Government Internal Auditors should leverage the power of Financial Management Information System (FMIS)

Puneet Kapoor[1]

A major element of internal control in government is an independent and professional internal audit function. In most jurisdictions, government internal auditors continue to use traditional manual auditing method of testing controls by performing the tests on a retrospective and cyclical basis. Judging effectiveness of an internal control system through manual means is subjective. This can be minimized through use of the capabilities of a FMIS which most governments have implemented. Unfortunately, internal auditors have not been able to leverage the power of FMIS applications due to lack of awareness, skills and access. This paper discusses the role of internal auditors in the development of an FMIS application, using the system to conduct audit and leveraging the data available in FMIS. It introduces the reader to the usefulness of embedded controls, data analytics and computer aided audit tools, continuous online auditing and risk-based internal audit in relation to FMIS. This paper concludes that effective use of FMIS functionalities and data for internal audit needs is in its infancy. Proper advocacy, outreach and training can help internal auditors to gainfully use FMIS in their work enhancing effectiveness and efficiency of the internal audit function and making it relevant in the current environment, bringing benefits to the government and ultimately the citizens.

What is FMIS?

1. A Financial Management Information System (FMIS) is the backbone for all financial operations of a government, whether at the national or sub-national level. FMIS solutions enable governments to plan, execute and monitor the budget, comply with financial regulations and reporting standards and support decentralized budget operations and other information and communication technology (ICT) solutions. FMIS platforms also facilitate the disclosure of public finance information to citizens to improve budget transparency, government accountability, and participation. An FMIS system often digitizes the core government functions that include budget planning/preparation, allocation of resources, cash management, commitments, management of expenditures and revenues, accounting and reporting. These would normally be linked with other government systems such as tax/customs, debt management, asset management, procurement, payroll, and more[2]. Whenever FMIS and other information systems are linked with a central data warehouse to record and report daily financial transactions, offering reliable consolidated results for budget analysis, controls, decision support, performance monitoring and web publishing, these platforms can be referred to as Integrated FMIS (or IFMIS).

2. Development and implementation of a FMIS system requires significant time and financial resources and efforts in change management and hence these systems should be used to their potential. The global FMIS database of the World Bank indicates that of the existing central government FMIS platforms in 198 economies, 55% are based on commercial off the shelf packages (mainly configured, with minimal/no customization), and 45% are based on custom developed software which are bespoke solutions that are fully customized to implement improved country specific processes. FMIS is also a key element of the GovTech Global Initiative of the World Bank launched in 2019 which is a whole-of-government approach to digitalization that aims to promotes simple, accessible and efficient government and there is a strong interest in leveraging digital technology in the Bank's client countries[3].

Internal Controls in FMIS

3. The "Three Lines of Defense" model explains the relationship between the risk management framework, the senior management and the governing body and how responsibilities are divided. The first line of defense include functions that own and management risk and includes the Internal Control system that are the processes and procedures designed, implemented and maintained by the management of an organization to provide reasonable assurance over three objectives, namely (i) reliability of financial reporting; (ii) effectiveness and efficiency over operations; and (iii) compliance with laws and regulations. The second line of defense are functions that oversee risk management and compliance. And the third line of defense are functions that provide independent assurance the key being internal audit. The main function of internal auditors' is to understand the internal control system, evaluate its design and assess whether these controls are implemented and working adequately and advice management on internal controls.

4. An FMIS application incorporates automation of processes, most often after a business process reengineering is done[4]. FMIS ensures compliance with legal and ethical practices, enhances information management and the audit trail and internal controls. FMIS applications contain system-embedded controls including system ex-ante controls that eliminates most of the manual verification procedures. That is, the government's risk management process (internal controls and internal audit) is integrated in FMIS. A FMIS system enables governments to establish a strengthened internal control system.

