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Chapter 10

An Information Systems Design Framework for Facilitating TQM Implementation

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This paper provides a framework for information systems (IS) design for TQM implementation. The framework consists of three main phases. In the first, TQM implementation tasks are established. These tasks include identifying customer satisfaction variables (CSV), translation of CSV to firm response variables (FRV), benchmarking, and continuous improvement. The second phase includes analyses of communication effectiveness requirements between the organizational entities such as sales/marketing, top management, operations, accounting/finance and also with the customers. In the third phase, appropriate IS component inventories for different communication interfaces are generated. This was accomplished by first mapping the TQM implementation tasks for the communication interfaces. Then appropriate IS/IT solution was recommended for each interface. The final IS design is achieved by integrating IS components at technological, functional, and strategic levels. Finally, a hypothetical example for a large manufacturing firm is provided.

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Total Quality Management (TQM) is a philosophy that emphasizes customer satisfaction as a driving force for all organizational activities. It results in many benefits to organizations (Chalk, 1993; Sabbaghi, 1990; Rooney, 1990; Vansina, 1990). Several approaches to TQM have been proposed (Adam, 1994; Flynn, 1994; Caudron, 1993; Powell, 1995). We adopt the definition of TQM from Flynn (1994) "An integrated approach to achieving and sustaining high quality output, focusing on the maintenance and continuous improvement of processes and defect prevention at all levels and in all functions of the organization in order to meet or exceed customer expectations."

A number of studies have discussed TQM implementation processes (Ayres, 1993; Sabbaghi, 1990). Some others tried to relate TQM to operating and financial performance (Adam, 1994). Some of the current research have identified an integrated organizational communication system as a critical success factor for TQM Implementation. For example, Schoenberger (1983) and Tillery (1985) concluded that co-operation, coordination and integration of many different functions within the organization is a key aspect of total quality management. Flynn (1994) describes the necessity of linkages between every pair of functions, and forming a web like networking of all functions. Adam (1994) and Powell (1995) through empirical studies have concluded that factors such as objective feedback on performance, and empowerment are more significant than certain other factors such as process improvement and training.

Several of the above-mentioned studies in the TQM area have established the importance of an integrated organizational communication system. However, there is a lack of theoretical or empirical research to suggest how this can be done.

In a traditional organization, growth of information technology (IT) often is not well planned. Most of the growth in IS/IT occurs in pockets and in isolation (Doll and Vonderembske, 1987). Generally, departmental or individual managers vie for sophisticated IT in their own domain. Most often, a decision to implement such technology is born out of the individual desire to be technologically up-to-date rather than from some business necessity. This is contrary to the TQM strategy. Innovative organizations are relying increasingly on IT for maintaining and sustaining the strategic advantage over their competitors (Ali and Miltenburg, 1991; Goldhar and Jelnik, 1985; Kettinger, et al., 1994; King and Teo, 1994).

In the last few years, we have seen the explosion of technologies such as the Internet, intranet, extranet, data mining, and data warehousing which have the potential of alleviating some of the pitfalls of traditional culture. Also, the

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