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Research Article

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Factors Affecting Integrated Financial Management Information System Application in Kenyan Public Sector

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Abstract: The research aimed at assessing the factors affecting Integrated Financial Management Information system application in Kenyan public sector. There has been a very little improvement in financial management in Kenyan public sector. The factors affecting the application of IFMIS have not been clearly investigated. Objectives were: to examine the effect of Technical Operation Skills; Level of IT Infrastructure, Management skills and assessing the association of split model diagrams for constructs derived from factors affecting IFMIS. Data was adopted from a thesis research, Sample size of 300 respondents, which consisted of employees from public sector. Data was analyzed by Structure Equation Modeling. Findings indicated an overall low significance on LOIT, with strong association by MgtS & *TOS*. Results on three Split model Path diagrams indicated that Mgts & LOIT have slightly strong association power (45%) while TOS & Mgts have a weak association power 25%. Results for Correlation of TOS,MgtS & LOIT indicate that Mgts & LOIT registered a very strong Correlation 97.5% indicating high association power. Its clear that factors Mgts & LOIT combine together to influence the IFMIS use. While TOS & Mgts posted a Correlation 0.841(84.1%), which was weaker compared to that of Mgts & LOIT hence low association power. Contribution of this research is: the use of second generation techniques; Structure Equation Modeling, Utilization of Model Split Path diagrams. Recommendation is tailed towards further research on LOIT to establish its low significance, the need to employ Model Group Comparison and a method of Bootrapping for future analysis.

Keywords Integrated Financial Management Information System (IFMIS), Structure Equation Modeling (SEM) and Analysis of Moment structures (AMOS)

1. Introduction

IFMIS in governance refers to the computerization of public financial management processes ranging from preparation of budget execution to accounting and reporting, with the help of an integrated system for the purpose of financial management [1]. According to Diamond and Khemani [2] and Chene [3], a well-designed IFMIS is a management model that gives a range of financial and non-financial information. Bhatia [4] erected strong support for IFMIS as an IS that integrates budget preparation, budget execution, accounting, financial management and reporting activities for effective financial management. IFMIS is coined with emerging factors which are categorized as hardware and software solutions that included integration of ICT infrastructure that expanded upon and extended the scope of traditional Manufacturing Resource Planning (MRP) systems. The Need for an IFMIS system application relied on basic infrastructures as important factors to function. Adequate IT infrastructure, hardware and networking are crucial factors for the success of an IFMIS project [5-6].

1.1. The study Overview

The study presents factors of IFMIS as: Technical operation Skills (TOS), Management Skills (MgtS) and Level of IT Infrastructure (LOIT). It provides a literature review, formulation and Development of Hypotheses .The methodology involves, Sample size, Respondents. Output is provided along with a brief, statistical interpretation

of results. Study covers analysis by the use of mean, correlation, covariant, Path split diagram to predict the, mean, variance error difference. Discussion of results, Conclusions and study recommendations are provided.

1.2. Technical Skills

Peslak and Boyle, [7] defines, Technical Operation skills as the introductory skills that you will need to develop in order to become comfortable with accessing and using computer programs. IT professionals must address the reality and, in some cases, the hangover of perception regarding their soft skills, which must be at least equal to those demonstrated by professional leaders across all sectors and organizations. Each type of technical specialist possesses a range of required skills that depends on the business field and job description. This study considers a technical skilled person to have information and high technology era, good technical skills and knowledge are a must for all level of management and job positions.

The uthor attests that it's essential for an IT technical skilled person to be able to **work effectively** with a wide range of computer software programs, applications, hardware, and devices. Typical use scenarios in technical operation include application design, customization, configuration, installations, development, testing and deployment [8]. This study argues that the effort and cooperation of technical team and operation experts, as well as end-users, is necessary for the success of an IFMIS use. Therefore, involving people with both institution and technical knowledge into the IFMIS system implementation is essential for success [8].

