

PERFORMANCE MEASUREMENT: HOW FAR IT HAS TRAVELED AND WHERE IS IT HEADED

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Abstract

Purpose of this paper is to understand the phases of evolution of organizational Performance Measurement (PM) so that the future direction of PM may be predicted and organizations can prepare for it accordingly. Literature review method was adopted for the study. It was found that the PM started taking roots in the business world around 1900. In the last hundred plus years PM has evolved through four distinct phases, namely, Efficiency oriented era, Result oriented era, Quality oriented era, and Integrated perspective era. Business practices in each phase were dominated by a particular management philosophy which greatly influenced PM in that era. The future PM system is expected to be responsive, dynamic and predictive. It is expected that in future the risk management system will be combined with the PM system. The role of PM is seen to be changing from measuring past results to a system which will be able to predict the performance in the future and also identify the factors hindering success. The future scope of PM is seen to be widening to include supply chain and other network partners. Organizations taking a lead in moving towards futuristic PM will stand a better chance to succeed.

Keywords: Performance management, PM history, future, phases, PM evolution

INTRODUCTION

Performance measurement is a complicated and time-honored phenomenon (Meyer, 2007), its history can be traced back to at least the 13th century when double-entry book-keeping system was developed (Neely, Kennerly & Adams, 2007). Well-kept records from 1800s, atypical for the period, show performance reports of Roberts Owens's textile mill in New Lanark, Scotland (Prowse & Prowse, 2010). Except for a few sporadic cases like the Scottish textile factory, it

was only from the 20th century that organizations started making a conscious effort to measure, record and report performance. The PM systems have evolved over time from simple to complex, from static to dynamic and from a discrete activity to a continuous program. And there is no evidence that this process of evolution will stop. In fact, the developments in the past couple of decades clearly indicate that the changes are now becoming more rapid than ever.

Organizations are interested in measuring performance as it has been established to a significant degree with empirical evidence that formal performance measurement in organizations motivate employees to try performing at higher levels (Leeuw & Berg, 2011). It has also been demonstrated that PM helps in employees' capacity building which in turn leads to improved performance (Koufteros, Verghese, & Lucianetti, 2014). Therefore, the organizations that are able to successfully anticipate the changing trends and adapt their systems quickly stand a better chance to succeed amid intense competition in the twenty-first century as compared to those who remain stuck with an out-dated PM system.

The purpose of this article is to understand the stages of evolution of performance measurement in the organizations so that the future direction of PM may be predicted and organizations can prepare for it accordingly. To meet the research objective, this study was conducted with the following questions in mind:

- I. What are the different phases in the history of performance measurement evolution?
- II. What is the new direction performance measurement is heading towards?

The rest of the article is divided into sections as follows: Section 2 compares several definitions of PM drawn from literature. Section 3 explains the research process adopted for this paper. In section 4, findings from literature review are reported. Section 5 presents a discussion of the findings of this study along with their implications for practice and suggestions for further research. Finally, in section 6, the limitations of the study, research conclusions and recommendations for future research are offered.

WHAT IS PERFORMANCE MEASUREMENT?

Before tracing the history of PM, it will be useful to first clarify what is meant by performance measurement. Literature provide several definitions of performance measurement. Some scholars saw PM as a "result", for instance, Payer-Langthaler and Hiebl (2013) defined performance measurement as assessment of the results from intentional action. Others including Hall (2010) argued PM to be a "system" which translates strategies into results. PM has also been closely linked with "metrics" hence Neely, Gregory and Platts, (2005) described performance measurement as a "set of metrics used to quantify both the efficiency and

effectiveness of actions implemented to achieve the strategic goals of an organization” (p. 1229). Those who saw PM as a “tool” for example, Cruz, Scapens and Major, (2011) argued that PM practices are the actions and tools, which support the assessment of progress of an organization in moving towards its goal and which may become formalized over time. Wadongo and Abdel-Kader, (2014) enriched the concept by adding the “future” dimension in PM. They defined performance measurement as “the past, present or future accomplishment of a given organizational task or dimension measured against pre-set known standards of accuracy, completeness, value, or time” (p. 683).

