Tech-Clarity

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Tech-Clarity Insight:

Going Social with Product Development

Improving Product Development Performance with Social Computing

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Executive Overview

Manufacturers must continue to raise the bar on product development. While the last decade has certainly seen major advancements in processes and tools, most manufacturers are still looking for ways to improve their product development performance. Why are executives still placing such high emphasis on improving product innovation and engineering? There are two primary factors:

- Today's product development environment has become much more complex, making the development of profitable products more difficult.
- Competitive adoption of engineering and product development software has increased performance and raised the standards for product development.

Social computing and "Web 2.0" technologies show significant promise to raise the bar on product innovation, product development, and engineering performance.

Faced with the complexities of today's product development environment, manufacturers are searching for new options to gain an upper hand over their competition. One area that manufacturers are turning towards is the application of social computing techniques. New social computing and "Web 2.0" technologies are being applied in a growing number of business applications, and show significant promise to raise the bar on product innovation, product development, and engineering performance. Specifically, social computing is enabling product developers to:

- Enhance product development team execution and collaboration
- More naturally capture and share product knowledge and expertise
- Enable the discovery of new IP and product value

The intersection of product development software and social computing disciplines, or "Social Product Development," offers an important opportunity to improve efficiency and effectiveness of new product development (NPD) teams. Social product development is well positioned to further the gains that engineering software has offered to enhance both individual contributions and manage corporate engineering assets. Integrating blogs, wikis, messaging, communities, and other social computing capabilities with product and project data allows manufacturers to extend the benefits of product development systems by tapping into the collective knowledge of extended engineering and product development networks. While social networking by itself can provide value, companies that develop a strategy to leverage the concepts behind social computing in a product development business context will likely gain greater advantages in product profitability than others.

Raising the Bar on Product Development Performance

The executive suite is calling for more innovation. Tough markets require more compelling products and faster time to market. In this fiercely competitive, global environment business leaders are demanding more than ever from their product developers. Today's manufacturer must embrace and extend today's major improvements to product development enabled by software technology. CAD and related engineering software have drastically improved the performance of engineering, enabling engineers to develop and validate designs that were previously inconceivable. At the same time, enhanced data management and business process control have enabled manufacturers to better control information, maintain history, implement best practice processes, and manage corporate assets. Now that these capabilities are becoming more widely adopted, how will manufacturers get the upper hand on their competition?

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There is still significant room for improvement, even in the best run companies. Even though product development solutions have helped raised the level of product development performance, the business of bringing profitable products to market is fundamentally harder today than it used to be. Even as tools and processes improved, the obstacles to high performance product development have grown more challenging. Today's global markets, global design environments, resource constraints, aging engineering workforce, and shrinking product profitability windows require extremely efficient, effective, and rapid product development. In addition, as more companies have adopted enabling solutions and improved the product development effectiveness, the competitive bar has been raised on product performance, quality, cost, and time to market.

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To succeed in this more challenging environment, companies must continue to look for new ways to enhance product development performance. At the same time, every new wave of technology offers new potential for business value. This has many people asking how the current explosion of social networking can help address the more intense demands on engineers and product developers. Social computing techniques are showing promise to help manufacturers raise the bar on NPD performance, not by replacing but by building upon the design tools and enterprise automation they have already put in place.

Boosting Team Performance and Collaboration

Manufacturers are starting to turn towards social computing to help boost product development teamwork and results. After all, isn't product development inherently a social activity? Or at least a team-oriented one? Experience and best practice dictate the use of cross-functional product development teams. Along with this, manufacturers have moved to more distributed, virtual models for design and production of their products. For these reasons, social computing seems to be a natural fit for product development. But it will take more than just having engineers sign up for Facebook or Twitter –social computing needs to be applied to the *business* of product development.

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The first and most obvious application of social computing in product development is enhancing collaboration. Today's distributed product development networks do not have the benefit of physical proximity. Collaborative approaches and technologies have stepped in to extend interaction between remote team members, and also to extend product development to people outside the team, including company specialists, customers, suppliers, outside experts and others throughout the extended enterprise. In addition to more formal collaboration approaches, these extended teams need a place to innovate, with less restriction and control than is needed for released products. Social computing offers the opportunity to give them the means to foster ideas, work, collaborate, and develop.

Part of our strategy is to include the whole product development community to allow them to communicate, share, and iterate around product information.
Ryan Murphy, Principal Program Manager for PLM, Microsoft

Ryan Murphy, Principal Program Manager for PLM in Microsoft's E&D (Entertainment & Device) division is responsible for the automation of product development for the Xbox console, accessories, Zune, and PC hardware such as mice, keyboards, and cameras. "*We have a comprehensive program to shift product development capabilities internally*," Mr. Murphy said, "*Part of our strategy is to include the whole product development community to allow them to communicate, share, and iterate around product information*." Microsoft is not alone. Many companies are shifting to concurrent development, involving more parties sooner in product development and in parallel. Developing different aspects of the product concurrently drives faster time to market by overlapping previously serial tasks. Perhaps more importantly, getting more diverse input on product designs early provides significant value by preventing late changes that are costly and degrade product profitability.

