Digital Transformation in Global Manufacturing

October 2021

Passport

The data included in this report is accurate according to Euromonitor International´s market research database, at time of publication: October 2021

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Overview

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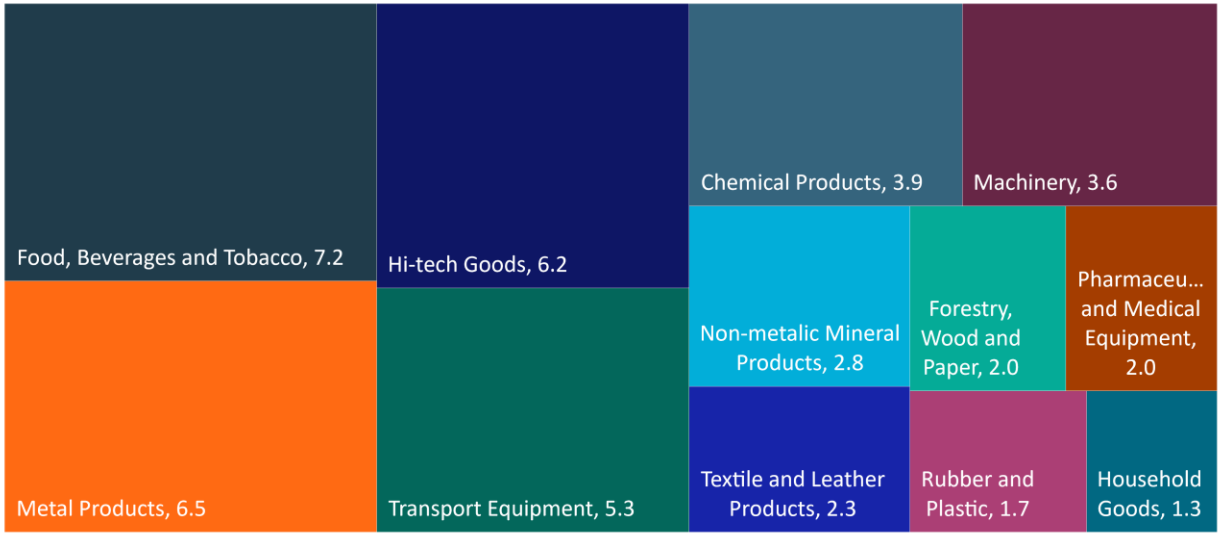
Scope

Global Manufacturing Landscape, USD trillion, 2020



Digital transformation has been identified by industry leaders and through our global analyst network as one of the most important themes for our clients, particularly in manufacturing, education industries and cities.

Investments into digital technologies and industry 4.0 are transforming economies and consumer behaviour. The briefing examines how digitalisation manifests in manufacturing.

The outbreak of COVID-19 has accelerated investments into digital tools as companies are looking for ways to make supply chains more resilient. Manufacturing companies are expected to benefit from new business models and revenue streams created in the next decade. Greater transparency of the supply chains and pool of new data available can help to transition into new sectors.

Key findings

Companies invest in digital tools

The outbreak of COVID-19 has accelerated investments into digital tools as companies are looking for ways to make supply chains more resilient. Around 60% of companies globally plan to reshape and implement digital strategies.

Emerging countries catching up

Transition into digital manufacturing has been led by developed economies although emerging countries are expected to catch up. Middle East and Africa, Asia and Latin America are forecast to offer most growth opportunities for digital tools providers.

Production automation on the rise

Investments into production automation accelerate as it helps to improve production efficiency and reduce costs. Around a third of manufacturing companies globally are planning to accelerate investments into automation.

New tools to bring productivity gains

The global manufacturing sector is forecast to achieve USD1.3 trillion in productivity gains per year thanks to the use of digital and production automation tools. These gains come through improved efficiency, lower operating costs and elimination of production bottlenecks.