It is evident from the above cited definitions that scholars have defined PM differently, focusing either on features, or role or the process. To avoid any confusion because of lack of an agreed definition for PM in the literature, I have followed a more generic concept of PM put forward by Franco-Santos, Lucianetti and Bourne (2012), they argued that: *“a PM system in an organization exist if financial and nonfinancial performance measures are used to operationalize strategic objectives”* (p. 85).

RESEARCH METHODOLOGY

Electronic research database including Emeraldinsight, JSTOR, Proquest, Elsevier's ScienceDirect, and SpringerLink were reviewed with keywords including “performance measurement/management/frameworks/models/systems, and future challenges in performance measurement”. Appropriate filters like “AND”, “OR” were used to find relevant material. In addition, printed books from the main library of Universiti Malaysia Sabah were also perused. During the review, it was found that the literature has discussed PM from several different perspectives such as conceptual, structural and design aspects, implementation problems, process issues, factors affecting PM, theories in PM, and impact of PM among others. A total of 162 articles and 21 chapters were downloaded. The abstracts of the articles and summaries of chapters were reviewed to identify whether the study had discussed characteristics of contemporary PM systems, influence of thinkers, history of PM and future direction of PM. Thirty-three articles and eleven book chapters found relevant were reviewed in detail.

FINDINGS

The literature review revealed three important points about the development of performance measurement across history. First, every few decades a particular performance measurement concept has dominated the business environment. Second, once a particular PM becomes popular it never got replaced completely by new metrics or frameworks, most organizations continued to use the old metrics to supplement the new system. While many organizations

simply did not adopt new system and preferred to work with the older system. Third, the nature of industry did not influence the choice of PM. In other words, the new developments in PM were adopted by organizations from all industries and sectors.

Summarizing and synthesizing literature reveals that PM evolution can be classified into four phases but it must be noted that these phases are not discrete rather it is a continuum. These phases are efficiency-oriented period, result oriented period, quality-oriented period and integrated perspective period. Figure 1 depicts these overlapping phases. Also, the forward pointed arrow emphasize that the domination of a particular orientation period may have been limited to a couple of decades but its usage continued in the future although no longer as a dominant phenomenon.

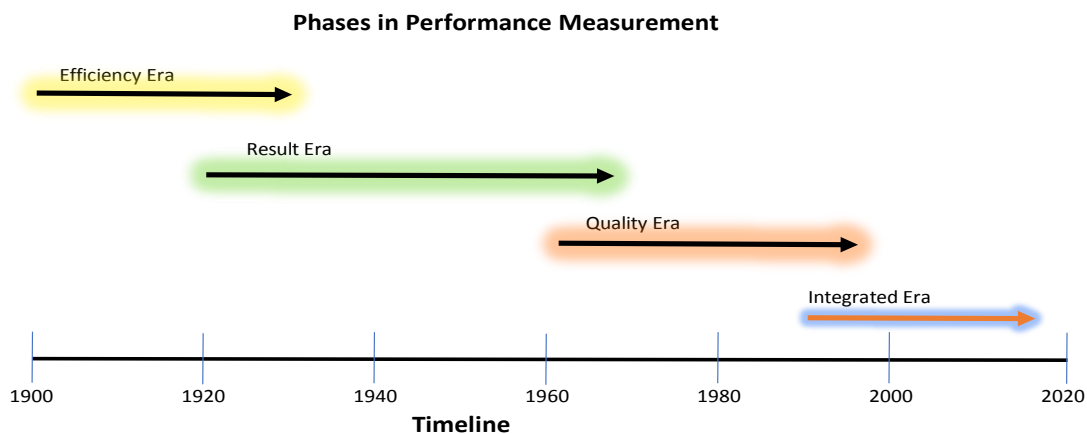


Figure 1: Performance Measurement Evolution

Efficiency Oriented Era (1900-1920s)

Perhaps the most ardent supporter of bringing efficiency in manufacturing processes in organizations was Frederick Taylor. A mechanical engineer by profession, Taylor introduced the concept of industrial efficiency (Gould, Bourk & Joullié, 2017). He argued that efficiency can be quantified and hence improved through time and motion studies. The concept was initially employed by steel industry and others followed later. The introduction of observing and documenting the processes (input resources) leading to specific outputs (production units) started the tradition of performance measurement.

