the unions and of the departments concerned. The guidelines proposed in its first report with regard to training, working conditions and participation of staff form, in conjunction with those laid down by the CIIBA, the thread of government policy.

1. Redefinition of the Duties and Responsibilities of Staff

Those in charge of the administrations must be well informed on the management of their services and also the vehicles of a modernisation project. They must be approached in a manner which takes account of the possible changes in their work.

The under-managers are seen in the role of mediators contributing to the spread of a technological culture. Their involvement in the design of the systems and their "staff" function makes them the pillars of every organisation.

User participation, which was initially limited to consultation on decisions of a secondary nature, conditions all policy and programmes choices, by involving all the staff concerned. There are many instances of negotiation at interministerial level (the N.I.T. Planning Group, the Supreme Council of Civil Service) or with individual administrations (Joint Technical Committees - COMI).

The unions have external technical expertise at their disposal through the Institute of Economic and Social Research. The Ministry of the Economy and Finance has used the method of quality circles for the introduction of SCRIBE and the assessment of its organisational impact, but the unions do not consider that it affords the officials any real autonomy.

2. Working Conditions and Training

Numerous studies conducted both by manufacturers and by organisations such as the National Research and Safety Institute and the National Agency for the Improvement of Working Conditions testify to the attention paid by the Administration to considerations of an ergonomic nature. These considerations intervene right from the design stage of projects and they could form the subject of a framework agreement at interministerial level negotiated with the unions, whilst the detailed rules would be worked out with the users concerned, i.e. within the framework of the Health and Safety Committees.

As regards the status of officials assigned to automatic data-processing, a decree of 1973 (1) laid down the principle of a distinction between official grade and duty performed. The State has refused to allow central civil servants and employees of the communes to form a body. Civil servants assigned to automatic data-processing must be classed in an official grade job (attaché, technical assistant, junior executive officer, engineer ...), implying compliance with the statutory rules on recruitment, promotion and remuneration, their only special feature consisting of individual allowances. Although it would guarantee a career, the legal framework of a separate status would be hard put to keep pace with technology (office automation, microcomputing, telematics), the changing profile of skills and the special requirements of local or central administrations.

However, because of the statutory security of employment covering all civil servants, the increases in productivity generated by the N.I.T's have not resulted in a proportional decrease in personnel costs; this is attributed to:

- an increase in conventional tasks greater than the increase in the number of employees;
- the reduction of working time;
- the performance of new jobs with no increases in staff;
- the redeployment of labour in other (new) services.

(1) Decree No 73-80 of 23 July 1973.

Staff training schemes in the N.I.T's are relatively recent. Personalised access to equipment, combined with microcomputing, is serving to accelerate training requirements. Training amongst the 800,000 employees of the administrations affected by introduction of the N.I.T's is necessary on two counts: as an indispensable accompaniment to the use of the new tools, and as a necessary condition for genuine participation. For the non-specialist staff of the Administration and the local authorities, apprenticeship covers, in addition to technical training, training in organisational methods and human relations. In all cases, data-processing is not regarded as an end in itself, but as a component of the policy to modernize the Administration.

Parallel to this, training must take into account the increasing need for high level specialists, to act as occasional advisers at the users' premises or to advise on installation projects.

V. SOCIAL IMPLICAITONS

1. Personnel costs and employment structure

The share of personnel costs in the overall expenses of the Administration has shown a slight decrease since 1979, after an increase of 3% in comparison with the period 1970 -1975.

In the local authorities, this figure is less stable, due to sudden fluctuations when new systems are acquired.

Table IV: Personnel Costs of the Administration, (FF million)

	70-75	76	77	78	79	80	81	82	84
Personnel Costs (1)	832	1803	2081	2464	2773	3334	3990	4402	5368
AAGR	15.5	32.7	15.4	18.4	12.6	20.2	19.7	10.3	10.4
in % of total cost	37.3	40.8	39.5	39.4	41.6	40.3	40.6	40.3	38

Source: Department of Industry
AAGR: Annual Average Growth Rate
(1): includes data entry personnel from 1980 on.

In the Civil Service, personnel are divided into 5 categories:

- "Staff" are those in charge of data-processing services whose training and duties are not exclusively technical. They include project managers.
- Higher technicians: analysts, programming managers, system programmers, processing managers;
- Technicians: programmers and console operators;
- The duty of the operators is to help the higher category staff to implement and control the operation of the computers;
- Data entry personnel.

There is now a slight deceleration of personnel increases, but no change in the category structure. The only notable decrease over the past two years has been in the number of operators (-15%). In the local authorities, personnel numbers remain low and their structure reflects recent computerisation (a high proportion of system designers).

For the communes, the number of personnel depends on the size of the commune, amounting to 13, 32 and 77 people for communes with less than 2000 inhabitants, with 2000 to 5000 inhabitants, and with 5000 to 10,000 inhabitants respectively.

The number of personnel is not determined by the cost of a particular category but follows a pattern parallel to that of wages on the market.

Table V: Breakdown of Administration personnel grades by % and Number of Staff: 1976 - 1980 - 1985

At 1.1.	Staff	Hghr. Technician	Technicians	Operators	Entry. Prsnl.	Total (1)
76	14	29	35	21	n.d.	100
80	9	20	24	13	35	100
85	10	20	23	11	36	100
76:N	2432	4874	5648	3996	n.d.	16950
80:N	2707	6332	7462	3953	11100	31454
85:N	3586	7883	8713	4231	13363	37576

Source: Ministry of Industry
n.d: not calculated
N: number
(1): includes data entry personnel since 1980

2. Working Conditions and Organisation

The increase in the computer stock of the Central Administration and the local authorities keeps constantly ahead of that of personnel, a tendency which is amplified by microcomputers.

Table VI: Comparative Trends of Computer stock and Number of Personnel of the Administration

	70-75	76	77	78	79	80	81	82	83	85
AAGR Stock. (1)	23.4	22	15	32	21	16	18	1(3)	11	20
AAGR Persnnl.	12.5	15	7.7	12.3	6.2	55.1 (2)	4.7	4.6	5.7	3.2
Ratio Men/ machines	12.9	10	9.4	7.4	6.5	5.7	5	5.3 (3)	5.1	3.5

Source : Ministry of Industry
AAGR : Annual Average Growth Rate
(1) : Total Administration computer stock (in number)
(2) : Artificial development associated with incorporation of data entry personnel
(3) : Artificial development associated with raising recording threshold for computers from FF 60,000 to FF 250,000.

The interest shown in the N.I.T's is based on the improvement of working conditions and the skills they require. Working on a screen is not necessarily in itself laborious and is even regarded as clean and pleasant for office automation applications. Software plays a central role here: their degree of ease of handling and the possibilities of modifying them or adding to them are decisive factors from the point of view of user-interest and user-fatigue. When these conditions are met, the work content is found to be enriched, - in quantitative terms in that new tasks become accessible (effect of the microcomputer in 49% of communes), and in qualitative terms by enrichment of the duties already performed (63% of communes).
The administrations see the N.I.T'S as a means of promotion for personnel. By facilitating the improvement of communication inside the structure (local offices) or between the structure and the outside, the N.I.T's provide civil servants with an opportunity to acquire new skills in organisational matters, the management of their use of time and the use of their increases in productivity. Although their perception of the potential offered by these technologies differs from one administration to another, most regard them as the vectors of simplification at work organisation level (in the case of the microcomputer, 61% of the communes take this view).

Telematics plays a unique role in this field. Those local authorities which are equipped (13% of communes, 35% of the regions and 49% of the départements) develop its applications for information purposes.

The information mainly serves the internal services and concerns training plans, administrative procedures or other specific needs. By giving the civil servants greater autonomy of judgement and increased flexibility in decision making, information cannot fail to have repercussions on the deployment of the various services and on working methods.

3. Implications for Users

Installation of the N.I.T's in the administrations enables them to offer a rapid, personalised service, by simplifying administrative formalities and guiding users in their operations (telematics).

Appreciable progress has been made as regards bodies which regularly have to complete voluminous information forms on tax, social, economic matters, social security, etc, such as INSEE (National Institute of Statistics and Economic Studies) and the Ministry of Labour and Employment.

The system works on the principle of the Transfer of Social Data to a single Centre, which is responsible for redistributing the data to enquiring organisations.

The second group of simplifications concerns the alleviation of the administrative duties of firms. Since 1981, Administrative Formalities Centres for Firms have been systematically installed, making it possible for the firms to call on the services of a single body for all the administrative procedures they have to carry out.

For private individuals, the benefits of computerisation are less noticeable, as they do not have as many formalities to carry out as firms. One striking application, although still in the pilot stage, is the memory card. Used as a portable filing system, this enables the memory of central filing systems to be decentralised whenever possible and convenient to individuals.

As regards access of the public to administrative information, the Administration is continuing to install "à Votre Service" 'At Your Service' Centres (CVS), which the Government decided to set up in 1982. These centres permit the direct, personalised reception of the public, in association with the Centres Interministériels de Renseignements Administratifs (CIRA) 'Interministerial Administrative Information Centres', by direct access to a large number of data banks. The programme provides eventually for one centre per département.

