

Towards an integrated measurement of IS project performance: The project performance scorecard

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Abstract Determining the contribution of information system (IS) projects is a difficult endeavour. This research presents a framework for evaluating and measuring IS project performance that seek to address this problem while moving away from the reliance on the traditional assessment method (time, cost, specifications). When IS projects fail or succeed is difficult to determine what conditions enabled the outcome. However, if we are to develop a higher level of IS project management competence we need frameworks that can help in assessing IS project outcomes while critically reflecting and learning from IS project management practices. The Project Performance Scorecard (PPS) recommended here is one framework that can help to advance our understanding IS project management and evaluation approaches. This framework integrates concepts from existing models of IS success, the Balanced Scorecard and project management practices. A case study approach is used to illustrate the use of the PPS, and offers insights into how it can be useful in assessing the performance of IS projects.

Keywords Project performance scorecard (PPS) · IS Projects · Project management · Performance measurement · Project success · IS evaluation · IS Success · Balanced scorecard

1 Introduction

Effective management of information systems (IS) projects is important to the business strategy of organisations.

Significant investments are made in IS projects with a view to improving the competitiveness and value of these organisations. In today's increasingly dynamic and competitive environment, organisations are faced with numerous strategic alternatives; and managers must decide which IS projects to implement and how best the organisation can maximise the benefits of selected projects. As our understanding of the challenges faced by IS projects continues to evolve, the demands and expectations have also increased. This is further complicated because various organizational stakeholders (business process owners, users, information technology (IT) developers, business managers, etc.) each having different goals and objectives are involved in assessing project outcomes. A fundamental problem of IS project assessment is the varied and sometimes contradictory stakeholders' expectations and their perceptions of failure. This problem is also reflected in the IS project failure literature which reports very high failure rates, even though organizations continue to successfully implement new IS projects (e.g. Standish 1994, 2004; KPMG 2005). A key finding of the KMPG (2005) survey was that 49% of the survey participants experienced at least one project failure within the reported year, as compared to 57% reported in a previous survey. Interestingly, the survey highlights the predominance of the traditional approach to assessing project success or performance.

From one perspective, the continued depiction of failure indicates an ongoing struggle to successfully manage IS projects and to assess their outcomes. There is growing criticisms of the current methodologies employed in IS Project assessment and a call for a "new theory of project success" (Glass 1999). One of the key arguments made by Glass (2005, 2006), is that industry practice indicates that IS projects are being implemented and accepted by organisations, thus this high perception of failure does not seem to reveal the complete picture. Some studies have

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highlighted various challenges of managing IS projects and assessing outcomes (Ewusi-Mensah and Przasnyski 1991; Agarwal and Rathod 2006). Some of these studies point the use of triple constraint methodology and its inability to account for the varied dimensions of IS projects that need to be considered in their assessments. There is emerging consensus among researchers that the traditional approach to measuring project performance, the so-called triple constraint measures of time, cost and quality objectives is much too limited (Atkinson 1999; Dvir et al. 2003; Collins and Baccarini 2004). Further, there is growing research on alternative management methodologies (such as agile methods) aimed at addressing the high failure of software development projects. Agile project management (PM) methods (Alleman 2005), promote flexibility in methodological approaches throughout the project and interactions with stakeholders. Despite the advantages of these new agile approaches there is still continued reliance on traditional measurements to determine success or failure. According to Jugdev and Miller (2005) the triple constraint assessment method limits the view of project management to that of providing tactical value and not strategic value because it does not include the necessary links to the project's product/service. It is therefore essential that the evaluation of IS projects convey both the tactical and strategic value of these projects.

Improved management IS projects as well as better methods for assessing performance outcomes is of critical and requires more attention from IS researchers. The current state of research reveals that there is lack of agreement on not only what constitutes project success but on methods for more comprehensive assessment of project outcomes (Pinto and Slevin 1987; Jugdev and Muller 2005). Noting that all projects are different, Shenhar et al. (2002) argues that most research on IS project assessment have failed to make a distinction between the project genres. Thus, IS project assessment methods deserve more research attention if they are to account for the complexities and nuances of IS projects. Additionally, this issue has become more complex as the nature of these investments and the benefits they can deliver has evolved over time and has changed rapidly (Lin and Pervan 2001). Therefore, performance criteria needs to take into consideration all aspects of the project (Wateridge 1998).

This paper seeks to contribute to PM research through the introduction of a multi-dimensional performance assessment method. This method called the Project Performance Scorecard (PPS) provides a six dimensional framework from which projects can be evaluated: project process, benefit, innovation and learning, quality, use and stakeholders perspectives. A central theme of the PPS is interactions with key stakeholders and their view of success and understanding why the project is important which is

turn is used as basis to measure the performance outcome of the project. A methodology is also provided that allows for easy adoption by practitioners. The PPS is influenced by IS research, especially Delone and McLean (1992) IS Success model and subsequent extensions (Seddon 1997; Seddon et al. 1999; DeLone and McLean 2003) as well the Balanced Scorecard (BSC) (Kaplan et al. 1992) which presents an approach to measuring organisational performance from four perspectives: financial, customer, business process and learning. The PPS model proposed here posits that service quality, information quality, system quality, information use and user satisfaction are necessary dimensions for assess IS Project Success.

2 Measuring the performance of a project

Researchers have argued that IS/IT project success may mean different things to different stakeholders example, contractors, sponsors, project managers, team members, and clients (Shenhar and Levy 1997; Shenhar et al. 2001). Thus, it is reasonable to assume that assessing IS/IT project performance will be complex and involve multiple distinct yet interrelated constructs that cover different dimensions and perspectives of the problem. There is an ongoing debate on what constitutes project success that provides some interesting and divergent perspectives (Baccarini 1999; Cohen and Graham 2001) which has influenced the measurement framework. In the pursuit of improved understanding researchers have argued for various dimensions of project success. deWit (1988) and Cooke-Davies (2002) held similar views on project success. They distinguished between *PM success* in terms the traditional measures (time, cost, quality (scope) and *project success* being the overall objectives of the project, which may be discerned from the stakeholders. Thus, in this context project management influences project success. There are practical examples of projects failing to meet their PM objectives while being deemed successful. Baccarini (1999) and Collins and Baccarini (2004) provided a complementary perspective, that suggested that project success consists of two components, *PM success*, which ties into DeWit's perspective (time, cost and scope) combined with objectives of the project stakeholders, while *product success* is aligned with the product outcome of the project.

