

A Review of Contextual Factors Influencing Performance Measurement System Adoption in the Construction Industry

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Abstract

Adopting the performance measurement system (PMS) is one of the most important initiatives introduced in different industries and sectors, such as the construction sector of many countries. However, in practice, it has been noted that despite the enormous possible advantages that the PMS could provide, some organizations are facing difficulties in its adoption, and failing to achieve the full potential of the system or, worse still, fail totally in adopting it. Through an extensive review of previous studies in the literature, this paper will discuss the contextual factors that affect the adoption of such a system in the construction industry. Several factors are determined as important enablers of PMS adoption among construction firms and are classified as external and internal factors. More specifically, this review paper addresses external factors such as environmental uncertainty, stakeholder involvement, and competition, besides, internal factors such as leadership, strategy, information system, and quality management practices.

Keywords: PMS; adoption; construction; internal; external; factors

INTRODUCTION

The construction industry has long been the target of criticism for underperforming. Numerous researchers have strongly emphasized the significance of adopting the PMS to enhance the present state of the construction industry (Yang, Yeung, Chan, Chiang, & Chan, 2010).

Although it is widely believed that the PMS can play a strategic role in the effective and efficient management of organizations, the challenge lies in the successful adoption and implementation which has become a critical issue still being debated publicly and in academic circles (Kennerley & Neely, 2002). Despite the great advantages that organizations gain from the performance measurement system, many organizations are facing obstacles in adopting this system, thus not enjoying the full benefits or none at all due to implementation failure (Taticchi, Balachandran, & Tonelli, 2012; de Waal & Kourtis, 2013). Further, previous studies have maintained that a better understanding of the factors that lead to successful PMS adoption and implementation will increase the chances of higher adoption and implementation success rates (Keathley, 2016; Quesado, Aibar-Guzmán, & Rodrigues, 2016; Abubakar, Saidin & Ahmi, 2015). Similarly, several factors are said to influence a firm's adoption of the performance measurement system (Pedersen, & Sudzina, 2012).

In addition, there are many researchers who have studied the performance measurement system in different countries and different industries. They have attempted to investigate the factors, motivations, or obstacles facing the adoption and effective implementation of this system. For instance, Alharthi (2014), undertook research on government organisations in the UAE. In addition, Garengo and Sharma (2014) studied corporate governance structure as a PMS contingency factor in Italian and Indian SMEs employing multiple case-study techniques. Furthermore, Rao and Vaidya (2016) studied the factors that influence the scope, implications and aims of the PMS in e-commerce and m-commerce companies in Hyderabad, India.

The fact is that similar to any other management control initiative, implementing PMS is normally linked to the existence of certain organizational environmental features, which render some companies more likely to adopt it than others. On the other hand, most empirical studies have emphasized the generic analysis of the implementation of some PMS tools, such as BSC, its features and the application outcomes (Hoque, 2014), while determining the factors that influence the adoption of PMS in organizations is an issue that has not received much attention.

Similarly, despite a significant contribution of construction organizations to the economies of developed and developing countries, the literature offers only a few studies with information regarding the adoption of PMS in construction organizations. Most existing literature has focused on manufacturing firms. To address this issue, the objective of this paper is to study the environmental factors that promote the adoption of PMS in the construction industry by presenting and discussing prior literature. Moreover, the research conceptualizes external and internal factors. The following section will discuss the external and internal environmental factors found in previous studies.

EXTERNAL FACTORS

This study divides the contextual factors of the organization into external and internal. This paper deals with the factors that are outside the control of the organization as external factors. Variables such as environmental uncertainty, stakeholder involvement, and competition have been addressed in previous research as external factors that affect the adoption of management systems in general and PMS in particular. Generally speaking, prior studies investigated that environmental forces affecting the adoption of novel ideas. Choe (2003); Ambler, Kokkinaki, and Puntni (2004); Al-shareem, Ernawati, & Kamal (2015) pointed out some factors such as the emergence of new technology, outsourcing, market competition, environmental uncertainty, and market readiness. The following sections explore the effect of environmental uncertainty, stakeholder involvement, and competition on the adoption of PMS.

