

Information Technology and Innovation in Tax Administration

by Glenn P. Jenkins

Introduction

Since the early 1980s the world has experienced an unprecedented pace of advancement in the field of information technology. These technological innovations are having a profound impact on the administration of fiscal systems, and have revolutionized the way in which tax reforms are implemented.

To have an effective tax system, a high degree of voluntary compliance is needed. Raising the level of voluntary compliance is a key element of tax reforms in creating a modern tax system. Building a high level of compliance requires a wide range of political and administrative inputs, from the perceived legitimacy of the government in power, to the effectiveness of the tax administration to detect and punish the people who attempt to evade taxes. In the past, tax administrations have tended to emphasize enforcement (audit and collection) as the primary instrument under their control to enhance compliance. Enforcement, in turn, relied on the development of a skilled (and honest) cadre of tax auditors, to undertake both desk and field audits of the taxpayer returns. Information systems, even when computerized, often have been focused on recording and controlling information on the compliant taxpayers, rather than detecting quickly those who are evading or otherwise in arrears.

Strategies which rely solely on skilled manpower to improve compliance face serious obstacles, particularly in developing countries. Auditing skills are scarce, and private sector accountants typically earn a multiple of the official wages being offered by the public sector. Furthermore, when developing countries experience even modest rates of growth, the competitive salaries of people with professional accounting skills tend to grow at rates which are substantially greater than the average growth rate of wages in the public sector. At the same time as the real cost of skilled manpower is increasing, we find the hardware

and software costs of computerized information systems falling at an unprecedented rate. New applications of modern information systems to enhance voluntary compliance are being discovered and tested at an increasing frequency.

Managers of tax systems and fiscal reform specialists are becoming aware of the fact that the introduction of computerized information systems generally means restructuring administrative systems. Such restructuring is a time and management intensive undertaking which is full of pitfalls and opportunities for failure. The way the tax system is organized and managed, rather than the precise configuration of hardware and software, is usually the primary determinant of the success of the information technology. In all the case studies covered in this volume, the employment of information technology has been a tool to build or enhance the operations of a modern tax administration, not an objective in itself.

The advancements of microcomputer technologies and local area networks, and the widespread use of 4th generation computer software languages has enabled tax departments to take control of the computer systems they need, and to use them as an integrated part of the administrative process. Changes in the applications of information technology can be made quickly and cheaply as the administrative procedures are altered. Once expertise within the tax administration has been developed, changes can be made to the information systems as part of the normal operations of the department, not requiring a reliance on outside expertise.

As many countries are opening their economies to international trade in a global environment, there is a need to be internationally competitive and reduce costs. For private business, the process is stimulated, and indeed forced, by the competitive forces they face in open markets. That, however, is not enough. Major inputs to operating in the global market, from ports to product standards, are the services provided by the public sector. The tax system also must function in an open economy in a very different manner than it would in an economy that is protected and inward looking. Not only are the tax bases different, but the compliance costs imposed by the tax system become part of the costs which affect the international competitiveness of enterprises.

To assist in reducing compliance costs, tax departments have begun to focus on the service they can provide to assist taxpayers in meeting their legal tax obligations. With this approach the authorities come to view taxpayers first as clients, rather than as potential objects of enforcement actions. Taxpayers who are well informed about their tax obligations and who are aware of the actions of the tax authorities to ensure compliance, tend to comply voluntarily.

As the overall rate of voluntary compliance increases, the level of administrative congestion caused by the use of informal channels to settle tax liabilities is greatly decreased. It is this process which ultimately reduces the total amount of private compliance costs incurred to finance the public sector.

Implementation of Information Technology Systems as Part of Tax Reform

The role which information technology should play in the tax reform process is a subject of considerable debate. Installing computers and writing software to assist the tax administration is no substitute for political will, along with sound assessment and enforcement procedures, which are the critical elements for enhancing taxpayer compliance. Without these key ingredients in place, computerization can easily serve as a way to absorb technical assistance, and camouflage the fact that little or no fundamental progress is being made on the reform. If the essential political, legal and administrative elements for tax reform are being put in place, then modern information technology can be a powerful tool to enhance the capabilities of the reformed system.