The Central Administration 'the Civil Service' also makes telematics data bases available to the general public. Nevertheless, since rapid, complete cross-checking of information on a person can form an instrument for the investigation of his private life, the National Data Processing and Civil Liberties Commission (CNIL) supervises the conditions of use of computer files and has imposed restrictions in the case of the computerised identity card.

I R E L A N D *

I. INTRODUCTION

In terms of employment, the public service in Ireland is usually viewed as comprising seven major divisions: the civil service, the local authorities, the health services, the state-sponsored bodies, the Defence Forces, an Garda Siochana (the police force) and the education sector.

A narrower definition of the public service (excluding the Defence Forces, An Garda Soichana, and the Education Sector (viz. teachers)) is more appropriate when viewing the public service from the viewpoint of administration.

The system of public administration can be seen as comprising four main groupings:

- The Civil Service: made up of 17 departments some of which provide services directly, the remainder of which coordinate and control the activities of other public service organizations.
- Local Authorities: including 117 local bodies responsible for the provision of local services such as housing, roads, water supply and sanitary services.
- Health Boards: comprising 8 regional organizations responsible for the provision of hospital and community health services.
- State Sponsored Bodies: including 100+ commercial and non-commercial state organizations, e.g. Coras Iompair Eireann - CIE (the state transport company), Aer Lingus (the state airline company), and Radio Telifis Eireann - RTE (the state television and radio broadcasting company).

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* Summary of a report prepared by J.F. DINNEEN and M.E.J. O'KELLY, Department of Industrial Engineering, University College, Galway.

II. DIFFUSION OF INFORMATION TECHNOLOGY

1. Civil Service

The degree of computerization varies widely across the civil service. While some central Government departments have developed considerable in-house expertise, many still depend on central computing services for the supply of computing facilities.

Automation in the civil service first took the form of mechanical tabulation based on punched cards (from the 1930s to the 1950s), followed by the use of IBM electronic accounting machines (EAMs) (in the 1960s). In 1963-1964 an Automatic Data Processing (ADP) unit was established in the Department of Finance to evaluate proposals for computerization within the civil service and to assist in the introduction of computer. This was superseded in the 1970s when a central computing centre was established under the auspices of the Department of Public Service (DPS), which had been created in 1973. The Central Data Processing Service (CDPS) was staffed largely by personnel from the ADP unit in the Department of Finance. CDPS' functions were defined as follows:

i) Formulation of policy for EDP development within the service and related civil service agencies.
ii) Public service aspects of national policy issues regarding overall computer development.
iii) Co-ordination, determination and sanctioning of the overall computer hardware requirements of the civil service and related agencies.
iv) Development of computer systems for government departments and related agencies.
v) Operation and development of the public service computer bureau.

Since its establishment, CDPS has been the chief influence on the pace of computer development in the civil service. In addition to its role as controller of hardware acquisition, CDPS operates a major systems development and operations bureau for a wide range of public service departments and agencies. Of the 40 organizations which use computing

facilities, only nine do not use any of the services of CDPS. Systems development is a major service of CDPS reflected in the fact that only 8% of civil service systems use package applications.

At present, total staffing in CDPS numbers 200 of which approximately 130 are systems analysis/programming staff. Total civil service staff engaged in systems development number approximately 275. Annual expenditure by CDPS on hardware resources amounts to approximately IR£ 1,000,000 per annum.

The only major independent computer centre in the civil service is the Office of the Revenue Commissioners. Another major user is the Department of Social Welfare, which relies heavily on CDPS for systems development aid. Some other civil service departments and agencies have minor local capacities and operate largely independently of CDPS. Such bodies include the Departments of Agriculture and Defence, the Central Statistics Office, and the Meteorological Service.

Overall, the development of computerization in the Irish civil service has taken a constant rather than a spectacular pace. At present, most systems are oriented toward the technologies of the early 1970's. However, many applications take advantage of developments in on-line systems and telecommunications networks. The majority of current systems cater for routine transaction processing with limited office automation and decision support systems under development.

2. Local Authorities

Computers were first used in the local government sector in the early 1970's. By 1974, five of the larger authorities had acquired computers and sixteen local authorities were using the services of computer bureaux. Accounting applications and the processing of large batches of data such as municipal rates and the register of electors were the principal applications at that time.

In 1975, the Minister for Local Government established the Local Government Computer Services Board (LGCSB) to provide a computing service for the local government sector. From the outset, LGCSB concentrated on serving the smaller local authorities. Between 1977 and

1982, the LGCSB supervised the installation of computer facilities in twenty-two sites leading to a total of thirty-one local authority computer installations in 1983.

The LGCSB has its own in-house computer which is used for systems development and the provision of bulk processing services to local authorities. The LGCSB has developed fourteen major systems to date including payroll, water charges, housing allocations, electoral register and traffic fines. The five largest local authorities have their own significant computer facilities. These local authorities undertake their own processing and systems development. They occasionally make use of LGCSB's services and contribute to its policy deliberations.

III. GOVERNMENT POLICY

1. Promotion of Information Technology in the Public Service

Following a review during the early 1980s, the CDPS was reorganized in 1985 into three separate bodies that form the kernel of the government's further plans for computerization of the civil service: the Central Computer Service (CCS), Control, and the Information Management Advisory Service (IMAS). The Central Computer Service (CCS) has taken over the computer facilities of the CDPS and operates a mainframe computer bureau for users who require that facility or for those smaller departments which cannot economically justify or support their own installation. It also provides and supports common and service-wide applications such as networking, electronic mail, payroll, text processing and shared information systems.

Control is responsible for the final approval of any computerization programs. Lastly IMAS operates as an internal computer consultancy offering independent advice to departments, offices and CCS on all aspects of information technology (planning, strategy, organization, staffing, procurement, project management, systems development and implementation). It is also responsible for the coordination of plans and policies between departments, offices and CCS and for the development of service-wide standards for planning, procurement, systems development, staff and management training. It initiates service-wide

and interdepartmental projects and is responsible for computer research and development work in the civil service. IMAS is currently concentrating on four aspects of information technology: networking, microcomputers, office automation and planning for information technology.

The Government attaches such importance to the role of information technology that departments will be required to formulate plans for its effective implementation and to decide what role information technology will play in helping them achieve their departmental objectives.

Staff will be given the time and training to develop competence in this field, and will have the opportunity to pursue a career in the area of information technology should they so wish. Information technology will be regarded as a special case requiring exceptional treatment and flexibility in relation to staffing and other controls. Expenditure on information technology in the Irish public service is about half that of comparable administrations, and significantly less than in countries where its use is at an advanced stage. The Civil Service Training Centre (CSTC) is to give priority to programmes which will familiarize top management with information technnology. Similar training will eventually be extended to all management levels.

The Government has decided to commit a minimum of IR£ 3,000,000 to enable major new directions in the application of information technology to be explored and developed. This will be in addition to resources available in the normal course of events. At the level of the local authority there are three possible strategies. First the local authority can develop its systems completely autonomously (this is generally only possible for the larger towns). Secondly, the local authorities can secure the advice and assistance of the LGCSB in installing and running their systems. Thirdly, they can subcontract their computing requirements to the LGCSB's computer bureaux services.

In 1982, LGCSB put forward a major strategic plan for computing in the local authority sector. The plan proposed the continuation of the present cooperative approach to decentralized processing allied to centralized coordination and systems development. It also envisaged the acquisition of new hardware by the local authorities capable of

exploiting new technological developments fully. Subsequently, the decision was made to standardize on Honeywell equipment. The plan envisages the development of a national processing network providing for distributed processing and the development of on-line systems at an accelerated rate in the latter half of this decade. Proposals for the use of dedicated micro-computers for planning and engineering purposes are already well advanced. Planning systems will focus initially on the computerization of planning application files with provision for interactive enquiry and report generation features. The engineering systems package will incorporate the latest developments in computer-aided design techniques.

The local authority sector has made substantial progress in relation to computerization in the last ten years. Consolidation and a continuation of this trend can be expected over the coming years making the local authority sector one of the most advanced users in the whole public service.

2. Data Privacy

Ireland does not have a clearly defined law of privacy. The present Government, however, is committed to the introduction of a Data Protection Bill using guidelines provided by the OECD (1980) and by the Council of Europe (1981). The Dail Committee on Legislation is currently forming a view on possible legislation but progress is painfully slow as the proposed bill has only "relative priority".

IV. POLICIES OF THE SOCIAL GROUPS

1. Policies of Trade Unions

In "Confronting the Jobs Crisis" [1], the Irish Congress of Trade Unions (ICTU) states that because of its young, well-educated labour force, Ireland is in a good position to take advantage of innovative applications of advanced basic technologies that have been developed elsewhere. This potential can be realized, provided there exists a

1 "Confronting the Jobs Crisis: Framework for a National Plan". Dublin: I.C.T.U. 1984.

clear and coherent strategy on technology as an essential component of industrial policy, as well as an industrial relations climate which assists technological change.

