Mobile collaboration

Karen McCandless explores how having access to data from a connected manufacturing community on mobile devices can enable product innovation

Being able to bring the best, most innovative products to market as quickly as possible can be the difference between success and failure for manufacturers. But this continuous need for product innovation, coupled with incredibly short life spans, razor thin margins, intense regulatory scrutiny and an endless range of brands and products makes managing each product's lifecycle a challenge. While manufacturers have expanded their operations across the globe to secure their place at the forefront of product innovation, this means that increasingly dispersed engineering teams have to work more closely together to design smarter, connected products in a shorter time frame.

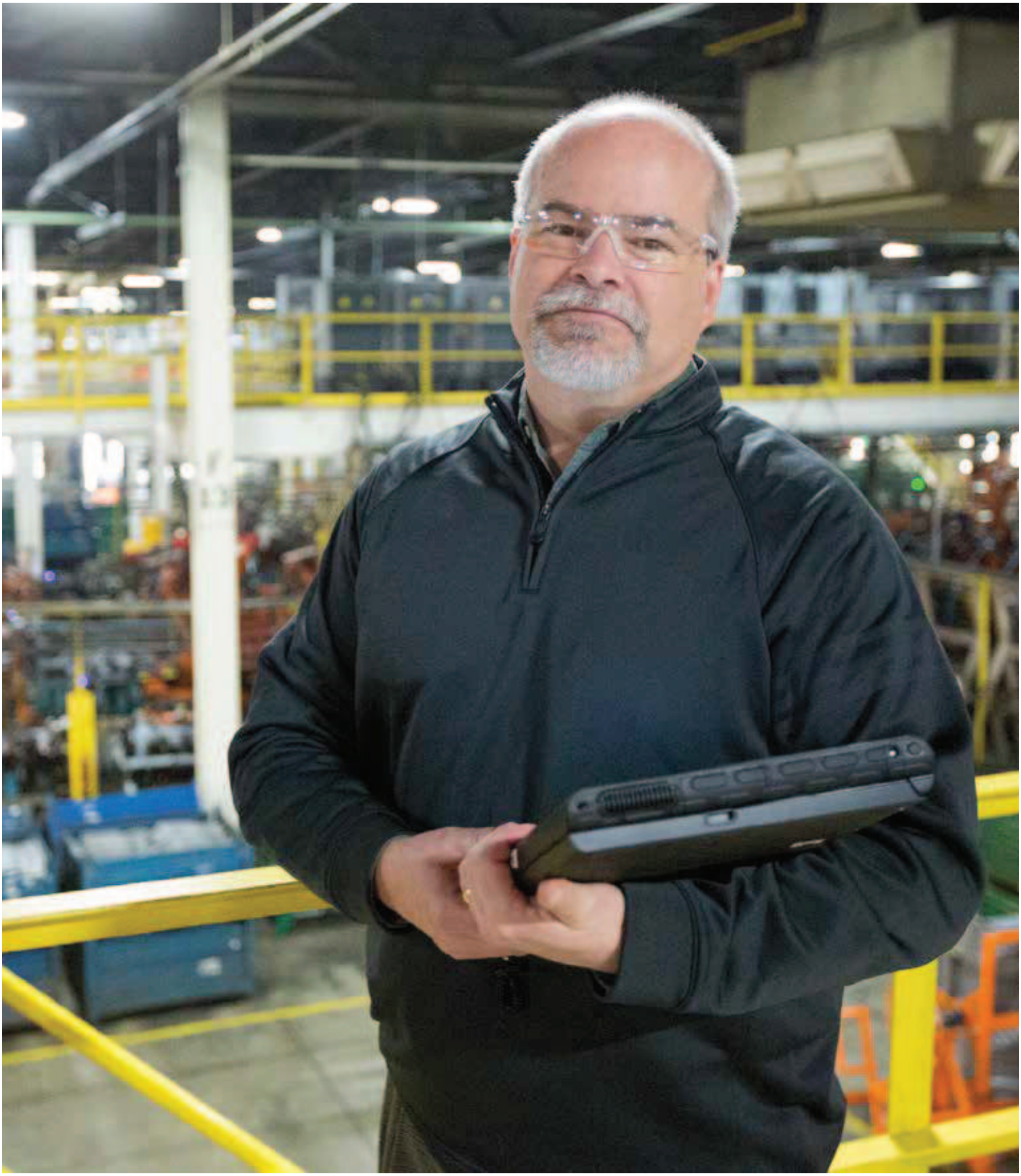
"Manufacturers are increasingly asking us how they can better work with their extended design teams across the globe – be that their partners, suppliers, outsourcers or design partners – to improve product lifecycle management (PLM)," says Simon Floyd, director, Innovation and PLM Solutions at Microsoft.

