



OPTIMIZING THE ART OF PRODUCT DEVELOPMENT

The Manufacturing Midmarket

**Competing in Difficult Times through
Integrated Program and Product
Management**

The Manufacturing Midmarket: Competing in Difficult Times through Integrated Program and Product Management

Motivation

Small and medium sized manufacturers are facing tough challenges. As manufacturing has globalized, high quality, low cost suppliers have emerged all over the world to compete without regard to geographical or political boundaries. Their customers, usually larger manufacturers, have tried to remain competitive and preserve their margins by sourcing globally and using new technologies such as product lifecycle management (PLM) and supply chain management (SCM) software very effectively. Since most small and medium manufacturers cannot claim unique technological advantages, they must rely on speed, low cost, and high quality to overcome competition and win business.

Just as large manufacturers have used technology to their advantage, their suppliers can now do the same, thanks to new *software technology* and the *Internet*. Together, these technologies have brought about *two* powerful changes.

The web makes information instantaneously available.

First, through their ability to make live program and product information available to all – from project teams to executive management, they have transformed the way people work both autonomously and in collaboration. Meetings have given way to asynchronous work, business processes can now be very flexible, and updates are instantaneous.

Web-based applications cost much less to use than traditional enterprise software.

Second, these technologies have brought enterprise software within the reach of the small company and triggered a powerful change in how enterprise software is delivered. No longer does an aspiring user have to make large investments in software, hardware, training, and annual upgrades. Instead, the user buys low-cost annual licenses for *web-based* enterprise applications that are hosted either locally or by a third party. The need for additional hardware disappears, training costs are modest and non-recurring, and upgrades don't cost extra.

Small and medium sized manufacturers are in a position to take advantage of these advances. In fact it is imperative that they do. The benefits are strategic and impact all stakeholders in the Product Development process.

The Greatest Challenge

The markets judge manufacturers by their products. Companies are under increasing pressure to create more products in less time, and meet even the smallest product requirements. In this environment, good decision-making at all levels is the key and there is no room for mistakes. Recognizing the importance of information to decisions, large companies are investing millions to integrate their disparate systems to make current *product* and *program* information readily available to managers and engineers.

Universally, product development initiatives are born within programs. A program manager defines a roadmap, detailing timelines, intermediate deliverables, and high-level requirements that have to be met by an initiative. He assigns resources and tracks the progress of the designers and engineers who create use and technical data, specifications, test results, etc. While the program manager uses project management tools, this *product data* is held in separate applications. Therefore, project decisions involve querying two systems and assembling information manually. The systems are synchronized by manual data entry, and so cannot provide current status. These shortcomings hurt both the speed and quality of product development decisions.

Decisions based on stale information are overly risk averse.

Lack of current information forces sub-optimal decisions

Engineering and project managers are involved in numerous decisions. Not having up-to-date information forces extra caution – they might allow extra time for a task, or allocate additional resources to speed it up. The task in question may already have recovered from a temporary delay. But this information is too current to be available. The result is cost or delays, both avoidable.

The overhead of data gathering has a false legitimacy.

The effort of data gathering diverts from core activities

Program managers need data from engineers to keep their systems updated and track progress. Usually, the task of providing it falls on engineers whose time is better spent in product development. Ironically, this essential task of tracking progress inhibits progress itself by diverting the engineer from his primary role. This is frustrating for both parties.

Many interdependent processes share information poorly because they use different software tools.

Inadequate communications between functions cause delays and errors, leading to poor product quality

In product development, activities and decisions span multiple functional groups – engineering, procurement, manufacturing, product management, etc. Their decisions are interdependent and occur in patterns that are part sequential and part parallel. The absence of a common tool for information sharing makes for poor communication and bad decisions that compromise quality and time to market.

The lack of automation is responsible for *avoidable* delays.

