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Abstract

Information systems projects play an important strategic role in organisations and are key drivers to the delivery of change. Given this prominence it is essential to find measurement methods that effectively analyse and communicate the performance to its stakeholders. Further, to assure contribution to both research and practice it is essential to verify the utility of the artefacts (i.e. methods) developed to help validate or justify that the solutions are suitable for practice, and fit the needs and contexts for which it is created.

Grounded in the design science paradigm, this paper reports an exploratory evaluation of the perception of certain qualities of two recently developed measurement methods (The Project Performance Scorecard and Project Objectives Measurement Model) against the traditional Triple Constraint method. An analytic scenario-based survey of fifty-one (51) participants, comprising of three (3) sets of independent sample of seventeen (17) respondents each was used. The study analysed dimensions of task performance, ease of use, perceived usefulness, perceived semantic qualities and user satisfaction from the perspective of the participants. The preliminary study revealed encouraging results for the new methods and the general design process which can help guide current use and further refinements. The limitations of the study and future research directions are discussed.

Keywords: IS projects; measurement methods; project evaluation; design science.

1 INTRODUCTION

Recent developments have seen increased proposals on suitable perspectives or approaches for the evaluation of information systems (IS) project performance. For many years, the de facto standard has been the standard conformance to time, cost and specifications, or the triple constraint method (TCM) (Atkinson, 1999; White & Fortune, 2002). However, some researchers have questioned the suitability and completeness of this approach to effectively analyse the contribution of IS projects to the organisations and its stakeholders (Atkinson, 1999; Cohen & Graham, 2001). In response, several alternative approaches have been developed (Atkinson, 1999; Stewart, 2008) to help address this gap. However, an analysis of the project evaluation literature reveals that diverse empirical investigations have also become a top priority.

Against this background, the research adopts the principles of design science (Hevner et al., 2004) and evaluates two recently developed measurement methods, the Project Performance Scorecard (PPS) (Barclay, 2008) and Project Objectives Measurement Model (POMM) (Barclay & Osei-Bryson, 2008) against the standard approach, the TCM. Hevner et al (2004) proposed that the utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well executed evaluation techniques, and can be evaluated in terms of *functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes*. They further proposed several evaluation strategies including: observational (e.g. case studies and field studies); descriptive (e.g. scenario construction); analytical (e.g. static analysis, architecture analysis); experimental (through controlled experiments and simulation); testing (through functional or black box and structural or white box testing). As part of the design process, observational case studies were first used to help validate and justify the two artefacts/methods in previous studies (see Barclay 2008; Barclay & Osei-Bryson 2008). This approach was used as it allows for an in-dept study of the given artefact in an organizational context that would in turn provide feedback that may be used for the appropriate improvement of the artefact (Hevner et al., 2004). In this current exploratory study, the evaluation process is extended through the application of a mixed-method approach in the implementation of both the descriptive and analytical techniques. This involves the development of a real-life project scenario and the evaluation of the structures of each method using static analysis (e.g. complexity or performance) to identify attributes based on the perceptions of business and project practitioners. Static analysis is commonly used in software development to analyze the components and resources without running the programme (Chess & McGraw, 2004). While the proposed methods are not software components, the technique is suitable as practitioners are given the documented information (i.e. the components) to analyze each method in terms of elements such as usability, perceived semantic quality and completeness. To support this process, the conceptual model proposed by Maes & Poels (2006) is used as a basis to develop the research measurement instrument. This instrument was chosen because it addresses the limitation of procedures to help analyse the static qualities of IS artefacts (e.g. models or methods), and is based on seminal IS Success models (DeLone & McLean, 1992, 2003; Seddon, 1997), and are therefore consistent with the goals of this research.

The research provides contributions to both research and practice. The study extends the knowledge base in the IS project evaluation field through the analysis of the empirical observation of users' interaction with three (3) distinct measurement approaches. The exploratory findings also have positive implications for both newer methods, and provide an opportunity for them to be implemented in practice to assist in the analysis of the contribution and performance of IS projects.

