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Chapter 4: Achieving seamless government financial operations through strategic IT system integration

4.1 Introduction

Exclusively, this project report aims to describe research towards achieving seamless government financial operations through strategic IT system integration and to give descriptions of relevant work. Work described in this document has been accomplished in the Orion II contract of the State of New Jersey, which has highlighted the need for state-of-the-art methods. The execution of the contract is under the State Technical Support Program funded in part by the U.S. Department of Transportation and the Research & Innovative Technical Solutions Program of the New Jersey Department of Transportation (Dawes & Helbig, 2010; Janssen et al., 2012; Gil-Garcia & Sayogo, 2016).

The financial management activities in which all government entities engage are significant. For state governments, these functions include recording the receipt and disbursement of governmental funds and also monitoring, controlling, reporting, and auditing, through which the government ensures that its fiscal operations match intentions expressed in the budget. All state government entities, regardless of their specific missions, have approved budgets, and their financial operations support both the approved budgets and all policy decisions embodied in the budget. These systems derive their significance from providing the capability to effectuate policy decisions that significantly affect the citizens of any state. It is impossible to overestimate the importance of maintaining these state governmental systems with sufficient integrity, accuracy, capability, security, and reliability to meet their obligations.

Government financial statements are now prepared more as a result of administrative requirements than as a part of the whole organization in the service of executive and

legislative oversight. These reports do not present either the flows of public services or the wealth of citizens. Reports that quantitatively present useful information about the real flows and stocks of public wealth do not yet exist. Accounting must help, and not impede, the management of public service delivery and the resulting public asset and liability changes (Luna-Reyes et al., 2007; Parycek et al., 2018).

4.1.1. Significance of Financial Operations within Government Entities

Government financial operations—the procedures, systems, and methodologies by which governments plan, spend, and account for funds dedicated to established priorities—are among the most critical to the success of any governmental entity, and thus to the overall well-being of our society. The federal government devoted approximately $5.8 trillion to various priorities in FY 2022 and has an estimated $6.3 trillion in revenue, while states and local governments have responsibility for spending and accounting for the investment of trillions more annually. These financial operations activities are essential to the financing of initiatives to ensure that citizens receive essential governmental services and programs, including public safety, education, and a social safety net, as well as the investment in infrastructure to enable economic development, growth, and stability. Furthermore, effective government financial operations must help to ensure that government entities maintain sufficient liquidity to

Fig 4 . 1 : Achieve Seamless System Integration

meet current operational and debt service obligations, even when faced with uncommon development, whether positive or negative. The establishment of policies and oversight by management and governing bodies, including legislatures and boards; the designing and implementing of an enabling technology environment; and the management of supporting resources, such as staff, advisors, and external resources. The ultimate need

is to promote the successful acquisition, allocation, investment, and accounting of funds that meet the requirements of laws and regulations, established objectives, and stakeholder expectations.

4.2. The Importance of Financial Operations in Government

Financial operations management is commonplace in the private sector where efficiency drives the bottom line. In the public sector, where taxpayer money contributes to the coffers, ensuring efficient government financial operations should be a public goal. The "efficiency" of government financial operations is not always easy to define or measure. Efficiency can be understood as the ability of the government to minimize the relative level of inputs that it consumes in the production and delivery of favored services or outcomes. Another way to assess the efficiency of a government entity is through the accuracy of its financial statements. Audited financial statements allow taxpayers and other interested parties to review how the government is funding and carrying out its services.

Governments in the United States report their financial operations using two sets of rules that are facilitated by a system of recordkeeping. The first part consists of budgetary controls that tell citizens and other stakeholders how the government plans to use the funds it receives and for what services. The second part consists of financial accounting controls that review the actual inflow and outflow of funds within defined periods. Relevant agencies use these statements to inform executive decisions and assess conformity to specific reporting guidelines based on a U.S. statute.

4.2.1. Key Elements of Effective Financial Operations in Government

We organize the discussion on key elements of effective government financial operation to consider the answer to the questions, what is done, who is doing it, and how it is done. The actions that collectively comprise performing government financial operations fall under seven categories. The time required to perform each of these actions varies considerably depending on how revenue and other cash flows are managed and the volume, variety, and processing methods of other transactions affecting the timing and amount of cash flows. The time spent on these individual actions also varies with the workforce approaches employed to complete assigned tasks.