New revenue streams

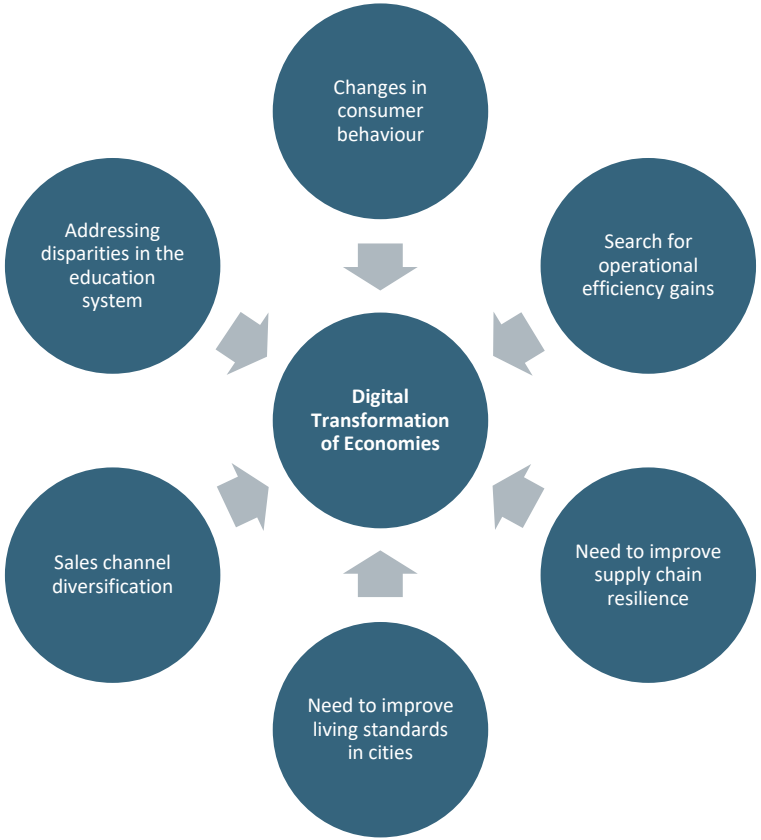
Manufacturing companies are expected to benefit from new business models and revenue streams created in the next decade. Greater transparency of the supply chains and pool of new data available can help to transition into new sectors.

Exploring Digital Transformation in Economies and Consumers

Digital transformation of the economies is taking shape and, in turn, changes how consumers are purchasing goods, the interaction of companies and the way businesses are structured. Moreover, new data flows enable countries and companies to increase operational efficiency, improve living standards in cities and provide better access to public services.

Digital transformation of business activities is becoming ever more important after the COVID-19 pandemic. Companies feel increasing pressure to invest into digital tools and production automation equipment in order to better prepare for future shocks. New technologies can help to improve operational efficiency, make supply chains more resilient and open new sales channels.

Improving household access to the internet and the post-pandemic effects are also driving changes in consumer behaviour. Digital tools allow consumers to stay connected while at home and re-enter the outside world safely. This is anticipated to change the way consumers live, shop, work and travel.



Digital Transformation in Economies in-depth

Digital business tools

- Companies invest in digital tools to improve operational efficiency

Production automation

- Addressing the need to improve efficiency and supply chain resilience

B2B e-commerce

- B2B sector expands e-commerce presence to diversify sales risks

Trends driving digital transformation in manufacturing

Smart cities

- Digital tools enable improvements in living standards and transportation

Digital learning

- Digital tools enable better access to education and more flexibility

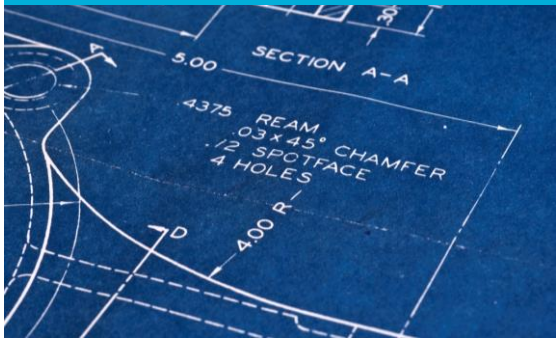
Connected households

- Improving access to the internet drives consumer behaviour changes

Three areas of digital manufacturing

Product design

Covers engineering, design and simulation of products. Data analytics, machine learning tools and simulation models help to design, test and refine products before their mass production.



Smart manufacturing

Covers physical manufacturing or products. Smart machines, predictive maintenance tools, 5G network help track the production process in real time and help to refine and optimise the production process.

Value chain management

Covers component sourcing, supply chain and sales process management. AI and data analytics tools, e-commerce platforms and sensors help to feed and analyse the data to optimise inventories and improve product quality and customer satisfaction.