1.3. Management Skills

BISL [9] Content that to be a good IT manager is to understand IT success based upon a blend of skills that mixes IT craft, ability and knowledge with a true understanding of what the organization or public sector is trying to achieve. This study opines that technical ability and knowledge represent sound bedrock for an IT leader, who also portrays a picture of a skilled manager; however this is not enough in a modern world where information and technology can revolutionize business models, social norms, perceived wisdom and even nation states. The uthor in this study appraises that the vailability of skilled IT manager and their participation in the project is valuable to good Management Skills for a public sector. He erects strong support for Management skills to be linked to Users' skills since the quality of end users and their general IT skills are considered as one of the critical factors necessary for system success [7]. It is more likely for skilled users to understand the need for process changes than less skilled ones and in organizations where users have required skills and expertise, it is reasonable to suggest that IFMIS user success will be higher compared to where such expertise in management is lacking [10-12].

1.4 IT infrastructure

This study considers IT infrastructure as a major factor of IFMIS which include : Cables, Local Area Network (LAN), Wide Area Network (WAN), Network Security (NS), Network components and Network Software's (NSft).Radiofrequency Transmitter Receiver (RFTR), System security (SyStu), Application, software, Database (Dbase),Servers and Operating System software (OS). Research show that institutions rely on an IS infrastructure, consisting of hardware, software, networks, data, facilities, human resources and services to support their decision making, business processes, and competitive strategy [13]. Adequate IT infrastructure, hardware and networking are crucial for the success of an IFMIS project [5-6]. The more the complexity of organizational legacy systems (e.g., multiple platforms in enterprise applications), the higher the mount of technical and organizational efforts required in IFMIS application and vice versa.

2. Literature Review

Ifinedo [14] in his research asserts that IFMIS application is supposed to be secure from destruction, corruption, unauthorized access and breach of confidentiality so that there is efficient cash management. This research further content that Flexibility of local IFMIS design can decrease chances of failure in cash management. [15], analysis showed that a study of seven cases of companies in Finland and Estonia users obtain the best benefits from their system when they are assisted by consultants or suppliers who have communication skills and provide quality training programmes. Wang and Chen [16] and Ifinedo [17] also confirmed that the quality of

external expertise on IFMIS application influences the quality of the system. Study by De Guinea *et al*., [18] placed high premium on the management commitment saying it is positively correlated with the ease of IFMIS system application.

Guimaraes et al., [19] and Sabherwal et al., [20] confirmed that user involvement in the information system use has a significant effect on the system quality, concluding that the participation of the manager in initiating the system is important .In the context of IFMIS system application, Wang and Chen [16] showed that management commitment participates indirectly in IFMIS application quality via its positive influence on conflict resolution during the implementation process. Abdalla, I. H. [21] modified part of Heller's contingency model of leadership influential in skill use, job performance and job satisfaction. Data from a study of 97 British and Sudanese managers were used to test the modified model.

According to Staehr [22], IFMIS needs an infrastructure to support a variety of activities including reliable communication networks to sustain collaboration between learning programming. He further, argues that IT infrastructure includes: LAN,WAN. Radiofrequency Transmitter Receiver (RFTR), Application software, Database (Dbase), Servers and Operating System software (OS), which concurs with the literature in this study on IT infrastructure. The author argues that the case of developing countries, IFMIS system application is affected by the ICT infrastructure of the country. Staehr [22] contend that Management skills have been identified as one of the important factors in IFMIS projects [7].

Author erects strong support for Management skills to be linked to Users' skills since the quality of end users and their general IT skills are considered as one of the critical factors necessary for IFMIS system application success [7]. It is more likely for skilled users to understand the need for process changes than less skilled ones and in organizations where users have required skills and expertise, it is reasonable to suggest that IFMIS system application success will be higher compared to where such expertise is lacking [10-12]. In Rwanda there were three teams responsible for the development of IFMIS. Lack or little co-ordination between the teams resulted in IFMIS being incompatible with the system developed for the Rwanda Revenue Authority [23].
Australia and China have the relevant support, although the level of development is largely dependent on the technical operation, management skills and IT infrastructure of individual. India is still working to improve its readiness as a country. More resource-rich Universities in India have institutionalized the use of ICT infrastructure into their systems, but even they have several barriers to overcome before they can achieve their objective to deliver high-quality education seamlessly and operation of education systems [24].
A number of researchers have argued that technical skills are significant than others. For example, Lee and colleagues (2001) discovered that IS professionals, as compared to more experienced employees, are likely assigned to activities that are technical in nature**.** Several IFMIS studies, argue that the skills of IT professionals must be adequate to ensure success with system. It seems that IT systems are more likely to succeed in organizations where general IT skills and relevant in-house IT expertise is high [25-30].

