

# Global Product Development (GPD) - Moving from Strategy to Execution

A global study of successful practices for distributed  
product development



Research conducted by BusinessWeek Research Services  
and sponsored by PTC



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### About this report:

This report was prepared by BusinessWeek Research Services (a division of the BusinessWeek marketing department), based on research developed and conducted by BusinessWeek Research. The research, and publication of this report, were sponsored by PTC.

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## The Need for Global Product Development (GPD) to be Successful

"Global product development (GPD) is now an essential business strategy for manufacturers of all sizes in all industries, and in all markets, which is driving manufacturers to pursue more successful GPD practices." By now, most manufacturers understand *what* GPD is and *why* it is important but few really understand *how* to make it successful.

This is the primary conclusion reached by BusinessWeek Research Services as a result of the completion of more than 1,000 online surveys and 30 in-depth interviews conducted among U.S., European, and Asian product development and senior management executives in the first quarter of 2006. (Details on this research, conducted by BusinessWeek Research Services and sponsored by PTC, can be found in Appendix A beginning on page 17 of this white paper.)

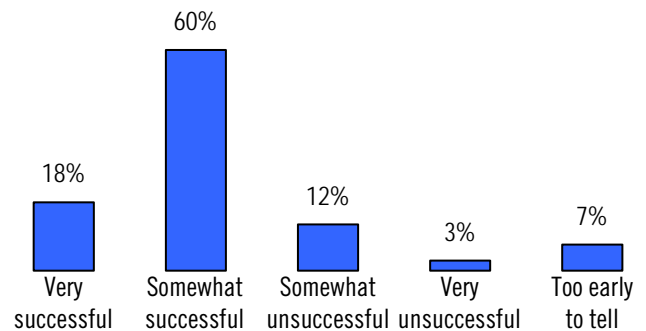
### The following key findings are discussed in detail throughout this landmark research report on GPD:

- Positive perceptions and business benefits are driving aggressive GPD plans.
- Manufacturers are motivated to overcome the implementation and execution challenges to make GPD very successful.
- The Leaders, those that are most successful at GPD, clearly approach and execute GPD differently than those that are less successful.
- There are specific management and operational practices that are much more likely to contribute to successful GPD.
- The most successful GPD programs focus on different methods of improvement.

Why are manufacturers demanding more from their GPD programs? As product development and senior executives told us during this research, "the world is flat." Competitive advantage lies more and more in the ability to successfully deploy – and manage – flexible networks of global resources. This includes multiple aspects of product development, and manufacturers show a strong desire to improve their admittedly immature programs.

GPD is seen as a combined business growth enabler and competitive requirement in every industry and geographic region researched. Product development and senior management executives who participated in the research labeled GPD as a "competitive necessity" and stressed that they are now looking for ways to refine their GPD programs to remain competitive. This is why only 18% of those executing GPD, perceive their GPD programs to be 'very successful' at this point in time, leaving room for improvement for the vast majority of the manufacturing sector.

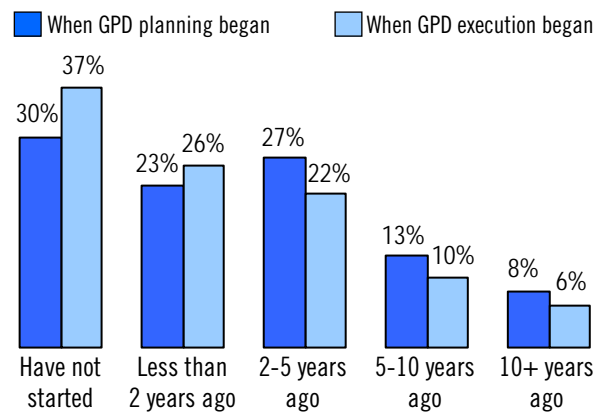
### PERCEIVED LEVEL OF GPD SUCCESS - ROOM FOR IMPROVEMENT



Total base: 628 executing GPD

Other quantitative data points from this research imply that GPD has grown beyond the status of a competitive advantage in many markets. Almost three-quarters (70%) of the manufacturers surveyed have already engaged GPD, at the very least, through the initiation of an implementation plan, while almost two-thirds (63%) have already executed a GPD program in some form or fashion.

### MOST HAVE ENGAGED GPD



Total base: 1,157 manufacturers

The net result of our research and analysis is this:  
***Increasingly global markets require increasingly global product development, forcing manufacturers to improve and maximize their GPD programs.***

**This report provides guidance for accomplishing GPD effectively by examining three key GPD management concerns:**

- Perceptions of GPD;
- GPD Challenges; and
- Best Practices in GPD Management.

Throughout this report, we will refer to examples from the research, providing charts and graphical illustration of what the most successful GPD executives and managers are doing, and why it's working.

This research was sponsored by PTC, a leading supplier of Product Lifecycle Management and Enterprise Content Management solutions for over 40,000 companies of all sizes. PTC enables manufacturing, services, publishing, and government organizations to optimize the development of physical and information products with the combination of its market-leading Product Development System and its 20 years of product development process knowledge.

## Positive Perceptions & Business Benefits Are Fueling GPD

In order to collect accurate and meaningful results, the following description of GPD was provided to the product development and senior management executives that were interviewed and surveyed. This was done to standardize interpretation and response to all questions pertaining to GPD.

