

THE STATE OF **DIGITAL** TRANSFORMATION **IN** MANUFACTURING



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Tech-Clarity

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The Digitalization of the Manufacturing Industries

Digital Transformation Priorities

Manufacturing is going through a significant, digital transformation that is disrupting the industry status quo. Companies are investing in digital transformation, smart manufacturing, Industry 4.0, Internet of Things (IoT), and other related initiatives. What are they prioritizing? And, what are they *actually* taking action on?



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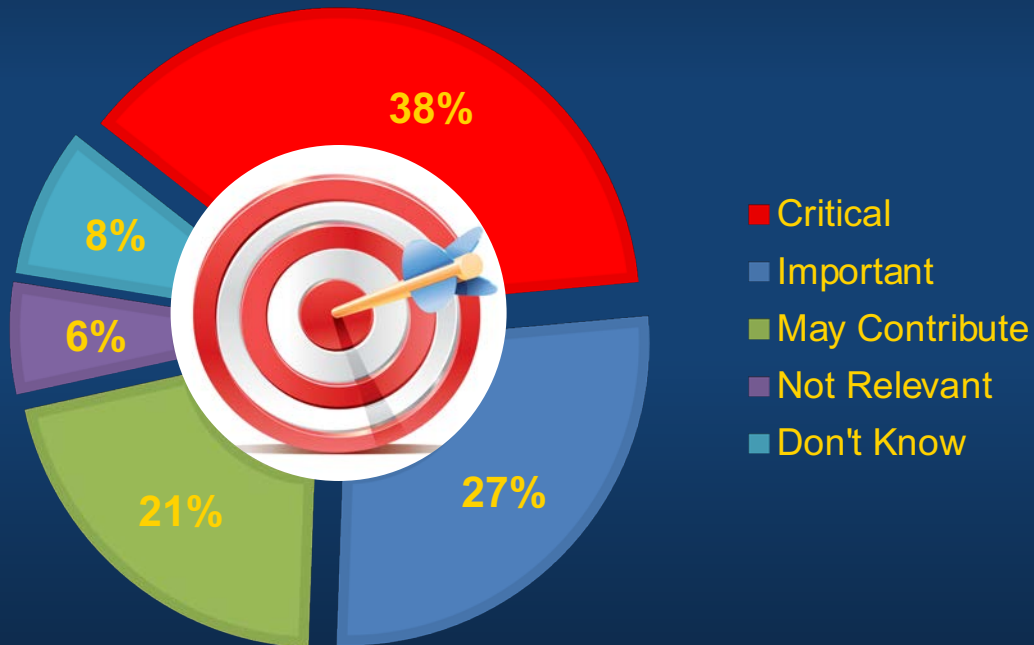
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“Digital” is Viewed as a Significant Business Priority

DIGITALIZATION IMPORTANCE TO BUSINESS STRATEGY



Executive Overview

Manufacturers are weighing their options and considering a number of strategic manufacturing initiatives. Many of them are related and all are competing for budget, time, and attention. Which investments are getting the most attention? How are manufacturers addressing the opportunities? How are they leveraging PLM solutions as an enabler? Tech-Clarity conducted a survey of over 130 manufacturers to find out.

The program most frequently cited as critical to the business strategy is Digitalization / Digital Enterprise. More than one-half of respondents say that these digital initiatives are “important” if not “critical” to their business strategy.

PLM’s Role in Supporting Digital Transformation

The survey also investigates how Product Lifecycle Management (PLM) supports these strategic manufacturing initiatives. The study finds that PLM not only provides strategic value to existing operations, but also maps well to the manufacturers’ strategic initiatives. This reflects PLM’s importance as the backbone of the digital manufacturing enterprise.

A Variety of Digital Initiatives are Deemed Strategic

Digital Transformation is the Leading Priority

Surveyed companies report Digital Transformation as the initiative most critical to achieving their business strategy. The second most commonly cited initiative is IoT (Internet of Things). IoT may be a subset of an overall digital transformation initiative. In fact, "Digital Transformation" may serve as a strategic umbrella for many of the initiatives investigated.