5. An FMIS consists of an interrelated set of sub-systems/modules with each subsystem having automated internal controls such as access passwords, allocation of roles to individuals to carry out different tasks, and segregation of duties. Processes in FMISs are configured as work-flows for optimum efficiency. Internal controls in FMIS monitors the government processes at every stage forcing users to be more vigilant when doing their activities, as the system provides audit trail and trackers/flags to track all activities happening within the application. Internal controls constitute a considerable part of an FMIS which can play a critical role in increasing efficiency of financial controls and provide reliable reports for stakeholders. However, judging effectiveness of an internal control system of an organization through manual means is subjective and this can be done efficiently if audit is conducted using FMIS. Internal controls in FMIS should be built in at the time of system development and deployment – it would be too costly to incorporate controls after the system is moved to production.

Do internal auditors have a role in FMIS?

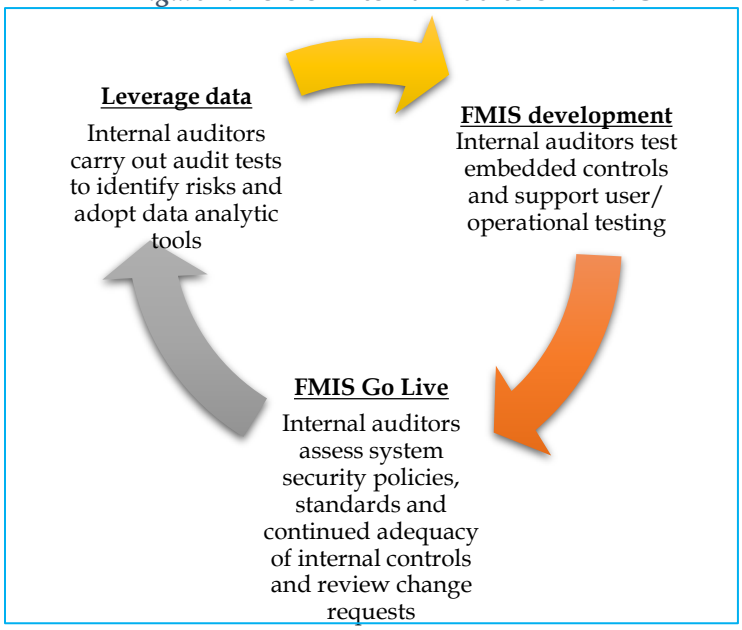
6. The answer is simply yes, both during the development and testing of FMIS and after going live (see Figure 1). Using FMIS functionalities opens new vistas for internal auditors and help cope with the large volume of transactions in government. Internal auditors can audit the FMIS itself to identify risks and vulnerabilities and audit the government transactions using the various functionalities of FMIS.

- During FMIS development, internal auditors can be involved in testing of the embedded controls, define the way internal audit function can leverage on technology, and could be involved particularly at the points of system acceptance of the software and the early stages of user/operational acceptance.

- During live environment, internal auditors can assess whether the FMIS system is run with adequate security policies and standards and test the continued adequacy of internal control procedures.

- Where amendments are proposed in the system, internal auditors can review the adequacy of the necessary controls in the change request.

Figure 1: **Role of Internal Auditors in FMIS**



- Several terabytes of data may be available in FMIS solutions, but this is hardly leveraged during audit which continues to focus on traditional approach of transactional audit. Internal auditors can leverage the data available in FMIS to carry out several audit tests to identify risks including adoption of data analytics tools. Interrogation of government data provides richer insights and could contribute to increased audit quality. Internal auditors could assess with far greater detail and frequency whether the automated controls are working and the extent of manual interventions.

