AN EXPLORATION OF QUALITY ISSUES IN THE CONTEXT OF THE DESIGN OF DATA WAREHOUSING, KNOWLEDGE MANAGEMENT AND E-COMMERCE SYSTEMS

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Abstract

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Three recent information technology (IT)-enabled innovations that have found wide application are data warehouses (DW), knowledge management systems (KMS) and applications of electronic commerce (e-commerce). Despite the recent interest in these innovations as strategic resources, most organizations are still oblivious to the quality issues surrounding their deployment. The aim of this dissertation is to identify and explicate some of the quality issues that are relevant to these three systems, using a multi-paper dissertation approach, consisting of four papers. This research was conducted using the design science approach.

The first two papers are conceptual papers; they define a set of quality dimensions pertaining to knowledge management and e-commerce systems respectively. Defining these dimensions is a critical first step in addressing quality as they can be used as an important benchmark for comparing the quality of similar systems and to determine if proposed quality improvement techniques are actually effective. Additionally, quality dimensions should be incorporated into the design

of these systems thus ensuring that quality issues are addressed early in the development process.

The third paper describes the development and evaluation of a quality-based, cost-benefit analysis model for data warehouse (DW) development. This model can be used to identify the data with the potential to produce the greatest net value for an organization and therefore can be used to determine the most cost effective data tables to load in the warehouse.

The final paper proposes an approach for developing and evaluating an important component of a number of these IT-enabled innovations – the ontology. The aim of this approach is to improve the quality of the ontology. The proposed approach will be demonstrated by applying it to the IT infrastructure domain at a university campus.

The most important intention of this body of work is to provide insights into, and to unearth effective measures of quality relevant in the three domains, KMS, e-commerce systems and DW. These domains have become very important to organizations but their impacts have been significantly impaired by the absence of appropriate quality considerations.

Keywords: Quality, Knowledge Managements Systems, E-Commerce Systems, Data Warehouses, Ontology