The chapters in this volume by Lasheras and Menendez-Ros (Spain)¹, Gil-Diaz (Mexico)², and Marshall (Canada)³ all describe tax reform programs where modern information technology systems were introduced. In the cases of Spain and Mexico, comprehensive tax reforms were implemented covering the legal and administrative aspects of all the tax systems, from income tax to customs. In Canada, the conversion of the antiquated federal manufacturing sales tax system into a comprehensive value added tax was accompanied by a complete reorganization of the tax administration and the introduction of modern information technology into the administration of indirect taxes.

In all three cases, the fundamental tax reforms were driven by the need to implement new tax policies and administrative systems consistent with the economic and political objectives of the country. For Spain, it was admission to the European Community which gave it the incentive to harmonize its tax system with the rest of Europe. For Mexico, it was the need to modernize its economy and break the cycle of corrupt practices in its tax and customs administration so that its economy could become integrated into the rest of North America. For Canada, it was the need to modernize its obsolete indirect tax system so that it could reduce the level of economic distortions it created and be internationally competitive.

In all three cases information technology has been used to increase the quantity and quality of the information available to the tax administration. The quality of the auditing process has been significantly enhanced by the improvements in speed and quality of information available to those carrying out this function. Reorganization of the available human resources was a major factor in the restructuring of the tax systems in all three countries. Because of the particular institutional constraints faced by the Mexican fiscal reformers, it has been essential to bring private service companies into several aspects of the administration of taxes and customs. Canada also has used private contractors extensively in the development of its new management information system for the administration of the value added tax. Even though Spain has spent heavily on computer hardware and software, it still has one of the lowest administrative cost systems in terms of the administration costs per unit of revenue collected, or as measured by the number of employees per 1,000 taxpayers.

The technology used by these three countries is a reflection of the time in which the systems were designed and implemented. Spain began introducing modern information technology in the early 1980s, hence it relies much more heavily on mainframe computers and terminals linked to these computers. In Mexico and Canada, the systems were developed about a decade later and rely much more heavily on local area networks and microcomputer technology. The central mainframe computers are used primarily for information storage and data analysis.

Information Technology and the Re-Engineering of Tax Administrations

The papers by Philcox and Westfall (USA)⁴, Venner (Canada)⁵, Mason (New Zealand)⁶, and Hutchison (EEC)⁷ all discuss situations where information technology is being used to fundamentally change the way that tax administrations have functioned in the past. The papers which outline the innovations taking place in the USA, Canada, and New Zealand all have the objective of reducing the compliance burden on the taxpayers in their communications and contacts with the tax administration. Voluntary compliance is being enhanced through a wide range of service programs from taxpayer assistance to electronic filing and funds transfer. An overall increase in the quality of service is envisaged by changing the structure of the organizations to allow individual officers to be able to complete the transactions with the taxpayers quickly and without error.

Making the relevant information readily available and retrievable electronically by the authorized personnel will both save time and improve the quality of the service.

A modern administration for taxation needs to be integrated with: private information systems which provide third party information used to assist in the enforcement of taxes; the information systems of other public programs which are administered by the revenue system; or, the administrations of other related tax systems. The papers in this section provide graphic examples of each of these three requirements. Both Canada and the United States heavily use withholding reports and information returns, from financial institutions and business organizations, to verify tax returns. The future will see this information entering the system electronically and not via paper reports.

Canada, in particular, has used the tax administration to administer a wide range of social and economic programs. These include old age security, unemployment insurance, the child tax benefit, and over 50 incentives, credits and surtaxes for provincial governments. It has provided these services to the public with a high level of efficiency, but in order to maintain this record and cut costs it has had to introduce technological innovations in almost every area of tax administration.

Given that over 60 percent of the information on the Canadian income tax return relates to programs other than income and taxes, the taxpayer information services have had to become much more comprehensive than what would be required for the administration of income tax alone. As a consequence, special applications of modern information technology are being employed to assist in the department's communication. Tax information telephone services, electronic letter creation systems, a public inquiries information bank, and expert systems are all being employed to assist the staff in dealing with inquiries accurately and quickly.

