# Back to basic: data capabilities as a prerequisite for effective design and utilisation of financial management information systems

## 1. Introduction

Data science (technical) and data application (use of data for decision or policy making) capabilities are an essential complement to financial management information systems (FMIS). Without adequate human competencies to capture, analyse, present and use data, information systems become simply an expensive architectural shell without potential to improve expenditure control, oversight or decision making.

As part of an ongoing project on information systems in PFM, CABRI is investigating the manifestation of data capabilities amongst (i) FMIS design and maintenance personnel, (ii) public finance statistics managers and line ministry data controllers, (iii) data capturers including administrative, accounting, procurement, revenue and personnel clerks, and (iv) data end users who use the data from the system for policy analysis, allocation decisions, accounting and financial reporting and performance monitoring, in the Central African Republic (CAR), the Republic of Ghana, and the Republic of Guinea. Beyond the assessment of technical and analytical competencies, an overview of capacity building programmes is presented to understand how government fills the skills gap, ensures FMIS resilience and at what cost.

Delineating capabilities amongst these groups and identifying where gaps lie is essential for appropriate design of FMISs, effective utilisation of FMISs, designing and implementing tailored capacity building throughout the public sector, and ultimately facilitating data-driven and effective decision and policy making.

## 2. Data capabilities amongst FMIS design team and users in CAR, Ghana and Guinea

Table 1 summarises the key capabilities required of each group and how these present in CAR, Ghana and Guinea. Cells shaded in red indicate an absence of relevant capabilities, while those in blue indicate the presence of those capabilities.

Across the three countries, the following similarities in data capability gaps are shown:

- Weak system administration and support functions with significant skills gaps among design and maintenance teams.

- Generalised inability to analyse data beyond descriptive analysis such that trends and correlations are scarcely undertaken, which hampers policy and decision making. This is perhaps unsurprising considering that capacity building is oriented more towards data capture than data analysis.
- Classifying and comprehending accounting standards and budget classifications remains a challenge partly due to the complexity of international accounting standards and reforms, but primarily due to neglect of standards and classifications during training workshops. This results in inconsistent classifications across administrative functions and economic categories, misalignment with international accounting standards, and delayed and inaccurate recording of transactions[1]
- Inability to output large data sets for use off-system. This results in inefficiencies in the time required to process data for analysis, limited accessibility of data for various data users, and constraints in data visualisation as well as analytics.
- Skills transfer is limited due to recourse to foreign IT experts and across the three countries there are untapped opportunities for less experienced personnel to learn from experienced local staff.
- Training has not routinely resulted in significantly improved data capabilities or widespread ability to seamlessly operate FMIS.

**Table 1: Assessment of data capabilities in CAR, Ghana and Guinea**

| **FMIS design and maintenance team** | | | |
|---|---|---|---|
| | **CAR** | **Ghana** | **Guinea** |
| Comprehending financial (and non-financial) data sources, system objectives and user needs | | | |
| Determining key data, procedures and controls, how to structure data, and programme system accordingly | | | |
| Designing reports in different format | | | |
| Running system tests and adjust existing functionalities | | | |
| Continuous capacity building | | | |

[1] IMF Fiscal Affairs Department. 2019. HOW TO NOTE: How to Design a Financial Management Information System—A Modular Approach.

| | | | |
|---|---|---|---|
| Long-term system management, including database and data warehouse management | | | |
| Designing, devising and programming new functionalities and reports | | | |
| System upgrade | | | |
| Comprehending accounting standards and classifications | | | |
| **Public finance statistics manager and line ministry data controllers** | | | |
| Outputting large datasets for off-system use | | | |
| Cleaning and validating data to ensure accuracy, completeness and uniformity | | | |
| Consolidating and processing data for processing for consistent public finance statistical data series | | | |
| Defining and maintaining data categories and classifications | | | |
| **Data capturers** | | | |
| Competent in relevant software package (e.g. access, utilise, save and close templates) | | | |
| Knowledge of accounting standards and classifications definitions and their application in the institution to categorize and classify raw data | | | |
| Comprehending system flows, processes and data standards vis-a-vis internal controls | | | |
| **Data end users** | | | |
| Extracting pre-programmed reports | | | |
| Competency in the chosen software package (e.g. read reports, authorise steps and extract data) | | | |
| Compiling standardised financial accounts and reports | | | |
| Interpreting data for decision-making, monitoring and auditing | | | |
| Devising and applying analytical procedures to extracted data | | | |
| Identifying patterns and trends in data | | | |
| Effectively communicating and presenting findings | | | |

### 3. Country-specific data capabilities and capacity building efforts

**Central African Republic.** Public finance statistics managers and data capturers in CAR have the necessary skills to undertake their daily tasks with the System for Management of the Expenditure Chain (*Système de gestion de la chaîne de dépense informatisée* or Ges'Co). It is interesting to note that this situation prevails despite data capturers' not receiving any formal training nor transfer of skills from foreign service providers. Data capturers and IT technicians have been forced to learn on the job individually or with the help of other officials who had benefitted from training previously or who have become proficient in the use of the system. However, this process of learning on the job, is particularly inefficient given that data capturers in MDAs only use Ges'Co on a scheduled basis in the Ministry of Finance premises.

