

Strategic Performance Measurement and Management in the Public Sector: Indispensable Role of Performance Measures

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Abstract

Purpose - Since the introduction of New Public Management (NPM) in the late 1970s in Western jurisdictions, there has been publications galore on strategic performance measurement and management (SPMM) in the public sector particularly over the last three decades. Regardless, not much of it quizzes the role of measures of performance, commonly known as Key Performance Indicators (KPIs) in the public sector, despite their centrality in SPMM efforts in this sector. This paper explores this rarely tackled subject and contributes to public sector SPMM theory.

Design/Methodology/Approach - The study was based on a systematic review of 266 published and unpublished documents on the derivation, application and use of performance measures / KPIs in the 'New Public Management' context. The papers were subjected to a thorough, precise and balanced double phase, single review process which was meant to reduce bias or systematic error and enhanced the rigour and overall quality of the research.

Results/Conclusion - The paper tracked early literature insights on performance measures in both the private and public sectors, before deep-diving into KPIs' derivation, application and utilisation based on NPM implementation experiences from the West. The systematic review established some prevalent core features of KPIs in most reviewed SPMM models which coalesced around several themes on how KPIs are formed, applied and performance information utilised in the public sector. The results of the empirical analysis coincided with main aspects of KPIs identified in literature, namely "deciding what to measure", "how to measure it" and "interpreting the data and communicating the results." The study identified benchmarking as a distinctive SPMM system where KPIs were a central pre-condition. Moreover, KPIs are taking centre stage in public sector organisational performance and accountability to citizens and are also becoming more sophisticated with the introduction of "third generation" SPMM systems premised on advanced ICTs, artificial intelligence, predictive data analytics and modelling. The paper also interrogated challenges of public sector KPIs and established that, despite their perceived and real shortcomings, KPIs' use in the public sector is well-established, well defended and supported. The paper concludes that the criticisms of KPIs are generic and abstract and do not really detract against the practical value added of performance measures. The study thus confirmed the indefatigable role of KPIs in the public sector and validated them as a *sin qua non* for execution of successful SPMM systems.

Research Limitations – The study was too broad, the literature too diverse hence the systematic review was cumbersome and time-consuming considering attendant constraints which could result in bias and impact replicability.

Practical Implications – The paper took a rare practical approach to interrogating the role of KPIs in the public sector. It proposes a comprehensive public sector KPI framework complemented by recommended KPI characteristics based on broad literature recommendations which is expected to facilitate future public sector KPI implementations.

Originality/value – The systematic review profoundly covered the role and progression of KPIs from the not oft considered lens of the public sector covering a period of over three decades thereby contributing SPMM theory and practice in the turbulent digital era.

Keywords: Strategic, performance management, performance measurement, key performance measures, key performance indicators, New Public Management, public

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I. Introduction

The evolution of strategic performance measurement and management (SPMM) reveals that performance measures or key performance indicators (KPIs) are as old as the subject itself. Just as with several SPMM terms the definition of performance measures as a concept is not universally agreed in literature, but its understanding seems to be clearer and agreed than most concepts.

The literature also distinguishes between performance measures and KPIs albeit the terms are used interchangeably in most literature (Boyle, 2000; Eckerson, 2009) and in this paper. The apparent broad consensus on and comprehension of performance measures or KPIs as a concept in the literature may lead to the conclusion that the whole role purpose of developing, tracking and use of performance measures or indicators is to assist the organisation to systematically assess its progress towards achieving its pre-set goals. The definitions of the SPMM concept adopted in literature clearly illustrates the centrality of performance measures or KPIs in the entire strategic performance management process. Notwithstanding the multiplicity of definitions of SPMM in the literature, it is clear from each single definition that any meaningful interrogation of SPMM cannot be done without examining performance measures since they are evidently central to these systems (cf. Pfefferkorn, Bititci & Jackson, 2017).

A lot is published on performance measures and their role in the private sector. The lack of literature that comprehensively analyse the development and execution of public sector measures of performance makes this study a necessity and hugely appealing for both public sector SPMM researchers and practitioners. It will make rich contribution to this literature stream considering the subject's fast evolving nature in a continuously turbulent operational environment. This paper interrogates the role of measures of performance in the public sector by conducting a thorough systematic literature review. The paper seeks to answer the following research questions:

- i) How and why are specific KPIs selected, established, and utilised in the public sector?
- ii) What challenges are associated with KPIs and how can we assess their effectiveness on public sector strategic performance measurement and management?

The study aims to explore the role of KPIs in the public sector, thereby drawing insights on their criticality from the extant literature and how they have evolved in the fast changing SPMM within the turbulent era. The specific objectives of the review are to:

- i) Review the genesis and development of performance measures in the public sector;
- ii) Assess how performance measures are implemented in the public sector and attendant challenges; and
- iii) Conduct an analysis of how the public sectors manage through measures and derive a framework for public sector key performance measures for future use in public sector organisations (PSOs).
- iv) Assess the influence of KPIs on strategic SPMM in the governmental context?

The following is the organisation of the remainder of this paper:

- Section 2 is the conceptual review of key public sector SPMM issues;
- Section 3 provides a brief account of the systematic literature review for the study;
- Section 4 is a presentation of the study results;
- Section 5 discusses the study results; and
- Section 6 enunciates the conclusions, managerial implications and recommendations

II. Review of the Literature

This section reviews the literature on measures of performance in generic SPMM before zeroing in on the public sectors and other key concepts of this research namely; definition of performance measures, conceptual review and the New Public Management.

2.1 Terminology and Definition

Considering the proliferation of terminology and definitions in the SPMM field (Franco-Santos et al., 2007; Goshu & Kitaw, 2016; Muravu, 2020, 2020a; Ratnayake, 2009), it is necessary to define performance measures and key performance indicators (KPIs) from the onset. From the systematic review, it was clear that performance measures are broadly mentioned in the literature but moderately defined (c.f. Boyle, 2000; Ferreira & Otley, 2009; Harvey, 2008; ICAEW, 2015; Macki, 2008; Neely, Gregory & Platts, 1995; Pazvakambwa & Steyn, 2014; PEA, 1999; Pfefferkorn, et al., 2017; Ratnayake, 2009; Stefanovic, 2014; UNGSC, 2014; Muravu, 2020). A common distinction between a performance measure and a KPI is that the former refers to "precise quantitative data" while the later means "signals to alert managers to issues which may need to be examined further" (Boyle, 2000, p.94).

Eckerson (2009) differentiates a "metric" from a KPI by stating that *metric* refers to measurements of organisational activity while the later exemplifies a strategic objective and measures performance against a goal or a specific target. Resultantly, KPI differentiates between ordinary metrics and strategically aligned metrics. There are several definitions of performance measures from the literature. Liebetau (2015, p.11) provides the following comprehensive definition and attendant citations:

- A performance measure is a metric used to capture the efficiency and/or effectiveness of action (citing Bourne et. al., 2003; Neely et al., 1996b; Neely et al., 2005).

- Performance measures can be financial or non-financial, internal or external, quantitative or qualitative and lagging or leading (citing Bourne et. al., 2000; Eccles, 1991; Epstein & Manzoni, 1998; Gregory, 1993; Gomes et al., 2004; Neely et al., 1997; Meyer, 2008).
 - They should be connected to strategy (citing Bendoly et al., 2007; Bhasin, 2008; Bisbe & Malagueño, 2012; Bourne et al., 2000; Braz et al., 2011; Neely et al., 1994, 1996b; Neely et al., 1997; Neely, 1999; Micheli & Manzoni, 2010; Zanon & Alves Filho, 2012).
 - The terms indicator, metric and Key Performance Indicator (KPI) are often used synonymously
- Other definitions for performance measures include:
- Chearskul, (2010, p.5, citing Franco-Santos et al., 2007; Neely et. al., 1995; Simons, 2000)
 - Ferreira & Oatley (2009, p.271)
 - ICAEW (2015, p.5, citing Ferreira & Oatley, 2009)
 - Pfefferkorn, et al., (2017, p.2, citing Fenton & Bieman, 2014; Neely et al., 1995), and
 - Ratnayake, (2009, p.153, citing Euske, 1984; Hronec, 1993). Similarly, definitions of KPIs include Stefanovic (2014, p.3), UNGSC (2014, p.3) and Pazvakavambwa & Steyn (2014, p.253).

Performance measures or metrics are more commonly used in generic or private sector SPMM literature while KPIs are usually adopted in public sector SPMM literature. Since organisational SPMM systems are concerned with more than just measuring organisational activity, preferring to measure performance aligned with business strategy, then one may be inclined to prefer the term KPI. However, considering that the literature converged upon the need even for performance measures to be linked to organisational strategic objectives as a necessary and desirable condition for effective SPMM, our view is that the relevance of the distinction between KPIs and performance measures has faded. This paper uses measures of performance to jointly refer to performance measures and KPIs. Consequently, the two terms are used interchangeably in this paper for simplicity. As Boyle (2000) puts it, given the unique nature of the public services, KPIs tend to appear much more frequently than performance measures. Pertaining to nomenclature and definition of measures of performance, we reckon the two commonly used concepts and their numerous definitions encountered in the literature reflect more of semantical diversity rather than nomenclatural or definitional substance.

2.2 Conceptual Underpinnings

Performance measures are linked to several SPMM concepts and theories which are in turn connected to management accounting literature and had a central role in early performance measurement systems and practices dating back to pre-1800 cost accounting systems (Chenhall & Lang-Smith, 2007; Johnson & Kaplan, 1987; Noreen, 1987; Otley, 1999; Wanderley & Cullen, 2013; Waweru, 2010) even though at that stage they were only finance-based (Henri, 2004; Kaplan & Norton, 1992; Metawie, 2005, Neely, 1995). Accounting historians claim that early use of performance measures was for evaluation of divisional and managerial performance and/or for controlling industrial processes in the newly formed multi-activity vertically integrated corporations such as Du Pont around 1903 and General Motors around 1920s (Bourne, Neely, Mills, & Platts, 2003; Chenhall & Lang-Smith, 2007; Johnson, 1981; Johnson & Kaplan, 1987; Kaplan, 1984; Noreen, 1987).

Some accounting, operations, and strategy authors have interrogated trends in development of SPMM theories and research and concluded that the literature has utilised several research methodologies and research methods (Muravu, 2020, 2020a; Wanderley & Cullen, 2013; Zawawi & Hoque, 2008; Franco-Santos, Lucianetti, & Bourne, 2012; Bititci et al., 2006; De Waal et al., 2009) implying that there is no dominant research method. These studies also revealed that SPMM researchers have utilised theories to their abundance (Wanderley & Cullen, 2013; Zawawi & Hoque, 2008; Muravu, 2020), again implying that there is no single dominant theory in the SPMM field.

Agency theory or principal-agent theory is highlighted in literature as the key theory underpinning SPMM, at whose core measures of performance lie. Kaplan (1984) articulates agency theory as related to management accounting theory as a model in which “accounting information is viewed as basis of contracting between economic agents who have different ownership rights, different information, perhaps different prior beliefs, and different preference for outcomes” (p.404). Franco-Santos et al. (2012) revealed that agency theory in SPMM literature is ordinarily used with other theories like contingency theory or theories from psychology. Notably, agency theory application to the public and third sectors is not as straightforward as in the private sector as the former two sectors lack the profit maximisation objective of the later and unlike it they also may have multiple principals and objectives (Gao, 2015). Propper and Wilson (2003) postulate that even assuming just one principal, there may be cases of divergence from standard agency theory predictions in the public-sector context.

