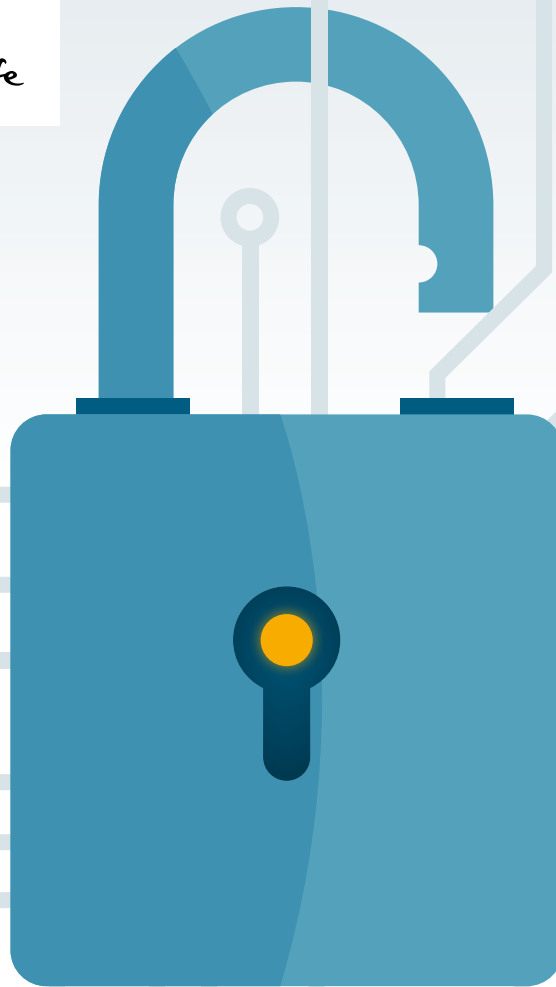


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Unlocking digital transformation: the finance factor

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Management Summary

SME manufacturers are at a watershed moment, following their larger counterparts on a journey of transformation to digitalize their technology base and thereby gain competitive advantage.

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This is especially true for precision engineering and machining companies, where digitalized machine tools can offer improved client services and value:

- lower product tolerances for greater accuracy
- reduced setup time for greater speed and agility
- reduced time-to-market through virtualized product development and testing
- improved uptime through predictive maintenance modeling
- greater energy efficiency

The competitive landscape, however, is becoming more challenging for precision engineering and machining companies.

In this study, they report that they are competing in a globalized market where a majority of these companies:

- mainly face competition from foreign competitors (61%)
- find that foreign competition is increasing (57%)
- yet expect to increasingly depend on foreign sales themselves (67%)

Transforming their technology base is seen by respondents as critical to their global competitiveness, with 80% saying they are under pressure to upgrade to new-generation, digitalized production systems.

76% also say that their company is upgrading machine tools technology more often to keep up with increased innovation cycles, an indicator of the accelerated technology investment pressure that precision engineering and machining firms are currently experiencing.

Consequently, pressure is also increasing on the companies to explore a broadening range of financing techniques with which to find sustainable funding methods for their technology investments.

63% say they are already using various forms of asset finance to enable their upgrade to a digitalized technology platform.

21% specifically mention integrated vendor finance, where flexible financing is offered as a package with the technology solution, and can often be flexed to suit individual circumstances based on the technical insight of such specialist financiers.

78% say their company's demand for alternative financing techniques such as asset finance has increased in the last three years, indicating that reliance on bank loans is already diminishing.

Finally, it is clear that technology financing is now a core strategic enabler for precision engineering and machining firms.

60% saying a broader range of financing techniques is either "very important" or "crucial" in making their company more competitive and achieve growth in foreign/global markets.

Digitalization for SME manufacturers – the time is now

The manufacturing industry is currently in the process of digitalization, a journey that introduces the benefits of a digital, connected, automated, data-rich world to the manufacturing environment. Large-scale manufacturers seem to have led the drive to digital transformation, perhaps because they have complex multisystem challenges to meet, and at the same time have deeper resources to draw upon than their small to medium-sized counterparts. The next few years, however, are likely to see major change in the underlying technology platforms of SME manufacturers, with digitalized equipment and systems becoming a key factor in their future competitive edge in an increasingly globalized marketplace.