In the "Evaluation Report of the Trade Unions' Group" [2] on technological development in the public service, a seminar held in Dublin on 19/20 September 1985, a number of key observations were made including:

a) Problems relating to the provision of advance information for the benefit of employees, negotiation of the conditions under which the changeover is organized, training, and working conditions.
   - The process of changeover should involve three phases - information, consultation and negotiation.
   - The new working conditions (factors such as visual displays, isolation, stress etc.) should be the object of appropriate negotiation.

b) Training, both technical and conceptual (improving the general level of worker knowledge on information technology) in new skills is necessary to avoid any wasteful redundancies.
   - Due to the evolving nature of information technology, continuing training should be orgaized on a rota basis, with 5% of the workforce atteding courses at any given time.

c) The introduction of information technology should be accompanied by a reduction in working time to take account of both the new kinds of stress and mental demands of the changeover, and to share the benefits of the increased productivity.

d) Workers representatives should receive specific training geared to negotiation over the introduction of new technologies and they should also be given advice for this purpose by independent experts.

e) Finally, given the enourmous social and economic implications of the introduction of new technologies, information technology should be the subject of a standard European agreement.

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2 "Technological Development in the Public Service: Impact on General Public and Employees" (Evaluation Report of the Trade Unions' Group). In New Technology in the Public Service, Ireland. Dublin: European Foundation for the Improvement of Living and Working Conditions.

V. SOCIAL IMPLICATIONS

1. Employment Effects

Guaranteed job security is a feature of public service employment policies in Ireland. Consequently, no staff are made compulsorily redundant as a result of computerization. This is not to say there are no staff savings. Automation saves staff costs in that increasing volumes of work (especially in the social security area) can be handled without the expense of recruiting extra staff. For example, a doubling of staff would have been required in the Disability Benefits Section of the Insurance Division in the Department of Social Welfare to administer sickness benefits systems (as a result of the introduction of compulsory social insurance and pay-related disability benefit in 1974) had not computerization been introduced [3]. Computerization also results in substantial cost savings through the reduction or elimination of overtime working. Extra payments to staff to operate computer equipment together with guarantees of no rendundancies help obtain the support of staff. Also, a process of natural attrition or "wastage" is being used to effect governmental policy of cutting back the numbers employed in the public service.

2. Career Effects

In the medium- to long-term significant reductions in employment numbers will occur as more advanced technologies are introduced. Technology, as it is currently applied, is not seen as offering much promotion potential to non-specialist administrative and clerical staff. In the specialized field, however, increasing demand for qualified staff is predicted. While greater use of technology is one factor influencing this demand, loss of qualified staff to the private sector (which offers higher financial rewards and better career structures) is probably equally (if not more) important.

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3 BLENNERHASSETT, E. & R. MORAN "Technological Developments and The Public Service: Impact on the General Public and on Employees in Ireland". In New Technology in The Public Service, Ireland. Dublin: European Foundation for the Improvement of Living and Working Conditions, 1984.

3. Job Design Effects

Almost invariably, technology is implemented in such a way as to reinforce existing work arrangements and underlying patterns/styles of management.

To some extent different after-effects are being experienced even within the same small work unit - differences between grades of staff in terms of quality of work being even more marked following computerization. Blennerhassett & Moran (1984) [4] found that at one end of the spectrum - the clerical level in all three case studies - there is increased supervision, loss of control over work, deskilling, fragmentation, and time pressures; at the other end of the spectrum - the supervisory level - there is job enrichment, task diversity, greater control, higher levels of motivation and job interest. Unfortunately, the negative end of the spectrum is encountered more frequently (presumably, because more people work on the lower echelons than on the upper ones).

In general, although work often tends to be more difficult and concentrated following computerization, it is rarely more skilled.

4. Effects on Service

Blennerhassett & Moran [5] found that the most obvious changes associated with the transition from manual to computerized systems of administration are:

- changes in methods of payments;
- changes in speed of payment and personal service;
- changes in frequency of contacts between employees and clients - there is a general trend for computerization in the social security area to be associated with less frequent face-to-face contact between public service organizations and their clients. Although face-to-face contact between employees and clients tends to be less frequent, this is compensated for by a more sensitive personal service. There is less overcrowding and queueing; staff have more time to deal with individual claimants; and there is greater privacy and less humiliation for the claimant.

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4 Ibid
5 Ibid

- Difficulty in tracing and correcting errors in records: as long as information is input correctly, computerized records are generally accepted as more reliable than manually-kept files. Difficulties arise, however, when data is input incorrectly. Correcting such errors as do arise may involve a timelag of several weeks or even months because of the way in which the work is organized.
- Difficulty in understanding forms: Following on computerization, especially with disability benefit application forms, Blennerhassett & Moran (1984) [6] found clients had difficulty completing very comprehensive forms or understanding the details given in explanatory leaflets - in particular, the language used, the condensed format, and the print size. The wealth of detail contained in forms is really for the benefit of the administration and as such may sometimes be considered merely of nuisance value to the client.

5. Data Privacy

In the medium- to long-term, there is a lot of concern expressed about the possible linking up of databases. Concern focuses on (a) possible violation and abuse of individuals' democratic rights inherent in the trend towards the creation and amalgamation of personal databases containing a vast amount of information on individuals; and (b) the use of technology as a social control mechanism e.g., to disclose abuses of the social security system by cross-checking taxation records with social security records [7]. Many are skeptical about the adequacy of data protection laws in controlling the use of advanced technologies in the public service. Current data processing arrangements are also cited as a factor contributing towards the erosion of individual rights - often responsibility is blurred and deferred.

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6 Ibid

7 B. Ryan, "Let the People Know", Seirbhis Phoibli, Vol. 7, No. 2, Meitheamh, 1986.

I T A L Y *

I. INTRODUCTION

The Public Sector is composed of the Public Administration and some public firms (Post Offices, State Monopolies, State Telephone Company, Railways Board).

The Public Administration is composed of the Central Administration, the Local Administration and the agencies of the social security system, among which is prominent INPS, the national agency for pension funds.

The Central Administration includes all central administrations of the Italian Republic. The government administration is organized by Ministries whose number and denominations have had marginal changes in the recent past. The Central Administration also includes some agencies for statistics and research, one public firm (the State company for road-works) and a few other bodies whose powers extend all over the country.

The Local Administration includes councils at three levels: the Regional Councils, the Provincial Councils and the Borough Councils. The Regional Councils have substantial powers for labour market policies, the national health system, the control of the environment.

In Italy Public Administration has been characterized by the absence of any strong tradition of qualified, centralized administration, due to the late political unity of the country and the continuing difficulties in the social and administrative merger of the different regions of the country. The characteristics of local administration are still remarkably different in different parts of the country. The training and professional standards of civil servants have been a chronic problem - low productivity and low efficiency of Central Administration are commonly recognized as generalized phenomena.

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* Summary of a report prepared by Bruna INGRAO, Dipartimento di Scienze Economiche, Roma.

II. THE DIFFUSION OF INFORMATION TECHNOLOGY IN THE PUBLIC ADMINISTRATION

Public Administration is a network of offices processing a huge amount of data to accomplish their institutional or administrative tasks. A first stage of computerization (but indeed a basic one) is the systematic use of hardware and software information technologies to accomplish these tasks at higher speed with an efficiency gain. A second stage of computerization involves a more active and rich interaction among the activities performed by bodies inside the administration and the possibilities offered by the new information technologies. At a third stage of development information technologies are adopted as a systematic support to decision making and the evaluation of public policies.

A very detailed Report on Computerization of Public Administration is published yearly by the General State Procurement Agency, a department of the Treasury in charge of public procurement for central government[1]. The survey covers the computerization of Ministries, other agencies of the Central Administration, public firms within the public sector, the agencies of the social security system and a few other bodies, among which telecommunications companies under public control. Computerization of Local Administration is not considered.

In 1984 total expenditure on computerization of the administration covered by the survey amounted to 1106.9 billion lire, including hardware and software (purchased or rented), the salaries of personnel (inside or outside the Public Administration), the rent for telephone lines, the maintenance expenditures, the development expenditure.

In central government, big investment efforts haven been accomplished by a few departments, especially for the purpose of financial administration, but also for police and law administration and the management of civil servants careers. Apart from these few advanced experiences, computerization developed rather slowly in Central Administration. Although the attitude towards computerization has changed in recent years, innovation of any kind in the Italian Public Administration is still a rather long and difficult process.

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1 Provveditorato Generale dello Stato, "L'automazione nell'amministrazione dello Stato", Istituto Poligrafico, Roma, 1985.

95.7% of total expenditure on computerization is accounted for by seven Ministries. Four of these seven administrations alone spent 78.8% of total computerization expenditure in 1984 (the Ministry of Finance, the Treasury, the Ministry of Education, the Ministry of Justice). Important amounts have been spent also by the Ministry of Defense and the Ministry of the Interior. The Report observed that concentration of expenditure in a few Ministries seemed to be increasing, adding the following comments: "This might also mean that in many Administrations which play a strategic role for improving the efficiency of Public Administration computerization diffuses rather slowly".

