The Role of Technical Factors in the Development of Performance Management Frameworks in Intergovernmental Organizations

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Abstract

Performance measures are the stricter indicators of performance that have endured the test of time. Both conventional and modern-day management have maintained the centrality of metrics that are represented in numbers, percentages, ranks and other quantitative figures as the central indicators of performance, albeit the inclusion of other non-metric indictors. In the process of developing the performance measures, a threshold of technical factors has been found to be widely required in the studies across the globe. The purpose of this study was to examine whether the widely advanced technical factors including personnel competences, analytical capabilities, and technology, would be supported in a related study conducted in IGAD in the African context. IGAD which formed the unit of analysis in this study, is a project-oriented institution that employs performance measures as an important performance management tool. The study followed a non-experimental research design methodology and copies of questionnaires were distributed to 108 respondents online. A response rate of 93.5% was realized. From the study, it emerged that, the said technical factors of personnel competences, technological and analytical capabilities were statistically positively related to the development of performance measures. As such, it is concluded that, this study offers support to other scholarly works that have found technical factors to be critical antecedents in the formulation of performance measures.

Keywords: Analytical Capabilities, Key Indicators, Personnel Competences, Performance Measures, Technology, Technical Factors.

Introduction

The performance of any entity is vital in determining the degree to which the entities vision, mission, and objectives are being achieved. At whatever point, the measured performance provides an update of the degree to which the entity is on course of the achieving the said different key indicators. Such a performance, depending on the degree to which the entity is on its course, informs the subsequent corrective measures which could be either to continue on the course, make slight adjustments, major adjustments, or even completely change an entire course of direction.

While the performance of an entity is vital, the measures accuracy is heavily dependent on the successful development and implementation of a performance measures framework [1].

The successful development of a performance measurement framework is of importance towards the performance of an entity for a number of reasons. One of the reasons is that, a performance measurement framework, provides guidelines and rules that are followed to measure the performance of an entity. The performance of an entity could be defined in terms of strategic goals that take longer period, annual goals, and even technical

goals [2]. Such goals are then cascaded to different levels which could entail department, teams, and right down to individuals. Undoubtedly, in order to have an effective performance measure, a facilitative framework is necessary. Another importance of a performance measurement framework is that, it forms a foundation through which an entity formulates the different human resource interventions such as, staffing, training programs, work designs, and employees' contracts [3]. The said interventions follow the expected performance goals, formulation of which is guided by a performance measurement framework. Equally, a performance measurement framework is a foundation of an effective performance management, as it provides the guidelines on the appropriate metrics through which performance is defined [4]. The said importance is in line with the long standing view that, "what cannot be measured cannot be improved.'

Relatedly, successful implementation of a performance measurement framework, which is also among the objectives of this study, is a central process in matters relating performance of any entity [5]. As noted, performance measurement framework helps to guide the performance standards, rules and contracts entered between an entity and the employees [6]. As such, a performance measurement framework affects both the organizational structures, its production and service delivery processes, and the various staff members involved in the different process of production and service provision [7]. Given its impact on structures and the staff, successful implementation of a performance measurement framework calls for a threshold of factors and capabilities that are worth investigating.

As to the threshold of factors that are necessary to the successful formulation of performance measures, the resource based theory provides a persuasive model to guide a study [8]. The resource-based theory purports that the strength of the resource endowment can

be instrumental in determining the degree of success an organization achieves towards its realization of set objectives and in the competitive world [8]. In this study, it is advanced that, for an organization to successfully formulate and implement a performance measurement framework, it needs a threshold of technical resources that are important antecedents [9]. In particular, the technical factors considered worth examining include, the capability to determine performance indicators, management system, and analytical capacity [2].

Drawing from resource-based theory, there is a wide consensus that a threshold of technical factors would be necessary to facilitate the development of performance measurement framework [10]. Nonetheless, few single studies have been conducted to specifically, purposely and exhaustively determine the critical array of technical factors that have the strongest impact in the development of performance measures. Instead, many studies have mainly generalized both non-technical and technical factors together. In addition, most of the available studies have mainly assessed performance framework of profit making or nongovernmental organizations [10]. A few have examined the technical factors that affect the performance framework of complex intergovernmental organizations, like the Intergovernmental Authority on Development (IGAD), which forms the entity of interest in this study [11]. The said gaps provided an opportunity to undertake a single study aimed at assessing the key technical factors that influence development of a performance framework for further processing.