2.1. Formulation and Development of Hypotheses

2.1.1. *Developing hypotheses for Technical operation Skills*

It was established that the establishment of an advanced information technology would introduce a change in management accounting practices; this study considers management accounting practices as IFMIS application. In the case of IFMIS systems, it is considered an important source of new accounting practices. In this study, it was proposed to focus on the technical operation skills of IFMIS systems and examine their impact on IFMIS practices. The uthor in this study formulates the following hypotheses:

H_1*: Technical operation skills has significant effect on use of IFMIS in public sector*

2.1.2. *Developing hypothesis for Level of IT Infrastructure*

According to Umble, Haft, & Umble [5], IT infrastructure includes: Cables, Local Area Network (LAN), Wide Area Network (WAN), Network Security (NS), Network components and Network Software's (NSft). Radiofrequency Transmitter Receiver (RFTR), System security (SyStu), software, Database (Dbase), Servers

and Operating System software (OS). Optimum IT infrastructure include: hardware and networking [6]. The following hypothesis is therefore formulated:

H_2: Level of IT Infrastructure has significant effect on use of IFMIS in public sector

2.1.3 *Developing hypothesis for Management skills*

In his thesis, Xu (2003) showed that management commitment is the most important factor among 25 factors in determining the quality of accounting information. In this study, if a public sector aspires to have good IFMIS use, it is necessary for managers to have the initiative to ensure that quality is adhered to. Ismail and King [31] showed that poor understanding of IFMIS use by managers deprives public sector of an IFMIS use that is able to align the information requirements with its technical capacity. Hence, this study puts formulated the following hypotheses:

H_3 : Management skills has significant effect on use of IFMIS in public sector

3. Methodology

Research Design: this research employed a cross-sectional descriptive survey. Quantitative research methods were key to this study. The respondents were selected from departments such as: Planning, Accounting, Security, Auditing, Budgeting, Finance, computing, Human Resource and Procurement. Instruments used were Questionnaire for data collection. The forms of the question were developed as either closed or open. Data was adopted from a ***Thesis research*** on public sector (Sanja .M.,M.,2017), whose Sample sizes was 300 respondents. The study focused on IT staffs and management department at Counties, Public universities, Government Treasury and Parastatals.

4. Analysis and Results

Data was analyzed by Structure Equation Model using (AMOS). Analysis of MOment Structures implements general approach to data analysis known as structural equation modeling (SEM), also known as analysis of covariance structures, or causal modeling. In this study correlation and covariance each measure and summarize the strength of *bivariate association*, but the correlation is a *scale-free* measure (which ranges between -1 and +1), while the covariance is a *scale-dependent* measure (which can range between negative and positive numbers of arbitrary magnitude, depending on the metrics of the constituent variables). This study argues that scale free nature of the correlation can be very useful if you want to compare the strengths of bivariate associations across variables and settings. Covariance, on the other hand, retains and incorporates the scaling of its constituent variables, and therefore contains additional information that becomes useful when one wants to do more than simply chat about the strength of association

4.1. Analysis of Mean

Results in Figure 4.1 show that LOIT had the highest mean 2.10 and TOS had the lowest mean 2.02. However the mean difference has very minimal range. The results portray a mean difference of 2.10 - 2.04 = 0.06 (6%) as it ranged from the highest to the lowest while 2.04-2.02 = 0.02 (2%)

4.2. Analysis of Correlation

The study analyzed the Correlation of Technical operation skills sub- model, Management skills sub- model and level of IT Infrastructure sub- model. Correlation is practically generated from standardized menu of AMOS and that of covariance is generated from unstandardized menu of AMOS. Results in table 4.1 and figure (4.1) generated from AMOS indicate that (Mgts – LOIT) registered a strong (association) Correlation 0.975 (97.5%), which is the highest as indicated by difference (Mgts model – LOIT model) the two are related with an association on each other .While (TOS model – Mgts model) posted the lower Correlation 0.841(84.1 %) in other words the variables together have a low association .The study went ahead to establish Covariance of variables, the uthor argues that the notion of covariance between two variables is closely related to correlation, but potentially more useful than the notion of correlation.

