The Study of the Difference in Performance Measurement System in Different Industries

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This research focuses on the test of the difference in performance measurement system (PMS) in Thai organizations operating in different industry. Data was collected from managers whose responsibilities are related to organizational performance measurement. 248 questionnaires were returned. The results show differences in PMS design, attributes of performance measures, target setting, PMS reporting system, and PMS reviewing system. The results obtained from this study can be useful for those who are looking for best practices in PMS.

INTRODUCTION

A Performance Measurement System (PMS) is vitally important to the survival of an organisation. Unfortunately, although many organisations have invested heavily into the design of a PMS, they still fail to realize its benefits. The failure to gain from the PMS does not necessarily refer to deterioration in the firm's financial performance; what defines failure is the lack of use of the system in the organisation, and by implication the waste of funds and other resources used to create the PMS.

The success of PMS can be measured in various ways. Based on interviews and survey research, Rompho & Boon-itt (2012) proposed a model to measure the success of PMS that was divided into two main categories: Design success and implementation success. Design success looked at PMS validity, PMS completeness, not too few or too many measures, and measure accountability; implementation success looks at the report itself, i.e., it provides the correct picture, is easily understood by staff, provides good analysis, is timely and consistent, and the results are actually put to use in the workplace. Ferreira & Otley (2009) also proposed a method of analyzing PMS under 12 headings: vision and mission, key success factors, organisational structure, strategies and plans, key performance measures, setting targets, evaluating performance, information flows, systems, and network use, changes in PMSs, and strong and coherent links in PMS.

Other studies also propose different attributes for success of PMS. At the performance measure level, a PMS is considered successful when measures are clear and easy to understand (Fortuin, 1988; Hronec, 1993), contains clear goals (Maskell, 1989), is objective and uses the right scale (Crawford & Cox, 1990), is part of a control system (Bungay & Goold, 1991), easy to assess and cost-effective (Fortuin, 1988; Hayes et al. 1988), integrated into every level (CAM-1, 1991), provides historical data and can be used for future planning (ICAS, 1993).

At the level of the group of measures, PMS should contain a balanced set of measures (Kaplan & Norton, 1992), show cause and effect linkage (Fitzgerald et al., 1991), contain no conflict among measures (Fry & Cox, 1989), and support the strategies of the organisation (Skinner, 1971; Maskell,

1989). As for the relationship between the PMS and the organisation, a successful PMS should be in line with organizational culture and compensation (IPM, 1992) and provide data for benchmarking (Hayes et al. 1988).

Although there are numbers of studies that investigate the attributes of successful PMS, there are few studies, if any, that compare these attributes among different industries. This study therefore aims to fill this research gap in order to identify these differences. Additionally, results of this study can be used to identify the industry whose the best practices in PMS design and implementation can be learned.

LITERATURE REVIEW

There are studies that investigate the PMS in various industries. For example, in manufacturing industry, Bourne et al. (2002) conducted case studies to investigate factors affecting successful PMS implementation. The results of the study suggested that there are four main blocking factors for PMS implementation. These are 1) the effort required for implementation, 2) the ease of data accessibility through the IT systems, 3) the consequences of performance measurement, and 4) the new company initiatives. In construction industry, Robinson et al. (2005) studied performance measurement practices of UK construction engineering firms and found a growing number of firms using both financial and non-financial measures to assess their performance. Moreover, there are four barriers to the PMS adoption, which are: problems in determining and monitoring performance measures, lack of data in terms of the process of collection, collation and standardization, and time and financial resources. For hotel industry, past studies revealed various benefits of the PMS such as the Balanced Scorecard (BSC). Examples of the benefits are encouraging managers to focus on both long-term and short-term measures of success, making performance appraisals more objective, facilitating the dissemination of strategy information throughout the firms and promoting the explicit sharing of best practice (Denton & White, 2000; Huckstein & Duboff, 1999) and identifying negative trends before the deterioration of financial performance (Evans, 2005). However, a study of McPhail et al. (2008), which explored HR managers' perspectives of hotels in Australia, found the limited awareness of the BSC concept amongst hotel managers and that the BSC is not being widely adopted in hotels. In aspect of government agencies, outputs and process efficiency/quality measures are commonly adopted rather than measures for employee learning and growth and input measures (Cavalluzzo & Ittner, 2004; Hoque & Adams, 2011). For banking industry, a study of Wu (2012) used BSC as a model to determined key performance indicators (KPIs) for improvement of banking performance. Results of the study stated three most important KPIs, which are customer satisfaction, sales performance, and customer retention rate. It could be concluded that banking institutions which are in service industry should focus on customer-oriented performance measures.

