



Towards a holistic enterprise innovation performance measurement system



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ABSTRACT

This paper identifies the gaps in previously proposed enterprise innovation performance measurement schemes vis-à-vis today's enterprise needs and proffers a process based innovation performance measurement scheme, which improves upon existing schemes by significantly broadening the measurement scope. A number of industry surveys bear out the discontent of enterprises with existing innovation performance measurement schemes. In order to address pertinent enterprise needs, a literature review of innovation performance measurement schemes is presented, followed by a set of guiding principles for developing a more robust scheme that emphasizes the distinction between the measurement of invention and exploitation and can be used as a taxonomy for innovation key performance indicators.

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1. Introduction

Competitiveness arising from globalization has forced enterprises to increasingly look towards innovation in order to offer differentiated goods and services as well as lower costs for meeting their long term business objectives (Porter, 1998). Therefore, innovation has become one of the top most priorities for a majority of enterprises today. Moreover, there is a need for enterprises to measure the performance of their innovation initiatives to ensure effectiveness of their investments. It is easy to measure things that are established, stable and well-understood. However, if things are new, evolving and dynamic then what to measure and how to measure them are the challenges (Kirchhoff et al., 2013). Innovation management itself is evolving and presents enterprises with tough challenges in performance measurement. It is not surprising that a number of industry surveys bear out the discontent of enterprises with their existing *Innovation Performance Measurement* (IPM) systems. Less than 41% of enterprises regard their IPM systems as effective and a large majority of enterprises have felt the need to improve their IPM systems. These points are borne out by a number of industry surveys on innovation including McKinsey innovation metrics survey (Chan et al., 2008), performance management survey by Business Application Research Center (Bange et al., 2009) and Boston Consulting Group (BCG) innovation survey (Andrew et al., 2010). Evidently, the surveys underline the need for enterprises to review their IPM systems to strengthen the outcome of their

innovation efforts. There are several IPM systems that have been proposed in the literature (refer Section 3 on literature study), but from a practitioner's perspective, none of these seem to be effective in addressing the complete needs of an innovative enterprise. In addition, enterprises are facing difficulties in establishing a clear relationship between innovation and enterprise performance because of disagreement on how to measure innovation and how to link innovation with enterprise performance (Cruz-Cázares et al., 2013).

The subject of innovation is considerably diverse and deep (Lawson and Samson, 2003). Before discussing innovation performance measurement, it is essential to understand innovation in the context of the enterprise. Numerous definitions of innovation have been proposed in the literature. Roberts (1998) definition has been preferred, as it is relevant in the context of this discussion:

Innovation = Invention + Exploitation

In this definition, invention implies conceiving and developing the idea into a workable application, whereas exploitation entails the process of commercialization and reaping the benefits. Notably, this definition includes the creation of innovations; whereas most definitions in the literature focus only on adoption of innovations (Ravichandran, 1999). For example, one commonly cited definition of innovation is “the successful exploitation of new ideas” (Branson, 1998). It may be contended that innovation cannot be effective unless there is an efficient mechanism for generating and incubating ideas, which are of benefit to the organization. In this paper, the term innovation is presumed to include all kinds of innovations including product, service, process, technology, and business model.

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The contribution of this paper towards IPM theory is twofold:

- An extensive review of IPM literature has been provided with mention of key industry surveys. This provides a strong foundation for subsequent research in this area.
- We have derived from our research, a set of guiding principles for developing effective and robust IPM schemes. Researchers can leverage these principles to develop more exhaustive IPM schemes.

Further, the contribution of this paper towards IPM practice is threefold:

- The guiding principles enlisted provide a strong foundation for industry practitioners to develop robust IPM systems. This can help enterprises improve innovation measurement and thereby extract more gains from their innovation investments.
- The case study explains how an IPM scheme was derived from the guiding principles. Enterprises can use this IPM scheme directly or take help of our framework to derive their own IPM scheme.
- Adoption of a uniform set of IPM guiding principles across enterprises can eventually lead to development of relevant IPM industry standards as well as open up the possibility of establishing global innovation performance benchmarks.

This paper begins with a discussion on IPM systems in [Section 2](#) followed by the literature review in [Section 3](#). The guiding principles required to develop a performance measurement system are discussed in [Section 4](#) along with the IPM scheme in [Section 5](#).

