Abbott Labs Excels at Concurrent Engineering

SITUATION

Abbott Diagnostic Division (ADD) is the global leader in in-vitro diagnostic products and is a part of Abbott Laboratories, a worldwide healthcare company that produces nutritional, pharmaceutical, chemical, agricultural, hospital, and diagnostic products. In 1990, managed care initiatives began putting pressure on ADD to hold down the prices of its products. At that time, development cycles were long. Reliability was threatening to become a problem, and it was getting increasingly difficult to predict product development timelines. ADD officials came to the realization that for the division to survive the dramatic changes in the medical equipment market, it would need a more efficient and effective product development process.

OBJECTIVE

Establish a new product development process better suited to the increasing complexity of ADD's medical instruments and the increasingly competitive nature of the medical equipment industry.

PROCESS VISION

Create a widely adopted concurrent product development process that would:

– Improve time to market

– Cut development costs

– Increase re-use of design data

– Reduce prototype iterations

– Facilitate communication among geographically dispersed development team members.

"In 1990, we had no common processes, very few enabling technologies, and 17 different CAD systems in Dallas alone. We have since built a hardware and communications infrastructure for concurrent engineering (CE) and standardized on I-DEAS Master Series™ software. A CAD system that is tightly integrated with downstream applications is the underlying requirement for the kind of communication needed for CE."

- Don Netzer, Director of Advanced Instrument Engineering, Abbott Diagnostic Division

ACTIONS

✔ ADD instituted a Program Manager's Council charged with the task of improving product development practices.

✔ From the beginning, cross-functional design teams were formed involving people from manufacturing, service, and reliability groups in product development. The needs of these groups now are made a part of design specifications.

✔ To ensure that all team members and sites could share information quickly and effectively, ADD encouraged standardization on a single CAD system, I-DEAS™ software. The company then provided additional communications technology (such as a WAN) with dedicated T1 lines,

I-deas™

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video teleconferencing systems, Lotus Notes, and HP's SharedX viewing and markup software.

✔ All mechanical design is now done in solids using I-DEAS software. The 3D model is the master document for each part. It is also the model from which extensive tolerance, structural, thermal, fluid and mold flow analysis is done. Solid models are also used to create prototype tooling through rapid prototyping techniques or fabrication of machined parts, and traditional steel tools are made using solid models as input for CAM software.

RESULTS

✔ ADD has cut its development cycle time by one-third to one-half through the re-use of design data in analysis and manufacturing, and by using computer simulation instead of prototype testing.

✔ In a recent project, ADD shrunk the average tooling cycle time for 105 tools for a prototype instrument from 26 weeks to 6 weeks. The division attributes this dramatic result to having molder's and toolmaker's input into design, and to the use of solid models for toolpath production.

✔ Assembly and testing time have been cut in half on some projects due to the use of up-front computer simulation for refining and optimizing designs.

✔ The total number of parts has been reduced in all new systems developed with concurrent engineering due to better visualization with I-DEAS solid models and the use of the software's assembly modeling/ interference checking.

✔ As a result of having all programs creating only solid modeling data, re-use of existing parts is now taking place and projected to be as high as 70% in future products in the same platform series.

✔ In recognition of its significant accomplishments in the implementation of concurrent engineering practices, ADD received the *Machine Design* magazine/SDRC Concurrent Engineering Award in 1996.

PLANS

ADD plans to maintain its award-winning CE implementation by continually upgrading hardware and software to maintain leading-edge capabilities.

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