The survey found 67 EDP (electronic data processing) centres in Ministries and the following hardware equipment: 101 mainframe systems, 664 mini computers, 13596 terminals, 49 personal computers. The prevailing architecture is systems of mainframe computers connected to networks of terminals. In 1984 85.4% of terminals were in operation in just five Ministries.

The total hardware expenditure (including maintenance and renting) amounted to 153.3 billion lire in the same year. Of this amount only 443 million lire was spent on the purchase of personal computers, although the increase over 1983 was substantial. An even smaller amount was spent on office automation equipment; but for both types of investment the survey might underestimate the total investment by Central Administration.

The quality of systems is thought to be very good, even according to critical independent experts.

It is more difficult to assess the state of diffusion in Local Administration since no comprehensive survey is available. A survey [2] on computerization in Borough Councils was conducted by Honeywell Italia. The rate of EDP diffusion was estimated at nearly 46% at the end of 1984. The Honeywell Report observed that a boom in compterization took place in Borough Councils in the early eighties, followed by a slow down in the mid-eighties. Over 60% of Borough Councils using EDP adoped EDP in the three years 1981-1983. The delay is explained by the need to think over the technical solutions, after

2 Honeywell: "L'evoluzione del mercato EDP in Italia nel 1984", mimeo, 1985.

the first enthusiasm and the pressures and suggestions of hardware producers. Not all experiences of computerization in small Borough Councils were successful, because in many cases the investment effort in hardware equipment was not accompanied by the necessary rethinking of procedures, or appropriate software architectures, so that the global efficiency gains were low. A wide gap remains among different regions of the country.

A survey on computerization in Regional Councils has been published by Formez, an agency for the promotion of growth in the Mezzogiorno[3]. The survey found 160 computers (from mainframe to personals), 240 word processing systems, 40 specialized systems and 2023 terminals. The total annual expenditure by the Regional Administrations was estimated at 110 billion lire in 1983. This was evaluated as an important investment effort, comparable to the investment effort of Central Administration. A few Regional Councils have a clear lead in computerization. Piemonte and Lombardia, and, in the South, Molise and Puglia, are the most active users (measured by number of computers installed).

In both Central and Local Administration the first computerized areas were usually the accountancy and financial administration, personnel accountancy and personnel careers and various registration procedures. Accountancy tasks are performed in 74% of EDP centres in Ministries; lower but still significant percentages go to other areas of application as data banks, filing systems, registers for certificates. Only a minority of EDP centres in Ministries work on mathematical modelling (3%), planning (1%), technical and scientific applications (1%), process control (6%). In view of this, it has been argued that computerization of Public Administration was too often limited to the very first stage of current management, without using the full innovative potential of the new information technologies [4]. This is indeed a very sound criticism, not denied even from official sources [5]. By tradition and by habit, as by the basic structure of controls, management in Public

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3 Formez: "Rapporto sull'informatica nelle regioni italiane", Roma, 1985.
4 A. Zuliani: "Intervento sulla informatizzazione della Pubblica Amministrazione", Informazioni Economiche, XII, 11, November 1985, p.6-16.
5 D. Siclari, A. Spadaro, E. Acquati, R. Tesi: "L'occasione informatica, L'Amministraione dello Stato e le nuove tecnologie", Istituto Poligrafico, Roma, 1984, pp. VIII - 285.

Administration is strongly oriented to putting a high priority on respect of stated procedures and strict adherence to what is permitted by administrative laws. This prevailing attitude has been a serious impediment to the search for more efficiency through computerization and it may even have perverse effects since, once computerized, the inefficient procedures become crystallized and even more intangible than before.

Even accepting the criticism, computerization of current management, when effectively implemented, was the source of important know-how and useful instruments for policy making and it improved the quality of the administration.

III. GOVERNMENT POLICIES

The promotion of computerization of Public Administration became an explicit target of government policies only rather recently, in the early eighties. The computerization process started earlier, under the coordination of the General State Procurement Agency, which was institutionally charged to buy the hardware equipment; but there was still no government promotion policy. Promotion and implementation were in fact realized by separate departments of the administration pushing for special projects under the supervision of the General State Procurement Agency. In the late seventies and early eighties the urgent need to reform the Public Administration was increasingly perceived. An official report on the reform of Public Administration was published [6]. A new Department for Public Administration was created and a new Commission for Computerization of Public Administration was established in the Prime Minister's Office, within the Department for Public Administration.

No coordination agency existed for Local Administration. Regional Councils had no common reference structure; they did not coordinate their policies and indeed had only limited exchanges of experiences [7]. In some cases Regional Councils acted as promotional agencies for Borough Councils.

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6 M.S. Giannini: "Rapporto sui principali problemi dell'Amministrazione dello Stato", Rivista Trimestrale di Diritto Pubblico, 3, 1982.

7 Formez, op. cit.

The lack of clear, comprehensive regulations have so far been one of the weaknesses of computerization of Public Administration. Regulations are not yet clearly defined for software protection, public procurement or the protection of privacy. A group of university teachers in Law Faculties recently wrote a petition to the Minister of Justice and the Chairman of the Chamber of Deputees to solicite adequate legislation to regulate electronic data banks. It was noted that Italy has no Act passed by Parliament on this very important matter.

Public procurement policies were also the cause of many discussions, since from the very beginning computerization of Public Administration was associated with the intervention of large software companies of the IRI holding, Finsiel. The choice of a preferential relationship with software houses of the Finsiel group has been much criticized and it is indeed at variance with the usual procedure of public procurement, that is to select firms for orders after a regular tender. More competition on the supply side is generally considered an important way to improve the quality of realizations and to speed up innovation.

It is very difficult to forecast how long it will take to move to the direct management by Public Administration of its own EDP centres. There are many difficulties, particularly in Central Administration. The difficulties pertain not only to the lack of training among civil servants, but more important to the impossibility in defining appropriate careers and establishing an effective system of incentives, productivity and controls. In Local Administration, Regional Councils adopted a variety of solutions to build and manage their systems. Almost all Regional Councils established computerization commissions. Five Regions chose to establish a shareholding company to develop and manage computerization of their administrations. That means that they recognized the impossibility to work with their own human resources. Nine Regional Councils chose the opposite solution, building up internal structures for computerization, but only a few of these experiences were successful, thanks to the open attitude of the local administration towards cooperation with specialized firms and research agencies. Overall in Local Administration, the institutional framework is still changing.

Regulations are missing also from another point of view, that is the lack of standardized procedures in many Public Administration activities. The revision of procedures, their transparency, their uniformity seem to be necessary targets to be pursued before computerization is started.

Special projects in Central Administration

An early attempt at computerization was started in 1969 at the State Auditors Office. Preparatory work went on for two and a half years and a detailed survey was conducted in offices, trying to standardize procedures and change internal organization when needed. This reorganization was limited to procedures which could be changed inside the department, while all procedures which pertain to accountancy laws are outside the control of the managers of the department. Indeed computerization of the budget accountancy was implemented without a simultaneous reform of accountancy laws.

The system now connects 150 offices with 500 video terminals and 400 print terminals. The main EDP centre, installed in a new modern building in Rome, is connected also to the Ministry of Finance, the Court of Auditors, the Bank of Italy and the Parliament. The computerized accountancy system at the State Auditors Office has drastically improved both the quality of data available and the timing of the budget.[8]

Another important system for the financial administration is the general tax register at the Ministry of Finance. In this case the first implementation was rather long, difficult and initially unsuccessful. A very large EDP centre is now operated by Sogei, a software house of Finsiel which designed and managed the general tax register after the initial failures. The files of the computerized tax register enabled the Ministry of Finance to produce very detailed data on all aspects of income taxes and government revenues and especially detailed data on the repartition of the tax burden among different social groups. The tax register was certainly not fully utilized for the quick detection of

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8 S. Ristuccia, "Informatica e Pubblica Amministrazione", relazione al Convegno "Strategie culturali per la società informatica", Milano, 27/10/1984.

fiscal evasion, quite apart from any reason concerning computerization; it is all the same a powerful instrument in the hands of the administration.

A very interesting experience was started early in the law administration thanks to an early interest of judges in computerization. In 1973 an Electronic Documentation Centre of the Supreme Appeal Court was opened: this is a fully fledged data bank and information retrieval system for local and state legislation and decisions of courts. This experience was one of the most successful also because the software architecture was built with a substantial contribution of the administration in designing the frameworks for files.

IV. POSITIONS OF SOCIAL GROUPS

Collective agreements

In September 1985, the first debates were opened on the renewal of collective agreements for civil servants, including eight groups of civil servants (employees in Ministries, Local Administration, public firms in the Public Sector, the National Health Service, teachers in primary and secondary schools, university teachers, other civil servants): around three million people. By an act of 1983, the so-called "general framework for civil servants" (29-3-1983), the first part of the bargaining was at the national level, involving all the eight professional groups. A general agreement was reached in December 1985, which states as follows:

1. when EDP systems are introduced or changed trade unions will be informed in due time on the general characteristics of the new system;
2. trade unions may express suggestions and proposals and the creation of mixed commissions among trade unions and managers might be considered;
3. the administrations are ready to guarantee systems of protection of privacy, whenever the system might involve direct controls of workers at their work place;
4. workers anyway have the right to know their personal files in case of disputes.

