



TechniCom, Inc. and DRM Associates

66 Mt. Prospect Avenue, Clifton, NJ USA 07013, (201) 470 9110

A leading consulting firm founded in 1989, TechniCom, Inc., focuses on the forces and dynamics surrounding the mechanical product design and manufacturing marketplace. Its principals are recognized authorities who have a solid, fundamental understanding of the marketplace, the leading products, and the vendors producing these products.

PRODUCT DEVELOPMENT ASSESSMENT / BEST PRACTICES: A WORKSHOP AND METHODOLOGY FOR IMPROVEMENT

A description of our workshop for assessing, during an intensive 1 day on-site meeting, how a company compares against "best" industry practices

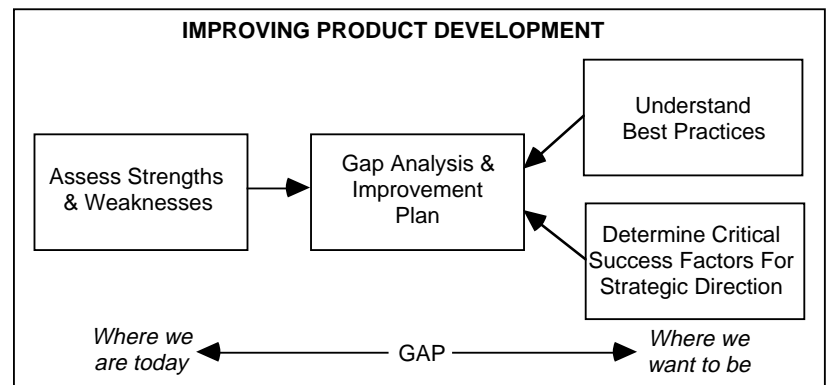
About the Workshop

This Workshop, for the first time, allows companies, in one intensive session, to compare their practices against industry best practices., **and** to determine where the gaps lie using their own assessment.

To run the workshop TechniCom sends two of its senior consultants to your site for one day. After an introduction to the methodology we intend to use, we immediately break into small groups who each spend the next few hours delving into a description of best practices, assess the importance of each to their company, and perform a self assessment of the company performance as it exists today. Later, in the day, after we tabulate the answers and review the preliminary assessments, each group stands and defends its ratings to its peers. In turn, we develop a group assessment among the attendees.

Having taken a critical look at the current performance and relative importance of the categories, we then lead the group into a mutual assessment of the "gaps," where improvements will most benefit the company.

Finally, we end the day ranking those area that need the most improvement, and begin to develop the beginnings of an implementation plan. By the end of the day the attendees will have a clear understanding of how their practices compare to industry best practices and where their focus needs to be to improve the gaps.



What are the benefits?

In one intensive day you can compare your company to industry best design process practices.
The participatory nature of the workshop creates a common understanding of how others in the company perceive the strengths, weaknesses and needs.
The resulting gap analysis will allow clear focus on what to improve in the design process.

Why compare to best practices?

In this era of hyper competitiveness companies are focusing on improving the product development process — generally the primary bottleneck to improving time to market. Some improvement opportunities are obvious to personnel within an organization.

Other opportunities may not be obvious or there may be so many things to do that it becomes a question of where to start. Management wants to know answers to a number of questions. How do we compare with the rest of industry? How do we compare with the best in industry? What are our strengths and weaknesses? What are the best practices for product development that we should adopt? What improvements should be made? Where do we start? What are our priorities

Sample Workshop Agenda

- Introduction to the Self Assessment (60 mins)
- Presentation of the company background (45 mins)
- Consultant Guided Self Assessment Workshop. Client breaks meeting into small groups, each with responsibility for certain assessment areas
- Lunch (while we review and summarize the data)
- Technology Overview (optional if time allows)
- Presentation by groups of their assessment and reasoning, for those items rated high in importance
- Review of the findings and presentation of areas for improvement
- Discussion on ways to pursue "closing the gaps"
- Conclusion and wrapup

How can we accomplish so much in one day?

The Workshop is an outgrowth of our self assessment methodology. Prior to the Workshop we engage in a series of conferences calls, so you can familiarize us with general information about your company and its products. This allows us to tailor the on-site assessment methods to your business.