Following a major reform in tax policies, New Zealand in the late 1980s developed a plan to modernize its tax administration. This program has been comprehensive and has employed modern information technology extensively. The various functions of the tax system are linked from registration to, return generation processing of returns, third party information matching, audit selection, debt management, and revenue forecasting. While the system was first designed for the administration of the income tax system, other tax systems such as the tax on goods and services and the withholding tax on interest and dividends also are being integrated into this comprehensive automated information system.

The system has been implemented and running for more than five years, and the returns both in better service and cost reductions have been impressive. Although New Zealand is a relatively small country, the system has saved the government approximately \$50 million each year, with a further savings of \$25 million arising from interest earned from the faster banking of remittances. Staff has been reduced by approximately 24 percent. The service has been improved greatly in a whole range of functions, from the new debt management system which allowed the government to identify \$200 million more debt for collection, to electronic filing of tax returns which allows assessment notices and refund credits to be made within four days.

Few organizational re-engineering efforts can match the magnitude of change that the formation of the European Community has brought about in the taxation systems of Europe. In his paper, Ian Hutchison describes the new VAT information exchange system enabling the countries of the EC, without customs or VAT border administration, to administer their individual VAT systems on a destination basis. This information exchange system came into operation on January 1, 1993 and has allowed the countries of the EC to dismantle their border controls over the movement of intra-EC trade. At the same time, they have not had to harmonize their VAT systems or give up sovereign control over the policy and revenues generated by this tax.

The EC countries agreed to build an information network which allows them to exchange the registration numbers and identifiers of their VAT taxpayers. The exporter, in order to zero rate an export item, must verify that the importer from the other country has a valid taxpayer registration number. This system will allow traders to verify a VAT identification number of an importer from another EC country simply by contacting their VAT administration via telephone. For sales to registered importers, the exporter will submit on a quarterly basis a record of exports by the taxpayer ID of the importer. This information will be given to the importing country via an integrated information network to make sure that the appropriate VAT is paid on the imported items. For sales to unregistered importers, the VAT rate of the exporting country will be levied on the sale.

This system requires the up to date VAT registry data bases of each of the countries be shared across all the EC countries via a computerized information network, and the periodic transmission of tax information on cross border transactions. This on-line system is a major breakthrough for the administration of VAT for the EC countries, and points to the direction in which the administration of international trade flows is likely to move in the future.

A chronic problem of developing countries with weak customs systems is obtaining accurate information on the origin, classification, and valuation of imports for the purposes of taxation and economic information. Such information could be obtained much easier from the exporters of the products, but to date there has been no system for such information to be transmitted directly to the authorities of the importing country from the country of export. If such a system could be institutionalized between the developed and developing countries, the savings from the improvement of the administration of international trade flows would be enormous. Customs procedures in many countries of the world has changed little for centuries, but the transaction costs inflicted by these obsolete systems have grown exponentially with the expansion in world trade flows. The EC's value-added tax information exchange system is not the complete answer to this problem, but it represents the initial breakthrough that will enable information on international trade transactions to be exchanged in the future on an on-line network between trading countries.

Innovation in Property Taxation Through the Use of Information Technology

Real property taxation is the ultimate example of the administrative assessment of a tax. The tax administration uses information on the ownership of properties, the size and nature of each property, and their estimated values for purposes of taxation, and then applies the appropriate tax rate to calculate the tax liabilities. It then delivers the tax bill to the taxpayer. The taxpayer has to do little in the process of obtaining an assessment other than register the property at the time of the purchase. Voluntary compliance, in the case of this tax, is to pay the tax bill when it is delivered, and to not obstruct the authorities in the process of registering and valuing the property for purposes of taxation.

To relieve the tax authorities of the tremendous burden of manually processing such vast amounts of data, information technology can be employed and to a greater degree in the administration of property taxes than in most other types of tax systems. Property tax administration is also an area where often expensive technology has been misapplied to produce better and more refined land maps, property registers, and property valuations, but with little or no impact on the revenue yield of this tax. The papers by Kelly (Indonesia)⁸ and Montes (Chile)⁹ are operational guides of how, using inexpensive methods which are effective, computerized information systems can be designed and implemented for the administration of property taxes in developing countries.