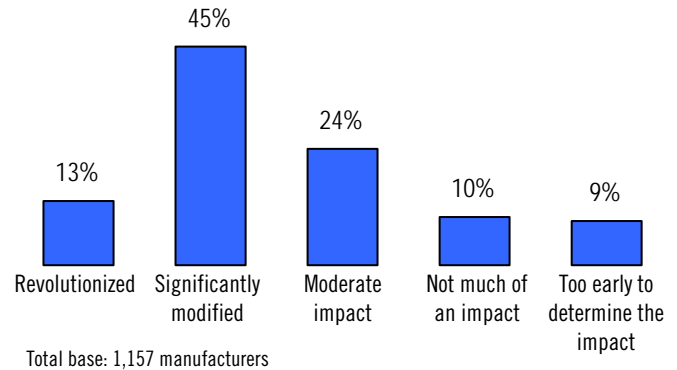
### GPD DEFINITION

*Global Product Development (GPD) is typically defined as a unified product development process where design teams work collaboratively on a single process or product across multiple geographic locations. This process often involves countries with a low-cost labor structure and possibly outsourcing. When answering the following questions about GPD, please keep in mind that we are interested in the engineering and product development activities between teams across different geographies, NOT manufacturing activities.*

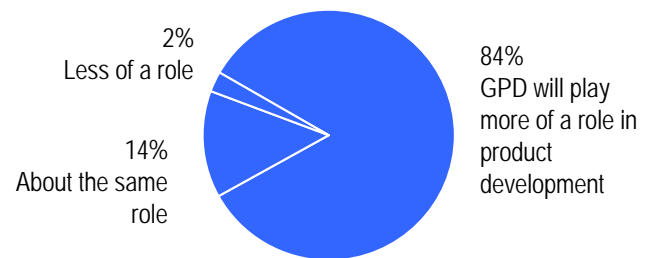
After becoming familiar with the definition of GPD, product development and senior management executives were first asked to describe their impressions of GPD within the realm of their individual business units. In fact, one of the most salient findings of the research is that most respondents already have very positive perceptions and lofty expectations for GPD despite the fact that the majority of them have engaged it within the last five years- so to say the least GPD is evolving at a rapid pace.

Evident in the following two charts, product development and senior management executives believe that GPD is here to stay and will continue to grow in size and scope. A majority (58%) believe that GPD has either revolutionized or significantly modified the way products are developed, while an even greater percentage (61%) think that the benefits of GPD outweigh the execution challenges. Given these positive attitudes, eight out of ten (83%) foresee GPD playing a greater role in product development over the next five years.

### IMPACT OF GPD ON DESIGN AND DEVELOPMENT PRACTICES



### BIGGER PLANS FOR GPD



The interview phase of the research unearthed additional ideas on why GPD seems to have so much momentum in the minds of product development and senior management executives. For starters, product development and senior management executives clearly understand the business and operational advantages of GPD, and cite two basic reasons for pursuing GPD:

- To get design resources closer to the needs of local markets; and
- To get design resources closer to distributed manufacturing resources.

Interestingly and contradictory to popular belief, GPD is now used less frequently as a means of reducing product development costs by taking advantage of lower-cost design labor. Instead, manufacturers are looking for GPD to deliver a far more strategic outcome: product success in local, emerging markets.

#### EXECUTIVE COMMENTARY

*“No one understands the local customers as well as the people we have in those markets,” summed up one executive in our research interviews. “We need to have design and development on the ground where things are being built and used,” added another.*

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Time and time again, those that were interviewed described GPD as a combined business growth enabler and competitive requirement, thus fueling their desire to take GPD to the next level. As a result, lofty goals for GPD are being established, critical challenges are being confronted, and GPD teams are learning as they go, all at once. It is no wonder why product development and senior management executives are scratching their heads and contemplating ways to increase the scale of their GPD programs. This is why the remaining pages of this report focus on providing ideas and insights on how to effectively improve and advance GPD.

## Identifying & Overcoming Critical GPD Challenges

Most product development and senior management executives surveyed consider their GPD programs to be in the early stages of execution, where they will most likely confront and experience critical implementation and management challenges for the first time (see chart below). In many instances, those that were interviewed, admittedly underestimated the effort it would take to overcome the implementation and execution challenges of GPD.

Given their strong desire to advance and increase GPD activity (as indicated in the previous section), it becomes imperative to anticipate the most critical challenges in order to overcome them as quickly and painlessly as possible. In fact, most of the interviewees stated that if they had begun their implementation strategies with a much higher degree of commitment, the challenges would have been overcome sooner.

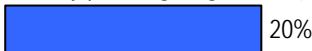
The current section of this report reviews and provides ideas on how to overcome seven challenges that are closely associated with GPD. The seven that are covered in the research are as follows:

- Collaboration Challenges
- Intellectual Property (IP) Protection Challenges
- Institutional Learning & Knowledge Management Challenges
- Engineering Productivity Challenges
- Innovation & Quality Challenges
- Managing Organizational Change Challenges
- Management Control Challenges

*(Note see Appendix B for the definitions that were provided to interview and survey participants)*

### MOST ARE IN IN THE CRITICAL LEARNING STAGES

Actively planning stage (working on implementation plan)



Pilot/Prototype stage (testing strategy)



Limited production (not yet running at full capacity)



Full production (running at desired capacity)



Total base: 817 planning or executing GPD

In the quantitative survey, product development and senior management executives were asked to rate their level of concern and capability across the seven GPD challenges that are listed above. In doing so, they admitted for the most part that their management capabilities lag their potential to address the challenges that are associated with GPD. Intellectual property (IP) protection is clearly the most problematic challenge faced, in that manufacturers concerns far exceed their perceived capabilities.

Differences between industry, company size, region and job title emerged when comparing concern and capability ratings. Some of the most interesting differences are as follows:

**Industry segmentation:**

- Aerospace manufacturers exhibit the highest concern for most of the seven GPD challenges and are much more likely to perceive IP protection as a threat than other industries.
- Electronics manufacturers are more confident in their capabilities to overcome more of the seven GPD challenges than other industries.

**Company size segmentation:**

- The largest manufacturers (sales of \$1 billion or greater) show greater concerns for most of the GPD challenges, but at the same time feel the most capable in overcoming them.