Right at the cutting edge of such developments are precision engineering and machining companies. The operating technology for these companies takes the form of machine tools technology. As one major trade association notes,

the machine tools sector “is concentrated on customized and small-scale production of high-precision machines, machines that produce various goods from bicycles to planes, from watches to computers. It is not too much to say that machine tools have a fundamental impact on the productivity and competitiveness of the entire ... manufacturing industry.”¹

Confirmation that the precision engineering industry is facing a digitalization watershed moment comes from a commentary related to a recent international metalworking exhibition, which observed: “Even as manufacturers are still preparing for the fully connected reality of the Industrial Internet of Things (IIoT, or Industry 4.0, or the ‘Fourth Industrial Revolution’), they should be prepared to make the next step to Smart manufacturing, the concept describing the full digitization of sensors, actuators, devices and components within a manufacturing system.”²

Digitalization drives competitive advantage

The competitive advantages that digitalization offers precision engineering companies are various. They start with the fundamental ability to harness robotics and automation to make better, more accurate products faster and at lower cost (or without any cost escalation).³ Digitalization can also reduce setup time, allowing greater productivity between processes.⁴ Order and production patterns can be analyzed for better demand prediction.⁵ Virtualized new product and process modeling reduces time-to-market.⁶ Predictive modeling based on data from the manufacturing processes can increase uptime by initiating preemptive equipment service.⁷ Energy consumption can be reduced through automated monitoring and modeling.⁸ The list goes on.

The need to invest in new-generation, digitalized technology alternatives is clearly becoming increasingly urgent for manufacturers in general, and for precision manufacturing in particular.⁹ As one major global commentator notes, “Manufacturers are highly focused on achieving new growth; many expect to be aggressive in their search for new opportunities. Yet with limited baseline growth expected in most markets, **manufacturers will need to either invest into new technologies in order to ‘grow the pie’** or resort to a brutal competitive fight to steal market share away from rivals. The only certainty is that there will be winners and losers.”¹⁰

Nations across the globe are looking to grow the high-value-add segment of their manufacturing sector¹¹ (high-value-add can generate higher profits; high specialism can counter competitive threats). Precision engineering is a key subsegment of high-value-add, advanced manufacturing. It is concerned with designing and producing components, machines, fixtures, electronics, and other items within very tight tolerances. Examples of sectors reliant on precision engineering are aerospace, med-tech, electronics, automotive, oil & gas and robotics. These industries have an extensive supply chain of precision manufacturing component suppliers, all of whom rely on the capabilities of their machine tool base for their place in the market. By the same token, each of those component suppliers is looking for smart and sustainable ways of affordably investing in digitalized technology platforms in order to retain and grow their business.

This study looks at how the precision engineering and machining sector – which relies so heavily on advanced machine tools for its manufacturing and production platforms – is developing its businesses in order to compete more effectively.

Increasing foreign competition

One major factor fueling competition in manufacturing as a whole is **globalization**. As a result of developments in communication, e-commerce, logistics, market transparency and market access, even small to medium-sized manufacturers can now successfully sell to customers all around the world.

Also, manufacturing demand is becoming more evenly spread around the globe. It is predicted that by 2025, half of global consumption will be in emerging markets.¹² Rising wages in low-cost economies,¹³ along with the increasing affordability and capabilities of manufacturing automation,¹⁴ are leveling the global competitive playing field.

Precision manufacturing has undergone a parallel globalization. Global precision engineering firms have been moving to Asia to tap its burgeoning market. Meanwhile, Asian companies have been adapting to this competitive threat by placing a greater emphasis on technological advancement in order to move up the value chain and produce more sophisticated products.¹⁵

“Yes, increasing technology investment amongst our competitors abroad is making it harder for us to compete in [global and domestic] markets.”