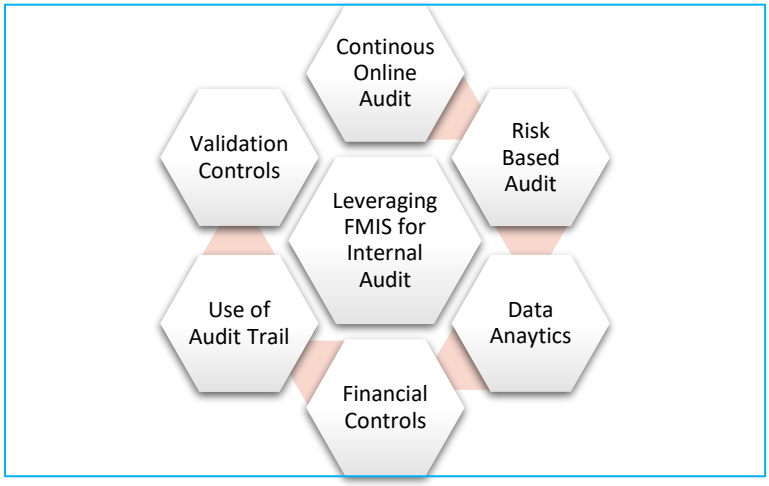
What are the challenges?

7. Most often, internal auditors are not able to leverage the power of FMIS in their audit planning and execution functions. Continuous development of the FMIS application, including upgradation and modernization, limits access to the system. Another reason is that custody of data remains in a few hands and not made available for audit or for public consumption. Internal auditors may not be involved in the development process, including the governance arrangements, as they are perceived not to have the competency and skills to understand FMIS architecture and functionalities. Above all, it is perceived that providing FMIS access to internal auditors could "harm" the data in the application and compromise its integrity and reduce system performance.

What needs to be done?

8. Internal audit resources (manpower and budget) in government is most often limited and an effective way to mitigate this is to use new technologies to create an agile and future focused function by using modern tools of the trade including audit management systems and data analytics[5]. Internal auditors can gainfully use the embedded controls in FMIS to their advantage in their work to reduce time in control testing, automate the analysis of evidence and use the vast amount of disaggregated data available in FMIS. Using FMIS can help auditors analyze cross-department audit data, access data directly say from the solution, have multiple auditors work on the same set of data and use automated audit tests. Read-only access could be provided to internal auditors to enable them to extract the data and use them in their work. Another approach could be to have a data warehouse which is a big data pool or repository with tools to extract and analyze the data and is usually hosted in a separate server to minimize load on the host system performance. Figure 2 illustrates what internal auditors can do around/through FMIS. Moreover, in some countries such as Ghana and Malawi, strengthening of internal audit function was taken up as a reform along with implementation of FMIS.

Figure 2: **How internal auditors can leverage FMIS**



Using automated controls in FMIS enhances auditors' efficiency

9. One set of controls are **application controls** comprising of input, processing, output and master file controls that are established by the organization in any computer-based system and are part of the ICT security or user management controls audits. Examples of such application controls are as follows:

- unauthorized users cannot operate the system and initiate transactions
- users with more than one identity are not allowed
- user is not allowed to initiate and/or authorize payments without oversight
- controls authorize only individuals with permissions to access specific FMIS modules
- segregation of duties or approval hierarchies
- password policy requires users to change passwords, say every 60 or 90 days
- all approval processes are trackable; audit trails (or trackers) of users who logged in, carry out transactions, the action performed, and the time are captured
- protocols for software patch updates and anti-viruses are formalized
- data transmitted without encryption over insecure medium is avoided
- system ensures that stored information in FMIS is not corrupted or lost
- allows electronic storage of documents
- automated cross-referencing of personal identification numbers

- proper application documentation is available (e. g. FRS, SRS, user manual)

10. The other set of controls are the **financial controls** and could include the controls in the statutory and financial rules of the organization and controls in a manual system that are automated in FMIS. In case of a government, financial controls are known as fiscal controls or budgetary controls or expenditure controls. See Box 1 for examples of expenditure controls that are usually configured in a FMIS solution. Such controls are embedded in the FMIS solutions though the extent of controls automated may differ between governments. These encompass all the government activities of payroll, pension, procurement, payments etc.