In terms of the available literature, technical capacity provides a threshold of capability to develop a performance measurement framework that meets both the performance management principles in general, and the specific needs of the organization. Notably, a performance indicator, majorly referred to as key performance indicators, are measurable

values that determine how effectively an individual, team or organization is achieving a business objective [10]. Specifically, a key performance indicator, is a quantifiable measure that can be used to assess the degree of progress that an individual, a department, or an organization makes towards achieving the intended results [12]. An effective key performance indicator ought to be relevant and adequate to guide the performance in organization. In stricter terms, the key performance indicators are expected to meet what has been termed as the "SMART (Specific, Measurable, Attainable, Relevant and Timebound) test [13]." Undoubtedly, developing such key indicators requires technical competences.

In another positive development in the modern world of work, some organizations have devised key indicators that can tracked in real time [14]. This is mainly enabled through technology that can capture almost every task undertaken in an organization [15]. Thanks to smart technology, it is possible to develop key indicators that can be automated as to have a track that can enable real-time information about the performance of the organization right from individuals and aggregated to the organization wide level [16].

Based on the aforementioned information on what amounts to a practicable performance measure, the success factors and the fine details of how to develop one, there is enough justification to argue that a threshold of technical competence would be needed. Such capability entail dividing goals into small jobs as to identify the KPI that would be assigned to individuals, departments and the entire organization. Such a task would require expertise among personnel and possible use of technology and related aids.

In terms of the widely advanced technical factors in the development of performance measures, technology ranks among the critical technical factors. In particular, Management information system is a central factor that can

aid in the development of performance measures at all levels of organizations [17]. There is thus a wide consensus that MIS is vital tool. The question on cards however, is the ability to select the right MIS for the intended use, and this is what amounts to technical capabilities.

In regard to the centrality of MIS performance measurement framework, is that it aids in information, analysis, and reporting as to enable decision making regarding the same. In this regard, the degree to which the process can be hastened is partly, the degree to which performance measures would be appropriate [18]. Ideally, all organizations, regardless of the means, are expected to collect information, analyze it and use it to develop workable performance measures [19]. This is so since performance measures is part of performance management. With MIS especially the updated versions, organizations are able to have an almost real-time processes of obtaining the said information and providing report [20]. This amplifies the centrality of MIS in performance measurement framework.

Equally, Analytical capacity is a technical factor that is worth consideration during the formulation of performance management measures. Important to note is that, performance measures are largely dependent on numbers and metrics. The analytical capacity to collect and analyze different aspects of works to be done and objectives to be achieved becomes significant [21]. In this regard, an institution in question may need to analyze past historical data of works done before in an organization and other better performing organizations as to adopt measures that are appropriate for subsequent project [22]. Additionally, the process may involve practical case study and experiments where analyses are undertaken in order to develop measures that are practical [23]. All the said processes call for analytical capacity which falls under the technical capacity required of an organization when developing performance measures that

are to be appropriate [21]. The analytical capability can either be in terms of human capacity or technology.

Further, personnel technical capacity is required in order to develop performance management measures that are aligned to the organizational goals [24]. Organizations are meant to achieve a given long term objectives and as such, ensuring that departments and projects are formulated with the strategic goals in mind. The process requires cascading the specific measurement indicators to each of the departments and project which are to be formulated, and ensuring that they are aligned to the main strategic goals. The said processes can effectively be achieved when the key players involved in the formulation of the performance measures possess the technical capabilities to do so [25].

Given the assessed scholarly views, a study seeking to find out the key factors that fosters the development of performance measures, may have to bear in mind of the centrality of the technical factors in terms of the personnel capacity, technology, and any related capabilities. This particular study sought to examine the extent to which technical factors have influenced the development of performance measures framework in the Intergovernmental Authority on Development (IGAD) which is one of the African Union's Regional Economic Communities

Materials and Methods

The present study followed a non-experimental research design method [27] that focused on a single target group of individuals from one intergovernmental organization called the Intergovernmental Authority on Development (IGAD), located in Djibouti city, the Republic of Djibouti, which served as the unit of analysis.