Who should attend the Workshop

We primarily gear the workshop to the product development process, with a heavy emphasis on design engineering. Therefore we recommend that senior and middle management from the engineering ranks attend the Workshop. In addition, since many of the questions involve areas outside of engineering you will probably also want to consider having representatives from manufacturing, purchasing, quality, marketing, and finance there to participate in the assessment of their related topics.

given the resources that we have available? What benefits can we expect? How can we figure this out quickly so that we can get started? Now a methodology, supported by software, and optionally this workshop, is available to answer these questions.

Approaching the improvement process

No organization can improve all aspects of product development at once. The implementation of product development best practices can best be viewed as a journey (continuing process improvement) rather than a destination. Priorities need to

be developed for implementing the best practices of product development. The organization must start by understanding what practices should be adopted (what is possible). Next it must consider its strategic direction (e.g., being the low cost producer, the most innovative producer, the highest quality producer, flexibility to respond to new products and markets) given its market, its objectives, and its competitors. Next, the organization must assess its strengths and weaknesses. By focusing on the "gap" between where a company is and where it needs to be, priorities can be set for making improvements. This is represented in the figure below.

Product Development Best Practices and Assessment

Supporting the workshop, we offer The Product Development Best Practices and Assessment (PDBPA) software, which describes 250 best practices that have been identified from researching and identifying many companies product development practices from around the world. The PDBPA provides a structured assessment methodology for the product development process based on these best practices. While our experienced consultants have conducted this assessment for the last five years, we have now developed a software-based self-assessment that describes these best practices and guides company personnel through the assessment process. This methodology and the associated software offer the following benefits:

- Identify best practices more quickly and cost effectively than traditional benchmarking and research;
- Aid in economically assessing, measuring, and comparing the effectiveness of the product development process; and
- Lead to prioritization of the high payoff improvement opportunities through gap analysis.

The breadth and depth of these best practices and the associated assessment identifies specific strategy, organizational, process, design optimization and technology practices to address as part of a product development improvement program. These 250 product development best practices are further organized into twenty-eight categories for summarization and reporting purposes as shown to the left.

Most of these best practices are universal - they apply to the development of any kind of product in any type and size of company. Some of these best

PRODUCT DEVELOPMENT BEST PRACTICES ASSESSMENT WORKSHOP

practices are relevant to only certain types of products or business environments (e.g., maintainability/serviceability practices don't apply to consumable products; design for manufacturability isn't as important with one-off products such as a satellite, etc.). Therefore, an importance weighting is used to tailor

the importance of the best practice to each company's products, development process, and business environment.

Associated with each of these best practices is a set of questions to aid in this assessment process. A company's product development activities are evaluated with respect to each of these best practices, and a quantitative rating is developed. This assessment is supported by a narrative evaluation scale which describes four stages of evolution toward best practices for each assessment category. As performance ratings are made, findings or the rationale for the performance rating should be documented. This will help to improve understanding and build consensus as the assessment results are communicated to others in the organization. We have found that companies that are not as advanced in

BEST PRACTICES ORGANIZATION				
Strategy (24)	Organization (40)	Process (78)	Design Optimization (64)	Technology (44)
Business & product strategy (4)	Management leadership (10)	Process management (10)	Design for manufacturability (12)	Product data (10)
Product planning & management (10)	Early involvement (8)	Process improvement (8)	Product cost management (12)	Design automation (10)
Technology management (10)	Product development teams (11)	Customer orientation (5)	Robust design (14)	Simulation and analysis (7)
	Organizational environment (11)	Requirements & specifications management (9)	Design for testability (14)	Computer-aided manufacturing (6)
		Development process integration (6)	Design for operation & support (12)	Support technology (7)
		Supplier/subcontractor integration (7)		Knowledge organization (4)
		Transition to production (6)		
		Configuration management (9)		
		Design assurance (8)		
		Project & resource management (10)		

() Number of best practices / questions

their understanding and application of the best practices tend to overrate themselves. On the other hand, companies that are knowledgeable and sophisticated, tend to be more self-critical and will underrate themselves.

Part of a sample worksheet for this assessment process is shown to the left.