Box 1 – Example of Expenditure Controls automated in FMIS

- Administrative and Financial Sanctions
- Denying payment processing in the absence of enough budget balances – spending authorization
- Delegation of financial powers
- Segregation of duties
- Proper accounting classification
- Reconciliation procedures
- Payments through electronic means
- Reporting

11. FMISs help in transforming controls by shifting the manual controls to the automated system implying that the ex-ante controls exercised by the treasuries (particularly on payments) are automated in FMIS. Basically, a good FMIS will help governments to comply with the applicable regulations and rules. A high-risk area that could be the focus of internal audit are transactions that are outside the purview of FMIS in which the FMIS embedded controls are circumvented, presenting potential for irregularities. Setting up a FMIS without the necessary control functionalities could speed the hemorrhage of resources instead of controlling it[6]. Absence or inadequate controls in the FMIS in Kenya led to loss of millions of public funds[7].

12. Other features that could be included in FMIS and useful to the work of the internal auditor are: elimination of multiple parallel system for the same function; effective integration with other systems; inbuilt matching rules are applied which matches input with existing database (e. g. vendor name from the vendor master); and capabilities to generate automated exception reports based on pre-defined criteria.

13. A properly engineered FMIS focuses on different features that can assist internal auditors in their work, provide data for risk assessment and can reduce several audit steps. The internal auditor can test the design and effectiveness of these controls as a specific activity and can then let the system take over and conduct periodic audits to test the continuing effectiveness of these controls.

Leveraging data capabilities in FMIS for internal audit

14. FMIS applications house a large volume of data collected from/entered by multiple accounting centers or budgetary units covering most of the government functions, breaking down the data say into how and where the money was spent. This data can be leveraged for a variety of analyses and decision-making across departments.

15. Internal Auditors can leverage the vast amount of transaction data available in a FMIS system. The use of data analytics based on FMIS databases (often combined with data from other sources) promises enormous potential for use by internal auditors. They can answer questions

such as - where was the money spent? who spent the money and how much? and what was the payment trend? With data analysis, auditors can increase efficiency and take a deeper dive into key risk areas, reduce costs involved in auditing and monitoring and enable early detection of potential fraud, errors and abuse.

16. Some use cases of data are as follows, particularly from a performance audit perspective[8]–

- identifying spending trends by service or product sector (overall or by institution/sector)
- knowing which types of goods or services are associated with higher spending
- identifying how to better control "accounts payable" and detect inappropriate payments
- identifying how much different regional and national institutions are paying for the same items and under what conditions
- determining the main suppliers of goods and services and how much each institution spends on each
- identifying the cheapest, highest rated supplier
- identifying projects with the best financial performance in previous year(s)
- determining where spending at the current rate will exceed the budget and why
- supporting budget preparation based on cost analysis and the actual contribution of programs to the objectives proposed (and not based solely on previous year's execution with the addition of a growth factor)
- analyzing the data from other ancillary systems interoperated with the FMIS, such as the public procurement system

17. Data can be mined from a data warehouse that can extract data from the FMIS database (hence the need to understand the datasets configured in FMIS) and other systems and assessed based on pre-defined criteria to identify the audit universe. For instance, contracts awarded by government departments, either as a whole or office-wise, can be mined from FMIS and analyzed applying tools such as trends, value outliers, concentration on particular suppliers etc. and exceptions that can be included in the audit plan.

18. The technique of data analytics along with Computer Aided Audit Tool (CAAT) have been adopted by the supreme audit institutions in various jurisdictions and can be gainfully used by government internal auditors. For example, Comptroller & Auditor General of India used CAATs in the audit of e-procurement system in the state of Chhattisgarh in India that led to reporting of serious gaps in the e-procurement system including suspected collusion and unfair tender practices[9]. The auditor analyzed the data in the database of the e-procurement system through the business intelligence module and IDEA software tool.

19. Expenditure profiling of government expenditure is another use case of data analytics using FMIS and the granularity of the transactions can reveal several insights that would be useful to internal auditors in risk profiling (see Box 2). Using such data analytics can help internal auditors to do a risk-profiling of the government or the ministry/department they are auditing, review and assess the adequacy of internal controls and make constructive recommendations. The authors to the quoted study suggest a "differential risk-based control strategy" by subjecting low value transactions to less stringent ex-ante controls than high value transactions - this would enable easier access to small amounts of money that spending units need for their day to day operational needs[10].

