

THE USE OF IMPORTANCE-PERFORMANCE ANALYSIS (IPA) IN EVALUATING FACTORS INFLUENCING DATA QUALITY OF PUBLIC SECTOR ACCOUNTING INFORMATION SYSTEM IN INDONESIA

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Abstract

The focus of this paper is to evaluate the critical factors influencing data quality of accounting information system in public sector of Indonesia. In this research, the Importance-Performance Analysis (IPA) grid was used to measure the critical factors from the information producer's perspective. A list of 23 influencing factors was identified from previous studies and each of the factors was rated using a five point Likert scale. On a five point Likert scale, the survey enables respondent to rate the relative importance of the factors, followed by another factor's performance rating. The purpose of the survey is not only to measure the actual satisfaction level, but also to highlight important areas for improvements. The IPA, a two dimensional grid, is broken into four categories: (1) concentrate Here; (2) Keep Up the Good Work; (3) Low Priority; and (4) Possible Overkill, to enable each of the factors to be plotted in to the grid. It is clear and powerful evaluation tool for organisation to find out factors that are going well and factors that need to be improved, which require action immediately. The results are useful in identifying areas for strategic focus to help develop the quality of information generated by the information system.

Keywords : *data quality, financial report, Importance-Performance analysis, data quality critical factors*

1. INTRODUCTION

Although a major effort to enhance transparency and accountability of the state financial management can be achieved through the presentation of timely financial reports that comply with the generally accepted government accounting standards, evidence show that the accountability and transparency of financial statements of the public sector in Indonesia have not made much progress and the improvement of the national Accounting Information System (AIS) is still far from satisfactory (Nasution, 2008). This is substantiated by the fact that the Central Government Financial Statements had never obtained unqualified opinions from the Supreme Audit Board from 2004 to 2014.

Ryan, Stanley & Nelson (2002) stated that presentations of financial statements are generally considered as the main medium for discharging accountability. Mardiasmo (2002) indicated that accounting information is a tool for discharging public sector accountability. The role of financial reporting in providing relevant information to users has gained increasing attention in recent years. Harun (2007) draws attention to the importance of improving the quality of public sector accounting in Indonesia, in line with the aims of reform and democratization, and in the context of decentralization.

In the process of preparing financial statements, source documents such as evidence of transactions are the most needed data. In practice, the source documents that guarantee the quality of the input data are not well managed and maintained. For example, duplication of data, incomplete data, invalid data and inconsistency of data are major causes of low productivity, poor decision-making, and declining reputation (Rochadi, 2013).

High quality data is a first stage to generate a highquality information, organisation should be aware of the critical factors that influence the data quality. It's requires a high performance of those critical factors. Xu (2003) found that while organisations placed a high degree of importance on certain factors, the performance of those factors can be quite different.

Previous research on data quality critical factors, espessially assesing perceived of importance and performance (Xu, 2003, 2015; Xu & Al Hakim, 2005), had mainly focused on the difference/ gap between perceived of importance and perceived of performance of those factors. However, no research has been made to assess and evaluating the distribution of organisation resources of those factors. One of the main knowledge gaps that would be addressed in this paper is the introduction of Importance-Performance Analysis (IPA) as a strategic decisionmaking tool that can assist organisation decision makers in Indoenesia to strategically allocate resource to improve the data quality of financial report.

2. LITERATURE REVIEW

a. Data Quality Critical Factors

The TQM philosophy has an extensive and proven body literature of principles, guidelines, and techniques for product quality. Based on TQM, knowledge has been created for data quality practice. Wang et al. (1998, 2002) had introduced a concept of treating data/information as a product. The analogy between physical products and data/information products is presented in Table 1.

Table 1
The analogy between physical products and data products

	Product Manufacturing	Data Manufacturing
Input	Raw materials	Raw data
Process	Assembly line	Information system
Output	Physical products	Information products

Source: Wang et al. (1998, 2002)

In the data quality area, few researchers have investigated the critical success factors for ensuring high quality data. The study of Wang et al. (1995), Xu (2003, 2015) developed an instrument to determine the most critical success factor for AIS data quality (DQ). The framework was further employed to analyse articles relevant to data quality research in the same study. It covered articles from a wide range of different disciplines and across the years of 1970 up to 1994, which provided a comprehensive review of studies in data quality and related areas. Case studies and surveys were the methods adopted for this research; respondents come from a federal government department, government-funded research institution, public utility, higher educational institution, private educational institution, private educational enterprise, a federal agency, and private national agricultural enterprise. The result of the seven main case studies suggested 25 factors that may have an impact on data quality in AIS. Furthermore, the factors are tested empirically by the survey method. The survey instrument was developed based on the findings from a case study. The framework developed by Xu (2003) was the first of such framework built on an empirical study that explored factors that influence data quality in AIS and their intercorrelationships with stakeholder groups and data quality outcomes.