Although these studies shed some light onto what a successful PMS should look like and how PMS has been used in different industries, they do not provide any comparison of those attributes among different industries. Different industries face different competitive forces and thus their PMS might need to be different in some ways.

Perceiving this as an area that needed to be assessed, this study is designed to test the differences in PMS attributes among different industries with the objective of providing comparisons and insight as to how PMS is used in firms competing in different industries.

METHODOLOGY

Based on literature review, a new five-point Likert scale instrument was developed for this study to measure eight PMS attributes, which are 1) benefits of PMS, 2) uses of PMS 3) PMS design 4) attributes of performance measures 5) target setting 6) PMS reporting system 7) PMS reviewing system and 8) PMS interpretation and analysis. The instrument was reviewed by two anonymous academics and two anonymous professionals who are involved in PMS in two large firms. For data collection, on-line questionnaires were distributed to managers whose responsibilities are related to PMS in companies

operating in nine different industries in Thailand: agro-food, consumer products, financials, industrials, property and construction, resources, services, technology, and non-profit organisations. F-test was used to compare the differences in PMS attributes among different industries.

Based on the 248 questionnaires returned, most respondents are female (67.9%) and work in their current organization for almost 7 years. The industries, which their organization belong to are shown in Table 1 as follows.

TABLE 1
THE INDUSTRIES, WHICH THE RESPONDENT'S COMPANIES BELONG

Industries	%
Agro-Food	3.7
Consumer products	13.6
Financials	15.7
Industrials	16.5
Property and construction	6.2
Resources	1.7
Services	18.2
Technology	6.2
Non-profit organization	18.2

FINDINGS AND DISCUSSION

Generally it was found that firms in various industries use PMS for many purposes and found it to be quite a useful tool (score of 5 refers to the most useful and 1 refers to the least useful). According to the results as shown in Table 2, the most useful aspect is "PMS as performance reporting tool" (Mean of 4.29) and the least useful aspect is "PMS as a market tool" (Mean of 3.59).

TABLE 2
BENEFITS OF PMS

Benefits of PMS	N	Mean	S.D.
As performance reporting tool	241	4.29	.794
As an early warning	245	4.10	.811
Can alter employee's behavior	247	3.95	.807
Can help firm on implementing strategies and policies	246	4.19	.728
Provide trend monitoring	244	4.08	.774
As a project prioritization	242	3.85	.866
As a project evaluation	242	4.13	.906
As a marketing tool	241	3.59	.984
For employee's performance appraisal and rewarding	244	4.19	.924
As a benchmarking	239	3.92	1.009
Increase employee´s motivation	243	3.95	.923

For uses of PMS, the results in Table 3 show that the PMS is mainly used for firm's improvement (Mean of 4.07), whereas the least usage is in term of day-to-day operations (Mean of 3.82).

TABLE 3
USES OF PMS

Uses of PMS	N	Mean	S.D
For strategic planning tool	247	4.02	.804
For day-to-day operations (such as problem solving for daily tasks)	245	3.82	.841
For firm's improvement (such as process improvement)	246	4.07	.887

For PMS design, the results shown in Table 4 indicate that "have a responsible person for each measure" is the attribute that most firms possess (Mean of 4.02). On the contrary, "consider the learning cycle of measure" is the least concerned issue in the PMS design (Mean of 3.36).

