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Industry 4.0: Rising to the challenge

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Companies who continue to invest – even during uncertain economic times – thrive in the longer term and gain measurable competitive advantage



This study from SFS – the first of a series – estimates that the global investment challenge for smart factory transformation is just short of \$400 billion over the next five years²



Digital transformation to Industry 4.0 platforms – a one-time opportunity to gain long-term competitive advantage - requires substantial investment



New financing models are emerging, mainly from manufacturing-specialist financiers, to provide commercially sustainable ways of paying for digital transformation



Previous research from Siemens Financial Services (SFS) has shown that the window of opportunity to get ahead of the competition has a 'tipping point' of 5-7 years, after which manufacturers will be playing catch-up¹



These are often aligned to business outcomes, in order to integrate financing closely with the expected rate of return-on-investment delivered through the benefits of digitalized technologies

1. Surviving and thriving: A window of opportunity for competitive advantage

With divided opinion on the economic outlook for the industrial sector, many manufacturers have adopted a 'wait and see' approach, deferring both re-structuring and investment decisions. Amongst global analysts however there is a consensus that it is critical to **maintain investment**³. Historical evidence points to those who invest (wisely) – even in a downturn – and in so doing often gain a long-term competitive advantage that their rivals struggle to match. A recent HBR analysis⁴ points out that “digital technology can help cut costs... [and] make companies more agile and therefore better able to handle [...] uncertainty and rapid change...” The same analysis finds that companies who do NOT invest in digital transformation are likely to fall dramatically behind their competitors⁵, noting “Companies that have neglected digital transformation may find that the next recession makes those gaps insurmountable.”

2. New financing business models to manage growth

Streamlining operating costs while continuing to invest can be made possible by deploying smart financing techniques. A study from McKinsey⁶ identified several management principles that help companies survive challenging markets and thrive afterwards; and went on to observe that “companies that emerged in the top quartile spent 15 percent more on capital expenditure.” Yet the same top quartile companies also, the study says, “reduce leverage” and maintained a “higher cash balance”. Smart financing techniques help to address the need to invest, harnessing sustainable third-party capital to reduce the burden on corporate lines of credit, as well as deploying cash flow management techniques that help maximise available working capital.

In the context of digital transformation, a growing number of Industry 4.0 solution providers are integrating smart finance into their overall value proposition for the manufacturing sector. This adds value to the overall proposition – not only providing best-in-class technical solutions, but also making access to them financially sustainable and aligned to the business benefits they deliver. Manufacturing decision makers are thereby better placed to achieve their desired business outcomes, using the most appropriate combination of industrial technology and software, advisory, services and financing. Smart financing deploys a combination of new business models and financing techniques, with a focus on achieving the expected measurable business outcome.

3. The investment challenge

Currently just 10% of global manufacturers can be classified as ‘digital champions’, with almost two thirds in the early stages of their digital journey⁷. A study by McKinsey⁸ notes that companies expect to replace around 50% of the installed base of manufacturing equipment in the course of Industry 4.0 transformation. This investment level can be expected to be amplified by retrofit and upgrading of existing machinery and technology. The window of opportunity to invest and thereby gain competitive advantage is limited, making the issue an urgent one. Previous research from SFS⁹ has shown that the window of opportunity to get ahead of the competition has a ‘tipping point’ of 5-7 years. By this point, it is expected that 50% of manufacturers will have made substantial investments in Industry 4.0, and so after this point manufacturers who have not yet invested in digital transformation will be playing catch-up¹⁰.