**Regional segmentation:**

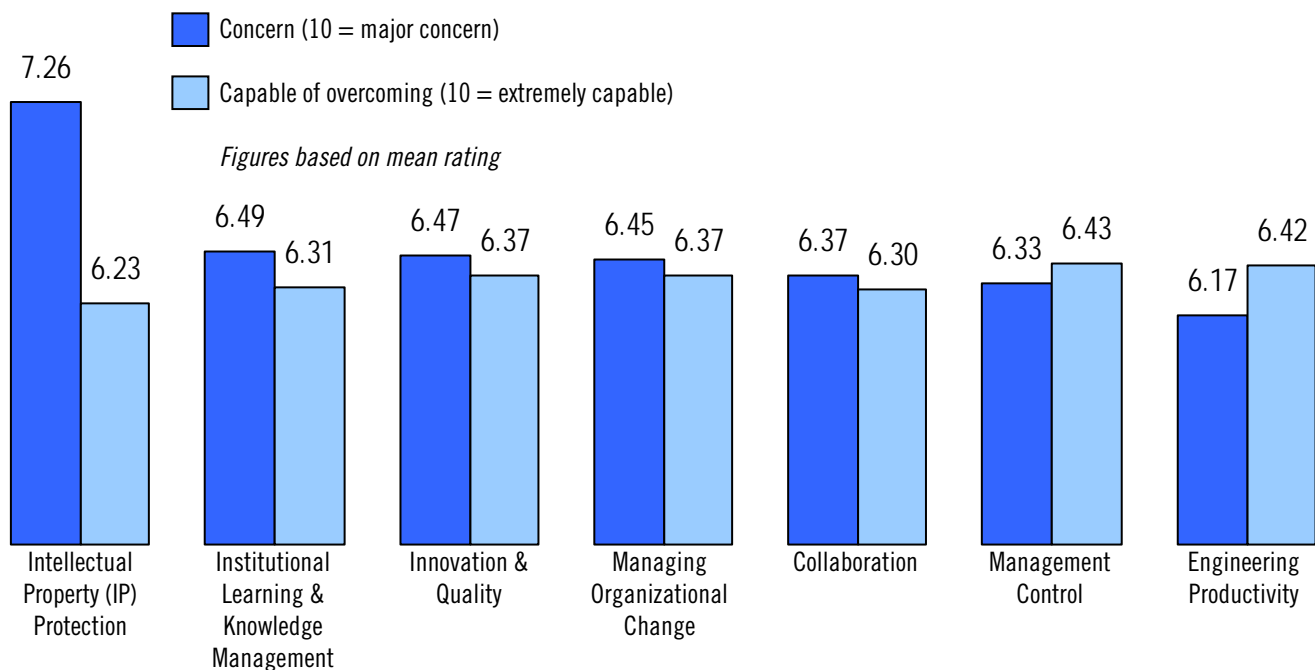
- European manufacturers show greater concerns for most of the GPD challenges, but at the same time feel more capable in overcoming them than U.S. and Asian manufacturers.

**Job title segmentation:**

- Engineers/Designers show the greatest concern for GPD challenges and seem to fixate on collaboration, engineering productivity, and control challenges more so than executives, directors and managers.

**CONCERNS OUTWEIGH CAPABILITIES**

**More confidence and experience is needed to overcome key GPD challenges**



Total base: 1,157 manufactures

What was made clear in the interview portion of the research is that product development and senior management executives are not, by any means, in a state of denial and are highly motivated to work through various challenges to make GPD successful. Typical responses from the interviews included statements such as "We know we can improve" and "We see GPD as a work in progress, and expect to get better as we get more experience."

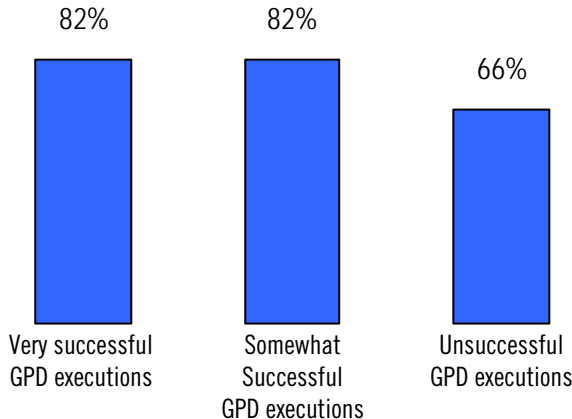
The following are a series of tips and pointers that were provided by product development and senior management executives on how to overcome each of the seven GPD challenges. (Note: the following are based on the qualitative feedback gathered from the interview portion of the research)

GPD Challenge	GPD Tips & Pointers
Collaboration	<ul style="list-style-type: none"> <li>• Fund and centralize collaboration and communication tools as early as possible so that individual groups do not build their own technology silos</li> <li>• Provide real and substantial incentives for teams to collaborate</li> </ul>
Intellectual Property (IP) Protection	<ul style="list-style-type: none"> <li>• Motivate employees to pursue and document patents</li> <li>• Approach IP protection in the frame of mind that anything that is shared will get stolen – "if it's so innovative then why share it?"</li> <li>• Avoid GPD partners that have high staff turnover</li> </ul>
Institutional Learning & Knowledge Management	<ul style="list-style-type: none"> <li>• Document processes, practices, and standards to reduce redundancies and repetitions in training, processes, and production</li> <li>• Rotate executives and managers between locations (co-location) to disseminate institutional knowledge (especially through the transition to GPD)</li> </ul>
Engineering Productivity	<ul style="list-style-type: none"> <li>• Stop and fix things as soon as there is a problem and don't move on to different phases until problems are taken care of</li> <li>• Pick partner product development teams yourself – read the resumes</li> </ul>
Innovation & Quality	<ul style="list-style-type: none"> <li>• Make quality the number one metric to gauge success and make it clear that team performance will be based on quality</li> <li>• Leave room for creativity</li> <li>• Develop skill competency plans at each location and pursue a geographically-based Center-of-Excellence model so that it's clear exactly what each center does</li> </ul>
Managing Organizational Change	<ul style="list-style-type: none"> <li>• Dedicate resources full-time to GPD transition and ongoing operations – it's not a part-time undertaking</li> <li>• Think long term and stay the course, its better than starting over and selecting new partners</li> <li>• Create meaningful jobs wherever you do business</li> </ul>
Management Control	<ul style="list-style-type: none"> <li>• Establish a strong design authority to set standards and drive compliance across the network</li> <li>• Involve the CEO directly in GPD</li> <li>• Provide high-level visibility to key GPD metrics like quality and schedule</li> </ul>