CFO, Turkey

Respondents to SFS’s research – precision engineering and machining companies – noted that the emerging global opportunities are being matched by pressure from globalized market competition. The majority says that the larger part of their competition comes from foreign competitors and it is rising. At the same time, most (67%) respondents see their own export sales increasing over the next five years. The study also notes the watershed moment for technological digitalization in the precision engineering and machining industries and the competitive advantages it brings. The following sections identify how businesses are responding to the increased competitive threat, the critical role that access to new-generation digitalized technology plays, and the broadening range of financial techniques being employed to access that technology.

67% say their exports to foreign markets will increase over the next five years

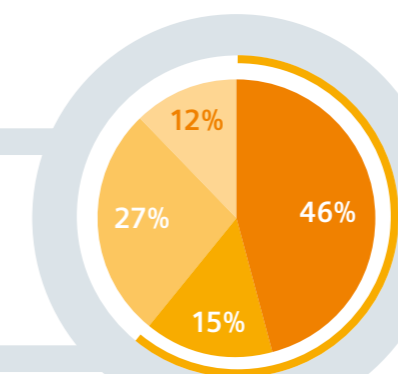
57% say competition from abroad is increasing

“Future market growth will be via EU sales rather than home markets.”

CFO, UK

“People are obsessing about the Far East, but in our experience, we’re seeing just as much investment in new digital technology by competitors in Eastern Europe – to improve their competitiveness on world markets.”

Production Director, Sweden



61% of respondents report competition from foreign competitors

- Mainly foreign
- Foreign and domestic equally
- Mainly domestic
- Can't tell

Automation is key to performance optimization

Overall performance optimization is the major goal for precision engineering and machining companies, with a particular focus on production automation (producing more products, better, faster, at lower cost),¹⁶ along with a reduction in running costs by addressing factors such as energy consumption.

Automation embraces not only the introduction of robotics to perform tasks and processes at very low tolerances; it also encompasses automatic detection of faults, obstacles, errors and any failure to meet mandatory quality standards through digital sensors. In fact, using predictive analytics,

data captured from the production process can even be used to foresee upcoming technical failure, in order to introduce preemptive corrective action that treats a problem before it actually occurs.¹⁷ Such actions, made possible through automation and digitalization, can radically improve key measures such as mean time between failures (MTBF)¹⁸ and guaranteed product specification tolerances, all of which can be promoted as a sales advantage over competitors.

“We keep on saying this... access to increasing automation using the latest innovations means we can compete with our peers across the world. We can produce an even better range of products, with that quality enhanced by the agility to change production runs very quickly. Automation is our future.”

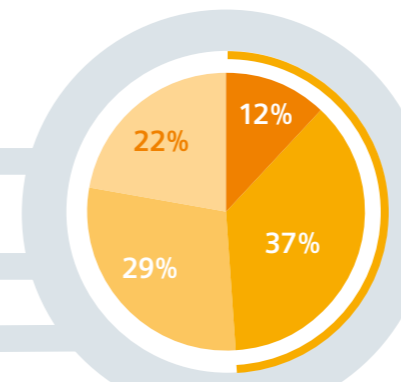
CFO, France

“We currently use a lot of automated equipment and robotics solutions... We think that automation is a huge competitive advantage.”

CFO, Germany

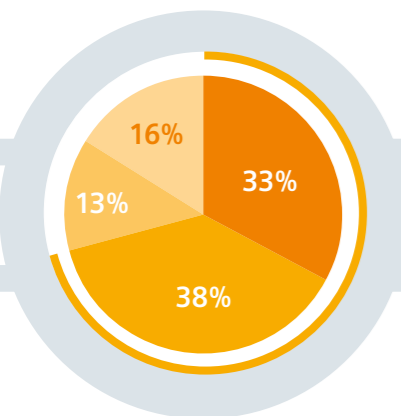
“Being able to use the latest automation technology is fundamental for our company to exist. Only with the latest generation technology can we be competitive in international markets.”

