DIGITAL PROTOTYPING
TAKING MANUFACTURERS ON A FAST TRACK TO THE FUTURE

by Simon Ordish, Director Majenta Solutions
The manufacturing world is in flux. Change is being driven by the evolving expectations of consumers that are better informed and have more choices than ever thanks to the Internet and the proliferation of new communications channels. Customers do more research before they buy and go to the vendor knowing what they want rather than asking what they need. In short, they hold the aces and their preferences have a growing influence on what manufacturers end up delivering.

At the same time, we are seeing sweeping changes in production processes with more data sharing and internal collaboration together with more interconnected processes, flexible manufacturing models and technological advancements like 3D printing.

Together, these factors are increasing the pressure on manufacturers. Innovation and enhanced efficiency are no longer options, they are necessities. And the focus on innovation must not just be on the product but also on the way that product is manufactured. The future of making things is changing. It’s time for manufacturers to respond.

There is much to do. There are still many pockets of traditional 2D approaches in place and plenty of examples of paper-based shop-floor drawings and sign-off processes in use. Equally, many manufacturers persist with manual data entry. The laggards will typically still be testing physical prototypes and testing them to destruction – a time-consuming and expensive process that mitigates against fast time to market. They will be managing their data manually, expending significant time and cost getting things signed off, looking for missing data, and duplicating work. There are likely to be quality issues and problems with the design or the engineering phase of product development, may only get spotted late when they are expensive to remedy.

We also see many manufacturers who having made the move from 2D to 3D believe that is sufficient to enable them to meet the demands of the new digital age. The reality is of course, that organisations have to put more effort into making a 3D model than they do in creating a 2D draft. The rationale of going 3D is to be able to use that 3D model digitally downstream and gain benefits as a result.

The Digital Prototyping process consists of 6 key stages:

- Conceptual Design
- Engineering
- Simulation
- Manufacturing
- Maintenance
- Sales & Marketing
- Data Management
That’s where digital prototyping comes in. Digital prototyping is not just 3D, it goes beyond that. It lets manufacturers design, visualise and simulate products rapidly and cost-effectively across the whole development workflow from concept through design onto engineering; manufacturing; sales and marketing and after-sales service. It is a fully-connected process founded on collaboration that can go as far as automating repetitive tasks, capturing the knowledge in the designer’s head and ensuring it can be deployed downstream to drive efficiency benefits.

Critically, digital prototyping enables manufacturers to get to market with new products faster and more cost-efficiently. The digital process gives manufacturing professionals the opportunity to virtually explore a complete product before it is built. Problems can be found and rectified up front and real-world performance can be simulated and validated - all without the need for an expensive physical prototype.

The whole process is focused on driving efficiencies. In concept design, for instance, the traditional approach would be to use pen and paper to ideate and explore themes. With digital prototyping, the sketches would be created digitally and then brought into the 3D CAD system in order for 3D models to be created directly from them. Mistakes can be rectified instantly, saving cost and keeping the design concept clear. The ability to improve collaboration early in the process is also key. Bi-directional interoperability means engineers can bring 3D concept models into their engineering workflow and work from it to develop the digital prototype further. Enhanced collaboration can also be key outside the organisation where it can help break down the barriers between cross-functional teams. The approach utilises the power of realistic visualisations to promote communication and parallel working and supports the creative cross-pollination of ideas. Manufacturers can get their ideas out early to customers and prospects, gaining invaluable feedback to incorporate into design specifications before they even start to cut metal.

Arguably the most compelling benefit of digital prototyping however and certainly the one which has the greatest sway with the board is that it drives enhanced return on investment. Digital prototyping is not just about making better products, it is also about driving down development and production costs and getting new products to market faster, benefits that positively impact on both balance sheet and bottom line and directly translate into real financial gains for the business.

**Changing Times**

Today, we are seeing a seismic shift in the way products are designed and manufactured across all vertical sectors. Manufacturers need to accept that the customer is king, that they are living in an increasingly competitive world and that they need design and validate their products and solutions more quickly and accurately to survive and thrive. They need to understand that the future of making things is already here and take action now to make sure they can be a part of it. Digital prototyping will enable them to transform their entire product development cycle, drive competitive edge and reach this hallowed future today.

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We will conduct a thorough review of your current design to manufacture process identifying key challenges and business priorities and then make recommendations to help you eliminate these issues and improve efficiency so that you can get to market faster.

Areas typically covered during the Design Process Review include:

- Reviewing what your current design to manufacture process looks like
- The impact of these processes on other departments such as Sales and Engineering to identify any bottlenecks
- Identifying where and how design automation may be implemented to streamline your design process
- Commercial discussion to capture your business drivers and goals
- Assess what CAD technology is already in place and how it is utilised within your business
- Assess skill level and capability of existing users
- Review available resources within your company to assist the needs of the Design Department
- Identify suggested priorities for addressing challenges
- Provide recommendations for appropriate technology demonstration.

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