## Learning from the Most Successful (The GPD Leaders)

As mentioned in the opening of this report, 18% of the product development and senior management executives surveyed consider their GPD implementations to be 'very successful,' leaving most (60%) to believe that their GPD executions are only 'somewhat successful,' while 15% went as far as to say that they are 'unsuccessful.' Nonetheless, even most of the less successful expect to conduct more GPD projects over the next two years, implying that they have the desire to sharpen their GPD practices as quickly as possible to remain competitive in a global manufacturing environment and by no means are they giving up. This desire to accelerate GPD has led to one common regret that was noted by almost all of the product development and senior management executives that were interviewed- **the regret of not starting GPD sooner.**

### EXPECT NUMBER OF GPD PROJECTS OVER NEXT TWO YEARS TO INCREASE – BY GPD SUCCESS



Total base: 628 executing GPD / Bases vary for segmentation data

After segmenting and analyzing the survey data by how successful and unsuccessful GPD implementations are perceived, it became evident that the 'very successful' manufacturers approach and practice GPD quite differently than those who deemed themselves to be less successful. As a result, the following three segments were created to help the less successful specifically understand how the 'very successful' are executing their GPD programs.

### GPD success segments:

- **The Leaders** - The 18% that perceive their GPD implementations to be 'Very Successful'
- **The Determined** - The 60% that perceive their GPD implementations to be 'Somewhat Successful'
- **The Struggling** - The 15% that perceive their GPD implementations to be 'Unsuccessful'

*The Leader segment can be interpreted as a blueprint for successful GPD execution (i.e., do what the very successful do).*

Before discussing how The Leaders have become 'very successful' at GPD, it is important to understand what makes them different from The Determined and The Struggling from a profile standpoint.

Very successful GPD execution boils down to practice and experience. Almost half (47%) of The Leaders began planning a GPD strategy five or more years ago, while conversely, two-thirds of The Determined (67%) and The Struggling (67%) only started planning within the last five years. Earlier planning has provided The Leaders a jump in actual GPD execution experience. More than one-third (39%) of The Leaders have been executing GPD for five or more years as opposed to less than a quarter of The Determined (23%) and The Struggling (24%).

### BEGAN PLANNING GPD

	<2 yrs. ago	2-5 yrs. ago	5-10 yrs. ago	10+ yrs. ago
The Leaders	14%	39%	25%	22%
The Determined	22%	45%	22%	11%
The Struggling	24%	43%	22%	11%

### BEGAN EXECUTING GPD

	<2 yrs. ago	2-5 yrs. ago	5-10 yrs. ago	10+ yrs. ago
The Leaders	25%	36%	23%	16%
The Determined	40%	38%	14%	9%
The Struggling	44%	32%	18%	6%

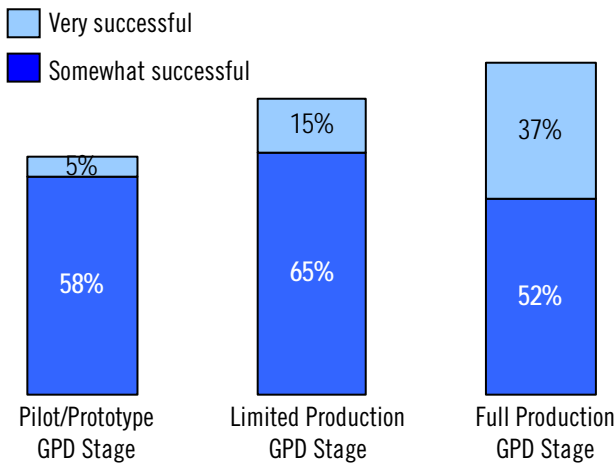
*Leaders characterize themselves as "very successful" and also have the experience to know that it's more than luck*

Total base: 628 executing GPD / Bases vary for segmentation data

The Leaders, who are the most successful at GPD, are also much more likely to have gone the distance and reached full GPD production. This shows us that those who have worked through the most challenging stages of GPD, pilot/prototype and limited production, are the most satisfied. This also indicates once again that The Determined and The Struggling should implement the practices of the Leaders if full production is considered to be the end game.

**SATISFACTION BY GPD STAGE**

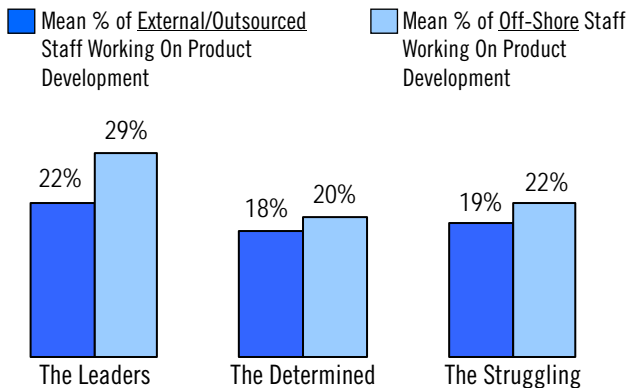
*Those that reach full production are the most satisfied with GPD*



Total base: 628 executing GPD / Bases vary for segmentation data

More experience (years executing) and more execution (full production) of GPD provides more confidence in outsourcing and offshoring. The Leaders outsource and off-shore greater percentages of their overall product development work compared to The Determined and The Struggling.

**SATISFACTION BY GPD STAGE**



Total base: 628 executing GPD / Bases vary for segmentation data

## Successful GPD Tactics - What The Leaders Do Really Well

A greater understanding of GPD and stronger management capabilities have allowed The Leaders to overcome more of the execution challenges, and have eased the concerns associated with GPD implementation and execution.