These perspectives may not be pervasive as the conventional definition of project success which espouses conformance to budgetary, schedule and scope constraints (see White and Fortune 2002; KPMG 2005). Further, a range of project success criteria, beyond the triple constraints have been suggested (cf. Table 1) in an attempt to advance the practice of project measurement. Performance criteria are influenced by wide spectrum of variables

Table 1 Dimensions of project measurements

Dimensions	Measurement concepts	Literature
Traditional measurement	Triple constraints: time, cost, scope	(Nelson 2005; Atkinson 1999; Shenhar and Levy 1997; Shenhar et al. 2001, 2002)
Organisational and project benefits	Project functionality, project efficiency, project management	(Freeman and Beale 1992; Morris and Hough 1987)
Stakeholder (customer) benefits	Utility, use, customer satisfaction, safety, impact on customer	(Lim and Mohamed 1999; Nelson 2005; Morris and Hough 1987)
Product benefits	Safety, commercial performance, technical performance business and direct success, financial rewards	(Lim and Mohamed 1999; Freeman and Beale 1992)
Preparing for the future	Value, personal growth, learning	(Bryde 2005; Nelson 2005; Freeman and Beale 1992)

(Shenhar et al. 2002) and encompasses varied objectives including increase shareholder value, cash flow management, best time to market selection; a shift from fixed budget, schedule and outcome perspective (Cohen and Graham 2001). Several alternatives to the triple constraint methodology have been explored in the literature (Morris and Hough 1987; Wateridge 1998; Atkinson 1999; Bryde 2003, 2005; Nelson 2005). An analysis of literature reveals an intersection in concepts. The enhancement to the traditional measurement is shown with dimensions of benefits to organization, stakeholders and product combined with learning, value and personal growth factors that may aid stakeholders in preparing for the future. These alternatives underscore the important of wider contextual considerations including the strategic value these projects may provide. Several of these studies e.g. Atkinson (1999) are conceptual in nature and thereby provide the foundation from which other studies may be derived. Research suggests that designing a comprehensive framework for developing preconditions of project success should involve items such the determination of value the project bring and the perspectives of the actors or stakeholders involved in its performance combined with the project's product actual use. Several of the perspectives are summarized in Table 1, the culmination of research is the core consideration in the assessment of IS projects.

Another important body of research that can provide guidance to IS project measurement is the IT/IS evaluation. This literature examines IT/IS evaluation from different perspectives and suggests some strategies to effectively measure IT/IS contribution to business value (Kleist 2003; Kumar 2003; Lu 2003; Remenyi 2004). However, the current discourse also confirms the difficulties in assessing some factors such as information systems reach (Brandon 2006), the nature of tangible versus intangible benefits and the question of benefit evolution (Remenyi 2004). In addition, the ability to evaluate IT/IS investments effectively is of utmost importance in today's

environment due to issues such as the huge capital outlay (Fitzgerald 1998) which has at least in part, contributed to the IT productivity paradox (Brynjolfsson 1993). Research on assessing IT/IS business value have pointed to areas beyond the traditional financial measures to intangible benefits such as improved customer service, increased responsiveness (Kumar 2003); readiness for the future (Kaplan and Norton 1992, 1996a, b); implementability and flexibility of the IS investment (Fitzgerald 1998). Researchers have also argued that these solutions need have practical relevance (Winter et al. 2006) in order to aid practitioners in their decision making process. While these studies influence this research, this paper seeks to focus on the holistic process through which these investments are implemented in the organisations, i.e. through the project perspective. It is argued this area requires additional examination into finding appropriate measures for evaluating the actual performance of these IS projects.

3 Conceptual foundations

The perspective of this researcher is that project performance must consider three distinct but interconnected constructs: *Project Success*, *Project Management Success* and *Product Success*. The underlying assumption is that organisations will maximize their efforts to elicit optimum performance from all these elements in an effort to attain organisational benefits. Project performance involves assessing the progress and outcome of the project against predetermined criteria. These assessment standards involve success or *failure* that are aligned to the perspectives of the stakeholders against the predetermined criteria (Barclay 2007). Performance measurement should involve processes for assessing progress against predetermined objectives (Bourne et al. 2003). Therefore success or failure is seen as the outcome of the performance and performance is all the encompassing activities or processes. This implies a

shift from the narrow description of project success. Thus, in establishing the argument for project performance research it is important to distinguish it from project success. As seen in Fig. 1, project success is one of three constituents of project performance. PM success is measured against PM objectives, inclusive of the triple constraint objectives. Project success is measured against the overall project stakeholder objectives. Product success is measured against the value of the project outcome to the project and client organisations.

This framework builds on the perspectives of Baccarini (1999); Collins and Baccarini (2004); Cooke-Davies (2002) and deWit (1998). PM success is subordinate to product success, PM success influences product success, and project success is affected by time (Baccarini 1999; Collins and Baccarini 2004). These tenets are encapsulated in the project performance framework. However, the framework distinguishes between project and PM success, and posits that the three dimensions influence project performance. In other words, PM, project success influences product success and these influences the performance of the project. This will ultimately lead to positive returns on organisational financial and non-financial investments.

3.1 Perspectives on measuring IS projects

Several theoretical models can contribute to the evaluation and determination of project performance, such as the balanced scorecard, IS success and IS quality models. The balanced scorecard and D & M IS success models were selected because of their seminal nature and their applicability in aiding strategic decision making.

3.2 Balanced scorecard

A common approach to assessing organisational performance is the BSC (Kaplan and Norton 1992). The BSC illuminates for the organisations an accurate understanding of the goals and methods for the achieving these goals.