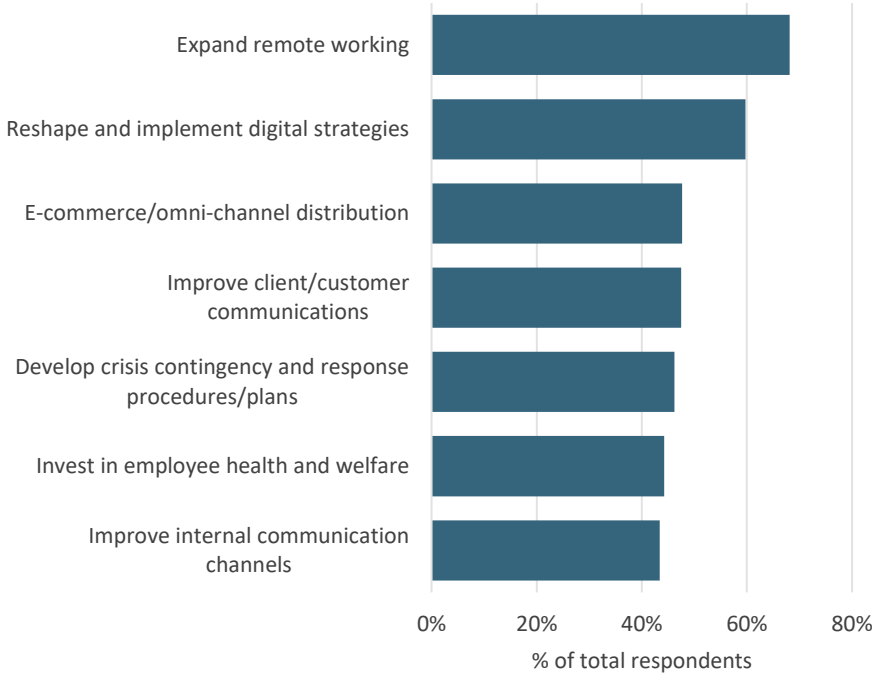
COVID-19 pandemic accelerates digital transformation

The manufacturing industry was already investing into smart manufacturing and digital solutions, yet the COVID-19 pandemic has proven to be the biggest accelerator to the transition. Facing production and supply chain disruptions, companies accelerated spending on robotics and other automated production solutions. Moreover, the growing importance of e-commerce has sparked investments into data analytics tools which help to better analyse consumer behaviour and reduce decision-making time.

According to the Voice of the Industry Survey April 2021 results, companies are expected to continue investing more into digitisation of business activities. Expanding remote working and ensuring employee welfare remain the top priority, followed by plans to reshape and implement digital strategies. Almost 60% of companies globally plan to review their digital strategies as digital tools helped them to better cope with the pandemic's effects.

Around 50% of the companies in the survey also indicated plans to invest more into e-commerce channels and improve communications, both internally and with their clients. Improved communication and diversified sales channels can help to reduce operating risks and digital tools will be crucial in supporting these objectives.

What future measures do you expect your business to introduce or adapt to prevent similar risks in the future?



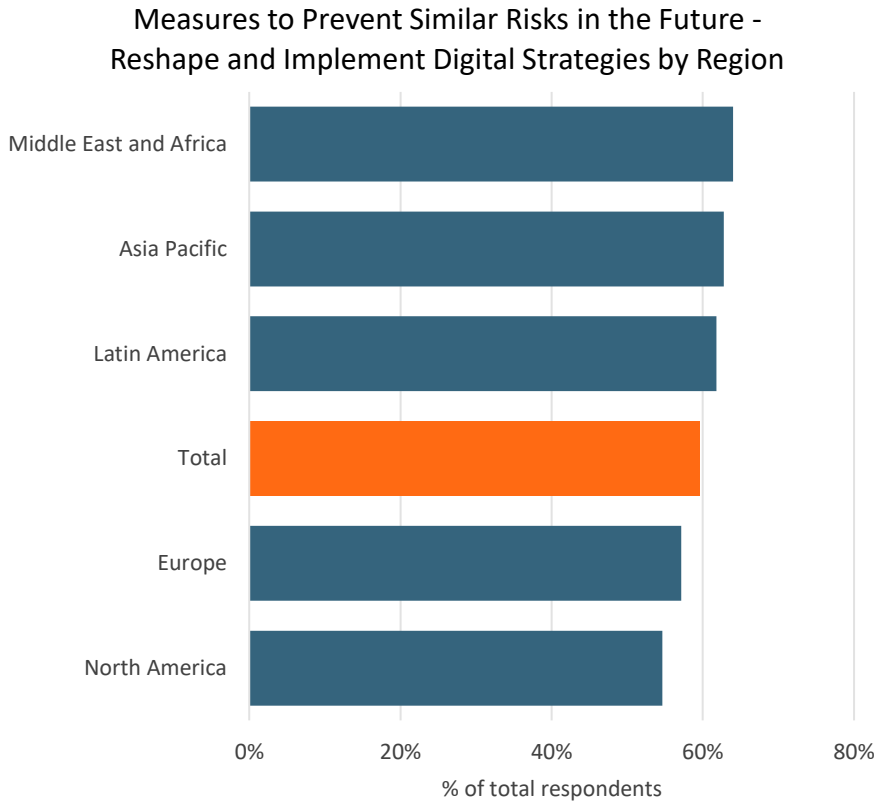
Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