In addition to the performance rating against each best practice and for each

higher level category, an overall performance rating is developed by again assigning a weighting factor to each category based on its importance given the nature of the business and the product. This performance rating, when compared to that of other companies, gives an indication of the urgency of improving the development process.

Gap analysis focuses attention on the improvement opportunities that will yield the highest payoff. The categories with high weighting factors and relatively low performance ratings yield the largest gaps between what is important to the organization and what it does well. These are the areas that require the highest priority in improving the development process and will likely have the largest payoff. On the other hand, categories with low importance ratings and relatively high performance ratings indicate low priority areas not deserving as much attention.

11.0 REQUIREMENTS AND SPECIFICATIONS MANAGEMENT			
EVALUATION SCALE			
Traditional (0)	Developing (3)	Committed (7)	Best Practice (10)
No formal methodology or process exists to determine customer requirements or establish specifications. Requirement & specification documents may not be created or if they are, the content is not standardized. Specifications are not maintained as requirements change. Requirements are not tracked.	A formal requirements document is prepared, but requirements are not tracked after the project starts. A structured, standardized specification is prepared & distributed to key personnel. However, the process for considering changes to requirements and specifications is not well-defined and managed. QFD used on a pilot basis to help define requirements.	The process of gathering & documenting requirements is formalized. QFD is regularly used. Specifications are developed based on a formal methodology. Development milestones require approval of requirements and specifications before development activities continue. Major changes are evaluated before approval given to proceed.	A formal process exists for gathering, documenting and tracking requirements. QFD is used extensively. A standard specification format is used. Requirements and specifications are updated as needs change on when determined by a rigorous management process. Systems exist to support requirements tracking and allocation.
			Importance Performance
11.1	Understand competitor strengths and weaknesses. Are competitor's products analyzed or benchmarked to understand customer needs, strengths and weaknesses, and positioning in the marketplace? Is this information made available to and considered by development personnel?		5 0
11.2	Capture internal and certification requirements. Are internal management requirements for a new product (based on company strategy and definition of target markets) formally captured? Are compliance or certification requirements identified at the start of the development cycle?		5 0
11.3	Use QFD. Is quality function deployment (QFD) or similar techniques used to organize customer needs and priorities and translate them into specific product requirements in an organized way? Is this process used to develop an agreed upon set of product requirements and objectives? Are multiple functional disciplines involved in defining the product requirements and objectives?		10 0
11.4	Document requirements and specifications. Is a formal requirements document, QFD house of quality/product planning matrix, marketing specification, functional specification, and/or product specification prepared? Is this communicated to development personnel? Is this reviewed and agreed to by development personnel prior to start of development? Are requirements thoroughly reviewed to determine missing, infeasible or ambiguous requirements?		10 0
11.5	Address trade-offs and life cycle requirements. Does the requirements definition and specification process adequately consider trade-offs not only in product performance and features, but also in terms of cost, quality, schedule, and risk? Do requirements and specifications address the broader life cycle requirements rather than just product performance?		5 0

This analysis becomes the basis for identifying improvement actions and priorities. An example of this performance summary and gap analysis is shown to the left.

Planning and Implementing Improvements

Once categories with the largest gaps are identified, an examination of the performance ratings against individual best practice criteria will help identify the specific practices that require attention. This then becomes the basis for developing priorities and, eventually, an improvement or

implementation plan. In addition, the expertise of an internal manager or outside consultant very knowledgeable in product development best practices or integrated product development concepts and improvement strategies can aid in identifying priorities. This expertise is important because of natural relationships and sequences with the implementation and use of these best practices. For example, moving to a paperless environment with digital product data as the “master” record is not realistic until there is a certain level of CAD/CAE/CAM capability and network infrastructure in place.

