THE POTENTIAL OF REGIONAL GOVERNMENT FOR THE RATIONALIZATION OF LOCAL INFORMATION SYSTEMS (LE POTENTIEL OFFERT PAR UN GOUVERNEMENT REGIONAL DANS LA RATIONALISATION DES SYSTEMES D'INFORMATIONS LOCAUX)

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ABSTRACT

The quality of local government information systems varies widely; the few good systems standing well above the milieu. The development of Regional Government in Ontario poses opportunities to improve this situation by offering a vehicle with the necessary economies of scale without loss of local autonomy. The potential role of the Region in information handling is examined and current experience directed towards realizing this potential is discussed. It has been found that the information required to manage the financial and administrative affairs of government can be met in a highly cost effective manner. The methodologies used to integrate existing routine applications and new applications making use of current information systems technology are described and these techniques are illustrated by examples for current situations. (La qualité des systemes d' information des gouvernements regionaux varie largement, et les quelques bons systemes ressortent aisement de la moyenne. Le developpement des gouvernement regionaux en Ontario crée des opportunites d'ameliorer cette situation en offrant un moyen ayant les economies d'échelles necessaires sans qu'il y ait perte d'autonomie locale. Le rôle potential de la region en ce qui a trait à l'administration de son information a eté examine et nous avons

discuté de quelle façon, l'éxperience presente tent à prouver ce potentiel. Il est prouvé que l'information requise, afin de gerer les aspects financiers et administratifs du gouvernement, peut être recueillie de façon très effiçace quant au cout. Les methodes utilisées afin d'integer ces systemes existants et les nouvelles methodes utilisant la technologie la plus recente quant aux systems d'information, sont décrites et ces techniques sont illustrées par des exemples de situations courantes.)

POTENTIAL OF REGIONAL INFORMATION SYSTEMS

INTRODUCTION

Local government is a peculiar enigma: the focus of community participation, the seat of local autonomy, the bulwark against the encroachments of higher levels of government, and, at the same time, plaintiff for more funds to support locally administered projects.

The firm of P. S. Ross & Partners has had a continuing involvement with both large and small local governmental bodies. We are developing, in co-operation with the City of Toronto and the Province of Ontario, an extensive financial management and simulation system called PROMUS. We have served the Regions of Ottawa-Carlton and York and have assisted many cities and towns across Canada.

The complexities of the information requirements of local governments within metropolitan areas have been discussed at much lenght in other forums. I should like to concentrate upon the potential future development of local governmental information systems outside major metropolitan areas, and to identify the leadership required from senior levels of government if such projects are to be fully effective.

The Government of Ontario is establishing Regional Governments throughout southern areas of the Province. The principal differences between the regions and the former counties is that the constituent municipalities are an integral part of regional government. The new governmental functions are more extensive than those of the counties; regions are usually responsible for:

1. Police protection;
2. Road construction and maintenance (except in area municipalities);
3. Land use and transportation planning;
4. Water and sewage construction (except in area municipalities);
5. Health, Welfare and Social Services.

The constituent municipalities continue to administer:

1. Fire protection;
2. Local roads;

3. Internal water and sewage.

Still other agencies provide services for hydro electricity and education.

The regional services are financed in two ways:

1. By a levy from the constituent municipalities;
2. By Provincial grants for services rendered (i.e. roads, welfare).

This fragmentation of services may not be conducive to the most efficient use of information, but it is a standard division of responsibilities based on the premise that region-wide functions are the responsibility of the regional government and that local functions are the responsibility of the local government. Despite the seeming disadvantages of this division of responsibilities, the regional level of government turns out to be an economic and viable information processing unit. Potentially, regions are the nodes in a network of provincial information flows.

P. S. Ross & Partners has just concluded a study for The Regional Municipality of York, which is situated due north of Metropolitan Toronto. The total information requirements of the Region were analyzed and the potential for developing a comprehensive local information system explored. I should like to draw upon this experience as well as our recent experience at the Town of Mississauga to illustrate the potential for senior government leadership in guiding the development of local information systems. First, the general requirements for information are summarized, then a data structure well suited to meeting these requirements is described. Because of the potential cost of developing the necessary application programs, the contracting approach employed on behalf of The Regional Municipality of York is discussed. The precautions taken to overcome the inherent risks of this approach are explained.