2 OVERVIEW OF IS PROJECT EVALUATION METHODS

There are various forms of evaluation methods that have been applied to analyse the performance of projects in different contexts. The traditional approach (TCM) has been the most popular technique used to help determine the success or performance of many projects in industries, and is largely endorsed by project management bodies (PMI, 2004). With the growing demand to find techniques that better fit the complexities of contemporary projects, research has begun to respond to this call. Some studies have reviewed factors impacting performance while others have developed strategies to assess performance. A review of key project evaluation literature reinforced that the primary responses to examining the performance of projects, outside of the TCM, have been to develop alternative success criteria to assess these projects (Atkinson, 1999; Morris & Hough, 1987; Nelson, 2005), and critical success factors (Belassi & Tukel, 1996; Fortune & White, 2006; Pinto & Slevin, 1987; Shenhar et al., 2001; Shenhar et al., 2002) while others have focused on the business value contribution of these investments (Fitzgerald, 1998; Kaplan & Norton, 1992; Kumar, 2003). Similarly, in an analysis of the project literature over a forty-year period, Jugdev & Muller (2005) showed the evolution of our understanding within the framework of the project and product life cycles in the discourse of performance evaluation perspectives. The four (4) evolving research themes were categorized into project implementation and handover, critical success factor (CSF) lists, CSF frameworks and strategic project management paradigms (Jugdev & Muller, 2005).

It is noted that the studies on project evaluation techniques or methods have been a mix of conceptual and empirical studies, with the latter primarily involving only validation or observation of the proposed solutions. This provides an opportunity for our current examination.

2.1 Description of Alternative Project Evaluation Methods

2.1.1 The Project Performance Scorecard

The Project Performance Scorecard (PPS) proposed that several considerations are essential to help project practitioners to enhance their analysis of the contributions of IS project activities. It is argued that to effectively analyse performance in these dynamic projects, a multi-dimensional perspective is necessary to help provide a more robust view. This includes considerations of the project events throughout the life of the project, the project management processes and the impact of the project's product. Six (6) interconnected dimensions are therefore introduced which can be used as a platform to evaluate the performance or success of the project in different organisational settings: *stakeholders, project process, benefit, quality, learning and innovation, and use* (Barclay, 2008), figure 1. The PPS framework relied on theoretical contributions of IS success (DeLone & McLean, 2003), Balanced Scorecard (Kaplan & Norton, 1992) and quality paradigms to help communicate its purpose.

Stakeholders include those that are involved in the program or have a vested interest in its outcome (PMI 2004; 2006). While there may be stakeholders with negative and positive agenda, the method concentrates on the positive view. Understanding and accounting for what is important to the stakeholders establish the framework for better management of expectations during the project because of earlier involvement and consensus of what is important to them.

Project process considers the processes of the project from conception to handover to the client. It incorporates the view of the classical paradigm and looks closely at the project processes to gather insights into areas such as the financial gains, the efficient use of time, management of uncertainty and resource allocation.

Benefit focuses on the gains and business value that are attributable to the project including the rationale for the project selection and considerations of the project business case are embedded within this dimension. It is important to note that while organizations are primarily concerned with the bottom-line; there are other important considerations that affect performance (Kaplan & Norton, 1996).