The property tax systems in Chile and Indonesia are cases of systems in different stages of evolution along a common path. Chile has had a well administered property tax for many years, and has updated its information system as the technological advances have become available. At this time the property tax information system is integrated with the other tax systems so that common modules, such as the taxpayer registration and collection functions, are shared with other taxes. Indonesia is at an earlier stage of development, but its fundamental modules of property registration, computer assisted property valuation, tax bill and receipt preparation are all similar to the Chilean model.

The evolution of the Indonesian property tax system has followed much the same path as the historical development of most successful tax systems, except that it has progressed at a "fast forward" pace. The process began with the reform of the legal structure in 1985, followed by a collection-led administrative reform strategy. Modules of the administration that were essential for making the property tax operational and effective as a source of revenues were implemented first. This included the computerization of bill production and receipt processes, and a system for collection through banks.

When these processes were operational and real property tax revenues had increased approximately 400 percent, these modules became part of an integrated property tax information management system. The integrated system was not the starting point. It was the outcome of an extensive effort of administrative improvement with sustained political support. This information system covers all property tax operations, such as the assignment and maintenance of the unique property identification number, mapping, field data collection on the nature of the properties, computer assisted valuation, bill delivery and monitoring, collection monitoring, enforcement, and taxpayer service.

Given the size of Indonesia and the stage of its economic development, the strategy for successful implementation and sustainability of the property tax under such circumstances is worth consideration. Kelly in his paper identifies the following seven lessons which he feels were important determinants of the favorable outcome:

- a. The system should be comprehensive and integrated.
- b. It is important to mobilize political, managerial and operational support.
- c. The system must be implemented strategically.
- d. New systems should be first tested using pilot projects.
- e. The system design, structure and operations should be kept simple.

- f. Realistic expectations should be developed, impossible promises should be avoided.
- g. Wherever possible standardize equipment and software.

While these recommendations came out of the reform of the property tax administration in Indonesia, we find these themes put forward by Glenday from his experience in Africa.

Information Technology and the Facilitation of International Trade

It has become increasingly clear that the expansion of a country's international trade flows under market conditions is generally a necessary, although not a sufficient, condition to experience rapid economic growth. International trade, in turn, requires inputs from communication, financial, transportation, customs, port and supervision services which in large part are either provided or regulated by the public sector. The efficiency of these services is critical to the international competitiveness of a country's enterprises. In some developing countries, avoidable transaction costs account for 10 to 20 percent of the cif price of imports, and a similar percentage of the fob price of exports. It is the design of systems to reduce these avoidable costs which is the focus of the papers by Sahami-Malmberg (UNCTAD)¹⁰ and Yeow (Singapore)¹¹.

Since 1981, UNCTAD has been developing a customs data-entry system to record trade flows (ASYCUDA). It was developed to: accelerate the process of clearing goods through customs; improve the collection of customs duties and taxes; improve the compilation of trade data; promote international harmonization of procedures and documents; and, improve the quality of information.

Experience to date has shown that the successful implementation of customs reform requires a strong political endorsement and the support of the leadership of customs administration. As customs administration is usually one of the most corrupt areas of public administration, with deep vested interests, it is much easier to set up a parallel computer system which captures data for statistical reports than it is to restructure the customs functions to lower the transactions costs of international trade.

The ASYCUDA information system provides most of the functions which a modern customs system in a developing country needs to have to operate efficiently. Its introduction has been attempted in dozens of customs departments,

with mixed results. The slow rate of acceptance and change is not caused by any obvious defect of the computer system, but perhaps because no computer system will either collect taxes or administer customs effectively if the organization is not committed to these objectives. Perhaps the success rate of this program would have been higher if attempted implementation had been restricted to those countries who were both politically and institutionally committed to reforming the customs process. As this information system has typically been made available free as part of a United Nations Development Program assistance package, little or no financial commitment from the government has been necessary. Hence, the constituency for the successful implementation of the system has often been weak. In the future, as the expansion of international trade increases, and the business interests in many countries come to understand the impact of inefficient public institutions on their international competitiveness, we should expect to find a better climate for the implementation of such information systems.