Manual processes take time and are variable, and leave room for cutting corners in the face of deadlines

A typical program has many paper-based and face-to-face processes. Forms are filled, quotations are requested from vendors, and meetings are held to report status, seek solutions to problems, and make decisions. Each instance of such processes must be initiated manually. They wait on desks for action, are difficult to control, and cannot automatically inform members about new events and information. This keeps members in a reactive mode, rushing to act on information that was delivered late, and compromising on quality in the process.

Poor and untimely information can thus be traced to business practices that predate the Internet age, when separate applications served related tasks and human effort was essential for bridging them.

Every day, managers must confront the critical task of good and timely decision-making, aided only by partial and stale information. But the core task of delivering products to market is complex and difficult, and has no room for artificial boundaries.

Meeting the Challenge

Many manufacturers have created internal systems and processes to overcome the inefficiencies of poor information. Data is transcribed into spreadsheets and emailed to staff, regular status meetings are held, and standard reports are circulated. These processes perpetuate the problems discussed earlier by not addressing their root cause.

With Internet-based solutions that employ new software technology, manufacturers can address many facets of the information challenge. Furthermore, they can do it without disrupting existing processes and without a large up-front investment.

To do this, manufacturers need a solution that recognizes the different roles within program management and product development, while linking their information elements.

Armed with real-time information, managers can look forward to optimal decisions.

Make information instantaneously available to engineers and managers

Instead of depending on stale or imperfect information, users must have information as soon as it becomes available. A leading analyst has concluded that managers are willing to be more aggressive if they have current information. They will prioritize better and cut the "overdesign" in their decisions. This will allow them to control cost and delays.

Linking programs with product data improves the efficiency of both managers and engineers.

Provide information access across program and product development

If essential product development information (like progress, problem resolutions, etc.) is available to program managers, they will no longer have to ask others for it. Also, access to essential program information will make engineers more responsive to program goals. By integrating program and product data in a common repository, everyone gets access to the same data. Freed of the burden of providing report of their progress, members can focus on their core tasks.

Integrated (but selective) information sharing provides more time to act, eliminates paper communication, and reduces the need for meetings.

Equip different groups with a common communication tool

Communication across groups needs to be more functional than e-mail. Teams should have access to appropriate (but not necessarily all) information elements, be able to inform others of their actions, and provide documents and deliverables to others through a common mechanism. This capability will allow information sharing across groups and enable them to execute more work simultaneously but without conflict. This will help reduce time to market without the errors of a rush job.

By triggering actions from business events, precise notifications can be delivered without further human involvement and delay.

Automate business processes and event notification

Automated business processes are initiated at the click of a button, or triggered when an event occurs. When a design engineer completes a task, his supervisor is notified to sign off, the manufacturing engineer is notified to study the completed design for manufacturability, and the program manager gets an updated completion report. The design engineer need not send messages to the team informing them. This saves time and provides a tremendous cycle time improvement. With immediate notification, nothing waits on desks and users have time to execute their tasks without the usual rush.

ProductDossier's Program and Product Solutions

Focused on helping medium and small manufacturers compete, ProductDossier's **PDServer-PLM** family of solutions target the *inefficiencies* in program management and product development by understanding the relationships, similarities, and differences between them. They:

- **Remove** artificial information barriers between functional groups,
- **Integrate** program and product information,
- **Eliminate** the delay of information propagation, and,
- **Provide tools** for automating business processes and event notification.

Solution Approach

PDServer-PLM takes full advantage of the Internet and current software technology to deliver a solution that *comprehensively* spans both program and product. Its simplicity allows for *rapid adoption* with very little training, and its highly modular structure allows for *incremental deployment*. Further, ProductDossier recognizes the importance of rapid returns on investment and is fully committed to provide value that will *pay for itself* in a few months.

Our solution strategy is to provide

- Comprehensive Program Management,
- Best-in-class Product Data Management, and
- Flexible and seamless integration between the two with an eye toward the details of both functions

Capabilities like fine-grain control of program workflows, and deep integration with market-leading CAD tools are offered out-of-the-box.

