



## Agility in metals: digital transformation in the steel and aluminium industry

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### Introduction

*Adopting the right digital strategy now can dramatically improve margins – by as much as 16% on a tonne of steel*

The metals industry is facing economic, political and technological disruption, and the combined weight of these forces is the catalyst for a digital revolution among steel and aluminium makers. But we think that embracing the use of connected machines and sensors with the ability to communicate in real time with suppliers and customers, and refining processes based on data analytics, can lead to a significant increase in productivity – and profitability – in this highly competitive industry.

The challenges affecting the ability of steel and aluminium makers to grow profitably and sustainably are considerable. After strenuous efforts to recover from a recession a decade ago, global over-supply caused a further collapse in prices three years ago. Although the relative health of the global economy has boosted demand again, the market must now deal with the imposition of tariffs as a result of trade tensions between the US, China and the European Union.

Stricter environmental regulations, volatility in raw materials prices and greater competition from producers in lower-cost economies are also crimping profitability. At the same time, clients want stronger and more durable kinds of steel, more diversified and specialised portfolios of products and grades, and shorter innovation cycles.

Some companies have successfully implemented, on a piecemeal basis, digital changes such as monitoring and analysing temperature data to maximise performance of the furnace, or predictive maintenance in rolling mills. However the challenge is to build these individual initiatives into a coherent digital business model.

Significant performance improvements and cost reductions can result from a number of approaches, including use of “track and trace” within a steel plant and additive manufacturing, as well as real-time data sharing with customers on the quality of a coil. Digital champions – defined as those with an over-arching digital strategy from production to interaction with customers – are already seeing the benefits of doing this.

Our proprietary analysis shows that getting this digital process right can significantly increase margins, by as much as 16% on a tonne of steel. To reap such rewards, metals

companies must work to create a fully integrated digital ecosystem with their suppliers and customers, combining processes and data at every stage, from raw materials to the end product.

### **The value of the right digital strategy**

Strategy& recently carried out an in-depth analysis of 31 steel companies and 19 aluminium companies, covering the five-year period up to 2017, which showed unequivocally that it pays to adopt digital in the right way.

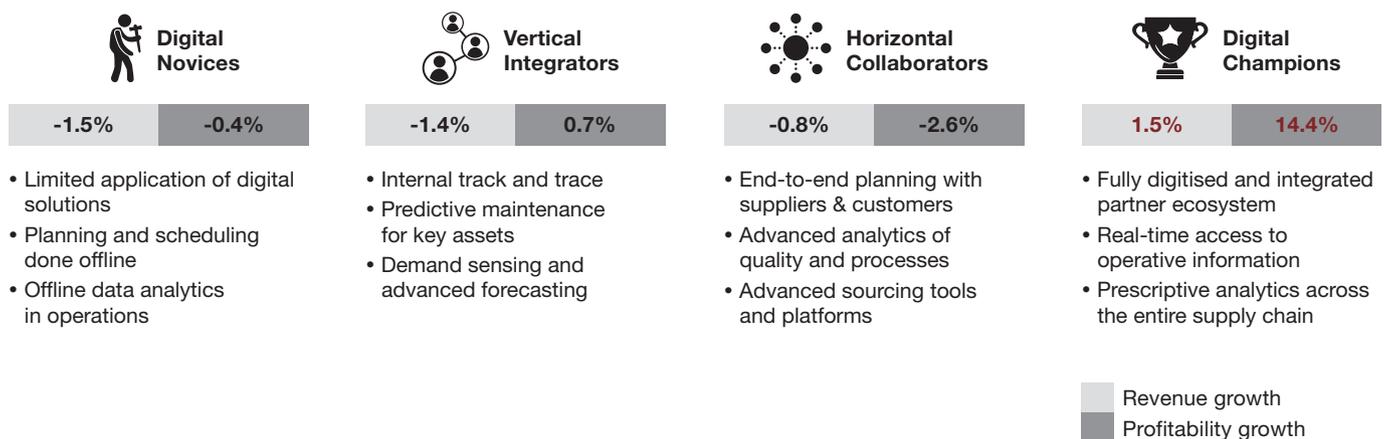
There is a clear divide between the digital champions in the group – which display good top line and margin performance – and digital novices, whose revenues fell over the period while margins shrank.

Digital champions were the only companies in the group achieving a reasonable level of top line growth – a compound annual growth rate of about 1.5% over the five-year period of the study. The same companies also grew their margins by more than 14%. They were better-positioned to handle fluctuations in raw material prices, tended to have less debt and, in the western world, were able to remain viable in the face of considerable price pressure from large Asian competitors.

Price pressure is even stronger for aluminium companies because they are lagging behind their steel counterparts on digitization. The few digital champions we found in aluminium did very well, increasing their revenues by 7% over the period, significantly outperforming their steel counterparts. But the rest of the aluminium sector needs to catch up.

## **Exhibit 1 Digital champions outperform their competitors**

Average compound annual growth rate (revenue/profitability), 2011-17



Source: PwC Strategy& analysis

## In detail: stages in the digital journey

Our analysis looked at how each metals company performed in digital products; market and customer access; value chain processes; IT architecture; compliance and legal; and organisational culture. We then divided them into four groups based on how far along they were in their digital journey: digital novices; vertical integrators; horizontal collaborators; and digital champions (see exhibit 1, page 2).