ENVIRONMENT UNCERTAINTY

Environmental uncertainty (EU) is defined as the inability of the organization to predict the stakeholder's concern accurately, interests and activities towards the products or services that the company offers and it is the failure of the corporation to forecast the environmental changes that the organization operates in (Naranjo-Gil, 2009). Hence, it is one of the significant obstacles that firms could face regarding the quality of decisions or the speed of the process of decision-making. Furthermore, the lack of information or ineffective management of the available information and data could be a reason for the ambiguity of the organization's future circumstances and the external environment.

In addition, the EU is one of the most influential factors that affect the strategic vision of the firm. Certainly, previous studies in different industries and various countries confirmed their influence in a number of areas. For instance, the EU is viewed as a significant factor in establishing public-private partnerships, especially in developing countries (Al-shareem, Ernawati, & Kamal, 2015). Similarly, Hoang, Dinh, Tran, & Nguy (2018) claimed that perceived environmental uncertainty affected the implementation of the balanced scorecard (BSC) in Vietnam's enterprises.

COMPETITION

Competition is one of the important factors that motivate the organization to adopt advanced managerial and industrial techniques. Prior studies have asserted that competition is fundamental for innovation adoption especially in the construction industry (Havenvid, 2015). In the domain of performance measurement, the results of the previous study suggested placing greater emphasis on a range of measures for performance measurement, which is related to businesses confronting stiff competition. Similarly, Lisi (2015) asserted that the expected competitive advantage influences the environmental performance measurement system positively. In addition, Ahmad and Mohamed Zabri (2015) claimed that the level of market competition affects the use of performance measurement positively in small and medium organizations in Malaysia.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement was identified in previous literature in the performance measurement system as one of the essential drivers of use performance measurement information (Alexander Kroll, 2015). The

author claimed that stakeholder involvement is one of the most significant elements that have been regularly shown to be a positive influence. To clarify, obtaining legitimacy is the main cause of strategic change in organizations rather than enhancing actual performance as claimed by the institutional theorists.

Therefore, Ashworth, Boyne, & Delbridge (2009) and Scott (1987) stated that the motivations of an organization to shift its characteristics are external reasons, such as legitimizing or political, but not technical or rational ones. Moreover, Lisi (2015) declared that perceived stakeholder concerns influence the use of environmental measurement systems for decision-making purposes. Additionally, external pressures promote a collection of performance measures in the United States local government (Krishnamurthy, Desouza, Dawson, & Ho, 2018).

INTERNAL FACTORS

Internal variables are a set of controllable elements that influence the organization's performance and work environment positively or negatively. Qadri, Azhar and Imam (2013) believe that organizational determinants of a particular organization are those features that are considered a remarkable barrier in decision making related to strategic adoption and supposed to be under control. Accordingly, the authors concluded that organizational factors are believed to be a barrier to the balanced scorecard (BSC) adoption for performance measurement in Pakistan. Likewise, a practical study on the higher educational institutions of South East Asia found that organizational factors influence PMS (Mansor, Chakraborty, Yin, & Mahitapoglu, 2012). Moreover, several internal elements are distinguished in the literature that has an influence on PMS adoption and uses such as organizational culture, strategy, management style, technology and management systems (Pedersen, & Sudzina, 2012).

This study examines the effect of leadership, strategy, information system and quality management practices, as internal factors, on PMS adoption. More discussion about these factors is in the next sections that follow.

LEADERSHIP

Leadership is invariably key to the success of any activity involving collaboration among a group (or groups) of people. In the construction industry, leadership is even more crucial, and this has been confirmed in most previous studies (Ofori & Toor, 2012).

Effective leadership is crucial if a firm or business sector, including the construction sector, is to perform successfully (Liphadzi, Aigbavboa, & Thwala, 2015).

Leadership is defined as "the process of influencing others to attain a common goal" (Oyetunji, Adebiyi, & Olatunde, 2019).

Roger, (1983) stated that generally, the managers are significantly influential with regard to the acceptance of innovation in the organization and particularly in the adoption of contemporary management accounting practices (Trang & Huyen, 2017). Moreover, Al-mamary, Shamsuddin, & Aziati (2014) stated that "the support of top management is one of the factors that affect the success of accounting information systems adoption in organizations in order to improve organizational performance." In addition, Nguyen' (2016) argued that the absence of leadership support has a negative influence on the successful use of activity-based costing methods in Vietnamese firms. Besides, Tran (2016) asserted that managers/owners' understanding of management accounting has an important effect on the management accounting practices in small and medium-sized firms in Vietnam.