More relevantly for KPIs, Van Thiel and Leeuw (2002) stated that the practitioner theory upon which NPM is premised in the public sector is the separation of the role of politicians (policy creation) and that of autonomous agent or administrators (policy implementation). This necessitated the establishment of a contract

relationship clearly stipulating roles and responsibilities between central government (principal) and policy implementers (agent). The contracts state the specific “performance” expected of the executive agent expressed in the form of performance indicators (measures) as well as the commensurate compensation (“reward”) (Van Thiel & Leeuw, 2002). The resultant adoption of private sector business managerialism or techniques (e.g. performance indicators) to measure and improve performance under NPM changed the way public sector performance was viewed and measured in the public sector forever. To illuminate the role of KPIs in the public sector, we need to investigate their role in the New Public Management, and other administrative reform programmes undertaken by countries under various monikers with a view to public service performance improvement.

2.3 New Public Management

Christensen and Yoshimi (2003) state that for a better part of four decades public sectors have been subject of significant reform both rhetoric and real with focus on improving performance. A glut of literature has assessed these Public-Sector reforms around the New Public Management (NPM) concept (Hood, 1999), Salem (2003) reckons that, “It is difficult to read about ‘New Public Management’ without finding reference to Performance Management or any of the terms associated with it” (p.9). Christensen and Yoshimi (2003) reckon NPM is a critical technique which forms a core conceptual framework for Public Sector performance reporting evaluation and research further arguing, “assessment of PS (public sector) performance reporting from NPM perspective will always positively contribute to literature on the subject” (p72). Metawie (2005) asserts that performance measurement is a primary aspect of modernisation of the public-sector.

NPM became the foundation of public sector reforms in Western jurisdictions during the final two decades of the 20th century (Brignall & Modell, 2000; Hood, 1991; Pollitt, 1995; Sanderson, 2001). The early NPM adopters hoped to achieve performance improvement and increased managerial accountability within the public services in OECD. The “more with less” mantra as adopted in the public sector may have been over-ambitious then but, with hindsight, it provided the basic criteria upon which success or failure of NPM, was later to be judged as Western countries came under pressure from tax payers reduce taxpayer burden through fiscal consolidation and improved public service delivery. NPM reforms saw varied government-wide SPMM initiatives being implemented under different banners in many countries globally and performance management being implemented universally and becoming pervasive in some public sectors and institutionalised beyond rhetoric in others (Binnendijk, 2000; Brignall & Modell, 2000; Fryer & Antony, 2009; Christensen & Yoshimi, 2003; Hailey & Sorgenfrei, 2004; Harun & Kamase, 2012; Hood, 1991, 1995; Macki, 2008; Marr & Creelman, 2011; Muravu, 2020, 2020a; Northcott & Taulapapa, 2012; Ridwan, Harun, An & Fahmid, 2013; Ross, 2011; Ruzita et al., 2012; Sanderson, 2001).

Hood (1991) and O’Flynn (2007) suggest NPM originated from an amalgamation of ‘new institutional economics’ and business-type ‘managerialism’ in the public sector. The former became the basis of administrative reform doctrines built on ideas of contestability, user choice, transparency and close concentration on incentive structures while the latter, founded in the international scientific movement, became the basis of another set of administrative reforms based on ideas of “professional management” which would help “achieve results and central and indispensable to better organisational performance”. Despite hefty academic criticism of the NPM concept’s underpinnings and questions around its effectiveness (Hood, 1991; Pollitt, 1995; O’Flynn, 2007), the official evaluations are strongly positive and it has made some hugely significant and demonstrable positive practical changes in the public sectors of many countries that it remains popular and may not be going anywhere anytime soon. From these affirmations, the direct link between public sector SPMM and NPM is uncontestedly established.

2.4 The imperative for the thorough investigation of measures of performance

The issue of the quality and fit of measures of performance has been central in SPMM literature such that there were still residual issues around lack of consensus and guidance on their identification and selection which necessitated further targeted academic inquiries. Considering the adoption of most private sector SPMM approaches by the public sector under NPM, we must first explore issues arising on performance measures in the private sector SPMM literature stream and later review KPIs from public sector literature perspective.

The performance measurement revolution (PMR) literature focused primarily on the design of contemporary multi-dimensional SPMM systems but paid little attention to the performance measures despite their centrality to the entire systems. Several authors agreed on the criticality of identification and selection of specific measures and targets at various organisational levels and that they are key success factors in the design of any organisational SPMM system (c.f. Franco-Santos & Bourne, 2005; Otley, 1999; Kaplan & Norton, 2001a, 2001b). The literature prescribed that performance measures must be valid, reliable and focus on aggregation as opposed to individual measures, all aspects which were then not well researched (Franco-Santos & Bourne, 2005). Researchers agreed that setting targets and milestones (measures) is important for design of

SPMM systems, yet the literature severely lacked the necessary guidelines for their identification / selection, which are very sensitive to organisational context and circumstances (Kaplan & Norton, 1996; Tangen, 2003).

Following failures in initial systems implementation per early empirical studies, researchers reverted to the drawing board to find out what had really gone wrong. The close examination established that most organisations surprisingly still relied on traditional finance-based or cost-related measures (Kaplan, 2001a, 2000b; Tangen, 2003) which were severely criticised during the PMR. The apparent resistance to adopting the new performance measures was attributed to lack of consensus on what constituted the new performance measures to be adopted and / or their selection criteria (Tangen, 2003). The choice of specific performance measures to be utilised is an intricate undertaking further complicated by continued increase in quantity and type of available performance measures.

Eckerson (2009) reviewed the role of performance measures in SPMM from several dimensions, namely organisational change, performance management and performance management system and confirmed the invincibility of the famous adage “what gets measured, gets done” (p.4). Organisations utilise performance metrics to define and communicate strategic objectives, to manage team and / or individuals’ performance and provide linkage to organisational goals, to improve productivity and alter an organisation’s strategic direction. However, he cautioned that incorrect performance metrics can have serious unintended consequences; “they can wreak havoc on organisational processes, demoralise employees, and undermine productivity and service levels” resulting in an organisation that is “efficient but ineffective” (Eckerson, 2009, p.4). Eckerson’s (2009) study on the role of performance measures (integrated data and metrics Figure 1 below) in SPMM clearly revealed their centrality in the entire performance management cycle and in providing a framework to assess the effectiveness of the organisation’s strategic and management processes.

The challenges associated with development and use of performance measures in the private sector implied that the public sector was automatically seized with principally similar problems. In fact, the public sector’s problems were magnified due to its unique and more complex characteristics. The systematic review was aimed at establishing what the literature says about how and why specific performance measures and indicators are selected, established and collected and including assessing their influence on effective SPMM systems.

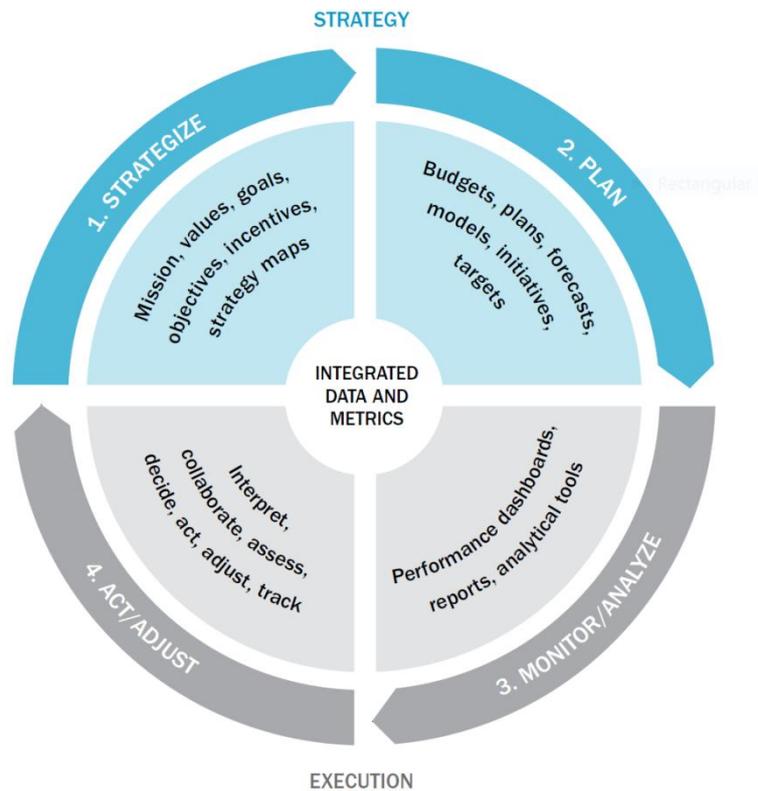
III. Method

This paper adopted the systematic literature review (SLR) protocol to address this question. The systematic review protocol is which is a widely used approach in SPMM research (e.g. Denyer & Tranfield, 2006; Franco-Santos & Bourne, 2005; Franco-Santos, et al., 2007; Franco-Santos et al., 2012; Hall, Beecham, Bowes, Gray, & Counsell, 2012; Kareithi & Lund, 2012; Pfefferkorn et al., 2017; Tranfield, Denyer, & Smart, 2003). The SLR comprised three stages and 12 phases, namely, planning the review (identification of the need for a review, specifying the research question(s), scoping study, developing and evaluating a review protocol), conducting the review (identification of studies, selection of the primary dataset¹, study quality assessment, data extraction and monitoring, data synthesis) and reporting the review (specifying dissemination mechanisms, formatting the main report, evaluating the report).

An SLR is considered methodical, transparent, replicable and state-of-the-art research methodology which affords an all-inclusive perception via conceptual synthesis of the topic being explored. According to Franco-Santos and Bourne (2005), it provides more rigour, is less susceptibility to researcher bias, and replicable hence it is considered more reliable than conventional “narrative” reviews. A total of 266 published and unpublished documents were subjected to a double phase, single review process over a period of seven months. The thorough internet document search over an extended period enabled the researcher to familiarise with the subject matter, search parameters as well as key subject matter experts.

¹ “Selection of primary studies” in original SLR protocol by Tranfield et al. (2003) but rechristened by Muravu (2020)

Figure 1: Performance measures sit right at the core of the four-step virtuous SPMM cycle



Source: Eckerson (2009)

The researcher made all efforts to ensure a comprehensive, precise, thorough and unbiased process, to limit bias or systematic error in conducting the review of the publications (Kareithi & Lund, 2012). The specific outline of the SLR protocol adopted for this paper and the rationale thereof is fully described in Muravu (2020, 2020a) and there is absolutely no academic value in repeating it here in full.

The following key pillars emerged from sub-analysis of the role of public sector performance indicators.

- i) Derivation of performance measures/key performance indicators in the public sector;
- ii) Application of performance measures/key performance indicators in the public sector;
- iii) Use / utilisation of performance measures/key performance indicators in the public sector;

The inclusion and exclusion criteria entailed published and unpublished documents on derivation, application and use of performance measures / key performance indicators as per the identified pillars. SPMM literature outside the three pre-identified themes was automatically excluded from the systematic review.