Taylor was a staunch believer in system analysis. Vliet (2015) summarized Taylor's business philosophy as under:

- Business should be controlled by professional managers trained in scientific management.

- Productivity can be improved by division of work into groups of repetitive activities.
- Formulate objectives and choose best alternative to achieve them.
- System can be optimized.
- Deviations are caused by external factors.



Figure 2: Taylor's Business Process

Characteristics of PM in Efficiency Era

Influenced by Taylor's scientific principles organizations were strongly focused on increasing productivity by grouping repetitive and concurrent tasks. Emphasis of owners was on how to produce higher number of units in a given time. Hence, the information they needed to measure performance was the number of units produced and wages paid. And for confirmation they would look at the sales and profit figures. This was the birth of performance measurement in the business world. With few exceptions the practice of formal reporting on PM was confined to larger manufacturing concerns. In summary, during this period organizations used accounting (value) and production (units) figures such as sales, cost and profit for their performance reporting.

Result Oriented Era (1920s-1950s)

Dupont gave the world not only Nylon and Teflon but is also credited with inventing a ratio analysis method in 1912 based on Return on Equity (ROE). Donaldson Brown, a salesman at Dupont came up with this ROE formula which we know today as DuPont Formula or DuPont Analysis (Phillips, 2015).

$$\text{ROE} = (\text{Profit margin}) \times (\text{Asset turnover}) \times (\text{Equity multiplier}) = (\text{Net profit/Sales}) \times (\text{Sales/Average Total Assets}) \times (\text{Average Total Assets/Average Equity}) = (\text{Net Profit/Equity})$$

DuPont formula was the first statistical approach towards performance measurement incorporating financial ratios. In the early twentieth century most businesses were family run ventures and for measuring success the traditional accounting figures of sales, cost and profits were used. For strategic decision making the companies relied on the intuition of their Board members which primarily consisted of the owners' family. DuPont formula in such time was not just a departure from the norm but was an evolutionary step in the development of modern performance measurement as it provided a scientific alternative to an arbitrary process.

Underlying philosophy in DuPont formula is:

- Ultimate objective of every business is maximizing profit.
- Risk increases with time.
- Improvement can be achieved by getting that combination of profitability, asset efficiency and financial leverage which maximizes their product (ROE).

The DuPont formula provides a single number which indicates the earning power of the organization's assets and thanks to its ratio format, it is independent of the size of the company. This independence facilitates comparison across the industry. DuPont's Donaldson Brown, the inventor of the formula, later joined General Motors as its CFO and introduced the concept over there. Quickly, Ford Motors and other big manufacturing organizations followed and thus the DuPont formula became a standard analysis metrics in the corporate sector and ruled the performance measurement world for decades (Yadav & Sagar, 2013).

Characteristics of PM in Result Era

The management of organizations during this period was target driven such as specific sales, production units and profit. All the attention was towards the output or the end result (Prowse & Prowse, 2010). The sources of information for the PM system were production and accounting, the same as in the earlier era of efficiency. The major difference in this era was in specific target setting which was not a practice in the previous era. The DuPont formula proved to be quite useful in determining the financial health of a company in the short-term because to achieve higher ROE for the year, the managers had no incentive to invest in the long-term projects or in research and development whose benefits would accrue far in the future. This strategy proved to be detrimental for several organizations which did not invest adequately in the research and development (Skousan, Albrecht, Stice & Swain, 2001). Problem with the PM in this era was the lack of a concrete theory underpinning the exclusive focus on outputs. The traditional financial ratios provided no indication of future performance and little guidance on how to improve (Kaplan, 2013). It was like driving forward but looking at the rear-view mirror only.