Social computing in product development enhances collaboration by bringing collaboration more fully into the process flow, and ties it back to the underlying context – product development projects, processes, and data.

Of course collaboration is not new, nor are electronic forms of product collaboration. Social computing technology, however, enables more natural and fluid forms of collaboration. For example, where someone may share photos with friends and family on Facebook, a designer may share 3D product mockups with the extended product development team. Like Facebook, those interested in that particular product or project could subscribe to any information published about it. Then, anyone with access can quickly provide feedback or click a project team member to collaborate interactively. Similarly, instead of a Twitter status an engineer could share a brief message with his teammates to provide real-time visibility to his progress on an engineering task. "*Very often we need instantaneous feedback,*" Microsoft's Murphy commented, "*You can see who is online immediately and get the information that you need immediately. You don't have to think about it, it's just a natural part of the product development process*," he concluded. Social computing in product development enhances collaboration by bringing collaboration more fully into the process flow, and ties it back to the underlying context – product development projects, processes, and data.

Capturing Product Knowledge from "Social" Interactions

Collaboration is a good start, but is only one form of enhanced product development value available from social computing. Capturing product, project, and process knowledge from the product development team provides a lasting record that can be reused throughout the years. This could be as simple as recording the discussion threads related to resolving an engineering issue, and making that information available to others so they don't spend time rehashing the same arguments. By recording both the result and the decision-making process manufacturers are creating a reusable knowledge asset. These discussions are even more valuable if they are tied back to the products and projects that generated them, so the discussion lives on throughout the product lifecycle.

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By automatically capturing engineering information from collaborative conversations, social computing can capture decision-making history as opposed to just the answers, allowing for better learning and reuse of corporate history. For example, design notes from within a design session could be captured and associated directly to the CAD

model, and maintained with the rest of the product data on the server. The same is true for project information. As Ryan Murphy explained, "*We spent a lot of time searching for information, like trying to find anything from last year's stage-gate review; that becomes much easier with social computing.*" Giving product development teams the ability to rapidly find and reuse existing company knowledge and know-how improves efficiency and product development results. Even products and projects that aren't brought to market still contain valuable information. Engineering and product development can learn as much (or more) from abandoned efforts as from successful ones. A past product that was discarded may be viable today because of a change in the market, the supply of a part, or some other change – but these opportunities are typically lost because people don't remember why that path was abandoned. Recording design and decision-making conversations through social computing can help capture those lost opportunities.

We are building communities of practice hosted by experts in specific product development fields.
Ryan Murphy, Principal Program Manager for PLM, Microsoft

Existing process knowledge can also be captured in wikis or blogs, allowing experts to share knowledge in a repeatable, searchable, secure environment. This can be particularly useful for companies that are facing the retirement of an aging workforce. "*We are building communities of practice hosted by experts in specific product development fields*," explained Microsoft's Murphy. "*These leaders moderate discussion boards, post articles, maintain a content repository for documents, and even point to articles on the web*," he commented. As social computing technologies evolve, profiles and communities could be generated by analyzing the knowledge demonstrated in product development software users' activities, interactions, and deliverables.

Discovering Knowledge from Product Networks

Enhancing collaboration is extremely valuable, but may only be the first level of value attainable from social computing in product development. In the same way that collaboration enables product development with people you know, "social discovery" helps companies find new people whose knowledge can be tapped. For example, finding product history, project artifacts and deliverables is helpful, but a short conversation with someone that knows the history can offer significantly more insight and help point to the right information to leverage.

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Social computing can help manufacturers and individuals extend their addressable networks by linking and connecting weak ties across social distance, sometimes referred to as "linking in" as in the popular social networking site LinkedIn. Social computing allows engineers to search across social distance to find indirect connections. Some social computing solutions may even be able to recommend new associations. People are much more likely to listen to another person to learn lessons from the past than read through old status reports or research old designs.

Microsoft is in the process of developing communities of practice and expertise. Beyond the development of specific discussion forums, individuals will be joining an extended engineering community. "*All identified participants will have a profile, and can register as an expert in a community of practice*," explained Microsoft's Murphy. "*Everybody will be catalogued so we can find the right person with the right expertise*."

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Murray D. Martin, Chairman, President, and CEO, Pitney Bowes

Extending the reach of the product development team into their extended networks allows for much broader input into product development. In his Annual Letter to Shareholders in 2008, Pitney Bowes Chairman, President, and CEO Murray D. Martin said "*Pitney Bowes is an innovation-driven company. In addition to a significant annual investment in research and development under a top-notch team of scientists and strategists, we take our forward-thinking approach to every organizational level and every employee. We engage employees through a variety of mechanisms such as the use of social networks for sharing ideas about new offerings, new markets and new ways to deliver customer value.*" Social networking is a new way to engage this broader community to leverage the combined expertise of the company and the extended enterprise.

