TQX: USING EXPERT SYSTEMS TO IMPROVE
TRAINING IN TOTAL QUALITY MANAGEMENT

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INTRODUCTION

Challenges to improve productivity and quality are two battles American industry constantly faces. Management deals every day with the frequent perception that American products are lower in quality or that the American worker is less productive than foreign competitors. One weapon; in this battle for quality and productivity is new, or improved, applications for technology. Another weapon is the application of the TQM principles. This paper proposes a new tool to assist with improving productivity and quality. The new tool results from a marriage between an existing information systems technology, expert systems and TQM principles: TQX, an expert trainer for total quality management.

TOTAL QUALITY MANAGEMENT

According to the Deming TQM philosophy there are a number of issues which must be addressed in order to reestablish American competitiveness in world industry. His approach is not just statistical methodology, but a management philosophy which may be applied to manufacturing, as well as service organizations. Deming summarized the TQM philosophy in a series of fourteen essential factors and sever deadly mistakes that enable management to train and to empower their employees to become more productive by producing only top quality goods and services.

The guidelines provide structure for an environment promoting improvements in productivity and quality. However, it is in the application and interpretation of these guidelines where the experiential knowledge of TQM experts is needed. Us in: an expert system for training TQM allows the propagation of the knowledge of managers experienced in. the application of TQM principles as well as shortening reinforcing the learning process for managers s just beginning to with TQM philosophy.

TQX

An expert has a large set of perceptual patterns and an indexing scheme that allows the rapid solution of problem. An expert system captures this knowledge about a specific domain rather than the of few domain-independent techniques. Managerial problems, in this case TQM implementation, represent a class of problems that are characterized as unstructured and of an organizational as opposed to an individual level. This organizational level of problem solving means that an expert system for these problems is more complex than an expert system for an individual (Dhar 1987) Expert systems also aid in problem solving where all the relevant knowledge cannot be entered into the system. In these situations, Al techniques still assist the problem solving process (Luconi, Malone, and Scott Morton 1986). An expert system is an excellent way to deliver high quality, timely, and relevant training. An expert system uses known expertise to solve a problem provide information based on selection rules, or train an individual in a task that requires special knowledge (O'Connell 1990).

TQX the proposed expert system for training and consulting in Total Quality Management (TQM) principles. Its knowledge base would be derived from the expertise of practitioners and academics with expertise in the implementation of TQM. Once the knowledge base is created the expert system can be used to assist in training other managers, and future managers, in the principles implementation of TQM.

A manager wishing to learn about TQM would first have training in the basic principles of TQM i.e. Deming's 5 14 points and seven deadly diseases. The new TQM trainee could then use TQX to assist in examining the application of the TQM philosophy in different case settings. Each case would presents different challenges and opportunities for applying TQM principles as well as avoidance of the dreaded deadly diseases.

The TQX system not only guides the TQM student through the process but it can also explain why certain actions are taken example, a student in a P/OM or Business Policy class studys the basic philosophies of TQM. However, when faced with implementing these policies in & real world situation, the student doesn't possess the required level of knowledge. The TQX system takes the student through the process of implementing the TQM principles. At each step in the process, The student can query TQX and ask why the step is required TQX responds with the reasons behind the decisions by which it arrived at its current recom mendation. TQX would provide a method for giving students of TQM access to the expertise of those more experienced in the application of the TQM principles and philosophy.