

**Tech-Clarity**

*making the value of technology clear*

## **Tech-Clarity Insight: Better Service from Better Product Information**

***Evolving to Visual,  
Product-Centric Service  
Communication***



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## Executive Overview

Service is critical to company profitability and customer satisfaction for today's manufacturer. This puts significant pressure on service organizations to perform. They have to close service calls quickly to save time and money. More importantly, they must service equipment accurately to keep customers happy and ensure they get maximum value from the products they buy. As Andrew Miller, Technical Consultant for Whirlpool explains, "*Our ultimate goal is 'first call complete,' our customers rely on our products.*" This is strategic, as Tech-Clarity's report The Service Lifecycle Management Approach: Strong Customer Relationships Result in Profit in the Service Industry concludes, "*Customer satisfaction is extremely important to building long term relationships. It is also good business, because it leads to greater profitability through customer retention and repeat business.*"

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***Documentation is an invisible aspect of service.***

*Debra West-Maciaszek, Sr. Information Architect, Nikon*

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To service products effectively and efficiently, technicians need to be armed with the right product information. Timely, accurate, and easy access to service manuals, training materials, and customer service information is critical. "*Documentation is an invisible aspect of service, one of our top two business priorities,*" says Debra West-Maciaszek, Sr. Information Architect for Nikon's Precision Equipment Business. "*When things go wrong, you can often trace it back to a missing or inaccurate graphic.*" Without the right information service technicians and customers have to reinvent processes and make guesses, neither of which are conducive to doing the job quickly or correctly.

Modern service information should be highly graphical to enhance communication and cut across language barriers. Beyond simple 2D illustrations, 3D service communications provide an even richer way to communicate with ease and accuracy. Gene Harrel, Supervisor for Technical Manuals at General Atomics, says simply, "*3D is much easier to use.*" 3D is far more realistic, and interactive 3D allows technicians to rotate, explode, and interact more naturally with the product information.

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***Beyond compelling graphics, service communications must provide product and service information in the context of the product.***

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Beyond compelling graphics, service communications must provide product and service information in the context of the product. To address this, companies are beginning to address service as an extension of their Product Lifecycle Management (PLM) infrastructure. This allows them to take a holistic approach, share more accurate product data, manage communications throughout the changing product lifecycle, and bring about tighter linkages between Engineering and Service organizations and information.

## The Service Imperative – Opportunity and Challenge

Service has become more strategic and mission critical. It is now a competitive differentiator and an economic imperative, with many manufacturers viewing service as a profit center. “*Parts revenue is the most profitable part of the business,*” offers Whirlpool’s Miller. “*Aftermarket sales is where the money is.*” In addition, contracts that include through-life service, service-based billing, performance-based logistics, strict service level agreements, and other shared risk approaches make service excellence a must in order to maintain profitability. “*If a customer’s machine goes down we may have to pay financial penalties,*” explains West-Maciaszek of Nikon. It is also clearly important to optimize the value to customers. “*Beyond that, we want our customers’ machines to run as well as they can, 24x7, to make money for them,*” she adds. And as customers look to extend the life of existing assets due to global economic conditions, service opportunities – and demands – are growing.

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***Parts revenue is the most profitable part of the business.***

*Andrew Miller, Technical Consultant, Whirlpool*

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At the same time it has become more important, the business of service has become increasingly more difficult. Today’s products are simply more complex. As highlighted in Tech-Clarity’s report The Five Dimensions of Product Complexity, products are now more complex due to new materials, miniaturization, smarter capabilities, and other trends. “*Our machines have become more elaborate and more complicated,*” Nikon’s West-Maciaszek confirms. Manufacturers are also increasing complexity by developing more product configurations and variants. Customers want personalized and specific documentation for their exact product variant. “*Our documentation has to be unique to each installation based on the configuration,*” explains Harrel of General Atomics, a high technology systems developer.

