

THE APPLICATION OF INFORMATION PROCESSING IN TURKISH PUBLIC ADMINISTRATION

Prof. Dr. Cemal MIHÇIOĞLU

FIELD OF APPLICATION

Background and a General View

Turkey falls within the category which may be termed as «slightly automated countries.» Mechanization of information processing in the Turkish public service started in 1934 at the Agricultural Bank, a government corporation. A first generation computer was installed at the State Highways Department in 1960. It was followed by Istanbul Technical University which acquired a second generation computer in 1964 and pioneered in the training of programmers by organizing courses and seminars. The Electrical Survey Administration installed a third generation computer in 1966 at the same time as other European countries. *Appendix I* contains the list of the government organizations that set up electronic information processing systems up to the end of 1970.

The distribution of these systems according to major categories of agencies is as follows :

Ministerial departments	4
Other agencies in the central machinery of government	6
Government corporations (State economic enterprises) and government-owned banks	22
Universities	6
Local self-government (cities)	3
Total	41

Objectives of Automation

The most common objectives of automation in public administration are the reduction of work load in mass administrative

operations and making completion of certain operations possible at specific deadlines and with a greater degree of accuracy. Although it is mentioned by some, the reduction of cost does not generally seem to be a matter of major concern for agencies interested in automation. The new possibilities of information evaluation in depth opened up by automation seems to be a much valued aspect of the use of electronic computers.

One pathological tendency in this respect is the inclination of some organizations to attach an overly high prestige value to automation. This tendency is reported to be more predominant in public administration than in the private sector. Banking advertisements are occasionally seen in the newspapers with a picture of an electronic computer occupying the center. This writer was smilingly told of a private brick factory management in a rich southern city of Turkey employing some 500 workers that was interested and succeeded in acquiring an electronic computer.

Main Applications

Operations most commonly performed by computers in the Turkish public service come under what is termed «mass administrative applications.» These are operations related to payroll, stock control, personnel records and statistics. Other operations of a managerial nature are accounting, budget analysis and control, and banking operations.

Another category is engineering applications and this kind of operations are of greater importance in such technical agencies as State Highways Department, State Hydraulic Works, Land Registry and Survey Administration, and Electrical Survey Administration. In *Appendix II*, one can see a detailed listing of operations processed in the computer system of the State Highways Department. This list could, in its relative emphasis on scientific and managerial applications, be taken as typical for agencies concerned mainly with engineering activities.

Research projects on social problems or engineering subjects form still another category of applications. Although universities make use of their own computers for research purposes, administrative agencies are usually cooperative in making their facilities available to scholars and researchers.

One of the noteworthy applications of electronic information processing in the field of education is the «inter-university entran-

ce examination.» In Turkey, admission, examination and evaluation (scoring) procedures in entrance to universities have been centralized for some years. This centralized system covers seven out of eight universities in the country and several other institutions of higher education. The eighth university which is outside this «club» applies a similar system for the selection of students to its various faculties.

The Ministry of Education administers similar examinations for the selection of students to teacher's colleges. Selection to military schools is also done in a centralized manner through computers.

A most practical and highly appreciated aspect of these centralized systems is the distribution of successful applicants singled out from among tens of thousands of candidates to various faculties or schools on the basis of scores obtained in the objective type aptitude and achievement tests and the applicants' expressed preferences.

The use of electronic information processing techniques in the field of health services is just beginning in Turkey. Hacettepe University in Ankara, which is rapidly developing around a Faculty of Medicine and its hospitals, began pioneering work in this area towards the end of 1970. The following are some of the operations this university is interested in computarizing: Such hospital management operations as the availability of beds and other hospital facilities, the location of hospitalized patients, medical records containing data on individual patients; diagnosis of various diseases on the basis of symptoms and other medical data fed into the computer. The latter use is at the experimental stage and is intended to be used as complementary to individual physician's medical judgment. Some other operations performed at the university's computing center are the follow-up control of book orders, and social and engineering research projects.

At the end of 1970, the State Planning Organization was negotiating with a local private engineering firm a scheme involving, among other points, the mechanization of the control and follow-up of public investment projects. Government agencies are required by law to submit quarterly progress reports on their investments for purposes of central coordination. The volume of these reports is so high that it is nearly impossible to process them manually. The

scheme under study provides for the use of punched cards and electronic information processing techniques to handle the mass of information that reaches the central planning agency. The engineering firm to which reference is made conducted a rather comprehensive study which also covers the processing of a variety of data concerning private as well as public investment projects, information on the production and consumption of goods and energy, imports and exports, employment, wages etc... One of the objectives of automation in this field is the elimination of overlappings in the collection of data by such agencies as the State Statistics Institute, Ministry of Industry, Union of Chambers of Commerce and Industry, and State Planning Organization.