Part I of this book examines how governments collect revenues, manage investment and other asset accounts, and process, record, and report expenditure transactions, and discusses the staffing and systems resource implications of these considerations. Part II considers the various approaches that different levels of government employ to the other

aspects of financial operations. We consider various issues about how it is done by exploring timing and technology-related decisions about cash management, data collection for revenues, data collection for expenditures, expenditure processing and disbursing activities, accounting, and interface with financial analysis and planning. The processes discussed are designed to produce certain supporting outputs.

The purpose of government is to provide accountable, fiscally responsible, and responsive services to citizens. Financial management is an essential part of providing good governance. Government agencies need efficient financial operations to support their accountability and transparency responsibilities as demonstrated in the producing of external financial reports, and to provide the correct information to internal financial report users, to be used for operational and economic decisions, planning and budgeting, control and audit, and performance evaluation as demonstrated in the producing of internal use financial reports.

4.3. Overview of IT System Integration

Information technology (IT), and particularly software, has become an integral component of contemporary economies. Properly designed and implemented IT systems can increase labor productivity, enable service innovations, decrease costs, and enhance service delivery quality. While it is difficult to imagine important domains of the economy and society where IT does not play a role, the workings of government are among the most traditional of the social institutions. The modern state is responsible for the vast resources, the fiscal and loan portfolios, and indeed the very existence of nations. The ability of government to function smoothly, uninterrupted by crises of incompetence, lack of financial integrity, or misallocation of resources is therefore a matter of crucial importance not only for the government but also to the economy and society. The public sector's microeconomic justification of providing public goods, correcting for market failures, meeting the needs of the disadvantaged, and ensuring the security of the nation has led to the establishment of tax and revenue systems and other financial mechanisms. However, these activities are often fraught with difficulty, and mishaps and accounting collapses do occur, with consequences for society at large.

The IT systems that support the work of governments worldwide handle tremendous volumes of mission-critical transactions. They operate in a uniquely complex environment, characterized by fluctuating priority demands, changing resource allocations, ever-shifting expectations of the citizens, and an increasingly convoluted interface with other IT systems. The complex and high-impact trading environment in which financial systems are required to operate makes their performance, responsiveness, and reliability crucially important. Further, they require the integration of numerous subsystems, developed over the years in different environments, often on

different platforms, at a very high cost. As a favorite saying goes, “Governments never invest wisely, they are always in knee-jerk mode.”

4.3.1. Evaluation of Integration Readiness and Capability

Whether an integration initiative will be successful or prove to be a futile exercise, is often the exclusive function of considering the integration readiness of a government agency and the integration capability of its infrastructure. Integration readiness is about the willingness of the agency to make such changes and the motivation to do so. The agency will need to dedicate ever-scarcer skills and resources towards pursuing a goal that may be perceived to be outside its core value proposition. The other side of the coin is integration capability – is the agency’s technology, data, processes, and organizational structure ready to support such an initiative at the current level of service and business emphasis? It will be important to determine whether progress is being made in developing the capability, before demanding comprehensive integration of all parties. A practical readiness and capability model for promoting integrated government financial operations needs to be developed that balances the process improvement to eliminate waste and redundancy and the risks of affecting day-to-day operations adversely. A challenge is to select the right area, and level of transaction for such a model that is meaningful and actionable. The first option is expertise – questionnaires, interviews, and focus groups can elicit the opinions of both finance and IT staff. They can determine the state of the agency's financial infrastructure and readiness to adopt integration as the preferred choice for pursuing innovation and automation, as well as the pros and cons of past experiences and lessons learned from the limited use of integration to date. Staff should bring perspectives on ease of implementation, and implications on other aspects of the business value proposition.

4.4. Current Challenges in Government Financial Operations

To achieve seamless government operations, accountants must transform financial practices from transactional to managerial. Traditional government financial functions serve as the backbone of control, accountability, and transparency. However, added-value economic management has been historically absent within government organizations. Initiatives to address this shortcoming have often fallen short and focused on addressing operational challenges that rely on transactional excellence instead of creating the conditions for organizational success through benign change management efforts. From a broader economic perspective, the constraints are predicated on the transition to the Knowledge Economy, whereby management relies on qualitative value judgments that are harder to define and measure than operational KPIs.