After questioning product development and senior management executives about the state of their GPD programs, they were then asked to rate their organizations' capabilities across twenty-nine different GPD tactics. Once again the data collected from the survey was segmented and analyzed by the three segments, The Leaders, The Determined, and The Struggling, to identify the tactics and practices that contribute the most to successful GPD programs.

**The following is a list of practices that are the main drivers behind successful GPD execution:**

- Motivate team members & deploy technology to support collaboration

- Foster deep (versus transactional) relationships with GPD partners
- Manage product information strategically to enable effective reuse
- Define roles and responsibilities to drive utilization rates of remote partners
- Use GPD resources for innovation (not just quality assurance)
- Establish multi-level relationships with GPD partners and set clear accountability for transition management

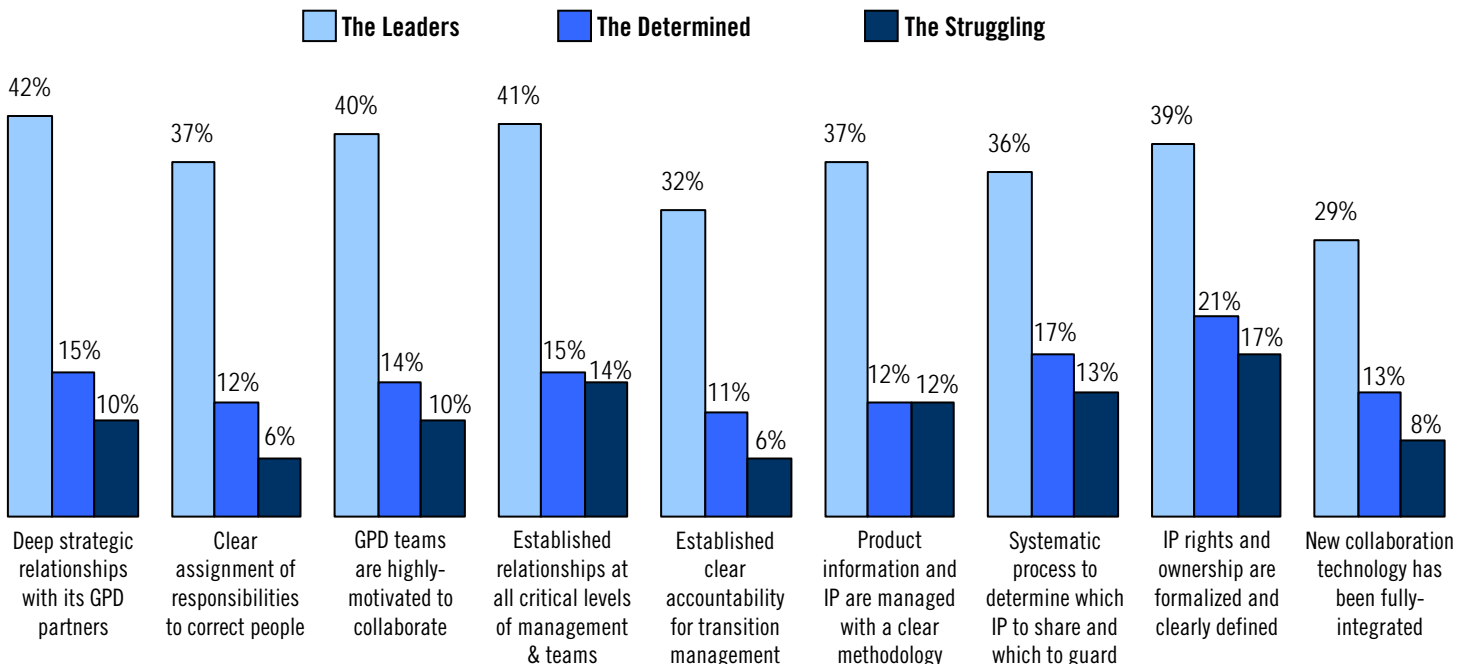
*(Note: the above list was developed and based on the culmination of the twenty-nine practices which The Leaders are more likely to excel at than The Determined and The Struggling)*

The chart below provides even more detail and insight into what a successful GPD execution formula would look like. The specific practices that The Leaders are much better at than The Determined and The Struggling touch upon a wide array of management, operational, processes, intellectual property and technology issues.

### WHAT THE LEADERS ARE MUCH BETTER AT

Do these well and you are more likely to become a GPD Leader.....

-----% that strongly agree that their business unit does well-----



Total base: 628 executing GPD / Bases vary for segmentation data

Not only do The Leaders perform critical GPD practices better than The Determined and The Struggling. **The Leaders also have a much higher propensity to use specialized product development and collaboration tools to help them through their GPD implementations.** For example, The Leaders are twice as likely to use digital mockup, digital manufacturing/manufacturing process planning, and online design collaboration tools than The Struggling.

The interviews also revealed helpful observations regarding the use of collaboration tools. There was strong sentiment among those interviewed that it is vital to over-invest in technology and standardize collaboration tools at the outset of a GPD implementation as indicated in the quote below.