A DEFINITION OF REQUIREMENTS

The information requirements of regional government centre around financial control, however, to manage a region effectively, much more than financial information is required. It is our experience that an information system, designed with an integrated

financial structure in mind, can provide as effective a mechanism for handling non-financial information as any other system while ensuring that the financial integrity of the system is maintained and is available for audit. Therefore, we have adopted an approach to system design which is illustrated in a simplified fashion in Figure I.

The heart of the financial system is, of course, the General Ledger. In general, each department has both revenue and expense accounts associated with the service it provides. Departments providing complex services require complex sub-ledgers to maintain control of these services. We found that the Engineering Department required a sub-ledger cpability to control both ongoing maintenance and new construction and to control the revenue entitlement earned under provincial cost sharing arrangements. The Health and Social Services Department required a detailed sub-ledger to handle the welfare payroll and the revenue entitlements generated from welfare payments.

From the above examples, it is apparent that the sub-ledgers contain much more than merely debits and credits; they are the master files for standard municipal applications.

Some applications have no financial component; for instance, Police have voluminous statistics on the occurance and dispositions of various criminal occurances which must be sorted, stored and reported. In The Regional Municipality of York there will be an opportunity to interface a digital communications network with the routine data processing functions thus greatly simplifying the analysis of the time spent by the various police constables in the performance of their duties.

A summary of the major Regional data processing applications by functional area is given in Figure II.

During our work at The Regional Municipality of York, it became apparent that any system to serve the Region would also have to have the capacity to serve the constituent municipalities. Furthermore, while there is some duplication of requirements, the main volume of data processing for the municipalities is associated with tax collection and utility billing. These applications, being oriented towards the land within the municipalities, complement the Region's requirement for engineering data for this land. That is to say, when