Table 2
The critical success factors for AIS data quality

No.	Author (Year)	Type of Quality	Critical Success Factors
1.	Xu (2003, 2015)	Data quality on AIS	<ul style="list-style-type: none"> - AIS characteristics, - DQ characteristics - stakeholders related factors - organisational factors
2.	Bauwhede (2001)	Financial statement quality	<ul style="list-style-type: none"> - Management's decisions - Quality of external government mechanism - Quality of internal government mechanism - Regulation as to financial reporting and external and internal governance mechanism
3.	Tee,Bowen, Doyle & Rohde (2007)	Data quality	<ul style="list-style-type: none"> - Management commitment - The presence of a champion - The perceived need for data quality - The need to comply with regulatory requirements - Meeting government priorities
4.	Xiao (2009)	Data quality	<ul style="list-style-type: none"> - Top management support - Capability on regulation and process management - Business-IT alignment - Staff participation - Integration of Information Systems (IS)
5.	Xu et al. (2003)	Accounting Information quality management	<ul style="list-style-type: none"> - Human issues - Organisational issues - Systems issues
6.	Ebiyamore et al. (2012)	Data quality	<ul style="list-style-type: none"> - Training and communication - Customer focus/ user involvement - Nature of information system - Change management - Input controls - Information supplier quality management - Top management

Previous research on importance and performance of data quality critical success factors has been conducted by Xu (2003), Li and Liu (2014), Xu & Al Hakim (2005) and Li (2007). Li and Liu et al. (2014) investigated the gap between expectation and actual perception of customers of

information quality. The research revealed that people tend to have high expectations, thus leading to low information quality. It is not because the actual information quality is bad, but simply because people have too many expectations.

Furthermore, Li (1997) examined the perceived importance of information system success (ISS) factors using meta-analysis. The data were collected from past ISS studies and also from a field survey to analyse the differences in the perceived importance of ISS factors among four groups of the subject from North America, namely the user staff, the IS staff, and the managers of the two groups. It revealed that there is no significant difference of importance rating between the IS manager and the IS staff.

Xu and Al Hakim (2005) conducted a study to determine the data quality alignment of factors affecting the data quality of AIS among AIS stakeholders. The research found that perceived performance of factors affecting AIS' data quality is less than the expectation. This study also found that top management commitment and input control were ranked within the top three important factors.

b. The Importance of the IPA Model

The Importance-Performance Analysis (IPA) originated from marketing and was developed to facilitate easy management diagnosis of new product success. Originally conceived in the late 1970s, IPA is a matrix-based technique that seeks to present customer perceptions of importance and performance in an easy to interpret format (Skok & Kophamel, 2001). The IPA technique combines measures of customers' perceived performance and importance into a two-dimensional plot to facilitate data interpretation (Martilla & James, 1977). This plot classifies attributes into four categories or quadrants to set the priorities in allocating limited resources. The four quadrants are typically identified as 'keep up the good work' (Q1), 'possible overkill' (Q2), 'low priority' (Q3) and 'concentrate here' (Q4) (Figure 1).

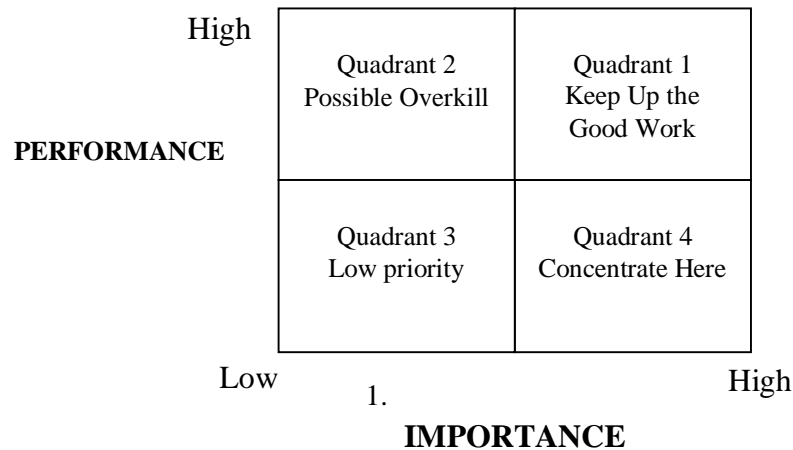


Figure 1
The standard IPA plot

From Figure 1, the first quadrant, ‘keep up the good work,’ represents major strengths and potential competitive advantages of a product or service. The attributes situated in this quadrant are considered to be performing well and need continued investments. On the other hand, Quadrant 2, the ‘possible overkill’ area, contains attributes of low importance to customers; which are performing strongly, indicating a possible waste of limited resources that are inefficiently used and could be reallocated elsewhere (Dwyer et al., 2012). The attributes that fall into the ‘low priority’ area, Quadrant 3, are not performing exceptionally well, but are considered to be relatively unimportant to customers; therefore, managers should not be overly concerned with these attributes. They represent minor weaknesses and poor performance, which is not a major problem. The most crucial region in the plot is Quadrant 4: the ‘concentrate here’ area. Attributes situated in this quadrant are considered to be underperforming and, as such, represent the product’s major weaknesses and threats to its competitiveness. These attributes have the highest priority in terms of investments (Saver, 2015).