4.3. Analysis of Covariance

Estimating the *covariance* of one variable with another offers another important way of summarizing the strength of association between the two variables .This study tested the covariance, this study content that a covariance is the foundational quantity from which correlation is derived. A correlation coefficient is simply the covariance between a pair of standardized variables. The study tested covariance of technical operation skills model , Management skills model , and level of IT Infrastructure model , since estimating the covariance of one variable with another offers another important way of summarizing the strength of association between the two variables by (John B., 2011). Results in figure (4.2) indicate Mgts – LOIT have an association power 45% while TOS – Mgts have have a weak association power 25%.

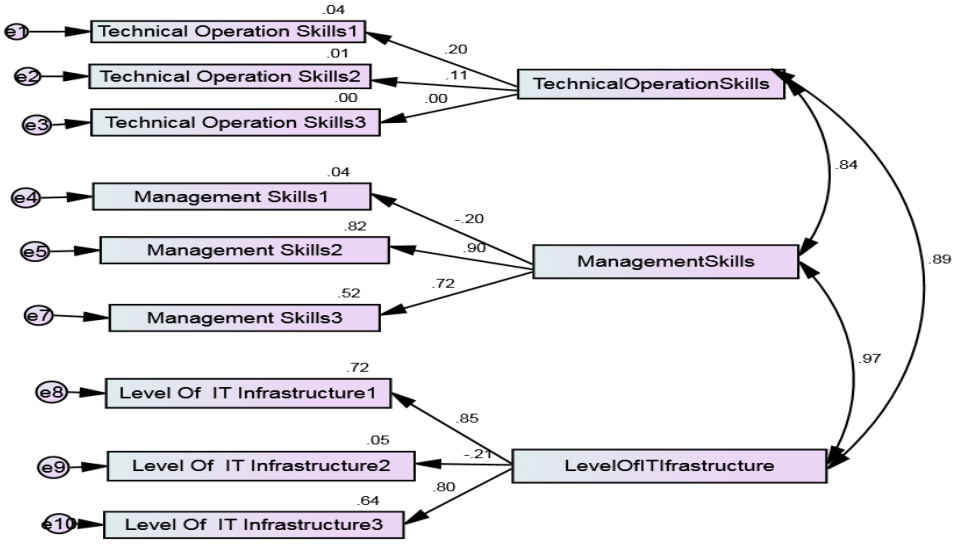

Figure 4.1: Three Split Path diagrams Correlation (Standardized)