FIGURE I

SIMPLIFIED SYSTEM CONCEPT

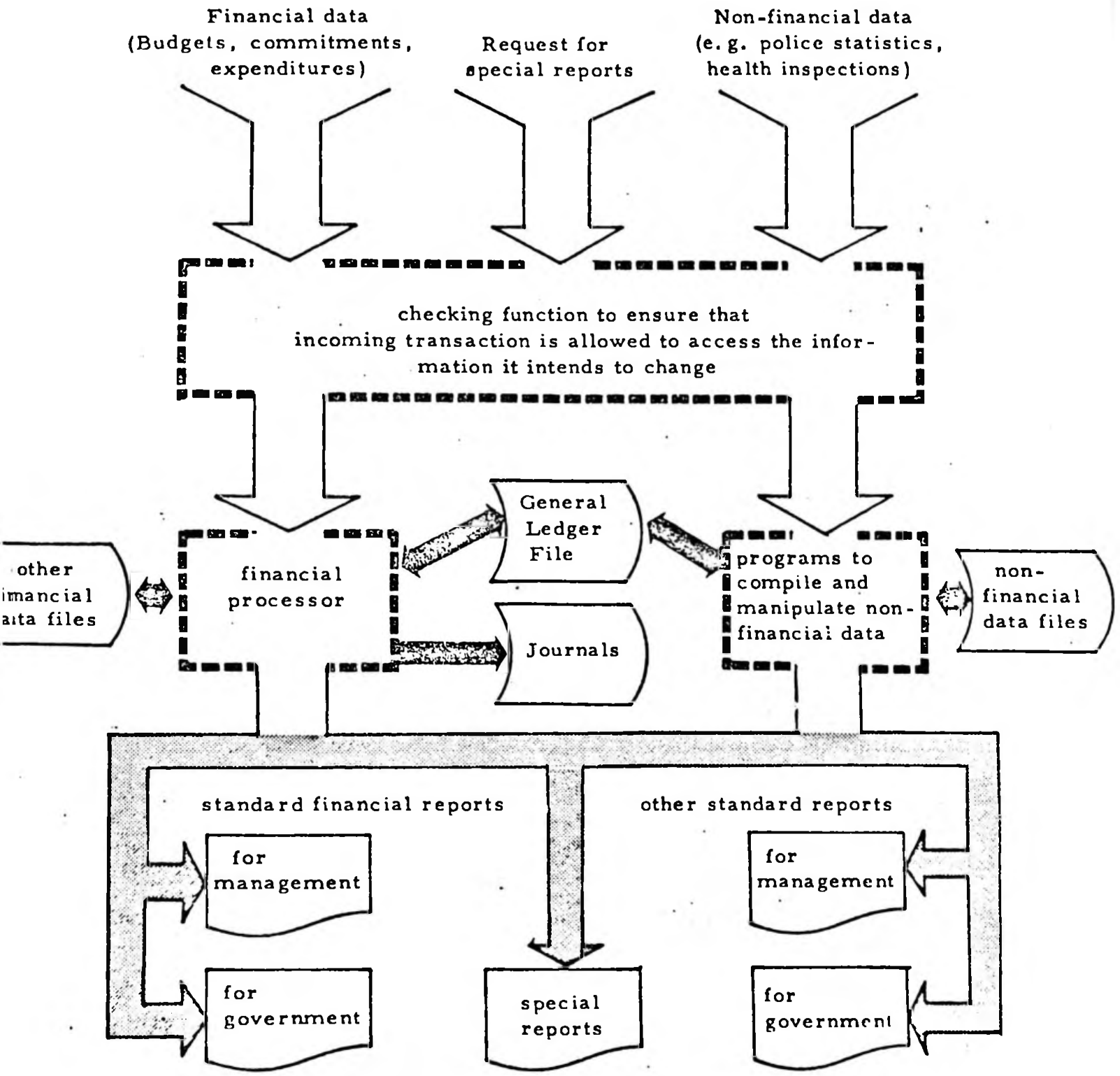

FIGURE II

AREAS OF POTENTIAL DATA PROCESSING APPLICATION WITHIN REGIONAL ORGANIZATION

ENGINEERING

- Design, Project Supervison and Control
- Maintenance for Roads, Water, Sewage
- Vehicle Maintenance
- Traffic Flow
- Property

HEALTH AND SOCIAL SERVICES

- Welfare
- Public Health Nursing
- Homes for Aged
- Health Inspection
- Special Sections (dental, daycare, etc.)

POLICE

- Crime Occurrence Records
- Traffic Summons Control and Accident Analysis
- Vehicle Maintenance
- Manpower Utilization

TREASURY

- General Ledger
- Subsidy Control
- Payroll
- Budgeting (with encumberances)
- Cash Flow

PLANNING

- Land Use

both Regional and Area requirements are viewed as a whole, there is a need for an integrated property-oriented data base. P. S. Ross has already explored the development of such a data base for the Town of Mississauga. The experience gained in Mississauga is reflected in the information structure described in the next section.

A summary of the data processing applications applicable to the municipalities is given in Figure III.

POSSIBLE INFORMATION STRUCTURE

Let us now look ahead to what type of structure would be best suited to meeting these information requirements. Ideally, the total Regional Information System would be organized as a functional data base with some elements of data being easily subdivided by municipality while other elements would contain only information pertinent to one municipality. Some of the components of this data base have been identified as follows.

General Ledger

Each municipality would have its own unique general ledger, however, the structure of each of these ledgers would be standardized. The revenue accounts would provide information on revenue entitlements earned as well as budgeted revenues and revenues actually received. In a similar manner, the expense accounts would support encumbrances as well as budgetary information and actual expenditures.

Special Ledgers

Functions such as engineering would require special ledgers to assist in the control of projects for both new construction and for maintenance as already described. If a region and several of its municipalities required engineering application, each user would have his own ledger, but all ledgers would have a similar structure.

Payrolls

The region and constituent municipalities would share an employee data base which provided personnel information and payroll records to each user. Integrating the processing of such functions while maintaining the ability to provide separate accounting reports

FIGURE III

AREAS OF POTENTIAL DATA PROCESSING APPLICATION OUTSIDE REGIONAL ORGANIZATION

AREA MUNICIPALITIES

- Water Billing
- Tax Billing
- Assessment Roll - Planning
- Any functions supported for Region (Slide 3)

ELECTRIC POWER DISTRIBUTION

- Billing, Accounts Receivable, Collections
- Vehicle Maintenance
- Manpower Utilization
- Work Order Control
- Payroll
- General Ledger

COUNTY HOSPITALS

- Payroll
- Inventory Control
- Capital Equipment Control

helps to realize the economies of scale available from the joint use of the data processing facility.

Resident Name and Address File

To simplify the process of maintaining the current name and address lists for residents of the region, such lists would be maintained in only one file and linked to other files by appropriate data base techniques.