Developing New Product IP from Communities

New technologies often help companies enhance existing processes, but can also enable new processes altogether. Advanced use of social computing in NPD offers more than just furthering existing product development capabilities. Social product development extends to new business models for engaging within the extended product development network and with customers. Engaging with communities to get better "voice of the customer" or supplier input is showing promise. For example, some manufacturers are replacing or extending traditional requirements gathering and focus groups with the use of social networks. This allows them to gather different customer insights. Ryan Murphy explains that Microsoft uses online product communities, such as the Xbox Live community, because "*it's important to have open conversation with customers*." Pitney

Bowes CEO Murray Martin emphasized this point as well, writing "*Innovation is not only about products and services. It is also about optimizing every touch point of every customer relationship.*"

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As an industry, manufacturing is in the beginning phases of exploiting social computing in product development. New techniques in social computing are offering even more innovative approaches. For example product managers may choose to adopt "reputation modeling" approaches. By analyzing which participants gain better feedback from others in the community, product managers can determine who in their community is developing ideas that resonate broadly with customers. This leverages the community itself to help filter and rate ideas and innovators to identify potentially compelling product ideas. Beyond managing existing products, projects, and knowledge, manufacturers may also adopt focused programs and innovation challenges that can help generate new IP for the business.

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Going Social with Product Development

Clearly, there are a lot of social computing techniques that can be adopted to drive more productive – and profitable – product development. Social computing can be an important productivity boost, but may also be a way to generate new ideas and IP. With so many options, how can companies decide how to apply these capabilities to their product development processes and organization, and where to start?

Most companies will start by enhancing collaboration because it has clear benefits but does not require a fundamental change in the business model to achieve an ROI. Distributed teams will naturally draw to these forms of communication as they use these tools in their social interactions, particularly younger engineers that have grown up with social networking as a part of their personal lives.

We have a program to enliven collaboration within the four walls of Microsoft using social computing.
Ryan Murphy, Principal Program Manager for PLM, Microsoft

Most companies will start internally. For example, Microsoft has a group called "engineering excellence" which owns the product development lifecycle. As Ryan Murphy says, "*we have a program to enliven collaboration within the four walls of Microsoft using social computing.*" Beyond collaboration, companies will likely move to knowledge capture and mining. Following that, companies are more likely to stretch into more fundamentally different business models.

Organic adoption of tools, particularly public tools that are not built for product development, carries risk of compromising IP, and does not provide an appropriate security model or audit trail. For this reason – along with concern that the tools will not be used in a business context – many companies have chosen to shut down access to public social networking sites. Although many of the concepts are applicable, current social networking tools are not intended to support product development. Alternatively, engineering software providers are incorporating these social product development concepts into their product development solutions, tailoring the capabilities to the special needs of the product development community. This approach will likely be much more attractive to engineering and information technology departments alike.

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Whatever the approach, it is important to develop a strategy that addresses short-term and long-term opportunities and minimizes risk. But companies should also recognize that this will be a learning process. On the other hand, it should not be done haphazardly, either. Adoption of social computing in product development – as with any new technology – without a strategy and operational guidelines could lead to disruption.

Conclusion

Product development software has provided tremendous advantages for companies to improve product development performance and control their IP assets. As more companies adopt these technologies, they are moving from a competitive advantage to a competitive necessity. At the same time, the challenges in bringing profitable products to market continue to grow. For these reasons, manufacturers must find ways to continuously improve their product development capabilities. Social computing is the next step forward in enabling product development, and social computing in the product development business context – tied into product innovation, product development, and engineering processes and data – are poised to help companies capture this value.

Recommendations

- Improve and extend global product development collaboration with social computing techniques.
- Capture and share knowledge from collaborative conversations, incorporating messaging, wikis and blogs into product development software.
- Enhance product development through the use of social discovery to tap the collective product intelligence of the extended network.
- Look for opportunities to extend current business practices to better capture voice of the customer and generate new product IP from online communities.
- Develop a strategy for social product development that enhances value and minimizes disruption and risk, adopting a gradual, measured adoption of social computing.
- Extend advantages gained by individual contributors with CAD software and by corporations with PLM by using social product development to enable better product development team performance.
- Take advantage of social computing and Web 2.0 capabilities to improve product development performance, while maintaining focus on protecting product IP and other special requirements addressed by specialized product development solutions.

About the Author

Jim Brown is the President and founder of Tech-Clarity, an independent research and consulting firm that specializes in exposing the true business value of software technology and services. Jim has over 20 years of experience in application software for the manufacturing industries, with a broad background including roles in industry, management consulting, the software industry and research spanning enterprise applications such as PLM, ERP, SCM and others. He is passionate about improving product innovation, product development, and engineering performance through the use of social computing techniques.

Jim is an experienced researcher, author and public speaker and enjoys the opportunity to speak at conferences or anywhere that he can engage with people that are passionate about improving business performance through software technology. He is also an avid social networker.

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