Study Variables

The study had technical factors as the independent variable for the study while the development of performance management measures formed the dependent variable. From the reviewed literature, technical factors included technology, analytical capacity, and personnel capacity [26].

Survey Instrument

The majority of the survey questions were adopted from the survey instrument of Eliuz, 2016, however, a few new questions were added based on the theory and literature reviewed. These questions were measured on a five-point agree/disagree Likert scale. The study collected primary data using a quantitative approach with the questionnaires administered through an online survey tool.

Sampling Techniques and Size

The Intergovernmental Authority on Development (IGAD) was purposively [27] selected as a single target group for the study. The target population are the IGAD staff members who are grouped in four categories namely, Senior management, programme managers/coordinators, project experts and support staff. For this study, the sampling frame included only the list of staff categories involved in the development, implementation and utilization of the performance measurement framework. Therefore, the total target population of relevant staff in the organization at the level of senior management, Managers or coordinators and Experts is 108. From this small population size, a sample size of 103 staff members was randomly selected from the three relevant strata at 99% confidence interval and 3% error of margin. However, given the already small population size of the study, it was decided to interview everyone from the target population.

Results

Respondent's Demographics

Out of the 108 questionnaires that were distributed, 101 were retrieved by the time the data collection was completed and as such, a

response rate of 93.5% was realized. The demographic details relating to the participants showed that the male respondents formed a large majority of the people that participated in this study constituting 73.3%. A majority of the respondents were in the 50-and above age group representing 26.7% of respondents. In addition, majority of the respondents had served the institution for 10 and above years representing 25.7% of the respondents. In respect to the period the respondents had served in performance management, majority had served between 3 and 10 years, representing 50.5% of the respondents. Finally, majority of the respondents had been holding the position of a specialist and this constituted 61.3%. In conclusion, the respondents were well acquainted with aspects of performance management which was the factor of interest in this study.

Confirmatory Factor Analysis for the Technical Factors

After undertaking a confirmatory factor, the initial classification of the independent variable, the technical factors were revised to technology capabilities and personnel competences.

Development of Performance Measures

The survey instrument had five panels of statements relating to development of performance measures. For each of the development of performance measures statements, individual responses were scored according to the following ratings as shown in table 1 below:

Table 1. Five-Point Agree/Disagree Likert Scale Applied in the Study

Five Point Likert	Scale
Strongly Disagree	1
Disagree	2
Neutral/no opinion	3
Agree	4
Strongly Agree	5

In each panel, a mean response was calculated for each of the supporting statements, and an average of all supporting statements compared with the mean response to an overall summary statement. Mean responses between 4.50 and 5.00 were interpreted as an informal indicator of strong support for the statement; between 3.50 and 4.50 were interpreted to indicate moderate support; responses between 2.50 and 3.50 were interpreted as inconclusive; and responses between 1.00 and 2.50 were interpreted to indicate a clear disagreement with the statement. A Cronbach alpha statistic was also calculated to assess the level of internal consistency within each panel. Cronbach alpha scores were interpreted according to the range of values shown in table 2 below.

Table 2. Cronbach's Alpha Range

Cronbach's Alpha	Internal Consistency
> 0.90	Excellent
.80-.89	Good
.70-.79	Acceptable
.60-.69	Poor
<.60	Unacceptable

Source: Hair et al (2006)

Table 3. Analysis of Internal Consistency of Responses to Development Factors Affecting PMFs

Development of Performance Management measures	Mean	Std. Deviation
IGAD has adequate number of staff involved in developing PMF	2.88	1.07
IGAD's PMF is derived from international standards and guidelines already developed by the Organization	3.28	1.08
Developing PMF is mandatory for all IGAD programmes and projects	3.49	1.08
IGAD Senior Management enforces strict compliance to development of PMF	3.51	1.04
IGAD has staff capable of collecting performance data in a timely manner.	3.37	0.87
The use of performance measurement helps managers and coordinators to better develop solutions to managerial and operational problems in their departments	3.15	0.71
IGAD's PMF has stimulated organizational learning and feedback about performance measurement issues and improvement across departments	2.72	1.08
IGAD Directors, Managers and Coordinators frequently hold meetings to discuss performance measurement issues	4.23	0.82
Grand mean	3.33	
Cronbach Alpa statistic	0.86	

Development of Performance Measures

The table 3 below shows a summary of responses in respect to the development of performance measures panel of statements.