Producing IPA begins with the generation of an agreed list of elements on which evaluation is conducted. This list is critical to the analysis and is generally obtained through literature review and interviews. From this, the survey instruments are developed, often using Likert or numerical scales, and these questionnaires are then administered to respondents. Finally, the importance and performance of the identified elements are plotted against each other, allowing comparisons to be made: this may also include competitor information (Duke et al. in Skok et al., 2001). Figure 2 summarizes the process of constructing IPA.

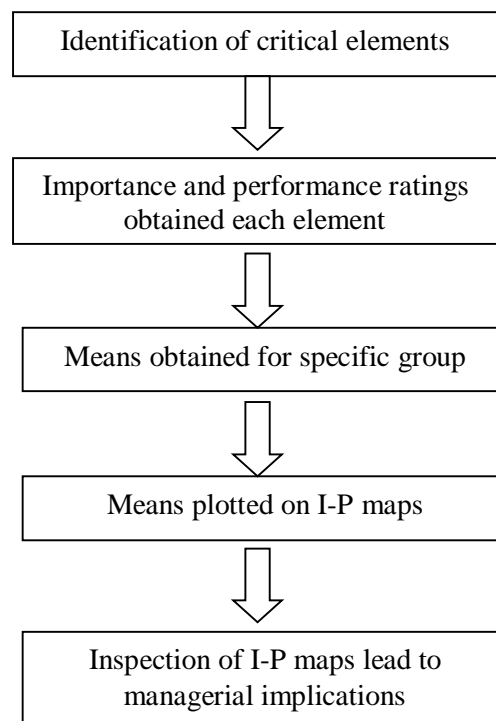


Figure 2
Constructing IPA (Duke et al. in Skok et al., 2001).

3. RESEARCH METHOD

This research used a survey method to measure the perception of Sistem Akuntansi Instansi (Institution Accounting System, SAI) personnel as information producer in preparing financial reporting of Central Government. The questionnaire was adopted from Xu's study (2003, 2015) and used five point Likert scale to measure the importance 1 (not important) to 5 (extremely important) and performance of the critical factors based on a scale from 1 (not applicable) to 5 (very good). In total, there were 23 factors adopted from Xu (2003, 2015).

To achieve a higher validity of the questionnaire, a pre-test was applied. The questionnaires are distributed to two academicians and five practitioners. The practitioners consist of four operators and one verifier. The aim is to confirm whether the items can be understood, correct, and consistent. After pre-testing, a number of changes and additions were made to the instrument.

The data in this study is collected by distributing the questionnaire directly to the respondents. A total of 215 responses were collected in the data collection process, representing a response rate of 79.60%. From all the returned questionnaires, there are 47 unusable responses because they did not answer at all or they only answer a small portion of the questionnaire. Thus, of the 215 questionnaires delivered, total usable responses were 168, representing a 78.14% of usable response rate.

4. RESULTS AND ANALYSIS

Table 3 shows the result of the study and ranking of the most important and most implemented factors of data quality.

The mean importance for all 23 factors was rated at 4.00, whereas the mean performance was just an average of 3.38. Therefore, if we were to plot the importance and performance on IPA grid, government leaders and strategist would be able to quickly identify areas in which factors of data quality should allocate their resources to maximise a high quality information of financial report. The IPA grid is shown on Figure 2.

The intersection in the IPA is made available using the mean level of importance at 4.00 and the mean level of performance 3.38. In quadrant I, *concentrate here*, SAI personnel perceive the factors as very important, but the perceptions of performance levels are below average. Thus, further improvement efforts should be concentrated here. There are three factors that fall into this quadrant, namely understanding of the system and DQ (D18), internal control (D23), and organisational culture (D8).

Factors such as top management support (D1), education and training (D3), input control (D9), DQ supplier quality management (D15), teamwork (D17), personnel competency (D20), physical environment (D21) and audit and review (D22), situated in quadrant II, *keep the good work*. On this quadrant, the factors are perceived to be very important and satisfied from the SAI personnel. All these factors are strengths of the organisations and the government institution should keep up the good work to produce high quality information, otherwise, these factors might risk falling into the *concentrate here* quadrant.

Some of the factors that are literally categorised as *low priority* in quadrant III are DQ manager position (D5), organisational structure (D6), DQ policies and standards (D7), user focus (D10), employee relationship (D12), management of change (D13), measurement and reporting (D14), continuous improvement (D16) and risk management (D19).