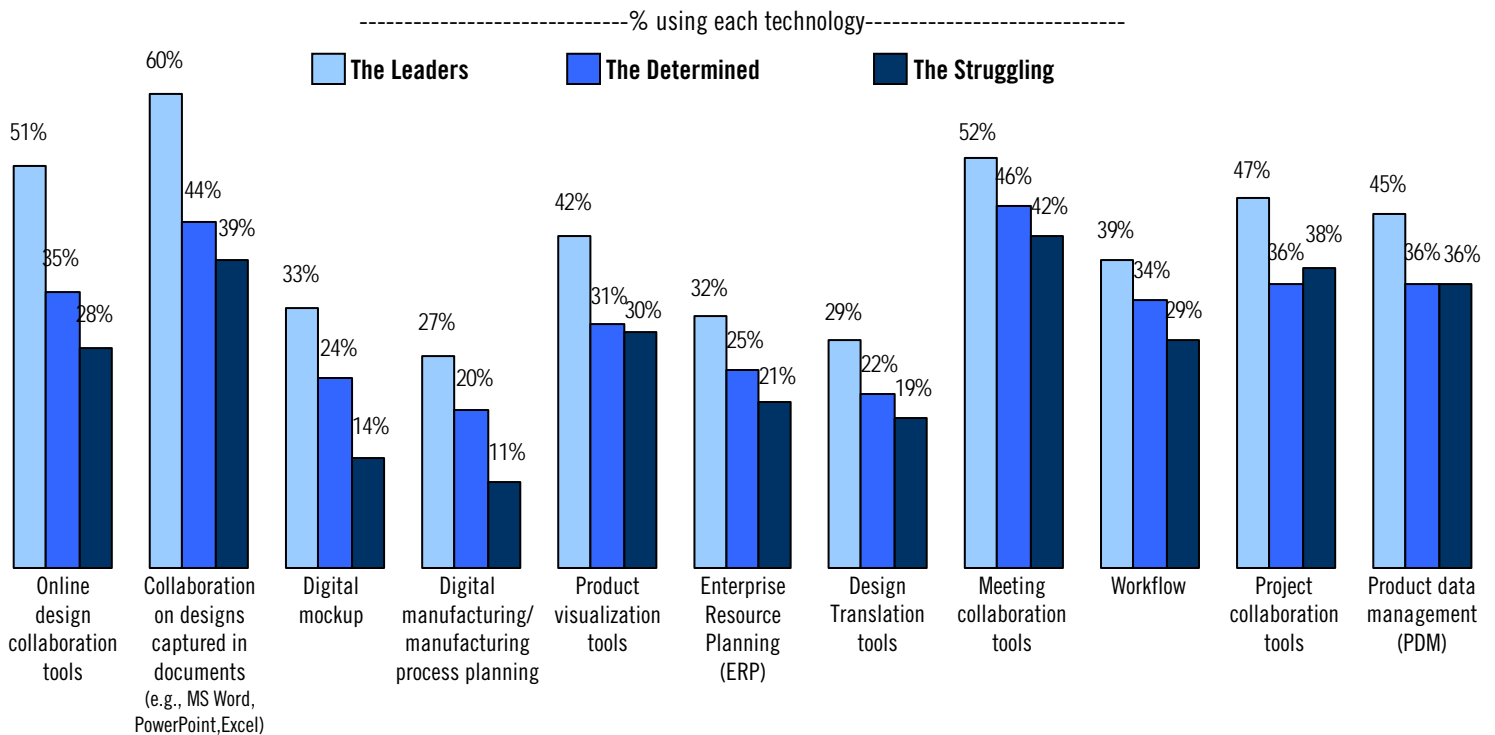
**EXECUTIVE COMMENTARY**

*“I wished we had invested more in a coherent collaboration and communication infrastructure before launching into GPD. We skimped on the upfront investment and it ended up costing us more as the individual groups built their own technology silos”*

Beyond technical, management, and operational aspects, hierarchal leadership of GPD within a company seems to dictate successful GPD as well. Among The Leaders, C-level executives are more like to be considered the 'owners' of GPD, while The Determined and The Struggling are more likely to leave GPD ownership in the hands of R&D and engineering heads.

Overall, the metrics that are used to gauge GPD success are more likely to revolve around production-oriented metrics than cost-related metrics. As such, The Leaders tend to focus more on product quality as a way to measure GPD success than The Determined and Struggling segments. This matches insights from the interview research, which indicated that, while cost savings is important, it is secondary to improved ability to meet market demand. Management focus on cost savings tends to be more directed at manufacturing than design at this point in time.

**THE LEADERS RELY MORE ON SPECIALIZED TECHNOLOGY**



Total base: 628 executing GPD / Bases vary for segmentation data

## Improving GPD - Where The Leaders Focus

Up until now, most of the data and analysis in this report has provided perspective on existing GPD practices (i.e., what's being done – or not being done – now to drive GPD outcomes). In contrast, this section of the report explores a more interesting topic: it summarizes what The Leaders would focus on if they were liberated from past decisions and investments and given the opportunity to begin anew with a clean slate. In other words, we asked them “knowing what you know now, what would be the most effective means of overcoming GPD challenges and driving success.”

### EXECUTIVE COMMENTARY

*When asked what manufacturers would do differently, to overcome execution challenges, almost all interviewees mentioned something to the effect of putting more and better processes in place earlier in the GPD experience in order to reduce the these barriers.*

In the survey, product development and senior management executives were asked to rate the effectiveness of twenty different management, technology and operational methods for *improving GPD*. Certain methods for GPD improvement were rated comparatively among The Leaders, The Determined, and The Struggling, and can be considered the 'table stakes' for successful GPD execution.

For instance, all three of the segments indicate, in almost equal amounts, that 'project and program management' and 'clear and documented roles and responsibilities' are very effective methods for improving GPD. However, The Leaders clearly focus on different aspects and prioritize their efforts to improve GPD differently (see table below).

The most notable differences (highlighted in the table below) between The Leaders, The Determined and The Struggling lie within how they view and prioritize “standardized product development tools” and “standardized and documented processes” as effective ways to improve GPD. The Leaders indicate that “standardized product development tools” are the second most effective way to improve GPD, while The Determined and The Struggling say it is the fifth most effective. The difference between The Leaders and The Struggling is even more pronounced in regards to “standardized and documented processes,” in that The Leaders rank it as the third most effective way to improve GPD, while The Struggling rank it eighth. Conversely, The Struggling may be putting the cart before the horse, in that they seem more focused on measuring GPD (setting "accurate and valid performance metrics") than first managing and standardizing the processes that drive GPD.