Quality Oriented Era (1960s-1990s)

Works of William Edwards Deming and Peter F. Drucker heavily influenced performance measurement in the second half of the twentieth century (Narasimhan, 2018). Both of these management gurus were instrumental in promoting PM in organizations as an active process changing it from the dormant, number crunching activity it had been till 1950s. Deming, an American engineer and professor, who is credited by the Japanese for helping them turning

around their industry brought the importance of quality to forefront of performance measurement (Ronald & Clifford, 2010). His business philosophy revolved around systems approach of which planning plays the most central role. All the later works on quality management for instance, total quality management, quality circles, six sigma, and lean sigma, credits Deming for highlighting the importance of quality in business. Interestingly, Deming himself remained sceptical about the utility of TQM and other such tools because he viewed quality as a result or an outcome and not as a method (Evans, 2008; Gitlow, 2009). Deming's management philosophy as summarized by Deming, Orsini and Cahill, (2012) is paraphrased below.

- Create constancy of purpose.
- Leadership can only be provided through profound knowledge of systems & knowing your people
- Each system must be first analysed and then customized as required.
- Focus on creating a resilient system and work on continuous improvement.
- Train employees and encourage self-improvement by providing a secure and supportive environment.
- Deviations are caused by internal system flaws. Identify the source of variation and correct accordingly.
- Eliminate numerical targets.

Deming's concepts transformed business from a linear process to a cycle as depicted in the Figure 3.

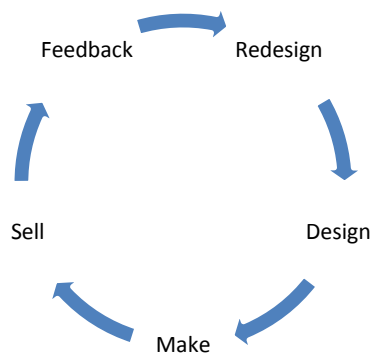


Figure 3: Deming's Business Process Cycle

Source : Deming et al. (2012)

Deming's advice to managers regarding performance measurement was to look at the numbers to manage the process and not the result. Through research he found that only 6% of the

problems stem from workers the rest 94% of the problems came from the system. Therefore, he argued, to improve, organizations should work on the system and not blame individuals. To identify the source of variation, several relevant variables should be measured all along the process. His famous Red beads experiment proved the importance of variation in analysis (Muraliraj, Zailani, Kuppusamy, & Santha, 2018).

Peter Drucker's influence on the corporate world during the same period cannot be ignored. He emphasized the importance of customers in the business and saw management as a responsibility and not a power. Drucker staunchly believed that the purpose of the business is to serve a customer (Wartzman, 2012). Drucker's management principles based on his multiple publications (Drucker, 2008) are:

- Define your objectives clearly.
- Plan and organize your activities necessary to achieve your objectives.
- Keep your employees motivated.
- Establish key measures of performance.
- Develop your employees.
- Satisfied customers improve your bottom line.

Clearly, Deming and Drucker's philosophy is very different from Taylor's. While Taylor believed that organizations have sufficient information to optimize their system, Deming argued that no system can ever be optimized so the objective should be building a resilient system and look for improving it on the basis of unique behavioural experiences of each system. Another difference between their philosophies is the leadership style. Taylor favoured an autocratic style where people must do as told. But Deming suggested that cooperation and appreciation encourages creativity which could increase efficiency. Similarly, Drucker believed without teamwork there will be noise only and no music.

Characteristics of PM in Quality Era

Performance measurement in the business world during this period shows clear influence of Deming and Drucker in the following ways:

i. Goal Setting

Both Deming and Drucker had suggested to start with clarifying mission and setting goals for the business. Deming called this constancy of purpose and Drucker called them as objectives setting. Organizations picked up on this advice and any standard performance measurement system would start from stating the goals.

ii. Linking Activities with Goals

Strategic planning exercises became a standard in the corporate world. Work flow analysis of Deming, and Drucker's point on linking of activities to the mission was the obvious driving force behind this.

iii. Variance Analysis

Organizations began to put more time and effort in trying to identify the source of variation, clearly, emanating from Deming's insistence on continuous improvement through fine tuning processes to address the root cause of variation.

iv. Key Performance Indicators

Organizations moved away from relying on a fixed set of financial indicators such as ROE and developed their own context specific indicators of success. Again, this is what Demin and Kaplan recommended.

v. Inclusion of Nonfinancial Indicators

Customer satisfaction, employee turnover, social responsibility and other nonfinancial measures were routinely included in the PM system of most organizations. Kaplan had pushed for meeting customer expectations as the primary criteria and Deming had long been proposing to stop putting too much emphasis on financial ratios.

