

What's Wrong with Collaboration?

CIMdata Commentary

There has been a lot of confusing discussion recently, particularly among people in the CAD user community concerning the definition of collaboration and the real value of the technologies that support it no matter how it is defined. The root terminology problem seems to stem from the haphazard use of the term “collaboration” in the marketing materials of the CAD and PLM vendors. It is probably not possible to get all of the various solution providers to adopt a single definition of collaboration because this would not serve their marketing needs.

PLM vendors now use the term collaboration to mean any activity in which people have to communicate and share information. The term is applied to PDM systems that promote data sharing through workflows with automatic notifications of required actions and organizing data so that it can be easily found. The term is also applied to real-time, online meetings in which data, often including 3D CAD information, can be viewed and annotated. It is also applied to tools that support shared design activities where one or more users can actually modify the design in real-time. The American Heritage Dictionary provides the following two definitions that are applicable to this topic: (1) Collaborate, v. “to work together, especially in a joint intellectual effort.” and (2) Concurrent, adj., “happening at the same time or place.”

All of these uses are actually correct. Collaboration can be accomplished in asynchronous or synchronous modes. Asynchronous collaboration is what we do when we send a package of information to someone else for their comment, they work on it independently, then send it on to the next appropriate person to add their contribution and so on. Synchronous collaboration is much more immediate, taking the form of real-time, online meetings with multiple participants to review information and discuss ideas. Thus, there are a number of levels of online collaboration solutions that can be useful. These can be used in various combinations as needed; there is no imperative that every organization has to embrace every type of collaborative service.

- Concurrent collaboration, also called synchronous collaboration
- Shared design (modifying designs in real-time—which requires access to a shared CAD solution)
- Shared applications (real-time access to data from many types of applications)
- Data inspection or exploration (measure, interference detection, and simulation)
- Data viewing and markup

The high-level goals of collaboration are to improve communication and foster innovation. Real-time collaboration also supports dispersed teams of people without forcing them to co-locate; essentially by providing a concurrent working environment in which peoples’ location (“place”) is not important. This is an increasingly important issue today because the outsourcing of portions of product design projects continues to increase as organizations seek ways to cut direct costs and improve product development by expanding their intellectual capacity. In product design, this leads to a need to communicate difficult ideas with people in different geographic locations. Without some

supporting technologies, this leads to a more fragmented and geographically distributed product development organization and to more severe communication problems.

Collaboration is easy to do when the collaborators are co-located and can communicate face-to-face, but various technologies have to be employed to support collaboration when people are not co-located. A problem is that the most popular methods used today (telephone, e-mail, teleconference, fax) lack immediacy and don't support brainstorming. Those who can collaborate adequately using only e-mails, telephone calls, and faxes are among a very select group that finds these communication methods fluid and workable—most people find these tools to be of limited communication value and the cause of many misunderstandings that result in rework and faulty products.

Companies frequently cite three direct monetary benefits from using collaboration tools to support concurrent engineering projects. The first benefit is fewer meetings because problems can be solved more easily, quickly, and completely when communicating with rich 3D design data on-line. The second is reduced travel costs because fewer people have to travel when meetings are held online. The third is reduced cost of product development due to improved communication among people and less time wasted in meetings and travel by all types of people in the product development process. Some companies have recovered the complete cost of acquiring and operating real-time, online collaboration just by reducing the expense of travel for design review meetings. However, many companies have documented substantial product development savings that are directly attributable to on-line collaboration.

Why do some people persist in the notion that online collaboration is little more than a toy that has been foisted onto an unwitting product design community by the PLM vendors? There are a number of factors that contribute to this misconception and cause collaborative tool initiatives to fail in some organizations.

- Foremost is the process. When new technologies are adopted, it is imperative that processes be reviewed and adjusted as needed to maximize benefits and ease of use. When collaboration tools are applied in organizations that do not encourage a collaborative process, it is not surprising that the tools will appear to fail. The problem with most failed PLM initiatives, including collaboration, is an inability of the organization to adjust to a new process—it is rarely the technology.
- Engineers tend to be inventive, but rather secretive, so during the design of new products they typically do not like to share their data. This is reinforced by a prevalent product development culture that has for a very long time been based on separating design from other activities such as manufacturing. The “throw it over the wall” syndrome characterizes the situation very well. It will only go away when companies begin to enforce a cultural change that embraces more open communication of ideas.
- Most of the current online collaboration solutions that are provided by PLM vendors today are too focused on engineering design. Thus, they don't provide a meeting support solution that is comfortable for non-engineers to support their diverse types of data and tools.
- Real-time collaboration tools are sometimes difficult to set up and use. This is an area that needs more development by some of the solution providers. Until they improve their products, it will remain a challenge to apply them to practical problems. However, this is not a problem with all collaboration tools so users have to select solutions carefully.
- Many users started out using inappropriate, generic online meeting tools for online product design collaboration, leading to an unsatisfactory experience. While these generic tools support sharing of applications with low-intensity graphics

requirements and work fine for simple online meetings, they are not appropriate for sharing CAD models and other rich data formats. They also lack many of the markup tracking and meeting documentation services found in many of the PLM vendors' solutions.

- Collaboration tools cannot be implemented in a vacuum. When people can't find information, they can't possibly collaborate around it. It is imperative that a collaborative PLM environment has an integrated data management component such as a PDM system.
- Security of data is often cited as a reason not to share it using Web-based collaboration solutions, reducing the effectiveness of these solutions by restricting access to them.

In summary, there are many arguments that people can make about the viability of today's collaboration solutions, as they can for any complex solution used to facilitate better business practices. In the case of collaboration, most of the negative discussion is predicated on peoples' misunderstandings of the basic concepts and values of the solutions. Some of this stems directly from inconsistent and confusing marketing by the providers of the PLM solutions, but some is driven by a lack of knowledge of how to apply collaborative techniques for business benefit. Real experience by user companies has shown that there are compelling reasons to consider collaboration solutions.

The benefits of collaboration accrue to projects in ALL industry segments and for ALL disciplines of workers. This is not just an issue for discrete manufacturers, but an important enabling solution for organizations in the process industries, electronics, services, and others. Improving communication among geographically-distributed teams is universally vital in today's global organizations. In order to maximize success from collaboration, organizations have to evaluate their product development processes and change them appropriately—just as they should for other major solution investments. Both asynchronous and synchronous forms of collaboration are both valid and can be beneficial when used properly and within appropriate processes.

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