Selecting a Mechanical CAD/CAM/CAE/PDM System for Small and Medium Businesses (SMB) - Executive Summary

For prospective buyers of mid-range Mechanical CAD (MCAD) systems, this Executive Summary proposes a logical, methodical approach for successfully selecting a new product development system.

Visit http://www.ptc.com/go/buyersguide for information on how to get a copy of the full paper.

Why is selecting a CAD/CAM/CAE/PDM so important for small and medium businesses?

For prospective buyers of mid-range Mechanical CAD (MCAD) systems this paper proposes a logical, methodical approach for successfully selecting a new product development system.

In the last decade, many forces have changed the way small and medium businesses need to develop products. Among these are the need for speed in bringing products to market; the need for world class quality; the requirement to operate in a global economy where customers, vendors, and even engineering can be anywhere in the world; and cost where customers can compare prices anywhere in the world by simply browsing the Internet.

For companies, large and small, who depend on world-class products and customer service for success, the product development platform is the infrastructure upon which their business success is built. If such an infrastructure is integral to your company's future business success, then a careful rational decision must be made to insure that such an infrastructure meets both your current and future needs. This paper can provide you with a logical and orderly approach, which, if followed, will allow you to select the proper CAD/CAM/CAE/PDM (CCCP) system for your company.

Selecting a CAD/CAM/CAE/PDM (CCCP) system is no easy task. While CCCP systems today offer enormous power at very reasonable costs, these systems now reach into many more corners of a company, and as such need careful planning. Unfortunately, today the selection of a system tends to be done at too low a level, with poor consideration of company strategic issues, with little understanding of the product development environment and any proposed improvement, and with little idea of expected ROI or metrics.

What is different about this approach?

This report is based on over 20 years consulting experience of working with large and small companies worldwide. Additionally, further research was done on companies in the USA, Europe and Asia to understand the best practices documented in this report. The report recognizes that smaller customers need a faster, yet still rigorous method to make a decision on their product development platform.

Other approaches to selecting a product development platform propose various ways to conduct vendor benchmarks based on a list of technical requirements. These approaches only tell a part of the story. Firstly, they just focus on evaluating the feature and function technical requirements of design department as an isolated island in a company and ignore the fact that the design department interconnected to several other key departments. Secondly, they often fail to place much importance on incorporating the companies business goals into the evaluation. We believe it is now more crucial to align a modern product development system with company objectives, since a product development (CAD/CAM/CAE/PDM) system can be crucial in meeting organizational objectives. Suggestions for establishing this alignment are discussed in the full report.

The steps in this process

The following sections provide an overview in how to go about the six-step selection process. The full paper describes the process in more detail.

Step 1. Analyze the Existing System

Through a series of questions, you can self-diagnose whether or not your company needs a new CCCP system or if you can improve your existing one to meet your needs.

Step 2. Business Benefits and Investment Justification

Depending on the size of your company or on the complexities of your products, the scope of a new system can stretch from a 3D CAD tool for one or two engineers to a more complex product development system

tightly integrating the entire design-through-manufacturing process. Regardless of the scope, gathering management requirements are critical. A new system can bring enormous benefits to your business so you should first understand your company's product development goals before identifying technical requirements.

- **Prioritize your company's product development goals. Quality**, **Innovation**, **Cost**, and **Time-to-Market**, in that order, are the leading business factors that lead users to select a new CCCP system. Analyze these areas and decide which need to be improved most. *[See Management Requirements in Appendix A of the full paper]*

- **Justify the investment by identifying the specific product development benefits. T**o achieve these product development goals, map out the "To-Be" desired design-through-manufacturing process and identify the specific areas of the process that a new system can improve. Look at a number of sources for these improvements; shorter quote, design and production times, reduced number of design and manufacturing changes, better design analysis, reduction in prototyping costs, reduction in scrap, higher productivity and increased innovation.