Feasibility Studies

Feasibility studies that precede the installation of electronic information processing systems in Turkey are usually conducted by the representatives of foreign firms that sell or rent computers and this practice is generally criticized for leaving the agencies to the mercy of these firms that would naturally be more interested in selling their machines than in making a thorough analysis as to the desirability of mechanization. These studies are sometimes carried out by the agencies concerned through their own specialists or with the help of foreign technical assistance experts.

What is normally done in such studies is an analysis by system experts of operations to be mechanized and the determination of the proper computer type and capacity. The time period between the beginning of feasibility studies and the systems' actually going into operation seems to depend on the particular case. It may be as long as 3-4 years. Studies carried out by electronic computer firms are reported to have lasted generally a year or even sometimes 6 months.

In practice, there is also a time period between the installation of the system and its actually going into operation. Of the systems existing in the middle of 1968, 40 % went into operation immediately after installation, the majority began to function with a minimum delay of six months whereas some were delayed for as long as two years. The main reason for these delays is the lack of qualified personnel, followed by financial difficulties and failure to have the place of installation ready on time.

ORGANIZATIONAL PROBLEMS

Location

In most cases, electronic information processing systems report to accounting units. In some agencies they are attached to planning units, in others they are organized as sections of the major organizational units that make the most extensive use of them, and in still others they report to the top administrator's office through one of his deputies. In universities they either report to the Rector's office or are a part of the faculties. University computing centers are usually operated through revolving funds. These centers' being generally under accounting units is partly explained by the prominent role they play in acquiring them, which renders these units stronger in claiming control over them. The organizational units controlling the information processing systems usually enjoy a higher prestige because of other units' dependence on them for having their work done in the computer. It is hard to generalize as to the most suitable place of information processing systems in the organization, and it seems that what is a proper arrangement for one agency may not be so for another.

Central Coordination and Planning for Automation

In Turkey there are as yet no coordinating organs for electronic information processing systems. Neither is there an information processing function in the public service or a general plan for introducing automation.

The only provision of a general and regulatory nature formulated in connection with electronic information processing in the Turkish public service is a measure contained in the 1971 program of the Second Five Year Development Plan (1968-1972) which reads:

«All electronic information processing equipment in the possession of agencies in the general budget and those having annexed budgets as well as government corporations are to be brought together in a center which will function under the Prime-Minister's Office. All operations of the interested agencies relating to personnel, machine utilization, machine supply, project evaluation etc. will be performed in this centralized system. Individual agencies' requests for the importation of new electronic information processing equipment, will require the approval of the Ministry of Finance upon the consent of the State Planning Organization.»

Although its feasibility is open to discussion, this measure is presently the only official attempt to bring some coordination and control to public service automation in Turkey.

Consequences of Automation

The most important changes brought about by the use of electronic information processing systems in Turkey are in such fields as accounting and stock control, and apparently no large-scale reorganization resulted from the automation.

The use of computers reduces to a minimum the amount of time and energy devoted to the control and processing of information.

Another tangible result of a general nature is the elimination of unnecessary operations and red-tape as a consequence of system analysis that precede the use of computers.

Problems of Proper Use of Computers

About two thirds of the organizations having electronic information processing systems rent their computers whereas the remaining one third own them. The advantages and disadvantages of renting or buying such equipment do not seem to be carefully weighed by government agencies when deciding on automation.

According to a survey conducted in June 1968, the computers in Turkey were being used at about half of their normal capacity. Out of 57 respondents in both private and public sectors only 21 answered the question relating to this point. These answers show that the annual total working time for 1967 was 20,366 hours. On the basis of a normal monthly working time of 180 hours, this represents only 45 % of the normal capacity. Five out of 21 computers were kept busy less than 500 hours a year, 9 were occupied up to 1000 hours and the remainder worked for over 1000 hours. Only two computers kept busy for over 2000 hours a year. It was concluded from these findings that if the first and second generation computers were replaced by last generation computers there would remain even a greater idle capacity.