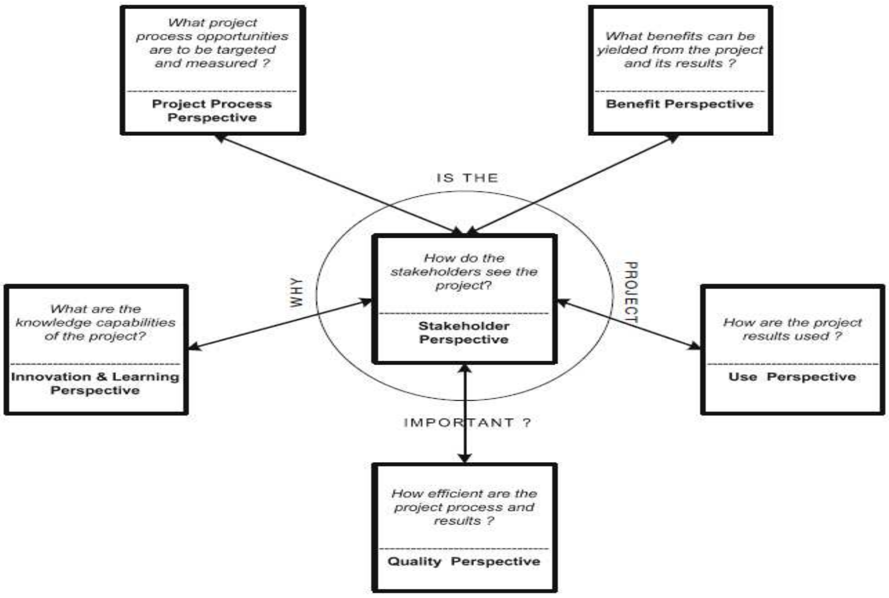

Figure 1: The Project Performance Scorecard

Quality is concerned with meeting or exceeding the stated objectives. Within the IS context, considerations of reliability, usability, efficiency, maintainability, portability and functionality of the product are essential in determining the value of the product and the project process.

Learning & Innovation focuses on the knowledge capabilities that can be garnered from the project, including gains, advantages, and value creating capabilities that may have been arisen as a result of involvement in the project.

Use considers how the results of the process are being used. For example, providing a software application aimed at improving internal efficiency is only part of the contribution, assessing how the application is being used and whether it achieves its stated objectives are necessary components in determining the contribution of a project.

2.1.2 The Project Objectives Measurement Model

The Project Objectives Measurement Model (POMM) involves the elicitation and development of objectives and measures that reflect the strategic and tactical vision of the project from the perspectives of its multiple stakeholders (Barclay & Osei-Bryson, 2008). It is distinct from other methods including the PPS as it focuses on the structured development of project criteria that are representative of the project stakeholders and does not rely on particular measurement dimensions.

Three key questions are reflected throughout the framework: d*o the project measures reflect the fundamental objectives identified? Do the project objectives reflect the project contexts? Does the evaluation process reflect the realities of the project?* To achieve these goals, the POMM is supported by two decision techniques: the Value Focused Thinking (VFT) (Keeney, 1992), and the Goal Question Metric (GQM)(Basili & Weiss, 1984). The VFT is used to help elicit and ground the values & objectives of the projects from the views of the different stakeholders, i.e. what is important to them from the context of the particular project. The GQM technique facilitates the identification of useful measures and aligns these to the identified objectives. Therefore, it can be seen that this method ensure continued collaboration with the project stakeholders to assure that their values and objectives are represented, tracked and evaluated in the project; useful and appropriate measures are identified; and the project can be evaluated based on the actual events that occurred. The POMM uses a series of iterative steps to achieve its mandate:

1. Identify key stakeholders of the project, taking into consideration the roles involved, the organisations or personnel that may be impacted by the project and its results
2. Elicit project values and objectives for each key stakeholder, including standard objectives relating to time, cost and scope
3. Apply VFT method to determine the fundamental (end) and means (facilitating) project objectives
4. Prioritize the fundamental objectives
5. Develop, review and refine (where necessary) the *project means-end network* that shows the relationships between the objectives
6. Apply GQM method to elicit project measures
7. Develop, review and refine (where necessary) the *project objective-measure networ*k that shows the relationships between the objectives and measures
8. Implement, monitor and take corrective actions throughout the project
9. Determine or assess the cumulative outcome of the project

3 EVALUATION METHODOLOGY

The study is influenced by the design science paradigm (March & Smith, 1995) and presents the evaluation phase of the design process (Hevner et al., 2004). Within this context, a preliminary analysis of three (3) project evaluation/measurement methods is performed to help guide the refinement and use of the alternative methods (POMM and PPS). Based on the principles of Hevner et al., (2004) a mixed approach of *descriptive* and *analytical* evaluation approaches is used in this instance. A construction of a detailed project scenario is used to demonstrate the utility of the artefacts while static analysis is used to study them for qualities such as complexity and usability. Thus a scenario-based survey was implemented among selected group of fifty-one (51) participants (business professionals and graduate students) to obtain their perception of the specific artefact in a controlled context. The participants were randomly separated into three (3) independent groups of seventeen (17) for each project evaluation method. The scenario-based survey consisted of two parts: (1) A hypothetical IS project scenario that describes a core application system implementation project. Ten (10) multiple choice questions were given to test the participants' *task performance* based on the specific project evaluation method given. Documentation on the methods was also provided as it was assumed that they had no prior knowledge about any of the approaches. (2) A questionnaire with 16 questions adopted from the Maes & Poels' (2006) conceptual model with likert-like scale of 1-5 (strongly disagree to strongly agree) was used to assess the *perception of static qualities*.