Production Director, China

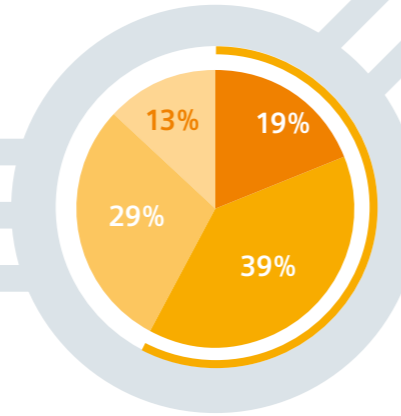


49% feel under “high” or “critical” pressure to improve energy efficiency

- Critical pressure
- High pressure
- Moderate pressure
- No pressure



71% report “high” or “critical” pressure to optimize performance along the entire value chain



58% report “high” or “critical” pressure to increase the level of production automation

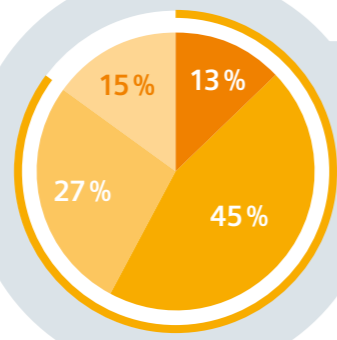
Digitalization and sensor-driven automation also play a crucial role in resource consumption for precision engineering and machining firms. Despite the fact that oil and gas prices have fallen, electricity costs have been largely unchanged as these fuels do not generally drive power production. Resource efficiency is a relatively easy way to save money on the bottom line for manufacturers, and automatic production cycle management is key to energy-efficiency management. The significance of energy management in manufacturing is attested by the fact that a range of leading solution providers are prepared to offer energy-efficiency solutions or upgrades wholly or largely subsidized by the energy savings that can be achieved.

Very specifically, respondents to the study confirmed that access to the latest digitalized machine tools technology is critical to their improved global competitiveness.

One global analyst said: “Manufacturing companies cannot afford to ignore these advances. By embracing them now, they can improve productivity in their own plants, compete against rivals and maintain an edge with customers who are seeking their own gains from innovation. ... Industrial manufacturing executives should be asking these critical questions: At a time of rapid change and limited upside, which technology investments will have the biggest positive impact on my business? And what is the value potential, return on investment, and risk of investing in these technologies?”¹⁹

85% say data analytics is either "important", "very important" or "crucial" for improving performance and control in their business

- Crucial
- Very important
- Important
- Not important



“Yes, technology turnover has become frequent... very frequent if we compare even with the recent past. A while back, we were replacing equipment every five years... and now is every two or three. In fact, we’re encouraged by this – so long as there is an economic way of getting access to the tech. It’s a sign of progress.”

CFO, Spain

Data from the SFS research shows that this view is shared by precision engineering/machining firms.

80% say they are under pressure to adopt and implement the latest digitalized machine tools technology.

76% say their company is upgrading machine tools technology more often to keep up with increased innovation cycles.

Sensor technology in the digitalized manufacturing environment is important not only for production process improvement and predictive maintenance, but also for the delivery of management information that helps to guide the parameters of service-level commitments, production quality guarantees, workload risk management, demand/

capacity balancing, additional capacity investment decisions, and so on. Analysis based on operating data from around the business is now being seen as a primary driver both for operational efficiency and business growth strategies.

“Data analytics is growing in importance with more and more managers in the business asking about it than ever before. Four to five years ago it would have been at the bottom of the scale of importance... now it is a hot topic.”

CFO, USA

“Analytics is very important now... to help improve our business results.”

COO, Russia

“Software that helps us analyze (performance) data is very important.”

CEO, India

Flexible finance enables new-generation technology acquisition

Even as the opportunity to grasp new-generation technology to gain a competitive edge presents itself, manufacturing is at the same time coming under unprecedented financial pressure. Globalized markets expose manufacturers to global price comparisons, inevitably creating downward pressure on prices, even for high-value parts of the manufacturing sector such as precision engineering companies. Therefore, as one global commentator notes, "Increasingly sophisticated tools and strategies will be required to optimize the global manufacturing enterprise from a talent, technology, operational, financial, tax and regulatory perspective."²⁰

63% use asset finance to fund new technology acquisitions

21% cite their use of integrated technology provider finance

A handful of respondents mention factoring, extended payment terms, and other methods

In parallel with enabling technology for manufacturing, enabling finance has to offer faster, more accessible, more flexible, and more sustainable solutions.