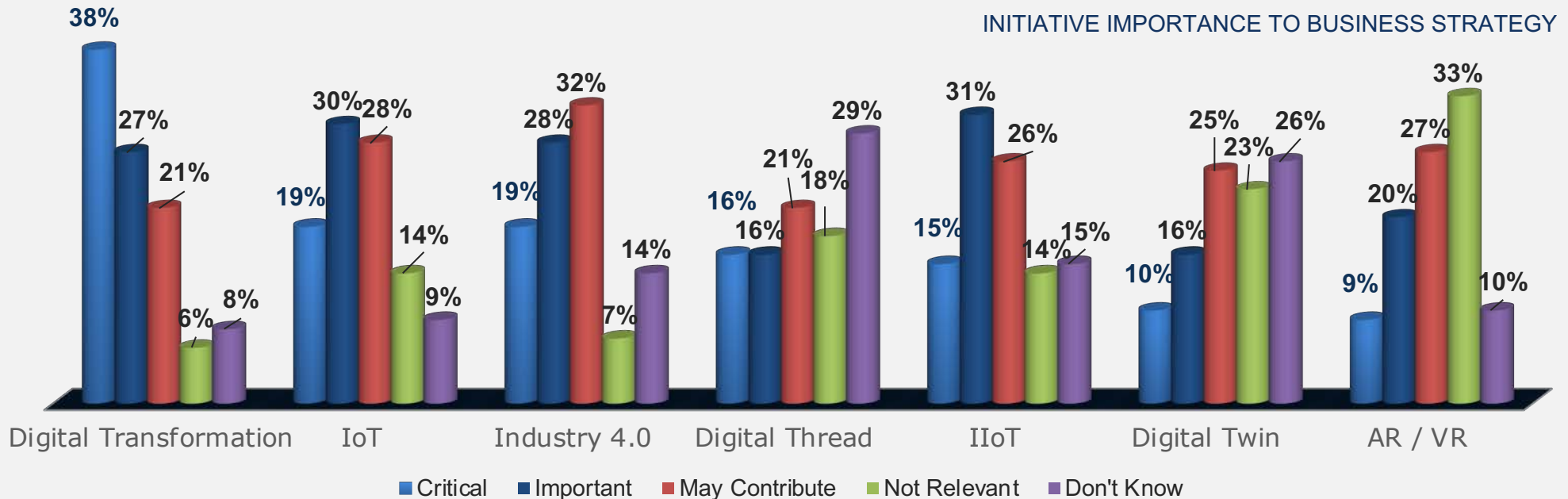
Industry 4.0 is a High Priority

Beyond digitalization, reported on par with IoT initiatives, is Industry 4.0 which was defined as "Industry 4.0 / Smart Manufacturing." Roughly one-half of companies surveyed say that these initiatives are important or critical to achieving their business strategy.

Uncertainty Surrounds Digital Twin and Digital Thread

Manufacturers appear to be unclear

about the value of Digital Twin and Digital Thread initiatives. For each, more than one-quarter of respondents claim that they don't know how important these initiatives are to their business. These are both newer concepts, or at least more prevalently discussed today. Manufacturers should educate themselves on the potential of these important initiatives and explore the value. Lastly, responses to AR / VR value likely reflect that they are more enablers than strategies by themselves.



Initiatives Vary in Level of Executional Traction

Investigating Initiative Traction

The initiatives most frequently reported as critical to the business strategy are Digitalization, IoT, and Industry 4.0. Let's look beyond what companies say is important to understand what they're doing about it.

Budget

Digital Transformation is more likely than the other initiatives to have a

formal budget. Other initiatives with budgets in one-half or more of responding companies include Industry 4.0 and IoT.