Integration Perspective Era (1990s-to date)

Building on Drucker's idea of linking mission with the performance measures, Robert Kaplan and David Norton suggested an integrated framework of metrics representing four different perspectives: Financial, Customer, Internal Process and Employee Learning & Growth. They called this "Balanced Scorecard" (Kaplan & Norton, 1992). Their view was that no perspective alone can truly capture the performance of an organization hence a *balanced* approach is needed. Their seminal paper of 1992 came out at a time which was just right as businesses were looking for a PMS which could cater for the new business realities. Intuitively, the managers were aware that financial indicators were inadequate but arbitrary inclusion of nonfinancial indicators also did not make much sense. In fact, Bititci (2015) explained, the over focus on financial ratios was proving to be misleading as it completely ignored many other key success factors such as quality of product or service, customer satisfaction, employee motivation and others. Neely (2007) called this a "measurement crises". Therefore, unsurprisingly, Kaplan and Norton's new framework – the Balanced Scorecard (BSC), became extremely popular. In essence, BSC is an intentionally selected set of quantifiable measures derived from organization's strategy. The success of BSC may be attributed to the fact that it is

not just a PM tool but is also a communication tool and in fact a complete strategy management system (Niven, 2008).

i. Customer Perspective

To be able to be successful, businesses need to sell their products or services to customers. To do this the businesses need to answer three critical questions: Who are our target customers? What competitive or differentiating advantage we offer in serving them? What do our customers demand and expect from us? The answer to these questions determine strategy and that leads to the metrics that can measure success. Examples of metrics under this perspective include market share, customer loyalty, number of new customers, and customer satisfaction.

ii. Internal Process Perspective

In this perspective key processes related to serving the customers (as identified in the customer perspective) of the organization are identified. Then relevant metrics for each of these processes are selected which can track progress. Examples of the processes are product development, delivery, production, and after sales service.

iii. Employee Learning and Growth Perspective

It is the employees who produce and serve hence for a business to be successful and sustainable it is of vital importance to invest in the employees – the human capital and to monitor their progress. Common measures under this perspective are: employee satisfaction, skills, training, retention and so on.

iv. Financial Perspective

This perspective measures success of strategies employed in the other three perspectives. Eventually, success in the other three perspectives should lead to improved financial results. Typical examples of financial measures are profit growth, revenue growth, and asset utilization.

Characteristics of PM in Integrated Era

More than sixty percent of Fortune 1000 companies have implemented BSC (Niven, 2008). Not only the companies in the private sector adopted BSC but a large number of public sector and non-profit organizations have also implemented BSC. Several adapted versions of BSC are also commonly used in different sectors and different countries. Scholars and researchers have paid significant attention to BSC and it is estimated that more than 10,000 articles on BSC have been published in the last two decades (Hoque, 2014). BSC is not without its critics. For instance, it has been criticized by Norreklit and Mitchell (2007) for lacking in causal validity and strategic coherence. They contended performance measurement is a complex phenomenon and hence cannot be accurately represented by a simple linear model. Neely (2007) pointed out that BSC overlook two very important stakeholders – employees and suppliers. Other frameworks

similarly incorporating multiple perspectives were quickly introduced for instance, Performance Prism (Neely, Adam, & Kennerley, 2002), Dashboard (Paton, 2003), Profit, People & Planet also called PPP (Elkington, 1997), but none could match the popularity enjoyed by BSC.

