Importance of Relationship Quality in the Success of Data Warehouse Systems

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ABSTRACT— Increased organizational dependence on data warehouse (DW) systems drives management attention towards improving DW systems success. However, the successful implementation rate of DW systems is low and many firms did not achieve intended goals. A recent studies show that improves and evaluates DW success is one of the top concerns facing IT/DW executives. Existing information system (IS) research has studied DW success more from information quality and system quality. Researchers argue in this study that we should also take the relationship quality, which has significant research and practical implications in that it connects to IS success directly. As our first attempt, this study, referring to both IS and marketing literature, examines how communication, coordination, cooperation, commitment, and trust can be achieved to some degrees by high quality relationships between DW parties.

Keywords- data warehouse, relationship quality, success implementation, information system, knowledge management, decisions making, decisions support system.

1. INTRODUCTION

Today many organizations possess Information Technology (IT) infrastructures that provide limited data management, integration, and access. These organizations would be better served by IT infrastructures that offer appropriate data and tools to support decision makers. DW appeared in the early 90s as a decision support technology that could integrate data from multiple sources, and that had a subject orientation in the way data was organized and presented. Inmon [1] defined DW systems as “a subject-oriented, integrated, time-variant, non volatile collection of data in support of management decisions”.

Literature is rich with evidence that DW provides a unique opportunity to improve the IT infrastructure [2]. DW addresses data management, integration, and access issues by creating a repository of quality data that can be manipulated to meet changing business data along common business subjects or dimensions and let users navigate through attribute hierarchies. Users can drill down, across, or up level in each dimension [3].

DW is probably the most rapidly growing system area today. Thousands of companies have implemented or are in the process of implementing DW system. One study reported an average cost of $2.2 million for a typical DW [4], while another study found that DW tools market repeated its 2004 performance in 2005 with an 11.3% growth rate to reach $9.6 billion in revenue [5]. A more recent study placed the enterprise DW market will experience double-digit growth through 2008 [6]. Another study expected that DW market size is likely to approach $7 billion in 2008 [7]. Organizations of any size should begin to assess their current level of investment in the analytic infrastructure [6].

However, DW systems are very expensive and highly risky, and once DW systems are implemented, management should evaluate whether it is successful. In fact, the use of DW has not always led to significant organizational improvements. In many cases, the estimation of DW systems success is very limited in meeting user’s expectations [2, 8-11]. Moreover, there have many reports on DW failure rates. The reported percentages vary based on the reporting agency but average between 20%-50% failure rates [12-14].

Furthermore, building DW is a complex process as designing DW requires techniques completely different from those adopted for operational information. In addition, DW systems integrate requirements, data and priorities of the organization and its multiple business units. Moreover, building DW requires an integration of many tasks, components, and coordination of efforts of many people [15]. Therefore, the existences of better quality of relationship between DW parties are absolutely necessary for achieving the business goals and reach success [16].

The relationship between business objectives and technology has surfaced in DW implementation. It becomes a fact that there are no studies examine the relationship quality in the context of DW. In this research, researchers revise the traditional definition of relationship quality by including affective trust, commitment, communication, cooperation, and coordination as a components of measuring relationship quality in DW success area.
2. LITERATURE REVIEW

2.1 Relationship Quality

Lee and Kim [18] define the relationship quality as the overall evaluation of the effectiveness of a relationship indicate by the extent to which the parties in the relationship meet mutual needs and expectations through mutual commitment, cooperation, and coordination. In addition, Sun et al. [19] acknowledge that the relationship quality is a key factor that connects IS factors and business profitability factors (such as commitment and trust).

The concept of relationship quality arises from theory and research in the field of relationship marketing [20, 21] in which the ultimate goal is to strengthen already strong relationships and to convert indifferent customers into loyal ones [22]. Palmatier et al. [23] stress the fact that relationship quality conceptualizes as a composite or multidimensional construct capturing the different but related facets of a relationship.

Although, previous researches [19, 24-29] discuss the concept of relationship quality in various research contexts, the definition of relationship quality differs from research project to research project. These authors also agree that the concept of relationship quality is a higher-order construct consisting of several distinct but related components or dimensions. An investigation of the extant literature indicates trust, commitment, communication, cultural, and user participation all positively impact the quality of the relationship [19, 28-35]. Organizations realize that the intangible aspects of a relationship may not be easily duplicated by the competition, and therefore may provide a unique competitive advantage [36]. Increasingly, companies are recognizing the value of establishing close relationships with customers as a means of increasing retention.

