Management Update: How HP Reinvented Product Development Management

Gartner presents a case study on how the Hewlett-Packard (HP) Imaging and Printing Group has standardized its tools, processes, procedures and program management to transform its product development process. HP’s complex global organization made this a major effort.

Background

Hewlett-Packard’s Imaging and Printing Group (IPG) was already looking at new markets such as digital imaging and cameras when the then-new HP CEO, Carly Fiorina, charged every division with “reinvention.” IPG is an approximately $20 billion business that accounts for roughly 25 percent of HP’s revenue. It’s the world leader in inkjet printers, laser printers and scanners.

The Problems

Corporate goals included 50 percent reductions in several areas:

• Time-to-market for new products
• Warranty expenses
• Product development costs

The achievement of those goals would be complicated by HP’s extensive use of third-party design partners and by the outsourcing of most of its manufacturing. IPG identified four major challenges that were impeding the acceleration of product development, limiting the reduction of product costs, and slowing the recognition and resolution of product defects:

• Divergence in new product development processes. For decades, myriad autonomous design centers, many of which were third parties outside IPG’s direct control, had evolved disparate sets of procedures. An initial target tied to this challenge was improvement in storing and accessing new product development data — for example, altering procedures and technology to reduce a day-
long process to access design change data to a one-minute process. Disparate procedures make it difficult to locate and reuse content, but standardization facilitates it because designers and others know where to find information.

- **Lack of scalability in new product development and other processes.** Product development processes had not been created for use in an extended enterprise; instead, they had been optimized locally. That included spinoffs and outsourcers.

- **Multiple HP organizations.** HP business partners had difficulty interfacing with multiple HP organizations, all of which had different data formats, planning processes, structures and decision making. That introduced the potential for delays and increased costs.

- **The complexity of IPG’s global business.** The challenges were magnified by the sheer complexity of IPG’s global business, featuring tens of thousands of products and suppliers. Products were assembled differently in several continents and regions based on different constraints, such as parts availability.

**The Objectives**

To meet those challenges, IPG launched its Enterprise Product Development Management (EPDM) initiative to reduce divergent new product development processes, unify its autonomous design centers, improve extended-enterprise collaboration and accelerate design. Its specific objectives included the following:

- Set up a single process for bills of materials, knowledge management and change management — the process would span IPG and its front-end design partners

- Unify nomenclature so that, for example, a product structure and the parts inside would share an identifier

- Secure access to safely allow external members of the extended enterprise into the EPDM systems

- Capture collaborative design results in near real time

**The Approach Taken**

To reduce complexity, IPG product lines would each need a single implementation “stream.” PTC’s Windchill-based applications were selected as supporting solutions, with implementation streams to be based on a single instance in a Windchill-based product design environment. The product life cycle collaboration framework sought to coordinate back-end design centers with the front-end regions’ product requirements in Europe, Asia and the Americas. Automated tool support and general acceptance of a common product configuration management process were important parts of this initiative. IPG selected the quasi-standard CMII from the Institute of Configuration Management for configuration management.

Configuration management of products, facilities and processes necessitated handling requirements in those areas, accommodating changes (such as through standard change notices and change orders) and ensuring conformance. With a single stream, the range of disparate business
requirements could be dealt with in a coherent manner, rather than via multiple, divergent product “instances.”

The first contained implementation of the EPDM approach to be managed in the PTC Windchill-based system was the InkJet Cartridge product line. Windchill-based applications were deployed worldwide, because the product line has worldwide markets with regional variants and design partners. The implementation began with product data management, followed by the management of bills of materials and documentation. The system was first deployed in January 2001 to 300 users; the number doubled in April of that year.

Prior to the CMII standard selection and the EPDM approach to the InkJet Cartridge product line, IPG initiated a “user simulation” involving 80 professional personnel from around the world. This was conducted for more than two weeks in a large conference room at HP’s Palo Alto headquarters. It was perhaps the major event of the initiative, because it enabled IPG to get feedback, perform testing and achieve initial buy-in; in retrospect, it was perhaps the turning point of the project. The 80 professionals’ activities, tests and feedback were thoroughly documented, and the participants themselves — a cross-section of user types — returned to their business units as “thought leaders” and key influencers.

