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Tech-Clarity Insight: Innovating Through an Economic Downturn

*A PLM Action Plan
for Small to Mid-Size Manufacturers
Facing Difficult Times*



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Executive Summary

Manufacturers today are facing significantly stalled markets as a result of the current, global economic downturn. Many companies are experiencing weak demand and lower sales, and reacting with budget cuts and other efforts to reduce cost. This can have a particularly large impact on small to mid-size manufacturers that have to make difficult trade-offs between product innovation and cost control. During this time, it is important to recognize that despite the reality of reduced budgets, companies that continue to invest in innovation will fare better during the economic downturn and beyond. This paper is aimed at helping companies develop an action plan that both recognizes the difficult reality that most manufacturers face today, and allows them to continue to invest in the future. Keeping these two priorities in mind will help these smaller manufacturers weather the current economic storm but also be prepared to capitalize on emerging markets during the eventual recovery.

This paper is aimed at helping companies develop an action plan that both recognizes the difficult reality that most manufacturers face today, and allows them to continue to invest in the future.

Manufacturers with limited budgets and resources have turned to product innovation, product development and engineering process improvement to support this dual strategy and get the most out of existing resources. These leading companies have adopted a strategy that includes a combination of elements, including:

- Product (and Market) Innovation
- Reductive Innovation (innovation to reduce cost)
- Process Innovation

These improvements are the result of thoughtful innovation strategies implemented with enabling Product Lifecycle Management (PLM) technology. Perhaps surprising to some, two of the manufacturers interviewed for this report chose to invest in these technologies during downturns in their business. They used the technology to help drive their recovery and are reaping the rewards today. The conclusions and recommendations of this report highlight practical techniques for other manufacturers to adopt these strategies and technologies, including the importance of adopting a step-by-step approach to improve product innovation performance. This approach, the “PLM Program,” is made up of a series of small, self-sustaining projects – all with positive ROI and rapid payback – that in combination contribute to a broader PLM vision. For mid-sized companies in particular, this incremental approach should allow them to gain the efficiencies and productivity gains they need to make it through the downturn, but also prepare them to respond rapidly to new opportunities that will arise in the recovering economy.

Balancing Short and Long Term Innovation Needs

Many manufacturers facing today's uncertain times appear to be paralyzed into inaction. Others have had knee-jerk reactions and made drastic cuts to research and development and new product development budgets. This report provides perspectives from mid-size manufacturers that have experienced downturns in their business and survived. Their experiences serve as a guideline for others facing difficult decisions, and provide examples of companies that have endured tough times and put themselves in a strong competitive position during their recovery. These companies are in far better shape today, and were more prepared to face the current economic downturn because of the improvements that they made during their difficult financial times.

One such company is industrial equipment and consumer goods manufacturer Werner Company. Werner is a fully integrated manufacturer and distributor of fiberglass, aluminum and wood climbing products. The company has been through some significant financial challenges, including Chapter 11 bankruptcy. Brett Latimer, who manages product development for Werner, explains that his company is doing relatively well despite the current global economic crisis because of the changes they made in their prior downturn. *"When we went through Chapter 11 bankruptcy, we had the challenge of getting back to financial stability without losing focus on product development,"* Mr. Latimer explained. *"The result is that we came out of Chapter 11 running on less resources than five years ago, and we are stronger than ever."* The improvements that Werner made helped them survive their difficult period, and left them prepared to compete in today's tough markets.

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Another mid-size manufacturer, consumer goods and industrial electronics company SEC Lighting of Slovakia manufactures light fixtures for indoor and outdoor use. Its products range from emergency and industrial lighting to customized lighting for the interior of public transportation vehicles and lights that act as signs. SEC describes the improvements their company achieved after facing difficult times in their local economy; *"Our product development speed is much faster, and we found time and cost savings because we need fewer people for product-related documents and data,"* says Roman Vachal, Marketing Manager for SEC Lighting. *"Improving our data management eliminated defective products, production errors, and claims caused by human errors during development and production stages."* The investments SEC Lighting made in improving their product innovation process helped them improve their business and innovate their way to significant business growth.

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Roman Vachal, Marketing Manager, SEC Lighting

What these manufacturers have in common is that they put a strategy in place that helped them survive their downturn and placed themselves in a strong competitive position for the future. The improvements and efficiencies that they put in place have provided long-term benefits, well beyond their troubled periods.

Reductive Innovation (decreasing cost)

During a difficult economy, one of the first places small to mid-size manufacturers turn for short-term improvement is cost reduction, or “reductive innovation.” After all, not all product innovation is about the distant future, and not all product innovation is about growing the top line. Product innovation can play a significant role in stripping cost out of the business to maintain profitability when a down economy is driving sales volumes and prices lower. A down market is a good excuse to go back to correct oversized or suboptimal designs that were acceptable during the good times.