The responses to supporting statements showed a variable pattern of moderate support and inconclusive support for the supporting statements, and the Cronbach alpha statistic showed an "acceptable" level of internal consistency. The mean score across all supporting questions suggested that there would be a range between inconclusive and moderate level of support for the summary statement. However, the responses to the summary statement show an "inconclusive" level of overall support.

Correlation and Regression Analyses

In this study, the degree of correlation between each of the nontechnical factors summary statements and the development of performance measures framework was conducted. A Spearman Correlation procedure was conducted to analyze the relationship between the variables of interest. The correlation scores were interpreted according to the range of values shown in table 4 below.

Table 4. Spearman Correlation Coefficient Range

Spearman Statistic	Strength of relationship
> 0.80	Very Strong
0.60-0.79	Strong
0.40-0.59	Moderate
020-0.39	Weak
<0.20	Very Weak

A summary of correlation results is as shown in table 5 below. Regression analysis further helped to assess whether the independent variables had a significant influence on the dependent variables. This helped to determine whether the hypotheses were supported or not.

Table 5. Correlation of Technical Factors and Development of Performance Management Measures

Correlations			1	2
Spearman's rho	1.TechnicalFPMMIGAD	Correlation Coefficient	1.000	.548**
		Sig. (2-tailed)	.	.000
	2.Development OFPMCIGAD	Correlation Coefficient	.548**	1.000
		Sig. (2-tailed)	.000	.
**Correlation is significant at the 0.01 level (2-tailed).				

From the above result, there was a moderate positive relationship between technical factors and the development of performance measures (r=.548). The relationship was also significant at .01 significant levels. This suggests that technical factors are positively associated with the development of performance measures.

The regression results in table 6 show that technical factors predict 23.4% (Adj. R Square=.234) variance in the development of performance measures. Technical factors are again found to be statistically significant predictor of development of performance measures given the p value(sig=.000) which is less than .05.

Table 6. Regression of Non-Technical Factors and Development of PMF in IGAD

Regression Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.492ª	.242	.234	.51696
ªPredictors: (Constant), TechnicalFPMMIGAD				

Coefficientsª						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.662	.324		5.124	.000
	TechnicalFPMMIGAD	.558	.099	.492	5.623	.000
ªDependent Variable: DevelopmentOFPMCIGAD						

In accordance with both correlation and regression results, technical factors were found to positively impact on the development of performance measures.

Discussion

The following section presents a discussion on the possible reasons why the results to the study turned out to be the way they were. According to the study, the technical factors of importance in the development of the performance measures in IGAD are technology capabilities and personnel competences. This view can be supported by the available literature which suggests that technology capabilities and personnel competences as the critical thresholds in the development of performance management frameworks.

In respect to technological capabilities, it is important to note that, in modern work environment, technology stands as highest-ranking factor that has been impactful in almost every aspect of organizational life [4]. Accordingly, performance management is one of the organizational management processes that benefits from technology [28] and thus the finding that technological capability being a technical factor that influences performance management measures processes of development, implementation and performance is admissible. Technology, more so information technology, could be instrumental in the projections, collection of data, analysis and reporting, and other assistance in management [29]. Such systems as Management Information Systems that assist in management are critical and could have been important in the processes of development, implementation and performance of performance management as have been found in other management processes in different organizations across the globe [30].

In categorizing personnel competences under the technical factors that could be instrumental in influencing development, implementation and performance management measures, the available literature is supportive. It has been noted that, in organizational management principles, technical competences are required where expertise knowledge is needed [1]. In the processes of development, implementation, and the performance of performance management measures, the technical capabilities could be in terms of expertise in framework formulation, expertise in performance measures yardstick, implementation, and even in detection of the degree to which such performance measures are achieving the set objectives [31]. From the available management scholarly works, expertise knowledge alternatively regarded as technical capabilities, are instrumental in the various management functions which includes performance management [32].

