

Autodesk's Focus on Enabling Industry Machinery Manufacturers

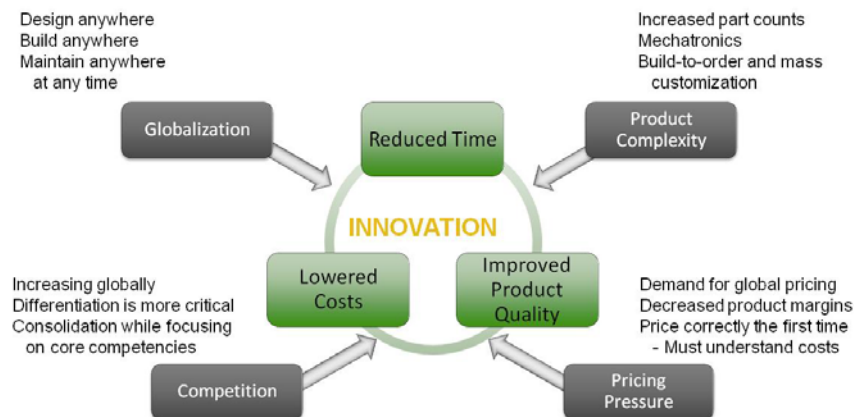
CIMdata Commentary

Industrial machinery (IM) is one of the broadest and most diverse industry segments in the PLM industry. IM is both a market unto itself and a major component of other industry sectors. Industrial machines have a strong presence within many other industries, i.e., process industries. Some of the other industry sectors are built using industrial machinery. Examples of industrial machinery include:

- Specialty process equipment (e.g., food handling or material handling equipment)
- Mechanical drives and power transmission, engines and turbines
- Industrial heating, cooling and environment controls
- Machine tools and high tech machinery and equipment
- Industrial electrical and electronic equipment
- Mining, agricultural and construction equipment
- Others

Because of the wide use of various types of industrial machines, we see a significant overlap between the IM sector and others, particularly in their manufacturing operations. This CIMdata Commentary looks at the IM market and Autodesk's position as a supplier of solutions for that industry.

As shown in the following figure, IM designers and engineers are facing the same pressures as their counterparts in other industrial sectors: deliver more innovative products faster, with continually better quality and a lower cost and now with sustainable, eco-friendly environmental design.



A key characteristic of the IM market sector is the increasing complexity of machines and machine tools. This is being driven by the need for companies to have more flexible operating and production (as well as manufacturing) environments so that they can quickly reconfigure machinery and respond to market demands. Increased machine complexity is putting pressure on the ability to design, validate, produce, and deploy those machines more effectively. Companies need not only get more innovative products to market faster; they are under

pressure to continually improve the quality of those products as well as ensure that they comply with regulatory requirements and green design initiatives.

Another characteristic is the need to improve the productivity of designers and engineers. In order to develop better innovative industrial machine products, designers need to be able to develop and analyze complex designs more and more quickly. They need to be able to evaluate multiple design options and make better informed design decisions. This requires having more robust and more comprehensive design tools, including integrated analysis and simulation capabilities. Today's designers and engineers must be multi-discipline-enabled so that they can come up to speed on a given project as quickly as possible. Companies need to have staff that can be easily deployed across projects and work in multiple disciplines to better leverage their engineering recourses for maximum productivity. Additionally, industrial machinery equipment suppliers are starting to realize the benefits of sharing designs with their customers to integrate their equipment and machinery into their customer's larger scale plans.

Autodesk has had a major presence within the IM industry for many years. Historically, AutoCAD (and various modules) was the primary tool used by many of the companies designing and manufacturing industrial machines, particularly in small- to medium-sized companies. While AutoCAD continues to be used extensively, Autodesk Inventor is now being adopted within IM manufacturers throughout the world. We estimate that Autodesk's direct revenues from industrial machinery are approximately 40% of their Manufacturing Solution revenues. Because of its historical position within SMBs and other IM manufacturers, Autodesk continues to be a leader in providing tools and now solutions to the IM industry.

Today, Autodesk Inventor and other competing tools are being rapidly adopted within the IM design community as companies migrate from 2-D drawing systems to 3-D modeling and design solutions. Its tools and solutions are used by a wide range of companies from very small ones or two-person shops to large enterprises. Autodesk's publicly-stated strategy is to bring its concept of Digital Prototyping to the IM industry with a focus on three areas: attainability, scalability, and cost-effectiveness.