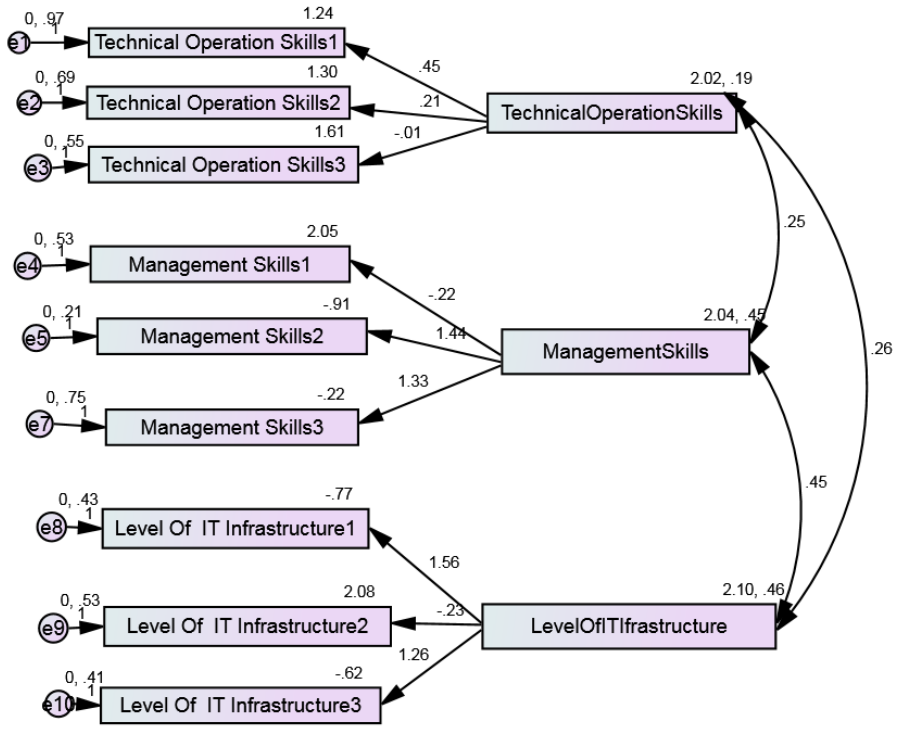

Figure 4.2: Three Split Path diagrams: Covariance

Results in 4.1, show that TOS – Mgts: yielded the Mean 2.02; Correlation 0.841 and Covariance 0.250, these results are lower than results obtained by (TOS – LOIT) and (Mgts – LOIT),while results for (Mgts – LOIT) are the highest as indicated in Table 4.1 (Mean 2.10; Correlation 0.975 and Covariance 0.450

Table 4.1: mean, Correlation and Covariance

	Mean	Correlation	Covariance
TOS – Mgts	2.02	0.841	.250
TOS – LOIT	2.04	0.886	.260
Mgts – LOIT	2.10	0.975	.450

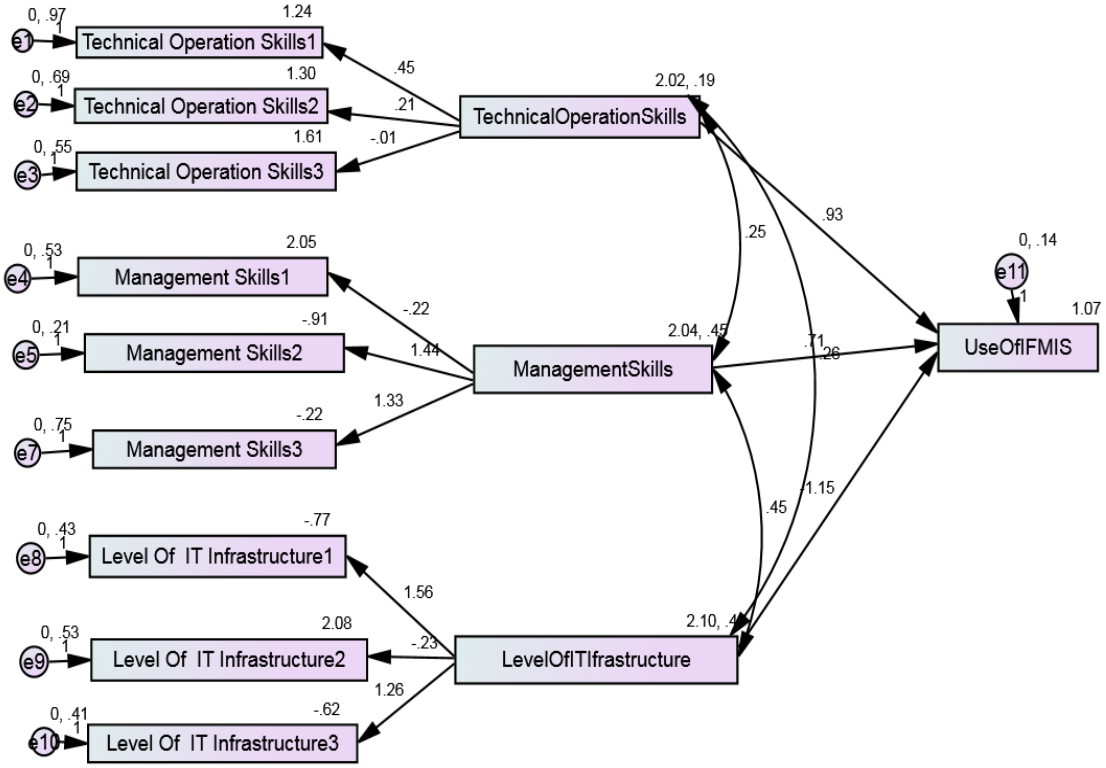

Figure 4.3: Three Split Path diagrams

4.4. Test of Hypotheses

Hypotheses were tested by means of variance, the study established that by dividing the variance for *Technical Operation Skills* with its standard error it gives the critical ratio = 0.454 /0.115 = 3.948. In other words, the variance is 3.948 standard errors above zero. The probability of getting a critical ratio as large as 3.948 in absolute value is less than 0.05, the departure form 0.05 indicates that Technical Operation Skills has a significant different on IFMIS use at 0.05 level. The variance for management skills is 3.978 standard errors above zero. In other words management skills has a significant different on IFMIS at 0.05 level.