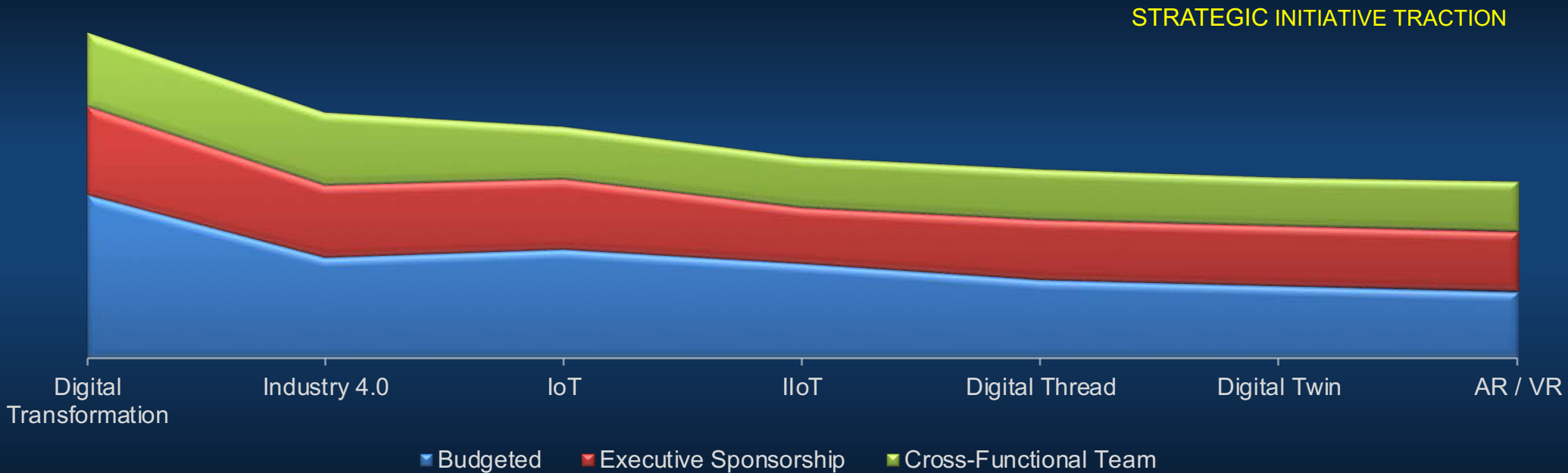
Sponsorship

The CEO / Board are more focused on Digitalization than other programs. There is more focus a level down at the VP / C-Level on additional items including Industry 4.0 and IoT. Most

initiatives, however, are more likely to be sponsored by mid-level managers / directors.

Execution Responsibility

Digital Transformation and Industry 4.0 are the most likely to be executed by cross-functional teams. Other initiatives are more likely to be executed at a departmental level.



PLM is Key to Strategic Manufacturing Initiatives

PLM Enables Digital Transformation

The survey analyzed how PLM supports the strategic initiatives manufacturers recognize as important to their business strategy. The responses show that PLM plays a critical or significant role in many of the initiatives. This highlights the importance of PLM as the innovation backbone for the digital enterprise.

PLM is seen as a major contributor to achieving digital transformation. PLM can provide the digital backbone, providing product context for data. It's also a contributor to the two less strategically viewed (and understood) initiatives, the Digital Twin and the Digital Thread. PLM can help track product development history, tie data together from step to step, and provide the product details needed to enable a complete digital twin, including revisions and configurations.