TABLE 4
PMS DESIGN

PMS design	N	Mean	S.D
Look for the whole picture (measures will not lead to other problems)	247	3.53	1.015
Able to explain the difference in performance gap	248	3.62	.901
Have sufficient detail to identify the causes of problem	246	3.47	.937
Timely report performance of the firm	244	3.43	1.133
Consider the learning cycle (knowing how long the performance measure will reflect the improvement initiatives)	245	3.36	1.045
Use PMS consistently	246	3.89	.945
Possess long-term consistency (measures can be compared from period to period)	245	3.77	1.024
Provide the system to control fear of the employees	246	3.38	1.171
Have a responsible person for each measure	248	4.02	.904
Accurate and acceptable by users	245	3.58	1.008
Easy to understand and relevant to users	241	3.70	.955

For attributes of performance measures, the results in Table 5 show that "related to strategy" is the attribute of performance measure that is mostly concerned in most firms (Mean of 3.85). On the other hand, the attribute of "include both short-term and long-term performance measures" is found to be the least consideration of the measures (Mean of 3.55).

TABLE 5
TABLE 5
ATTRIBUTES OF PERFORMANCE MEASURES

Attributes of performance measures	N	Mean	S.D
Related to strategy	247	3.85	.899
Have a cause-effect relationship with other performance measures	245	3.77	.847
Not too many or too few performance measures	245	3.73	.888
Include both short-term and long-term performance measures	243	3.55	1.021
Be able to interpreted and easy to understand	245	3.73	.924
Be able to be controlled by a responsible person	247	3.70	.896
Link to employee compensation	245	3.64	1.038

For target setting, "different level of each target" is the mostly applied in firms across industries (Mean of 3.83). In contrast, "related to appropriate rewards" is the least consideration (Mean of 3.49) as shown in Table 6.

TABLE 6
TARGET SETTING

Target setting	N	Mean	S.D
Adjustable to situation	246	3.80	.964
Different level of each target	244	3.83	.969
Challenging but achievable	244	3.77	.928
Related to appropriate reward	245	3.49	1.129
Have a minimum level of target	244	3.54	1.055

For PMS reporting system, "customized reports for each department" is applied mostly among firms (Mean of 3.73), while "present confidential information in term of % change" is the least used in firms (Mean of 3.36). The results are as shown in Table 7.

TABLE 7
PMS REPORTING SYSTEM

PMS reporting system	N	Mean	S.D
Easy to access	245	3.42	1.101
Relevant to users	244	3.62	.963
Customized reports for each department	244	3.73	.977
Provide sufficient information	244	3.66	.928
Report nonconformance	240	3.52	.937
Include composite index, which reflect overall firm's performance	238	3.52	1.046
Present confidential information in term of % change	238	3.36	1.123

For PMS reviewing system, the results in Table 8 reveal that "can help employee work more effectively" is the attribute that mostly reviewed in firms (Mean of 3.86) whereas "reflect actual firm's performance" is the issue that is least reviewed in firms (Mean of 3.55).

TABLE 8
PMS REVIEWING SYSTEM

PMS reviewing system	N	Mean	S.D
Consistent with firm's strategy	242	3.76	.874
Reflect actual firm's performance	245	3.55	.985
Accurate data collecting system	242	3.70	.895
Accurate reporting system	243	3.75	.890
Convenient to use	242	3.64	.976
Can help employee work more effectively	244	3.86	.898

In aspect of PMS interpretation and analysis in Table 9, it is found that the mostly used analysis technique is "analyse in both details and big picture" (Mean of 3.77). On the other hand, the least use of the analysis technique are both "analyse the relationships among performance measures in the firm's performance report" and "analyse in both department perspective and process perspective" (Mean of 3.58).

TABLE 9
PMS INTERPRETATION AND ANALYSIS

PMS interpretation and analysis	N	Mean	S.D
Analyse difference between actual result and target	239	3.62	.884
Analyse the relationships among performance measures in the firm's performance report	239	3.58	.884
Analyse process capability in the firm's performance report	238	3.63	.908
Analyse in both departmental perspective and process perspective	235	3.58	1.028
Analyse in both detail and big picture	241	3.77	.923
Looking for problems as well as opportunity	239	3.61	1.098

In view of the differences in each PMS attribute among different industries, the results show that out of eight attributes presented previously, three PMS attributes are found to be insignificantly different across the different industries. These are benefits of PMS, uses of PMS, and PMS interpretation and analysis. In other word, all firms operating in different industries view these three attributes in the same way. However, five PMS attributes, which are PMS design, attributes of performance measures, target setting, PMS reporting system, and PMS reviewing system are found to be somewhat different in some aspects across different industries. The test results for issues found to be significantly different are shown in Table 10.