2. Performance measurement systems

To make innovation sustainable within the enterprise, it is important to have a well defined IPM system that comprises:

1. The *performance measurement scheme* that defines and optimally clusters the key performance indicators (KPI) across appropriate dimensions ([Kerssens-van Drongelen and Cook, 1997](#)).
2. The KPIs and corresponding *benchmarks* for each dimension
3. The appropriate *reporting formats* according to enterprise needs
4. A proper *method* and supporting *infrastructure* to enable data gathering, analysis, interpretation and dissemination in the form of reports ([Neely, 1998](#)).

In this paper, when we use the term 'IPM system' we refer to the scope comprising all four points listed above, whereas by the term 'IPM scheme', we refer to a formal framework as mentioned in point 1 above that optimally groups tangible and intangible KPIs so that enterprises can derive maximum benefit from the innovation program. This paper essentially focuses on point 1 i.e. IPM scheme. The points 2 to 4 have been considered out of scope in the context of this paper. Discussion of KPIs and corresponding benchmarks (point 2) is a considerably vast subject and merits a separate discussion. Reporting formats are generally designed to meet specific needs of stakeholders at various levels of the enterprise, so point 3 is not covered here. Point 4 is significantly dependent upon the governance processes and existing infrastructure of the enterprise, hence this aspect has been kept out of scope.

The use of performance measurement systems has been witnessing steady growth. To quote [Godener and Soderquist \(2004\)](#):

The use and interest in performance measurement systems by enterprises has got increased importance over the years because the effectiveness and efficiency of these activities not

only determine a firm's competitive advantage, but its very survival.

Without having an effective performance measurement system, an enterprise may find it hard to effectively manage its operations and keep its employees motivated ([Globerson, 1985](#)).

Traditionally, performance of a commercial enterprise (in a capitalistic context) is measured by: (a) *financial performance*, using accounting measures like return on investment and payback period and (b) *operational efficiency*, using measures like productivity and cycle times ([Kaplan and Norton, 1992](#)). When viewed in the current context of creating competitive advantage by adopting innovation programs, enterprises' tangible assets are increasingly losing their importance to intangible ones; consequently, these commercial performance measures no longer appear to be adequate for an IPM scheme ([Kaplan and Norton, 2001](#)).

Enterprises today also need a focus on continuous improvement; often leading to innovation. To quote [Kaplan and Norton \(1992\)](#):

The traditional financial performance measures worked well for the industrial era, but they are out of step with the skills and competencies companies are trying to master today.

The late 20th century witnessed the emergence of several multi-dimensional IPM systems designed to address this need ([Bourne et al., 2000](#)). These systems provided some means of integrating a combination of financial and non-financial measures to measure the tangible and intangible value created by the enterprise. Some notable examples are the performance measurement matrix ([Keegan et al., 1989](#)), the results and determinants framework ([Fitzgerald et al., 1991](#)) the performance pyramid ([Lynch and Cross, 1991](#)), balanced scorecard (BSC) ([Kaplan and Norton, 1992](#)), and the performance prism ([Neely et al., 2002](#)).

Similar to the evolution of *enterprise performance measurement systems* in the past, IPM systems are also passing through a period of evolution. To quote [Milbergs and Vonortas \(2005\)](#):

The drive for improved [innovation] indicators stems from the understanding that currently available measurements largely reflect the industrial era and less so the knowledge economy unfolding around us: they largely reflect products and artifacts rather than ideas and processes.

Moreover, the adoption of reasonably uniform IPM systems by enterprises will allow for competitive benchmarking among them and thereby development of relevant industry standards.

The objectives for research and new product development mentioned by [Godener and Soderquist \(2004\)](#) are: (1) communication to clarify goals, (2) diagnosis, control and correction, (3) resource allocation, (4) employee performance evaluation and incentives and (5) continuous process improvement. Similarly, in case of innovation, the goals of measuring performance are not different; moreover, they assume a special significance when justifying resource allocation and investment decisions by demonstrating the value of innovations using quantifiable data ([Gama et al., 2007](#)).

Last but not least, organizations should have a well defined innovation strategy as it provides a strong foundation for developing a robust IPM scheme. To quote [Gurhan Gunday et al. \(2011\)](#):

Innovation strategy is an important major driver of firm performance and should be developed and executed as an integral part of the business strategy. Managers should recognize and manage innovations in order to boost their operational performance.

To understand IPM systems and schemes, we have studied academic and practitioners' literature. The observations are mentioned in the following [Section 3](#).

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