To clarify, prior literature confirmed that leadership is a major contributor to the success of PMS adoption and implementation (Akbar, Pilcher & Perrin, 2012). Similarly, Garengo and Sharma, (2014) proved the central role of leadership, as an aspect of corporate governance, in the development of an advanced managerial approach in India. In addition, some scholars argued that there is a direct link between leadership and comprehensive performance measures (Tuan L. T., 2010).

It is obvious that leadership has a significant influence on a variety of organizational change and improvement initiatives (Keathley, 2016) and its role in promoting the organizational culture for the change acceptance is effective (Masri, 2013).

STRATEGY

Performance measurement is a fundamental aspect of the strategic management process. Measuring performance is the obvious way to assess to what extent strategy has been appropriately used in an organization (Gosselin, 2011). The Author clarified the function of strategy in the organization. The author described that organizations must set clearly defined goals and then allocate adequate resources to achieve these goals. Ideally, a PMS will be congruent with the organization's strategy, but the literature shows that a key issue with any PMS is the problem of aligning it with the strategy across the organization.

It is, therefore, essential that the organization clearly defines its global goals and communicates these effectively throughout the organization prior to the development of the PMS. The relevance of the performance measures and the justification for their use need to be understood by all parties to minimize the possibility of resistance. Kaplan and Norton (1996) suggest a strategic map be developed to align the organization's strategy. Other authors besides Kaplan and Norton have described how unclear strategy results in poorly defined 'Critical Success Factors' (CSF) and 'Key Performance Indicators' (KPI), which then affect the credibility of the system, possibly rendering it unreliable or even irrelevant. A good example can be found in Johnston and Pongatichat's 2008 case study on a local Thai police force. This showed how the misalignment of the PMS with the organization's strategy created tension. To overcome this, coping strategies at the operational level had to be developed, consequently creating misalignment of strategy (Masry, 2013).

Empirical evidence derived from work carried out pertaining to this subject has indicated that the BSC is not associated with traditional systems of performance evaluation and control, taking into account the alignment between management indicators and the organization strategy, one of the keys to successful implementation (Hoque, 2014). (Quesado, Aibar-Guzmán, & Rodrigues, 2016)

Performance measurement and management researchers suggest that accounting performance measures should be planned in line with the firm's business strategy. While the significance of business strategy as a contingency variable has been studied for other management control systems, it has yet to be investigated with the uses of multiple performance measures. The PMS literature proposes that even though a PMS is essential in all companies, varying manufacturing environments require various measures for the assessment of a firm's effectiveness. The related literature advocates that organizations utilise those types of measures that fit with their strategy, their organizational structure, and the EU. The type of strategy used by a firm should affect the design of the PMS (Khan, Halabi, & Sartorius, 2011).

Similarly, according to the survey carried out by De Waal and Counet (2009), the significance of this deficiency is that, without the mission and vision is clearly understood throughout the organization, the developed KPI will not be relevant. At the same time, the study by Masri (2013) indicated that the main reasons for the failure of PMS adoption are deficiencies in the mission and vision of the organization and the communication of this throughout the organization. Also, the author indicated that the performance measures align with the organizational objectives. So, if only the financial aspects are reflected in the

organizational goals, the performance measures will neglect non-financial aspects as well. Further, Fleming, Chow, & Chen (2009) supported this notion when they found that there is a positive relationship between the choice of strategy and PMS practice.

INFORMATION SYSTEM

Information system (IS) has a central role in the management and communication of performance.

IS was defined in prior literature as “a system that deals with the planning, development, management, and use of information technology tools to help people perform all tasks related to information processing and management.”

In terms of data collection, an organisational information system should be able to handle integrated data from various sources and systems (Nudurupati, Bititci, Kumar, & Chan, 2011).

Organizations, therefore, need to integrate this system with other management systems such as supply chain management, customer relationship, and so on. Besides, most firms adopt Enterprise Resource Planning (ERP) for this purpose.