Surveys are practical research instruments, particularly when there is a need to move from observation to theory validation, and is useful in gathering data about individual preferences and expectations (Newsted et al., 1998). Thus, by studying a representative sample of the environment surveys seek to discover relationships that are common and facilitate the provision of generalisable statements about the phenomenon under study (Babbi 2004; Newsted et al., 1998). Further, Babbi (2004) suggested that evaluation research is undertaken for determining the impact of "some social intervention". This information provided additional motivation to apply this research method and therefore it is used as the basis to evaluate the three (3) different project evaluation methods. Future studies will extend the survey and apply different evaluation approaches such as descriptive and experimental studies.

3.1 Test of Independent Samples

In experimental research it is often necessary to manipulate what happens to people so that casual inferences can be made (Field, 2005). Our research undertakes three experimental conditions using different sets of individuals to participate. There are several techniques available to achieve this objective through the comparison of the mean of independent groups. Suitable techniques include the Independent Samples T Test (t-test), the Mann-Whitney (M-W) test and ANOVA (Babbie, 2004; Field, 2005). The t-test and M-W test are used to evaluate the scenario-based conditions relating to an assessment of task performance, and to analyse the likert-like scaled data generated from the survey of the perception of static qualities respectively. It is noted that the techniques differ but are specifically chosen because of the types of data being collected. Morevover, the t-test on independent samples and the Mann-Whitney test have similarities in that both are testing the identity of two independent populations. The t-test compares the mean scores of two groups on a given variable, and is used when two experimental conditions and different participants are assigned to each condition (Field, 2005). The M-W test is used to test the null hypothesis (H_0) according to which two independent samples were drawn from the same or identical population. We also acknowledge the usefulness of MANOVA and will utilise it in subsequent studies.

3.2 Empirical Observation Framework

3.2.1 Task Performance

To assess the three (3) methods with respect to task performance, a project scenario was used as the basis to compare the measurements methods against the performance of certain tasks. Hevner et al., (2004) posited that a useful approach that can help to demonstrate utility of an artefact is through scenario construction. Against this background the project scenario was developed in which the participants were asked, given a specific measurement method, to perform the particular set of tasks, i.e. answer the questions given based on the scenario and the measurement method given. The scenario detailed a typical contemporary event of an organisation experiencing the implementation of core application system. Within the scenario the stakeholders faced several competing objectives with varying perspectives on what is important to them, including conformance to tight deadline to implement the system, managing the budget, acceptance of the system by user, and use of application by its users. The ten (10) questions were aligned to the project process including identification of the *relevant stakeholders*, identifying and prioritising different types of *objectives*, determining suitable *measures* based on the scenario context, and determining what *criteria* would indicate successful completion of the stated project. The participants were explicitly asked to use only the information provided to answer the questions

3.2.2 Perception of Static Quality

The Maes & Poels (2006) was adopted as the framework upon which to assess the static qualities of the measurement methods. They argued that there is a paucity of practical evaluation framework that considers the quality of conceptual models from the user's perspective. The Maes & Poels' model (2006) relies on seminal IS Success models (DeLone & McLean, 1992, 2003; Seddon, 1997) which acknowledge quality as an antecedent to system success. Their model identified four interconnected constructs as necessary to help assess the quality of an artifact, which is adapted for our research context (Table 1). *Perceived ease of use* (PEOU) refers to "the degree to which a person believes that using a system would be free of effort" (Davis, 1989) or perceived as being difficult to use (Moore & Benbasat, 1991). *Perceived semantic quality* (PSQ) describes the correspondence between the information that users think the model contains and the information that users think the model should contain, based upon their knowledge of the problem domain (Krogstie et al., 1995). Thus, the users or participants can view the semantic quality of the model as how valid and complete it is with respect to (their perception of) the problem domain. *Perceived usefulness* (PU) relates to "the degree to which a person believes that using a particular system has enhanced his or her job performance" (Davis 1969). Within this context, the participant can evaluate the respective method based on completing certain task i.e. the project scenario activities. U*ser satisfaction* (US) is a subjective evaluation of the various consequences evaluated on a pleasant-unpleasant continuum (Seddon 1997). Against this background, the Maes & Poels' model is suitable for this research as it applied in similar contexts, i.e. the evaluation the three IS-related measurement methods from the perspective of users. Additionally, the framework has been empirically validated as an end-user evaluation tool (Maes & Poels, 2006) and have been applied in other recent studies.