Performance budgets, program accounting, and zero-based budget modeling are often legitimized based on renewing government financial practices. However, practitioners understand that transactional aspects remain demanding. The overall quality of financial data dictates the value of performance information. However, little cross-audit agency work is devoted to this link. Consider that in a typical government organization only 1% of expenditures are devoted to production accounting, while the audit approach examines the remaining 99% for validation and control, inevitably basing qualitative assessments on selective and often arbitrary quantitative choices made by operational managers. Thus, while monthly dashboards present and aspect KPIs, weeks or months may pass before unauthorized tripwires receive post facto confirmation. In short, it is unrealistic to expect finance ministries to assume a managerial role. The "Controllers" of government must be recognized as enabling functions for the executive as well as the operations of government.

4.4.1. Identifying and Overcoming Obstacles in Government Financial Practices

A key aspect of addressing government finance and treasury operations is to identify, understand, and overcome the various obstacles that exist. We have identified five obstacles to achieving an integrated government that leads to improvement: limits of resources, lack of political focus, lack of technical competencies, lack of security, and lack of training regarding integrated systems. Within each of these obstacles, several themes serve to streamline focus regarding those who want to achieve an integrated government system.

One such theme is resistance to change. This is especially concerning when there is a lack of understanding of the benefits that flow from integration, especially regarding the capabilities that are present in information technology. Naysayers are easily found, and those with vested interests in perpetuating the situation, blocking integrated endeavors, and forecasting doom for once an integrated system has been achieved abound. However, it is imperative that the threat they pose be addressed, as the military would wish. It is too easy for even political officials to place too much focus on the present. The emphasis, in terms of risk, difficulty, and misallocated resources is to focus on contract/asset management, not revenue/expenditure cycles, where the need is greatest. Importation is still the first step. It is ironic that at a time when the capability of information technology to handle the enormity and complexity of even the largest government is within grasp, few have access to such competencies where they are now needed. The connected and integrated government of the 1990s is not what is now being achieved. It is just a less integrated, connected, and cumbersome form of those foreign partners of the colonial era.

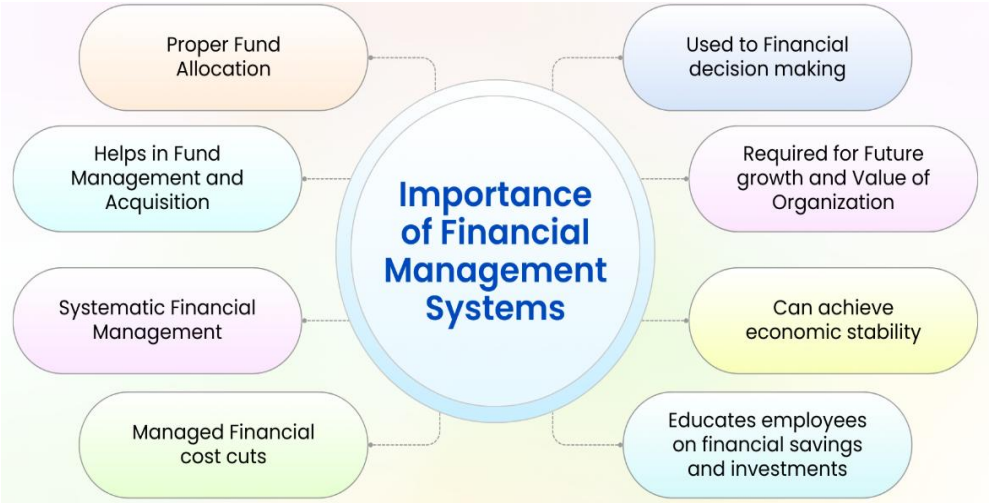

Fig 4 . 2 : Financial Management Systems

4.5. Benefits of IT System Integration

IT system integration provides significant advantages when utilized for financial operations in government. Pursuing a policy of full integration of IT-based financial systems brings the most significant benefits, while partial integration of some specific functions may render modest efficiency improvements, or reduce redundancy and improve the completeness of government financial information. Full integration of the government financial management systems allows for the creation of an effective business model for government organizations. It does so by harmonizing and structuring business processes, along with ensuring proper business activity controls. Today's focus on cash flow modeling and analysis, however, requires that management information systems access the treasury's integrated payment and receiving data model.