They argued that it allows organisation to monitor progress in building capabilities while acquiring the intangible assets they need for future goals. The framework posits these basic questions:

1. How do the customers see the organisation?—*Customer perspective*
2. What must the organisation excel at?—*Internal Business perspective*
3. How can the organisation continue to improve and create value?—*Innovation and Learning perspective*
4. How does the organisation look to the shareholders?—*Financial perspective*

Martinsons et al. (1999) offered a version of the BSC (see Table 2) that is geared towards the strategic management of information systems. They suggested that such an approach may help managers to evaluate IT investments and the performance of an IS organisation in a holistic manner.

With the different level of analysis the factors to consider in assessing performance may differ. In this scenario the IS department performance is viewed through the main customers—the end users, the value provided to the organisations by the department's processes, the internal operational processes and how prepared the department is for the future, future role in the organisation and wider marketplace. Taking this view is insightful and provides guidance to how organisational projects can be viewed and assessed.

3.3 IS quality

IS quality and IS success are important aspects of the process of realizing a new product, service or project outcome. Therefore, quality assessments are an essential element of the project life cycle, including the product, project and project management processes. Organisations are still struggling to improve the quality of information systems despite numerous research efforts and experience

Fig. 1 Project performance (adapted from Barclay 2007)

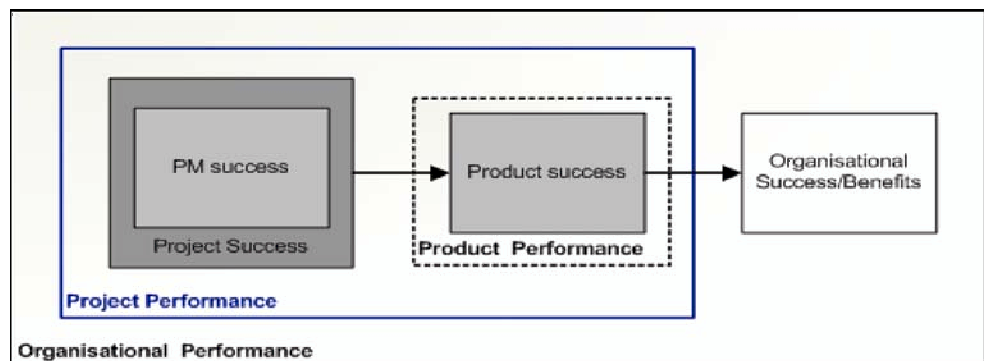


Table 2 Balanced IS scorecard (Martinsons et al. 1999)

Perspective	Objective
User orientation (end-users' view)	Are the products and services provided by the IS department functional area fulfilling the needs of the user community Establish and maintain a good image and reputation with end-users Exploit IT opportunities Establish good relationships with the user community Control IS costs Satisfy end-user requirements (e.g. cost, average response time, information quality) Sell appropriate IS products and services to third parties
Business value (management view)	Is the IS department functional area accomplishing its goals and contributing and contributing value to the organisation as a whole? Establish and maintain a good image and reputation with management Ensure that IS projects provide business value (e.g. revenue per employee; return-on-assets, return-in-investments, cost per new customer acquired) Be perceived as the preferred supplier of IS products and services
Internal processes (operations-based view)	Does the IS department create, deliver and maintain its products and services in an efficient manner? Anticipate and influence requests from end-users and management Be efficient in planning and developing IT applications Be efficient in operating and maintaining IT applications Be efficient in acquiring and testing new hardware and software Provide cost-effective training that satisfies end-users Effectively manage IS-related problems that arise suitability for the business
Future readiness (innovation and learning view)	Is the IS department improving its products and services, and preparing for potential changes and challenges? Anticipate and prepare for IS-related problems that could arise Continuously upgrade IS skills through training and development Regularly upgrade hardware and software Regularly upgrade IT applications portfolio Conduct cost-effective research into emerging technologies and their

(Duggan and Reichgelt 2006). In response there have been considerable divergent views about what constitutes a quality system and how to measure it (Ravichandran and Rai 1994). This trend is also evident in the IS project performance realm. This conundrum may be attributable, at least in part, to the diversity of stakeholders and the varied views of quality (Duggan and Reichgelt 2006). Additionally stakeholders may not be solely influenced by rational system objectives but also by political issues/factors (Robey and Markus 1984). Illustratively, the executive sponsor may view return on investment, the project client may be more concerned with decision support and usability while designers may be concerned with conformance to specifications (Duggan and Reichgelt 2006), support groups may consider maintainability of the product important (Bandi et al. 2003), or the customer experience in the case of a service.

IS quality involves observable features and quality of a system that contribute to the delivery of the expected benefits and satisfaction of perceived needs (Palvia et al. 2001). One of the challenges with such a definition is the

nuances in views on what can be perceived to be needs and benefits of the stakeholders. To meet this challenge and to illuminate the fundamentals of IS quality, several researchers (e.g. Lyytinen 1988; Markus and Keil 1994) have posited essential requisites such a timely delivery, systems and business benefits, acceptable response time, maintainability, scalability and usage of systems. These aspects are some of common criteria used in practice to assess IS. Duggan and Reichgelt (2006) suggest that a basis of organizing a quality model should include people, processes and practices dimensions. These are relevant considerations because they reflect industry and the wider contextual boundaries which are important in any conceptual development. Similarly other quality models have included dimensions that are useful for strategic analysis such as performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality (Garvin 1987), or as per the ISO 9126 framework (ISO/IEC 2001) which includes aspects such as functionality, reliability, usability and maintainability.

3.4 IS success

IS success is a multi-faceted issue that has influenced IS research yet based on review there is sparse explicit reference to it in IS project performance research. IS success essentially is about the delivery of business value to the organisation (Duggan and Reichgelt 2006) or project which may be derived from diverse sources such as improved efficiency, financial performance, functionality or improved user experience. In search for an accurate depiction of IS success or clear definition, DeLone and McLean (1992) initially found through extensive literature review that IS success could be explained by six dimensions: information quality, system quality, information use, user satisfaction, individual and organisational impact. The service quality dimension was later added combined with the distinction yet relatedness between intention to use and use constructs in the revised version of the IS success framework (DeLone and McLean 2003). The main concepts are intricately related and are critical to the understanding of the value of IS investments and management actions of which project activities are a part. It is widely accepted that IS success is the principal criteria for IS assessments (Rai et al. 2002), even with the range of perspectives that has been proffered. The DeLone and McLean Model (1992, 2003) is used as platform in this research because of its seminal nature, and as Rai et al. (2002) explained there is empirical support for its explanatory power.