PEOU1	It was easy for me to understand what the <measurement method> was trying to model.	PU1	Overall, I think the <measurement method> would be an improvement to a textual description of the project measurement process.
PEOU2	Using the <measurement method>was often frustrating.	PU2	Overall, I found the <measurement method> useful for understanding the process modelled.
PEOU3	Overall, the <measurement method> was easy to use.	PU3	Overall, I think the <measurement method> improves my performance when understanding the process modelled.
PEOU4	Learning how to read the <measurement method> was easy.	PSQ1	The <measurement method> represents the Project measurement process correctly.
US1	The <measurement method> adequately met the information needs that I was asked to support.	PSQ2	The <measurement method> is a realistic representation of the project measurement process.
US2	The <measurement method> was not efficient in providing the information I needed.	PSQ3	The <measurement method> contains contradicting elements.
US3	The <measurement method> was effective in providing the information I needed.	PSQ4	All the elements in the <measurement method> are relevant for the representation of the project measurement process
US4	Overall, I am satisfied with the <measurement method> for providing the information I needed.	PSQ5	The <measurement method>gives a complete representation of the project measurement process

Table 1: Measurement Instrument for Assessing Perception of Static Qualities

3.3 Research Procedures

To accommodate the examination of the measurement artifacts, procedures were developed and made available to the participants. The following strategy was adopted for conducting the study:

1. Design survey measurement instrument and extract the project evaluation methods' documentation. This included the development of a practical case scenario and questions on which the assessment and/or interaction with the measurement models are performed. The

second part of the evaluation includes the measurement instrument (Table 1) which is adapted from the Maes & Poels (2006) with minor modifications including assessment of a specific *measurement method* instead of *conceptual model* for the process, and *project measurement process* in place of a *process*.

2. Obtain independent review (pre-pilot) of the instrument and models documentation on the sufficiency of the variables and to confirm if the documentation is sufficiently informative and helpful in completing the scenario-based questionnaire. The scenario was later refined to improve its clarity and readability.
3. Identify and recruit pilot study participants.
4. Present each group with documentation on TCM, POMM and the PPS models accompanied with the research instrument and scenario. The instrument/questionnaire also includes the moderating variables of gender, experience and age along with other relevant data collection aids such as role and industry represented.
5. Record and analyze the responses of the study using the SPSS application
6. Refine questionnaire based on suggestions of the respondents. The documentations on the models were refined for clarity, particularly in the POMM where unnecessary areas removed (e.g. the conceptual diagram). The scenario questions were refined to improve its understandability.
7. Identify and recruit at minimum an additional 45 study participants and randomly divide them in three groups. Graduate students and experienced professionals were identified. The set of graduate students included those who are full-time and part-time students, with a large portion of them being currently employed.
8. Repeat steps 4-5.

4 RESULTS AND DISCUSSIONS

4.1 Task Performance

Our assessment of task performance was based on the average accuracy level of the participants when using the respective measurement method to interact with the scenario and complete the set of questions (i.e. tasks). We did pairwise comparisons of the three (3) methods using statistically difference of means tests. Table 2 provides a description of our results. These results suggest that with respect to task performance, PPS and POMM are attractive competitors to TCM as PPS outperforms TCM in a manner that is statistically significant, and POMM also outperforms TCM but with a difference that is not statistically significant. This suggests that participants using POMM or PPS were better able to accurately determine the most suitable project evaluation tasks including identifying complete list of stakeholders, applicable project objectives and measures and determination of success of the project. This finding coincides with objectives of the designing both PPS and POMM such as to provide practitioners with an improved alternative in performing project evaluating tasks and be better to analyse the performance of a project using multiple criteria.