On the other side, the agreement stated that to improve productivity and efficiency special projects might be proposed by the administrations and discussed with unions, then implemented. These projects should concentrate resources on those areas of the administration where efficiency is too low or urgent needs must be satisfied. A special incentive fund was created to pay productivity premiums to workers engaged in the projects, linked to the efficiency gains or the results obtained. The whole scheme has yet to be tried out and implemented.

V. SOCIAL IMPLICATIONS

Employment, working conditions, training

It has been estimated that the number of civil servants involved in the renewal of collective agreements in the current year is around three million two hundred thousand.[9] This figure includes over one million teachers, around six hundred thousand in the health service and less than three hundred thousand employees in public firms. Even when not considering these three professional groups, civil servants employed in computerization are a very low percentage of all public employment.

Detailed data are available for Ministries. In these administrations civil servants working for computerization were in 1984 around 10500, highly concentrated in the three Ministries of Finance, Interior and Education. In Regional Councils employees working for computerization were less than one thousand in 1983. Both in Ministries and in Regional Councils, the percentage of employees working on computerization is below 4%. Although these figures do not include employees working only occasionally at terminals, and not considered as employed on computerization, it seems that up to now computerization has only marginally affected the working conditions of civil servants. As far as employment levels are concerned the impact is even less than the impact on working conditions. In the Italian Public Administration it is almost impossible to fire workers: public employment is guaranteed life-long employment. Moreover, the efficiency of the administrations is so low in so many fields that redundant employees might be moved to other jobs within the administration without reducing the level of total

9 CENSIS, XIX Rapporto (1985) sulla situazione sociale del paese, Milano, F. Angeli, 1985.

employment or maintaining useless working places. The main obstacle to this relocation is mobility, which is low in the present institutional system and is not easily accepted by the employees themselves.

Moreover, where computerization has been introduced, it was aimed at covering new areas, distributing services to the public, speeding up procedures, so that it did not imply dramatic job losses, even apart from the institutional obstacle to firing. Another obstacle is the rigid structure of careers in public employment. Indeed, technical careers for new information technologies are not even defined in the official description of professional levels within the administration. The new information technologies have opened up a very dynamic section of the labour market, where career progression may be very rapid, salaries may easily rise above other jobs' salaries, well trained people quickly find new job opportunities. These characteristics are opposite to the characteristics of the internal labour market of public administrations. It is very difficult to attract software engineers or other qualified technical personnel to public careers. When well qualified employees are trained within the Public Administration, there is a very high risk that they will soon quit for the free market, since the wage differentials are so high in favour of private activity.

Almost all sources recognize that the training effort has been inadequate. The software houses which worked for the administrations have usually also provided training services. More recently the Commission for Computerization started a programme of induction training for top managers in the Public Administration. The Minister of Public Administration reacted favourably to the opening of a new "Institute for Computerization of Public Administration" by IBM, whose aim is to offer training services specifically to civil servants.
Much more remains to be done.

THE NETHERLANDS *

I. INTRODUCTION

There are three main levels to public administration in the Netherlands: central government, regional government known as "the provinces", and the local authorities, known as the municipalities.

Their respective responsibilities are the following:

1. The State: Government and Parliament have shared responsibilities for legislation. Executive power lies with the Government. Ministers and Secretaries of State (Under-ministers) have specific and coordinative responsibilities. Coordination means here that one minister coordinates the specific activities of his/her colleagues relating to a general problem or state responsibility.

2. Twelve Provincial Governments. Responsibilities are fourfold:
   a) financial supervision of local authorities;
   b) town and country planning;
   c) environmental control (air and water pollution);
   d) construction and maintenance of provincial roads, bridges, etc.

3. Municipalities, in charge of local administration, application of social security and welfare legislation, medical services, promotion of local economic interests, local town planning, housing, police, traffic, streets and roads, education, etc.

   Moreover, the water authorities occupy a special place in Dutch public administration. Traditionally, special bodies are in charge of flood prevention and water level control. Recently these bodies have also been assigned responsibility for water quality and pollution control.

In addition to this, as in other countries, a number of products and services are provided by entities owned or managed by a public and/or state/local authority. Examples : the central bank, postal services

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* Summary of a report prepared by C. Rottlander-Meijer, The Hague, September 1986.

and telecommunications, broadcasting and TV/cable network, postbank, railways, local transport, provision of water, electricity and gas, sewerage, waste disposal (partially), hospitals and medical services (partially) and education (partially).

II. INTRODUCTION OF INFORMATION TECHNOLOGY INTO PUBLIC ADMINISTRATION

1. The Computerization of Public Administration

The most recent figures issued by the "Centraal Bureau voor de Statistiek" - CBS (Central Bureau of Statistics) show that the use of computers in government departments is increasing rapidly. By the end of 1986 it is estimated that 5100 micro-computers were in operation in government departments, compared with 1050 in 1983. The number of computers costing Hfl. 50,000 or more could rise by something between 30% and 70%. The figures indicate a rise in the number of terminals from 17,800 in 1983 to 39,100 in 1986 (roughly 120%). The number of computer staff was expected to grow from 9800 in 1983 to 11,500 in 1986.[1]

Since the computerization of public administration is a matter for decentralized decision making, only overall figures can be given. The General Accounting Chamber gives a figure of Hfl. 3 000 million spent annually on computerization, of which Hfl. 500 million is used for development. In an article published in April 1986, Professor B.K. Brussaard, who works for the Directorate for Government Organization and Computerization, gives a figure for total annual spending of Hfl. 2000-3000 million, of which more than 30% is spent on hardware, software and services in the private sector.[2] Detailed figures of expenditure in the private sector are available only for 38 members of COSSO, the Association of Computer Services and Software Agencies. In 1985 their members won contracts with government organizations worth Hfl. 302 million (in 1984, Hfl. 226 million).

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1 Centraal Bureau voor de Statistiek, Automatiseringsenquete 1983: Automatisering bij de overheid (Automation Survey 1983: Automation in Government), Statistisch Bulletin, 8 September 1986.

2 B.K. Brussaard, Overheidsautomatisering doorgelicht (An Overview of Government Automation), Informatie en Informatiebeleid I&I, 4th Jg. No 1, April 1986.

A study carried out by Price Waterhouse/Computable shows that investment in the Netherlands concentrates on mainframes, although smaller systems are catching up. Government investment now tends to be more and more in mini- and micro-computers.[3]

The most recent detailed figures for the computerization of government departments are to be found in a 1981 CBS survey.[4] The survey includes computer systems for administrative and technical-scientific applications with a minimum value of Hfl. 20,000. In central government and at the provincial and municipal level, almost as many computers were installed in the period 1980-1981 (1320) as in the entire foregoing period (1490). At the end of 1981, 2700 computers were installed in government departments at all levels, 115 computers having been scrapped. The survey shows almost no expenditure on the development of custom-made software. This figure proves the assertion of the General Accounting Chamber and the Pannenborg Committee that expenditure on external services mainly relates to hardware and the development of systems on a strategic level, and that custom-made software is developed in-house. Staff costs are not shown in these statistics.

The computerization of government departments has been subjected to severe criticism. Every year the General Accounting Chamber publishes its report, in which malfunctions of parts of the central government apparatus are described. The General Accounting Chamber has regularly reported on malfunctions in computerization projects.[5]

In the period 1978-1985 most ministries and many interdepartmental organizations were criticized, in most cases, for mismanagement in the development and execution of their computerization projects. Criticism focused on the lack of know-how in government departments and ministries, particularly in relation to information technology project management and technical expertise, leading to inadequate planning of

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3 Bestedingen in '86 op 5,5 miljard geschat (Spendings in 1986 estimated to reach a volume of Dfl. 5.5 billion); Computable, 24 January 1986.

4 Centraal Bureau voor de Statistiek; Automatiseringsenquete: Computerinstallaties bij de overheid 1981 (Survey of Automation: Computer Systems in Government 1981), Staatsuitgeverij, Den Haag 1983.

5 Algemene Rekenkamer, Overheidsautomatisering (Government Automation), Tweede Kamer der Staten Generaal, Jaarverslag 1985 (Annual Report 1985), Staatsuitgeverij, Den Haag 1986.

projects, poor organization, coordination and documentation, little or no compatibility between planned and existing systems, faults in systems design and underestimation of the complexity of systems design.

III. GOVERNMENT POLICIES

There is a long history of computerization in the Dutch central administration. A number of different bodies have been established over the years to coordinate automation plans, starting as long ago as 1957 with the Interdepartmental Automation Committee. Since 1968, the Ministry of the Interior has been responsible for coordinating the organization and computerization of public administration. Since then, coordination has focused on technical performance of those tasks that could be covered by the scarce and expensive computers then available. During the 1970s the coordination of government department computerization was extended to EDP equipment. An "Advisory Committee on the Organization and Computerization of Public Administration" (AOA) was established. In December 1983 the AOA and the "Steering Committee for the Reorganization of Central Public Administration" were replaced by the Advisory Committee on Public Administration (ARD).