4 The Project Performance Scorecard

The *PPS* incorporates perspectives of the diverse stakeholders to provide a measurement system that assesses the value and performance of the project throughout the project and product life cycles. It therefore attempts to integrate a broad range of issues; the project performance spectrum, the complete project process, seminal evaluation frameworks and key stakeholders' objectives. The framework incorporates six dimensions: *stakeholder*, *project process*, *quality*, *innovation and learning*, *benefit and use* perspectives. At the core of the *PPS* is the determination of basis for the project in the first place, i.e. why is the project important. These are answered through the perspectives of all the stakeholders for each contextual project, including the project team, client organisation, and management. Establishing how the stakeholders see the project sets the stage for the other dimensions of the framework and thereby influences how the project is assessed. Essentially, all the dimensions are closely related closely intertwined relationship (see Fig. 2), and based on the project context, particular dimensions may play a greater role.

To summarize, some of the questions that are to be answered for each project are

Why is this project important	What are the knowledge capabilities of this project
How does the diverse project stakeholders see the project	How are the project results being used, i.e. is the results being used as intended or expected
What project process opportunities are to be targeted and measured	What is the perceived usefulness (efficiency) of the project processes and results
What are the benefits to be yielded from the project	What are the key project processes, and how are they performed

The *Project Process* perspective, considers the processes of the project from conception to handover to the client. The traditional measures are incorporated within this dimension as it provides the foundation from which other considerations are supplemented. However, it extends this view by looking closely at the project processes to determine the financial gains, the efficient use of time, risk management. The *Stakeholder* perspective, considers the complex nature of the stakeholders' expectations and objectives. As the project reach extends so does the groups with vested interest in its performance. Understanding how the stakeholders see the project will aid in appreciating what is most important to them. From there, these stakeholder objectives can be monitored throughout the project processes. The *Learning & Innovation* perspective distinguishes itself from the benefit perspective and focuses on the knowledge capabilities that can be garnered from the project. It indicates the gains, advantages and value creating opportunities garnered throughout the project process. It incorporates the opportunities for project learning from the perspective of the project organisation and/or client organisation evident through the establishment of process, practices that foster knowledge sharing, project learning within the project. With continued focused on fostering learning, knowledge and sharing it is essential that this strategic insight is filtered into each project. The *Benefit* perspective, considers the gains or business value that can be attributable to the project, particularly the soft benefits. The rationale for the project selection and considerations of the project business case are embedded within this dimension. Understandably, organizations are primarily concerned with the bottom-line; however there are other important considerations that affect performance (Kaplan and Norton 1996a, b). This guiding principle is used in the *PPS*. The *Quality* perspective relates to meeting or exceeding stated objectives of project process and outcome. Increased emphasis have been placed on IS quality (Duggan and Reichgelt 2006), project quality is an essential metric to contemplate for providing a more realistic

