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MANAGING ACCOUNTING INFORMATION QUALITY: AN AUSTRALIAN STUDY

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Abstract

The quality of the data provided is important to the success of accounting information systems. The evidence indicates that organizations have data quality problems. Accounting information systems are one of the core systems in the organization; therefore, knowledge of how to manage the quality of accounting information has become critical. The research proposed here will develop and test a model that identifies the critical success factors influencing data quality in accounting information systems. The research will involve case studies of accounting information quality in Australian organizations in practice and then will use case study findings to modify the initial research model and identify the possible set of success factors. This paper describes the overall objectives of this research and the methodology to be employed.

Keywords: Accounting information quality, data quality, critical success factors

1. INTRODUCTION

Global, national, and local organizations are all operating and competing in today's information society. An organization's basis for competition, therefore, has changed from tangible products to intangible information. Poor quality information can have significant social and business impacts (Strong et al. 1997). There is strong evidence that data quality problems are becoming increasingly prevalent in practice (Redman 1998; Wand and Wang 1996). Most organizations have experienced the adverse effects of decisions based on information of inferior quality (Huang et al. 1999).

In particular, accounting information systems (AIS) maintain and produce the data used by organizations to plan, evaluate, and diagnose the dynamics of operations and financial circumstances (Anthony et al. 1994). Providing and assuring quality data has been the primary objective of accounting since the inception of the field. With the advent of AIS, the traditional focus on the input and recording of data needs to be offset with the recognition that the systems themselves may affect the quality of data (Fedorowicz and Lee 1998). Empirical evidence suggests that data quality is problematic in AIS (Johnson et al. 1981). AIS data quality is concerned with detecting the presence or absence of target error classes in the accounts (Kaplan et al. 1998).

Thus, knowledge of the critical factors that influence the data quality in AIS will assist organizations to ensure and improve their accounting information systems' data quality. While many AIS studies have looked at internal control and audit, data quality (DQ) studies focused on measurement of DQ outcomes, but it appears that very little attempt has been made to identify the critical success factors (CSFs) for improving data quality in AIS. The research proposed here will develop and test a model that identifies the critical success factors influencing data quality in accounting information systems.

2. RESEARCH PROBLEM

In brief, it appears that there has been little discussion in the literature of the impact of CSFs on the data quality of AIS. Therefore, this research addresses the problem:

RP: *There is lack of knowledge of critical success factors for ensuring data quality in accounting information systems.*

Two research questions are derived from the problem above:

RQ 1. *What are the factors that affect the variation of data quality in accounting information systems?*

RQ 2. *Which of these factors are **critical** to ensuring high quality of data in accounting information systems and why?*

Specific objectives of this research include:

- Proposing a list of factors influencing the data quality of AIS from the literature
- Conducting pilot case studies, using the findings from the pilot study together with the literature to identify possible critical success factors for AIS's DQ
- Examining AIS DQ's critical success factors in real-world practice
- Comparing similarities and differences between proposed critical success factors with real-world critical success factors
- Identifying a set of critical success factors for AIS DQ from research findings
- Determining the sub-factors for each of the identified critical success factors

3. PRELIMINARY LITERATURE REVIEW

Traditionally, data quality has only been described from the perspective of accuracy. Research and practice indicates that data quality should be defined as beyond accuracy and is identified as encompassing multiple dimensions. However, no standard data quality definition exists today (Huang et al. 1999).

In accounting and auditing, where internal control systems require maximum reliability with minimum cost, the key data quality dimension used is *accuracy*, defined in terms of the frequency, size, and distribution of errors in data (Wang et al. 1995). In assessing the value of accounting information, researchers also identified *relevance* and *timeliness* as desirable attributes (Feltham 1968).

In order to ensure the data quality in AIS, it is important to understand the underlying factors that influencing the AIS's DQ. The knowledge of the critical factors that contribute to the success of AIS with high quality data is desirable but is still unclear at this time.

There have been some studies of critical success factors in quality management, such as total quality management (TQM) and just-in-time (JIT). Some of the data quality literature also addressed the critical points and steps for DQ. Table 1 shows the related research efforts and reflects whether these research efforts addressed certain issues or elements of critical success factors of quality or data quality management.

4. RESEARCH APPROACH AND METHODOLOGY

4.1 Initial Exploratory Research

The first phase will involve the development of the research model representing possible critical success factors for data quality in AIS. The conceptual study research method will be used together with the pilot case study in order to build the research model.

First, a list of factors that influence data quality in AIS will be proposed by synthesizing critical success factors, data quality, and accounting information systems concepts from the quality management, DQ, and AIS literature. A conceptual study method will be used, because it can capture and articulate the researchers' views and it is effective in developing new concepts and insights (Galliers 1991).

Two or three pilot case studies will be conducted. The pilot study will assist in refining data collection plans with respect to both the contexts of the data and the procedures to be followed (Yin 1994). It is expected to provide a broad picture of data quality issues in AIS and the evidence of accepting or rejecting initial proposed factors from the literature. The pilot study may uncover some "new" factors influencing accounting information quality that were not included in the proposed list.