An information system should also be dynamic and responsive to changes in the environment so that data and information are accurate, presented to users in real-time, provide information to the right people besides making the required information easily accessible (Taylor & Taylor, 2013).

Previous studies have confirmed the relationship between the information system and PMS adoption and implementation. For instance, Garengo and Bititci (2007) found a positive relationship between MIS and the implementation and use of PMS.

Actually, investment in information systems is not enough to promote PMS adoption in the organization. Other contextual factors are vital to take advantage of the information system in managing performance measurement information. To clarify, some studies which examined the impact of the information system on the adoption of PMS, concluded that organizations need external support to benefit from such a system (; Masri, 2013).

Further, prior studies found that management practices and human behavior with respect to the information system significantly support PMS development (Garengo & Bititci, 2007; Taylor & Taylor, 2013)

QUALITY MANAGEMENT PRACTICES

The Japanese presented a quality notion in the middle of the last century as a distinctive feature related to their products against volume and price that distinguished them from the American products. In fact, quality management in the construction industry differs from that of other industries, as the construction industry includes not only the products' quality but also the total management practices to meet the expectations of stakeholders (Rumane, 2011; Willar, 2017). The author stated that the construction industry in different countries is guided by several standards and policies that follow either international frameworks or local. Additionally, every country needs to develop proper PMS that meets its quality standards in the construction industry. Similarly, prior studies confirmed that quality goals could be achieved only if there are standards to measure them.

Various PMS models have been adopted in different countries. Some of them have been accepted worldwide, such as balanced scorecard (BSC), the European Foundation for Quality Management Excellence(EFQM) model, and the Construction Best Practice Program-Key Performance Indicators (CBPP-KPI) model. Some countries such as Indonesia, Malaysia and Singapore develop their own performance assessment models (Willar, 2017).

Moreover, practical studies indicate that quality management practices such as TQM seem to promote the adoption of not only PMS but management control systems in general (Malmi, 2001). Furthermore, performance measures and PMS are process-oriented in a TQM environment (Luís Pimentel & Maria João Major, 2014). In addition, the results of Abdel-Kader and Luther (2008) indicated that TQM is one of the

factors that influence the management accounting practices in UK food and beverage companies (Trang & Huyen, 2017). Further, the interaction between TQM and performance measures to enhance the performance was proven by the results of a survey of 39 organizational units according to Chenhall (1997). The author stated that organizational performance was improved compared to the adoption of TQM without such measures.

Quality management practices encourage a firm to apply different quality measurement tools. Sokovic, Pavletic, & Pipan (2010) and Neyestani and Juanzon (2016) claimed that the philosophy of the PDCA cycle that has been adopted in some quality management tools is to measure the organization's performance, whereas the third step involves assessment or checking the performance of the first and second steps (plan and do). Besides, Hoang, Dinh, Tran, and Nguy, 2018 reported that one of the crucial motives to promote the adoption of the BSC is the use of TQM.

Additionally, Taylor and Taylor, (2013) state that: "the implementation of the quality practices will establish a culture of empowerment, customer focus, continuous improvement and a mindset of fact-based decision-making, all of which can be supportive of PMS implementation without the need for such a PMS to pre-exist."

CONCLUSION

The ultimate goal of any organization in the construction industry is to attain superior performance and provide stakeholder's satisfaction. Adopting contemporary management control systems such as performance measurement systems helps to raise the competitive advantages of the company.

This paper provided a review of previous studies on the elements that affect PMS adoption and shed light on the importance of the factors that were discussed. Besides, it classified the contextual factors of organizations as external and internal. This method enriches the debate on the most important motivations (external or/and internal) that push organizations to change their characteristics to meet environmental changes. Besides, this classification helps the decision-makers to take these factors into account for promoting the adoption of a performance measurement system in the construction industry in a proper way.

This review introduced environmental uncertainty, stakeholder involvement and competition as an external driver to adopt PMS in the construction industry. Likewise, leadership, strategy, information system, and quality management practices were presented as internal factors that motivate organizations towards PMS adoption. According to prior studies, all these factors were investigated in different industries while there was a need for a more practical examination of the construction industry in the future. Gathering them all together in a single framework allows academicians and professionals to explore not only which group (internal or external) or factor has the strongest effect on the adoption of PMS but also can investigate the interplay between the variables.

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