ALLEGRO CL® @Work!

A Franz Inc. Customer Success Story

Cognition Corporation's Cost Advantage™ Captures Manufacturing Knowledge for Real-time Cost Analysis

Cognition Corporation has pioneered a new field of manufacturing design, direct engineering, with its Cost Advantage software system developed in Allegro CL. "This is a brand new area of generating designs," says Kevin Sullivan, Director, Software Development, "based on defining the parameters of the design beforehand. We're emerging as the leader in direct engineering systems." Sullivan indicates that this cutting-edge technology gives Cognition's customers a tremendous competitive advantage and cites such companies as Peugeot, Texas Instruments, Ford, Pratt and Whitney, Boeing, and many more as users.

Cost Advantage is a powerful Design for Manufacturability (DFM) expert system powered by Allegro CL. The system captures manufacturing process knowledge and leverages that information to identify and reduce costs at every stage of a product's life cycle.

According to Sullivan, Cost Advantage is integrated directly into MCAD and ECAD systems like Mentor Graphics' Idea Station, Board Station and Hybrid Station; Parametric Technology's PRO/ENGINEER; EDS' Unigraphics; and SDRC's I-DEAS Master Series. "Direct integration with these systems," explains Sullivan, "enables users to receive immediate feedback on designs within the various CAD environments. Cost Advantage provides users with estimated costs versus target costs, preferred practice violations and design guidance."

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>
> *Kevin Sullivan*
> *Director, Software Development*

Captures Knowledge

The Cost Advantage software system consists of three components: Process Models, CA-Modeler, and the Cost Advantage. Process Models consist of the collective expertise of manufacturing specialists in the form of information and rules. This knowledge is used to estimate costs and advise engineers on the manufacturability of product designs.

The CA-Modeler captures the specialists' manufacturing knowledge via the system's powerful graphical user interface. Users build and edit process models through easy-to-use on-screen menus, eliminating the need for computer programming skills. A natural rule language for creating "if-then" conditions is also incorporated, allowing the specialists to convey knowledge in a form accessible to novices and adding intelligence to the system that guides users through the complexities of the design process.

The Cost Advantage Module enables departments across the enterprise (such as marketing, engineering, purchasing, etc.) to access knowledge stored in the Process Models for the purpose of making intelligent decisions about cost and producibility. Cost Advantage prompts the user for product characteristics such as shape, form, finish, and material. As the user specifies this information, the system progressively evaluates the product for potential problems and updates the product cost estimate. If the product has features that that are not manufacturable by a specific process, or that are borderline for a process and therefore more expensive, the system will alert the user to the potential problem.

Transfers Knowledge

Cost Advantage contains an on-line explain feature that enables users to examine a process model's underlying assumptions, relationships, and calculations used in providing the estimates. The feature explains why the system makes certain recommendations or why a design's costs might escalate rapidly when using a particular process. By educating and transferring manufacturing knowledge to the user, that individual becomes increasingly efficient at finding cost-effective solutions.

Allegro CL Best Development Choice

Looking back on designing the Cost Advantage system, Sullivan is emphatic about the critical role that Allegro CL played in the development process, particularly the importance of dynamic objects technology: "The system captures dynamically changing scenarios such as those you typically find in a design environment. We couldn't do this without Lisp. We store information about classes and this information often changes while the system is running, as the user changes various parameters. Managing these dynamic classes is made much easier with the use of Common Lisp."

"Additionally, Cost Advantage is designed for ease of use," says Sullivan. "Our customers interact with the system using a domain-specific language we built on top of Allegro CL's Common Lisp. It's not at all required that they know how to program in Lisp. And, Common Lisp is immensely productive to work with. We built the system with a small number of developers, and were highly impressed with the level of support we got-and continue to get-from Franz."

For more information about the Cost Advantage software system and Cognition Corporation, please visit the company's web page at http://www.ci.com/.

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