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WHITEPAPER

# How Manufacturing as a Service Accelerates Product Development

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Manufacturing as a Service (MaaS) brings together external manufacturing engineers, outsourced production, and Just in Time (JIT) inventory management to reduce the time and cost needed to produce quality products. With the right partner, MaaS accelerates product development and transforms the processes that organizations use to bring new products to market.

Companies of all sizes seek MaaS partners to help them scale in various ways. For some, the combination of production speed and the variety of services draws them toward marketplace platforms. Other organizations strive to form a deeper relationship with a MaaS partner to both improve quality and consolidate logistics.

MaaS companies typically work with dozens – often hundreds – of clients across a broad array of industries, applications, and production methods. They apply their vast experience to complement the design-focused approach used by OEMs – as well as product designers, product engineers, and design firms. This results in the best of both worlds: well designed products that are efficient to manufacture and deliver.

## Marketplace Manufacturing and MaaS

The Marketplace Economy has spread beyond Uber and AirBnB and into manufacturing. For example, networks such as Dassault Systemes' 3DEXperience Marketplace, pair product designers with available manufacturers based on a range of criteria – such as capacity, location, and capabilities.

Marketplaces like these offer similar benefits to MaaS – including reduced overheads and JIT production. However, they also present additional challenges: such as risks related to quality control.

## Partnering with Manufacturing Engineers

MaaS partners design engineers with manufacturing engineers. This aspect of manufacturing is often overlooked. However, their skills are complementary as their combined knowledge and experience typically shorten production process and reduce costs.

Product designers work to create the best part for each project they're involved with. They look to understand the context of how each part fits into the overall product's larger schematic. As a result, they may not be as focused on the manufacturability of a particular part.

"The marketplace model can be great for low volumes of simple parts, especially during the prototyping phase of product development. But it tends to lack true partnership with manufacturing engineers, which can offer critical value over the entire lifecycle of a product."

**JIM QUINN, PRESIDENT AND CEO,  
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Manufacturing engineers offer unique insight into how best to produce a part. They may have a deeper knowledge of specific materials, or of the capabilities offered by specific manufacturing processes. As a result, manufacturing engineers often suggest more efficient ways to produce a usable part; by iterating slightly on the original design.

Finishes offer a simplified example of how a manufacturing engineer can add value to a project. While a design engineer or product designer may justifiably want to create the best looking part, a manufacturing engineer can point out where (for example) a chamfer would add cycle time, where a narrow, flat-bottomed hole would introduce the risk of a broken tool, or where a glass-smooth finish might not be necessary for a part that won't be visible in the final, assembled product.

Making iterations like these on a part design may not save much in terms of prototyping quantities. In fact, updating a design may even cost more than the savings realized at low volume. But manufacturing engineers consider scaled production – in which simple updates to a design can lead to hundreds of thousands of dollars in savings.

## Outsourcing Production

Though manufacturing has made giant leaps in the last few decades in terms of efficiency and capabilities, it has come at the cost of added complexity. Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, refers to this as the **Fourth Industrial Revolution** – in which the lines between the physical and digital world are blurring.

*The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.*

Specific to manufacturing, there are more ways than ever before to make a part – in even more materials. With this growth comes an ever-expanding knowledgebase of capabilities, properties, specialities, and dependencies related to materials, processes, and machinery.

In short, designing parts and manufacturing parts are now two distinct skill sets.

*"We offer our MaaS customers a designated manufacturing engineer for expert guidance on machining capabilities. This personalized design experience helps our customer's design achieve the highest quality, while working to ensure it is cost effective over the life of the product."*

**JIM QUINN, PRESIDENT AND CEO,  
PLETHORA**

Successful companies realize this distinction and find it more economical to outsource manufacturing rather than manage it internally. However, there are real and significant costs associated with keeping up with continuous improvements to hardware, firmware, software, and best practices. This can distract an organization from its ability to develop and bring compelling products to market.

MaaS shifts these costs to the manufacturer, who are better able to justify them due to their scale and volume. Producing high volumes of parts, over two or three shifts, warrants a continuous investment in the latest technologies and processes.

MaaS manufacturing partners are able to spread these costs across hundreds of customers and thousands of orders.

## Just In Time Production

Just In Time (JIT) inventory management produces goods as they're needed – avoiding the burden of carrying and managing excess inventory. JIT practices deliver parts or products directly from the manufacturer to where they're needed – such as for assembly or packaging – further reducing the costs associated with warehousing and transporting excess inventory.

JIT requires less working capital, because organizations only obtain inventory as needed. It also reduces the risks associated with inventories becoming obsolete.

JIT is also a lean and environmentally-friendly manufacturing method. It keeps production runs short, leaving less stock on hand and more funds to invest elsewhere.

Toyota has embraced JIT manufacturing for many years. The company produces vehicles based on orders from its dealerships. For each vehicle, only the necessary supplies are ordered and sent from the supply chain. According to Toyota's website:

*(The) use of JIT within the Toyota Production System means that individual cars can be built to order and that every component has to fit perfectly the first time because there are no alternatives available.*

## Extending MaaS Relationships

Today, MaaS partnerships are evolving well beyond just contract manufacturing. MaaS manufacturers are finding new ways to serve their clients. Designated manufacturer resources are also opening up new production opportunities – such as sourcing, logistics, assembly, and planning.

"Our clients have asked us to manage production through other vendors, and we're happy to do so. It makes sense for us because it helps our manufacturing engineers gain a deeper understanding of our clients' overall needs, and in turn we're able to offer more valuable suggestions and feedback that save our clients time and money."

SEAN CARDENAS, VP OF SALES AT PLETHORA