Developing markets take the lead in reshaping and implementing digital strategies

Digitisation in the manufacturing sector is increasingly important during and post-pandemic, as companies need more knowledge on every step of the supply chain. With digital tracking of their supply chain, companies can better prepare for disruptions, pinpoint bottlenecks, and optimise production.

Countries in the emerging regions are anticipated to invest more into digital strategies. Middle East and Africa and Asia Pacific are the top regions which are digitising their supply chain strategy. To some extent, this is due to a low comparison base as these regions are lagging in comparison to other regions when it comes to having digital strategies in place, and companies were more severely hit by the COVID-19 pandemic. Moreover, rising operational costs and changes in the labour market due to an ageing population in Asia will support investments into digital tools.

Companies in Europe and North America are forecast to invest more into digital strategies, partly due to anticipated production localisation and a general shift towards e-commerce and remote work. However, a smaller share of companies in these regions are predicted to invest into digitisation in comparison to the global average, partly because of already high business digitisation in these regions.



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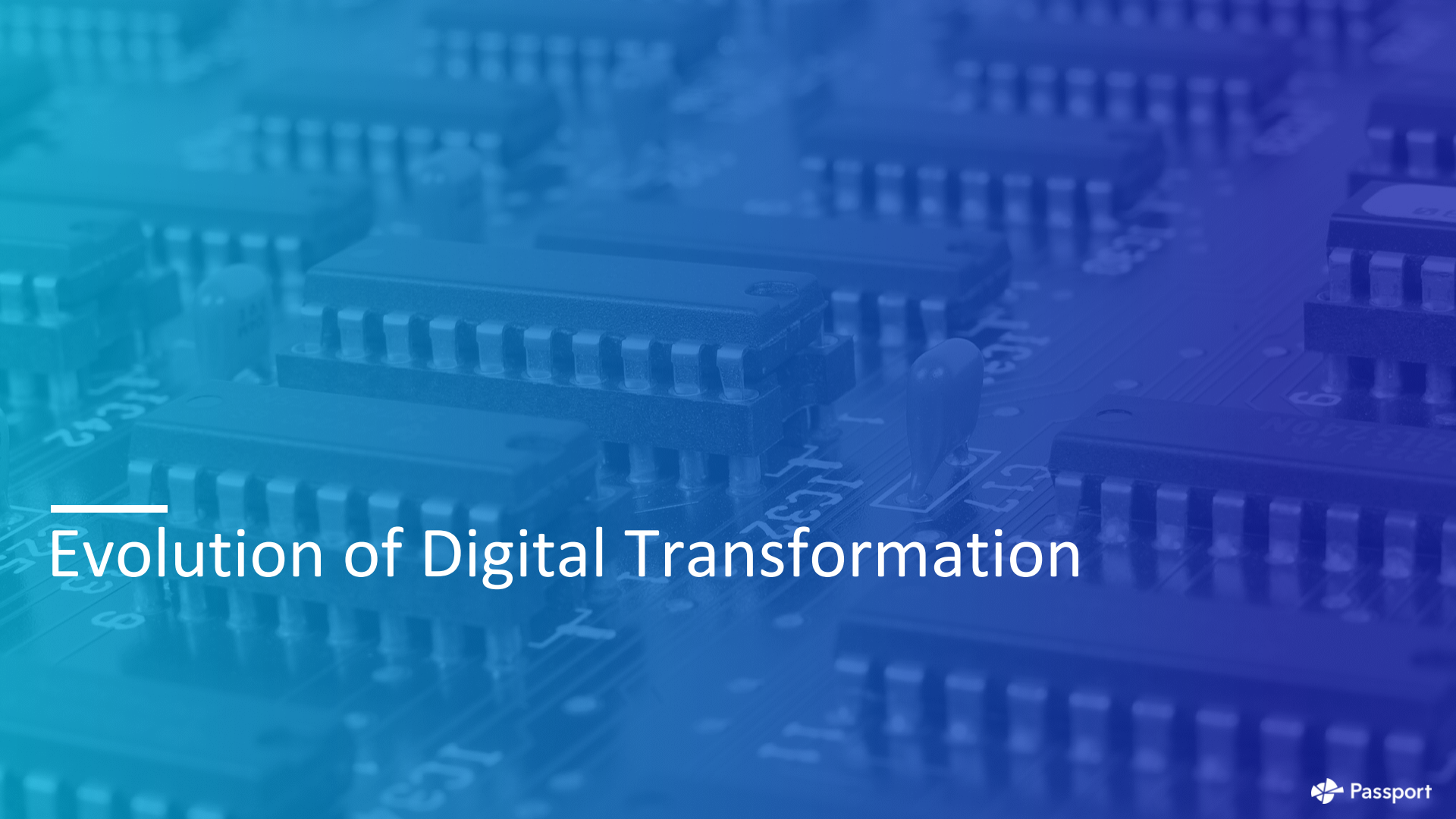
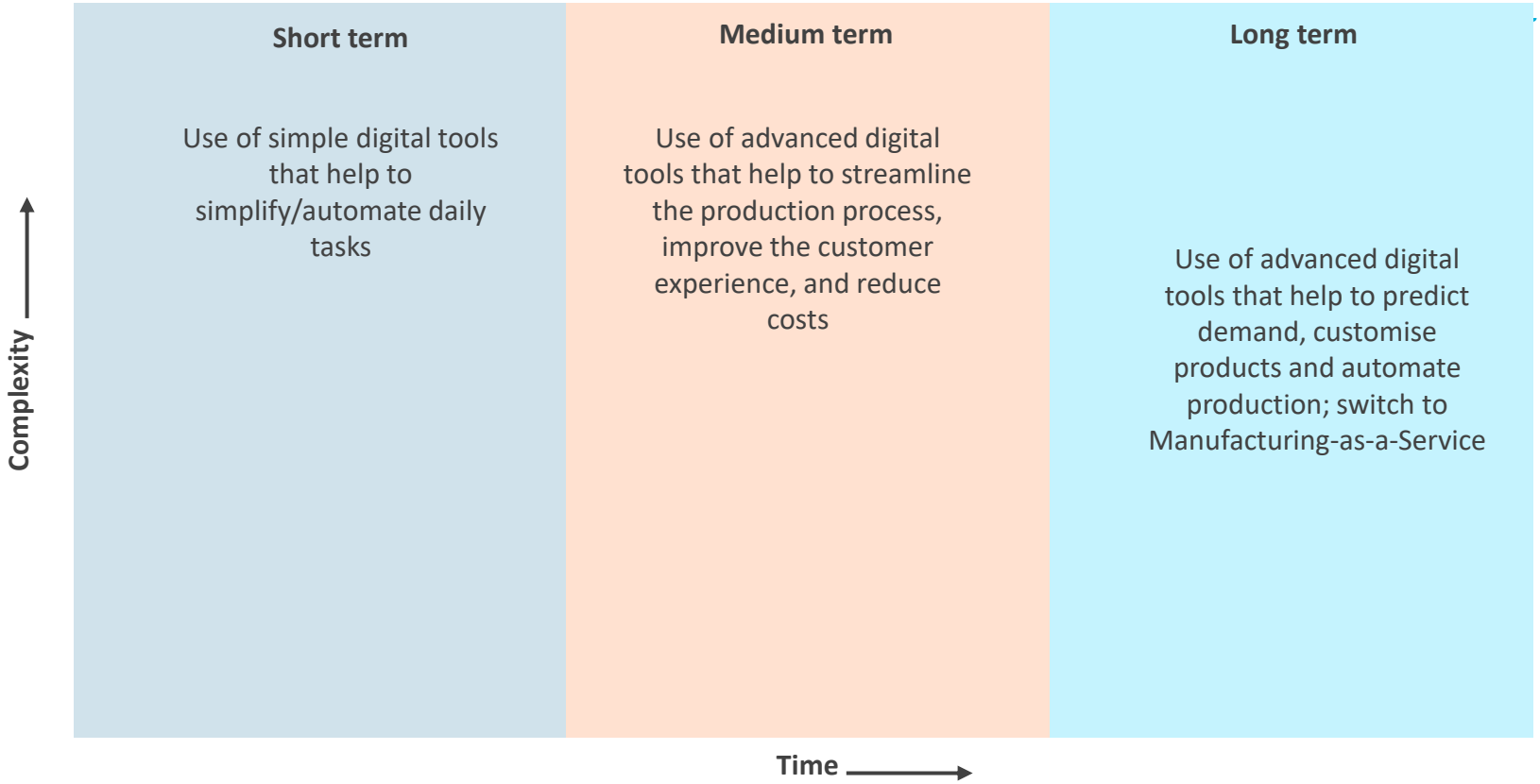


Evolution of Digital Transformation

Passport

Evolution of digital transformation



Digital tools to enable more advanced business models

Short-term benefits

Companies have accelerated investments into digital tools that help to simplify or automate daily processes, as well as remote work tools during the COVID-19 pandemic. This helps to solve existing challenges in the supply chain and business management.