In quadrant IV, possible overkill, two factors namely AIS nature (D11) and middle manager commitment (D2) are rated as low importance with high performance. On this quadrant, the SAI personnel are very satisfied with those factors performance, but present efforts on these attributes in this quadrant are exaggerated.

Table.3
Mean of the factors influencing data quality of AIS

Factors	Mean Importance	Mean Performance	Gap (I-P)	Rank of Importance	Rank of Performance
Top management commitment	4.01	3.49	0.52		
Middle management commitment	3.25	3.53	-0.79		
Education and training	4.08	3.52	0.56		
DQ Vision	4.00	3.40	0.59		
DQ Manager	3.95	3.26	0.68		
Organizational structure	3.78	3.32	0.46		
DQ policies and standard	3.79	3.33	0.45		
Organizational culture	4.05	3.37	0.67		
Input control	4.32	3.76	0.56		
User Focus	3.82	3.37	0.44		
AIS nature	3.95	3.51	0.44		
Employee relation	3.82	3.35	0.46		
Management of changes	3.84	3.38	0.46		
Measurement and reporting	3.80	3.22	0.58		
Data supplier quality management	4.33	3.69	0.64		
Continuous improvement	3.90	3.33	0.56		
Teamwork (communication)	4.15	3.52	0.63		
Understanding of systems and DQ	4.31	3.37	0.94		
Risk management	3.88	3.37	0.50		
Personnel competency	4.29	3.69	0.60		
Physical environment	4.27	3.71	0.56		
Audit and reviews	4.18	3.51	0.67		
Internal Control	4.09	3.34	0.75		
Mean	4.00	3.38			

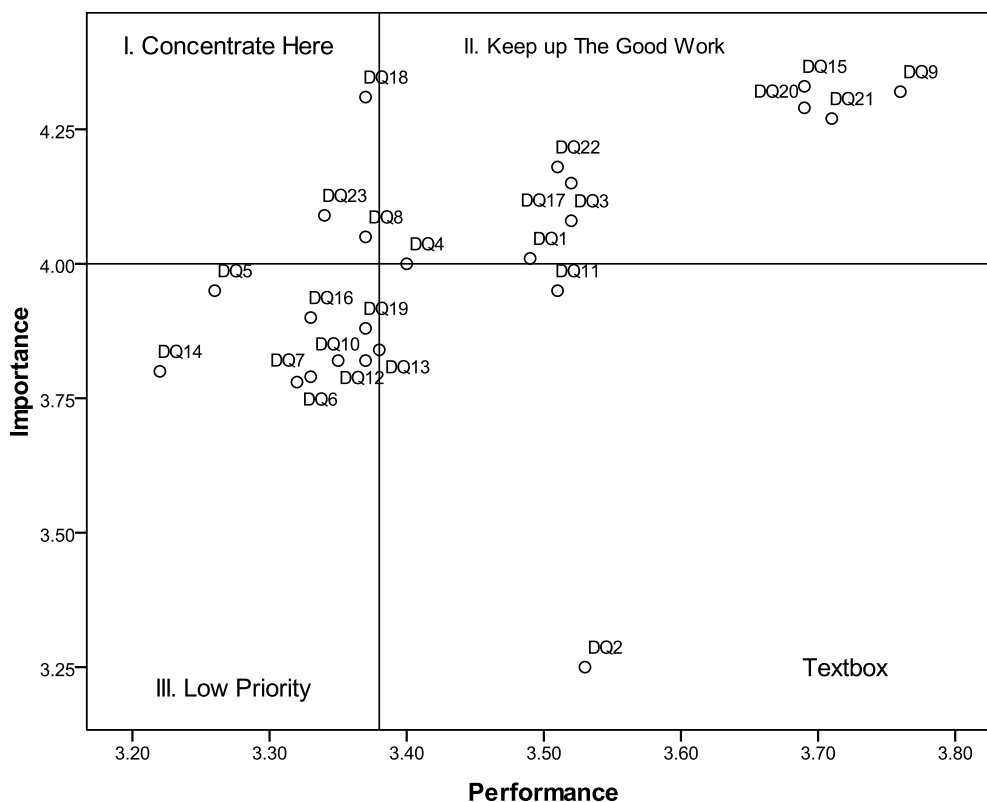


Figure 2
The IPA Grid

5. CONCLUSION

The IPA plot revealed that understanding of the system and DQ, internal control, and organisational culture are the factors that fall into “concentrate here” quadrant. This quadrant indicated that Indonesian government should focus their resources such as money, effort, and time to these factors. In the “possible overkill” quadrant, there is an over emphasis in the government’s allocation of resources on attributes deemed to be unimportant and it is time to consider divesting investment in this areas by allocating more resources to “concentrate here” quadrant.

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