Box 2 – Government Expenditure Profiling using FMIS

- **Pakistan** - most non-salary transactions processed through FMIS are of low value and do not make up a large share of the budget. Defense and railways related expenditure are left out of FMIS besides others.
- **Cambodia –** while FMIS coverage of the budget is good, the system may be used mainly for drawing advances (due to inordinate time to process payments through the treasury system of FMIS) and processing transactions offline indicating a wider control problem with the payment approval process

20. In many countries, supreme audit institutions have adopted technology and new audit approaches to leverage the functionalities and utilities in FMIS as is evident from the examples of Kenya and Chhattisgarh cited above. Internal auditors too could gainfully adopt such practices, which is not possible in the traditional transaction-based audit or the resources needed in a manual system may not be available.

Continuous online audits using FMIS

21. Today, it is recognized that the traditional manual auditing method of testing controls by performing the tests on a retrospective and cyclical basis, often many months after business activities have occurred only provides internal auditors with a narrow scope of evaluation and is often too late to be of real value to business performance or regulatory compliance.

Box 3 - Continuous Auditing- Definition

A methodology that enables independent auditors to provide written assurance on a subject matter, for which an entity's management is responsible, using a series of auditor's reports issued virtually simultaneously with, or a short period of time after, the occurrence of events underlying the subject matter

22. The modern way of conducting an internal audit is by performing control and risk assessments on a more frequent basis and one of the approaches used is Continuous Online Auditing (or simply called Continuous Auditing). See Box 3 for definition[11] and Box 4 for what a Continuous Auditing system does[12]). Continuous Auditing changes the audit approach from periodic reviews of a sample of transactions to ongoing audit testing of hundred percent of transactions (or whole population testing). Continuous Auditing can be considered as a meta control i. e. a control that provides information on other controls and is dynamic in the sense that it can be turned on and off depending upon the load configuration and the requirements of the audit plan. Continuous Auditing adapts to different IT environments and organizational changes.

Box 4 – What does a Continuous Auditing system do

- retrieves information from data sources, including databases, operating system files, and system logs
- analyzes data and detect deviations according to predefined rules
- maintains system integrity by establishing appropriate segregation of duties during an application's design, implementation, operation, and maintenance phases

23. There are six steps in implementing Continuous Auditing – i) establishing priority areas, ii) identifying monitoring and continuous audit rules, iii) determining the process' frequency, iv) configuring continuous audit parameters, v) following up, and vi) communicating results [13]. Practitioners advise that internal audit function should first automate its own processes and then transition to Continuous Auditing.

24. Continuous Auditing can be gainfully employed in FMIS as transactions are done digitally. This will help government officers to detect and correct erroneous and potential fraudulent transactions in a timely manner. This should be preceded by improving human resource capacity, internal audit infrastructure, internal audit governance arrangements and communication with key stakeholders. CAATs and the continuous audit approach can be converged to provide insights into the nature of the transactions. Malawi internal audit service is planning to adopt Continuous Auditing in their work[14] and use of ACL continuous auditing software in FMIS has started (see Box 5). Continuous Auditing was adopted in China in 2002 when the China National Audit Office launched a country-wide program called the "Global Auditing Project" with the objective of building a Government Audit Information System which facilitates the simultaneous use of budget tracing to track the government's budget management process throughout its life-cycle and employs Continuous Auditing to determine the reliability, conformity, and performance of the process.

> ***Box 5 – Malawi: Adopting Continuous Auditing in FMIS***
> Internal Audit Service of Malawi institutionalized ICT auditing and procured a computerized data extraction and interrogation tool (Advance Command Language or ACL) which was used to pilot audits of the FMIS and related HRMIS. One of the priority areas is procurement and implementation of continuous monitoring software for FMIS and HRMIS and carry out Continuous Auditing around these two applications to timely detect and correct erroneous and potential fraudulent transactions

25. In the context of government transactions, Continuous Auditing can be employed in situations such as purchases and cash transfers that are configured in FMIS applications. A purchase transaction (post procurement) involves four key steps namely issue of a purchase order, issue of good received note, receipt, processing and recording of invoice and payment to supplier usually through an electronic medium. Continuous Auditing rules can be configured such as matching rules to ensure payment for only goods received and accepted.