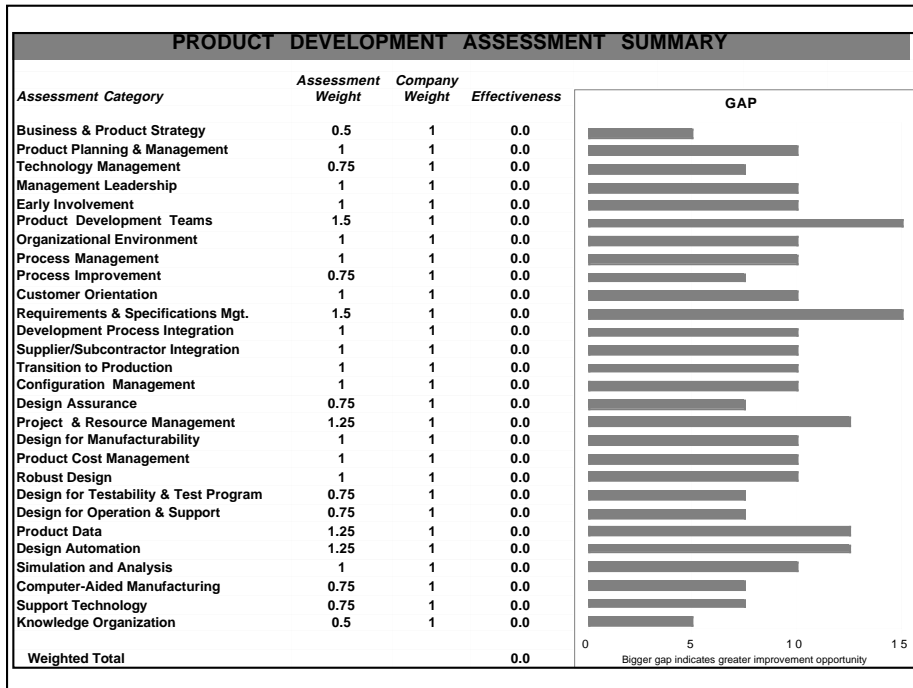
Once priorities are established, a project plan needs to be developed for implementing these best practices, effectively

introducing supporting tools and techniques, and improving the development processes. Personnel resources to support implementation or improvement activities are required. If the overall performance rating is low, a critical mass of personnel within the organization needs to develop an understanding of the concepts of behind these best practices. These people can then refine the implementation plan, perform various implementation activities, be involved in defining the desired way to develop new products based on best practice approaches, and assist in communicating the desired approach to the rest of the organization.

About DRM Associates and TechniCom

DRM Associates and TechniCom are leading consulting firms in the area of product development. DRM’s principal, Kenneth Crow, and TechniCom’s principal, Ray Kurland, have spoken at numerous conferences, authored many papers, contributed to books, conducted hundreds of workshops, guided management in client companies, and assisted product development teams. Ken is currently President of the Society of Concurrent Engineering.

DRM Associates and TechniCom conduct consultant-led assessments



PDBPA Software

The PDBPA software utilizes Microsoft Excel™ 5.0 and is available for the Windows™ and Apple Macintosh™ environments. The software includes further instructions on applying this methodology, descriptions of best practices, worksheets for performing the self-assessment, and summary reporting of the results. The software license fee also includes a benchmarking comparison report. Upon completion of the self-assessment, a copy of the worksheet is sent in and we prepare a report comparing your results with the results of the overall industry averages in our industry performance database.

The software license fee is \$495. It is a license for one computer at a single business unit site. Additional licenses for use within the same business unit site are \$250. Contact us for multi-site pricing. The assessment worksheets and reporting may be printed and distributed within the site licensing the software. The license fee includes shipping by mail. Include \$15 for overnight shipping. California customers add 8.25% for sales tax. Order with a purchase order or send a check.

using the PDBPA methodology and work with clients to develop improvement plans, re-engineer the product development process, establish a team-based environment, implement and improve the use of CAD/CAM systems, and assist individual development projects apply best practices.

Alternatives for proceeding with the Product Development Best Practices and Assessment

PDBPA Diskette purchase
PDBPA On-Site Workshop
PDBPA Analysis and Consulting

Fees

Contact us about the fee. We assure you they are reasonable considering the results. At the conclusion of the session we should have helped you identify ways to save the cost of the workshop many times over.

How to get started

To order the PDBPA software, send a check or purchase order to TechniCom, Inc. at the address below or telephone: (201) 470 9110; fax: (201) 778 6465; e-mail: staff@technicom.com. To inquire about how we might be of assistance contact at the address below.