

Unlocking the Potential of Digitalisation in Manufacturing: Advantages, Barriers, and Pathways to Success

by Anton Öreberg and Anton Nyberg

Digitalisation is a global megatrend which is revolutionising all aspects of society, especially impacting businesses in the manufacturing industry. The digitalisation of the manufacturing industry has accelerated since the Covid-19 pandemic and might help in solving some of the great challenges brought by society's increasing demands for various produced goods.

In manufacturing, the term Industry 4.0 has been used to describe the adoption and impact of digitalisation, referring to the fourth industrial revolution. The term encompasses the broad usage of advanced digital tools, the implementation of modern technologies and the interconnection of hardware and software to achieve business advantages. For successful practitioners the results have been eye-opening: Labour productivity can increase by as much as 30%, machine downtime may be reduced by up to 50% and the accuracy of production forecasts increased by 85%. The incentive for manufacturers to digitalise is obviously great. However, there are also several associated challenges.

As part of our master thesis, we've reviewed a wide selection of research articles as well as interviewed decision-makers at four Swedish manufacturing companies of various sizes and in different markets, who are currently in the process of digitalising. The intent was to discover what's standing in the way of the companies fully digitalising, and come up with solutions for all manufacturing companies to overcome the potential barriers so that the entire industry may benefit from these insights.

We discovered that the manufacturing sector has advanced rapidly towards digitalisation in recent years. While some companies have already embraced widespread use of digital technologies, others are just getting started. The high adoption rate of digital technologies in manufacturing points toward a shift in the industry where companies are increasingly investing in Industry 4.0, signalling a turning point where the adoption rate is at its highest.

Our findings indicate that digital technologies offer competitive advantages and numerous benefits for manufacturers, and may also have a positive impact on the environment in the end due to more efficient use of resources. To successfully digitalise does however require companies to overcome the barriers that they will inevitably face on the way. We found that these barriers come in the form of financial limitations, lack of skilled and competent people, employees mounting resistance to being unequipped for change, an overall low digital maturity of the organisation, and dissociation between strategy and execution.

To overcome said barriers, there are numerous factors that companies need to consider. Firstly, digitalisation should be viewed as an organisational change where companies need to focus on effective change management, developing a positive change culture, and mapping the digital maturity within the organisation. Furthermore, focusing on agile development is key to successfully implementing digital technologies. Other success factors that should be considered are, for example, visualising the advantages of digitalisation for the employees, and making efforts towards integrating suppliers and customers in the digitalisation journey.

The findings of the thesis indicate an ongoing paradigm shift in the manufacturing industry towards digitalisation and the potential it brings. To thrive in this reality, companies must overcome their barriers such as skill shortages, technical complexity and internal resistance. Effective change management, clear strategies and a positive change culture are for these reasons crucial for successful digitalisation.