Quality Function Deployment in Training Design

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INTRODUCTION

Since the 1950s, the designers of training systems have embraced the logical and deliberate methodology of the Analyze, Design, Develop, Implement, and Evaluate (ADDIE) Model in one form or another (Figure 1) (Dick, Carey, & Carey, 2001; Sugrue, 2003).

The inherent linear design of this model perpetuates thinking that a single input leads to a single output. Each phase has specific associated tasks dependent on the phase preceding it. The conceptual model is extremely linear in execution, albeit, ideally, the activities should be interwoven (Smith & Ragan, 1999). The traditional model implies terminality.

One cannot refute the efforts or the products, but given the rapid advancement of technology and the complexity of performance systems, it is time to question the success of time-intensive approaches based on the classic models (Foshay, 1995; Myers, 1999; Wallace, Hybert, Smith, & Blecke, 2003).

The Need for New Models

The field of instructional design (ID) recognizes that no one instructional strategy or approach fits all ID situations. Why then would designers accept or advocate that one design model fits all? As we learn more about how people learn, how information is reconstructed in new situations, and how technology applications can replace outdated instructional strategies, the need for a variety of models becomes readily apparent. Product improvement (training) is gained through a radical departure from current modes or methodologies (Hammer & Champy, 1993). Advancements in computer technology, multimedia, and telecommunications probably have the greatest impact on design, development, and distribution of content. Before a production group can create and develop an idea, conduct a prototype program, and evaluate its effectiveness, the content has changed. A business model must address how an integrated production team can design and produce quality products in fluid environments.

THE QFD PRODUCT DEVELOPMENT MODEL

Quality Function Deployment (QFD) has its roots in manufacturing as a design quality tool. Akao (1990) first conceptualized QFD in 1966 as an approach to new product development and concurrent engineering where customer requirements were integrated into product design. Hauser and Clausing brought QFD into the mainstream of the quality movement in the United States in 1988. They coined "House of Quality" to describe the modular building process for the QFD matrix in a manner similar to adding features to a house (Hauser & Clausing, 1988). Since its inception, QFD has been utilized worldwide in almost every industry to prioritize customer needs and wants, translate needs into actions, and to build

Figure 1. Classic ADDIE model
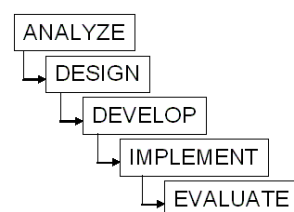
a product that considers customer satisfaction and business goals (QFD Institute, 2004).

In competitive market environments, a successful product is perceived by the customer as being of high quality. This quality imperative compels producers to make every effort to make their product possess the customer-desired attributes. QFD is an analytic technique that dynamically links and integrates stakeholder needs, system requirements, and design considerations. QFD also helps designers correlate and identify tradeoffs between the different design elements and insures that all stakeholder needs are met. The result is a product that can be efficiently and cost-effectively produced, while fully satisfying the customer.

The Stakeholder as the Key to Success

Key to producing a high-quality training product is the ability of the ID process to recognize and accommodate stakeholder needs (Ledgard & Taylor, 2004). These stakeholders are usually the learners, the department charged with the training mission, and the company that is the work environment of the learners.

The first stakeholder is the individual who acquires the skills and capabilities to perform the job within the operational system and environment. This stakeholder expects a "doable" and effective training environment and training that can be accomplished in a reasonable timeframe and that equips him or her with skills necessary to achieve success in the "real world."

The second stakeholder is the training system management that has responsibility for developing the requisite level of competencies to enable the learners to perform the jobs.

The third stakeholder is the organization. This is the employee's company that benefits from the successful implementation of the training.

Each stakeholder has a unique set of needs and expectations that must be addressed in the design effort. The following process description demonstrates how stakeholder needs can be identified, integrated into the design process, and tracked through the development process.

THE QFD PROCESS

The Quality Function Deployment technique is a graphic-based process using one or more matrices that show the relationships between stakeholder requirements and various design elements. The QFD process is flexible and encourages innovative thinking to tackle the many problems encountered with designing an instructional product that satisfies all the stakeholders. The process is adaptable for any situation.

Step 1: Identifying Stakeholder Requirements and Instructional Imperatives

The QFD process begins with the "voice of the customer" (Crow, 2004), that is, the identification of the stakeholder needs and requirements. These requirements are stated simply and represent the stakeholders' desired attributes of the instructional product.

This first step includes the following actions:

- identify instructional imperatives (such as strategies, delivery methods, or constraints) that accommodate the stakeholder requirements;
- generate stakeholder requirements and instructional imperatives by brainstorming or some similar approach.

Step 1 requires that designers maintain a stakeholder focus throughout the process.

Figure 2. Basic starting QFD matrix

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