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***Status quo is not enough to deliver service excellence and keep customers happy.***

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Globalization has also increased service and communication challenges due to global product variations and need for local language support. Unfortunately, customer expectations for service speed and accuracy have not diminished. In fact, they expect it to improve and expect to be able to diagnose and address issues on their own. Status quo is not enough to deliver service excellence and keep customers happy.

## Bring Speed and Accuracy to Service Information

Customers demand speed and quality of service and manufacturers need to deliver. Increased global competition for new products, service, and service parts means

customers need to be satisfied or take their service business – and potentially their product replacement business – elsewhere. If a customer’s equipment is out of service it must be addressed as soon as possible. Manufacturers must have the right information available. *“Looking for information doesn’t help the field service engineer, and the customer is in their face saying ‘fix my machine’,”* says West-Maciaszek of Nikon.

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Technicians can’t afford to spend time searching in multiple places for information. Looking up service procedures in one place and then parts in another just isn’t acceptable anymore. It’s a huge time sink to find service data, and they can’t do their jobs successfully without accurate information. Speed is also critical to new product development. Product introductions have become much faster, with time-to-market a key competitive advantage for manufacturers. Service documentation must be ready and available when the product ships. *“We don’t have the luxury of time anymore because we are trying to bring products to market fast to get market share,”* explains Whirlpool’s Miller. *“The whole process has sped up.”* Meeting the speed of business and customer expectation today is crucial.

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***Bad information leads to lost time, lost productivity, higher service costs, and downtime for the customer.***

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Finding information has to be fast and easy, but that is only part of the battle. It also has to be right and easy to understand. If the documentation isn’t correct, it can lead to expensive and potentially dangerous errors. As Debra West-Maciaszek of Nikon cautions, *“A procedure that is out of date or an illustration error could potentially lead to a mistake that could cost millions of dollars.”* Bad information leads to lost time, lost productivity, higher service costs, and downtime for the customer. It also makes it nearly impossible to close calls the first time – adding additional cost and damaging company reputation. Providing fast access to accurate service information is the key to effective and efficient service.

## **Enhance Service Illustrations**

Service information plays a vital role in getting it right the first time. To compete, companies have to increase the accuracy, availability, and timeliness of service illustrations and information. *“Our whole job is to make the job easier for the field service engineers,”* explains Nikon’s West-Maciaszek, *“Our goal is to make the most coherent illustrations that we can make.”* Graphics, illustrations, and animations can have a huge impact on the effectiveness of communications, according to Tech-Clarity report

## The Business of 3D Technical Communications: Evolving Strategies to Document Products.

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***Visual representation and navigation helps technicians find the right information quickly and allows companies to communicate graphically.***

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The adage “a picture is worth a thousand words” is true. Visual representation and navigation helps technicians find the right information quickly and allows companies to communicate graphically where text would be challenging at best. For example, consider how difficult it would be to write instructions to tie a shoelace when it is so much easier to demonstrate visually. “*All technical information is very graphical,*” says West-Maciaszek of Nikon. “*It has to be or we would lose our users, they just wouldn’t know what we are talking about.*” Visual communications also have the added benefit of working equally well in any language when serving a global market and requiring less need for text. This reduces the need for costly, time consuming, and error-prone translation and the need for service technicians to be willing and able to read lengthy service procedures.

### Leverage Existing Assets for Improved Communication

The benefits of using visual communications include faster and more intuitive access to service information. As mentioned above, they also reduce localization cost. In fact, many customers justify their entire evolution to visual communication techniques with just the localization savings. Overall, the investment to create service graphics has come down. Companies can now leverage existing engineering investments to create more realistic, accurate graphics.