Moreover, various factors and dimensions are used to study relationship quality within IS research. Chang and Ku [37] argue that relationship quality is the overall appraisal of the strength of a relationship and the extent to which it meets the expectations and needs of the parties on the basis of successful or unsuccessful encounters. They used three variables (trust, commitment, and satisfaction) to measure relationship quality for customer relationship management (CRM) performance. Sun et al. [19] acknowledge that the relationship quality is a key factor that connects IS factors and business profitability factors (such as commitment and retention). Carr [38] mentions that the quality of relationship is the glue that binds IS users to IS departments through the success and failure of IS project. Carr also states satisfaction, trust, and commitment as a measurement variables for relationship quality between the IS users and IS department. According to Chakrabarty et al. [29], high relationship quality implies high levels of commitment, trust, cultural similarity, communication, and balanced interdependence between IS outsourcing parties. Lee and Kim [18] present five relationship quality components affecting IS outsourcing success: commitment, trust, conflict, benefit and risk share, and business understanding. Roberts et al. [36] state four variables to measure relationship quality, they are: trust, commitment, satisfaction and affective conflict.

2.2 Relationship Quality and DW Success

As mentioned earlier, the data in DW system is collected from transactional systems from different departments or firms. Therefore, the existences of better quality of relationship between these departments or firms are absolutely necessary for achieving the business goals and reach success. In other words, managing the relationship of DW parties is critical for success of DW system in terms of commitment, trust, cooperation, coordination, and communication [9, 16, 17, 39-41]. Moreover, a good relationship between DW managers and business users could potentially reduce the time and effort which would lead to make decisions in a timely manner and with high accuracy [16]. Additionally, DW system is actually about tightly integrating different business functions, so the close cooperation, commitment, trust, and communication across disparate business functions would be a natural prerequisite in DW system success [9, 16, 40, 41].

Unfortunately, there is a scarcity of studies that examine the direct relationship between relationship quality and DW success. On the other hand, little research investigates the relationship between relationship quality construct and user satisfaction. Chakrabarty et al. [29] indicates that relationship quality is significantly associated with user satisfaction in IS outsourcing success. In the context of e-commerce systems, Wu [35] considers relationship quality as an additional quality dimension to IS success model for DeLone and McLean through its impact on use and user satisfaction. Moreover, in a study of customer relationship management (CRM), Chang and Ku [37] contends that relationship quality is positively correlated with organizational performance. Generalizing the above discussion, relationship quality is described in terms of the user’s expectation of benefit from the relationship. In addition, this study expects that relationship quality will be significantly related to DW success.

3. DIMENSIONS OF RELATIONSHIP QUALITY

3.1 Commitment

An investigation of the relationship quality literature shows a common theme cataloging commitment as a key factor in successful relationships [32]. Commitment reflects the parties view in order to sustain the relationship over time [42], and describes as “an enduring desire to remain in a valued relationship” [43] (p. 211). According to recent studies about relationship quality, commitment considers to be a major contributor to a successful relationship [19, 37, 38]. In the context of DW, Porter and Rome [44] contend that “building a data warehouse is extremely complex and takes commitment from both
the information technology department and the business analysts of the organization” (p. 43). The amount of data available in companies is often overwhelming, and collecting, maintaining and analyzing the data requires significant organizational commitment [45]. In addition, consider the more sophisticated tools for developing DW system need a long-term commitment to utilize this technology. There is often an erosion of strong corporate commitment to mandate the use of these tools throughout the entire organization, and once this occurs, it is very difficult to justify the costs versus benefits [46].

Furthermore, the commitment of top management support is very important to pass over sudden barriers and complexities in DW project, as highlights by [9, 14, 47, 48]. Bhansali [16] argue that high level of commitment of senior managers and DW managers is critical to successful alignment and adoption of DW. Obtaining commitment to DW initiative at the right level and at the right time is vital during the initial step of the project. The use of metadata encourages developers and end-users to cooperate in the planning and to encourage commitment to all of the stakeholders of DW [40].