The PMS Attributes	F stat	p-value	Agro-Food	Consumer products	Financials	Industrials	Property and construction	Resources	Services	Technology	Non-profit organisation
PMS design											
Timely report performance of the firm	3.081	.003	3.67	3.58	3.44	3.63	3.50	4.00 Max	3.65	2.40 Min	3.20
Consider the learning cycle (knowing how long the performance measure will reflect the improvement initiatives)	2.087	.038	3.78 Max	3.30	3.49	3.43	3.60	3.75	3.55	3.07	2.86 Min
Provide the system to control fear of the employees	2.757	.006	4.11 Max	3.58	3.34	3.53	3.27	3.50	3.63	2.53 Min	2.95
Easy to understand and relevant to users	2.272	.023	3.67	3.88	3.70	3.97	3.67	4.00 Max	3.76	3.50	3.20 Min
Attributes of performance measures											
Link to employee compensation	3.302	.001	4.22	3.78	3.66	3.82	3.67	3.25	3.57	4.27 Max	3.07 Min
Target setting											
Adjustable to situation	2.036	.043	4.00	3.82	3.84	3.90	3.80	4.00	4.07 Max	3.67	3.32 Min
Challenging but achievable	2.383	.017	3.78	3.82	3.97 Max	3.95	3.87	3.75	3.81	3.73	3.23 Min
PMS reporting system											
Present confidential information in term of % change	2.315	.021	3.38	3.29	3.55	3.38	3.80 Max	3.00 Min	3.63	3.53	3.05
PMS reviewing system											
Accurate data collecting system	2.473	.014	4.11	3.84	3.73	3.62	4.13 Max	3.00 Min	3.76	3.87	3.30
Convenient to use	2.283	.023	4.00	3.66	3.62	3.77	4.07 Max	3.50	3.83	3.13 Min	3.25

According to results presented in Table 10, firms operating in agro-food industry consider the learning cycle and provide the system to control fear of the employees more than firms operating in other industries. Firms operating in consumer products generally perform on average in every issue. Firms operating in financials industry have the most challenging target compared to firms in other industries. On the other hand, firms in industrials industry perform on average in every aspect.

Firms in properties and construction industry perform quite well in term of PMS reporting system and PMS reviewing system. Firms in resources industry, on the other hand, are very good at providing timely report, design the system that easy to understand and relevant to user. However firms in this industry perform quite poorly compared to firms in other industries in term of PMS reporting and reviewing system.

Firms operating in service industry perform well in target setting, especially in the way that they have target that is adjustable to change in situation. Firms in service industry, on the other hand, are very good at linking performance measure to employee compensation but perform quite poor in many aspects: timely report performance, provide system to control fear of the employees, and having reviewing system to evaluate whether the system is easy to use.

It is very interesting to note that non-profit organisation, including the government sector, performs poorly in many aspects, including consider the learning cycle, design PMS that is easy to understand and relevant to users, and target setting in term of adjustable to situation and challenging but achievable.

Also note that for any other aspect, there is no difference among firms operating in different industries.

CONCLUSION AND IMPLICATION

The results obtained by this study expand the boundaries of knowledge in research in this field in that it is one of the first studies designed to investigate the differences in PMS attributes across industries. In general, it is found that non-profit organisations are not doing very well in many aspects while firms operating in some industries outperform those in other industries in some aspects.

This research can be used as starting point for those who want to further investigate how firms operating in different industries perform differently in the field of PMS. It is also useful for those who are looking for industries that can be used as benchmarking in order to improve their PMS. For example, if they want to know how to set the target that is challenging but achievable, they should look at best practices in financials industry. Managers can also use the result of this study to design their PMS and use it properly in their organization.

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