Amongst other things the ARD advises in matters of computerization and informatics equipment. In the past preparatory work in this field was carried out by an administrative sub-committee, the ARD-1. Recently this sub-committee was replaced by the CCOI (Central Committee for Government Information). The CCOI is not a purely administrative body, as was the ARDI, but also has representatives and experts from interest groups in the profit and non-profit sectors among its members.

Decision-making in matters of government deparment computerization in the Netherlands is not centralized. The administrative structure in which policy-making takes place is therefore rather complex and has to be described at four different levels: the Cabinet, the ministries, interaction between central government and regional and local authorities, local level.

The Minister of Interior is also the coordinating minister for the organization of central public administration and computerization of government departments. He monitors the efficiency of computerization

and has to coordinate the public administration activities of different ministries and other bodies. Each ministry is not only in charge of computerizaton in its own policy field, but is also responsible for the computerization of its own administrative procedures. Each ministry therefore has its own organization and informatics department. In fact all ministries are fairly autonomous as regards their computerization policy. Restrictions are set only by their budget and by the centrally controlled allocation of (new) manpower resources and salary structures. As the need for coordination on a national level has been recognized, every ministry has to present the Ministry of the Interior with medium-term plans for computerization, which are periodically updated.

Many computerization projects are important not only for central government, but also for regional authorities, (the "provinces") and for the local authorities (the municipalities). In 1975 a committee was set up in which all three levels of public administration are represented: the BOCO (Institutional Advisory Board for Government Information), chaired by the Minister of the Interior as coordinating minister. The BOCO does not engage in coordination itself. Its role is to stimulate coordination of computerization at all levels. It can do so by:
- publishing reports on specific areas of government computerization;
- advising about specific fields of information;
- functioning as an informal communication channel.

The provinces and local authorities are even more autonomous in their computerization policy than the ministries, in that they can set their own budget without any control other than their local democratically elected councils. They are not restricted in their personnel policy, providing they respect salary scales for civil servants.

The developments in computerization have prompted the government to reconsider its policy in regard to the computerization of its own organization. In March 1984 the Minister of Economic Affairs set up a Temporary Advisory Committee on Government Expenditure on Information Technology (COI), referred to as the "Pannenborg Committee", after its chairman. The main aim of this committee was to advise the Minister about the various aspects of a more efficient organization of government computerization, including contacts with the private sector and privatization of government facilities but excluding the technical side

of computerization. In January 1985 the recommendations were published. Since then they have been followed by the Government almost to the letter.[6]

- The COI points to a general shortage of automation expertise.
- The free market is unable to satisfy the government's computerization requirements.
- An overall conclusion of the COI is that the private sector has not enough incentives to use modern techniques and develop innovation products for government.

The following are some of the more important recommendations made by the COI :

- Stimulate research by subject-oriented programmes, referred to as SPIN-OV.
- Develop a structure for a consistent government policy in general, by immediately creating a Central Committee for Government Information Facilities (CCOI). External experts and representatives of interest groups should also be included as members of the CCOI in addition to representatives of specific ministries.
- Create under the responsibility of the CCOI two central organizations with experts attached to a ministry to be appointed at a later stage : one organization with experts in government policy on information facilities now located in the Ministry of the Interior's Directorate for Government Organization and Computerization; another organization with experts in government and consultancy now located in the Central Government Administrative Equipment Office (Rijkskantoormachinecentrale).
- Organize and establish a private sector arena for the supply of government departments, the Council for Information Technology (RIT).
- Ensure that the new policy is realistic, create small independent committees and locate decision-making on a high level by reporting to the ministers in charge.

These recommendations were warmly welcomed by Parliament, and the government promised to implement them. But while the COI completed its tasks quickly, it took Government departments and the private sector a

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6 Commissie overheidsbestedingen op het gebied van informatietechnologie, Overheidsbestedingen en informatietechnologie (Expenditures of Government and Information Technology), COI, January 1985.

long time to implement the recommendations. The computing centres RCC and CCL were not changed until early 1986. Eighteen months later, in June 1986, the CCOI was set up with Mr van Veen, former chairman of the board of directors of Philips, as chairman. And, in the same month, the RIT was set up by the private sector.

IV. SOCIAL GROUPS

1. Political Parties

Until the presentation of the report "Government Computerization" by the General Accounting Chamber, Parliament had not really been very interested in the subject. Parliamentary references to informatics had hitherto mainly concerned the stimulation of information technology in the fields of telecommunication, business and the media. After the reports of the General Accounting Chamber and the Pannenborg Committee, all political parties agreed on the need for government action on the slow progress of computerization in government and the attendant waste of money.

It remains to be seen whether this interest in government computerization shown by politicians will continue. However, it is a hopeful sign that all the major political parties mentioned information technology in their election manifests at the beginning of 1986. Although most attention was given to the education system and business, the importance of a good strategy in the field of government computerization was recognized by almost all parties.

2. Trade Unions

The Trade Unions have hitherto paid almost no attention to government computerization. Only when the Minister of the Interior announced an increase in salary for computer staff in December 1985 and a bonus for computer staff in May 1986, did the unions react explicitly. The CMHA and the MHP, (unions of middle and higher management civil servants) reacted positively, though they reproached the minister for taking so long to announce these decisions. The ACOP, (general union of civil

servants), reacted negatively on the grounds that the measures divided the staff, while being insufficient to prevent high-level staff from leaving the service.

Several reasons can be given for the apathy concerning government computerization in contrast to the concern felt in the private sector. All of the unions' attention had been concentrated on government plans to reduce the number of civil servants by 2% and on the constant reduction and stagnation of salaries. However, up to now, no real reduction in the number of employees has taken place in government departments as a result of computerization. The loss of jobs in the Labour Councils in the future is the first case in which a real fall in employment is forecast. One last reason may be that the progress of computerization projects in general was delayed so much. The prospective staff cuts, together with all the difficulties caused by the delays in computerization, may have resulted in a certain indifference among the groups which participated in these projects.

V. SOCIAL IMPLICATIONS

Little is known about the social implications of government computerization in the Netherlands. The only information available relates to the effect on employment, although the information is not very reliable and more detailed information on a national level is only available for the year 1981. Nothing specific could be found concerning the quality of work. As for the training of staff, the only programmes available were for qualified computer staff. No information was available as to the social implications for the public. We therefore confine ourselves to a description of the debate on privacy.

1. Impact on Employment

The only data available on computer staff in government concerned central government staff in the years 1981 and 1983. An inventory by the Ministry of the Interior in 1983 found 3759 computer staff in all the ministries.[7] More detailed and probably more solid data can be

7 Ministerie van Binnenlandse Zaken, Jaaroverzicht Informatievoorziening in de Rijdsdienst (Annual Review of Information Facilities in Central Government), Tweede Kamer der Staten Generaal 1984-1985, No. 18.100, Staatsuitgeverij, Den Haag 1985.

found in the Computerization Survey by the Central Bureau for Statistics. This survey was held in 1981 and gives figures for different categories of computer staff at the various levels of government.[8] The survey includes computer staff in government services with a specific function in the computerization of public administration activities.

The survey shows that, at all levels of central government, employment involving computers expressed in number of men/year grew from 7950 in 1979 to 11500 in 1981, and that this growth was expected to continue strongly in the years up until 1985 when 16,475 people were employed in this category. In the survey a breakdown is also given for jobs in the field of information analysis, systems analysis, data entry, computer application, general. The growth expected from 1981 to 1983 is more or less the same in all these fields, namely about 25%.

Only one study could be found on the effects of computerization on the number of government employees. An administrative working group published a study in 1983 [9] the purpose of which was to gauge the effects of computerization on staff costs. Four cases were studied: only in the first case could job reductions be achieved without loss of service or quality of information. The reduction was substantial - 30%. In the other three cases, computerization had not resulted in fewer staff, but had restricted the growth in the number of staff. In the Organization for Study Grants and Loans the number of employees in 1966 was 96. By 1982 this figure had increased to 261. Without computerization, the number of staff would have risen in the intervening years to 1500-2000.

2. Education and Training

It is a long-standing general complaint that there are not enough skilled staff available to operate the newly acquired hardware and software.

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8 Centraal Bureau voor de Statistiek, Automatiseringsenquete: Automatiseringspersoneel bij de overheid 1981 (Automation Survey: Automation Personnel in the Central Government 1981), Staatsuigeverij, Den Haag 1983.

9 Commissie Heroverweging Automatisering in relatie tot de Personeelsomvang, Eindraport (Final Report), Den Haag, 1983.

In 1984, the consulting firm Bakkenist and Spits published the results of a study investigating the possibilities of setting up specific training programmes for information technology staff.