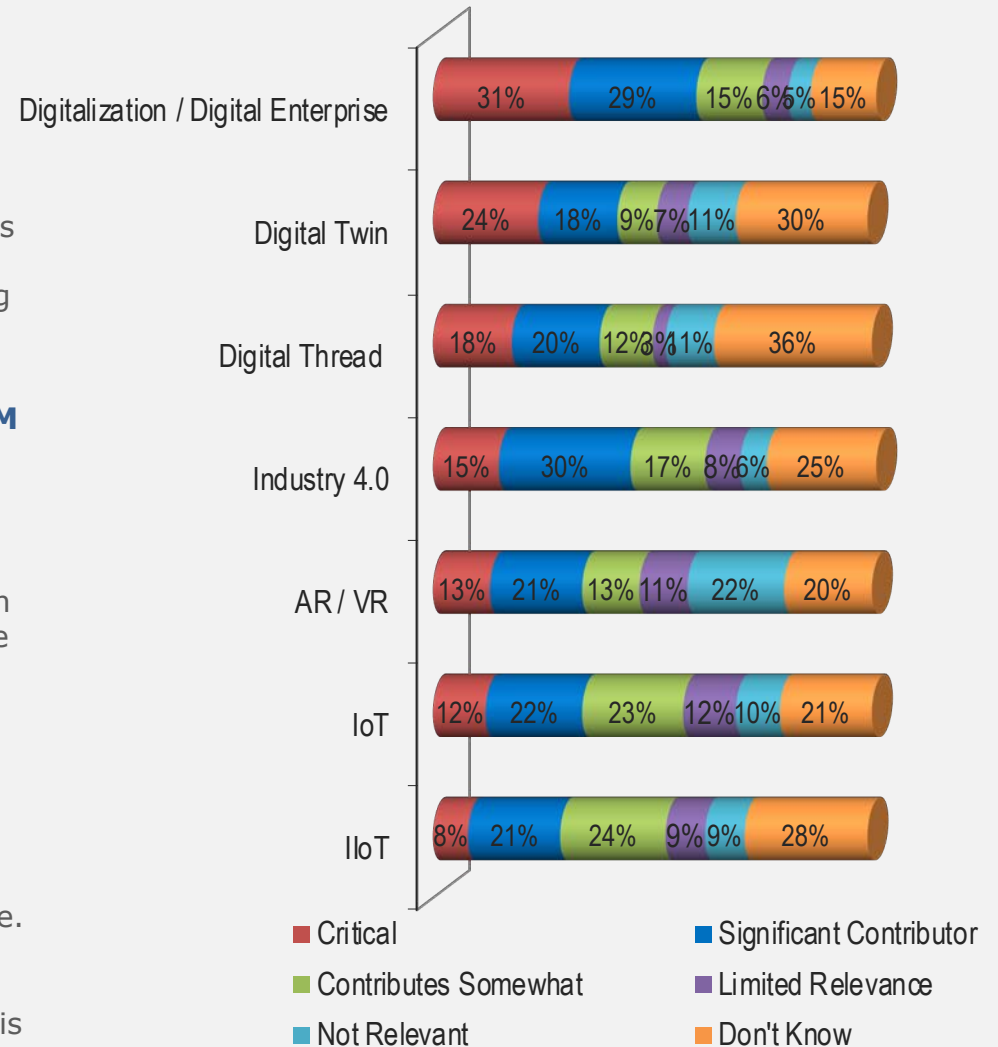
PLM Important to Support Industry 4.0

PLM is also a significant contributor to another big priority, Industry 4.0, although it's identified as more "significant" than "critical." This is likely because Industry 4.0 requires an ecosystem of solutions including MES (Manufacturing Executing Systems).

IoT and IIoT Leverage PLM as Part of an Ecosystem

IoT and IIoT are very broad initiatives, where PLM can play an important role by providing product information in a much larger context. The data, and experience, shows that IoT requires more than PLM. Supporting these initiatives requires analytics, dashboards, equipment communication, edge computing, ties to other enterprise systems, and more. Many leading PLM vendors have expanded their suites beyond traditional PLM for this reason.

PLM'S ROLE IN SUPPORTING STRATEGIC INITIATIVES



Conclusions and Next Steps

The Manufacturing Industry is in a Revolution

The manufacturing industry is changing rapidly and companies have to digitalize or risk losing their market position. Manufacturers are responding, targeting a number of important strategic initiatives related to becoming a digital enterprise.

