

CAD Selection Considerations: Multi-CAD Management

Dealing with Third-Party CAD Data

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The competitive landscape demands that product developers focus on productivity. They can no longer afford to recreate product models that were created in a different CAD solution than their own chosen design suite. Given dispersed work groups, acquisitions, and interaction with the supply chain, multi-CAD environments are common and expected. When selecting a modeling solution, prospective users must assess their needs for importing alternative CAD data formats in a manner that provides for a smooth transition and the ability to manipulate and edit imported model geometry.

In a series of brief papers, CIMdata identifies and discusses a number of functional capabilities within CAD solutions that have proven to be of critical use for leading-edge users. Research for this paper was partially supported by PTC.

Introduction

“Productivity and the growth of productivity must be the first economic consideration at all times, not the last. That is the source of technological innovation, jobs, and wealth.”

—William E. Simon; Secretary of the US Treasury, 1974-1977

In today’s aggressive worldwide marketplace, product developers strive for increased productivity in order to deliver new innovations ahead of the competition. Yet these same product designers often waste time by recreating CAD model data that was generated with a CAD solution other than their own chosen design suite. That lost time delays their new product introduction and can ultimately result in missing a market window of opportunity.

Increased productivity contributes to delivering new products ahead of the competition.

Many designers rationalize the recreation of CAD model data for a number of reasons. Often they are working with multiple supply chain partners using different CAD solutions. In other cases, designers within geographically dispersed corporations leverage work done in a different company group that uses a different CAD solution. This is a common occurrence when a parent company acquires a new business. Today many products are developed in a multi-CAD environment.

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When dealing with a multi-CAD issue, many companies fall back on a strategy of purchasing licenses for all the necessary CAD suites, and performing data translation between the different solutions. From a pure cost perspective, that approach comes with the requirement of dealing with multiple solution providers, additional training, and maintaining and validating each new software release. The burden becomes excessive.

The sensible solution is to purchase a CAD solution that can smoothly import foreign CAD data. Of critical importance, however, the CAD solution must provide a rich set of functions to manipulate and edit the imported geometry. This paper cites a number of functional considerations design engineers should look for in the ability of their CAD solution to handle multi-CAD data. The paper also highlights a number of key technology considerations that potential buyers should require from the solution they select.

Users need a rich set of functions to manipulate and edit imported geometry.

The Need for Productivity

As design companies introduce new products, they must be aggressively responsive to an ever changing market. Unwarranted delays in their product development workflow will negatively impact their bottom line. They cannot waste time recreating CAD data. As companies partner together and as they leverage a supplier network, they must live comfortably in a multi-CAD environment. Model geometry must be moved smoothly between CAD solutions to optimize the development process.

Delays in product development negatively impact companies' bottom lines.

The recreation of already existing model geometry stands in direct opposition to productivity. Each hour a designer spends rebuilding geometry is an hour not spent on other tasks that move product development forward. Even worse, a designer's recreation of geometry provides opportunities for errors to be introduced into the product model.

Selection Criteria

Potential buyers of a CAD design solution should develop a series of structured criteria against which they measure each solution's capabilities with respect to importing third-party CAD data. First, however, at a more fundamental level, the CAD design suite they select should provide all the necessary modeling domains they require, ranging from 2D design and sketching through full 3D design, and hybrid combinations of all three. Next the solution of choice must provide user interface environments for their potentially diverse set of users. Designer skill levels can vary between the casual user and the full-time power user. Each requires a different set of capabilities that matches their level of expertise, expectation, and experience.

The selected CAD design suite should provide all necessary modeling domains and a range of user interface experiences.

When doing due diligence on the selection of CAD, prospective buyers must ask:

- Does the CAD suite allow for the smooth import of all the third-party CAD data formats our company must accept?
- Does the CAD suite allow for the smooth import of all legacy CAD data formats our company must access?
- Once third-party and legacy CAD data is imported, can our designers manipulate and edit individual geometry items within the data?
- Can the CAD solution handle foreign data's design intent through feature recognition of form features and patterns?

- Once features and patterns are recognized, can the CAD solution handle edits to those geometric structures, especially those requiring topological change?
- Do the future goals of the CAD solution provider align with company aspirations for such capabilities as real-time updates to geometry in a multi-user environment?

Of course the smooth import of third-party CAD data is only one of many considerations a buyer should regard in determining their selection of a CAD suite. It is, however, critically important.

Conclusion

Modeling solutions must provide for the smooth import of third-party CAD data and a set of capabilities to manipulate and edit the geometry of those imported models; capabilities that eliminate any need for designers to recreate the geometry. It is one of the more decisive factors in the selection of a solution that will help drive productivity and profitability.

Modeling solutions must provide smooth import of third-party CAD data.

Overall, an effective CAD application must support the entire design cycle from concept through detailed design, simulation, and validation, to manufacturing planning and tooling. The design suite must unite best-in-class point solutions in a framework that supports multi-CAD interoperability and collaboration across the full design chain, including suppliers and customers. In addition, the design application should contain all the necessary factors that would allow it to reside comfortably within the larger context of a product development workflow that interfaces with non-engineering domains, such as procurement, marketing, sales, manufacturing, and services. Finally, the stability and solvency of the vendor, their responsiveness to issues, and the alignment of the client's and vendor's long-term visions must all be examined during the selection process.

About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM) solutions. Since its founding nearly thirty years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These solutions incorporate both business processes and a wide-ranging set of PLM-enabling technologies.

CIMdata works with both industrial organizations and providers of technologies and services seeking competitive advantage in the global economy. CIMdata helps industrial organizations establish effective PLM strategies, assists in the identification of requirements and selection of PLM technologies, helps organizations optimize their operational structure and processes to implement solutions, and assists in the deployment of these solutions. For PLM solution providers, CIMdata helps define business and market strategies, delivers worldwide market information and analyses, provides education and support for internal sales and marketing teams, as well as overall support at all stages of

business and product programs to make them optimally effective in their markets.

In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through PLM certification programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia-Pacific.

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