26. Other areas of application of Continuous Auditing in FMIS could be: highlighting locations where purchases are more than a specified limit versus the previous year/period; or identifying accounts with unusual activities; and flagging all extremely high-value transactions. Once the Continuous Auditing is up and running and has been tested, internal auditors need not audit these processes regularly and could rely upon the system controls once these are tested and their integrity is established.

Risk-based audit planning

27. In any government, there are hundreds of locations (auditees) and a large volume of transactions. Due to constrained resources, not all the locations or transactions can be covered in audit. In fact, it is not necessary to cover all the auditable units. FMIS data can help internal auditors to do a risk-based selection of locations to be covered under audit through physical presence. Based on data-driven criteria and necessary analytics, the need to visit all locations say

annually is minimized and only those locations that are beyond the criteria are included in the audit plan. For instance, criteria could be locations which exceed their original budget allocation by say 50%; or where the volume of purchases are more than 50% of the previous year; or in case of revenue departments, where revenue collected is significantly less than budgeted or in the previous year. These are examples of simple criteria, but internal audit can develop complex criteria for selection with multiple parameters. Processes can also be identified for audit based on such risk criteria, depending upon the risk assessment conducted by the organization or the auditors.

28. As discussed under expenditure profiling, a few spending units generate the largest transactions. Internal audit could focus on such high-value transaction spending units. This is another example of a risk-based approach, like focusing on large taxpayers on the revenue side. Such an approach could yield a very high audit coverage despite focusing only on a limited number of transactions.

Audit Module in FMIS

29. Business applications such as SAP and Oracle have an embedded Audit Module as a utility that identifies and reports transactions that meet or deviate from pre-defined criteria. An FMIS could also include an Audit Module that could have embedded audit functions which allows tests to be made at the time the data is being processed for a real time auditing. Audit reporting in the form of exception reporting or fraud alarming would occur more frequently and perhaps as transactions are processed. Data exchange between the Audit Module and the systems application server should be established. To reduce the burden on the host application most often data is transferred to a separate reporting server akin to data warehouses used in management information systems. Such a mechanism in FMIS can support both Continuous Auditing and risk-based selection of auditees/processes.

Limitation of FMIS

30. Benefits from FMIS can only accrue on government transactions that are routed through the application and which are subject to internal controls in FMIS versus those that are posted to general ledger after they have occurred[15]. Many times, the entire transaction is done offline and then entered in FMIS for accounting thus defeating the very purpose of the FMIS. In many jurisdictions, transactions may be initiated in FMIS or a related application but for instance approvals may be given offline on physical files and then a single person (often a data entry operator) who has informal access enters the transactions on FMIS. This undermines controls such as segregation of duties and access controls. Moreover, a FMIS could also be rudimentary having only the payments module. Such limitations need to be identified and factored in while internal auditors use FMIS in their work. These could be risk areas and perhaps internal auditors should focus more on these transactions versus those that are subject to the full suite of FMIS controls. Internal auditors could push their governments to bring all budgetary operations within FMIS.

Addressing skills gap

31. Internal auditors should be well-acquainted with FMIS systems including their development life-cycle. They should also be acquainted with the underlying technical and functional architecture and the controls in the FMIS application. Internal auditors should learn to conduct control testing to assess the controls that support the financial systems' internal controls over the input, processing, and output of financial data and transactions.

32. Internal auditors should effectively understand the underlying business processes and data flow/data structure of the government's FMIS solution. These can be mapped into the auditing process including auditing objectives, key controls and auditing rules. Auditing rules can be automatically embedded in the FMIS database to enable auditors to perform auditing tasks independently on a real-time basis. Internal audit manuals should be revised to include these aspects, including new audit approaches, and update the audit procedures and checklists accordingly.