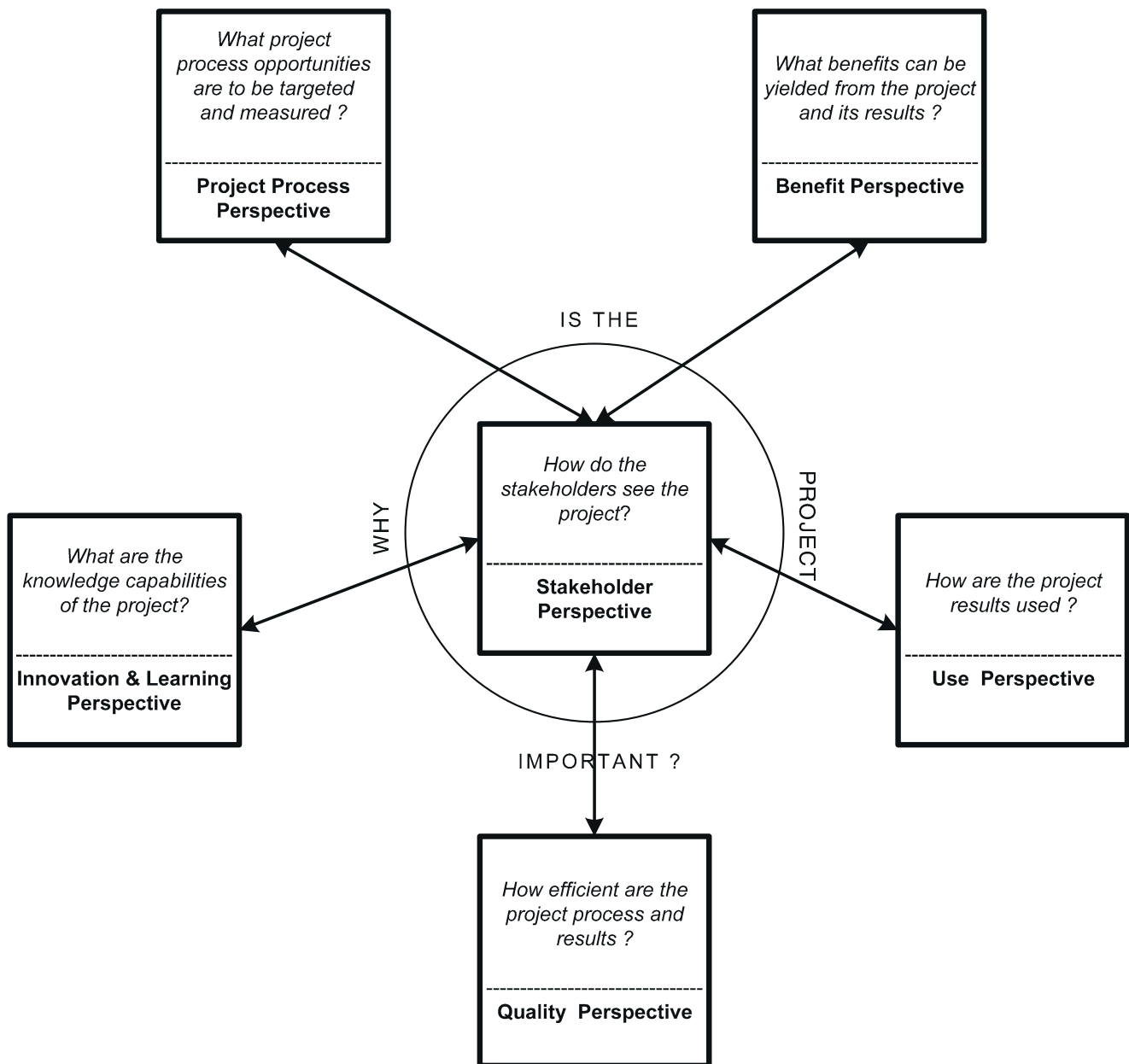


Fig. 2 Project performance scorecard

assessment of project performance. Highlighting specific measures makes it clearer and more structured for controlling and monitoring. For example ISO 9126 (ISO/IEC 2001) suggests reliability, usability, efficiency, maintainability, portability and functionality considerations. Finally, the *Use* perspective evaluates the use of the project outcome that is conducting a determination of how the project results are being used, if at all. It is complementary to (DeLone and McLean 1992, 2003) view on use. The perceived quality of the project outcome and other dimensions such as the stakeholder impacts the level of use or attitude towards the outcome.

4.1 Procedure for applying the framework

The dimensions of the PPS serve as an assessment guide for each IS project. Based on the contextual nature of the project understanding the rationale for the project and why it is being performed now sets the stage to understanding the project goals and objectives (see Fig. 3). The information gathering ideally should be done at the start of the project and become a living document that evolves as the project grows. Quantitative and qualitative measures would be derived that can serve as a basis for assessing the performance of the particular project. A structured outline

Table 3 Dimensions and measures

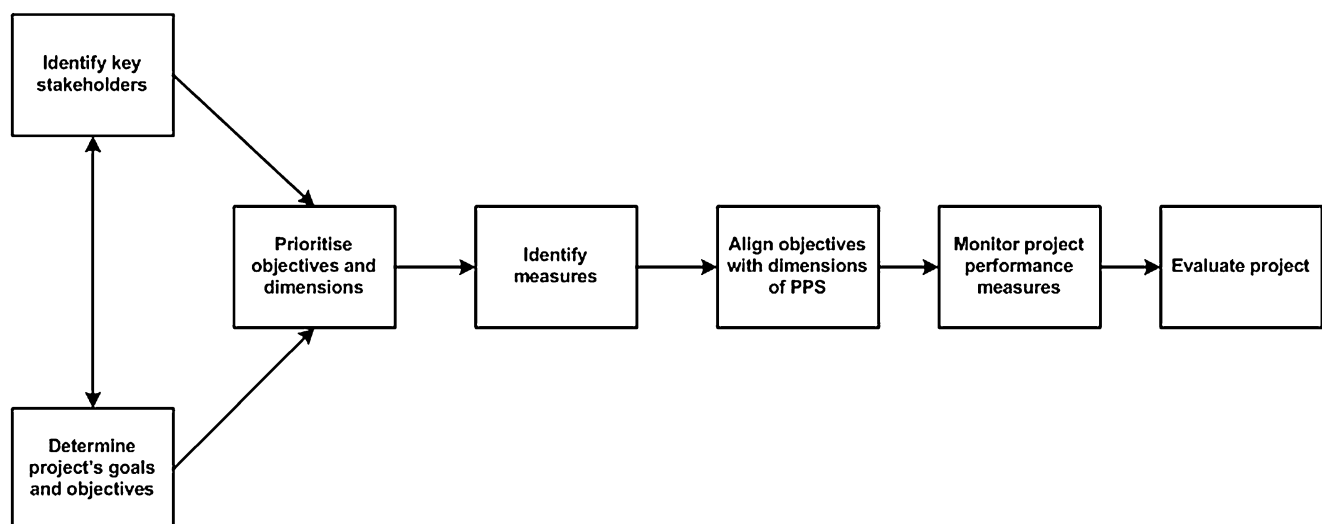
PPS perspectives	Explanation found in literature
Project process	Agarwal and Rathod (2006) considered the internal stakeholders in their exploratory survey and found that meeting scope was the highest determinant of success
Stakeholder	Develop a list of key project stakeholders at the beginning of the project and determine their success categories (Jugdev and Muller 2005) Meeting the project owner's strategic organisational objectives (Collins and Baccarini 2004) Benefits to the stakeholder community includes criteria such as satisfied users, content project team, personal development and learning, economic impact on surrounding community (Atkinson 1999)
Learning and innovation	Increased stakeholder knowledge to help prepare the organization for future challenges (Nelson 2005)
Benefit	Benefit to customer, organization and potential for the future (Shenhar et al. 2002) Improved effectiveness and efficiency of the client organization (Nelson 2005)
Quality	Acceptable quality of the product produced by the project (Nelson 2005) Quality of the project management process (Collins and Baccarini 2004) System and information quality (DeLone and McLean 1992, 2003)
Use	Use by the intended recipients (Nelson 2005) Information use (DeLone and McLean 1992, 2003)

of steps to be undertaken begins with the key stakeholders. Understanding the key stakeholders involved in the project and their needs sets the stage for the rest of the project. Based on the context and reach of the project, the key stakeholders are identified, and include sponsors, project manager, project team, end-users and contractors, each with a mix of distinct and interconnected objectives.

The key stakeholders will determine what objectives are important to them and what they wish to achieve. The Delphi technique which has been previously used to identify and prioritize issues for managerial decision making (Brancheau and Wetherbe 1987; Brancheau et al. 1996; Okoli and Pawlowski 2004) could be useful at this stage since it facilitates stakeholder involvement and the clarification of issues. Prioritizing the PPS dimensions and the objectives aid in the structuring of the assessment based on different project circumstances. It is expected that

different set of stakeholders' needs may take precedence, such as end-users' or sponsors' objectives. Following from the identification of the objectives, the Analytic Hierarchy Process (AHP) (Saaty 1987; Saaty 1990) is a suitable technique to aid in the prioritization of these objectives. It incorporates quantitative and qualitative considerations that aid decision makers in the selection of the best decisions, or priorities while providing rationale for the choices. In its application, AHP has been used to help evaluate enterprise resource planning projects (Teltumbde 2000) and evaluating the risks and uncertainty associated with construction projects (Zayed et al. 2007). The interaction of the stakeholders is underscored and consensus can be reached in the determination of the assessment dimensions that are most important, and the associated project objectives.