Specific measures such as establishing one common standard chart of accounts to be utilized by all government organizations, and adhering to universally approved accounting and financial reporting rules are also imperatives. In addition, identifying which organization is responsible for the development, integration, staffing, and oversight of automated financial systems would go a long way toward ensuring the financial and operational integrity of the government. Reliable real-time data should also be made immediately accessible to users, including non-financial managers at all levels of decision-making. Enhanced productivity, lower administrative costs, better operational performance, improved data quality, lower IT overhead, and convenience to users are just some of the many attributed advantages of automation, the Internet, and modern interactive technology.

4.5.1. Advantages of Integrating IT Systems in Financial Operations

Adopting the strategic integration of missions and IT systems across levels and areas of government has several advantages. In the first place, the integration process leads to considerable improvements in the speed and accuracy of reporting and the availability of reports at all levels and areas of government. The resulting higher data quality diminishes the number of rekeying requirements and other possible sources of error, resulting in a lower number of reconciliation requests. Substantial improvements in the time consumed to prepare budget estimates and other supporting documents are achievable through the introduction of a programmatic approach that would eliminate the need to align multiple budget submissions built on different structures and methodologies. The resulting streamlining of operations reduces workload pressure and cuts costs in some operations.

Additionally, process integration permits governments to improve data collection, reverse regulatory incentives, reinforce common objectives among finance and mission agencies, and provide controls that will increase the probability of success of many government programs. The cost can thus be reduced for repetitive activities that are discrete in standard cost accounting approaches but need to be seamless in a programmatic sense. Better integration will improve policy choices both in evaluative and normative terms. Moreover, governments that see their role in more integrated terms, managing a flow of interrelated programs, can also better coordinate discretionary interventions in distinct areas and thus reduce avoidable failures and costs.

Finally, mission information can also be used to explore possible efficiencies in data collection itself, particularly when data capture activities go well beyond the typical financial transactions of a government. The publication of economic and social statistics often relies on highly fragmented government organizations. Such fragmentation engenders costs of organization, which would be more effective with the use of integrated or shared data on economic or social transactions, especially for current accounts of those transactions.

4.6. Strategic Framework for IT System Integration

The proper integration of financial management systems can yield significant benefits to state and local governments. These benefits include greater accuracy, efficiency, resource savings, and increased analysis capabilities. To realize these benefits, CIOs and financial management personnel must work together from the outset to help ensure the careful planning and execution of each of these integration initiatives. The process to be implemented is similar to that used for many other IT initiatives. This section describes

a five-step strategy framework for ensuring a successful system integration effort in the area of state and local government financial management operations.

The first step in any system integration effort is to assess each of the systems currently in use within the governmental organization. The purpose of this assessment is to determine if the agency is using the best available budgetary, accounting, and other financial management systems given its unique set of needs and circumstances. If the systems are dated, not functionally capable of meeting the agency's needs, not interoperable, mistrusted by end-users, or costly to operate, the department may have justification for seeking replacement systems that better serve the agency's financial management needs. If replacement systems are needed, the agency should consider seeking a replacement system that is capable of serving multiple functions, like budgetary development and management, financial reporting, performance management, etc. The desire for a "best-of-breed" approach should be tempered by such considerations as the degree of trust users have in the various components in the system cluster as well as costs associated with operating multiple disparate systems. No system may be perfect, but the goal is to arrive at a rationale for seeking replacement systems that work together as an effective system cluster.