IV. Results

The following section considers the empirical studies on models, methodologies and / or approaches that were conducted between 1995 and 2016 to assess performance in the public sector and particularly the establishment and application of KPIs at the various levels of the public sector. The findings are presented based on the pre-identified thematic areas namely, the findings on the literature perspective on KPIs, followed by a deep-dive review of SPMM models and systems which have been implemented in the public sectors of many countries globally and establish how derivation, application and use of public sector performance measures stand up to scrutiny when compared with public sector literature recommendations. We then highlight the challenges that were associated with these KPIs and the attempts made at addressing them in their entire lifecycle (Brignall & Modell, 2000; Gadenne & Sharma, 2009; Kaplan, 2001; Lynch & Day, 1996; Macki, 2008; Niven, 2002; Nyhan & Marlowe, 1995).

4.1 Early literature insights on public sector measures of performances

The following is the literature perspective on measures of performance in the private and public sectors
Private sector performance measures

The 1950s saw the dissatisfaction with financial indicators which were the main corporate performance measures in use at the time (Carneiro-da-Cunha, Hourneaux, & Corrêa, 2016; Curtright, Stolp-Smith, & Edell,

2000; Eccles, 1991; Kaplan, 1984; Neely, 1999), General Electric developed and implemented the first “Measurement Project” or model that incorporated non-financial performance indicators in 1951 representing the shift towards “balanced indicators” (Carneiro-da-Cunha et al., 2016). This was supported by a movement of authoritative scholars namely Argyris (1952), Drucker (1954) and Ridgway (1956) who questioned existing measures arguing that their “side-effects and reactions” or “dysfunctional consequences” could outweigh their intended benefits (Carneiro-da-Cunha et al., 2016; Chenhall & Lang-Smith, 2007; Neely, 2005). To address what Drucker (1954) coined “desire to quantify” and “the unanticipated consequences of measurement”, there was need to introduce “balanced” measures, so he suggested a raft of performance criteria² (Neely, 2005).

From 1960s to 1980s, there was a focus shift towards new performance dimensions like quality, time, flexibility and customer satisfaction (Bititci, 2011; Bititci, Garengo, Dorfler, & Nudurupati, 2012; Carneiro-da-Cunha et al., 2016; Goshu & Kitaw, 2016; Hayes & Abernathy, 1980; Kaplan, 1984; Neely, 2005; Nudurupati, Bititci, Kumar, & Chan, 2011) thereby necessitating development of associated KPIs. From late 1970s to around 1990, a glut of literature heavily and repeatedly questioned the adequacy of finance-based traditional performance measures in the modern-day environment which became known as the “performance measurement revolution”. Key critics include Hayes and Abernathy (1980), Johnson (1981), Kaplan (1984) culminating in Johnson and Kaplan’s flagship “Relevance Lost” (1987) whose publication according to Brignall and Modell (2000) “irrevocably changed the performance measurement agenda” (p282).

The alleged inadequacies of the traditional cost accounting-based models and financial measures was that they were single-dimensional, backward-looking, internally-focused and encouraged short-termism leading to proposed addition of forward-looking and externally-focused “balanced” or “multidimensional” non-financial measures (Bourne et al., 2003; Carneiro da-Cunha et al., 2016; Chenhall & Lang-Smith, 2007; Dixon, Nanni, & Vollmann, 1990; Eccles, 1991; Goshu & Kitaw, 2016; Hayes & Abernathy, 1980; Johnson, 1990; Marr & Schiuma, 2003; Noreen, 1987; Kaplan & Norton, 1992; Keegan, Eiler & Jones, 1989; Neely, Mills, Gregory, & Platts, 1995; Neely, 1999, 2005; Metawie, 2005; Nudurupati et al., 2011; Ratnayake, 2009; Salem, 2003; Wanderley & Cullen, 2013).

From around 1990 to 2000, SPMM was acknowledged as a multi-dimensional field (Bititci, 2011; Bititci et al., 2012; Hayes & Abernathy 1980; Kaplan & Norton, 1992; Keegan et al. 1989; Neely et al. 1995; Neely, 1999) leading to more integrated and “balanced” approaches to performance measurement. This led to more complex frameworks, systems and models which balanced between internal and external measures called integrated SPMM systems (Carneiro-da-Cunha et al., 2016; Chenhall & Langfield-Smith, 2007; Eccles 1991; Henri, 2004; Johnson & Kaplan 1987; Neely, 1999; Nudurupati et al., 2011). The integrated SPMM systems which emerged this period, enabled alignment of a more balanced regime of performance measures to business strategy which had a basis in practical case studies and consultancy experiences of which the most widely known is the Balanced Scorecard (Bititci & Carrie 1998; Bititci et al., 1998a, 1998b, 2000; Bourne et al., 2000; Chenhall & Lang-Smith, 2007; Cross & Lynch, 1988–1989; Dixon et al., 1990; EFQM 1999; Fitzgerald, Brignall, Silvestro, Voss, & Robert, 1991; Kaplan & Cooper, 1997; Kaplan & Norton 1992, 1993, 1996, 1996a; 2001, 2001a, 2001b, 2004; Keegan et al. 1989; Lynch & Cross, 1991; Marr & Schiuma, 2001, 2003; Neely & Adams 2001; Neely et al., 1996, 2002).

The debate about the need to incorporate multiple-dimensions of performance to the traditional finance-based ones has been long-running since the 1950s³ (Drucker, 1954; Goshu & Kitaw, 2016; Johnson, 1987; Salem, 2003). The argument became much more heated and increasingly acceptable and directly set the stage for the performance measurement revolution of the 1980s and consequential rise of contemporary SPMM which saw the shift from traditional financial measures to “balanced measures” which included non-financial aspects in the 1990s.

Public sector key performance indicators (KPIs)

Given the already well-articulated importance of performance measures in the private sector, we review what the early or 1990s literature say about KPIs in the public sector?

- Performance measures are the “widgets” of the public sector as they assist monitoring and assessing the impact of public sector programs, products and services and daily activities (Lynch & Day, 1996).
- Taylor’s scientific management movement advocated some objective performance standards / measure (means) in defining work (Lynch & Day, 1996; Nyhan & Marlowe, 1995).

² Peter Drucker’s (1954) proposed list of balanced indicators of included market standing, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude and public responsibility (Ridgway, 1956).

³ Most of the SPMM literature pre-dates the multi-dimensional performance measures debate to the 1950s which was when some scholars started to question the traditional measures. Although not widely documented in literature, the emergence of the French *Tableau de Bord* in the 1930s, which was to have many similarities with the integrated SPMM systems of the 1990s lends us to argue or extrapolate that calls for multi-dimensional measures actually dates back then.

- At the outset, the Program Performance Budgeting System (PPBS), use of cost benefit analysis, MBO and output budgeting in the 1960s and 1970s, performance measures were concerned with “inputs” aspects, mainly financial resources which was later criticised and mostly abandoned (Salem, 2003; Thomas, 2006).
- In the 1970s, the Logical Framework (LF) approach was introduced, in favour of focusing on results and objective achievement in an effort to better track the process (Thomas, 2006). The LF metamorphosed into the RBM approach in the 1990s which concentrated on expected accomplishment, key performance indicators and outputs as well as detailed implementation processes.
- The mid-1960s “social indicators movement” advocated for collection and reporting of social indicators signifying planned shift towards selection and presentation of a range of social change measures or “social statistics and indicators” to measure the rates of social change and to establish a statistical series for predicting the future, aid planning and monitoring of government programs. It signified shift in public-sector performance to being measured and judged in terms of effects on society as well as efficiency (Lynch & Day, 1996).
- Literature highlights the influential and pragmatic role of The Bureau and associated organisations (e.g. the Urban Institute [UI], the International City/County Management Association [ICMA] and Research Triangle Institute [RTI]) in the promotion of applied study of public administration during its formative years seen as the genesis of modern budgeting and without whose mention the history of public sector performance measurement cannot be complete (Lynch & Day, 1996; Williams, 2003). Specific initiatives include:
 - a) The New York Bureau of Municipal Research (the Bureau) introduced efficiency standards into municipal management (Lynch & Day, 1996; Nyhan & Marlowe, 1995).
 - b) The Bureau developed sophisticated governmental performance and productivity measurement tools from 1900 to 1912 and built government’s capacity to measure performance (Williams, 2003).
 - c) The UI helped develop a measurement system geared toward local officer’s needs in cooperation with the ICMA and some US local governments and generated two reports. The first report provided an overview of local government effectiveness measurement, including criteria for the selection of measures. The second report detailed specific measures and data collection procedures (Hatry, 1977).
 - d) The ICMA and the UI are credited with early attempts to create precise measures of performance for specific service areas in local governments as way back as 1974 followed by the RTI in 1984. They recommended development of “performance objectives” via compromise among local authorities and citizens and utilising them as an “a priori” measurement basis. (Nyhan & Marlowe, 1995).
- Since 1980’s NPM, the emerging interest in quality assessment and improvement in public services of Anglo-Saxon countries gradually made quality dimension a critical component of most performance management systems. The new dimensions to public sector SPMM focused on the “three Es”, economy, efficiency and effectiveness (Kouzmin, Loffler, Klages and Korac-Kakabadse, 1999) implying there was need for development of performance measures that incorporated these dimensions.
- Despite US government’s efforts to improve performance measures in the 1990s, results reflected stages of immaturity and potential to benefit from performance improvement (Nyhan and Marlowe. 1995).

From the above accounts, there is evidence of modern-day terminology, practices and concepts being applied at the start of the 20th century which saw the introduction of initiatives that were aimed at “improving productivity and accountability” (Williams, 2003) through *gathering data* and data conversion to *useful information* and concepts such as *measuring of input, output, and results*; increased government productivity; comparative reporting; and focus on allocation and accountability which most literature, regrettably, gives the impression that they are all modern concepts which began with the NPM movement of the late 1970s to 1980s. We reckon these unsophisticated early developments were the “cutting edge” of governmental reform during the first decade of the twentieth century and form the conceptual foundation for most modern day public sector performance measures. Understanding the components of the early empirical approach to government management may help us develop a rich understanding of early measurement practices and how they influenced modern day governmental reforms such as NPM.

4.2 Evidence from the literature on the derivation, application and use of KPIs in the public sectors

Several SPMM frameworks were developed and applied in diverse levels of public sectors as more governments were trying to improve their performance by developing systems to measure and understand their performance (Brignall & Modell, 2000; Mackay, 2007; Niven, 2002; Pollit, 2005; Ruzita et al., 2012; Thomas, 2006). They were typically based on the “3E”s or the “triumvirate of virtue: economy, efficiency and effectiveness” (Mackie, 2008; Politt, 1986). This coincided with the adoption of NPM reforms aimed at accomplishing the “3Es” by “doing more with less” through “business managerialism” in public services (Brignall & Modell, 2000). Public sector managers have adopted performance measures to gauge their level of success (Niven, 2002). Just like in the private sector, reliance on traditional financial-based measures posed

serious challenges in the public sector. The public sector's unique contextual setting and challenges further complicated the determination of measures, targets and collection of relevant information for financial measures (Gadenne & Sharma, 2009). There was a risk that attempts would be made to develop performance measurement tools through adoption of frameworks originally meant for 'for-profit' sector to public and non-profit organisations without adapting them to the latter's peculiarities (Micheli & Kennerley, 2005).