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***Reusing CAD ties it back to the original engineering and makes it easier to develop illustrations.***

*Gene Harrel, Supervisor for Technical Manuals, General Atomics*

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Documentation specialists can generate illustrations more quickly by reusing CAD designs, working in parallel to Engineering, and focusing on communicating the right information instead of recreating geometry. “*Reusing CAD ties it back to the original engineering and makes it easier to develop illustrations,*” says General Atomics’ Harrel. “*It also maintains the continuity to the engineer’s intentions.*” Reusing CAD has the added benefit of reducing errors by bringing Engineering and Service closer together. Being connected to the engineering source is a key to increased accuracy. “*We started to leverage CAD data to get the illustration to be more accurate and lifelike, to look like the part,*” says Whirlpool’s Miller. “*Before they were more generic and techs were saying that’s not really what the illustration shows.*”

Effective communication, however, requires more than just sharing product geometry from the CAD system. To communicate important details, communication specialists must be able to easily add callouts, annotations, and symbols to communicate additional details, actions, or cautions. They can also incorporate 2D exploded diagrams and parts lists to provide quick access to the right information and provide a fast go-to information resource.

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***3D product communication goes beyond flat, static documents to incorporate richer, interactive, more realistic representations of products.***

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The addition of 3D can provide much more lifelike information, particularly for learning new procedures. As Tech-Clarity Insight: The Business of 3D Technical Communications concludes, “*3D product communication goes beyond flat, static documents to incorporate richer, interactive, more realistic representations of products.*” Many companies are also providing service instructions including animations. Whirlpool’s Miller explains that expectations are changing. “*Younger techs are more tech-savvy,*” he says. “*They want to see videos and graphics instead of just reading.*” Animations show assembly orders and complex procedures more clearly, and can communicate best practice approaches. They allow the viewer to get an overall sense of what is required so they are best prepared.

## **Move Beyond Pictures to Products**

In the end, the goal of service documentation is to enable better service by communicating the right information. Despite the power of visuals, service technicians and customers need to know more than what the product looks like to service equipment. There is more to products than compelling graphics, and service documentation can provide much richer information. “*People that are not involved in creating illustrations for tech procedures think the object is just making graphics prettier,*” Nikon’s West-Maciaszek points out. “*But it is about conveying information.*”

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***Providing the correct information requires a product-centric approach as opposed to viewing information as unrelated documents.***

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Providing the correct information requires a product-centric approach as opposed to viewing information as unrelated documents. For example, understanding product structures allows specialists to provide exploded views to show how parts fit into an assembly. They can also show assembly and disassembly order, or group like parts for convenience in viewing. Rich product information should be embedded within the illustrations to help service technicians look up specifications, tolerances, dimensions, and other critical data to help them do their job effectively by navigating through a familiar context – the product.

Younger technicians and customers expect relevant, specific data. They are less likely to accept “generic” instructions. Instead, they expect documentation that reflects unique variants and configurations. Intelligent filtering in the documentation delivery process allows unique elements of each configuration to appear where they apply. General Atomics leverages these capabilities. “*We reference different illustrations based on installation with applicability references,*” Gene Harrel describes. “*Then the viewer has to be able to filter the right information.*” The ultimate extension of this capability could be individual documentation per serial number, although that is not required (or perhaps even practical) for many industries. But providing the serial number can bring up the right documentation for that model and configuration.

## **Service the Product across the Lifecycle – Managing Change**

Perhaps one of the clearest reasons to develop centralized, product-focused information management is supporting engineering change. As products change, so do spare parts, service procedures, specifications, and related documentation. Most companies struggle with manual processes to determine which documents need to be changed. Today, many companies have to search through hundreds of change notices, do their best to determine where to apply changes, and then face significant manual effort to make updates. “*Engineering change is a challenge because right now we are not using a workflow,*” says Andrew Miller of Whirlpool. “*Technicians have to cull through documents to look for changes. It makes it difficult for them.*”

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On the other hand, managing graphics and service information in a structured manner helps companies understand where changes should appear. Linking product data with documentation and managing them together provides the opportunity to rapidly determine which graphics and information need to change and where. This way, specialists can view net change and impact and make the appropriate changes. Without this knowledge, the result is out-of-date and inaccurate information. “*Change management is incredibly important to the customer,*” cautions General Atomics’ Harrel. “*Techs in our sister company weren’t informed about changes until an incident happened and they lost an aircraft. We are quite concerned, so we have a process to mitigate it.*” With many customers keeping products longer and requiring service over longer periods of time, this problem will only get worse.