Respondents to the SFS survey confirmed their increasing desire to access a broader range of non-standard financing tools in order to acquire competitively critical technology. Most have already extended their portfolio of financing techniques beyond traditional bank loans and into various forms of asset finance. This is often driven by a desire to access more technology more quickly to grasp its competitive advantage in rapidly developing markets. Securing asset finance is often a quicker and less complicated procedure than relying on extending unsecured "relationship finance" in the form of standard bank loans.

It is also interesting to see that around one-fifth of respondents note that they are receiving finance as an integrated part of their technology provider's value proposition. Technology providers that also have a specialist financing business tend to understand both the technology and its industry applications in practice and are therefore able to offer customized packages that flex to fit the manufacturers' particular circumstances and cash flow. Respondents note that these arrangements are often comprehensive, embracing equipment acquisition, service, maintenance and even software upgrades. Precision engineering and machining companies also noted that tailored asset financing packages make it easy for them to understand total lifetime costs and thereby calculate a highly accurate and reliable cost-per-process stage – a major advantage for transparent financial planning.

"Financing arrangements that allow us access to the technology platform (plus software, plus maintenance, etc.) as a service is a new financing model, and it's getting popular in China."

CFO, China

"We're currently exploring a new finance proposition from our technology vendor – extension of the monthly payment deadline. There is an ability to negotiate the period so long as strong rationale is offered. But that's fine because these people understand how we will use and benefit from the digitalized technology."

CFO, Poland

"We're mainly using leasing and pay-as-you-use arrangements at the moment ... however, if other suitable financing solutions emerge that can provide the right funding and flexibility, we will always consider using them."

CFO, India

60% note a broader range of financing techniques is either “very important” or “crucial” to making their company more competitive and in achieving growth in foreign/global markets

65% say it is important to access a broader range of financing techniques to finance the latest technology acquisitions

78% report their company’s demand for financing techniques such as asset finance increased in the last three years

“Asset finance is our main source of financing alongside our own capital – we don’t tend to use bank loans – but we are looking at some new innovative financing arrangements, too.”

CEO, UK

Aside from asset finance, a handful of respondents mentioned invoice financing techniques – such as invoice discounting and factoring. These techniques are significant tools for cash-flow management that make working capital available at an early stage and avoid the restrictive effect of late payment. Additional innovative techniques were mentioned as well, including extended payment terms, where the payment terms of a technology acquisition deal are prolonged to as much as 180 days – an important emerging cash-flow and working capital management tool.

Respondents also made it clear that their rapidly growing need to grasp the watershed moment of digitalizing their technology base was matched by a similarly growing need for flexible financing techniques to fund this wholesale transformation.

Not only did they perceive a need to access enough finance to meet the digitalization challenge, they also saw a

growing need for a broader range and variety of financing techniques that offered sufficient flexibility to meet their particular circumstances, return-on-investment and market requirements.

In the view of respondents to this study, finance is a fundamental tool for them to deliver increased value to their clients and customers – improvements in product quality, turnaround times, time to market, production efficiency, flexibility for agile changeover of production processes, and the ability to offer reliable, optimized uptime. The breadth of financing techniques demanded is largely an indicator of the strategic role that finance now plays for precision engineering and machining companies. It signals their desire to find sustainable, innovative ways of acquiring the technology platform that will determine their future in a globalized world where, as analysts at KPMG note, “there will be winners and losers.”

Methodology

Telephone interviews were conducted with 41 precision manufacturing companies between April and July 2016. Respondents were either managing directors, finance directors or production directors. Country representation covered China, Finland, France, Germany, India, Norway, Poland, Russia, Spain, Sweden, Turkey, UK and USA. A handful of machine tools OEMs were also interviewed to capture their knowledge of their customers’ outlook and behaviors. Respondent views were collected on the subjects of digitalization, the business criticality of new-generation technology, technology replacement rates, the role of finance, financing techniques used and predicted trends in usage.

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