The design of performance measures is highlighted as a key aspect for design of public sector SPMM systems as they represent the means by which performance is measured (Gadenne & Sharma, 2009). For example, severe budget cuts in Australia, led more PSOs to adopt utilisation of performance measures as a means of allocating scarce resources (Micheli & Kennerley, 2005; Evans & Bellamy, 1995). The challenge for both practitioners and academia was to find ways to improve performance measures and to identify their value added. Concern has been raised that KPIs became "tools of government and senior managers in that they were 'top-down', prescriptive, value laden, input and process focused, and predominantly economy and efficiency-led" (p.21). Top decision makers were advised not use performance measures as a proxy for expertise on direct programme management but should place measures in a "management by exception framework" where trigger further inquiry which should encourage "learning, adaptation and improvement" (Macki, 2008). The systematic review identified aspects of KPIs which have been the core features of all SPMM models that reviewed and generally crystallised around several themes on how KPIs are established, executed and performance information utilised in the public sphere. These themes align with the main aspects of KPIs identified in most literature namely, "deciding what to measure"; "how to measure it" and "interpreting the data and communicating the results" thereby informing required performance management interventions (Eckerson, 2009; Fryer & Antony, 2009; ICAEW, 2015).

The following sections presents a review of how performance measures are derived and utilised in practice in the various public sectors internationally and can be considered as good practice of how and why key performance indicators and targets are identified and applied an assessment of and their contribution to public sector organisational SPMM as revealed in the systematic review. The models were from countries such as Australia, Canada, China, Germany, Ireland, Japan, Malaysia, Netherlands, New Zealand, Norway, OECD countries, Scotland, South Korea, Sweden, UK, U.N organisations and USA. They covered education, healthcare, local government services, social services, supply chain, federal / central government services and state/provincial services.

The various studied models were implemented in different ways which best suited the organisational circumstances and national contexts since they covered different countries, tiers of government and a myriad of programmes responsible for delivering hundreds, even thousands, of public services. Based on the review we drew some insights on key aspects of SPMM from actual implementation and how they can enhance future public sector implementation of performance measures. Certainly, some common themes ran across certain sectors, levels of government and various public services. The KPIS / measures were not static, while some were highly inter-dependent and tended to evolve over time.

4.3 Derivation of key performance indicators in the public sector

The systematic review of public sector SPMM models facilitated evaluation of the development of performance indicators and their contribution to / role in public sector organisational SPMM. It established some common themes around "deciding what to measure" or derivation of KPIs which are summarised below.

Adoption of formal strategic business planning: The frameworks highlight the primacy of having a clearly defined strategic vision or strategy statement, a strategic plan and defined strategic objectives linked to clearly measurable outcomes thus governments adopted a strategic approach to KPIs and targets setting (Boyle, 2000; Lynch & Day, 1996; Macki, 2008; Northcott & Taulapapa, 2012; Northcott & Llewellyn, 2004; NAO, 2010; Propper & Wilson, 2003; Ruzita et al., 2012; Shipley, 2009).

Linking KPIs with strategy: The public sectors were required to ensure that KPIs were derived from the organisational strategy with the link provided through annual programme performance plans and budgets while dashboards are designed to cascade strategic objectives from the strategic plan down to KPIs and targets (Macki, 2008; Lynch & Day, 1996; Propper & Wilson, 2003; Shipley, 2009).

Prioritisation and criticality of KPIs: KPIs were developed and prioritised for each identified organisational performance dimension based on their criticality relative to the critical success factors and the acceptable performance level. (Gadenne & Sharma, 2009; Kaplan, 2001; UNGSC, 2014). This enabled governments to better prioritise among competing demands and make more informed decisions.

Linking KPIs to processes and outcomes: The SPMM models accentuated development of strong linkages between various types of performance measures and main resources, processes, inputs, outputs and ultimate results / outcomes of public-service provision through incorporation of performance indicators into the annual business planning / budgeting process (Brignall & Modell, 2000; Boyle, 2000; Greiling, 2007)

Development of both financial and non-financial KPIs: The public sector was required to develop a “balanced set of KPIs” i.e. specific performance measures with objective, quantifiable and measurable goals/targets to be attained during the planning period e.g. use of service delivery indicators and financial performance indicators as modes to improve the quality of government public services through administrative modernization or reform implementation, resource allocation for increased transparency and public accountability. Some models stipulated and legally mandated public sectors or central agencies to develop and report on specific performance/service indicators as required by central government (Boyle, 2000; CGMA, 2016; Christensen & Yoshimi, 2003; Cowper & Samuels, 1997; Gadenne & Sharma, 2009; Greiling, 2007; Kaplan, 2001; Lynch & Day, 1996; Macki, 2008; NAO, 2010; Northcott & Taulapapa, 2012; Propper & Wilson, 2003; Ruzita et al., 2012; Shipley, 2009; UNGSC, 2014).

Linking performance measurement systems with reward. In some public-sector models government departments/ programmes agreed strategic objectives and key outcomes to be delivered with government or central agency in return for funding or either non-pecuniary or pecuniary performance rewards via links to specific targets (Propper & Wilson, 2003).

Use of agency self-assessment or self-rating: Some models made use agency self-assessment as a key step in performance evaluation. Agencies were required to rate their performance and provide evidence-based responses according to set criteria covering key aspects of the programme and the ratings were reviewed by designated authorities on annual basis. Some self-assessment-based models required that agency/program was supposed agree on the performance measures with the central agency. The self-assessment demanded high standard of compliance and thrust the burden of proof on the program to unequivocally show the full evidentiary requirements had been fully met. (US-OMB, 2003).

Adoption and adaptation of SPMM models from other public sectors: Public sectors adopted SPMM Models from pacesetters and adapted them to local conditions (Boyle, 2000; Christensen & Yoshimi, 2003; Macki, 2008); thus, learning from successes of earlier pacesetters.

TQM influence on design of measures of performance: As interest in TQM permeated the public sector in the 1990s so did interest in TQM performance measures as it afforded public managers the opportunity to evaluate, develop, or strengthen measures of performance by focusing on quality and designing the performance measures was crucial for successful implementation of TQM based SPMM model. [check TOPS article for reference)

Limiting the number of KPIs: Keeping it simple! Most models recommended use of a manageable number of indicators to avoid the over-complexity considered one of largest risks to SPMM implementation. In numerous different semantics both the public and private sector echo the importance of organisations’ prioritising its measures and that the quality of KPIs is much more important than quantity (OAGC, 2000)

Emergence of new generation SPMM models and KPIs: The literature revealed new models derived from use of advanced quantitative techniques and statistical modelling incorporating multiple composite elements and hypothesis testing (e.g. Monte Carlo risk modelling, and von Hagen’s (1992) model of fiscal performance). The various components are derived in several ways which may involve use of historic and current, financial and non-financial, internal and external data (CGMA, 2016; Dahlberg & Isaksson, 1997).

Emergence of Specialist KPIs: Certain trends have emerged which have seen the emergence of specialist KPIs in areas which would never have been foreseen before such as in health and wellness. The increasing societal importance of health and wellness by individuals, families and businesses in evaluating a destination location means it is now important for major metropolis globally to develop simple metrics (such as Health and Wellness Access KPIs) reflect citizen easy access to local facilities (CGMA, 2016).

Citizen and Other Stakeholder Participation: Public services have adopted participatory approach incorporating of citizens’ and other stakeholders’ inputs into policy and decision-making to enhance transparency and accountability. From a legitimacy perspective, information and strength still lies in management reporting, but today’s SPMM leaders in the public-sector endeavor to go from mere reporting to production of tools that are useful for management and citizens (CGMA, 2016; Macki, 2008; Shipley, 2009).

4.4 Application of key performance indicators / performance measures

The application or implementation of KPIs is very much prescribed in the public sector frameworks, models and constitute a significant portion of the reviewed literature. Once the indicators are set organisations start collecting the data using various “tools” or data systems which include the entities’ operational and financial management systems some of which are bespoke systems. The systems are used to measure actual performance and service delivery, review, analyse, monitor and report implementation progress against the framework. The models also determine the frequency of reporting depending on the target audience (internal or external stakeholders) or purpose of the reporting / information sharing (management or promotional). For internal purposes, reporting is much more frequent (e.g. monthly, quarterly) while for external stakeholders it is less so (e.g. annually) although some world class local government agencies now do it more regularly (e.g.

semi-annually). For most models progress towards outcomes is measured and monitored through performance reports or a system comparing key performance indicators against set targets and the performance results are communicated to the public via different means such as annual reports and online scorecards etc. (Boyle, 2000; CGMA, 2016; Lynch & Day, 1996; Macki, 2008; NAO, 2010; Northcott & Taulapapa, 2012; Propper & Wilson, 2003; Ruzita et al., 2012; Shipley, 2009).

4.5 Utilisation of KPI / performance information

Final utilisation of KPI information represents the stage where the outputs of the KPIs and entire SPMM system are used and is pre-determined or aligned to the intended purpose(s) (internal or external use). Both theory and practice agree that high performance organisations must use performance information generated from their SPMM activities for their long-term positive benefit through clarifying strategy, communicating strategy and challenging assumptions and continually adjusting their management systems and strategic planning processes. This means that use of performance information for learning and continuous improvement is the hallmark of leading organisations (OAGC, 2000; Nudurupati et al 2011; Waal, 2006, 2007). According to Bourvard et al. (2011) performance information can be used for various purposes. Behn (2003) listed eight different managerial uses of performance information: evaluate, control, budget, motivate, promote, celebrate, learn and improve. The uses can be broadly divided into internal (intra-organisational) and external (extra-organisational) and command different data requirements. Below are the findings of the systematic review pertaining to utilisation of KPIs in the public sector:

i) KPIs supporting stakeholder satisfaction have taken importance. Stakeholders perceive transparency to begin and end with those entrusted to manage the organisation. Administrative KPIs that support stakeholder satisfaction can go a long way to provide demonstrative evidence that those charged with providing services are actually doing so for the benefit of the citizens (CGMA, 2016).

ii) There is convergence among the various public sectors globally to employ modern performance measurement practices, tools, indicators in public administration including national and international benchmarking of projects with other public administrations and agencies (Greiling, 2007). The purpose and extent of utilisation of performance information may vary from one public sector to another considering local priorities, requirements and general contexts. This implies that a greater potential for exploiting SPMM for public sector benefit may still exist more in some public sectors than in others.

iii) KPI information has been used to formally evaluate the effectiveness of government programs and public service delivery. It presented opportunities to inform, improve and provide linkage between agency strategic planning and reporting with the overall aim to drive improvements in program performance. The resultant KPI information informed fiscal decisions and identification of appropriate corrective actions to improve results. The KPIs provided a consistent approach to assessing and rating disparate programs across government something which was hitherto difficult, if not impossible, to do. KPI reviews should inform overall program effectiveness, from program design, implementation and results achieved (US-OMB, 2003).

iv) The published reports and performance information was one of the common achievements of most public sector SPMM models whose most key results were:

- Vital re-assessment of agencies' roles / functions and positive contribution to better understanding their specific mandates in the public-sector service delivery chain.
- Widespread use of various types of indicators e.g. in activity planning and budgeting.
- Improved reporting of indicators.