## DIFFERENT VIEWPOINTS ON WHAT MOST IMPROVES GPD INDICATES DIFFERENT PRIORITIES

-----Rank based on % citing very effective method for improving GPD-----

Q: How effective would each of the following be in improving GPD within your business unit?

### The Leaders

1. Project and program management
2. Standardized product development tools
3. Standardized and documented processes
4. Strong process to manage portfolio of GPD projects (“what IP stays and what goes”)
5. Clear and documented roles and responsibilities
6. Clear accountability for transition management
7. Joint problem resolution process
8. Accurate and valid performance metrics
9. Project collaboration (non-design related)
10. Training on GPD (collaboration methods, use of new tools, cultural differences, etc.)

### The Determined

1. Clear and documented roles and responsibilities
2. Project and program management
3. Standardized and documented processes
4. Clear accountability for transition management
5. Standardized product development tools
6. Accurate and valid performance metrics
7. Strong process to manage portfolio of GPD projects (“what IP stays and what goes”)
8. Training on GPD (collaboration methods, use of new tools, cultural differences, etc.)
9. Joint problem resolution process
10. Product architecture optimized for GPD (discrete modules, defined interfaces, etc.)

### The Struggling

1. Project and program management
2. Clear and documented roles and responsibilities
3. Accurate and valid performance metrics
4. Clear accountability for transition management
5. Standardized product development tools
6. Training on GPD (collaboration methods, use of new tools, cultural differences, etc.)
7. Project collaboration (non-design related)
8. Standardized and documented processes
9. Strong process to manage portfolio of GPD projects (“what IP stays and what goes”)
10. Centralized product development data and workflow

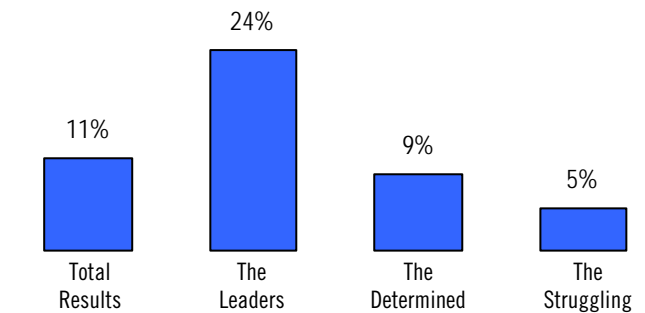
Total base: 628 executing GPD / Bases vary for segmentation data

Another way to analyze the same data to better hone in on what makes GPD successful is to identify the methods that The Leaders are *much more* likely to consider as very effective ways to improve GPD. The chart below points out the methods that The Determined and The Struggling may be overlooking in their efforts to improve their GPD programs.

The most-repeated refrains throughout the interviews were the need for clearly-articulated and administered management responsibilities and processes, and dedicated management resources tied together by standardized practices. The data in chart below fully supports the commentary from the interviews in that five out of the seven improvement methods that The Leaders are much more likely to consider very effective focus on standardization.

After GPD standards have been established, they can become even more beneficial if they cut across both internal and external GPD partners. Almost one-quarter of The Leaders surveyed indicate that their standardized processes are adhered to internally on an enterprise wide basis and by design partners, which is dramatically higher than The Determined and The Struggling.