The Digital Transformation Has Begun

Digital Transformation is seen as the most critical initiative for the manufacturing industries. Research for this report shows that digital transformation has significant support at the Board level. It's also a funded initiative that's more likely to have cross-functional teams executing the program. Industry 4.0 and IoT Initiatives are also frequently viewed as contributors to the corporate business strategy. Although the other initiatives may not have as much executive and enterprise traction, they are also being addressed and play important roles in the overall digital transformation of the company.

PLM is a Key Enabler to Support the Digital Revolution

PLM plays a key role in supporting digitalization initiatives, serving as the digital innovation backbone. PLM also supports important digital capabilities, including Digital Twin and Digital Thread, which show promise but require some additional education for many companies. PLM is important to the entire Digital Transformation strategy because it provides the product context, history, and details required to support the digital product and manufacturing strategy.

Recommended Next Steps

Activity level is high, and so are the stakes in terms of impact on business performance. We believe it's time for manufacturers to review their business strategy, make sure they are educated on these high-level initiatives, and determine how to put these strategies into action.

The manufacturing industry is changing rapidly and companies have to digitalize or risk losing their market position.

About the Research

Research Approach

This research is part of a broader study conducted by Tech-Clarity on behalf of ArcherGrey that shares additional detail on budgeting, sponsorship, and execution approach for these initiatives and manufacturers' views on Product Lifecycle Management (PLM).

Data Gathering

Tech-Clarity gathered and analyzed over 130 responses to a web-based survey. Survey responses were gathered by direct e-mail, social media, and online postings by Tech-Clarity and ArcherGrey.

Industry

The responding companies are a good mix of the manufacturing industries, including Automotive / Transportation (22%), Industrial Equipment /

Machinery (22%), High-tech and Electronics (15%), Energy / Utilities (15%), Life Sciences / Medical (11%), Consumer Products (10%), Building Products and Fabrication (10%), and others including Consumer Packaged Goods. Note that these numbers add up to greater than 100% because some companies indicate that they are active in more than one industry.

Company Size

The respondents represent a mix of company sizes, including 25% from smaller companies (less than \$100 million), 21% between \$100 million and \$1 billion, 11% between \$1 billion and \$5 billion, and 22% greater than \$5 billion. Another 21% did not choose to disclose their company size. All company sizes were reported in US dollar equivalent.

Role

The respondents were comprised of almost one-half (49%) who were manager or director level. Over another one-third (38%) were individual contributors, staff, or engineers. A small number (8%) were executive level and another 5% reported they were in another role.

Geography

The respondents report doing business globally, with most companies doing business in the North America (88%), just under one-half doing business in Western Europe (43%), over one-third doing business in the Asia (38%), under one-quarter in Latin America (20%), and others in Australia (10%), Africa (7%), Middle East (7%) and other geographies.

The respondents represented a mix of manufacturing industries and company sizes.



Acknowledgments



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About the Author

Jim's experience spans enterprise applications including PLM, ERP, quality management, service lifecycle management, manufacturing, supply chain management, and more. Jim is passionate about improving product innovation, product development, and engineering performance through digital transformation and the intelligent use of best practices and software technology.

Jim is an experienced researcher, author, and public speaker and enjoys the opportunity to speak at conferences or anywhere he can engage with people with a passion to improve business performance through software technology.

Tech-Clarity is an independent research firm focused on how manufacturers use digitalization, software technology, best practices, and IT services to drive operational improvement and business value. Tech-Clarity shares this knowledge with companies through publications, speaking, and strategic workshops to help company leaders understand and achieve the business value of product innovation, product development, engineering, manufacturing, service, Internet of Things (IoT), and other related software. The firm is dedicated to educating companies on making strategic improvements through the intelligent use of enterprise and digital software.



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