Those agencies that accept that they have idle capacity consider using this capacity by adding new management applications to their operations. Five agencies were doing work for other agencies to use their idle computer capacity in 1967.

Data banks in the real sense of the term do not yet exist in Turkey. The large mass of information available in the electronic information processing centers of various organizations is not readily usable. It has been reported to this writer that there are projects for the establishment of data banks in some agencies. One example is the State Statistics Institute which is planning to set up a tape recorded data bank for census data. Hacettepe University is also developing a medical data bank.

THE HUMAN PROBLEMS

Resistance to Change

Like all changes everywhere, the introduction of computers or the computerization of certain procedures meets with a varying degree of resistance. One of the common causes of such opposition seems to be the fear on the part of the existing personnel that they will ultimately become redundant or their status will somehow be threatened. But the experience shows that this danger is more imaginary than real. A successfully tried way of overcoming this resistance is the careful explanation of the probable results of the change and giving those concerned the necessary assurances. Experience has proved, in more than one instance, that fears of this kind are unfounded and the same employees —if not more— are utilized in the same department perhaps only after a short period of retraining. The natural increase in the volume of work as well as additional operations required by newly introduced laws and regulations tend to eliminate any likelihood of layoffs. In some cases, however, strong opposition may block the way to further mechanization. In one case, the rank-and-file of the accounting department in a government corporation who feared that they would be deprived of their overtime pay reacted so strongly that it was necessary to refrain for a while from mechanizing the accounting operations. The most frequent protests are reported to have come from the employees engaged in payroll and stock control jobs.

Personnel Problems

The major problem connected with electronic information processing personnel at the present time is the insufficiency of pay which directly affects their quality.

A survey conducted under the auspices of the State Planning Organization in June 1968 to which reference has been made abo-

ve shows that the remuneration of electronic information processing personnel employed in the public sector was on the average half that of their counterparts in the private sector. Although some agencies paid a special allowance (generally one-third of their salaries) to these employees and tried to manipulate such additional possibilities as overtime, premium and higher per diem, many of them were having difficulties in attracting and keeping the best qualified personnel. The new uniform pay structure which became effective at the end of 1970 is reported to have worsened the situation for all technical and scientific staff, and particularly for those employed in electronic information processing systems.

The findings of the same survey pointed out that electronic information processing personnel employed by public agencies were not up to the desired standard as far as their educational level and experience was concerned. Only 6.8 % of the employees had a higher education, 47.4 % were graduates of high schools or technical schools of the same level, 33.0 % had a secondary school (8 years) diploma, and the remaining 12.8 % were elementary school (5 years) graduates.

The average length of service of the 27.6 % of electronic information processing personnel was over 5 years, 37.4 % had experience of 2 to 5 years, 17.9 % had experience of 6 months to 1 year, and the remaining 17.1 % less than six months.

Of those employed in computer systems 7.1 % had administrative and supervisory responsibilities, 1.2 % were system analysts, 8.3 % were programmers, 1.8 % were maintenance personnel, 14.6 % were computer operators, and 67.0 % were auxiliary machine operators.

The maintenance of rented computers is assumed by the selling firms, but many of the agencies that acquire them are having difficulties in finding qualified maintenance personnel.

Courses are organized by the Istanbul Technical University and the Middle East Technical University in Ankara for the training of programmers and system analysts.

The selling firms (IBM, Univac and Burroughs) are also active in the initial and further training of electronic information processing personnel. Trainees are usually selected on the basis of an aptitude test. Priority in participation to such courses is given to customers or potential customers. IBM organizes two courses a

year in Ankara and Istanbul. Burroughs organized a 3-month course for the technical personnel of Hacettepe University's electronic information processing system which was installed in 1969 and roughly 80 % of participants had an engineering background. Univac has similar activities. Participants are occasionally sent to such European cities as London and Zurich or to the United States for training. These firms take the responsibility for the training of technical personnel when they negotiate with their customers before the installation of the system. But the training courses that are usually run before the systems go into operation tend to be theoretical and the participants do the real learning later on the job.

Training programs cover such subjects as introduction to computers, coding languages, programming and system analysis.

Some agencies recruit system analysts and programmers who have already been trained in foreign countries or send members of their own staff to the United States for further training or experience.

Reading material on computers and electronic information processing being rather limited in Turkish, the lack of a full knowledge of foreign languages handicaps training efforts.

The selling firms occasionally try to arrange residential information sessions of short duration in comfortable hotels for top administrators of public agencies likely to be interested in setting up electronic information systems, but such activities are looked upon as being predominantly of a publicity nature.