3.2 Trust

Zaheer, McEvily, and Perrone [49] define trust as the expectation that parties fulfill its obligations, act predictably, and behave fairly even when the possibility for opportunism is present. Findings at previous researches indicate the importance of trust in the success of relationships [18, 34, 37, 38, 50, 51]. According to Carr [38], trust provide the glue holding together the relationship between IS users and the IS department. In addition, Voss [50] and Daffy [51] emphasize the importance of the trust in developing a sustainable relationship among an organization, its users, and its business needs. Morgan and Hunt [32], argue that trust is a confidence in an exchange partner's reliability and integrity. The construct of trust particularly associates with the development of interest in relationship marketing in general [28] and particularly in the context of IS [34, 38]. The lack of the trust in the IS context identifies as one of the major obstacles in the adoption and success of IS technologies [52].

Similar results are reported in DW research. Perkins [53] states the fact DW that contains trusted strategic information becomes a valuable enterprise resource for the decision makers’ at all organizational levels. If its users discover that it contains bad data, DW will ignore and will fail. In the implementation of DW, executive sponsorship is characterized by the ability to build trust and consensus between DW parties [48]. Data driven decision-making involves collaborating and an assortment of skills the organization. Data analysis is one of the most important benefits of using DW. The capability to transform data from transactional to customer focused data is immeasurable. Business users need to trust the results of DW when they produce their reports [41]. According to [54], trust is an important factor since users need to have trust in providers in terms of the service as well as the confidentiality of data. As noted earlier, the data in DW collects from transactional systems in different departments or firms.

3.3 Communication

Anderson and Narus [55] define the communication as the proactive formal and informal exchange or sharing of useful and timely information between firms. This definition focuses on the effectiveness of information exchange, rather than amount or quantity. According to Kanar and Oz [56], communication is the number of people in the IT organization who have communicate to on any given warehouse subject. These subjects may include architecture, strategy, techniques, standards and guidelines, methodology, and tools [56]. Moreover, communication is an important aspect in the development and success of DW. Bhansali [16] acknowledges that “communication of the strategic direction between the business and DW managers is important for the strategic alignment of the data warehouse”. In order to make sure that the business rules of DW are correct, there must be communication between all development groups that supply data to the warehouse [57]. Further, Shin [58] outlines that DW architecture is a specification of formal processing and communication of a data warehousing environment. As mentioned by Mukherjee and Souza [48], top management needs to keep communication strong between DW parties and to continue supporting the concerns of those who now have a stake in DW system. As states recently, better communication capability between DW team will cause a positive impact on the successful implementation of DW [17].

3.4 Cooperation

Cooperation is a concept similar to coordination, but is a higher-level abstraction that more closely captures the nature of a relationship quality. Coordination describes the management of interdependent activities: cooperation indicates the participants’ agreement and acknowledgement of what those activities are [34]. Cooperation is defined as the complementary activities undertaking by organizations in an interdependent relationship with the goal of achieving mutual benefits [55]. Generally, DW research has shown cooperation to have positive impacts on implementation success. Quaddus and Intrapairot [59] argue that cooperation between IT departments and users will increase the diffusion of DW technology. DW literature also suggests that cooperation between departments in an organization has a large effect on the smooth flow of the required information and expertise among departments, which strongly influences the successful adoption and implementation of DW technology [9, 60]. Ganczarski [40] stated that, the process of designing and implementing DW demands new levels of cooperation among various business units. Moreover, cross-functional team cooperation and coordination is especially important in DW projects [61].
3.5 Coordination

In previous studies, coordination is considered to be an important factor in relationship success [18, 31, 34]. Goles and Chin [34] define coordination as “the process of managing interdependencies between entities to accomplish agreed-upon tasks”. In the context of DW, coordination of organizational resources should affect the successful adoption of DW technology [9]. In addition to this, the coordination of organizational resources can reduce unnecessary obstacles during the implementation process of DW by investing requested labors and capitals in the project [39]. According to AbuAli and AbuAddose [17], coordination and proper allocation of resources can help DW project teams to meet their project milestones and overcome organizational barriers.

4. CONCLUSION

A relationship quality dimensions for DW success has been identified, based on a review of DW literature. Literature found that commitment, trust, communication, cooperation, and coordination are the most important aspect of relationship quality. The importance of relationship quality is similarly stressed by prior studies, which cites that quality of the relationship between DW parties could potentially reduce the time and effort, which in turn leads to make decisions in a timely manner and with high accuracy. Likewise, DW managers and business managers need to be jointly responsible for collaborate continuously through strong partnerships and appropriate allocation of resources. Added to this, the effective communication, coordination, and cooperation between DW parties will facilitate the identification of areas for development in DW with the best return on investments. Finally, the successful communication, coordination, and cooperation between DW managers and business users are absolutely help in avoiding paradoxical decisions.

REFERENCES