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One mid-size manufacturer that has adopted this approach is aerospace industry supplier Weaver Manufacturing. Weaver produces high quality, close tolerance machined parts as well as tooling and prototype work. “*We are looking back on jobs that weren’t as profitable and trying to change them to make them profitable,*” says James Gordon, Programming Manager of Weaver Manufacturing, “*Now, it’s more important than ever.*” For example, some NPD projects may have traded product cost optimization for faster time to market. “*We may have developed a product when times were good, and we weren’t worried about extra material or an extra process,*” adds Werner’s Brett Latimer. “*That offers us an opportunity today.*”

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Manufacturers have a number of ways to reduce cost. The first, and probably most common, is to reduce direct product costs such as materials. Frequently, a “design for cost” approach is used to ensure that the product meets customer needs but is not over-engineered. “*We have cost improvement projects every year, but we look at it hard when*

the economy is down,” said Brett Latimer of Werner Company, *“We review material, process, and time – the whole picture.”*

Of course the challenge in reducing material costs is maintaining product quality in the eyes of the customer. *“The most important thing is delivering reliable and good quality products,”* cautions Roman Vachal of SEC Lighting. *“Customers are looking for reliable products, because they know that quality will lower the total cost over time versus the cheapest initial cost.”*

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Another approach that can reduce direct product costs is reduction of purchased or supply chain costs through a “design for supply” approach. This approach often involves procurement experts in addition to engineering participants. One way to reduce supply costs is by increasing the level of part reuse and standardization of parts. *“We went into a sustaining engineering mindset and went through all of our products to see what we could consolidate,”* explains Pete Robinson, Engineering Systems Administrator for Werner Company. *“Consolidation of parts reduces cost even if it’s a part we produce, because they have separate dies, we have to run separate extrusions, and we have to store them.”* Reuse and commonization save in multiple ways, including the ability to take advantage of bulk purchase discounts, reduction in the need for testing and validation, and lowered inventory carrying costs such as safety stocks, part obsolescence, and material handling.

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A manufacturer should not start a cost reduction project without a solid understanding of customer values. For some markets and some customers, cost is not the primary driver. SEC Lighting offers an example where reducing *total product cost in service* for their customers, including installation and maintenance, is the primary driver. *“For railway lighting, initial purchase price is not as important,”* explains Roman Vachal. *“Our customers don’t ask as much about price for one module, but for total life cycle cost, including all of the costs to keep the lighting system under operation for 20-30 years including maintenance, spare parts and service.”* Any cost reduction program would

clearly need to take these customer values into account. The key, of course is to design to the requirements and what the customer wants and needs. This is particularly true for more sophisticated customers where manufacturers can sell on value as opposed to just price.

Product Innovation

Cost reduction is only one way that product innovation can help. During a down economy, manufacturers can't afford to hunker down and wait for the storm to pass. Manufacturers in a downturn must innovate. They have to try new things, test new markets, and fight harder for business. In short, they need to continue to invest in new product development (NPD). On the other hand, companies may not be able to afford to take on very many high risk, high reward projects. The pragmatic approach is to rationalize their product portfolio according to the resources they have available.

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One approach is to focus on low-risk, incremental enhancements to keep products fresh for the market. *“When the economy is booming we can afford to take more risks, but with a tough economy we look at less risky programs that will make money but have a quicker payback on our investment,”* says Werner Company's Brett Latimer. *“Sometimes you need to give a product a facelift, save some money, but get a better product out of it.”* The goal at Werner was to continue new product development without spending a lot of time or money on things they couldn't move forward on. Instead, they chose to innovate and come up with products that would give the biggest “bang for the buck” in the short term.

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Companies have to be careful, of course, not to focus so much on the short-term that they forget to invest for the future. The key to success is to balance benefits and risks of incremental and breakthrough innovation. A down economy may actually be a good time to generate new technologies and platforms, to be prepared for – or better yet create – a recovery.

For example, SEC Lighting maintained a focus on a few potential “game changers” that could help accelerate their company's recovery. *“Some of our customers are trying to be*

more attractive in the market by bringing new ideas to their customers,” explained SEC Lighting’s Roman Vachal. “We realized that only micro-computer solutions would be successful for needs like central diagnostics or intelligent emergency lighting, so we started developing new technology before our customers were even ready for it. Now it is our advantage because we were ready when the customers realized that the new technology was the answer.”