There is, unfortunately, not yet an information processing personnel policy which looks towards the future, mainly because of the fact that the Turkish public service is under-automated, and there is an accompanying lack of consciousness in this field. It would be useful to enlighten the senior administrators and middle managers likely to assume top administrative responsibilities in the future on the subject of automation and its various implications for the creation of a better understanding of the problems of electronic information processing. Management seminars arranged for these administrators seem to offer a favorable opportunity for such an indoctrination.

The computer staff do not form a distinct professional group in Turkey and no code of ethics—which is one of the characteristics of professionalism—has as yet been formulated.

THE LEGAL PROBLEMS

The individual's right to privacy is protected by Article 15 of the Turkish Constitution that falls under the title of «Protection of individual privacy— Privacy of the individual's life» which reads :

«The privacy of the individual's life shall not be violated. The exceptions required as a result of legal proceedings shall be reserved.

Unless there exists a judgment duly passed by a court in cases explicitly provided by law, and unless there exists an order of an agency authorized by law in cases required by public order, neither the person nor the private papers and belongings of an individual shall be searched.»

Data banks being non-existent at the present in Turkey, no specific legal provisions have as yet been formulated for the protection of information stored in these banks. Disclosure of information of a private nature is, however, sanctioned by the Criminal Code. Article 198 of this Code reads as follows :

Whcever discloses, without a valid reason, a secret which he learned by virtue of his official title or rank, profession or trade, disclosure of which might be harmful, shall be punished by imprisonment for not more than three months and shall be fined not more than 50 liras».

Article 24 of the Turkish Civil Code enables the individuals who suffer illegal damage to their personal interests to ask the judge to stop it and to file a law-suit for damages or moral reparations.

The Law on Banks contains a relevant provision of a general nature in its Article 74 that may also be applied to the disclosure of the secret information available in the electronic information processing centers :

«Members of the staff of the banks and other officials who disclose to other than the competent authorities, secrets of the bank or of its customers, to which they have gained cognizance owing to their attributions and functions, shall be liable to a term of imprisonment varying from one month to one year and to a heavy fine of 500 to 2000 liras.

If the persons mentioned in the above paragraph disclose these secrets with the aim of securing a benefit for themselves or for others, they will, besides being liable to a term of imprisonment varying from 6 months to 2 years and to a heavy fine of 500 to 2000 liras, be furthermore sentenced to be permanently or temporarily prohibited from being employed by banks or deprived of their posts.

In case the bank employees and other officials should quit their work, the clauses of this article shall also be applied for a period of three years from the date of their withdrawal.»

The Organizational Law of the State Statistics Institute (dated 1962) provides in its Article 27 that the employees of this Institute are strictly forbidden to disclose the information of a personal and private nature. Those who do so are liable to a term of imprisonment of 1 to 6 months and a heavy fine of 100 to 500 liras.

In the field of health services, «Regulation on Medical Code of Ethics» (1960) stipulates in its Article 4 that doctors and dentists are forbidden to disclose the secrets of which they gain knowledge during the performance of their profession except under legal obligation. Those who do not observe this obligation are subject to disciplinary action according to the Law on the Union of Medical Chambers.

Another relevant provision is contained in Article 5 of the Law on Tax Procedure dated 1961. According to this Article, employees dealing with tax transactions and audits, personnel of Tax Appeals Commissions, those who attend the commissions as authorized by the tax laws, and experts used in tax matters, are prohibited from disclosing to any unauthorized persons or organizations any information regarding taxpayers, acquired during the performance of their duties or otherwise. The persons mentioned above are prohibited under penal sanctions from using for their personal benefit or for the benefit of third parties any information acquired from taxpayers' tax returns, books and records or any other documents relating to taxpayers' financial affairs.