The Singapore experience, as outlined in the Yeow paper, is in sharp contrast to much of the international experience with customs reform. In this case, the political will was present, the institutions recognized the need for change, and the local resources—both intellectual and financial—were mobilized to implement a truly innovative system. The system is an integrated information clearing house for all the institutions which play a role in the international trade of Singapore. These institutions include traders, customs, banks, shipping companies, and government departments required to give clearances. With TradeNet, customs in Singapore is paperless, cashless, and queueless.

Traders can complete their declarations on personal computers and send them to TradeNet at any hour or day of the year for routing to different government agencies for processing. Typically customs declarations are processed and approved automatically in 15 to 30 minutes. The system speeds up the release of cargo, thereby increasing productivity by 20 to 30 percent. The reduction of paperwork and transaction costs has saved Singapore billions of dollars to date.

The Singapore TradeNet system is truly a model for other countries to strive toward if they wish to eliminate avoidable transactions costs. However, Singapore has been working toward this goal for almost a decade. As in the case of the Indonesian property tax system, Singapore did not begin with the final design, but first developed a track record where modern information technology proved its effectiveness in specific functions and modules. It was only after various institutions were successful that they came together to agree on this

innovative and highly productive integrated system for the facilitation of international trade.

These cases illustrate the two alternative approaches to customs computerization discussed in the paper by Glenday (Sub-Saharan Africa). The ASYCUDA in practice has been a "background" trade-data-capture-and-reporting system based on customs entry documents. This is in contrast to the Singapore system, which is an "on-line" computerized customs administration system which provides trade data as a by-product.

There is no question that trade information generated by the ASYCUDA system in itself is important for monitoring the performance of the economy. Such a system also will be able to provide operational data on customs activities which could be of potential use to the managers of customs. The principal weaknesses of such an information system arise from the fact that the information system is not designed to be essential for the operation of the core customs functions. Hence, the entry of data and production of trade reports will often have a low priority. The information will not be available in a timely enough fashion to be of use for the management of the operations of customs. Further, the implementation of such an information system does not require a reform of the customs process beyond the rationalization of forms and commodity classifications.

In contrast, on-line customs computer systems tend to force the rationalization of customs procedures. It also is more demanding of skills and resources for its implementation. If the administrative and technical capacity exists, the on-line system has a number of advantages over the background system for capturing customs entries. First, the data is more accurate as it is cleaned of inconsistencies and arithmetic errors as the entries are processed. Second, superior control is gained by reconciling cargo entries with subsequent customs entries and duty collection. Fourth, the computer system can be used in the processing of the entries to alert customs officers to high-risk imports or importers. Finally, management reports will be available routinely with a greater possibility that they will be used and acted upon.

The applicability of either of these two approaches will depend on the goals of the computerization process, and the administration and technical resources available. At this point, it is not obvious that one approach clearly dominates in an overwhelming majority of circumstances. This is an area where there will be significant benefits from the careful monitoring of the performance of these alternative approaches.

Implementation: Organizational State, Human Resource Base and Strategic Plan

The process of implementation is one which has raised many questions, for which there are fewer answers. It must be recognized that there have been many failures, perhaps more than the number of successes, in the implementation of computerized information systems for tax and customs administrations. These failures have been costly in terms of resources wasted, and have provided ample justification for the recalcitrant managers to not make the organizational and managerial changes needed to improve tax administrations. In this volume, a number of such failures from both developed and developing countries are discussed. Some of the reasons why the results from computerization have often been below expectations are considered in the papers by Peterson¹² and Glenday¹³.