4.6.1. Assessment of Current Systems

System integrations are ultimately about enabling the desired data sharing with optimal performance, security, and supportability. As such an assessment of the current systems and how they work together is required. This includes Physical Integration, which is the physical touches of the systems, such as users of the system entering the same or similar data in multiple systems to share data with those systems, report writers that pull data from multiple systems and compile them, and the effort to provide support to keep these physical integrations working; Communication Linkages, which is the protocols and technologies that enable the computers to talk to one another, such as internal IP networking technology and protocols; Data Transfer Methodologies, which is the mapping and transfer of data from one system to another for example, using simple flat file downloads and uploads as well as communications; and Actual Data Sharing, which is the actual data moved and the conversion of that data into useful information, such as the number of budgetary transaction records copied for comparison and governance usage from a transactional system into the G/L system as part of the month-end budget versus actual transaction comparison process.

The purpose of assessing the current interfaces for any agency is to get an up-to-date understanding of how the business communicates internally and externally using the IT system. This includes (1) understanding the external systems interfaces and the type of data exchanged, (2) estimating the workload of the data file transfer processes, (3)

reviewing any documented data-sharing requirements to understand the future data transfers needed, (4) identifying the production scheduling requirements to execute any data transfer process used and (5) evaluating the effectiveness and efficiency of any existing file-transfer processes. This assessment begins the creation of a detailed infrastructure design that will ultimately provide the optimal amounts of IT system integration needed. Validation of this assessment with the business will confirm a business agreement to the types and amounts of systems integration activities supported.

4.6.2. Identifying Integration Opportunities

Common objectives will not only help the agency decide whether or not to integrate but will also guide the selection of what systems to combine and how to do it. Sometimes explicit agency policy prevents interference with sensitive program management. The budgeting, accounting, auditing, and internal control elements of financial management are designed to address issues of great importance to program managers. These elements should function to support program managers; however, they may also sometimes approach emotional levels of importance to drive a wedge between policymakers and financial managers. In those cases where some degree of integration is desired, defining mutually acceptable objectives and requirements can provide common ground to build a detailed integration plan. By having a clear picture of common objectives, deciding not to integrate a particular area is less likely to be viewed as abandoning or penalizing one party in the partnership.

First, the financial and budgetary sides want to limit development and operation costs. Keeping common data in one place, ideally integrated into one set of systems, obviously limits duplicated effort. Second, financial managers are experts in establishing and enforcing common data definitions and structures. Improving the operations and effectiveness of budget preparation, execution, and control should be an ongoing cooperative effort. Many decision and reporting requirements cut across agency program lines. The budget and the estimate for the governmentwide financial statement audit are examples of information products that are common to both budget and accounting functions. In addition, budget-related data play a key role in making important policy decisions related to agency and nationwide priorities and program effectiveness.

4.6.3. Developing a Comprehensive Integration Plan

A comprehensive plan provides the infrastructure for effective and efficient IT integration that can be used both in specific functional areas and in developing agency-wide policies, frameworks, and standards. Development of this plan will ensure that seamless integration becomes part of business as usual. The plan should include a

combination of formal and informal processes, guidelines, and resources that can be used to facilitate new and ongoing integrations. The plan should establish both common lifecycle phases and functional responsibilities for integrating systems. Emphasis should be placed on the early phases of the system life cycle for pre-implementation activities that are crucial to achieving the objectives of alignment, investment, capital planning, and return on investment. However, there are many ongoing investments in existing legacy applications that include a formal IT integration architecture and capability. These two aspects of the environment need to be coordinated to ensure a seamless event/case processing environment.

Enterprise architecture, or master data management, provides the overarching framework for integrating data related to business functions and processes, often termed the enterprise data model. Other aspects of collaboration include the broader implications of both external and internal entities involved in the event/case processing capabilities. These entities interact through either electronic or manual processes, which also should be factored into the enterprise data model, service model, and process model. These services may provide wrappers to the existing enterprise data structure and associated applications to provide adaptability until a phased rewrite can be accomplished. Other important aspects of trust and risk management, security, and interoperability must be part of and included in the coordination of the integration activities.

The key aspect of this integration plan is the establishment of the critical foundation for early and ongoing communication, collaboration, and cooperation between the various stakeholders involved in the integration activities and the development of associated products. The early process of defining the information roadmap based on a common enterprise information model, as well as the mapping of services to the functions being performed by various services, is critical to integration success.

4.7. Conclusion

In conclusion, government financial operations support a variety of services for taxpayers, including legislative expenses, teacher salaries, road and bridge maintenance, and veterans payments. In performing these functions, government finance is much in the news today due to deficits and debates on the fiscal impact of various issues. The financial operations of governments at all levels seek to support the provision of services while not incurring excessive debts that future generations may have difficulty repaying. Expenditures must equate with revenues in the long run. To meet this goal, government financial operations must be based upon principles of sound financial management and supported by accounting systems that produce timely and reliable financial reports to users.

The operation of any government financial operations as outlined is a complex process. The accounting system that supports this process allocates debt and specifies when revenues are recognized. Accounting units measure and record the receipts and disbursements of funds, yet the data from these accounting units is not suitable for publication in reports that describe the financial activities and financial position of the government. Reports that are useful in guiding the internal decisions of government executives and administrators are not the same as those required by citizens and external parties. The quality of information produced by a government's financial internal control system is essential to the efficient and transparent operation of government. However, a recurring theme throughout is that no reporting system can substitute for good operations.

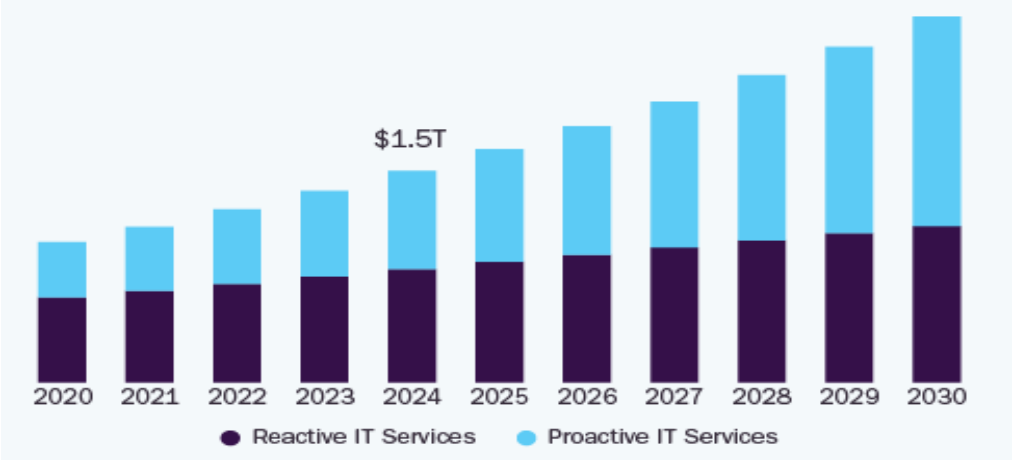

Fig 4 . 3 : IT Services Market Size And Share

4.7.1. Final Thoughts and Future Directions

The successful implementation of such a vision for government financial operations depends on the realization of a complete-service strategy offering seamless linkages and interfaces encompassing all principal financial and operations services. Integration in such a manner requires the re-examination and modification of legal, political, governance, organization, and financial aspects of governmental functions and processes as well as the existing IT systems. In the short term, however, it is much more likely that the path to achieving such a vision will involve working toward that ideal through a gradual and natural progression occurring episodically over time, especially in the current economic climate in which obtaining funding for transformational programs is limited.

Are there lessons to be learned from the past? One major lesson to be drawn from history is that integration is much more difficult to achieve than de facto fragmentation of government services. An aggregation that produces a new data processing service within existing organizational structures is a seductive but risky approach to integration. The imposition of a new financial information service without the political requirement that it replace existing structures will only hinder progress and encourage divergence rather than convergence. Yet providing an integrated service can easily lead to considerable changes in the way business is conducted and to changes in existing political and organizational structures. Such changes are never easy, and will not happen overnight. But they have happened, and with considerable success, for segments of the private sector.

Ministerial responsibilities must be more than an invocation of principal-agent relationships. Globalization and technological change demand the integration of processes and information across organizational boundaries within the public sector and with private sector actors. As in the private business sector, pressure for integration which results from increasing competitive international and national market pressures has become apparent in the government arena. The challenge for government policymakers is to impose incentives – whether through efficiency, accountability, or quality movement – to encourage convergence.

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