The investigation found a lack of knowledge in the following positions : project leaders, project advisers, information analysts and system designers. System controllers had often not received adequate training. The investigators therefore suggested the development of special programmes and a general programme to stimulate the training of computer staff, to be financed by government and by business.[10] These recommendations have been followed by the central government with the creation of the "NIIO-Programme". The NIIO-Programme also contains a section on Government Training, which is located as an independent office within the Government Training Institute - ROI.

The ROI has recently offered a growing number of training courses in the field of informatics techniques and management. In 1982, the courses developed by the ROI were placed in the hand of the Ministries. If necessary, the ROI helps to hire teachers and to provide training material. The ROI also organizes courses itself. In 1985, 99 training courses, attended by 1522 civil servants, were organized.[11] The ROI has no monopoly over central government training and is not specialized in training of informatics users. It is possible that a large proportion of user training may be provided by the private sector.

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10 J.G.Loot, e.a.; Haalbaarheidsstudie naar een nationaal inhaalprogramma informatica opleidingen (Attainability of a National Pursuit Programme for Education in Informatics), Bakkenist Spits en Co, April 1984.

11 Rijks Opleidingsinstituut ROI: Jaarverslag 1985 (Anual Report 1985) ROI, Den Haag, 1986;
Het ROI in Detail 1985, Bijlage bij het jaarverslag (The ROI in detail 1985, appendix of the Annual Report), ROI, Den Haag, 1986;
Management & Informatievoorziening, Conferenties over genautomatiseerde informatievoorziening bestemd voor het van de rijksoverheid (Management & Information Facility, Conferences about Automated Information Facilities for the Managerial Personnel of the Central Government), ROI, Den Haag, 1986.

4. Implications for the Public

The Privacy Debate

The first law on privacy dates from 7 April 1971. Telephone-tapping, the secret recording of conversations, and the unsolicited photographing of persons was prohibited by this law.[12] In 1971, many people refused to cooperate in the census. This led to a new debate and a new attitude towards privacy. In 1972 a Committee of State on the Protection of Privacy of Personal Records, the "Koopmans Committee", was set up. In 1976, this Committee presented a final report together with proposals for a legal solution for the question of personal records. In 1981 a bill of law on personal records was presented by the government incorporating the recommendations of the Koopmans Committee. There was much criticism of the complex character of the bill and the bureaucratic procedures that would have to be introduced. The procedures proposed would have meant a lot of verification work for government departments. Five years after this heavily critized proposal, a new bill of law on personal records was presented to Parliament in August 1985. The government now only wants to set general rules for the composition and use of personal records. As far as possible the organization responsible for the database is left to lay down the rules and procedures for the use of data and the protection of privacy. Although there has been some criticism, this bill will probably be passed by Parliament in the coming session.

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12 G. Overkleeft-Verburg, Het nieuwe ontwerp Wet Persoonsregistraties, 1 en 2 (The New Bill on Law Personal records, 1 and 2), I & I, December 1985 and July 1986.

UNITED KINGDOM *

I. INTRODUCTION

In the UK, central government is administered by permanent civil servants in the many government departments and offices. Power is devolved from central government to local government. These have a degree of autonomy in policy-making but Parliament has the constitutional power to create the system of local government and hence the Government can reorganize this system or abolish local authorities should it wish.

There have been a number of reorganizations of local government in the last twenty years. At present there is a two-tier system of local government with Counties and Districts in England and Wales and Regions and Districts in Scotland. The local authorities provide a wide range of services - protective, environmental, personal, recreational, and commercial.

According to the Chartered Institute of Public Finance and Accounting, "the first tier (the County Councils in England and Wales and the Regional Councils in Scotland) provides those services which are most suitably administered on a large scale - for example the highways and transportation, police, fire and strategic planning services - whilst the second tier (the District Authorities) provides the more local services such as local planning and development control, housing, refuse collection, and amenity and recreation facilities".[1] In this report, we shall only be considering the use of IT in administrative and legislative tasks. The health service, education sector and public enterprises shall be excluded from the analysis.

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* Summary of a report by Tim Brady, Science Policy Research Unit, University of Sussex, September 1986.

1 Local Government Trends, Chartered Institute of Public Finance and Accounting, 1984.

II. TECHNICAL ASPECTS OF COMPUTERISATION OF PUBLIC ADMINISTRATION

1. Diffusion of IT in Public Administration

Central Government is the largest user of IT in the UK. Approximately £750 million per year is spent on installation and running of computers, telecommunications and office automation equipment in the support of government administration. Procurement of computer goods and services accounts for some £250 million; purchase, rental and maintenance of telecommunications goods and services and advanced office systems accounts for some £250 million; and the staff costs associated with the development, installation and operation of computer installations takes some £200 million. Although no figures are kept for numbers of smaller machines, investment in them is running at some £150 million a year.[2] However, a 1984 government report[3] suggested that there were around 700 medium to large computer systems, 900 smaller ones and some 10,000 terminals. Two major projects under way at present - the computerization of the Inland Revenue's Pay As You Earn (PAYE) tax system and the enhancement of the DHSS's National Unemployment Benefit system - are expected to add an additional 18,000 and 10,000 terminals respectively. A consultancy report commissioned by the Government[4] forecast that by 1992 there would be in excess of 100,000 terminals in use in central government administration.

Diffusion of computers in local government is harder to quantify. Local authorities were early adopters of computers, the first being installed in 1957. By 1969 there were some 240 computers installed - all being mainframes since minicomputers had not yet reached the market. By 1980 the total had risen to some 500 computers (excluding microcomputers in schools or those that were deployed experimentally or for assessment, or were dedicated to particular functions within departments). This meant that almost 90% of local authorities had their own computer installations by this time. The majority of computers at this time were mainframe or mini computers. A survey of local authorities in 1979 found some 376

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2 Central Computer and Telecommunications Agency: Progress Report Information Technology and the Civil Service, IT Series No. 11, HMSO August 1985.

3 Strategic Study of Administrative Telecommunications, Information Technology in The Civil Service No. 5, HMSO March 1984.

4 Annex A in (2).

micro computers in use although this included micros in schools. However, LAMSAC estimated that by the beginning of 1980 there were some 600 word processor workstations in use and an equal number of microcomputers[5]. Unfortunately there are no more up-to-date figures available than this except for a 1983 survey by LAMSAC on word processing applications which suggested that about 70% of local authorities had developed and implemented word-processing applications.[6]

2. Structural changes resulting from use of IT

The use of mainframe computers for batch processing during the 1960s saw the establishment of central databases - such as the Driver and Vehicle Licensing information in Swansea and the Health and Social Security records in Newcastle. The current computerization programme in the DHSS involves automation of all the local offices as well as the central administration in an effort to improve the level of information available at that level. The emphasis has shifted away from efficiency alone towards the possibility of providing more effective services because of improvements in information.

These trends are also visible in the local government sector. Barras and Swann note that central batch computing in local government in the '60s was used mainly to improve internal efficiency: "Although the computer may have improved services by speeding up production and by eliminating errors, nonetheless the emphasis appears to have been firmly on administrative efficiency, and much less upon quality of service delivery - perhaps to its detriment."[7]

Since then, computer developments have continued to give scope for improving the efficiency of local government services but have also increasingly been able to improve and extend existing services, and even allowed the evolution of new services. Thus the emphasis has shifted towards improving the effectiveness of the services rather than simply

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5 Microcomputing in Local Government Element 2 "A Study of the Local Government Computer Environment", LAMSAC 1980.

6 Wordprocessing Applications in Local Government, LAMSAC 1983.

7 R. Barras and J. Swann, The Adoption and Impact of Information Technology in UK Local Government, Technical Change Centre, 1985.

the efficiency of their provision. This shift has coincided with increasing decentralization of the organization of computing in local government.

III. GOVERNMENT POLICIES

1. Promotion of IT in Public Administration

The main body concerned with the introduction of Information Technology into central government departments is the Central Computer and Telecommunications Agency (CCTA) but the CCTA is not primarily concerned with the promotions of IT in public administration. Rather it is concerned with the development of policies and strategies and in supporting the policies and strategies of and giving advice to individual departments.

The Office of the Future project is the most important example of IT promotion in the public sector. As one part of a five point promotion strategy in its Office Automation Programme, the Department of Trade and Industry established a number of pilot and demonstration systems in the public sector. In all, twenty-one pilots were financed in public sector bodies.

Under the terms of the scheme the DTI selected different types of users in the public sector and matched these users with an appropriately designed office automation system. The intention was that users and suppliers would then feed back information about the operation of the systems during the period of the trial - usually three years - and that the results would be published at the end. The DTI financed the project, up to a maximum of £250,000 for the hardware. This hardware is technically on loan to the users in the experiment who can choose to keep the system at the end of the experiment at a modest second hand price.

In local government there is no direct equivalent of the CCTA. There is a small body - the Local Authorities Management Services and Computer Committee (LAMSAC) - which conducts research on problems of computerization for local authorities. Its role is more in the form of a forum for discussion and research rather than a policy making role.