33. Internal audit staff should acquire knowledge of data analytics to identify new opportunities and launch projects to bring together business know-how with available techniques and tools. Knowledge of CAATs is important for leveraging the power of FMIS so that audits can be undertaken effectively and efficiency. Every transaction in government results in generation of data and this helps identify trends and reviewing that the business transactions have been processed by the FMIS application in the desired manner. CAATs are tools to extract and interrogate data digitally instead of manually. Use of CAAT tools ensures the integrity of the source data. Payroll data and procurement transactions are use cases for internal auditors to leverage FMIS with the help of CAAT.

34. In Africa, majority of the internal audit agencies in the eleven countries surveyed do not use CAATs and rely on manual systems and processes. But with the introduction of new financial management policy in Ghana (FMIS), more and more internal audit functions are migrating to computerized tools. The tools commonly used are TeamMate AM (for audit management) and ACL and IDEA for data mining[16]. See Box 6 on Ghana's initiative in adopting CAAT.[17]

Box 6 – Ghana: Adopting CAAT
Ghana recognized that the introduction of FMIS requires that internal auditors are adequately trained in CAATs and other data generation and analytical tools. Procurement and deployment of ICT tools and data analysis software and ultimately making use of ICT tools as an integral part of the work of the internal auditors was one of the reforms undertaken in Ghana along with development of FMIS

Conclusions and Way Forward

35. Effective use of FMIS functionalities and data for internal audit needs is in its infancy. Proper advocacy, outreach and training can help internal auditors to gainfully use FMIS in their work, enhancing effectiveness, efficiency and relevance of the internal audit function. Internal auditors should increasingly be consulted in any FMIS modernization activity or related integration projects. In any implementation or modernization of FMIS, governments should include internal audit in the reform process and ensure that their capacity is augmented to take advantage of the controls in FMIS and leverage the data available. Access to FMIS should be provided to the internal audit function and arrangements made for them to use their CAATs for

data extraction and interrogation. Internal auditors need to understand the necessary actions required to implement Continuous Auditing process and establish audit priority areas and determine the audit frequency.

36. In several cases, government internal auditors will have no choice but to use FMIS in view of several processes having no paper trial, for instance where government receipts are fully on an electronic platform. It is inevitable that internal audit function cannot work to the exclusion of FMIS and continue to conduct audit in the traditional manual based transaction audit process. Vice versa, FMIS owners will have to involve internal auditors in FMIS development and provide access to the FMIS system for auditing purposes. And the sooner the two institutions converge, sooner the benefits of FMIS will flow to the whole of government. Internal auditors will need to have a technology-centric strategic plan and enhance their skills for better understanding of IFMS functionalities. Short of detailed knowledge of the systems architecture or the internal logic, internal auditors should know what kind of information resides in the FMIS application and how can it be used – FMIS owners should be transparent and provide this knowledge to the Internal Auditors, in addition to recruitment of people with the required skills. Internal audit function should be accommodated in FMIS and the function should have access to the FMIS database. In countries where the World Bank has GovTech components such as a citizen-centric service delivery project or a public financial management reform project, internal auditors could involve themselves in an advisory role.

37. Many governments employ professional private auditors to conduct internal audit either as an outsourced or co-sourced model. Relative to their government counterparts, many of these professionals are better familiar with emerging technologies particularly data analytics and new audit techniques and can apply these to government internal audit, if encouraged to do so, and if access is provided to the government's digital applications. Government internal audit agencies could gainfully employ professional private auditors and leverage their knowledge for enhancing quality of internal audit. However, this is easier said than done as these auditors may not have the requisite knowledge of government procedures. This can be addressed through an education process and selection of auditors with appropriate skills. This is also an emerging professional opportunity for private auditors.

38. There are rising expectations from citizens for the government to perform at par with the service standards of the private sector. Technology has the potential to boost government efficiency, transparency, responsiveness, and citizen trust. Internal auditors should gainfully use FMIS as a technological tool in their work to enhance effectiveness and efficiency of the internal audit function and making it relevant in the current environment, bringing benefits to the government and ultimately the citizens.

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