The EPDM rollout has continued. The adoption of CMII in one part of product development had already resulted in some $14 million in annual savings — cutting change order cycle times in half, reducing change order frequency by approximately 20 percent and related labor costs by about 40 percent. With broader rollout and tool support, the savings will likely grow, and the subsequent adoption of the PTC Windchill-based tool to streamline product life cycle management processes is generating additional savings. More than 1,500 named users now collaborate in Windchill-based applications with minimal customization to the tool. Customization requirements have been reduced by PTC’s product “partnership” with HP, whereby many of HP’s specifications have become part of the product. Documents, drawings, bills of materials, change tracking and so on are shared worldwide, with secure, reliable access for contract manufacturers in such diverse locations as Singapore, Puerto Rico and Ireland, as well as at multiple U.S. sites.

Between the January pilot and the wider rollout, IPG spent five months preparing infrastructure and, especially, tuning processes. IPG recognized that, although tool support was essential, so were major procedural changes. Thus, many planning workshops during a period of roughly three months focused only on established vs. to-be processes. For the rollout, project management was a priority, with 30 project managers planning and controlling the various program and project activities using a multifaceted approach:

- **Scope management.** The team stressed thoroughly defining scope early in the planning phase.

- **Issue resolution.** Team members’ roles in issue resolution were published, and categories for project issues were defined and updated.

- **Project management tools.** Standard project management practices were established and reinforced with training, including in the PTC Windchill-based applications and, eventually, the ProjectLink module; integrated work schedules were also developed.
- **Proactive resource planning.** Profiles of the required resources were defined to ensure that the proper skill mix was allocated to the project.

- **Deliverables and milestones.** Via the Windchill-based applications, the project team and stakeholder groups were able to track progress on key deliverables.

- **Handling risk.** Risk mitigation plans were developed and maintained with periodic risk assessments.

Scope was tightly managed, so that many useful changes and suggestions were approved, but postponed. In addition, a Risk Management Steering Committee for EPDM was established, which met regularly. Before the broader release could go live, several “checkpoints” were reviewed in three major areas:

- The IT environment

- Processes

- Organizational change readiness (with training complete and support/feedback mechanisms in place)

Data migration and linkage to legacy systems were substantial issues. Significant data cleanup was needed, as was a major effort to prepare documents to move to the document management system. Careful selection of only that minority of documents and data that truly had to be moved (rather than a “mass migration”) helped mitigate this issue.

**The Results Achieved**

One benefit IPG is receiving is a reduction in change order cycle time, which IPG includes in the category of “collaboration benefits.” Another gain in this category is the ability to set up a new partner in 24 hours. Heightened levels of design and process leverage and reuse are also considered collaboration benefits.

“Global access” benefits include a reduction in stopped shipments due to revisions in engineering change orders. Under “consistency benefits,” IPG cites the advantages of using a single, CMII-based change process and other rationalized business processes: There are fewer “orphan” documents, bills of materials are more accurate and redundancy in product data entry has been sharply reduced.

More important, however, is that, without consistent, standard products and processes, IPG management had not expected to be able to keep up with volume production needs for inkjet cartridges. The ability to manufacture the same products with the same processes identically around the world facilitates higher-volume production. IPG is now able to quickly build new assembly lines, facilitated by the ability to manage information about assembly line design in PTC Windchill-based applications so that standard assembly lines are reproducible worldwide.

**Critical Success Factors and Lessons Learned**
Among the success factors identified was the clarity of the change program’s goals around speeding design by rationalizing new product development processes, unifying design centers and improving collaboration in the virtual enterprise.

The “user simulation” in Palo Alto, which involved 80 thought-leading professionals, was critical to the successful adoption of a standard CMII process.

Equally important was containing the scope of the program, which was a difficult task.

Other lessons learned involved the difficulties of migrating to new systems in terms of moving data and the need to move only the most-needed data in a cleansed, standard form. It took several months to analyze and prepare the IT infrastructure to support newly defined collaborative design processes and tools.

**Bottom Line**

- Enterprises seeking business transformation should aggressively manage scope and organizational change, using program and project management techniques.

- Trade-offs and costs in standardizing processes, migrating data and adapting IT infrastructure should be expected.

Written by Edward Younger, Research Products

Analytical source: Matt Light, Gartner Research

For related Inside Gartner articles, see: