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OEM SERVICES

Predictive modeling can help manufacturers

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Manufacturing engineers are often handed product designs that lack essential elements. Unfortunately, when production fails, blame falls on manufacturing engineers who were "unable to develop" the design handed to them, causing unhappy surprises throughout the organization.

To compete in today's global market, companies need to closely examines their products in the earliest design stages and optimize them before investing in manufacturing. By focusing on manufacturing at the design stage (where 70% of manufacturing costs are determined), predictive approaches can help manufacturers improve profits, quality, and time to market.

By working together from the first stage of design, management, finance, engineering, and manufacturing help ensure the products they want developed are actually developed. One tool we've created to aid in this process is MAP3 modeling software (manufacturing, affordability, producibility, product, and profit). Its methods and tools cut across an organization to promote communications to help ensure:

- Executives are confident products are designed and manufactured to customer specs and that quality, weight, manufacturability, labor, serviceability. and sustainability are on target.
- The finance group can monitor engineering designs and directions, and deliver information via a securely shared Sarbanes–Oxley-compliant costing tool.
- Product engineers can understand design ramifications on cost, quality, weight, manufacturability, labor, serviceability, and sustainability.
- Manufacturing can be involved from the first customer contact to first customer shipment.

The software stores data in a repository that is populated early in the concept stage with the vision and specifications of the proposed product that extend through end of life. Importantly, all functions within the organization provide input at the concept stage, ensuring a holistic approach from the start for cost and complexity reduction. Once populated, the tool registers and calculates sustainability, and offensive practices or materials are identified and designed out. It continues to manage cost and producibility details across all departments as development matures to launch.

The software was developed to determine two indices for assessing feasibility and profit potential in the concept stage. The Confidence Index evaluates the production knowledge used in the design and the related confidence in its results. This standardized index accounts for customer needs, specifications, schedule, and budget to make sure poor decisions or processes don't send the design off track. The Producibility Index determines the feasibility of a design using preestablished architecture, value, assembly, and quality metrics.

The software was developed to meet the needs of an entire company and includes a vast array of functions, including:

- Mixed variant modeling determines potential profits by quantifying affordability and producibility concerns related to product variants.
- Customizable math lets users download company-specific algorithms into secure software that complies with Sarbanes–Oxley.
- Cost of quality determines the cost values driven by the design and PPM rate, quality conformance, service costs, Sigma value, CpKs, scrap, repair, Design Failure Mode & Effects Analysis and Process Failure Mode & Effects Analysis, and lists potential failure modes, their effects on the product, the severity and probability of occurrence, and probability of detection.
- Lean-design process map establishes a production breakdown by laying out the product-design structure and manufacturing process.
- Manufacturing readiness levels define a company's level of manufacturing maturity, and maturity shortfalls, along with associated costs and risks.
- Reporting compares design alternatives (standard and custom) and generates process sheets and work instructions, and service manuals.

For more information: *www.leandesign.com.* **MD**

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