These attributes are important for companies in the IM market as they strive to acquire new solutions that will help drive more affordable innovation and better enable them to remain competitive. The industrial machinery market as described earlier is very diverse, crosses multiple industries and a wide range of companies, each having different business and market needs. Rather than developing tools for a specific set of customers (e.g., large or small), Autodesk's stated strategy is to deliver a range of products that are suitable for any IM business.

As a leading supplier to the IM market, Autodesk has been continually improving the tools and solutions they provide. Traditionally Autodesk has been perceived as a supplier of applications focused on individual productivity to multiple segments of the PLM market, but not as a supplier of full PLM platform environments or solutions. Though Inventor is Autodesk's flagship product for IM, Autodesk has integrated multiple products to provide more comprehensive domain solutions.

Autodesk is also beginning to focus its efforts on the Digital Factory to deliver expanded solutions for the IM market. One of their major efforts is to support manufacturing operations with tools to outline manufacturing layout using Navisworks for Manufacturing. Additionally, Autodesk is now providing capabilities to allow Digital Prototyping solutions to communicate more effectively with the Building Information Modeling process and the Revit product family. According to Autodesk, Inventor is now able to generate simplified intelligent models for use in Revit, allowing architects, engineers, builders, and facilities managers to coordinate how industrial machinery can be installed, commissioned, and operated within the facilities, plants,

and buildings where it often resides. For the Digital Factory, this integration can help provide expanded capabilities for IM companies by enabling them to integrate factory, facility infrastructure and production line design with tool and machinery design.

More recently, Autodesk has been combining multiple tools to create solution suites focused on specific industries. These solutions integrate multiple domains, e.g., mechanical CAD design and simulation and analysis by embedding key capabilities from specialized applications into their design tool solutions. This expanded breadth and depth of Autodesk's suite of manufacturing offerings has been supported by both acquisition of new technologies and applications and integration of other Autodesk products such as Revit into their suite of manufacturing offerings. Autodesk's states they are shifting from providing individual tools to solutions that should help their users be more effective and productive.

For its acquisitions, Autodesk is following a program of embracing the newly-acquired technologies and determining how to simplify and repackage them to be effective within the Autodesk suite of products. Their goal is to make the acquired technology available to as wide an audience as possible and they refer to this process of simplification and repackaging as "democratization" of the technologies. To Autodesk, democratization means to take niche and/or advanced technologies and products that are typically used by specialists and embed their functionality within Autodesk's solutions such as Inventor in order to provide solutions that more fully encompass the development lifecycle and make these capabilities more usable and affordable. Democratization is intended to help designers and engineers work within their standard environment, yet have the ability to perform tasks that would normally have been passed to a specialist or require launching another application and be able to evaluate designs faster and make more informed design decisions. This can help shorten product development times and reduce the cost of development.

Autodesk has done this in a variety of ways. One example is integrating and embedding simulation and analysis technologies obtained through acquisitions into Inventor. Another is integrating Navisworks with Inventor to help manufacturers better visualize complete manufacturing facilities including industrial machinery, factory floor models, and production lines.

The Industrial Machinery market is, and will continue to be a major PLM industry sector. Its impact on other sectors has continued to grow, therefore increasing the importance of improving IM product design and engineering. As with other industrial sectors, in order to be successful, IM manufacturers must better leverage their valuable engineering resources to develop and deliver innovative products faster than their global competition. Autodesk is working to provide more comprehensive solutions for the IM industry by integrating Inventor with its other products. Companies in the IM industry who are evaluating technology solutions should include Autodesk in their evaluation.

About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM) solutions. Since its founding more than 25 years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These solutions incorporate both business processes and a wide-ranging set of PLM enabling technologies.

CIMdata works with both industrial organizations and suppliers of technologies and services seeking competitive advantage in the global economy. CIMdata helps industrial organizations establish effective PLM strategies, assists in the identification of requirements and selection of

PLM technologies, helps organizations optimize their operational structure and processes to implement solutions, and assists in the deployment of these solutions. For PLM solution suppliers, CIMdata helps define business and market strategies, delivers worldwide market information and analyses, provides education and support for internal sales and marketing teams, as well as overall support at all stages of business and product programs to make them optimally effective in their markets.

In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through PLM certificate programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia Pacific.

To learn more about CIMdata's services, visit our website at www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 (734) 668-9922. Fax: +1 (734) 668-1957; or at Siriusdreef 17-27, 2132 WT Hoofddorp, The Netherlands. Tel: +31 (0)23 568-9385. Fax: +31 (0)23 568-9111.