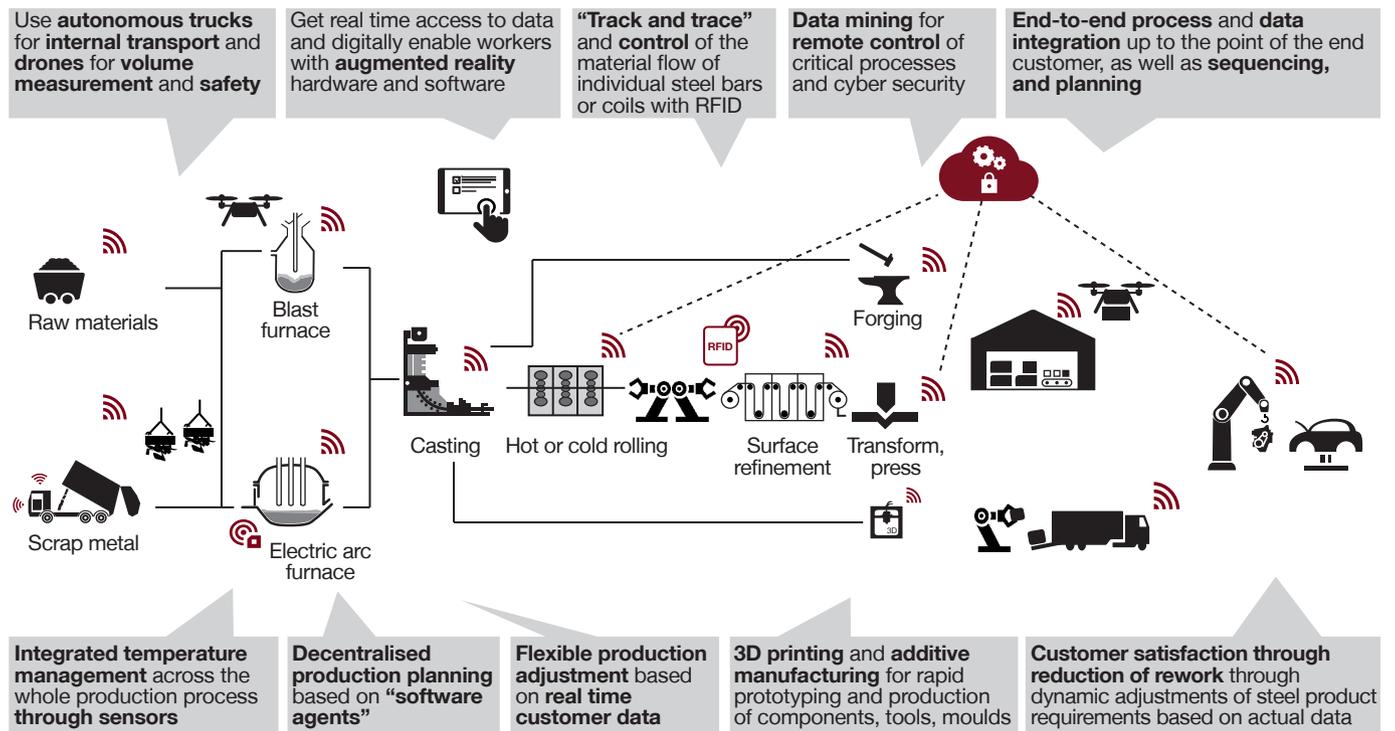
## In practice: what digital champions are getting right

Digital champions are vertically integrated, using digital tools to ensure their production is seamlessly organised and monitored for efficiency. They are also horizontally integrated, sharing data and analytics with suppliers and customers. They are now starting to build digital business models based on these two key elements. Below are two examples of what this means day to day (see exhibit 2):

- One area where vertical integration can work is in the “hot phase” of the steel-making process, where managing variations in temperature between the furnace, hot-rolling and casting stage are critical to manufacturing efficiency.

## Exhibit 2

### Digitisation of metals production and its value chain leads to a productivity revolution



Source: PwC Strategy& analysis

Digital champions will typically combine three kinds of data: data from sensors on furnaces, which are measuring temperature; process-related data like the time taken to cool the steel before the casting process; and finally data showing the quality of the processed steel. All of this is used in real time, incorporating big data analysis to increase efficiency.

- When it comes to horizontal collaboration, digital champions have figured out how to get closer to their customer base by integrating the data they have with the processes of their end customers. For example, a steelmaker supplies information on the quality of its products on a real time basis to an automotive customer, so the automaker can precisely calibrate the pressing of a car body part, helping to reduce waste and scrap.

### **Looking forward to 2025**

Strategy& believes that the next step for metals companies is the creation of a fully integrated digital ecosystem that combines processes and data across the whole value chain. This will include digitisation of the physical product (e.g. information about the quality of the coil), digital services (e.g. product development and quality management) and digital interaction with customers.

By 2025, we see three possible roles for the steel industry:

- Suppliers in a digital ecosystem with consolidated and centralised sales, distribution and planning for various steel producers.
- Far closer integration with customers: steel companies supporting customers with design, development and component production, in a similar relationship to today's battery companies and electric car makers.
- Network supplier: a similar business model to internet platforms would create a virtual and digital network of partnerships in production, development, and sales.

To become digital champions, companies in both steel and aluminium must streamline their processes (vertical integration) while using digital tools to work more closely with suppliers and customers (horizontal collaboration), using them as the basis to build digital business models.

Doing so will revolutionise productivity and enable them to thrive in a landscape of technological change, volatile demand, increased regulation and political uncertainty. The path to success has its challenges, but the time to act is now to lock in the many competitive benefits of embracing a fully digital model.

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