In conclusion, the grouping of the technical factors that affect the development, implementation, and performance of performance management measures into technological capabilities and personnel capabilities is well supported by management scholarly works.

Conclusion

Performance measures form the basis for performance management in organizations. Practically, there are general metrics of projected organizational indicators and then cascaded downwards to cover departments, teams and individuals. To effectively develop such measures, a threshold of factors is expected. In this study, the aim was to examine the technical factors that are critical in the development of performance measures framework in a project-oriented entity, and in particular the IGAD. The purpose was to find out if the factors that have been found to be salient from the previous studies would be the same factors that can be considered important in the entity of interest. Based on the results, the main technical factors namely personnel competences, analytical capabilities, and technology, which have been found to be important in the development of the performance measures, were supported in the present study.

Conflict of Interest

There's no conflict of interest

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References

[1] Mio, C., Costantini, A., & Panfilo, S., 2022, Performance Measurement Tools for Sustainable Business: A Systematic Literature Review on the Sustainability Balanced Scorecard use. *Corporate Social Responsibility and Environmental Management*, 29(2), 367-384.

[2] Adhikara, A., MF, M., & Nur Diana, M. B., 2022, Organizational Performance in Environmental Uncertainty on the Indonesian Healthcare Industry: A Path Analysis. *Academic Journal of Interdisciplinary Studies*, 11(2), 365-377.

[3] Sauermann, J., 2023, Performance Measures and Worker Productivity. *IZA World of Labor*.

[4] Hervani, A. A., Nandi, S., Helms, M. M., & Sarkis, J., 2022, A Performance Measurement Framework for Socially Sustainable and Resilient Supply Chains using Environmental Goods Valuation Methods. *Sustainable Production and Consumption*, 30, 31-52.

[5] Sutrisno, S., Prasetyo, H. A., & Faot, A. I., 2022, The Measurement of Human Resources Employees by using Human Resources Score Card Method and Analytical Hierarchy Process Method. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*,5(2).

[6] Borji, A., 2022., Pros and Cons of GAN Evaluation Measures: New developments. *Computer Vision and Image Understanding*, 215, 103329.

[7] Danilwan, Y., & Dirhamsyah, I. P., 2022, The Impact of the Human Resource Practices on the Organizational Performance: Does Ethical Climate Matter? *Journal of Positive School Psychology,* 6(3), 1-16.

[8] Barney, J. B., 1996, The Resource-Based Theory of the Firm. *Organization Science,* 7(5), 469-469.

[9] Unegbu, H. C. O., Yawas, D. S., & Dan-Asabe, B., 2022, An Investigation of the Relationship Between Project Performance Measures and Project Management Practices of Construction Projects for the Construction Industry in Nigeria. *Journal of King Saud University-Engineering Sciences,* 34(4), 240-249.

[10] Al Dakheel, J., Del Pero, C., Aste, N., & Leonforte, F., 2020, Smart Buildings Feature and Key Performance Indicators: A Review. *Sustainable Cities and Society,* 61, 102328.

[11] Armstrong, M., & Taylor, S., 2023, Armstrong's Handbook of Human Resource Management Practice: A Guide to the Theory and Practice of People Management. Kogan Page Publishers.

[12] Kim, D., Oh, W., Yun, J., Youn, J., Do, S., & Lee, D., 2021, Development of Key Performance Indicators for Measuring the Management Performance of Small Construction Firms in Korea. *Sustainability,*13(11), 6166.

[13] Sagala, A. I., 2022, Analysis of Application of Key Performance Indicator With SMART-C. *International Journal on Social Science, Economics and Art,*12(3), 113-121.

[14] Manoharan, J. S., 2021, Study of Variants of Extreme Learning Machine (ELM) Brands and its Performance Measure on Classification Algorithm. *Journal of Soft Computing Paradigm (JSCP),* 3(02), 83-95.

[15] Atmaja, D. S., Zaroni, A. N., & Yusuf, M., 2023, Actualization of Performance Management Models for the Development of Human Resources Quality, Economic Potential, and Financial Governance Policy in Indonesia Ministry of Education. *Multicultural Education,* 9(01), 1-15.