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In this case, the company invested in new technology platforms before the market was ready to adopt them, setting themselves ahead of the competition when the market came around. The key was making sure to have products ready for the market before they were in demand. Not all companies have been as aggressive on new technologies in the downturn. *“Out of 15-16 open ideas, we chose a small number that we kept working on part time,”* said Pete Robinson of Werner Company. *“We had to balance cost improvement and new products,”* explained Mr. Latimer, *“You don’t want to drop new products completely and do nothing new, because then when the economy turns around you will be behind and will be starting again from scratch.”*

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The two companies took different approaches to their downturns. SEC Lighting decided to invest heavily in new production technologies, and shifted their product strategy to more sophisticated lighting products. They also shifted their focus to a more sophisticated, global market. Werner Company focused on more tactical approaches, but kept an eye towards innovation in parallel. What the two companies have in common is that they both turned to process innovation to get more product development throughput from available resources to allow them to keep focusing on the future.

Process Innovation

Cost reduction and product innovation are important to both short-term and long-term success. But not all innovation is directly related to a company’s products. Many innovative ideas are product lifecycle related and impact the efficiency of developing and managing products. By improving the efficiency of product innovation and product

development, smaller manufacturers can afford to spend more of their limited resources on developing winning products. *“You can’t just downsize to save on expenses, you need to find other ways to save costs and increase profits so that you are not dealing with a lack of resources when the economy turns around,”* explains Werner’s Brett Latimer. *“You have to be more efficient, that is how to still make money in a down economy.”*

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Process improvement is extremely important in the current market to allow companies to do more with less, but also to set them up to capitalize on the upturn. *“We are taking the slow times to strengthen processes and procedures,”* explained James Gordon of Weaver Manufacturing, *“We will be streamlined and better than the competition so we can react more quickly to opportunities as they come up.”* These changes are particularly important for smaller manufacturers who typically compete on agility. For these companies, this is the time to ensure flexibility and improve customer responsiveness.

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One of the largest opportunities for small to mid-size manufacturers is improving the efficiency of change management. For many manufacturers, change management is a troublesome nuisance that is full of inefficiency and leads to costly errors. Poor change management processes also slow the introduction of changes to the market. Considering that many change orders in this economy are focused on driving cost reduction, few companies can afford to delay their introduction. On the other hand, they can’t afford to introduce errors and disruption into manufacturing either.

“We used to have a spreadsheet with ECOs (engineering change orders) that tracked where they were, that was a full time job in and of itself,” explained Werner Company’s Pete Robinson. *“We introduced workflow for engineering changes to facilitate the process, but it also eliminated mistakes and errors.”* Workflow allows companies to implement standard, best practice processes. In this case, Werner was able to include more people in the sign off process and transition from using e-mail where there was no way to track status. *“One of our biggest improvements was really the engineering change process,”* commented Mr. Latimer, *“It used to take extra effort to get a high priority change done in a couple of days, now it’s a couple of days for all of them.”*

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Process improvement helps companies with limited resources do more with less, and get the most out of existing assets and resources. Engineering change management is just one example of a process that can be streamlined. Many companies start with their change process and then apply the same philosophy to reduce paperwork and increase efficiency in other areas. Werner Company, for example, is applying the same approach to development and approval of artwork and quality documentation, leading to additional time and cost savings.

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Process improvement saves time and money, which is very compelling in a down economy. More sophisticated customers may even recognize the value of improved processes, resulting in an impact on the top line. *“Customers are looking for a reliable supplier, they want to know about product and price, but also the whole system used in the company including development,”* remarked Roman Vachal of SEC Lighting, *“They do regular audits to check production and quality, but are also interested in the processes and systems we use for development – it influences their decision on choosing us as a supplier.”* In addition the gains they have enjoyed in productivity, SEC Lighting is able to leverage their advanced processes and PLM systems as a competitive edge in the marketplace to gain greater market share.

Enabling Innovation

Whether innovation initiatives are focused on cost reduction, product development, or process improvement, enabling software technology helps companies make the necessary changes in the way people work. It also helps to make the changes “stick.” Perhaps this is why the research revealed that companies that used PLM were better able to survive their downturn, and better prepared for the recovery. One of the first areas that small to mid-size manufacturers focus with enabling PLM technology is getting their product data under control.

“We have a portfolio that includes 1,600 different models, and without PLM we would be lost,” explains Roman Vachal of SEC Lighting. *“We also have a lot of custom products, and each project requires entirely different lighting fixture designs. To manage everything, we need some powerful software. That is why we chose (ENOVIA)*

SmarTeam.” While not every company has the challenges that SEC lighting does, centralizing and managing product data in PLM improves innovation efficiency and promotes design and part reuse. It also serves as a foundation for process improvement and automation. SEC Lighting even uses their PLM software to manage both mechanical and electrical design in one place, which has eliminated claims resulting from incorrect versions of software on the microcomputers. *“Since we used PLM, the number of problems dramatically dropped,”* Mr. Vachal remarked.