52%

of companies globally increased tech capacity to enable new work patterns during the pandemic

Medium-term benefits

Companies are planning to invest more into advanced production methods and digital tools during the next five years. More advanced solutions would provide medium-term gains thanks to improved productivity, lower costs, better customer experience and greater flexibility of supply chains.

60%

of companies globally plan to reshape and implement digital strategies to avoid disruptions in the future

Long-term benefits

In the long term, digital tools and advanced production machinery are expected to gradually transform the manufacturing sector. Greater transparency of supply chains, e-commerce platforms and data analysis tools would accelerate product customisation and help to switch to the Manufacturing-as-a-Service method.

30%

of companies globally plan to accelerate investments into automation and new supply chain technologies

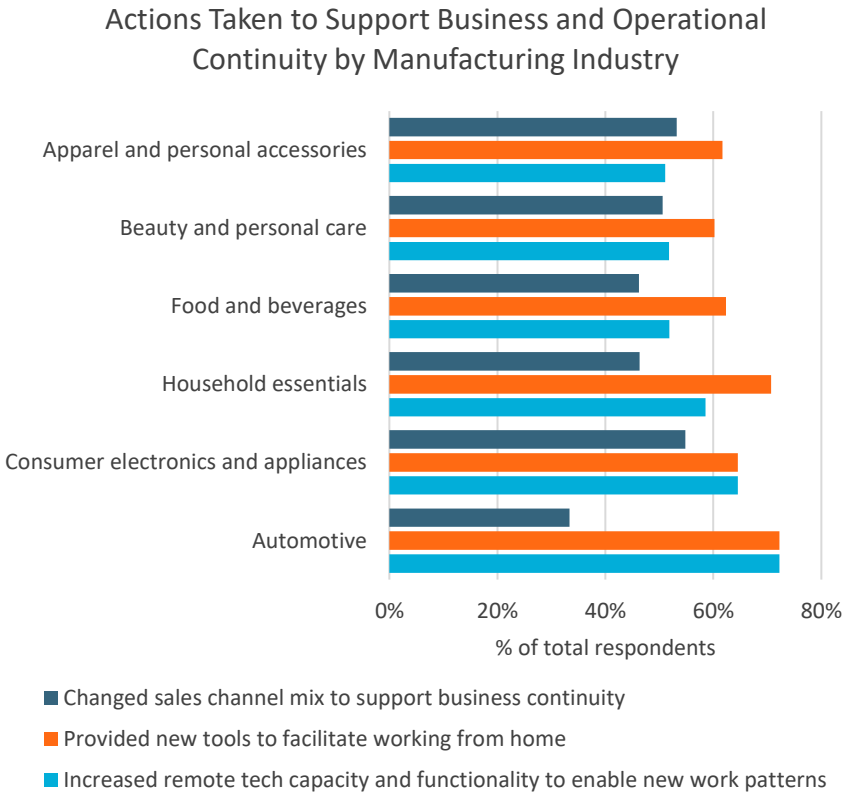
Companies turn to digital tools to cope with COVID-19 effects

The outbreak of the COVID-19 pandemic acted as an additional catalyst for the implementation and usage of digital tools. Companies started to use new tools that enabled remote working. Digital tools also helped to redistribute the sales mix by switching more sales to online channels.

The launch of tools enabling remote work was the initial response by many companies, with 62% of companies providing tools to facilitate working from home. Additionally, more than half of the companies increased remote technology capacity and functionality. This helped to maintain daily business activities relatively unscathed by the pandemic and ensure business continuation.