What, then, is the **cost of manufacturers not investing**? Where are the potential financial gains from Industry 4.0 that the low or no-investors will miss out on, and which smart finance enables? The benefits of digitalization have been highlighted by several studies:

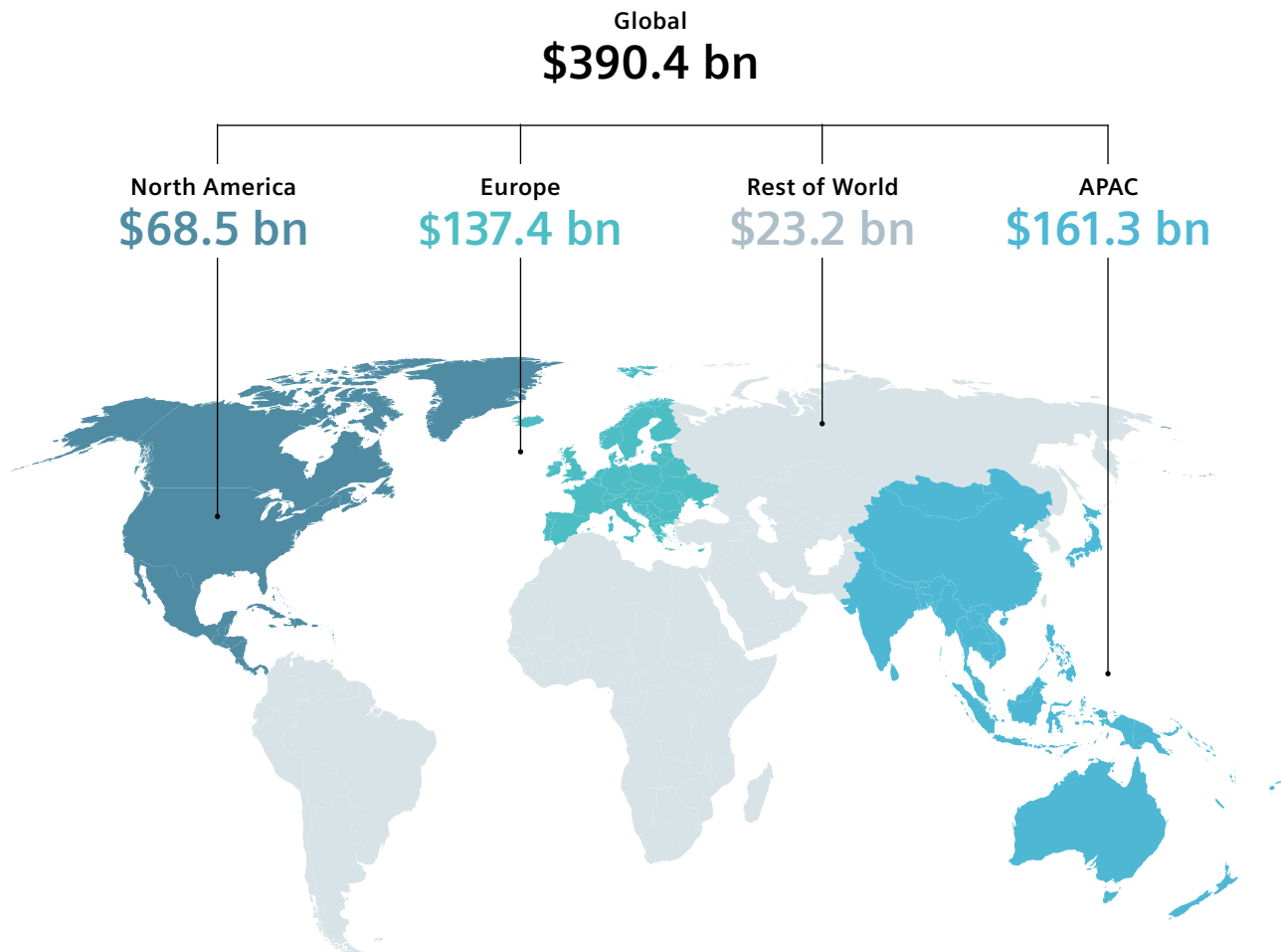
- **Overall productivity benefit from reduced costs & increased revenues: c.6% of revenues¹¹**
- **Predictive Maintenance: Maintenance cost reduced by 12%¹²**
- **Energy optimization: The baseline cost benefit from optimizing manufacturing energy generation and consumption is c. 25%¹³**
- **Process optimization and production productivity: 5% cost reduction, 20-30% gains in production volume¹⁴**
- **Product quality improvements: 50% fewer defective products and 10-20% reduction in quality failure costs¹⁵**
- **Reduction in inventory holding costs of 20-30%+¹⁶**

SFS has developed a model¹⁷ which conservatively estimates the size of the investment challenge faced by the manufacturing industry as it seeks to digitally transform. The model takes a variety of analyst predictions of the value of the smart manufacturing market for the five-year period 2020-2024 inclusive. The resulting figures are then adjusted to reflect the proportion of smart manufacturing that is already being acquired through smart finance. Additionally, the estimate is reduced to just half of the ‘available market’, to give a highly conservative view of the sheer scale of investment required even to reach 50% market penetration¹⁸.