Centralizing and managing product data in PLM improves innovation efficiency and promotes design and part reuse.

PLM technology is also the best way to implement and reinforce streamlined processes and to automate redundant work. *“Electronic workflow helps immensely, it’s far more efficient,”* said Werner Company’s Pete Robinson, *“We saw a lot of things we could leverage to eliminate day to day tasks with workflow, but when our business went global it became an absolute necessity.”* There is a large opportunity for mid-sized manufacturers to achieve business process optimization by implementing best practice methodologies.

Another core capability of PLM that helps companies innovate is an enhanced ability to work across cross-departmental and dispersed teams. Leveraging centralized data, it is easier for companies to collaborate around product innovation and product development. Recently, more companies have expanded their use of PLM to manage both technical and commercial product data. *“Now that other people need to get to product information, we need to control what they have access to,”* said Weaver Manufacturing’s James Gordon. *“The main purpose for using (ENOVIA) SmarTeam is to secure product data in a better environment than Windows-based file storage, and to log and track revisions through engineering, programming, and quality.”* PLM helps provide the data management, process improvement, and collaboration capabilities that manufacturers need to survive in a downturn.

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Getting to PLM

PLM can help manufacturers in multiple ways. Small to mid-size manufacturers, in particular, need to decide what they want to accomplish with their PLM initiatives. These smaller companies need solutions that are affordable to purchase, and can be implemented quickly with limited resources. These solutions should be implemented modularly in a series of short, low risk projects with rapid return on investment (ROI). At

the same time, small to mid-size manufacturers should not lose sight of a larger vision so they can realize greater advantage from PLM over time. This “PLM Program” approach allows companies to achieve a strategic vision of PLM in incremental steps that provide rapid payback and value along the way. In this economy, this approach is more important than ever.

“A big part of our strategy was to go a step at a time, but we ultimately now have what we wanted,” explained Pete Robinson of Werner Company, *“But we had to dissect it down and figure out what we could accomplish. You have to be careful not to look at the big picture too late and see that you can’t do it,”* he explained. To enable this strategy, it’s important for companies to adopt software that will support a modular approach. The solution should offer proven best practices and be easy to use, to reduce risk. With the right approach, the right strategy, the right software, and the right implementation approach, the benefits are compelling. *“The good thing,”* Werner’s Brett Latimer added, *“is that our PLM software, ENOVIA SmarTeam, didn’t take that long to implement because it does not have a long learning curve.”*

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Conclusion

Product innovation – enabled by PLM technology – can help small to mid-size manufacturers leverage innovation to combat the down economy. By executing strategies that include product innovation, cost reduction, and process innovation, companies that have invested in PLM were better prepared for their downturn. As Roman Vachal of SEC Lighting explained *“PLM helped us bring our company to another level of quality and control.”* Pete Robinson of Werner Company explains the benefits in terms of time to market and cost, two key drivers of profitability. *“PLM eliminates mistakes and errors that are costly in time and money.”*

These same companies were not only more successful in their downturn, but also more prepared to take advantage of opportunities as the market recovered. Their experiences should serve as an example for other small to mid-size manufacturers facing a downturn, that they must continue to invest in innovation to help them survive in the short term and thrive during the recovery. *“Despite the fact that it was a poor time in the market 10 years ago, we decided to invest money into new technology because we saw opportunity and we believed we would be successful,”* says SEC Lighting’s Roman Vachal, *“Now we are only 5% selling at home and doing well internationally, the result is visible.”*

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Recommendations

“Now, history is repeating itself – the whole world is in crisis – but we are choosing to invest,” summarized Roman Vachal from SEC Lighting, *“It is not simple to implement PLM, but the benefits are incomparably higher.”*

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The experiences of these companies lead to the following recommendations developed to guide similar small to mid-size manufacturers in their strategy to innovate through an economic downturn:

- Use the down market as a trigger to go back and correct over-engineered or suboptimal designs that may have been acceptable during the good times
- Rationalize the product portfolio to reflect product development capacity and reduce risk, but be sure to keep some “game changers” – balancing the risk between incremental and breakthrough innovation
- Develop an understanding of customer requirements before starting a cost reduction program
- Look for new markets for growth or to replace business in down segments
- Get product data under control to promote efficiency and reuse
- Streamline and automate processes, implementing best practices for product innovation, product development, and engineering
- Enable streamlined and automated processes with PLM
- Reduce material cost through reuse, consolidation, and redesign
- Adopt enabling PLM technologies using a PLM Program approach for rapid payback that results in a strategic vision
- Adopt PLM with lower risk using proven approaches and modular solutions that are easy to deploy
- Look for PLM solutions with ready-to-use capabilities, but are capable of being customized to meet specific company needs
- Put in place the capabilities needed to capitalize on the upturn

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.

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