Table 1. Summary of Literature Review Identifying Factors Influencing (Data) Quality

Factor	Saraph et al. (1989)	English (1999)	Firth (1996)	Wang (1998), Huang et al. (1999)	Segev (1996)	Zhu and Meredith (1995)	Orr (1998)	Birkett (1986)	Yu and Neter (1973) Cushing (1974) Fields et al. (1986) Nichols (1987)	Johnson (1981) Groomer and Murthy (1989)	Bowen (1993)
Role of top management	✓	✓	✓	✓	✓	✓					
(Data) Quality polices and standards			✓	✓	✓						
Role of (data) quality and (data) quality manger	✓	✓	✓	✓	✓	✓					
Training	✓	✓		✓		✓	✓				
Organizational structure (communication)		✓				✓					
Nature of the system Product/service design	✓				✓		✓				
Approaches (control and improvement) Process management	✓	✓		✓	✓						
Employee/personnel relations	✓		✓			✓					
Supplier quality management	✓			✓		✓					
Performance evaluation and rewards (responsibility for DQ)		✓		✓				✓			
Manage change		✓									
External factors								✓			
Evaluate cost/benefit tradeoffs					✓	✓					
Audits							✓			✓	
Internal control (systems, process)									✓		
Input control											✓
Customer focus (user involvement)				✓			✓				
Usage of data (“use-based” DQ)							✓				

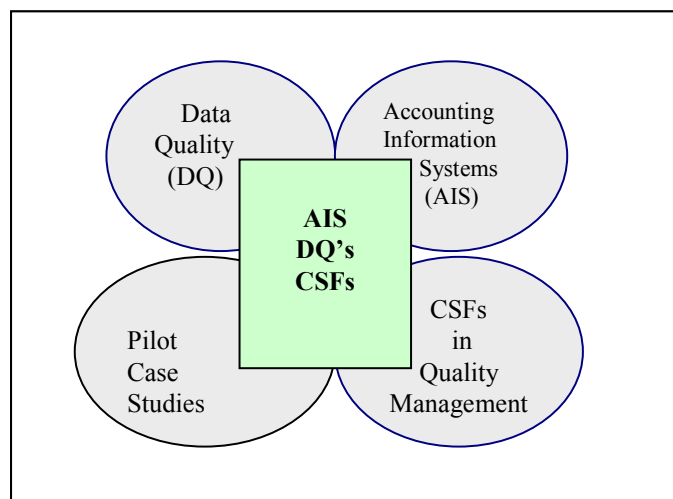


Figure 1. Areas That May Contribute to the Model Building of this Research

conducted on DQ critical success factors in AIS, there is a need to examine the real world AIS DQ critical success factors and modify the initial proposed critical success factors based on real-life practice. Therefore, the case study method seems appropriate for this phase.

Case Studies. The case studies will be conducted within Australian organizations in relation to the factors that impact on data quality in their accounting information systems. It will lead to a deeper understanding of critical success factors on accounting information quality.

Multiple case studies. After the pilot study, multiple case studies will be conducted as the methodology to further investigate the critical success factors for accounting information quality. The evidence from multiple cases is often considered more compelling and the overall study is therefore regarded as being more robust (Herriott and Firestone 1983).

Sample selection. Cases for the study will be carefully selected, so that each case either predicts similar results (a literal replication) or produces contrasting results but for a predictable reason (a theoretical replication) (Yin 1994). The number of case studies included in this study will be six to ten, as the ability to conduct that number of case studies, arranged effectively within a multiple-case design, is analogous to the ability to conduct the same number of experiments on related topics (Yin 1994). Within those six to ten cases, half will be chosen from large organizations and the other half will be small to medium (SMEs) organizations. This design will allow for the investigation as to whether organizational size influences the critical success factors and whether it is possible to generate some common critical success factors for organizations of different sizes. Due to funding constraints, the selected organizations will be from cities on the eastern coast of Australia.

Data collection and unit of analysis. Semi-structured and unstructured interviews with key AIS people will be conducted, including accounting and finance managers, finance systems managers, senior managements, internal auditors, and data managers.

In data quality studies, four types of stakeholders have been identified: data producers, data custodians, data consumers, and data managers (Strong et al. 1997; Wang 1998). In this study, stakeholders of data quality in AIS are defined as follow:

- Data producers are those who create or collect data for the AIS
- Data custodians are those who design, develop, and operate the AIS
- Data consumers are those who use the accounting information in their work activities
- Data managers are those responsible for managing the entire data quality in AIS

Because auditors play a very important role in monitoring AIS data quality, the study will also include the organization's internal auditors. It is likely that SMEs have less personnel involved in their AIS, therefore, it is possible that the study will interview fewer stakeholders in SMEs than the large organizations. Table 2 shows the details of interview plans for this study.

Development of the Research Model. The findings from the pilot study will be used together with the available literature to build the research model, which will include the possible critical success factors for DQ in AIS. Figure 1 shows how different areas of literature and the pilot study contribute to the model building of this study. The initial exploratory research will also be used to re-design the interview protocol and data collection procedures, which will be used in next phase.