These modelled estimates will be of interest to both international and regional industry 4.0 solution vendors in the US, Europe and Asia-Pacific. Smart finance, embedded as part of the overall value proposition, will be a key enabler for each solutions provider across the entire Industry 4.0 technology supply chain to maximize their market penetration. Smart sales finance makes digital transformation more financially sustainable for manufacturers – removing obstacles to investment. Moreover, refinancing tools for solutions providers refresh cash flow and make sales volume acceleration similarly sustainable for the vendor.

Digital Transformation: The Smart Factory Investment Challenge

An estimate of the investment required to implement smart factory technology during the five-year period 2020-2024 inclusive (based on 50% penetration of predicted market value¹⁹).



4. Smart finance: aligning to measurable business outcomes

Smart finance for digital transformation in manufacturing tends to come from integrated specialist financiers, where the funder understands the technology, the markets, the applications and the operating pressures. Using this knowledge, they create and align financing structures which are focused on achieving recognizable and clearly identified desired business outcomes for the manufacturer, through access to the right technology, services and advisory.

So what kind of outcomes are typical of digital transformation in manufacturing industry? What business objectives from digital transformation are being enabled through smart finance, without any loss of flexibility, agility, or commercial sustainability?

Outcome #1 Digitalization Upgrade – Designed to enable the acquisition of a system or piece of technology or machinery, financiers with a deep knowledge of manufacturing will flex the finance period and terms to align with the likely benefits the manufacturer will gain from the technology. Often this type of financing will cover associated costs of ownership, such as maintenance, into a ‘bundled’ monthly payment. To enable rapid acquisition and implementation decisions, a financier will often have a ‘master’ agreement with a manufacturer, streamlining the process of agreeing future financing.

Outcome #2 Asset Value Extension (Retrofit) – Technology innovation and upgrade periods are shortening²⁰. Finance can provide the flexibility to upgrade during the course of a financing period, offering protection against technology obsolescence. Upgrades often involve retrofitting hardware and/or software onto the main technology platform, extending the life of the platform and the value and capabilities it delivers to the manufacturer. Specialist funders understand the associated risks and can incorporate the software element into a total financing package.

Outcome #3 Transition Management – Recognizing the challenges of transition from an existing technology or manufacturing platform, financing arrangements are available that defer payment for a new set up until it is reliably up and running, removing the financial challenge of having to pay for the new system while the old one is still running.

Outcome #4 Energy Efficiency – Payments can be predicated on the expected business benefits that the technology makes possible²¹. Savings or gains from access to the technology are used to fund monthly payments, making the technology cost-neutral for the manufacturer. Arrangements effectively capture future savings to finance the current investment, without the need to tie up capital.

Outcome #5 Performance and Productivity – Specialist financing comes in a range of packages where payments can be aligned to defined productivity targets.

Outcome #6 Sustainable Growth – Increased production capacity and productivity, while improving price competitiveness, can require greater quantities of raw materials or component parts. Invoice finance solutions are available to help manage the cash flow challenges that success through digitalization brings.

Equally with digitalization, manufacturers may experience tightened liquidity due to rapid growth. Asset based lending allows a borrower to access the cash that may be tied up in working capital assets. A revolving line of credit, secured by the borrower's accounts receivable and inventory, provides the liquidity needed to meet daily cash needs.

Outcome #7 Sales Enablement – Relevant to industrial technology solution providers, such as machine builders, that both buy technology components from their suppliers, and sell their manufacturing technology to other manufacturers. Specialist financing provides integrated packages that make the investment affordable for the providers' customers.