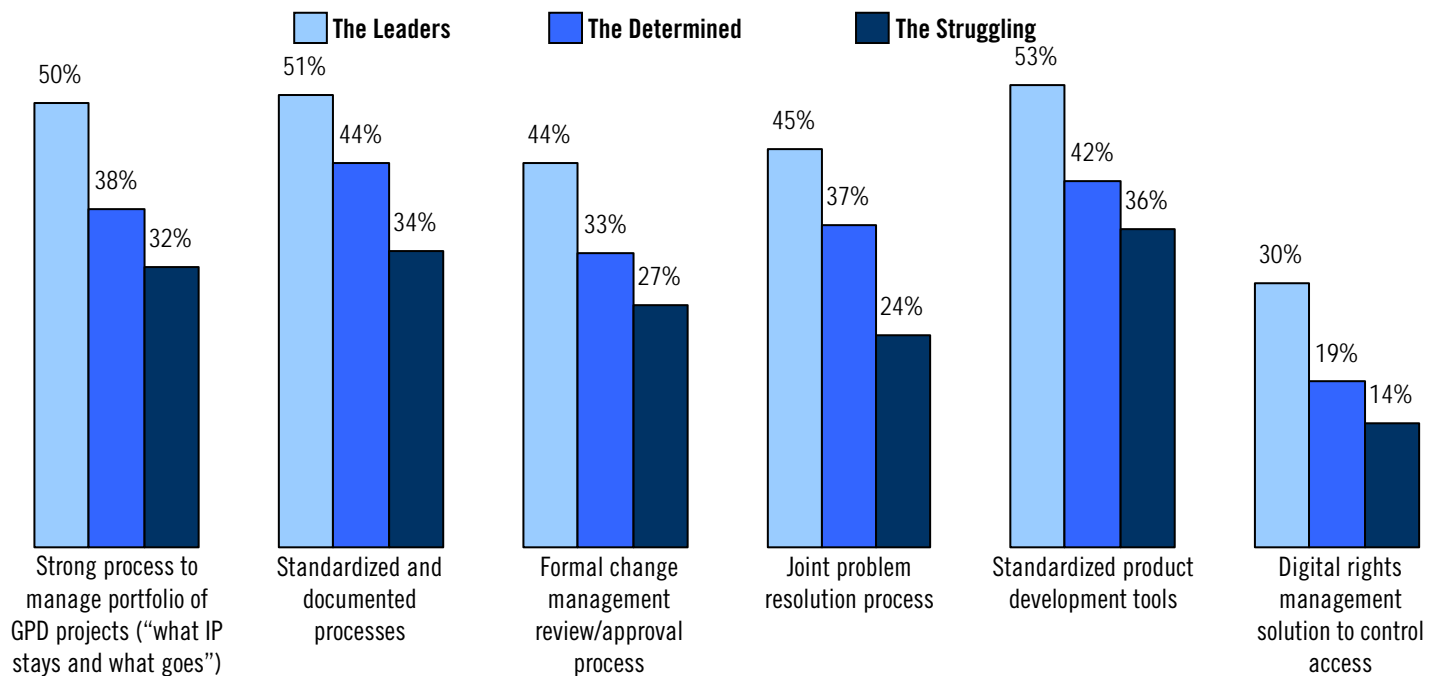
**STANDARDIZED PROCESSES INTERNALLY AND WITH DESIGN PARTNERS, ENTERPRISE-WIDE**



Total base: 628 executing GPD / Bases vary for segmentation data

**METHOD FOR IMPROVEMENT THAT THE LEADERS ARE MUCH MORE LIKELY TO FOCUS ON**

-----% citing very effective method for improving GPD-----  
Q: How effective would each of the following be in improving GPD within your business unit?



Total base: 628 executing GPD / Bases vary for segmentation data

## Final Thoughts - Succeeding in a GPD World

In summary, it's clear that companies have positive perceptions of GPD, and that the push to implement GPD is growing. At the same time, most firms are in the early stages of their GPD implementation, their GPD capabilities are somewhat limited, and firms are struggling to resolve standard GPD challenges.

However, several firms have emerged as GPD Leaders, and this report culled their experience and learning to present "GPD best practices." Other firms can use this knowledge to avoid standard GPD pitfalls, and realize a GPD implementation process that is both faster and more effective.

The insight gathered in this study illustrates that companies should focus on the following "GPD Keys to Success":

- Just like any other new business strategy, being successful at GPD takes time. Having appropriate and realistic expectations at the start ensures a common view of success.
- GPD visibility should be provided at multiple levels within the organization, so that all key stakeholders can participate meaningfully and understand progress against goals at any given point in time.
- Invest for success – don't chase operating expense savings. Savings (and quality, efficiency, etc.) will follow once strong processes and infrastructure are established.
- Take a systematic approach to GPD – otherwise individual "heroes" will reactively and inefficiently attempt to solve the same problem with different solutions in different parts of the organization.
- This systematic approach should be comprehensive, in that it should address all 3 major components of GPD: Process, People, and Technology.
- Standardize processes and tools from the outset, to drive compliance and effective methodology.
- Don't just think of GPD as an "event;" think of it as a "state," or a "mindset;" it should be viewed as an on-going organizational competency to be developed and refined over time.

GPD has transformed the way companies do business and, as companies evolve and adapt to the new philosophies and processes, growing pains are unavoidable. But by focusing on those who have enjoyed success and learning from what they have done – or would do differently if given the chance – manufacturers with the will to succeed will climb the steep GPD learning curve faster than those who have come before.

## Appendix A: Methodology

### Feedback from a global and highly engaged GPD audience

#### Phase 1: Executive Interviews (Qualitative)

- Telephone interviews conducted with 30 executives from large manufacturing companies that currently practice GPD.
- Thirty to forty-minute in-depth conversations about GPD implementation and execution were conducted January 23 - March 2, 2006
- Interviews captured a global perspective (20 interviews with U.S. executives, 5 European, and 5 Asian)
- Insight and key findings from the interviews were used to craft an effective online survey for the second phase of the research

#### Phase 2: Online Survey (Quantitative)

- A total of 1,157 online surveys completed by product development-oriented executives and engineering/design professionals from large manufacturing companies.
- Online survey consisted of 40+ in-depth questions about GPD
- Fieldwork conducted March 2 – 14, 2006
- Samples were selected from the BusinessWeek and McGraw-Hill databases
- Online survey also conducted globally (65% of the total sample consisted of respondents from the U.S., 17% Europe, and 18% Asia)

### A collaborative research partnership

#### The players:

- PTC – product development specialists & research sponsor
- BusinessWeek Research Services – conducted the research
- Saugatuck Technology – strategic consulting

#### The partnership:

- PTC engaged BusinessWeek Research Services to conduct an in-depth research study to identify successful Global Product Development (GPD) strategies and tactics.
- BusinessWeek Research Services consulted with and retained Saugatuck Technology Inc. to analyze and articulate the key findings of the research.

#### Number of Surveys Completed

United States	753
Germany	72
United Kingdom	61
France	37
Italy	29
Japan	119
China	41
South Korea	28
Taiwan	16
Singapore	1

## Appendix B: GPD Challenges

The following definitions were provided in the survey for the respondents:

**Collaboration Challenges:** Engineering employees will not have the tools, aptitude, and/or motivation, to share ideas and work products rapidly and effectively with remote design teams, both internal and external to the enterprise.

**Intellectual Property (IP) Protection Challenges:** Ideas, inventions, trade secrets, processes, programs, data, formulae or patents could be compromised when shared with parties outside of enterprise boundaries.

**Institutional Learning & Knowledge Management Challenges:** Geographically remote team members will not be aware of or know how to find and then use the collective, but distributed, product development knowledge (e.g., design approaches, material suitability, supplier performance, etc.) that resides in the systems, processes, and people of the enterprise.

**Engineering Productivity Challenges:** Engineers will suffer downtime while waiting for remote teams to make/communicate decisions and/or complete work or, alternatively, will have to conduct re-work to correct for faulty assumptions that were made with incomplete information.

**Innovation & Quality Challenges:** Engineers will struggle to strike the appropriate balance between rigid processes/standards -- necessary to ensure quality -- and flexible, rapid, iterative experimentation -- necessary to yield innovation.

**Managing Organizational Change Challenges:** Engineers may resist the new processes and systems required to address the geographic distances, time zone differences, language barriers, etc. of Global Product Development.

**Management Control Challenges:** Engineering managers lack the ability to closely monitor and control key drivers of the product development process such as: change request and approvals, milestone achievement, design reviews, as well as other ancillary product discussions.