KPI's may have initially been used to evocatively report government activity to stakeholders but transformed into systematic programs which led to significant reform of public-sector performance monitoring regimes.

v) There is need for continuous improvement of KPIs: One of the achievements of use of KPI information, which is perhaps underplayed has been continuous maintenance of performance indicators. This is because revision and updating of KPIs is normally perceived from a system maintenance perspective as opposed to information use (Christensen & Yoshimi, 2003).

vi) Public sectors are using KPIs and performance reporting as a tool for tracking and improving the efficiency and effectiveness of their services and for improved transparency and accountability of government operations / public managers for public service delivery and for creating a more responsive public sector even in countries where the concepts were virtually hitherto unknown (Christensen & Yoshimi, 2003; Macki, 2008; Shipley, 2009).

vii) Communication strategy is a key requirement for most of the SPMM frameworks. Most models allowed citizens to access online management scorecards to view the criteria and track progress of performance of state agencies. Some public sectors such as local authorities were required to publish their performance, as reflected by PIs, standards and targets, together with comparative performance results (Boyle, 2000; Macki, 2008; Propper & Wilson, 2003). Some main SPMM system outputs were annual reports and annual publication

of summary performance measures through league tables e.g. UK (Propper & Wilson, 2003). The systematic review established that even when effective measures of performance are derived, communicating performance information both internally (to improve organisational management) and externally (to demonstrate efficient utilisation of public resources) remain hugely problematic (Nyhan & Marlowe, 1995). There are some excellent exemplars of best practice communication in the public services e.g. City of Seoul, New York (CGMA, 2016).

viii) Reliability of data is key. The public sector must ensure that, like with any system, the end data produced by the SPMM system is reliable. ‘You are only as good as your data’, goes a common saying. This implies that the public-sectors must have the right skilled staff to provide assurance of the high quality of its data (CGMA, 2016).

ix) Some models provided pecuniary and/or non-pecuniary incentives for meeting agreed social development goals and outcomes and sanctions for failure to do so. For example, some programs awarded large bonuses to local authorities for meeting pre-defined social targets and the ‘league table’ system in UK schools and ‘report cards’ system in US schools provided explicit and implicit incentives for schools and teachers to improve their services. The *UK Healthcare performance system* measured performance of health care buyers and providers and was linked to greater financial and managerial autonomy for the excellent performers (reward) and to replacement of management for “non-star” performers (sanction) (Propper & Wilson, 2003).

4.6 The derivation, application and use of key performance indicators in benchmarking

The derivation, application and use of KPIs in benchmarking has been treated separately since benchmarking is a specific form of performance measurement and management which is not perfectly similar to other models which fit into a common framework. Benchmarking is an SPMM system that was developed and pioneered in the private sector and has been widely used in the public sector. 19% of the models studied were on benchmarking and reflect the various benchmarking initiatives, how indicators were derived, applied and results utilised;

Identifying performance indicators in benchmarking

The fact that benchmarking is defined as the process of comparing data to established measures (Broekcling, 2010) makes the derivation of measures a precondition for benchmarking. These measures can be derived from different sources and can assist organisations identify potential areas for improvement by comparing their processes and results and explore “best practices”, such as more efficacious techniques for achieving results (Broekcling, 2010). Since performance measurement through benchmarking is based on performance comparison within and/or without the organisation or unit, performance indicators or individual measurement units can help break down a complex program into comprehensible and comparable units thereby facilitating meaningful cross-comparisons (Broekcling, 2010).

Below are examples of identification of performance indicators for some major international benchmarking initiatives and how the KPIs were developed in public sector benchmarking:

- i. In public sector benchmarking, the performance indicators used tend to focus on cost and efficiency or differentiation. Qualitative metrics such as client satisfaction or service quality indicators are based on customer surveys (Ryan, 2018).
- ii. Cost and efficiency indicators can be acquired from previous benchmarking exercises by similar organisations from relevant literature or online, or the benchmarking organisations (Ryan, 2018).
- iii. Required KPI metrics for previous benchmarking exercises can be acquired from relevant literature, online or benchmarking organisation and access to such information tends to be easier in the public sector than would be possible in the private sector due to commercial considerations (Ryan, 2018).
- iv. Process and results indicators can be established from prior performance, outcomes of other programs, acknowledged universal standards, pre-set targets, or results of comparable institutions, commercial enterprises or programs with diverse service delivery types (Broekcling, 2010).
- v. Some public-sector benchmarking utilised prevailing models, award schemes and embracing service standards like quality based models to facilitate comparison with existing private sector data or across agencies considering that uniqueness of agencies impeded direct performance comparisons. Some models prescribed specific criteria or indicators through use of self or third-party assessment to derive measurable and comparable data on their performance against set criteria (Cowper & Samuels, 1997).
- vi. Other benchmarking initiatives utilised performance tables to measure performance of individual public agencies which allowed organisations to benchmark their performance against similar services. Central agencies were mandated by government to consult and collaborate with agencies whose performance was to be measured to develop and agree on performance indicators for each area of activity to ensure appropriateness, and reasonableness and adaptability of chosen indicators over time to ensure that they accurately captured key aspects of performance and to reduce collection costs (Cowper & Samuels, 1997).

- vii. Some forms of benchmarking such as process benchmarking, value for money, time and / or policy assessments did not have performance indicators given their nature (Cowper & Samuels, 1997).
- viii. Some unique benchmarking initiatives had specific KPIs developed based on certain unique requirements, methodologies adopted and purpose to be achieved by the explicit initiative (Cowper & Samuels, 1997).
- ix. A review of SPMM in healthcare in OECD countries, undertaken over decades, revealed that most of them relied on readily available data in the initial stages of developing measures, after which their systems concentrated on deriving targeted outcome measures in the 'hard to measure' dimensions of health care performance (Propper & Wilson, 2003).

Application of performance measures in benchmarking

Application of benchmarking in the public sector has been undertaken first through voluntary or strategic pilot assessments considering the great number of agencies involved. Data was collected from the agencies, compiled and summarized by the central agency. The various performance scores were assigned for each of the various categories and compared to the standards set in the model. The pilots were designed to ensure exactly same conditions and same process were experienced to those of other agencies or private sector organisations to facilitate direct comparison (Cowper & Samuels, 1997). Pertaining to award schemes, award recipient organisations were required to provide evidence of their performance against set standards or indicators, reveal year-on-year improvements in the quality of their services and demonstrate customers satisfaction with their services. (Cowper & Samuels, 1997). In some cases, government provided legislative mandate for a central agency to produce and publish annual comparative performance indicators of public services e.g. through publication of annual performance tables (Cowper & Samuels, 1997).

Some benchmarking models required public sectors to publicise their performance details against indicators in the local print media. Similar information was provided to the central agency every year-end. They used the data for publication and issuance of annual reports to inform the public discourse about the performance of public services. The complete range of indicators and full details of public sector performance was published annually (Cowper & Samuels, 1997). Benchmarking (e.g. UK's Citizen's Charter) allowed the performance of all government departments and agencies to be measured against the single set of indicators and the results publicised. Government consulted service users about the standards and revised them based on feedback (Cowper & Samuels, 1997).

Utilisation of performance measures in benchmarking

Performance information and benchmarking results use has ultimately been similar to use of other performance information which includes: performance improvement in management and delivery of public services, imbedding of a performance culture in public sector, improved customer service, increased efficiency, effectiveness and continuous improvement of public sector, and direct communication of performance indicators or performance information on the performance of public services to the public. It has solicited positive responses from most of the public-sector agencies who participated in the initiatives.

i) Post assessment Agencies were able to identify key areas for improvement through development of appropriate action plans and the improvement actions undertaken reflected areas of weak agency performance or to reinforce good performance even further

ii) Agencies readily accepted the results of benchmarking thus indicating that the greater focus on improving the management and delivery of the executive functions of government - the main goal of benchmarking initiatives - was taking root in agencies. The managers and staff of Agencies were able to demonstrate a commitment to the principles of increasing the efficiency and effectiveness of their organisations and sought to adopt a culture aimed at continuous improvement.

iii) Award schemes and service standards adoption provided standards of performance against which the achievement of individual public service providers could be benchmarked which did not exist before. The creation of realistic, sufficiently challenging but attainable standards and awards which enjoyed high level government support raised the profile of customer service within the public sector and clearly acted as an incentive for managers to critically examine their organisations' performance to make required improvements.

v) Other uses involved development of better public-sector performance measures for future use guided by earlier benchmarking implementation results to try and increase the impact of performance indicators at a local level. This entailed the use of benchmarking results to improve performance and publicising how the indicators could help inform the performance review process (Cowper & Samuels, 1997).

vi) Direct communication of local authorities' performance to the public was done via publicisation of computerised and / or electronic performance indicators or performance information for some local authorities' services (Cowper & Samuels, 1997).

x) Benchmarking also resulted in implementation of some key policy recommendations in various public service areas leading to reduction in overall public expenditure and improved efficiency and the

establishment of well-articulated policy choices, priorities and standards for assessing and comparison of the program and service portfolios (Dahlberg & Isaksson, 1997).

International benchmarking comparisons

Despite international benchmarking comparisons being one of the key objectives during early stages of benchmarking, it could not be achieved at that time as several models were still being adapted for public sector use. This was because some challenges were encountered in applying the original unadapted models to the specific circumstances of the public sector. Also, the nature and scope of some organisations covered by the models (e.g. Citizen's Charter) were such that there were considerable practical challenges in making direct cross-country comparisons of public services (Cowper & Samuels, 1997). New trends in international benchmarking comparisons reveal increasing demand of indicators, fronted by OECD and some European Institutions, that allow comparison of European countries' public sectors internationally since the 2000s. Such indicators have become prevalent in the international development community where they have been employed or at least considered in development aid decisions by donor countries (Arndt & Oman, 2006; Van de Wall, 2008;).

The literature highlights that the need for such indicators is drawn principally from two factors:

- i) Use of information as a stick for poor performing countries to be forced to improve their public sectors.
- ii) Countries' reputation as either efficient or bureaucratic. Perceptions about a country's reputation may differ but capital fears and flees bureaucracy. So does highly-skilled talent in a "flat" world due to labour mobility facilitated by global ICT and transport connectivity and modern systems. Donors won't lend to wasteful and corrupt developing countries so public sector performance indicators may help reassess these situations.

4.7 Challenges associated with Public Sector Key Performance Indicators

Several challenges have been identified with implementation of KPIs in the public sector since time immemorial. The main ones are articulated below.