To improve PLM processes, manufacturers must improve communication and collaboration across the globe, but also within their own four walls. "The semiconductor industry has become quite specialised and complex," says Michael Munsey, director of ENOVIA Semiconductor Strategy at Dassault Systèmes. "Designers working on high-level abstract designs early on in the process often don't speak the same language as the engineers that are working with physical design specifications. This means data in PLM systems needs to be presented in a way that both groups can understand so they can communicate and solve problems more easily."

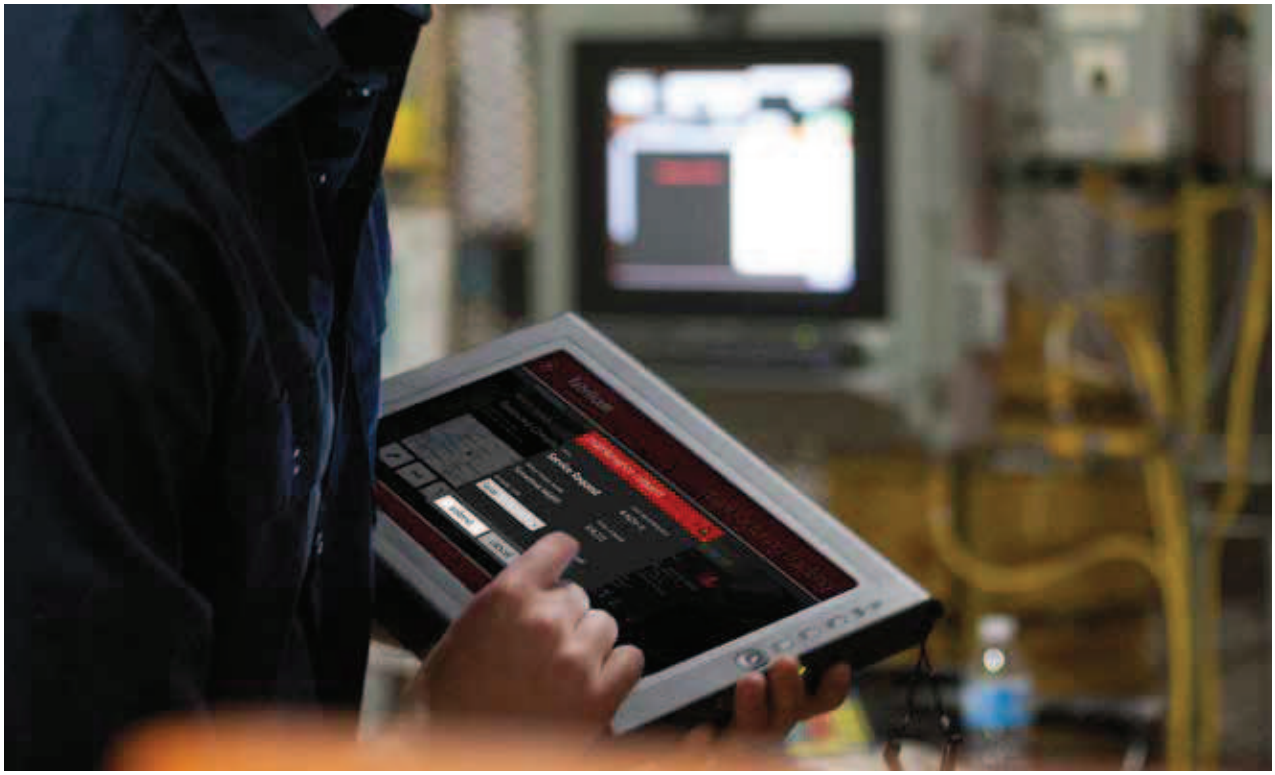
In the past, this data was stored and presented in an unstructured way, which inhibited collaboration and made accessing and sharing information more complicated. However, many manufacturers still use paper on the shop floor. "Traditionally, operators had a thick set of instructions with a load of steps they had to follow," says Don Busiek, general manager of operations management at GE Intelligent Platforms. "By digitising this information through 3D diagrams and videos, these steps come to life. Imagine having to crawl under a turbine to find a specific piece of equipment. Instead, with video you can see what you have to do rather than reading from a handbook."

"Manufacturers need to store all data in a highly visual and easily accessible way so that it can be understood by any member of the team, whether it be a manager at headquarters, a designer, an engineer or a maintenance worker," adds Munsey. "This data also needs to be in a format that can be manipulated, analysed and interpreted."