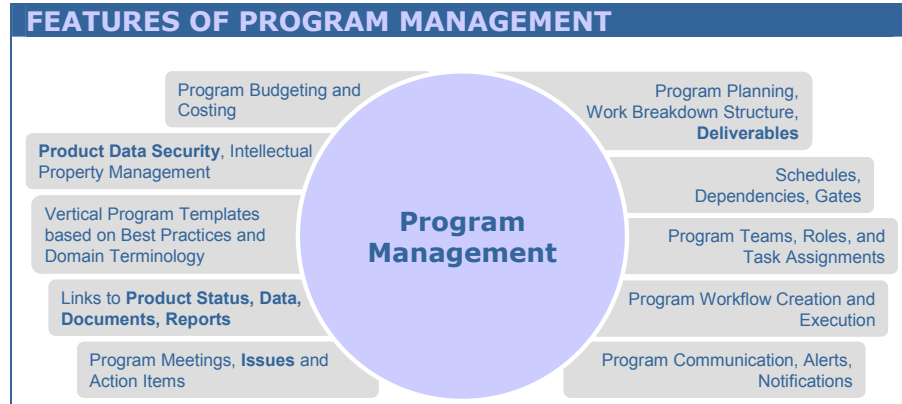
Users create programs and product structures to suit their business, and build specific actions. A rich array of user-configurable options enhances usability and value, and eliminates the need for expensive custom development.

Comprehensive Program Management

Enterprise-wide program management requires an internet or intranet based integrated platform for project planning and execution, collaboration and communication.

Figure 1: Program Management

Bold items indicate key points of integration with Product Data Management



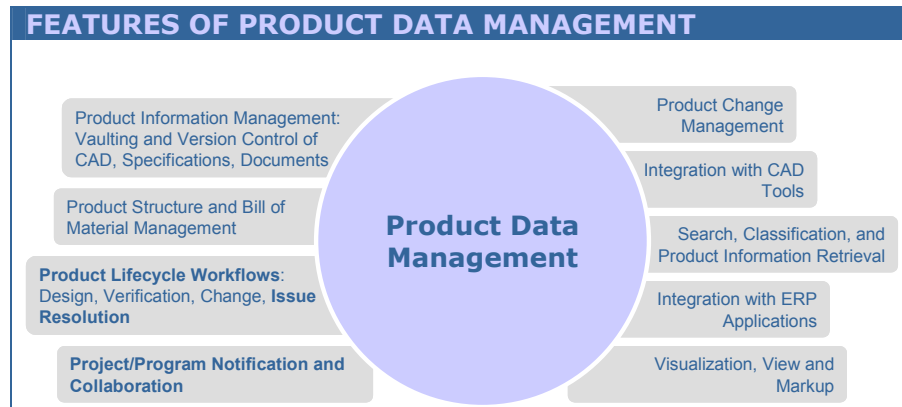
PDServer-PLM's Program Management module, **PDServer PM** is a flexible and easy to use solution that comprehensively meets all these needs.

Comprehensive Product Data Management

A comprehensive Product Data Management solution requires a product development environment that allows designers and engineers to work efficiently and collaboratively, encouraging design reuse and providing tools to enhance productivity.

Figure 2: Product Data Management

Bold items indicate key points of integration with Program Management



PDServer-PLM's Product Data Management module **PDserver PDM** addresses these requirements and provides an easy to use solution. By offering functions that span product concept, definition, planning and iterative design, **PDserver PDM** provides the capabilities normally offered in high-end PDM systems. ProductDossier's commitment to offering a comprehensive solution is further demonstrated through high-value features like off-the-shelf integration with leading CAD and ERP applications,