In the next stage, the measures associated with each objective are identified which may be based on the group

**Fig. 3** An approach in applying PPS

decision-making of the stakeholders. Structured approaches include AHP and Goal Question Metric (GQM) (Basili et al. 1994) methods. The GQM approach involves the determination of measurement which involves three levels: specification of the project goals or objectives, tracing these to the data or source and interpreting the data with respect to the stated goals or objectives. Thus, decomposing the project objectives and understanding the data that would be useful in linking the objectives would be useful measure for the stakeholders to help identify suitable measurements. Thereafter, the objectives and measures are aligned with the PPS and any gaps are identified and resolved. The measures and performance are then monitored and refined throughout the project upon which the overall project performance is assessed.

The methods suggested within the framework are involved tools. However they have the overall benefits of garnering stakeholder involvement while taking detailed consideration of the essential goals, priorities and measures of the project at the formative stages of the project. Therefore with strong commitment the application of the PPS is feasible with the added value of providing efficiency and effectiveness to the performance measurement process.

5 An illustration of the PPS framework

The case study approach is embraced by researchers as it aids in the desire to understand complex social phenomena as it allows researchers to retain the meaningful and holistic characteristics of real-life events (Yin 2003). It is explained as an “empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident” (Yin 1994, p. 13). It is further underscored by the embodiment of a history of past or current phenomenon drawn from multiple sources of evidence (Leonard-Barton 1990) and provides the researcher with an opportunity to understand the nature and complexity of the phenomenon (Sheng et al. 2005). These qualities are aligned with the research purpose of obtaining an improved understanding of IS project performance by investigating an alternative measurement perspective. The applicability and usefulness of the case study approach help made this methodology an appropriate choice for this research.

5.1 Company and project background

The case study examines a small financial services company based in the Caribbean which has just over 2,000 employees. The company is considered as an “employer of choice” and has seen an influx of applicants

and new employees over the last couple of years accentuated by the current job market where demand for jobs are higher than supply. The present recruitment system includes a manual process that helps to manage the application process, including sorting and filing of application based on predetermined criteria, such as position and date; review of application; acknowledgement of receipt of application, if short-listed; interview set-up; and selection. The unit responsible for managing this process received over 600 unsolicited applications per month compared to over 50 solicited applications to advertised positions per month, which were at an average of three vacancies per month. As expected, the human resources (HR) team experienced difficulties in executing their task effectively and in a timely manner based on the workload and the lack of supportive infrastructure to complete tasks. In response to these set of problems, the organisation’s executives decided to an Online Recruitment System (ORS) with its main objectives being: (1) a streamlining of the current manual intensive recruitment process to improved its workflow processes thereby improving operational effectiveness (2) increase the employment net to attract more qualified and well suited applicants thereby improving the management of human capital inflows into the organization while reducing or eliminating unsolicited applicants. The expected results of this new ORS include reduced workload of the HR unit and effective management of a leaner recruitment process.

5.2 Data collection

The project with which this case study is concerned was deemed a failure by the traditional triple constraint method. The author considered this an opportunity to investigate the operations of the ORS project to provide an approach beyond the narrow dimensions of the traditional measure. Additionally, the study seeks to ascertain if the PPS approach would have led to a different assessment of the project outcome. Using interviews and questionnaire data collection techniques, supplemented by archival documents the author developed an assessment of the project using the PPS approach. A questionnaire was used to gather background information on the project, obtain an initial appreciation of the performance of the project, the set of challenges faced and possible explanation to the reasons for the project may not meeting all its objectives. The project manager was the single interview contact within the organization and was the most familiar and intimate with the project and had all the necessary history of the project from initiation. The rest of the project members had returned to their substantive posts and had vague recollection of the project. The project manager held a managerial position within the organization, had strong project man-

agement background and formed a part of the project department responsible for managing organizational projects. The project manager was accountable for delivering the objectives of the project, managing the project resources and communication at the project and steering committee levels. The interviews were semi-structured and included used open-ended questions to help ascertain from the interviewee's perspective the history of the project and how it progressed through to implementation, the underlying culture and behaviour project stakeholders, and so on. A follow-up interview was also done to augment the initial set of information and to help clarify areas. Both interviews lasted between 40–50 min and notes were taken of key points of interview sessions and information accuracy was confirmed with the interviewee. The participant was also accessible through email to answer additional queries during the data analysis process. Project documents including the business case, project planning documents, meeting notes were also supplied and reviewed. Short interviews were used to elicit users' opinion on the product performance of the ORS project (Table 4).

5.3 Research findings

The project was approved with high expectations however over time the project faced several challenges that resulted in it failing to meet some of the stakeholders' expectations. The ORS project had a relatively small budget was important to the HR unit in helping to achieve its strategic mandate. It was executed primarily by staff members with an external software development team, as summarized below.

The agreed assessment criteria were conformance to schedule, budget and system functionality, based on the PMI® methodology adopted by the organisation and this project. The ORS project was therefore assessed as challenging primarily because the system was delivered many weeks behind schedule. However, two key stakeholders, the project executive and project sponsor had different views on the outcome. The project executive was mainly concerned with the timeliness of delivery and considered the project a complete failure because of that

fact. In their eyes “the most important factor was time”. Contrastingly, the project sponsor considered the project a success because it delivered on its expected functionality. Interestingly, the project sponsor was played a direct role in the ORS project and was intimate with all its challenges and therefore considered it successful despite the issues involved during execution. The project manager agreed with the initial assessment from a professional standpoint of adherence to the standard methodology but also felt that the project achieved its main objectives as the system was successfully implemented and being used by the HR unit. Therefore, the project manager understood and appreciated the viewpoints of the both the project sponsor and project executive.