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## Evolve to Structured, Product-Centric Service Communications

Service information needs go beyond “documents” and requires a comprehensive, effective management and delivery system for information. Centralizing service information in one place allows service technicians, engineers, and others to electronically find the right information instead of going to multiple sources to get what they need. “*Years ago, documentation was located in a couple of spots,*” recalls Debra West-Maciaszek of Nikon. “*Field service engineers didn’t know where to look and while they were searching for information, there was a machine waiting to be repaired and an unhappy customer.*” Consolidating the information improves the flow of information from Engineering to Service and other parts of the business in the context of the product.

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***We would definitely like to have an engineering change order trigger documentation changes. Our vision is to connect both sides using PLM.***

*Debra West-Maciaszek, Sr. Information Architect, Nikon*

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In addition to making service information accessible, it has to be accurate. Manufacturers need to manage the lifecycle of illustrations, information, and documentation along with the product lifecycle. “*We have compartmentalized our documentation into data modules, and can change common information in one place so everybody gets the most accurate information,*” explains Gene Harrel of General Atomics. Consolidating and integrating service information in an associative way allows changes to CAD designs or product metadata to propagate automatically through documentation. This process can update documentation automatically, or more likely with a quick review and acceptance from a documentation expert. “*We would definitely like to have an engineering change order trigger documentation changes,*” says Nikon’s West-Maciaszek. “*Our vision is to connect both sides using PLM.*”

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***It is a natural extension for PLM to manage product-centric service information in the service lifecycle such as illustrations and documentation.***

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Nikon’s vision mirrors a trend reported in Tech-Clarity Insight: The Business of 3D Communications indicating that companies are moving in the direction of integrating product communications with PLM. Because of the role PLM plays in managing product information, it is a natural extension for PLM to manage product-centric service information in the service lifecycle such as illustrations and documentation. PLM is well positioned to provide a single source of information across the enterprise, beyond just Service. “*We were managing thousands of files and we needed to smooth out the process, automate as much as we could, and manage where content was used,*” says West-Maciaszek of Nikon. “*We chose PLM because it was more than we needed for content management and it was also useful for product information by other departments.*”

Using PLM also offers the potential to pull Engineering and Service more closely together around the products they jointly focus on. This offers the potential to not only better communicate product data to Service, but also to close the loop and provide valuable feedback to engineers. It also offers the potential to align service planning more closely with Engineering

## Conclusion

Effective and efficient service is critical to profitability and customer satisfaction. This information should be graphical in nature to enhance communication and cut across language barriers. Service organizations are embracing 3D and animation technology to provide clearer direction and more detail. The investment required to make this transition has dropped because companies can now leverage CAD data to create communications and enhance them with additional information.

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***How could they service, maintain, and repair without graphics? They couldn't. You can't create useful service procedures without illustrations.***  
*Debra West-Maciaszek, Sr. Information Architect, Nikon*

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The need for better illustrations and information is clear. “*How could they service, maintain, and repair without graphics?*” asks Nikon’s West-Maciaszek. “*They couldn't. You can't create useful service procedures without illustrations.*” By taking this information and putting it in the context of the product, companies can take a more holistic approach. They can provide better, easier to access information and readily manage it throughout the changing product lifecycle. PLM is ideally suited to enable product-centric, visual service communications that provide fast, accurate information to improve service performance.

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## Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations:

- Leverage faster access to more accurate, usable service information to optimize service, improving profitability and customer satisfaction
- Make service information more graphical to improve service effectiveness and save on text translation costs
- Reuse CAD data to develop illustrations to improve efficiency and reduce errors
- Link product information such as parts directly to illustrations to provide richer information to service technicians and others in the enterprise
- Manage change effectively, linking engineering change to documentation changes to understand the impact of change and potentially propagate change to documents
- Dynamically filter product information based on configurations and variants to provide technicians and customers specific, relevant information
- Manage the service lifecycle with illustrations, information, and service documents associatively with product lifecycles

## About the Author

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

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