The essential ingredients for the successful implementation of modern information technologies into the public sector have been summarized by Peterson, as: Trust, Need, Help, and Urgency. First, the decision maker must trust the proposed solution and those who are going to implement it. Second, the decision makers must recognize the need for an improvement in the information system. Third, the information technology reforms must provide a solution which is helpful to the organization. Finally, the decision makers must feel that it is urgent that an improvement be made. The author then presents a case study and a number of examples from his experience in Kenya which illustrate the importance of these four ingredients for successful implementation.

Glenday in his paper examines the issues facing the computerization of tax systems and draws from his extensive experience in Sub-Saharan Africa. He provides a useful categorization of computerization situations and considers the nature of the effort required for the administration of taxes. He finds that the tax systems tend to have large and complex organizations, which in developing countries are among the most difficult to computerize. Tax departments often have a weak management structure which hinders the planning, implementation, and sustainability of a computerized administrative system. Typically the budget allocation process provides excessive funds for capital purchases relative to what is needed to cover operating costs. This often results in the purchase of equipment that is too sophisticated and solutions that are too complex for the local expertise to operate and maintain. While at the same time, the operating budgets are too small to pay the level of salaries required to retain the few skilled programmers and computer technicians available.

Glenday points out that choice of strategy to implement modern information technology systems in tax administrations is critically dependent on the base of knowledge and experience the department has had with the use of computers, the management available to direct the process, and the preparedness of the private sector “customers” of the tax system to provide information which is accurate and complete enough to be processed by computer. Often it is easier to process incomplete or inaccurate returns manually, rather than by computer.

In circumstances typical of many developing countries, a strategy which allows the tax department to introduce information technology in stages is preferred. In this way the management, staff, and customers will all have the opportunity to learn from the use of the basic modules such as registration, accounting for assessments and payments, and document control, before moving on to the more sophisticated processes, such as assessment preparation.

It is in the area of implementation where the lessons from our collective experience is most needed. As the capital costs of technology continue to fall rapidly, and the need for an improvement in the performance of revenue systems becomes increasingly critical, there will be pressures to try to use information technology as a tool to reform tax administrations. However, the basic elements of the operating environment, including political will, management, administrative and technical skills, and budgets to cover recurrent costs, are unlikely to change as quickly. Given this situation, if we want to avoid the cycle of unfulfilled expectations, we need to have a clear strategy for administrative reform which is much broader and more sophisticated than one which simply implements information technology.

Notes

- 1 Miguel A. Lasheras and Isabel Menendez-Ros, "Tax Administration and Information Systems in Spain," this volume, Ch. 2.
- 2 Francisco Gil-Diaz, "Reforming Mexico's Tax Administration," this volume, Ch. 3.
- 3 David Marshall, "The Use of Technology in the Administration of the Canadian Goods and Services Tax," this volume, Ch. 4.
- 4 Henry H. Philcox and Larry G. Westfall, "Strategic Directions in Tax Administration: The Internal Revenue Service of the United States," this volume, Ch. 5.
- 5 George W. Venner, "Technology, Taxpayer Service, and the Future of Tax Administration in Canada," this volume, Ch. 6.
- 6 Geoff Mason, "Application of Information Technology to Integrated Administration of Core Tax Systems," this volume, Ch. 7.
- 7 Ian Hutchison, "The Value-Added Tax Information Exchange System and Administrative Cooperation Between the Tax Authorities of the European Community," this volume Ch. 8.
- 8 Roy Kelly, "The Evolution of a Property Tax Information Management System in Indonesia," this volume, Ch. 9.
- 9 Marco Montes Marmentini, "Development and Operation of the Property Tax Information System in Chile," this volume, Ch. 10.
- 10 Massi Sahami-Malmberg, "Trade Efficiency: Automated SYstem for CUstoms DAta (ASYCUDA)," this volume, Ch. 11.
- 11 Tay Chng Yeow, "The Computerization of Customs in Singapore: TradeNet," this volume, Ch. 12.
- 12 Stephen B. Peterson, "Making IT Work: Implementing Effective Financial Information Systems in Bureaucracies of Developing Countries," this volume, Ch. 13.
- 13 Graham Glenday, "Perspectives on the Computerization of Tax Systems in Sub-Saharan Africa," this volume, Ch. 14.