APPENDIX I

LIST OF GOVERNMENT ORGANIZATIONS HAVING EIP SYSTEMS IN TURKEY

(Years of Installation)

- | | |
|------|--|
| 1960 | State Highways Department |
| 1963 | Istanbul Technical University |
| 1964 | State Statistics Institute, Ministry of Education (Bureau of Testing and Measurement). |
| 1965 | Land Registry and Survey Administration, Workers' Insurance Agency, Machinery and Chemical Industries, Turkish Maritime Bank, Başak Insurance Inc. |

- 1966 Turkish State Railways, Ministry of Forestry, Electrical Survey Administration, Istanbul University (Faculty of Economics)
- 1967 Pension Board, Ankara University (Faculty of Science), Real Estate Credit Bank of Turkey, People's Bank of Turkey, Istanbul City Utilities Administration (electricity and bus), State Hydraulic Works.
- 1968 Ministry of Finance, Central Bank of Turkey, Foundations Bank of Turkey, Petroleum Office, Sümerbank (2 systems), Ereğli Coal Production Enterprise (2 systems), Turkish Iron and Steel Works, Istanbul Security Fund.
- and Ministry of Health, Chief of General Staff, Istanbul City Utilities Administration (second system installed), State Statistics Institute (second system installed), Maritime Transportation Corporation, Middle East Technical University, State Hydraulic Works (second system installed), Turkish Petroleum Corporation, Central Bank of Turkey (second system installed), Ankara City Utilities Administration (electricity, gas and bus), Aegean University, Hacettepe University, Agricultural Bank.
- 1969
- 1970

APPENDIX II

USE OF THE ELECTRONIC COMPUTER SYSTEM IN THE TURKISH HIGHWAYS DEPARTMENT

A brief outline of the present uses of the electronic computer system in the Turkish Highways Department is as follows :

1. **Highway Design.** Usage here is concerned with the preliminary and final location and design of highways. The object is to arrive at the best location for the highway at the least cost and to make best use of the available engineering manpower. Specific programs for doing this are as follows :

- a. Earthwork line shift.
- b. Profile grade and superelevation
- c. Slope determination
- d. Earthwork volumes
- e. Stage construction
- f. Elevation reduction
- g. Stadia reduction
- h. Traverse and horizontal curve
- i. Horizontal alignment
- j. Offsets between lines
- k. Coordinate conversion
- l. Triangulation ties

These programs have to do with the geometry of highway location.

2. **Bridge Design.** Here the computer assists the engineer to design and detail all types of highway bridges and structures. The potential use here is

very great and many programs have been developed and are available. A few of these are listed:

- a. Moment distribution and influence lines
- b. T-beam design
- c. Concrete general flexure
- d. Continuous bridge analysis
- e. Quantities of steel, concrete etc.
- f. Bridge geometry
- g. Bridge elevations

3. **Highway Construction.** Electronic computer methods here assist in staking a job for constructions, simplify the computation of quantities, speed the payments to contractors etc. Most of the programs listed under «Highway Design» are used here.

4. **Equipment and Shop Operation.** There are over 15.000 pieces of equipment operated by the Turkish Higways Department. For efficient usage, the following reports are prepared monthly, with summaries quarterly and annually:

- a. Equipment inventory
- b. Equipment inventory costs
- c. Equipment use
- d. Equipment rental
- e. Shop operation
- f. Equipment salvage report (beyond economical life)
- g. Tire usage analysis

5. **Equipment Part Control and Supply System.** This is concerned primarily with the maintenance of a 200.000-item stock of equipment parts and supplies, with proper ordering, transfer etc. Programs for this are:

- a. Yearly inventory taking in 20 warehouses
- b. Inventory updating
- c. Parts substitution

6. **Traffic.** The computer assists in the analysis of present traffic (as to volume, speed, accidents, etc.) and is used to predict future traffic data. Some programs are:

- a. Loadometer analysis
- b. Origin and destination survey
- c. Accident analysis
- d. Traffic assignment
- e. Sign inventory and control

7. **Planning.** Several programs included under «Traffic» may also come under this heading. Additional programs are:

- a. Sufficiency rating of highways
- b. Traffic count expansion

8. **Materials.** The computer can be useful in this field for research, analysis of test results, etc. An example is the determination of the safety factor of embankments constructed on various types of soils.

- a. Slope stability analysis

9. **Highways Cost Accounting.** In addition to engineering applications, the computer is useful in general data processing work. The following are examples in the accounting field :

- a. Labor cost distribution
- b. Equipment rental cost distribution
- c. Material issues distribution
- d. Payroll preparation (40.000 employees)

10. **Personnel.** Presently permanent employee analysis and raports are made. Later it is hoped to include an up-to-date file of employees job ratings, sick and vacation leave, etc.

11. **Utility and Special Programs.** Many programs useful to the computer itself have been prepared, to make the writing of production programs easier. Other programs under this heading are :

- a. Mathematical (including matrix algebra)
- b. Statistical
- c. Bid analysis