Jan Larsson, senior marketing director EMEA, Product Engineering Software at Siemens



Factory supervisors and maintenance personnel equipped with mobile devices can facilitate better and smoother product lifecycle management



Mobile devices can be used across the entire value chain, from corporate users to the factory floor

"With our app, supervisors on the factory floor can easily go from station to station to check progress and access manufacturing intelligence"

Jordan Berkley
DELMIA Apriso

PLM Software, believes that seeing a product in 3D rather than a text description is much more powerful. "If you are making any type of product, you work in the context of the 3D product always referencing an accurate virtual version where you can drill into more details at will for critical decisions," he says. "You can access and perform analysis on, for example, material properties and do quick what if studies, for example if the product can operate properly in Poland given the typical usage and regulatory compliance in that market or if it might fail and when. Our JT data format allows manufacturers to view and share digital 3D product information in real-time throughout all phases of the product's lifecycle. The high-resolution graphics enable manufacturers to see all the information in the context of the product. If they want to find out who supplied a certain part, they can drill down through the different layers. This improved access to information enables better decision making. We also have a JT viewer for Windows 8 that allows on the go access to this information."

Windows 8 and the associated hardware devices provide a significant competitive advantage for manufacturers. "With Microsoft's heritage in the PC business, we have a major advantage in the mobility space," says Floyd. "Sure, there is the iPad, but it falls down in terms of security, manageability and device power. But our Surface Pro tablet is lightweight and easy to carry, and can run process intensive applications like CAD or simulation (or Angry Birds if you like!). It also reduces the amount of devices that employees have to carry with them, as they can replace their laptop and tablet with the Surface Pro."

These mobile devices can be used across the entire company, from the factory where using a keyboard and mouse is difficult, to field engineers on the road, to corporate users at headquarters. "Whether I'm walking the plant floor, or in line in the coffee shop waiting for the shift to begin, at home or on the road, I can access what I need through my device," explains Busiek. "It's about providing the right data on the right device to the right person at the right time."

While the form factor is important, it's also about the software that runs on these devices. One example is the Apriso for Manufacturing

application for Windows 8, which provides real-time mobile access to the company's complete suite of FlexNet applications, including Production, Warehouse, Quality, Maintenance and Time & Labor.

"With our app, supervisors on the factory floor can easily go from station to station to check progress and access manufacturing intelligence," says Jordan Berkley, product manager, MES, Product Management US at DELMIA Apriso, a Dassault Systèmes' brand. "Maintenance personnel can access interactive 3D diagrams or manuals to get better visibility into where problems are occurring or where the parts are that they can use to fix these problems. They also get real-time information, requests and alerts delivered directly to their mobile device. Meanwhile, corporate users can be notified of a performance issue straight away. For example, if there is a delay in an order in their Dublin plant, they receive a notification on their device. Our application then lets the user drill down further to see if they need to take any action. They can see that there was a stoppage in a machine, but maintenance has already fixed the problem so no further action is needed."

Meanwhile Siemens PLM Software can run CAD applications on workstation PCs and allow access to the application on mobile devices. "The product design team can use tablets to run remote graphics wherever in the world they are," says Larsson. "This means both the hardware and software is mobile."

Mobile devices can also help decision making by allowing engineers in the field to share information across communities of their peers and experts to get relevant input. "Engineers in the field spend a lot of time taking notes about ideas and problems," says Floyd. "But this information cannot easily be shared throughout the company and externally or documented for future generations to use. Engineers make thousands of decisions that never go through the management approval cycle but these on-the-spot decisions can determine the outcome of a particular product. If engineers can connect with this social community of users on their mobile device, it helps them to make a more informed decision."

An enterprise-level social network such as Teamcenter Community – which runs on SharePoint – can enable better data flow globally. "With increasingly complex design environments and processes, social communities provide valuable input and insight into the product design process," says Larsson. "Teamcenter Community integrates PLM data from many different sources in a secure manner into one interface. It enables information sharing throughout the entire product lifecycle in a highly visual way, meaning all participants have the right information at the right time to make informed decisions. Once products have been reviewed, the results can be fed back and alterations can be made to a product. If every stakeholder is involved – and from early on – then manufacturers can monitor whether everything is on track, what the costs are and get quicker sign off for the product to get it to market faster."

This collaboration needs to continue not only through product design but also through product assembly. "Products are often designed and built in completely different corners of the globe," says Berkley. "And when a product design is delivered by US engineers to a factory in Shanghai, for example, the plant manager may have

Viewpoint

Seamless PLM collaboration

Jan Larsson explains the importance of the JT data format to PLM collaboration

Siemens PLM Software's JT data format is the product lifecycle management (PLM) industry's most widely used 3D visualisation format, enabling collaboration and visualisation at the scale required. It streamlines processes, both internally and throughout the supply chain, in order to achieve cost savings and time-to-market reductions.