LAMSAC does concern itself with promoting the use of IT in local government and organizes conferences and publishes research findings. LAMSAC has been involved in a project examining the opportunities for office automation in local government. This project grew out of the recognition that only four of the DTI's Office Automation Pilots were in local authorities and that these four could hardly be considered representative of local government in general. As a result, LAMSAC commissioned a separate project at four more typical authorities launched in 1982 with the DTI contributing to the costs of the consultancy work commissioned by the participating local authorities.[8]

2. Procurement policy

The UK government pursued a policy of preferential treatment for ICL mainframe computers from 1966 until 1980. The public procurement policy only applied to large computers. During the seventies powerful minicomputers became available and these were not subject to the same procurement policy. A number of US manufacturers had established factories in the UK and were able to apply some political pressure on the government which prevented ICL being given preferential treatment in the minicomputer and peripheral market. Public procurement of microcomputers did not surface until 1980. Then the DTI established a microcomputer scheme with 100 prizes of a £2000 computer system for winners of an essay competition in schools. This was followed by the Micros in Schools and Micros in Primary Schools programmes again from the DTI. All the micros in these schemes were British manufactured machines.

The fourteen years of preferetial treatment for ICL mainframes came to an end in 1981 when the public sector had to conform to EEC and GATT regulations and the market had to be opened up to competitive trading. By this time ICL was only selling 8% of its turnover to the UK government but 30% of its large mainframe sales were in this sector.[9]

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8 Davic McFetrich, Office Automation in Local Government, LAMSAC 1984.
9 Jill Hills, 'IT and the State', D.C. Pitt and B.C. Smith (eds), The Computer Revolution in Public Administration, Wheatsheaf, 1984.

3. Data Protection/Privacy

The main legislation on Data Privacy is the Data Protection Act which became law in July 1986. Under the terms of the Act, a Data Protection Registrar will be responsible for protecting individuals from the misuse of personal information held on computers.

IV. POLICIES OF SOCIAL GROUPS

1. Policies of employers' organization

Central government policy on computerization has already been discussed. There is no coherent national strategy for the implementation of IT in local government - each authority has the autonomy to decide its own policy subject to the financial constraints on overall spending set by central government. The political complexion of the authority plays a large part in determining the type of applications which are computerized. Most Conservative-controlled local authorities tend to adopt computerization as a means to cut costs-usually by staff reduction. Labour-controlled authorities are less inclined to look for job reductions and may place more emphasis on introducing IT systems which improve the level of services. However, all local authorities face pressure from central government over expenditure level at present and so even some authorities which would like to expand the level of services find that the introduction of IT systems merely allows them to maintain the level of existing ones.

2. Policies of Trade Unions

In common with a lot of trade unions the main concern for the public sector unions over the introduction of new technology is job loss. The introduction of IT has to be placed against the prevailing government policy of reducing the numbers of people in the civil service and reduction of expenditure aims for local authorities - with rate-capping penalties for high-spending authorities. Naturally, trade unions representing public sector workers are cautious about the use of new technology when its justification is staff cost savings rather than improved levels of service. Most of the unions in public administration

directly concerned with the introduction of new technology stress the importance of achieving new technology agreements and several have been reached both at central and at local level. The Civil and Public Services Association, reached agreement with the government on the introduction of new technology in May 1986 on the basis of new pay and grading arrangements. The agreement accepted full cooperation in the introduction of new technology in return for special pay rises. Under the deal some 150,000 clerical and data-processing workers stand to get rises between 1.8% and 19.3% in return for working with computers. The deal also involves the merging of certain grades into the new grades of administrative officer and administrative assistant. The Inland Revenue Staff Federation eventually came to an agreement over the introduction of new equipment as part of the computerization of PAYE scheme in the spring of 1984, following a period in which tax officers refused to operate the equipment. The agreement allowed some experimentation in flexible working times, asked that redundancies should be avoided wherever possible, and that consultation should take place on this. NALGO (the National and Local Government Officers Association) policy is for local branches to negotiate their own new technology agreements and in a booklet designed for negotiators NALGO has attempted to provide a comprehensive guide to the negotiation of new technology agreements. In 1985, NALGO carried out a survey of New Technology Agreements secured by its branches throughout the country and came across 136 such agreements. Of these, 135 contained clauses about the provision of information on employers' plans concerning new technology; 125 (92%) included clauses saying that new technology or new working practices could only be introduced after consultation and negotiation or when established grievance procedures had been exhausted; 133 (98%) included clauses about job security; 132 (97%) included clauses on training and retraining; 72 (46%) had a separate health and safety code or a full and detailed section within the main body of the agreement.

V. SOCIAL IMPLICATIONS

1. Employment

There has been pressure in recent years to decrease the number of civil servants in central administration as a means of reducing administrative costs. Employment in the Civil Service peaked in 1976 at nearly 760,000 employees. Since then it has declined (to about 662,000 in 1983). Similar pressures on costs have been placed on local authorities by central government. The effects of IT on employment have to be discussed with this in mind.

Most of the major computerization projects in central government are justified on the basis of reduced staffing costs. The Inland Revenue's Computerization of PAYE scheme involves some 4,000 projected job losses and the computerization of DHSS benefits was originally expected to yield massive savings in staff costs - up to 20,000 fewer jobs by the 1990s. Since the original estimates of job loss have been made experience has suggested that the actual reductions in jobs will be lower.

In local government as well as central government there have been pressures to cut costs. Barras and Swann note that while some jobs have been cut in central services departments, many of these are due to internal reorganization rather than direct effects of new technology, and are also offset to some extent by job growth in computer services departments. Thus there has been growth of 43% between 1975 and 1984 in computer staff compared to a decrease of nearly 20% in employment in Management Services. Furthermore, they note that "where new technology creates the potential for job savings, these may not be realized because staff are redeployed to cope with increasing workloads, or because of the workforce's or Members' resistance to job losses."[10]

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10 R. Barras and J. Swann, The Adoption and Impact of Information Technology in UK Local Government, Technical Change Centre, 1985.

2. Skills, qualifications, work organization etc.

In common with the private sector, skilled IT workers are in short supply. The Ministry of Defence (with 5,500 DP staff the largest user of government computers) has an estimated shortage of 5-7% whilst at the DHSS (where there are around 3,000 DP staff) the shortage may be as high as 20%. But, it is the skills of the users of IT systems who are most likely to be affected by the widespread introduction of IT rather than the DP professionals. All told, there are some 17,000 DP staff in the Central Civil Service.

In local government, the greatest organizational changes have resulted from the introduction of computers into individual departments. Barras and Swann note organizational battles between the centralized Data Processing (DP) Department and individual departments but also point out that it is more common for conflicts to have arisen between central Management Services and DP Departments "with wordprocessing and microcomputers proving the most sensitive issue of all".

McFetrich, in his study[11] on office automation in local government, challenges the adequacy of the typical local government organization structure to cope with the introduction and management of a full office automation system. In the four local authorities studied the consultants identified a number of problems which they felt could only be resolved by organizational changes. Problems observed included project management shortcomings in DP development; shortage of good organization and management support in developing new technology applications; the general absence of policies for coordinating and rationalizing the purchase of microcomputers; a relative lack of skilled support staff for micros outside the DP department; managerial and technical problems associated with linking departmental systems to the central system serving the whole authority; and the absence of responsibility and accountability for corporate information.

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11 David McFetrich, Office Automation in Local Government, LAMSAC 1984.

3. Impact on education and training

Training for IT skills in the public sector varies according to the person requiring the training. DP professionals receive the same or better level of training as their counterparts in the private sector. In the Civil Service DP staff are 'grown' from within rather than being recruited for their expertise. Most are recruited at executive officer level and trained in DP skills. Most become programmers although some switch to operator tasks while others develop into systems analysts. In local authorities as with central government, more emphasis is placed on the training of DP professionals with formal training for users less widespread. The exception was when large-scale departmental systems were being introduced and a well-formulated training programme was an essential component of the introduction process. With regard to training of operators of existing systems formal training is almost non-existent - on the job training being most common.

4. The effect on services offered to the public

Up to now it appears that the main emphasis in introducing IT has been to increase efficiency or to reduce costs rather than to improve the services offered to the public. Many IT applications are in the internal management functions and do not change the nature of the services themselves. It appears then that in general the use of IT has allowed for the speeding up of and increased efficiency of existing services. Barras and Swann argue that without IT it would have been impossible to have implemented the housing benefit scheme as the volume of work this involved for local authorities was beyond the capability of any manual system.

There are some exceptions. Some local authorities have already started to provide some new services using IT. A Department of Trade and Industry report[12] claimed that some 20 local authorities were now using viewdata. Some are using the national viewdata system, Prestel, and others have chosen private viewdata systems. Library services have been the favorite application.

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12 Viewdata in Local Authorities, HMSO 1984.

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European Communities — Commission

Social Europe — Supplement
The Computerization of Public Administration

Luxembourg: Office for Official Publications of the European Communities

1988 — 149 pp. — 21.0 × 29.7 cm

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ISBN 92-825-8546-8

Catalogue number: CE-NC-88-004-EN-C

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