- a) The early efforts to create performance measures by the ICMA and UI and Research Triangle in the 1970s and 1980s was criticised as constrained on both "comparability and aggregation of measures". The diversity in local government data complicated generalisations on the nature of the performance measures to be collected. The GASB Service Efforts and Accomplishments (SEAs) approach attempted to address this issue in the derivation of performance measures through uniform reporting of prescribed performance indicators. Additionally, the ICMA, UI and GASB approaches were unsuccessful in trying to resolve the issue of "aggregation of measures" (Nyhan & Marlowe, 1995).
- b) Nyhan and Marlowe (1995) state that after governments' adopted performance measures in the early 1990s to improve performance, results were not commensurate, and their use of performance measures remained exceptional and not the standard. US federal accounting and financial management oversight bodies (GAO and OMB) accused federal / state / local government agencies of "little performance reporting" and this was supported by independent studies which confirmed "limited application of performance measures". Thus, there remained great potential to benefit from improved "performance, accountability, and responsiveness" through implementation of systematic and integrated SPMM i.e. use of performance measures to assess progress against strategic goals. Challenges identified included i) failure of existing measures of performance to "enhance organisational effectiveness" ii) "lack of utility of existing performance measures" and failure to facilitate comparison of measures across dissimilar programs and organisational units. iii) performance measures were mostly used to complement governmental budgeting and were criticised for focusing on "workload and efficiency measures" as opposed to "effectiveness" iv) implementation of measures that were "unrelated to program objectives or agency missions" v) failure by state agencies to report measures vi) failure by states to link measures to managerial practices, and vii) constrained use of local government performance measures (Nyhan & Marlowe, 1995).
- c) Some sections of literature argued that, 'the performance measurement systems have measured too many things and the wrong things' (Brignall & Modell, 2000; Atkinson *et al.*, 1997, p. 26).
- d) The performance measures have been imprecise and untargeted (Brignall & Modell, 2000).
- e) Deriving meaningful quantitative performance measures in the public sector remains a challenge owing to their pursuit of nebulous goals and provision of incorporeal services. While some literature has proposed that these sectors provide "nonfinancial quantitative measures of the quantity and quality of service provided", just as with private sector, there is no guidance on the derivation or selection of such measures / metrics (Kaplan, 2001).
- f) The literature exposes numerous recurrent criticisms levelled at the implementation of public sector performance indicators to date (e.g. numerous targets, highly inflexible and demoralises staff, have obstinate inadvertent impacts, unclear ownership of targets, and not so credible data) (Macki, 2008).

- g) Following main criticisms were raised on the utilisation of KPIs in assessing management:
 - i) They are illusory as they falsely convey impression of objective truth (Micheli & Kennerley, 2005).
 - ii) They magnify certain aspects of performance thereby diminishing the importance of other management activities (Micheli & Kennerley, 2005; Van Peurse et al. 1995).
 - iii) Most public-sector KPIs rely on subjective data and the question is whether subjective assessments, which form the basis of these indicators, provide an adequate picture of public sector performance.
- h) Van de Wall. (2008) raises significant conceptual problems associated with public sectors which can affect performance measurement and certainly benchmarking be it within the various sectors or in comparison between different public sectors within a country or across countries. These conceptual problems must be surmounted if the resultant KPI information and their use are to be meaningful and / or credible.
- i) Challenges with data quality on existing indicators have been reported elsewhere (Boyle, 2006; Van de Walle, 2006; Arndt & Oman, 2006) and included "biased or unreliable samples, an excessive reliance on subjective evaluations, and uncomfortable methods of aggregation". We argue that these are not the worst of problems as they are not insurmountable as the literature testifies (Van de Wall, 2008).
- j) Shipley (2009) acknowledges the good intentions of most governments to using performance measures "to help direct decisions, policies, and service delivery" but quickly points at a serious shortfall - there huge disconnect "between what the measures indicate and how government performs".

There above constitute the generic debates on the appropriateness of using public sector KPIs with respective merits and demerits being raised. Various theoretical and factual arguments have been advanced for or against these criticisms and to promote the use of SPMM Systems. Our view is that most of these are superficial or abstract criticisms which really do not detract against the confirmed value added of measures of performance. Moreover, even most literature supports the fact that these are not the worst of problems as they are not insurmountable.

According to Macki (2008) despite these perceived and real shortcomings of performance measures, the use of performance measures in the public sector is both well-established, well defended and supported. Support for targets retention in government is premised on the assumption that they could help organisations focus, facilitate cross-agency collaboration, symbolise government ambitions and primacies, avail a translucent context for making the public sectors accountable and publicise relevant data for citizens' and stakeholders' use. The ultimate objective of measuring performance and setting targets in government is quality improvement, enhanced performance and accountability of the public services. But does the experience to date support if governments have achieved this goal? This journey has confirmed that despite the dysfunctional effects of target setting, robust and comprehensive performance measures covering the full range of services being delivered will contribute to effectiveness of SPMM in the public sector.

V. Discussion

The following section is a discussion of the findings of this study on the derivation application and use of key performance indicators from the studied public sector SPMM models. It was interesting to note that several models for derivation and application of performance measures in the public sector were based on Kaplan and Norton's (1992) BSC-type or its customized versions (PEA, 1999) and Results-Based Management (RBM) methodology (Pazvakavambwa & Steyn, 2014). An organisation can chose one of the many approaches which enables it to establish performance measures that "make sense" to it and ultimately suits it culture and mission, although most organisations prefer the more effective BSC due to its requirement that measures be linked to the organisation's specific vision and mission.

5.1 Derivation of Key Performance Indicators

If the derivation of performance measures hasn't been so clear in the private sector, they seem to have been much more clarity with key performance indicators in the public sector. KPIs have been established and linked directly with the strategic plan in a prescribed manner. The framework basically determined how the strategic planning process worked, how indicators were developed and in most cases actually prescribed the specific indicators which the agencies/departments were required to report on e.g. through an Act of Parliament.

Public sector strategic planning: The derivation of KPIs by public sector following implementation of various SPMM models has resulted in the adoption of formal strategic business planning, a practice previously associated with the private sector. This implies that governments have well and truly incorporated SPMM as a cornerstone of their strategic planning process targeted at prioritising government intervention to ensure efficient deployment of public resources to most effective areas and incorporating a customer-centric approach or clear service and client orientation as an incentive to public service delivery. This became a necessary step considering that modern SPMM systems required strategy setting as a pre-requisite for design of the system itself.

KPIs prioritisation: The prioritisation of KPIs is crucial as to recognize that their importance varies depending on their impact on departmental or organizational effectiveness. Moreover, some indicators may be adequately generic to facilitate aggregation at the top organizational level, but most measures are functionally unique to the specific organisation, department/division or unit. Organisations must therefore take time to prioritise their KPIs both to limit their number and also to ensure that only those with greatest organizational impact and relevance are incorporated in the SPMM system.

Financial and Non-financial KPIs: The development of ‘balanced’ (financial and non-financial) KPI has facilitated government’s resource prioritization and allocation and “managing for results, decision making for results and reporting for results” and development of core performance or quality of service indicators linked to government and focused on service delivery issues as part of the organizational planning process.

Promulgation of laws: The incorporation and use of performance indicators and metrics in some public-sector performance models derived from or resulted in promulgation of enabling legislation (Propper & Wilson, 2003; Cowper & Samuels, 1997; Greiling, 2005).

Incentivisation: The linking performance measures to incentives for good performance and sanctions for bad performance is recommended in SPMM literature to manage potential effects of dysfunctional staff behavior. There was evidence that staff and managers do indeed “game” the system to attain performance targets with demonstrable negative effects on organisational goals but equally there is empirical evidence that performance standards worked as a partial check on gaming (e.g. cream-skimming by case workers).

Adoption and adaptation of SPMM models from other Public Sectors: This was clearly visible from the models studied and implied that that public-sector frameworks cannot be applied whole sale as they vary greatly even between various tiers of government or across countries which seemed to suggest that certain frameworks must be context- sensitive for them to be effective.

Limited number of KPIs: The need for limiting the number of KPIs in the models was obvious. However, there was no consensus as to the most appropriate number of KPIs in the literature. They range from as little as 5 to 7 to 25 to 50 indicators for a supposed good SPMM. Clearly, some models reflected difficulty in reporting due to the massive number of indicators involved which translated to humongous amounts of data. For example, *Australia’s* SEA reporting compiled almost 4,500 SEA outcome and output indicators compared to 870 indicators prior to its adoption. The number of public sector performance measures is dauntingly huge due to the unique nature of its public services and activities. Empirical evidence shows that many large local government authorities utilise between 150 and 1,500 KPIs making the assessment of departmental effectiveness intricate and daunting for officials and the public. This huge number of KPIs has been attributed to the diversity of the local authorities’ business and the myriad of different services they provide. Limiting KPIs in such circumstances is near impossible.

The emergence of new generation SPMM models and KPIs. This represents a new trend where organisations are now developing more robust, predictive KPIs premised on continuously changing risk factors which promotes long-term viability as they enable the organisation to mitigate emerging risks which enables the agency to proactively improve public services delivery. One interesting characteristic of this newer generation of KPIs is that they are not focused totally on past performance, but they incorporate previous trends, current performance and project into the future - an approach which facilitates proactive strategic improvement.

5.2 Application of Key Performance Indicators

Given the digitisation age, some world class public sectors have moved to providing the public with online access to performance information (e.g. Australia, New York etc). The City of Seoul makes extensive use of social media for public information sharing and interactions with city administration. This assists in providing timely reporting to the public who now demand real-time information but at the same acts as an improvement tool for agency accomplishments and helps identify service areas that require improvement during the year as opposed to annual and retrospective reports. Another observation is that the various SPMM tools (systems and reports) have been designed and used for service delivery improvement and to drive strategic decision making. The agencies’ performance reporting systems must be robust enough to be able to undertake extensive tracking required for the various agencies’ numerous, separate and disparate performance indicators that effect the agency’s customers or citizens. Some agencies use one or more of dashboards, graphs, KPIs, status updates, trends and comparisons and when these are integrated and utilised together this results in exemplary reporting. As seen, most models require preparing of performance reports in which various types of indicators such as input, outcome, output indicators are reported to the public on regular basis.

5.3 Utilisation of Key Performance Indicators

It does not matter how more or less sophisticated the organisational KPIs are: as the old computer adage goes, “garbage in, garbage out”. It is one issue to have even the most robust of SPMM models. The key issue is to what ultimate use the KPI information produced by these systems will be put. As already established

the ultimate aim for any public sector implementing such costly and time-consuming initiatives is to improve performance, considering that the public sectors are often accused of being inefficient, to increase managerial accountability, and public accountability in the efficient and effective utilisation of scarce public resources.

Lynch and Day (1996) state that the original enthusiasm on the benefits of systematic measurement started to be overtaken by the “reality that reporting by itself will not solve problems nor improve performance (Innes, 1990).” Shipley (2009) reviewed a collection of performance management essays and in similar fashion concluded thus: “performance measures alone cannot change the processes and performance of government services and policy decisions”. Thus, governments should integrate performance measurement practices into holistic performance management systems underpinned on objective information (KPIs) for results-based public service improvement and policy decision- making. PEA (1999) provides an important and interesting insight from early public-sector attempts to implement SPMM systems through a discussion on how Balanced Scorecard (BSC) methodology could be used not only for performance measurement but to effectively manage organisational performance. This echoes the “From Performance Measurement” to “Performance Management” shift in private sector SPMM evolution around the same time.

This study confirmed the literature position (Bourvard et al., 2011) that the use of performance information can be classified into two broad categories, namely:

- i) internally for performance evaluation, learning and improvement, or
- ii) externally for promoting and communicating organisational reputation and legitimacy in a competitive environment.

It can be foreseen that performance indicators are evolving from being mere measurement tools to communication tools supporting the fact that SPMM systems have been referred to as accountability systems. Bourvard et al., (2011) further propose that internal and external uses of performance information is complimentary in that it can be assumed that increased, and often compulsory, use of performance indicators and especially publicised rankings create pressure for internal organisational reform.