Simon Floyd, director, innovation and product lifecycle management solutions at Microsoft, explains: "You've heard the saying 'A picture tells a thousand words,' well in the context of design and manufacturing, you could say '3D answers your questions.' JT provides the ability to share 3D content easily and allows people to collaborate effectively."

The JT Data Format has been accepted as the world's first ISO international standard for viewing and sharing lightweight 3D product information data in PLM. ISO IS14306 provides a detailed and comprehensive description of the JT data format, enabling companies to further leverage JT in their PLM workflows and software applications. ISO adoption provides a benchmark for open access and enables industry leaders to have open access to shared data, to facilitate collaboration and innovation and enable reuse of data. Other 3D formats have been promoted in the industry but none have achieved the same level of acceptance.

And the innovation doesn't stop there, with Microsoft having introduced a JT viewer for Windows 8. "The viewer showcases how JT can seamlessly facilitate collaboration from the desktop to tablet, and all scenarios that need the flexibility of being able to access JT anywhere, anytime," says Floyd. "Soon we'll demonstrate how JT files can be managed and shared via Office 365 through a web browser, to facilitate seamless collaboration with suppliers, partners and internal teams."

The 3D Viewer for JT, which is made for touch-based interaction and the traditional desktop/mouse environment, works simultaneously with other applications to improve productivity.

Jan Larsson is senior marketing director EMEA, Product Engineering Software at Siemens PLM Software

Collaboration and idea sharing through social communities boosts product innovation

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Michael Munsey
Dassault Systèmes

to make adjustments on the shop floor if they haven't got the same specification of equipment. But often information about these adjustments doesn't make it back to the central engineering so they do the same thing again. In addition, everyone needs to make sure they are working on the latest version of the designs. This is where better collaboration and information sharing is key. To enable this, we leverage a range of Microsoft products in our solutions. This includes Lync unified communications solution for presence and chat, SharePoint and the Office 365 cloud productivity suite."

According to Floyd, Office 365 with Skydrive Pro is perfect for iterating on work-in-progress designs and documents with external team members, contractors, etc. because its fast and simple – with controls for security, tasks and version management when needed. "It can be as easy as saving a file in CAD," says Floyd. "Skydrive Pro synchronises the file automatically and shares it online in a secure workspace, which is a vast improvement over e-mail or web-based file sharing such as Dropbox."

The new generation of workers entering manufacturing plants collaborate by default, which provides more impetus for manufacturers to have the technology that enables this collaboration. "Consumer technology is driving change on the plant floor," says Busiek. "The new, digital native workforce has been playing on the Xbox since they were children. They're used to interactive, graphically rich systems that provide Facebook-style alerts and expect the same thing on the plant floor. These expectations are driving manufacturing technology to become user friendly."

And feedback from consumers is an untapped source of information for many manufacturers. In the past, organisations didn't have much interaction with consumers, especially if they supplied retailers and not consumers. "Design requirements often come from feedback from the customer," says Munsey. "The Boeing Dreamliner was the first example of an aeroplane that was built to provide the ultimate consumer experience. Designers are so used to working from set specifications, but they might be able to build a better product if they understood consumer needs and expectations."

"It's key to empower the workers and build a culture that helps people be their best"

Simon Floyd
Microsoft

Larsson believes that consumer feedback during the design and manufacture stages can be hugely beneficial to the product: "Product reviews early on in the design process from the target use base means that the design can be adjusted to meet these needs," he says. "A continuous feedback loop is also useful in finding out why a certain product didn't sell well, allowing manufacturers to adjust their designs or functionality accordingly. This collaborative design expands across the entire supply chain. For example, if a supplier informs you that they won't be able to provide a product within a certain timeframe, then this delay can be fed back to the end customer."

Collaboration and the creation of social communities can also improve the idea-capturing process and enable companies to create a breakthrough product. According to Floyd, companies are looking for creative thinking that is outside of what they are currently doing. "Manufacturers aren't just thinking about how they can improve what they already have, but get insight into what they don't already know," he says.

Capturing ideas is just one piece of the equation, manufacturers need to ensure they have a company culture that welcomes these ideas and has the processes to capitalise on them. "If employees don't have confidence that any feedback they provide or ideas they generate will actually be taken into account, then they are less likely to have confidence in the product," says Berkley. "But if you work at a company where each change is being captured then a culture of innovation will thrive, as well as a strong belief in the product."

"Getting insight from a wider range of people instils confidence in the product across the company," adds Floyd. "The psychology and culture of the team is critical to the outcome of a product. When people are disenfranchised from the product, you are much more likely to get mediocrity than brilliance. It's key to empower the workers and build a culture that helps people be their best. To bring about innovation, it is important to let people have a say."