Outcome #8 Sales Growth Management – Solutions providers such as machine builders need to sustain sales growth; either in a challenging economic environment or as a result of demand from their manufacturing customers who are themselves going through digital transformation. Specialist smart finance offers arrangements known as Extended Payment Terms. This helps industrial technology suppliers manage their own liquidity to meet the growing demand in a digitalizing sector.

Siemens Financial Services (SFS) is the financing arm of Siemens providing business-to-business financial solutions. SFS uniquely combines financial expertise, risk competence and industry know-how to create customer value and enhance customer competitiveness. For further information, please visit www.siemens.com/finance

1. Siemens Financial Services, Countdown to the Tipping Point for Industry 4.0, April 2019, Estimates the time period to the 'tipping point' for investment - when 50% of the global manufacturing community will have substantially converted to Industry 4.0 platforms
2. See references to table data below
3. A new study from Bain & Co (Bain & Co., Beyond the Downturn: Recession Strategies to Take the Lead, 16 May 2019) has re-emphasized a common truth learnt from previous economic turbulence in the early 2000s and in the Great Recession of 2008-9 – namely, companies that wish to survive and thrive in and after a recession need to continue to invest. The study notes that "[our] research shows that well-prepared companies emerged as winners during and after past recessions. They managed a strong defense and offense in parallel, reining in costs while simultaneously reinvesting in growth." A Harvard Business Review (HBR) study from a decade ago (Harvard Business Review, Roaring Out of Recession, Mar 2010) also found that the companies who come out on top and flourish through, and after, a recession those who "reduce costs selectively by focusing more on operational efficiency than their rivals do, even as they invest relatively comprehensively in the future by spending on marketing, R&D, and new assets." HBR cites research from McKinsey.
4. Harvard Business Review, How to Survive a Recession and Thrive Afterward, May/June 2019
5. ibid
6. McKinsey, Preparing for the next downturn, April 2007
7. Source: PwC Digital operations study, 2018
8. McKinsey, Industry 4.0 – How to navigate digitization of the manufacturing sector, 2015
9. Siemens Financial Services, Countdown to the Tipping Point for Industry 4.0, April 2019
10. Siemens Financial Services, Countdown to the Tipping Point for Industry 4.0, April 2019, Estimates the time period to the 'tipping point' for investment - when 50% of the global manufacturing community will have substantially converted to Industry 4.0 platforms
11. Sources: SFS, Digitalization Productivity Bonus, 2017; PwC, Financial Benefits of Industry 4.0, 2018
12. Sources: PwC 2018; McKinsey, How to navigate digitization, 2015
13. Source: SFS/Siemens DES, Future savings – current gain, 2019
14. Sources: Deloitte Insights, The smart factory, 2017; McKinsey 2015; Flex/WSJ/Emerson, How manufacturers achieve top quartile performance, 2019; Accenture, Industrial smart manufacturing, 2015
15. Sources: Deloitte Insights, 2017; McKinsey, 2015
16. Sources: PwC, 2018; IIoT, Bosch, an example when Industry 4.0 makes a difference, 2017; McKinsey, 2015
17. See specific table references
18. Estimation models built by Siemens Financial Services seek to avoid any risk of an exaggerated view of the investment challenge that manufacturers face globally. By sizing just half the 'available market' for smart factory transformation, this model builds in a margin of error for factors such as: over-prediction of market growth by analysts; price competition among solutions providers; breakthrough technologies that reduce the cost of transformation; step change in consumption of manufactured product markets.
19. Core sources for the smart factory market include: Markets & Markets, Mar 2019; GM Insights, Jul 2019; Reports & Data, Jun 2019; FM Insights, Oct 2018; Grandview Research, Aug 2019); Deloitte, 2017.
20. According to Siemens Financial Services research, published in Investing in Success (2016), 67% of manufacturing respondents observed that technology replacement/upgrade cycles are shortening
21. This whole subject is discussed in a Siemens Financial Services research paper, Opportunities and Outcomes, February 2017

Anyone interested in other SFS studies on Industry 4.0 solutions can visit:

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Published by
Siemens AG 2019

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Updated (unless stated otherwise): November 2019

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