Welfare Rolls

A simple file on all welfare recipients in the region could be maintained and would serve as a source of control for welfare payments and for other social service activities.

Physical Characteristics of Land

Such a file would describe location of every property, both taxable and exempt, within the region using the standard geocoding technique, and would provide such technical details as required by planning functions at municipal and regional levels, by engineering functions and by health functions.

Assessment Data

This file would be closely related to the property file and would provide all necessary information concerning assessed value of the land, the ownership of the land and the taxes due on the land. This data would allow the planners to view an integrated socio-economic picture of the region.

Data Reporting

The programs accessing such a data structure would facilitate preparation of reports not only to serve the business of municipal and regional administration but also to satisfy provincial requirements and to prepare entitlement claims for provincial funds under the various programs being sponsored by the province. The collection of the data into an integrated data base would in no way reduce the control of the respective municipal treasurers over their own funds. Transfers of funds between municipality and region and between region and the province would remain under the control of the appropriate treasurers. The proper organization of this data would simplify the

production of necessary managerial reports and allow the most effective use for the various civic resources such as health nurses, police, fire.

FROM HERE TO THERE

Since regional organization are new, they are usually unencumbered by existing information system structure. If a region can effectively resist the pressure to adopt a system similar to the one used in the county or to one used in one of the major constituent municipalities, it can develop an information system to suit its own requirements. When The Regional Municipality of York was first constituted, it built manual procedures around two antiquated accounting machines previously used by the county and then set about determining what its total requirements really were. The municipalities, which had a far longer history of civic government, were at various stages of sophistication. The pressure of tax billing and cash receipts had generally forced all municipalities to make some use of computer service bureaux in the handling of tax bills. The most sophisticated of these municipalities were finding that the local service bureau could not meet their processing requirements within their budgets and were actively considering acquiring their own computer.

Even without considering the requirements of the constituent municipalities, the potential systems design and programming tasks before the Region represented a major undertaking. Faced by the prohibitive costs of such an undertaking, we quickly found an alternative. None of the requirements that had been identified for either region or municipalities were unique and we reasoned that they could be met by existing programs. Our task therefore became one of defining requirements and finding the best source of supply of a total service, hardware and software.

Definition of Requirements

We set out to define our requirements so as to allow maximum latitude on the part of the supplier while at the same time maintaining sufficient exactness to ensure that there could be only one interpretation of the requirements. We quantified the volumes of inputs and frequency of outputs and identified the various elements of data that would be required in each. To ensure that the project would be carried out on schedule and within cost, we specified that a single contractor must take total responsibility for the whole project including

the supply of both computing services and software. No contraints were applied as to whether a utility or in-house computer would be used, however, it was specified that printing and data input had to be done on the premises of the Region.

Problems and Solutions

It was recognized that the extensive use of outside programming could result in the Region being left with the programs they did not understand. We elected to overcome this problem by insisting that the contractor use two members of Regional staff on his development team during implementation. To ensure that the variety of independent applications packages which the vendors were likely to propose would in fact be successfully meshed into a cohesive system, a number of constraints on software were laid out such that data names were to be common throughout the system and that input/output was to be performed by common modules. Not only would this meet the requirement of cohesion but also it would force the supplier to review his applications packages and allow the Region's staff to gain first-hand familiarity with them.

Tendering

Having defined the requirements in such a way as to make the maximum number of potential suppliers eligible and having set the conditions sufficiently stringent to protect the Region from any potentially inadequate bids, we invited a number of potential suppliers to tender. These suppliers included both hardware manufacturers and utilities. About one-third of the invitees responded with proposals. Of those proposals, several were acceptable in every regard. We ranked those proposals that were completely acceptable according to a number of predetermined criteria such as software capabilities, hardware capabilities and price.

CONCLUSIONS

I have demonstrated on the basis of the experience of P. S. Ross & Partners that the concept of regional government offers encouraging potential for uniting the information requirements of a number of local government bodies into a single body, and for realizing, not merely the economies of scale in computing, but also the economies of scale

of an integrated data base. While there is no doubt that the potential for greatly enhanced local government lies within the concept of regional government, it remains to be seen whether or not the spice of local politics overcomes the subtleties of fully integrated co-operative data processing on a regional basis.