The ORS project lasted 9 months and was faced with several issues that defined its outcome. One of the most important challenges faced was the level of project executive interference which negatively affected the project and team synergy. Team members were frequently redeployed to other areas causing critical resource constraints. The sponsor's influence was minimal, which was not the organisational norm. Typically within the organization the project sponsor has ultimate control over the project resources and is influential at the executive and board levels. In the event that there is a project executive, it is normally a collaborative relationship in which project status are communicated to each person. In this scenario however, the project executive was most influential and took on the role of project sponsor thereby leaving the project sponsor's role as minimal. The project had strong political undertones that impact the level of support received during its execution. The top challenges and lessons learnt are summarized in Table 5.

The challenges and lessons learnt points to the importance of alternative evaluation that looks beyond narrow objectives and incorporate the needs of the stakeholders during the project. The environment of the ORS project provides a strong opportunity for the PPS framework and methodology and the stakeholders may have reached different conclusions on the performance of the project. The experience of the ORS project embodies some of the critical elements of PPS as it allows for increases awareness of the project, greater clarity in the project objectives from diverse stakeholders, agreement of key project points and enhanced training and vendor management.

5.4 Project re-evaluation—ORS project revisited

Using the PPS methodology and the data collected the researcher reevaluated the ORS project performance. The review of the ORS reevaluation by the project stakeholders is the next step in the research approach. The initial strategy was to have the stakeholders reevaluate the project based on

Table 4 Data collection summary

Project stakeholders	Data collection approached	Documents reviewed
Project manager (1)	Interviews, questionnaire	Business case, project meeting notes, project plan, status reports
Users (2)	Interviews	

Table 5 ORS project summary

Project summary	
Project goal	To implement an online recruitment system
Duration	9 months
Budget	US\$ 80,000.00
Why is the project important	To achieve strategic objectives To improve the efficiency of recruitment process
Project team	Ten members including designated project manager
Principal stakeholders	Project executive Sponsor Project manager and project team Software contractor HR users and applicants
Assessment criteria	Schedule Budget Scope/functionality
Project outcome (traditional view)	Challenged—behind schedule
Project executive's view	Failed

the PPS dimension; however this was not viable for this research project. To achieve the research objectives it was important to readjust the view of the outcome of the ORS project and determine if the view of the *PPS* provided a different or improved outlook. It was apparent through the analysis that there was a divergence in stakeholders' perspectives on the performance of the ORS project. The examination of the project documentation revealed that there were several explicit objectives and outcome of the ORS project. The overarching objective of ORS project is the development and deployment of the ORS project to meet the needs of the organisation and the evolving job market.

The project process incorporated the pre-approval stage of the project where the feasibility and business case were being discussed through to implementation and post implementation checks performed by the project team.

The stakeholders for ORS extended beyond the organisations as prospective employees, job applicants had a vested interest in the successful completion of the system. The stakeholders in the project team and organisation included the HR department, board members based on the strategic nature of the project, the project organisation which includes the project executive, project sponsor, project manager project team and vendor team. With this complex network of stakeholders naturally there were different demands on the project which results competing objectives sometimes. The study found that the primary concerns of the stakeholder groups (see Table 6) were overlapping with the *delivery of a quality system, timeliness of delivery, robustness and ease of use* being paramount. These expectations could therefore be framed within the project process, quality and use perspectives respectively. The identification of other objectives that may be framed in other dimensions came about through further elicitation. For example, learning and innovation was a secondary consideration based on the lack of explicit documented objectives. However, based on interviews with the project manager questions relating to what were some of the learning objectives or innovations created in the project, or as a result of the project were highlighted, particularly in the transition through the various project stages (Table 7).

5.5 Analysis of results

Highlighting what is important to the stakeholders provide beneficial results. While there were different expectations there were also consensus among the group of elements of the project that were most important such as the timely delivery, robustness and ease of use which they perceived to be a quality system if these objectives were met. Contrastingly, the perception of the project outcome differs among the groups with the executive considering it a failure despite the successful achievement of factors outside of timely delivery. The project manager took the orthodox approach in assessing the project as challenged based on its failure to adhere to the project timeliness. This further illustrates the divergent perspectives on project perfor-

Table 6 ORS project

Top challenges	Key lessons learnt
Project executive interference	Political influence may influence the perceived outcome. Awareness and management at all levels is essential
Sponsor influence was low	Greater clarity and agreement of project objectives needed to manage project expectation
Project team low commitment level to project	Documentation and sign-off of standard operational procedures is relevant particularly for new initiatives
Low level of subject matter knowledge	Adequate training of project team on project tasks will increase efficiency
Software quality issues	Focused vendor management will enhance software development/implementation issues

Table 7 ORS project objectives and measures

PPS perspectives	ORS project objectives	ORS project measures
Project process	Develop and implement of HR system	System completion
	Automation of recruitment process	Implementation of system into production environment
	Project survival (i.e. cost and timely delivery of system considerations)	New and revised procedures that integrates with newly implemented system
Stakeholder: executive	Timely delivery of system	Conformance to budgetary and schedule requirements
Stakeholder: project manager	Robustness of completed system	Adherence to schedule
	Quality system	Percentage downtime
Stakeholder: project client	Ease of use	Number of reported defects
	System availability	Conformance to requirement specifications
Learning and innovation	Improved project process knowledge (project team)	Level of intuitiveness
	Improved understanding and knowledge of developed system (project client)	Percentage of uptime
	Team building	Project task performance (efficiency in completion)
	Conflict resolution	e.g. reduced errors and rework
		Process task performance (efficiency in completion)
Benefit	Improved efficiency in end-to-end recruitment process (HR unit, and end-users)	e.g. reduced errors and rework
	Cost reduction in processing	Level of communication and interaction (e.g. in team meetings)
Quality	Meeting ORS functional and business requirements	Number of resolved issues against issues raised (e.g. team relationship, project issues)
	Ease of use of the application (front end (applicants) and backend (HR users))	Reduction in processing time in application and recruitment processes (standardized outputs)
	Robustness of completed system	Reduced employee HR cost, i.e. total compensation
	Information quality	Conformance to requirements
Use	Use of system by HR unit and applicants	Error reduction
		Simplicity in interface (user perception)
		Number of reported defects
		Turnaround time for fixes
		Frequency of use
		Adoption

mance. Notably, particular attention to risk management concerns was not high on the agenda. This may be explained based on the type of project and the organisational conditions.