Step 3. Technical Requirements

Having prioritized the company's most important product development goals such as producing the highest quality or most innovative products, responding quickly and accurately to RFQs or becoming the lowest cost supplier, now you must determine the specific areas of the new system that are critical to achieving these goals. This can be challenging but local engineering consultants or service providers can help you to develop this list of requirements. *[See Technical Requirements in Appendix B of the full paper]*

Step 4. Typical CCCP System Considerations

Determine the scope and cost of the project –

- **Software:** Design, manufacturing, analysis, advanced specialty applications, data management as needed.

- **Training & Hiring:** Retraining of existing users and hiring new resources

- **Computer Hardware:** Microsoft Windows is recommended with the fastest hardware you can afford.

- **Data Migration:** Legacy data conversion recommended only if absolutely necessary or beneficial.

- **Data Access and Management:** Access to the product data for three types of personnel: data authors, approvers, and viewers.

Step 5. Detailed Evaluation

When you reach this stage, you should have already defined the primary product development goals, management requirements, and identified the most critical process areas that will be improved. You will also have an understanding of the technical requirements for the system.

Additionally, you should also take into account the implementation phases. It is important to tackle the most critical issues initially and to implement a new system in manageable steps. The overall system architecture must be scalable for all stages of the implementation. Here are the detailed steps in the process:

- *Appoint Team:* Plan on having an executive monitor their progress.

- *Document Requirements (Management & Technical):* Limit the technical requirements to less than 20.

- *Prioritize Requirements (Management & Technical):* Prioritize the requirements by grouping as: Must Have, Important, Like to Have, Could Live Without.

- *Allocate Budget*

- *Solicit Proposals from Vendors:* Keep the vendor list to a maximum of three.

- *Test Systems:* Test that the proposed systems meet both management and technical requirements. Consider a benchmark, a paper analysis, or install a trial systems in-house with a properly trained internal person aided by a vendor support person.

- *Make Final Decision:* Evaluate the ability to perform the 20 requirements and select the winner.

Step 6 - Implementing the system

Critical to a successful implementation is allocating the proper people, time, and budget. While implementation is beyond the scope of this paper, we will offer a few pieces of wisdom, assuming that you are a small, medium business.

- **Phased Approach:** Divide the implementation into phases. Typically plan a few (3 or 4) manageable steps, each with a defined, measurable benefit.

- **Resource and Budget Allocation:** Allocate the proper resources and budget to accomplish each phase.

- **Executive Sponsor:** Appoint an executive with responsibility for each phase.

- **Schedule:** Prepare a reasonable schedule, taking into account your ongoing workload.

- **Training:** Provide the proper training for the users.

- **Monitor and measure results :** Keep your long-term objectives in mind and continually evaluate the progress. Always be ready to re-assess your progress.

About the author

The author, Raymond Kurland, is President of TechniCom, Inc., a market research and analysis organization that specializes in understanding, consulting, and writing about Mechanical Engineering product development software. The opinions expressed in this paper are his own. In the sixteen years since TechniCom was founded, Ray has worked closely comparing systems and working with many manufacturing companies to improve their operational efficiencies, focusing on product development software. Many of the recommendations in this report are a result of that consulting experience.

TechniCom produces a monthly newsletter, specialized reports, and offers a continuing research program for software vendors. Ray also speaks at conferences on the subject and frequently consults with users considering embarking on re-evaluating their product development systems. He can be reached via email at rayk@technicom.com.

About the sponsor

PTC, a leading vendor in the PLM space, provided the funding for this report. I agreed to write it because PTC assured me that it would be completely unbiased -- and they have upheld this agreement. Why would they do so? Because they feel comfortable that small and medium business customers evaluating such systems will often decide upon their offerings, providing that customers have a rational approach to making such a decision. This paper provides such a rational approach. PTC and I know that no single solution is right for all customers. Visit PTC at www.ptc.com.

For the full paper

Visit http://www.ptc.com/go/buyersguide .

TechniCom, Inc.

PTC®