Comparison	Models	Mean	StdDev	Difference	Statistically Significant?
POMM vs TCM	POMM	6.7647	1.64048	POMM > TCM	NO
	TCM	6.2353	1.09141		(Signif. = 0.276)
PPS vs TCM	PPS	7.2353	1.67815	PPS > TCM	YES
	TCM	6.2353	1.09141		(Signif. = 0.048)
POMM vs PPS	POMM	6.7647	1.64048	PPS > POMM	NO
	PPS	7.2353	1.67815		(Signif. = 0.414)

Table 2: t-test Results on Comparison of the 3 Models

4.2 Perception of Static Qualities

The perception of static qualities is used to assess the quality dimensions identified (PEOU, PU, PSQ and US) based on the views of the participants as a result of their interactions with the requisite measurement methods. Also, pairwise comparisons of the assessment of the static qualities of the methods using non-parametric tests were also performed (Tables 3a-d). The results showed that there were no significant variations between the three methods. The average response per respondent primarily laid between 3 and 4 on the likert-like scale for all four dimensions being tested (figure 2). This means that that the respondents were fairly neutral and agreeable in relation to their perception of the quality dimensions for all methods. This has interesting implication for the newer methods in that the participants showed no significant negative reactions to them during their application. It is noted that while the results did not reflect a significantly strong positive review over and above the TCM, the opposite is also true. Thus, it can be argued that users may require more time to better understand the components of the methods, plus further simplification of the methods' structure to facilitate ease of application may also be needed. Moreover, the results also imply that POMM and PPS may be adopted in practice with little difficulty while providing an alternative perspective in the project evaluation process.

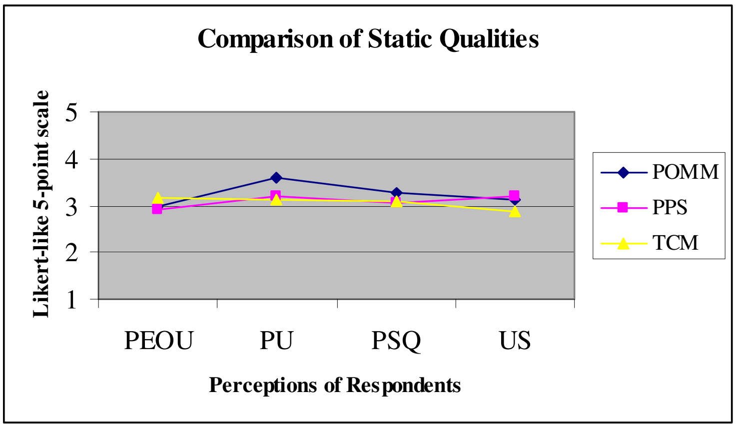

Figure 2: Comparison of Static Qualities

Comparison	Models	Mean Rank	Difference	Statistically Significant?
POMM vs TCM	POMM	15.71	POMM < TCM	NO
	TCM	19.29		(Signif. = 0.280)
PPS vs TCM	PPS	14.41	PPS < TCM	NO
	TCM	20.59		(Signif. = 0.065)
POMM vs PPS	POMM	18.59	POMM > PPS	NO
	PPS	16.41		(Signif. = 0.517)

Table 3a: PEOU: Results on Comparison of the 3 Models

Comparison	Models	Mean rank	Difference	Statistically Significant?
POMM vs TCM	POMM	19.18	POMM > TCM	NO
	TCM	15.82		(Signif. = 0.321)
PPS vs TCM	PPS	17.12	PPS < TCM	NO
	TCM	17.88		(Signif. = 0.821)
POMM vs PPS	POMM	18.59	POMM > PPS	NO
	PPS	16.41		(Signif. = 0.153)

Table 3b: PUS: Results on Comparison of the 3 Models

Comparison	Models	Mean rank	Difference	Statistically Significant?
POMM vs TCM	POMM	18.94	POMM > TCM	NO
	TCM	16.06		(Signif. = 0.390)
PPS vs TCM	PPS	16.71	PPS < TCM	NO
	TCM	18.29		(Signif. = 0.636)
POMM vs PPS	POMM	19.82	POMM > PPS	NO
	PPS	15.18		(Signif. = 0.165)