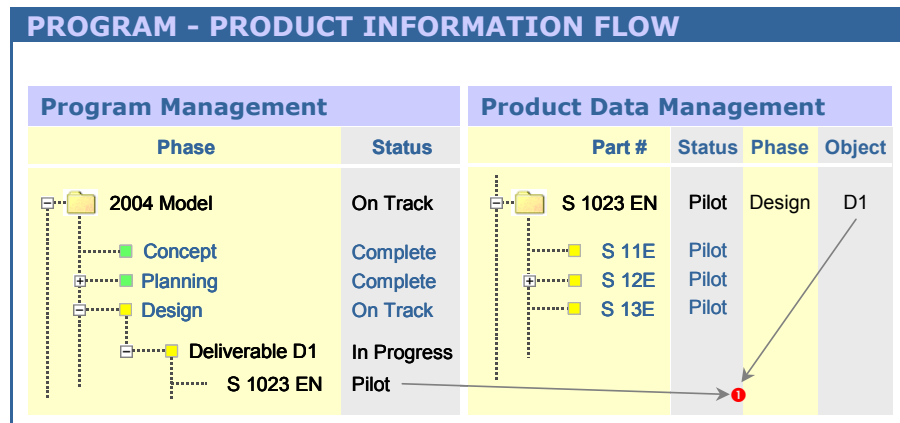
built-in tools for CAD visualization, and a powerful workflow module that is shared with **PDServer PM**.

Seamless Integration between PM and PDM

A significant challenge is to seamlessly integrate the Program Management and Product Data Management solutions. Information should not only flow within the program management and product data management, but also across the two applications as required. Figure 3 is an example of such integration.

Figure 3: PM-PDM Integration

The link between **D1** and part **S 1023 EN** (🔴) enables PM to monitor part status and PDM to update the status of the deliverable automatically.



A critical integration point is the notion of *deliverables* in a program. Deliverables could be CAD models or drawing, or other specifications for a part. When the design engineer *releases* this part, the status of the deliverable changes from *In Progress* to *Complete* and the program manager receives an automatic alert. **PDServer PM** also rolls up the status and presents a consolidated picture of program progress.

Tools for process automation, communication, and notification

Embedded into **PDServer PM** and **PDServer PDM**, these tools enhance collaboration, communication and provide much required discipline in adhering to standard processes. This directly improves the quality of the product, eliminates the time lag between the tasks completion and its reporting, and reduces rework and errors due to communication.

The central enabler for this set of capabilities is **PDServer Workflow**, which lets users define and implement business processes and associate them with a variety of actions. In keeping with ProductDossier's high-value approach, **PDServer Workflow** is easy to use, can handle arbitrarily complex workflows, and offers a wide variety of actions.

Conclusion

Having recognized the undeniable impact of information availability and visibility, large manufacturers continue to invest in custom-integrating their existing program and product data management systems. But, a tough market is also forcing smaller companies to take a serious new look at tools to improve speed, efficiency and product quality.

Fortunately, technologies born of the Internet offer highly flexible and functional solutions *today*, without the cost and delays of enterprise systems integration. The fully web-based **PDServer-PLM** family of integrated modules offers a combination of zero custom development, minimal training needs, and fast, inexpensive deployment.

By lowering the barriers to unified program and product data management, ProductDossier has put to work today's innovations for midmarket manufacturers, and created benefits that were once reserved only for the largest, best run companies.



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PDServer™ -PLM Family of Integrated Modules

PDServer™ PM	Program Management
PDServer™ PDM	Product Data Management
PDServer™ Vault	Data and Document Vault for PDServer™ PDM
PDServer™ Workflow	Workflow Authoring and Execution
PDServer™ Portfolio	Executive Dashboard and Product Portfolio Manager
PDServer™ API	Programming Interface for Integrating Third Party Applications
PDServer™ Office	Pre-Built Adapter for Microsoft Office Family of Applications
PDServer™ Autocad	Pre-Built Adapter for AutoCAD
PDServer™ Inventor	Pre-Built Adapter for Autodesk Inventor

ProductDossier Software Co. Pvt. Ltd.
18, Ashok Sankul-I
Ashok Nagar
Pune, 411 007
INDIA

www.productdossier.com
Phone +91 20 551 0775
Fax +91 20 551 0648

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