Since the implementation of SPMM models under the NPM doctrine since the late 1970s to 1980s, they visibly evolved from *ad hoc* implementation of performance management in public sector to more systematic implementation arrangements clearly influenced by multidimensional systems of the 1990s especially BSC and RBM type systems. The overall success rate of the SPMM models has been highly satisfactory with a few examples of earlier models having generally failed or considered unsatisfactory such as the UK’s *Financial Management Initiative* (FMI) introduced in the early 1980s, Canadian government’s disastrous Policy and Expenditure Management System in the 1970s and CompStat’s dismal failure Scotland. Despite these initial setbacks, the development, use and publication of performance measures and linking them to resources allocation proliferated during the late 1990’s that it became spread across the entire public sector globally and are still prevalent today.

Periodic reporting (e.g. biennially to annually) was initially replaced by regular reporting (e.g. quarterly or semi-annually) and is now replaced with continuous (online or real-time) reporting. Technology and digitisation have become key components of success of such programmes for millions of city residents globally, not only enabling but also enhancing transparency for citizens and the entire global community. Shining examples include the award-winning City of Seoul, South Korea which is a leading exemplar for government organisations globally and a standard setter in promoting transparent governance, communication and citizen engagement utilising digital tools such as online and social media. It holds policy consultation process to incorporate citizen inputs into planning, thereby making communication key to effective transparency. Moreover, it is quite clear that digital technology advances is providing powerful tools for SPMM.

Whilst the availability of digital technologies provides an opportunity for public sectors to employ more efficient SPMM systems there will be need for qualified and experienced professionals in the emerging highly specialised area / discipline of analytics who should be involved in evaluation of indicators, identification of appropriate data and determination of how this data is utilised, how it links to other indicators and performance measures to provide citizens and other stakeholders with meaningful information. Hence requirement for qualified individuals (such as professional accountants / analysts) kicks-in. Transparency requires the right mix of excellent intellectual capital, good judgment and confidence and the old school excuse that the public sector cannot compete with the private sector for exceptional talent clearly now belongs to the past.

There have been islands of excellence in implementation of public sector SPMM dating back many decades of which key notes are the following:

- The Commonwealth of Virginia which became a leading authority in US performance-based reforms.
- Sunnyvale, CA performance budgeting system introduced in 1973 and inspired adoption of US government wide strategic planning, annual program goal-performance reports and pilot performance budgeting.
- NYPD’s Compstat system led to “dramatic improvements in performance management” and “revolutionised policy management” and was highly recommended for adoption by other public services.

- Later examples included several US state and local governments which piloted (SEA) reporting and included Oregon and Minnesota, Sunnyvale (California), Coral Springs (Florida) and Portland (Oregon) which became pioneers and exemplars of best practice in local government SPMM.
- Tilburg, Netherlands' leadership in implementing holistic SPMM that accentuated the need to link KPIs to business planning which was widely adopted by several Germany municipalities.

A key lesson is that success of an SPMM model in one setting should not be taken for granted or to imply that it translates to automatic success in other settings. Contextual factors such as existing varied governance arrangements of the public sectors should be considered seriously to take into account local nuances as these can totally derail performance measurement despite its success elsewhere and assure its continued complementarity with current monitoring and evaluations systems such as evidenced by the failure of Compstat implementation in Scotland despite its remarkable success at NYPD. The UNGSC's (2014) framework is both a typical example of a supply chain SPMM and also one of how an organisation can use a generic framework and customise it to its own specific requirements considering the unique organisational context and challenges.

In the 1990s, public sector performance measurement was clearly in its embryonic stage characterised by lack of clarity and specificity about many of the indicators included in strategy statements and only a limited range of activities covered by KPIs. Despite this, the models which were introduced since the 1990s have been a fair success in that they have been implemented progressively, through adoption of new concepts such as BSC and RBM, while incorporating lessons learnt from earlier attempts. This perhaps explains the reasons why there seems to be no examples of what has been considered as catastrophic failures in the studied literature. Indeed, challenges were met especially in trying to transplant private sector solutions and managerial innovations into the public sector, but these were addressed resulting in reasonable outcomes.

There are numerous and varied themes emanating from SPMM models' literature and implementation studies and how they have evolved in response to the changing public-sector management context and incorporation of lessons learned from earlier implementation of performance indicators. A key observation has been the earlier concern over emphasis on input, process and output at the expense of outcome still needed to be explored earlier in public sector SPMM. But later models have decisively dealt with outcomes to the extent that outcome measures are now a common feature of newer models and systems.

The models acknowledge the criticality of human / behavioral factors in the development, application and use of performance measures such as need for executive sponsorship, a supportive central and managerial environment, a participative 'bottom up' involvement to instill a performance management culture that's responsive to citizen requirements and organisational goals but these do not fall under the purview of this study and remain an interesting area for further future inquiry. The following section presents a framework for public sector KPIs based the foregoing thorough interrogation of how KPIs are derived, applied and used at various levels of the public services.

5.4 Framework for Public Sector Key Performance Indicators

Despite the ubiquitous criticisms of public sectors KPIs implementation, their use remains widespread today which implies that there is something positive and beneficial about them or implying that the benefits far outweigh the limitations. According to Macki (2008), "Targets are a useful tool in the armoury of government which needs to ensure that public money is well spent and that important outcomes are realised". The impending question is, based on study evidence of experiences to date, have the objectives of KPIs and target setting in the public sector been met? If so, we can conclude that SPMM implementation has been a success but what are the lessons learnt for the future? If not, then what must be done going forward to improve their success rate?

According to the systematic literature review, the following have been the outstanding attributes of successful SPMM models for leading authorities:

- Steady reform legislative foundation
- Effective reform leadership,
- Incorporation of results-based activities into all strategic planning and management aspects
- Emphasis on active citizen involvement
- Combination of review, enhanced data use and associated accountability processes
- Ownership of KPIs and resultant actions
- Close involvement of staff and leadership of agencies to customise SPMM systems and develop fit-for-purpose KPIs that are responsive or drive long term viability
- System of seminars, interrogation, strategies for results improvement, and desired change management
- Robust communication strategy implying that mere reporting of performance data is no longer enough for today's "difficult" stakeholder and citizen who now demands real-time information.
- Reliability of data from KPIs.
- Deployment of properly qualified talent with appropriate skillsets

Interestingly, the studied models acknowledge the centrality of human / behavioral factors in the development, application and use of performance measures such as the requirements for executive sponsorship, a supportive central and managerial environment, a participative ‘bottom up’ involvement to instill a performance management culture that’s responsive to citizen requirements and organisational goals but these do not fall under the purview of this study and remain an interesting area for further future inquiry.

Based on the results of this study, we developed a framework for development of KPIs systems in the public sector to guide future implementation and review of SPMM systems in this critical sector. The resultant common themes from the literature were plotted against the originally identified three dimensions namely, derivation, application and utilisation of KPIs, to create a comprehensive KPI framework for the public sector (refer to Table 1 below). In addition, Table 2 below outlines the recommended characteristics of KPIs as established from the literature while Table 3 provides an example of KPI measurement dimensions, outcomes, leading and lagging KPIs for a supply chain SPMM.

It was interesting to note that most models for the derivation and application of performance measures in the public sector were based on Kaplan and Norton’s (1992) BSC-type or its customised versions (PEA, 1999) and Results-Based Management (RBM) methodology (Pazvakavambwa & Steyn, 2014). An organisation can chose one of the many approaches which enables it to establish performance measures that “make sense” to it and ultimately suits its culture and mission, although most organisations prefer the more effective BSC due to its requirement that measures be linked to the organisation’s specific vision and mission (strategy).

The framework reveals that a sound / good KPI must meet the CREAM criteria (clear, relevant, economic, adequate and monitorable) and similarly follow SMART principles (specific, measurable, achievable, realistic and time time-bound). Furthermore, the framework developed from the public-sector literature reflected common themes which crystalised around the finalised model. All phases in the final framework are considered necessary to ensure an effective SPMM system. It can be concluded that integration of information from hitherto separate public-sector Performance Monitoring and Evaluation Systems into an effective model is crucial aspect of SPMM that will ensure management’s utilisation of the information.

Table no 1: Comprehensive Public Sector KPI Framework. Adapted by author from UNGSC (2014), PEA (1999), Pazvakavambwa & Steyn (2014), OAGC (n.d) and Macki (2008)

SPMM Dimension	Process Step
1. Derivation of performance measures	1.1 Define the organisational vision, mission, and strategy.
	1.2 Define the goals, objectives and measurable outcomes to be achieved.
	1.3 Identify the various processes and activities that can impact the achievement of planned outcomes.
	1.4 Identify performance drivers in the processes, and activities and parameters that accurately measure them, and other critical success factors for the intended outcomes.
	1.5 Identify comprehensive KPIs compatible with organisational requirements and policies.
	1.6 Determine KPIs’ data measurement / collection, calculation, reporting techniques and KPI ownership.
	1.7 Assess the relative importance of KPIs and set acceptable respective performance targets.
	1.8 Align KPIs’ performance levels with corrective action mechanism and/or financial incentives.
2. Application of performance measures	2.1 May include piloting to test the new performance management systems.
	2.2 Measurement of actual performance data from SPMM systems on regular basis (various data sources).
	2.2 Reporting and evaluation of actual KPIs data / results against set targets and rectifying identified deficits.
3. Utilisation of performance measures	3.1 Regular assessment of performance against targets by KPI owners and end users
	3.2 Evaluation of KPIs’ effectiveness to ensure continued relevance and user compliance.
	3.3 Use of KPI information for management decision making
	3.4 Integration of lessons learned, and findings of self-evaluations based on information from performance monitoring systems.
	3.5 Finally, performance information from SPMM systems and external performance reporting to stakeholders is evaluated as complimentary.

Table no 2: Shows KPI characteristics recommended from the literature. Adapted by author from Ammons (2008), Brignall & Modell (2000), CIMA (2002), CIMA (2012), Gao (2015), Macki (2008) OAGC (n.d), Pazvakavambwa & Steyn (2014), PEA (1999) and UNGSC (2014)

#	Characteristics of KPIs
1	Performance measures must be linked to the government’s strategic or policy framework
2	KPI must be well defined and clearly and understandable by all stakeholders
3	KPI must be easily measurable in terms of time, effort and cost of data collection
4	KPI must be reasonable and credible under the conditions expected.
5	KPI must be traceable to the outcomes as an explanation of their relevance
6	KPI’s values and outcomes are shown for a predefined and relevant period
7	KPI should be “balanced” to reflect the interests of the various stakeholders.