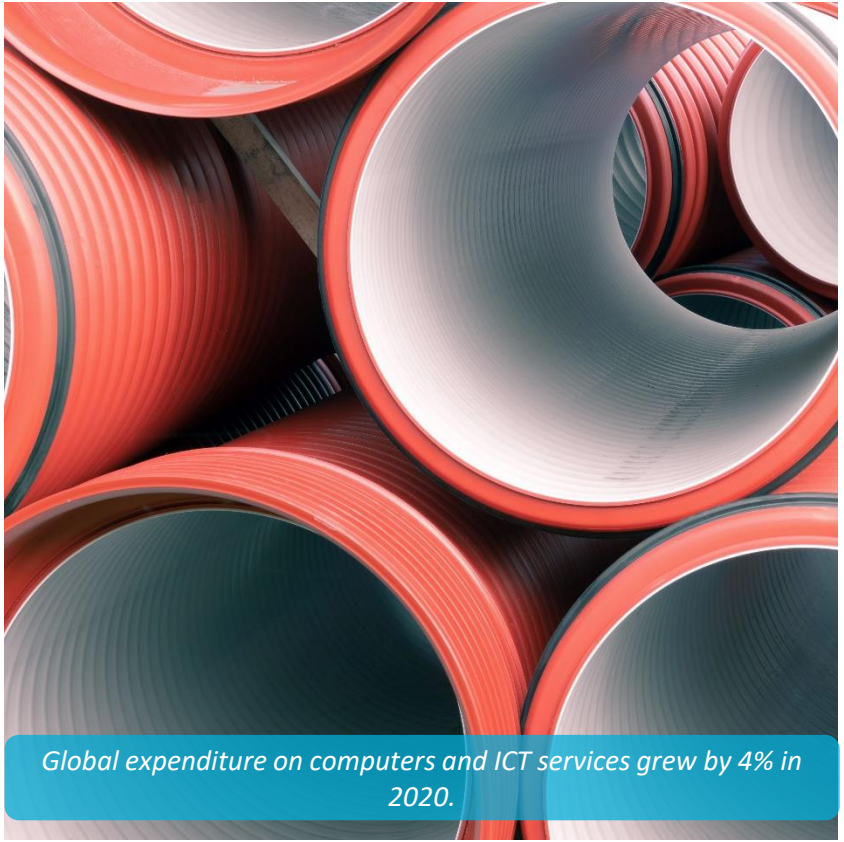
Digital sales platforms was another area which companies explored. Around 35% of companies globally have reviewed their sales mix during the pandemic and strengthened online presence. The shift to e-commerce helped to partly offset losses caused by lockdowns.

Digital tools enabling e-commerce and remote work are expected to become a mainstay in the industry. Improved work flexibility and diversified sales channels will help to better prepare for future risks. However, as more companies start to use these tools, initial competitive advantage will wane, and companies will need to invest into more advanced digital tools.



Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

Case study: Garlock – using digital tools for crisis response



Global expenditure on computers and ICT services grew by 4% in 2020.

Characteristics

- Garlock is a multinational producer of pipeline and fluid sealing solutions.
- After the outbreak of COVID-19, Garlock, with the help of external suppliers, was able to create in less than 24 hours secure and password-protected pages which all employees could access.

Context

- With the rapid changes and social distancing measures caused by COVID-19, the company needed a safe digital platform to manage its crisis response plan remotely.
- Digital solutions helped the company to quickly share time-sensitive information, critical to crisis response plans, and to efficiently communicate internally and externally with clients.

Consequences

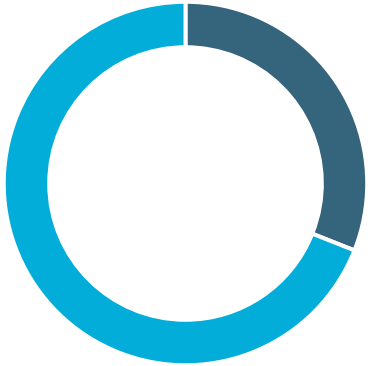
- Digital tracking tools help companies to improve internal communication during a time of emergencies and add more operational flexibility. Tools enabling e-commerce or remote work are anticipated to become the mainstay in the industry.

Advanced production methods to help manufacturing companies remain competitive

In the next five years, manufacturing companies are expected to accelerate investments into advanced production methods and digital tools. Intense competition in the market and the need to make supply chains more resilient is expected to drive innovations.

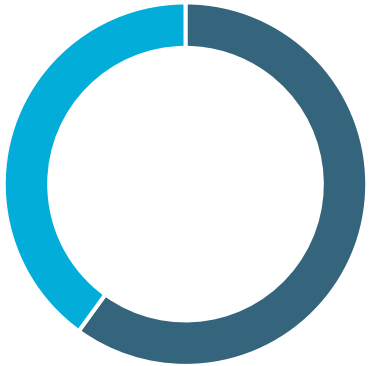
Companies are planning to invest more into advanced manufacturing technologies to reduce operating costs and improve production efficiency. Moreover, automated production methods can help companies to localise part of the production and, in turn, be closer to the end consumers and save on logistics. Production localisation is especially relevant for manufacturers, with 21% of manufacturing companies globally planning production localisation, according to the Voice of the Industry COVID-19 survey (April 2021).