The variance for management skills is 3.978 hence its standard errors are above zero. In other words, the variance for Level of IT Infrastructure is 1.454 standard errors below zero. The probability of getting a critical ratio as small as 1.454 in absolute value is less than 0.001. In other words, the variance estimate for Level of IT Infrastructure is not significantly different on IFMIS use, since 0.146 is greater than 0.05.

Table 4.4: Variance for Test of Hypotheses

	Estimate	S.E.	C.R.	P	Comment
Technical Operation Skills	0.454	0.115	3.948	***	Is Sig
Management Skills	0.183	0.046	3.978	***	Is Sig
Level of IT Infrastructure	0.051	0.035	1.454	0.146	Not sig

5. Discussions

Results for Correlation *of technical operation skills, Management skills and level of IT Infrastructure* indicate that (Mgts – LOIT) registered a strong Correlation 0.975 (97.5 %), which is the highest as such (Mgts – LOIT) combine together to influence the IFMIS while (TOS – Mgts) posted the weak Correlation 0.841(84.1 %). Similar study by John [32] in their analysis obtained changes in both distraction types cause a statistically significant reduction in test scores. Similar study by Ranzato [33], did a study on system image using one set of binary latent features that model the image-specific covariance and a separate set that model the mean. Study by Ranzato [33], examined parameters of the model, in his study he used 81 filters to encode the mean, 576 filters in C to encode covariance constraints and pooled the filters into 144 hidden units through matrix P. P is initialized with a two-dimensional topography. Studies done by Osindero [34] did a study on covariance part of the model it produced features that are more discriminative, but modeling both mean and covariance further improved generalization.

Previous research argues that the technical operation of the system as the bility of all its technical characteristics to design and consequently to use IFMIS. More so the technical operation on IFMIS use, in Rom [35] test indicated a strong positive significant. Similar studies done by Li [36] tested hypothesis on Infrastructure , it identified 14 such information technology tools, among them Electronic Data Interchange , (ERP), internet, and extranets, study established that grouped tools were significant use of ERP, it was channeled into three groups in terms of their primary purpose: communication tools, resource planning tools, and supply chain management tools. Given this classification, two sub factors are considered in this research: communication and planning tools.

Studies by Abdalla [21] attest that there is a strong effect between skills and Obong'o [37] vindicated system performance following a critical evaluation of the skills required to improve the performance of Ministries of Government in Kenya through the personal computer system. Moreover, completeness, compatibility, usability and integrality of the current systems should be achieved and current infrastructure might be upgraded [38].

Conclusion

Study findings indicate that Covariance between Management Skills and Level of IT Infrastructure have the strong association power, while Level of IT Infrastructure and Management Skills have the weak association power. The management is more vigilant. Findings confirm that Correlation between (Mgts–LOIT) had a strong Correlation, which is the highest so far. While (TOS–Mgts) posted the weak Correlation, the variance estimate for Level of IT Infrastructure has no significantly different on IFMIS use, Technical Operation Skills has a significant different on IFMIS use at 0.05 level .

Data was analyzed by Structure Equation Models using Analysis of Moment structures. Findings indicated an overall low significance on LOIT, with strong association on MgtS & *TOS.* Results on three Split Path diagrams indicate that Mgts & LOIT have high association power 45% while TOS & Mgts have a weak association power 25%. Results for Correlation of TOS, MgtS & LOIT indicate that Mgts & LOIT registered a strong Correlation 97.5% indicating high association power. Its clear that factors Mgts & LOIT combine together to influence the IFMIS use. While TOS & Mgts posted the weak Correlation 0.841(84.1%) hence low association power. Contribution of this research is: Use of second generation techniques; Structure Equation Models, Utilization of Model Split Path diagrams.

Recommendation

The study recommends that the dministration should ensure the information generated by IFMIS is consistent, timely and adequate. Recommendation is tailed to, further research on LOIT to establish its low significance, the need to employ Model Group Comparison and a method of Bootrapping is called upon, lastly the government should consider the pplicability of Mgts & LOIT on IFMIS in Public sector

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