The study revealed that there commonalities in some of the challenges faced in the management and delivery of IS projects. The ORS project encountered strong political influence that affected the pace of completing deliverables and the level of support that the project received although it was an important strategic project. In this context, the sponsor influence was low and was often undermined by the executive, they apparently had different perception of the value of project management. These factors influence the level of commitment of project team. These issues are not unique to the ORS project as there are recurring themes in managing projects. As a project lead it is essential to be cognizant of the political and cultural issues within each project, especially when it is cross-sectional. Setting clear

procedures and communication guidelines provide aid in stemming some of these challenges.

The re-evaluation of the ORS project revealed numerous opportunities through which the project could be assessed through the PPS framework. As seen in Table 8, the PPS framework provides a fairer depiction of the ORS project than the traditional approach. The ORS project manager welcomed a measurement tool that can critically assesses the actual performance of the project outside of the narrow standard view and felt that it included important dimensions that were not considered by the organisation. Factors such as the completion of the project, conformance to requirements, recruitment process changes and use of the ORS application would indicate a successful outcome despite its initial challenged perception. Applicants of the system thought the system served its purpose of delivery a leaner recruitment process. Notably an assessment of the product did not form part of the original assessment. Therefore, the

Table 8 Comparison of traditional approach and the PPS

Dimensions	Traditional Approach	Project Performance Scorecard
Time	Behind schedule	Behind schedule
Cost	Within budgetary limits	Within budgetary limits
Scope	Conformed to specification	Conformed to specification
Other project processes		Successful implementation of ORS application Automation of recruitment process
Stakeholder	General perception of challenged system	Stakeholders may objectively view project based on objectives and achievement of results based on PPS dimensions
Learning and innovation		Improved project and process task performance over time
Benefit		Reduced employee overhead Reduced recruitment processing time
Quality		Error reduction
Use		Ease of use in application submission Use of the application by applicants and HR team

revised results of the ORS project can be interpreted as challenging but was mostly successful because it met most of its objectives. Having a strategic outlook on a project provides the individual stakeholder to consider objectives beyond their limited perspectives and embrace a holistic approach to achieving beneficial project results. The PPS provides this avenue by allowing stakeholders to look beyond the traditional measurement assessment of each project.

The PPS is an implementable and workable tool that can be incorporated into a project to monitor and control the stakeholders' objectives. Opportunities for rich analysis of the framework can be found in the investigation of projects in other contexts, purpose, industry and other classifications. While framework provides an alternative perception, the buy-in from organisational stakeholders may take some time as procedural norms dictates continued use of the traditional measures. Qualitative measures are difficult to identify and agree upon. It is helpful for the project manager and key stakeholders to determine consensus at the beginning of the project (Baccarini 1999), and the adoption of PPS methodology would be useful.

6 Research contribution

The PPS framework provides a process in the rethinking of the IS project performance evaluation, fusing the essential elements from research including the balanced scorecard and IS Success methodologies to provide a six dimensional multi-tiered evaluation approach that is suitable in many contexts and environment. The model proposed seeks to span the full spectrum of project performance framework incorporating the project, project management and product stages of performance. Thereby implying that it is not

sufficient to judge the product or project management processes distinctly. The model proposes to determine why the project is important from the different stakeholders' views and use that as a basis for contribution assessment. Multiple dimensions are incorporated to provide a comprehensive and suitable measurement that is aligned to the dynamism and complexity of each project. The PPS considers more relevant dimensions in both depth and breadth than previous approaches. For example, the project process extends the traditional measurement realm to consider areas such as of risk management, communication and team management. The approach taken to elicit stakeholders' objectives seeks to carefully consider the views of all key stakeholders and then determine objectives and measures important to them instead of viewing the stakeholder as monolithic unit or with minimal variation in views.

The research presents an alternative project performance framework that extends current perspectives and proves its usefulness in industry. The application of the PPS within a single project provides interesting insights into additional hard and soft measures that may be suitable to evaluate IS projects. The case study evaluation provides evidence of the operation of a project within this financial services organisation and usefulness of the framework. The empirical investigation also provides new insights into Caribbean project organisations. Although, a single case study it shows that Caribbean organisations may face similar challenges as other regions. It is therefore important for researchers to continue to examine these organisations and proffer solutions that are geared towards this environment. Caution must be taken in the preliminary findings as there issues of generalisability (see Lee 1989) in diverse project contexts because of the initial single case study evaluation. Therefore, a next step in future research is the extension

into diverse projects including software development projects and across different industries to help provide richer analysis. A clear methodology for applying the framework in practice is described which is aimed at providing practice with tangible guide to adopt the framework within their environment. While the methodology is in its formative stages it presents a clear guide to complement the PPS framework. Further investigation of PPS and its methodology will be examined to refine the tool while examining its suitability in practice.

7 Concluding remarks

Viewing the measurement framework as a decision model is a critical step in understanding the need to have sound evaluative models that may aid IS project performance and PM practices, thereby enhancing PM competency. IT management research is enhanced with the continued investigation of robust measurement framework that can provide solutions to contemporary IS project performance challenges. The research contends that with the growing disenchantment of the traditional approach in measuring project effort it is prudent to consider tools that overcome these limitations. Alternative project management approaches offer only part of the solution because the assessment of the project contribution is still a challenge. From a pragmatic perspective it is injudicious to use a simple monolithic measure to fit or assess a complex undertaking that has diverse and intricate expectations and objectives. With calls to extend the conceptual boundaries of project management (Winter et al. 2006), it is believed that this investigation begins to respond to these calls through the incorporation of a multi-disciplinary approach. Therefore, this research goal incorporates the provision of alternative view on IS project performance measurement through the PPS framework, clarity on its usefulness through empirical investigation and how it can be adopted within organizations. This study while in its formative stages it offers research and practice another approach to assessing project contribution and sets the stage for future debate and extensions.

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