Future Direction

Extant literature claims the future PM will have the following characteristics:

- i. **Predictive Measures:** Traditional rear-view measures which considers the past results will be replaced (or supplemented) by predictive measures. Increasingly, managers are beginning to look for “predictive” measures such as statistical process control (SPC), which show that something is going out of control, before too much damage has been done (Neely, Gregory & Platts, 2005).
- ii. **Flexible Framework:** A performance measurement system which takes account of the changing business environment. Current PM systems lack the ability to incorporate the context or the business environment. Since the need has already been felt, it's a matter of time that PM system with such capabilities will surface (Fuehles-Ubach, 2018; Paranjape, Rossiter & Pantano, 2006).
- iii. **Performance Killers:** Some scholars (see Parida, Kumar, Diego, & Stenström, 2015) expect integration of Risk management and PM in the not too distant future. So far, the PM has been focussing on the success factors only thus leaving the measurement of factors which are “killing” the performance. The role of a PM system in the future will enhance from simply measuring how much the organization has achieved to be able to tell that what factors have hindered in achieving success.
- iv. **Co-creation of PM and Strategy:** Melnyk, Bititci, Platts, Tobias and Andersen, (2014) argued that in future businesses will be designing their PM system and strategy together. The focus of a PM system in an organization will move away from monitoring of progress against a set standard to strategizing the actions required to achieve those standards.
- v. **Collaboration with Network Partners:** Supply chain management processes and networks are becoming increasingly important in determining success of an organization (Narasimhan, 2018). Therefore, measuring how efficient and effective these processes should be a part of an organizational PM system. Specific common

metrics will need to be developed for this purpose and a strong collaboration and mutual trust will be required between partners (Papakiriakopoulos & Pramataris, 2010).

DISCUSSION & CONCLUSION

It is clear that PM is not going to go away. A PM system is needed not only for internal management purposes but external agencies are also demanding more information about performance (Neely, 2007). This study found that the past one hundred years have seen domination of just four systems each based on a unique philosophy. No doubt over time the PM systems have become much more sophisticated, multi-layered and multi-dimensional but the business environment has also grown into a highly complex web where everything is connected to every other thing. Organizations no longer rely only on the traditional financial metrics nor do they look at only the final outcomes. The currently used integrated PM systems such as the Balanced Scorecard provide a much wider and inclusive picture to the organization of where it stands. The direction in which PM seems to be moving is that it will be able to tell the stakeholders not only where the organization stands currently but also where it is headed.

The giant leaps which communication technology has taken in the last decade has increased the awareness level and expectations of the stakeholders. Sarbanes-Oxley Act 2002 was a wakeup call for the society to put pressure on the businesses for more transparency and higher accountability (Ostrower, 2007). The apparent sudden collapse of giant companies like Lehman brothers, Bear Stearns, Dell and Motorola in the recent years demonstrates clearly the inadequacy of PM systems these organizations were using (Groysberg&Slind, 2012). Hence, development of a new PM system with ability to predict and highlight the level of risks involved is now needed.

To conclude, a look at the graph shown in Figure 1 indicates two things. One that organizations tend to stay with their PM system for long periods of time. Second that a new era for PM is now due. A responsive, dynamic and inclusive PM system is needed for globalized businesses, a system which should be able to help organizations and their stakeholders to predict and prepare rather than picking up the pieces after damage has been done. Current era of integrated perspective broadened the scope of the PM by including other relevant and important nonfinancial perspectives. Perhaps it is time to push the boundaries further and include the supply chain and other network partners in a standard PM system.

The study was based on literature review method that, despite being systematic and rigorous, might have missed significant relevant works that (a) may have been published in journals not covered by the databases used in this study, (b) were missed by the filters used (c)

were not published in English language and (d) the study was limited in scope to the private sector organizations only.

More research is needed to expand our understanding on what triggers the organizations to change its PM systems. While extensive research have been done on the effectiveness of different PM frameworks for example, BSC, few studies have focused on how the organizations balance differing expectations of its diverse stakeholders with regard to PM systems. Hence, there is a lack of empirical evidence on the decision-making processes concerning design of PM and selection of PM tools. Finally, this study specifically contributed to the literature on PM in private sector companies, future researchers might consider the PM evolution trend in the non-profit and public sectors.

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