International Journal of Information Technology Project Management
Volume 15 • Issue 1

Improving IT Project Outcomes With the Deming Management Method:
A Quality Management Approach

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ABSTRACT

Introducing technological change into an organization is a difficult undertaking, so it is not unexpected that firms struggle in their pursuit to achieve the desired level of quality for IT project outcomes. The purpose of this research is to examine the Deming management method to determine if its theories about quality management can be applied to IT projects. Survey data was collected from 168 IT professionals and analyzed. The results provide strong empirical support for the application of the Deming management method to address this persistent problem. In particular, the results support all hypothesized relationships among the quality management concepts comprising the Deming model, while at the same time the Deming model provides strong predictive ability for both customer satisfaction with IT project deliverables and meeting project performance goals of budget, schedule, and system functionality.

KEYWORDS

Deming Management Method, IT Project Management, PLS, Quality Management, Survey Research

1. INTRODUCTION

Information technology (IT) systems are crucial to the success of contemporary businesses. They facilitate processes improvement (Davenport, 2013), enable communication between organizational departments (Wang, et al., 2022), facilitate the integration of supply chain partners, and are central components for executing many organizational strategies (Drnevich & Croson, 2013). Given the importance of IT, it is unsurprising that in 2021 U.S. companies invested approximately $1.94 trillion on technology (Sava, 2021).

Despite the importance of IT to organizational success, many firms fail to effectively manage the quality aspects of their technology initiatives. The negative repercussions of this persistent problem are considerable. For example, 11.4% of the investment spent on technology projects is wasted due to poor project performance (PMI, 2021); one report found that 80% of technology professionals

DOI: 10.4018/IJITPM.335118 *Corresponding Author

working on software projects spent more than half their time correcting quality issues (Geneca, 2017). The consequences of poor quality management for IT projects are not limited to the performance of the systems development process. The desired level of business value received from IT projects is often not achieved; 41% of firms report mixed results for the delivered value provided by completed IT initiatives (Feldman, 2014). In 2020, U.S. companies experienced $1.56 trillion in total costs from operational failures caused by poor quality software solutions (Krasner, 2020). As these statistics illustrate, organizations need to reconsider their approach to managing the quality aspects of their IT initiatives.

Quality management can be broadly defined as a formalized approach to managing business processes in an effort to achieve quality goals and objectives. The concepts and philosophies of quality management have been adopted by firms throughout the world in the form of quality programs, such as ISO certification and Six Sigma, to improve products and services. The core values shared by these quality programs include a focus on the customer, leadership, incremental or continuous improvement, and the idea that prevention is less expensive than correction. While quality management has received a great deal of attention in manufacturing and services contexts, its concepts have only recently been applied to IT projects (Marchewka, 2012). The focus of this research is project quality management, which focuses on the processes used to execute an IT project. Project quality management ensures that the outcome of a completed project will meet or exceed client/project sponsor expectations, while also satisfying the needs for which the technology initiative was undertaken.

Of particular interest to this study is the quality management approach articulated by W. Edwards Deming. In his book, *Out of the Crisis* (1986), Deming provides a foundation for quality management based on his set of 14 Points for Management. While Deming's philosophies on quality management have been embraced around the world, minimal research has empirically tested the Deming model, a theoretical model grounded in the Deming management method (DMM). Given that many of Deming's 14 Points for Management are being applied to project management in practice in an effort to improve quality, the aim of this research is to conduct a rigorous empirical examination of the Deming model in the context of IT projects.

The findings of this research should be of interest to both the academic and business communities. For academics, our results broadly provide further insights into the debate over the degree that quality management practices articulated in the DMM can be applied equally to any size or type of organization. For the information systems (IS) and project management literatures in particular, we test quality management theories that have received a great deal of interest and application in the practice of technology management that have only received limited attention from researchers. For managers, our results demonstrate that the DMM provides a practical approach for effective project quality management. As such, the DMM represents one viable avenue for addressing the quality issues that often challenge firms attempting to adopt new IT systems.

The remainder of this study is organized as follows. In section 2, we provide a review of systems development research that has examined quality management concepts, as well as a review of previous research assessing the Deming model. In section 3, we present our research model and develop a set of hypotheses for testing. In section 4, we discuss the research methodology used in our study. Section 5 summarizes the results of our research, including details about the characteristics for our respondent and their organizations. Section 6 provides conclusions based on our results, a brief discussion of our study's limitations, and suggestions for further research.

2. LITERATURE REVIEW

2.1 Information System Quality

The concept of information system quality is not new to academia. Identifying dimensions of system quality and studying the effect that quality has on system success have long been pursuits