CUSTOMER-BASED PRODUCT DESIGN MODULE

This is a continuation of application Ser. No. 08/243,638, filed May 16, 1994, now abandoned, which is a continuation-in-part of U.S. patent application Ser. No. 07/926,333, filed Aug. 6, 1992.

BACKGROUND OF THE INVENTION

The growing speed of product development (with shorter time to market, rapid addition of new product features and transformation of many products due to technological change) makes the ability to measure and deal with complexity considerably more difficulty. The rate of product evolution in many product categories has become faster than ever, so measurement methods must evolve to keep pace with the speed and scope of business decision making. Unfortunately, it still generally takes 30 days or more to run many types of meaningful studies in areas like human factors product testing, market research and product field trials. Such labor-intensive studies, conducted by degreed professionals, are also expensive. Since many product design decisions will not wait or do not have the budget, they are made without the benefit of in-depth customer-based studies that would make those decisions clearer, simpler and more accurate.

In some areas current test methods are immature and only partly assist in making crucial product decisions. For example, a growing number of software and computer-integrated products (which may actually be built around a special purpose computer such as a medical monitor) aim to enhance customer performance, problem solving abilities and complex types of thinking. While learning tests are able to determine whether or not a product's users have learned the procedures for using that product, it remains difficult to assess complex thinking skills and changes in attitude toward one's tasks. Those effects must be inferred instead of measured, forcing decision makers to make crucial product decisions based on guesses instead of knowledge.

In other areas it is extremely difficult to obtain action and behavioral information during the actual use of products, services and information systems. From design and business decision making viewpoints this is essential for understanding how products or processes perform across the spectrum of situations and countries to learn their capabilities and deficiencies for actually achieving the goals for which they are purchased. There is a larger, more advanced reason that this information is required now that embedded microprocessors and software are increasingly transforming products, services and the information infrastructures used to operate many types of organizations. In-depth measurement and data are needed to dynamically trigger automatic and appropriate responses and reconfigurations in response to rapidly changing conditions and swiftly evolving situations.

In a growing number of product categories and industries one key to success is improving the full range of outcomes required by customers for their success. For example, the entire computing industry has been judged harshly for failing to significantly improve productivity measures. Similarly, the medical industry struggles to learn how to provide quality care with a lower cost-per-patient outcome. Such transformations in performance require simultaneous improvements by vendors, customers and everyday product users, which requires systemic and systematic measurement and dynamic adaptation across products, organizations, industries, markets and societies. The immediate availability

of accurate and meaningful decision making and reconfiguration information is essential for improving products, business decisions and competitive performance with the speed and scale that are required by today's competitive pressures and societies.

This broad range of needs clearly calls for faster, easier, more direct and broader means for learning customer requirements, measuring actual performance, communicating that information in automatically analyzed formats, and responding to customers and users dynamically based on their group or individual objectives and performance measurements.

This Customer-Based Product Design Module invention uses a combination of computer hardware, software and communications technologies to construct a module that is built into certain products and services, to establish a network of customer-vendor-distributor interactions and communications (or a network of internal organization-wide interactions in the area of computer-based performance). These make possible new customer and user roles in the design and development of products and services, and customer-vendor relationships. Over time, this may produce a gradual transfer to customers of commercial direction and market control, both in individual cases (such as the evolution of a particular product) and in aggregate, from vendors and distributors.

One of the core purposes of the invention is illustrated in FIG. **15**. This is the ability to learn interactively and iteratively from the users of products and information systems anywhere in the world while they are in use—without having to travel to their sites (or without having to bring them to a testing laboratory). Since this is a two-way link, it also offers the ability to respond meaningfully to customers and users based on worldwide, local, organizational or individual needs regardless of where they are located.

Information technology is so new that we're still figuring out what it is and what it should do for us. This technology turns the user interfaces in products, equipment, tools and toys into an interactive learning system that connects vendors, users and marketplaces worldwide. While this emerges from the built-in computing that is becoming an increasingly common part of many products, it transforms the product interface into a learning device and a learning system—for individual products, for marketplaces and potentially, for societies and economic systems.

Product interfaces are increasingly connected to built-in or embedded computing. These interfaces already surround people at work and at home on equipment (whether in business offices, doctor's offices, factories, construction sites, hospitals, etc.), computers, consumer electronics and more. These interfaces are moving into pockets and briefcases via handheld electronic organizers and PDAs (personal digital assistants). They are transforming millions of computer and TV screens via interactive services and channels. Picture a new module behind interfaces around the world. This enables them to "wake up" when these products and services are used so they ask questions based on how they are used. The module stores user answers and uploads them periodically, and its overall architecture delivers a clear and broad picture of the current state and evolutionary changes in individual and group needs. The module/architecture of this invention also downloads into products new questions, user support, or other new capabilities so that product interfaces provide continuous two-way learning, and users receive new information or features that can be delivered through the product itself.