Table 3c: PSQ: Results on Comparison of the 3 Models

Comparison	Models	Mean rank	Difference	Statistically Significant?
POMM vs TCM	POMM	19.35	POMM > TCM	NO
	TCM	15.65		(Signif. = 0.266)
PPS vs TCM	PPS	19.56	PPS > TCM	NO
	TCM	15.44		(Signif. = 0.219)
POMM vs PPS	POMM	17.29	POMM < PPS	NO
	PPS	17.71		(Signif. = 0.902)

Table 3d: US: Results on Comparison of the 3 Models

4.3 Implications for the 3 measurement methods

The results provide an interesting outlook on the methods under examination. The TCM continue to reveal fairly positive reviews by users despite the growing criticisms in research and practice. While both researchers and experienced professionals have suggested that the TCM does not sufficiently meet the analytical needs of current projects (Atkinson, 1999; Barclay 2008; Cohen & Graham, 2001; Nelson, 2005), the results show that it has been consistently positive in areas such as task performance, perceive ease of use, semantic qualities and user satisfaction. This may possibly help explain its continued use in practice (White & Fortune 2002) despite some identified weaknesses. This paradoxically relationship is worth additional investigations.

The newer methods POMM and PPS are also shown to suggest positive application in practice. For example, the PPS is shown to significantly perform better than the other methods with regards to task performance, i.e. evaluation activities for projects. This may be as a result of the additional dimensions (e.g. use or benefit) that can be used to help decision makers in their analysis of project contribution or performance. The POMM on the other hand facilitates better perception of static qualities in areas of usefulness, semantic qualities and perceived ease of use. This may be linked to the clear structured procedures and required stakeholder collaboration which are inherent in the approach.

While we can derive positive implications for this study, it is noted that a larger sample size may be required to draw conclusions with high(er) degree of confidence. We however acknowledge that the study underscores the need to have continued dialogue with practice and to search for improved decision tools for projects.

5 RESEARCH LIMITATIONS & FUTURE RESEARCH

The study provides a preliminary analysis of certain quality attributes of the measurement methods based on participants' interaction with them. This is intended to help guide future investigations and refinement of the alternatives approaches, POMM and PPS, and improve the understanding TCM's use in practice. Based on the resources available, a fair percentage of the participants were graduate students with relatively limited experience in IS projects although they otherwise had industry experience. Also, the time taken to learn about the artifacts (measurement models) was significantly less than what would be required in a real-world project environment. While the participants provided important insights into the perceptions of the methods, issues such as incomplete or imperfect understanding of the capabilities of the artifacts are taken into consideration. Thus, additional training may be required to facilitate a better understanding of the goals and capabilities of the PPS and POMM in particular.

We concur with the observations of Newsted et al (1998) that the survey approach is an effective research method because of its usefulness in gathering data about individual preferences and expectations, however, a key limitation is its provision of a just a snapshot of how individuals may be feeling at a particular time. This issue is taken into consideration as the participants' state of mind may have impacted their responses and therefore the results. Consequently, further analysis preferably under real-world project settings are required to better gauge the attitudes towards them and the actual performance of these tools. Action research, field studies, case studies in diverse project, organisational and industry settings are some of the considerations for future studies.

6 CONCLUDING REMARKS

The research is intended to encourage debate on the application of different measurement methods in practice and the perception of its users. We observed that while this research area is evolving, the path to assuring that the developed artefacts satisfy the needs of the project environment for which they are developed is sometimes ignored. This is evident by the number of conceptual contributions (e.g. Atkinson 1999; Stewart 2008) and the paucity of analysis on the perception of users to the traditional paradigm for example. This study therefore attempts to redress this concern through the comparison of three (3) measurement methods including the traditional method TCM, and recently developed alternatives, the PPS and POMM. This was conducted within the ambit of utility, perceived semantic qualities (PEOU, PSQ, PUS, US) based on the perceptions of users in experimental conditions. The initial results provide encouraging results and support the value of different approaches to help users and decision makers in evaluating IS project performance.

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