8	KPI must be aligned with accountability and decision-making authority
9	KPI should be explicitly linked to main conversion processes of inputs into outputs and ultimately outcomes of public service delivery
10	KPIs should be integrated and seamlessly cascade within and across the organisation.
11	KPIs may be linked to incentive system
12	Number of KPIs must be manageable/ limited
13	KPIs must be monitorable or open to outside validation
14	KPIs should not be too highly aggregated
15	KPIs must have clear ownership

Table no 3: Example of KPI Measurement Dimensions, Outcomes and KPIs for a Supply Chain SPMM.
adapted by author from UNGSC (2014)

Performance Dimension	Performance Outcomes	Leading Indicators	Lagging Indicators
Quality of products, works or services – (availability, capacity, reliability, flexibility, completeness, accuracy, consistency)	Product quality	Production process efficiency ratio	% of defects: # of defective items divided by total number of delivered items
	Customer satisfaction	Number of active/ open complaint cases	Number of substantiated complaints
	Quality of engineering design	Number of revisions before approval/ acceptance of design is granted	Design error identified/ corrections made during construction phase
Progress and schedule (timeliness, adherence to schedule, achievement of milestones)	On time deliveries	Scheduled production Production cycle time	Number of OTIF deliveries
	Adherence to schedule	Deviation between planned and actual progress of works Resources spend rate	Number of days of delay
	Equipment reliability	Meantime between repairs	Meantime between failures
Cost performance (expenditure, cost saving, cost control, payment terms)	-	-	-
Management performance (responsiveness, preparedness, professionalism, subcontractors /suppliers’ management, contractors’ staff competency)	Workplace safety	Usage level of Personal Protective Equipment	No. of injuries/ fatality
	Food safety and Hygiene	Weekly cleaning inspection/ audit result	No. of failed food safety test

VI. Managerial Implications, Recommendations and Conclusions

This section considers the managerial implications of the findings, discussion and conclusion of this systematic review in the context of the study’s contributions to the body of knowledge and practice.

6.1 Managerial implications and recommendations

This study is one of the most comprehensive systematic reviews which has vouched for the indispensable role of performance measures in the public sector. Unfortunately, most research and practice in SPMM has concentrated on the shift from traditional SPMM systems to modern multi-dimensional systems or the so-called performance measurement revolution of the last quarter of the 20th century at the expense of KPIs which are the blood that flows in the vein of any SPMM system. It has been akin to concentrating on the design of a vehicle for speed but forgetting the engine. Not surprisingly, most SPMM models and frameworks that performed dismally was due to the fact that KPIs had been overlooked and had to go back to phase one to rectify this. All new multidimensional SPMM models, including the over-publicised Balanced Scorecard apparently had this same deficiency.

Extending from the above point, the systematic review revealed that new trends have emerged on the future of the SPMM field such as supply chain, extended enterprise SPMMs, “third generation” or predictive SPMMs (Muravu, 2020) and a proposed “holistic systems-based approach to SPMM research” (Bititci, 2011; Bititci et. al., 2012). But there is no mention of KPIs – or their role – in all this. One can be tempted to think that this is because KPIs are the detail to be addressed later but let us not forget that this is exactly what happened when SPMM research and practice previously concentrated on the development of complex multi-dimensional models but totally overlooked this critical ‘detail’. We reckon KPIs should be at the forefront of any discussion about progression of SPMM systems if we are to assist managers with more pertinent and applied solutions that approximate reality and will be more useful today and in future rather than for KPIs to be treated almost as an afterthought, something which has led to disastrous results in the past.

Even when the role of KPIs became clearer and the need to link them to strategy, not much effort has been invested towards this. This study is a reminder, that warns PSOs to go back to basics if they are to reap any

reward from investing in expensive and cumbersome SPMM systems. For, as the old computer adage goes, garbage in garbage out. This paper complemented a lot of theoretical papers that have been written on KPIs in both private and public sectors but went further with empirical analysis of these SPMM systems to determine the practical role of KPIs something researchers have not paid close attention to before. It was concluded that KPIs play a key role in design and choice of public sector SPMM systems. Governments which have introduced use of KPIs such as Australia, United States, United Kingdom and Malaysia to name a few have reaped the reward in terms of public sector performance improvement.

A key best practice recommendation from this study is that governments must provide close guidelines on establishment of key performance indicators to guide public sector agencies in implementing performance measures. The key performance indicators must of necessity be integrated into planning, monitoring and reporting systems of the organisation (e.g. incorporation into annual budget estimates, annual reports and other reports to central government). This approach has positive results and led to SPMM system benefits realisation in prior implementations. The proposed public sector framework will prove invaluable in this regard together with the list of recommended KPI characteristics from this paper.

Governments should also mandate public agencies to harness the power of digitisation through adoption of modern ICTs such as artificial intelligence and data analytics in KPIs implementation. This would release staff and management for more value addition activities such as drawing insights from KPI information as opposed to routine compilation of KPI data. The fact that KPIs are now assuming new roles in sustainable and human development should be embraced by the public sector as something that will contribute to positive societal outcomes which is what every elected government aims to achieve.

6.2 Limitations and future research

The following are the limitations and suggested future directions for study.

Limitations

The research suffered from some limitations:

This paper was a spin off from a comprehensive doctoral research. Albeit covering pertinent subject areas, the research was very extensive, and lots of details had to be summarised. The literature was too broad, demanded bulk analysis and was too onerous in a highly time constrained environment which could result in bias and impact replicability.

Future research

The following prospective areas for future SPMM research emerged from this study:

i) SPMM is increasingly being linked with other disciplines such as enterprise risk management, public financial management and public sector corporate governance for it to be more effective, forward-looking and demonstrate capacity for future delivery. It would be interesting to study how key performance indicators in the public sector will evolve with these developments.

ii) Despite the fact that human resources is traditionally considered as a subjective and qualitative discipline not suited for “hard” measures, the literature revealed that process benchmarking can facilitate collaboration between many public sector departments and agencies in common areas such as HRM and provides a way to harness the qualitative with the quantitative to provide measurable outcomes. Administrative inter-comparisons are not highlighted in SPMM literature, but they can facilitate learning on process mapping and benchmarking, sharing different approaches, refining learned techniques and developing appropriate skills to conduct benchmarking of other processes making the public sector potentially a robust knowledge source of benchmarked processes and the benchmarking tool itself. This information would include the case studies themselves, collective learning and common issues and excellent evidence that should be diffused within and without the civil service. It would be interesting for future researchers to take up this as an area of further inquiry.

iii) The literature highlighted that the effectiveness of KPIs is impacted by variety of conceptual, behavioral and contextual factors in addition to the technical issues addressed in this paper. The contextual and behavioral dimension comprise power disparities, cultural and contextual influences and concerns about how to measure change in increasingly complex situation. Specifically, are KPIs impacted by cultural and contextual factors and if so, in what way? Finally, are there KPI-specific issues that need to be considered among the challenges of transferring SPMM models and methodologies across different cultures and context?

6.3 Conclusion

It appears that there is clear universal convergence on strategic performance measurement management from public sector perspective. The study of past and present models revealed that it is now a constant feature of modern day public sector management and administrative reforms spanning core functions such as strategic

planning and resource allocation incorporating use of inputs, process, outputs and outcomes key performance indicators in complementing other pre, concurrent and post- control tools and techniques. The resounding support offered to public sector SPMM from politicians and public managers alike has been highly instrumental, if not surprising, in their attained success levels but the literature is clear that their long-term viability depends on how well entrenched these systems are to sustain public sector performance improvement.

The literature converged that incentives for employing rational performance models both in public and non-profit sectors derive from a new view of state, scarce resources, search for efficiency, and demands for increased accountability. Increased austerity measures demanded the increased adoption and utilisation of performance measures as a scarce resource allocation technique in PSOs. This presents a challenge for both practitioners and academia to innovate ways to improve performance measures and to identify value added today going forward just as it did in the 1990s or perhaps even more than ever.

From the thorough study of the derivation, execution and utilisation of KPIs in the public sector, it can be concluded that their role is just as sacrosanct as in its close cousin, the private sector. Unfortunately, governments or public sectors tend to limit the use of KPIs which in turn curtails the realisation of full benefits from performance management. Despite more jurisdictions adopting KPIs, studies showed that results often did not improve the quality or efficiency of the public services in a commensurate manner. The literature recommends some factors that could assist PSOs use performance data for improvement and includes higher-order measures, public sector managers ownership of intergovernmental and service comparisons; and integration of KPIs and management systems.

As established by the systematic review was that use of KPIs in the public sector is going beyond its traditional remit and is now contributing towards addressing local and global challenges and in fostering the creation and maintenance / sustenance of thriving societies of the 21st century and beyond. It is already evident in New York's 21st century KPI reporting systems which help the city manage the daily operations and its interactions with its 8.5 million+ residents. Digitisation has proved a timely addition to SPMM as exemplified by the rise of excellence in city governance by Seoul's award winning social media-based city administration. KPIs have grown and become so important for everyday and crucial once-in-lifetime decisions such as choice of location destination in a world where physical barriers such as mountains and oceans have technically disappeared due to increased global transport and communication networks. This has resulted in cut-throat competition for major global cities and local authorities to attract the best talent, high net worth individuals and first-class corporates from across the globe to their localities.

Use of computerised performance dashboards will be a thing of the future and will ensure that KPIs can be more accurate while modern digital technologies and automation of systems can ensure that tracking is no longer as cumbersome as the traditional largely manual systems which made it almost impossible especially in areas where there are large numbers of KPIs like most public sectors. Advanced use of analytics and artificial intelligence means that KPIs will be available literally at the touch of the button and will require upgrading of skillsets of individuals to concentrate more on analysis and interpretation of KPIs as opposed to manual compilation. We have also seen increased application of advanced techniques such as "process mapping" and "business modeling" as fundamental techniques employed in public sector SPMM, yet these techniques were hitherto reserved for the most progressive and innovative commercial entities.

We also encountered and interrogated numerous conceptual problems / issues associated with public sector SPMM, in particular, as it impacts development and / or choice of KPIs, since they can affect performance measurement and certainly benchmarking within or across sectors and countries. These conceptual problems must be surmounted if the resultant KPI information and their use are to be meaningful and / or credible.

In conclusion the literature highlighted that demand for indicators for both performance measurement and benchmarking in international public-sector administrations, and to measure the quality of bureaucracies at the macro-level, has rapidly increased from inter- and supra-national organisations, international donor community, practitioners and scholars. The supply of these indicators has equally been rapidly increasing with a growing number of datasets being developed and promoted, with the World Bank governance indicators one such best-known. The literature concedes that most of these indicators and datasets are riddled with conceptual and data quality problems, making them less suitable for comparative public management scholars. Despite the numerous quality problems, the main challenge with developing indicators for measuring and comparing the performance of public sectors is mainly a conceptual as opposed to a technical one. Unfortunately, this conceptual discussion is generally diminished thus the challenge is "defined away" as opposed to being resolved.

Moreover, there is a real risk that the indicator boom may lead to superficial international comparisons. Blind reliance on existing data, is likely to endanger the quality of research. Public management scholars need to adapt the existing indicators to new developments in the definition of government and need to raise the methodological standards of some of the older datasets. By the same token, policy makers are challenged not to regurgitate new indicators or rankings but rather to extensively interrogate what they mean.

We hope that we have managed to demonstrate that SPMM in general and KPI in particular have had positive impact on governments as they thrust service improvement at the core of the public and political discourse, but we should be wary about what exactly they reveal about public sector performance.

This systematic review interrogated the derivation, use and application of KPIs in the public sector and provided us some insights on how they can be adopted to the public sector and concurrently validated their indispensable role. The study constitutes one of the single most comprehensive studies which concurrently explores this rarely tackled yet crucial dimension of public sector performance measurement and management thereby providing unique insights and contributions to literature.

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