[16] Dacholfany, M. I., Khataybeh, A. M., Lewaherilla, N. C., Yusuf, M., Sihombing, H. B. M., & Chang, M. L., 2022, Application of The Balanced Score Card Concept as a Human Resource Performance Measurement Tool at the Ministry of Higher Education in Indonesia. *Multicultural Education,* 8(04), 1-13.

[17] Hanafi, R., Setiawan, W., & Dirgantari, P. D., 2021, Design of Performance Management Business Process in State-Owned Enterprise in Field of Construction. In *5th Global Conference on Business, Management and Entrepreneurship (GCBME 2020)* (pp. 251-256). Atlantis Press.

[18] Mayer, J. H., Esswein, M., Göbel, M., & Quick, R., 2022, Getting Digital Technologies Right—A Forward-Looking Maturity Model for Enterprise Performance Management. In *Sustainable Digital Transformation: Paving the Way Towards Smart*

Organizations and Societies (pp. 183-201). Cham: Springer International Publishing.

[19] Mohammadi, T., Bohloli, N., Beykzad, J., & Rahimi, G., 2022, Identifying & Ranking the Ethical Components of Comprehensive Performance Management in Public Organizations. *International Journal of Ethics and Society,* 3(4), 44-54.

[20] Luo, X., & Jiang, C., 2022, Design of Hospital Operation Management System Based on Business-Finance Integration. *Computational Intelligence and Neuroscience,* 2022.

[21] Jayakrishnan, M., Mohamad, A. K., & Yusof, M. M., 2019, Understanding Big Data Analytics (BDA) and Business Intelligence (BI) Towards Establishing Organizational Performance Diagnostics framework. *Int. J. Recent Technol. Eng,* 8(1), 128-132.

[22] Dahr, J. M., Hamoud, A. K., Najm, I. A., & Ahmed, M. I., 2022, Implementing Sales Decision Support System Using Data Mart Based on OLAP, KPI, and Data Mining Approaches. Journal of Engineering Science and Technology,17(1), 0275-0293.

[23] Lai, G., Lei, J., Liu, J., Cao, S., Qin, H., Zeng, F., & Zhou, R., 2021, Numerical and Experimental Study on Comprehensive Optimization for the KPIs of Ship Propulsion Shafting Design Based On MDO. *Ocean Engineering,* 222, 108624.

[24] Müller, R., Drouin, N., & Sankaran, S., 2019, Modeling Organizational Project Management. *Project Management Journal,* 50(4), 499-513.

[25] Newman, S. A., Ford, R. C., & Marshall, G. W., 2020, Virtual Team Leader Communication: Employee Perception and Organizational Reality.

International Journal of Business Communication, 57(4), 452-473.

[26] Maware, C., & Parsley, D. M., 2022, The Challenges of Lean Transformation and Implementation in the Manufacturing Sector. *Sustainability,* 14(10), 6287.

[27] Parwoto, P., & Halim, A., 2020, The Effects of Organizational and Political Factors on the Development of Performance Measurement System (PMS) of Local Government Institutions. *Journal of Accounting and Investment,* 21. https://doi.org/10.18196/jai.2102146

[28] Taherdoost, H. (2022). A Critical Review of Blockchain Acceptance Models—Blockchain Technology Adoption Frameworks and Applications. *Computers,* 11(2), 24.

[29] Ojo, A. O., Tan, C. N. L., & Alias, M. (2022). Linking Green HRM Practices to Environmental Performance Through Pro-Environment Behaviour in the Information Technology Sector. *Social Responsibility Journal,* 18(1), 1-18.

[30] Varma, A., Budhwar, P. S., & DeNisi, A., (Eds.). 2023, *Performance Management Systems*: A global Perspective. Taylor & Francis.

[31] Garengo, P., & Betto, F., 2022, The Role of Organisational Culture and Leadership Style in Performance Measurement and Management: A Longitudinal Case Study. *Production Planning & Control,* 1-19.

[32] Kaliannan, M., Darmalinggam, D., Dorasamy, M., & Abraham, M., 2023, Inclusive Talent Development as a Key Talent Management Approach: A Systematic Literature Review. *Human Resource Management Review,* 33(1), 100926.