In CAR, gaps exist mainly within the system's design and maintenance team as well as data end-users. The gaps related to Ges'Co's design can be explained by the turnover of IT professionals who lose their motivation due to low salaries and limited opportunities for advancement. As a result, those who were fully proficient with Ges'Co have left for more attractive offers outside the government. However, the Budget Directorate calls upon them as consultants when the system experiences technical bugs. As a result, in-house IT staff is not highly qualified, specifically lacking structured query language (SQL) and programming skills. Moreover, they are not in possession of the system's source codes.

Data end-users are unable to conduct data analysis and to compile standardised financial accounts as well as reports. The extrapolation of the data is limited to the production of budget execution reports, the preparation of IMF and World Bank missions and the drafting of the Minister of Finance and Budget's speeches by the Directorate of Budget Preparation.

**Ghana.** The survey shows proficiency of financial statistics managers and data capturers and shortcomings both in the design and maintenance of the Ghana Integrated Financial Management Information System (GIFMIS), as well as in the use of the data. However, the similarity between all types of users is the "lack the requisite background in accounting which is essential in the use of the system"[2]. In other words, users should have a greater understanding of fundamental accounting and budgeting techniques as well as some knowledge of the government finance statistics.

Unlike in CAR, in Ghana, training and capacity building have played an important role in optimising the use of GIFMIS. IT professionals receive training that generally leads to professional certifications, whether it is from Oracle (courses/refresher, video tutorials, etc.) or EdX courses. They also get trained on the specifics of the platform by the Head of the Budget Technical Assistance and Support Unit who acknowledges that it takes an average of two years to have a firm understanding of the system, i.e. budget process, chart of accounts and approval hierarchy in the system. Thus, there are instances in which the IT function's support to other functions are not as coordinated as they could be because of knowledge gaps.

[2] Yaokumah, W., Biney, E. 2020. Integrated Financial Management System Project Implementation in Ghana Government Ministries

Interviews with Ghanaian officials reflect that a highly trained and skilled local IT team is essential in providing the requisite support needed by other functions and upgrading the system as required. While some recourse to foreign experts may be inevitable, and in some cases preferable, it is not only costly but also prevents optimal use of human resources and strengthening current personnel's skills.

**Republic of Guinea.** When taking stock of data capabilities in Guinea important gaps appear for each function. These relate not only to the inability to programme and update the system by the local IT team but also to the limited tasks of Create, Read, Delete, Update (CRUD), which prevent outputting large datasets for off-system use.

Regarding data capturers, their lack of understanding of system flows is mainly related to the recent changes in the system: the introduction of new modules of which they do not yet have full command. As a result, despite the training received, they often call upon the IT team for assistance on how and where to capture data. This questions the relevance and quality of the training workshops, which might not put enough emphasis on the assimilation of the reforms introduced.

Finally, data end-users access the system to retrieve or search for data relevant to their tasks to analyse budget execution and draft any relevant report for sector analysis. However, due to the system's configuration, the data analysis can only be performed off-system.

FMIS-related capacity building in Guinea has been led by a dedicated training department at the Budget Directorate. However, despite implementing training programmes as soon as new modules and functionalities are programmed, data capturers are not entirely at ease with using the system. This calls upon the training department to ensure that the right trainers are mobilised and the training programme goes beyond system issues and addresses gaps in knowledge and understanding of PFM processes more holistically.

## 4. Conclusion

Preliminary findings across the three countries included in this research, reflect that users have an overall command of public finance statistics control and consolidation as well as data capturing tasks; however, IT and data analysis present greater challenges. However, the proficiency in the former two functions hide that, on one hand, outputting large datasets for off-system use is a common challenge, mainly related to the design of the systems. This results in inefficiencies in the time required to process data for analysis, limited accessibility of data for various data users, and constraints in data

visualisation as well as analytics. On the other hand, data capturers' skills are challenged in contexts of rapid system change as they struggle to understand public-finance related flows and processes.

With regards to challenges in design, programming and maintenance, effective recruitment and retention of IT engineers, and investment in their training, is necessary to facilitate full ownership of and ability in the programming and upgrading of the FMIS. Moreover, that would avoid calling upon foreign expertise which is costly and may crowd out skill transfer within local teams. Finally, the challenges in data application arise due to lack of access to analytical tools and inadequate knowledge and skills to use data not only for the drafting of standardised reports but also for decision making.

To improve the use of the system and the data it produces, there have been efforts to institutionalise various forms of training programmes. These programmes mostly focus on the practical use of the system (which data to input, how to input it and where to enter it), however there is evidence that training programmes do not seem to result in full proficiency amongst users. This can be explained by four main reasons: (i) training curricula do not always respond to a well-identified gap in data or IT skills, (ii) training is either infrequent or inconsistent, (iii) high staff turnover and pervasiveness of new users, and (iv) frequent and complex reforms in budget processes, classifications and accounting standards limit users' mastery of FMISs. Moreover, capacity building on specialised competencies such as data interpretation, analysis and presentation are not provided, limiting the use of data for policy or decision making.