4.2 Test the Research Model: Multiple Case Studies

The second phase of this research will be to examine the applicability of the proposed factors compared to the factors that impact data quality in AIS in practice. The case study research method will be used in this phase. Case study research is used to study the contemporary phenomenon in its real-life context (Yin 1994) and it can be used where the research and theory are at their early, formative stages (Benbasat et al. 1987). Given that little research has been

Table 2. Planned Case Study Interviews

Stakeholders Category	Position within the organization	
	Large organizations (3 to 5)	SMEs (3 to 5)
Data producers	Accounting managers	Accountants
Data custodians	IS managers	IS personnel
Data consumers	Senior managers	Senior managers
Data managers	Data managers (if applicable)	N/A
Internal auditors	Internal auditors	N/A

Data collection sources will also include relevant documents, such as position description, policy manuals, organizational structure charts, and training documents, as well as some published information about the organizations, such as their financial statements and annual reports. Documents can be used to corroborate and augment evidence from other sources and they play an explicit role in the data collection process in doing case studies (Yin 1994).

There will be two different units of analysis in the case studies. The individual organization is the unit of analysis when we compare difference types and sizes of organizations. The individual stakeholder is the unit of analysis when we compare the views of different stakeholders.

The purpose of the case study is to investigate key stakeholders' perceptions of critical success factors of AIS DQ and to determine the empirical validity of the proposed critical success factors concepts, leading to the identification of CSFs for data quality in AIS.

4.3 Identification of CSFs for Data Quality in AIS

The third phase is to identify a set of critical success factors for AIS DQ. From the analysis of the case study, some of our proposed critical success factors will be modified in order to make them more appropriate for representing real-life situations. Therefore, a set of possible critical success factors for AIS DQ will be able to be identified.

There are many differences between organizations in relation to size, form of ownership, and industry sector. The degree to which these will affect the CSFs will vary between organizations and industries and at different periods of time. However, there are also many similarities among organizations; therefore, the major factors that determine the AIS's data quality are likely to be common to most organizations. It may be possible to identify a general set of CSFs that influences the data quality of AIS.

This phase will also involve the identification of the sub-factors for each of the critical success factors based on the case studies findings. Furthermore, the phase may require going back to the case study organizations to verify and seek more data. This step might enhance the validity of the research findings.

5. DATA ANALYSIS

The data gathered from case studies need to be compiled and examined in order to address and answer the research questions. Case studies analysis will discuss the similarities and differences between the proposed critical success factors and actual factors that influence the data quality in AIS and how well the proposed critical success factors match the actual situations. The modes of analysis that will be used in this study are described below.

Pattern-matching. Comparison will be made between the findings of the case studies and the proposed factors. The comparison is between the findings of the case studies, as empirically based patterns, and proposed factors as predicted patterns. If the patterns coincide, the results can help case studies strengthen their internal validity (Yin 1994).

Clustering. The similar comments and ideas from case study findings will be grouped. The critical success factors of AIS will be used to cluster the findings from case studies, where “cluster” means inductively forming categories and iterative sorting of events, factors, settings, and sites into those categories (Miles and Huberman 1994). If clustered, the findings can be easily compared among different stakeholders and organizations.

Comparing. The comparison will include different stakeholders’ perspective within one case study and the similarities and differences of CSFs across cases.

It is likely that different stakeholders will have different perspectives as to what constitutes the CSFs for data quality in AIS. The study will compare different stakeholders’ viewpoints and, furthermore, will investigate whether there are some common factors that all stakeholders deem to be critical.

As the case study will involve different sizes of organizations and organizations from different industries, the study will also compare and contrast the similarities and differences of CSFs in different sizes of organizations and across different cases.

General factors versus sub-factors. The case studies findings could provide some possible sub-factors that constitute each of the CSFs. These sub-factors will be grouped under their relevant CSFs. This step is necessary, as there is a need for a generalised set of CSFs, as well as sub-factors within each CSF, which could provide more detailed guidelines to practitioners.

6. CONTRIBUTION OF THE RESEARCH

Given that little research has been conducted to identify the CSFs for data quality in AIS, the proposed research will make both theoretical and practical contributions to the field of data quality and accounting information systems in the following ways:

1. This research will make a contribution to the body of knowledge of data quality and AIS by identifying the critical success factors for AIS’s data quality.
2. The research could help organizations to focus on only the important factors, thereby obtaining better benefit from less effort. Such an outcome will be helpful to both Accounting and IT professionals in obtaining a better understanding of data quality issues in AIS.

7. LIMITATIONS

First, AIS has large number of stakeholders and different stakeholders may have different perspectives of the impact of critical success factors on data quality. This study will only include the major stakeholders in AIS. However, the perspectives of other, minor stakeholders may also be important and, therefore, further research should be conducted.

Second, the study will be constrained to organizations in Australia, especially from eastern coast of Australia. Therefore, the conclusions drawn from this study may have a potential problem with generalizability. It is acknowledged that culture differences may impact upon the results, a point beyond the scope of this research, and those issues could be addressed by further research.

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