E-commerce platforms are another area where companies are investing. Once production efficiencies are achieved, companies are expected to turn their attention towards customer experience and satisfaction. E-commerce platforms can help to better understand consumer behaviour, customise orders and gather useful feedback on product usage. In turn, companies can gather more data to help speed up product development and improve services.



31%

OF MANUFACTURING COMPANIES PLAN TO INVEST IN AUTOMATION AND SUPPLY CHAIN TECHNOLOGIES



60%

OF MANUFACTURING COMPANIES PLAN TO INVEST INTO E-COMMERCE AND OMNICHANNEL DISTRIBUTION

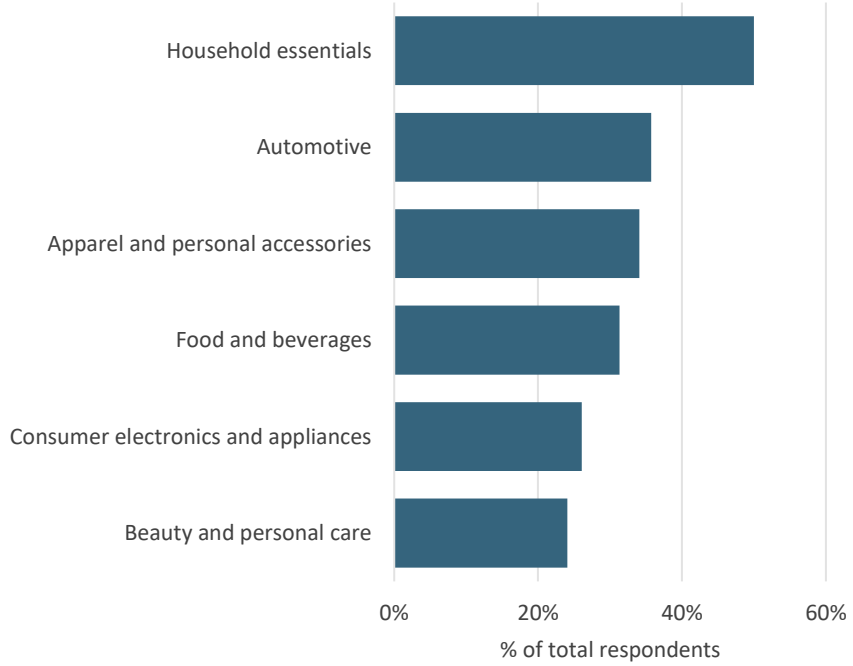
Household essentials leads investments in automation and new supply chain technologies

Automation remains a key investment for companies across industries. With companies needing to comply with new health measures and social distancing for employees, industrial robots and automation tools help to alleviate this pressure and increase productivity and product quality.

From Euromonitor International's Voice of the Industry Survey 2021, the household essentials industry comes out on top as having the most respondents investing in automation to prevent operations risks in the future. The global production of household essentials is set to increase by 33% during 2020-2025 with a forecast production value of USD1.7 trillion by 2025.

Household essentials is dominated by furniture, whose supply chains are especially sensitive to changes in materials and transport costs that were disrupted during the pandemic. Furniture manufacturers are also keen on reducing costs as much as possible; thus, implementing automation can boost productivity while keeping costs low. In addition, automation would place less pressure on furniture manufacturers whose productivity has already been affected by pandemic-related factory closures or social distancing measures.

Invest in Automation and New Supply Chain Technologies to Prevent Similar Risks in the Future by Manufacturing Industry



Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

Case study: Arrival – using microfactories to produce electric vans

36% of automotive companies plan to invest more in localised production.

Characteristics

- Electric van start-up Arrival is launching microfactories to produce its electric vans.
- The company is planning to build a network of 20,000 sq m factories. Each facility is around 24 times smaller than a typical car factory.

Context

- The new manufacturing concept is expected to provide more flexibility for the company and reduce investment costs.
- More importantly, microfactories allow Arrival to quickly apply and test new technologies and production methods on a smaller scale. This speeds up product development, a key advantage for a start-up.

Consequences

- Microfactories relate to the production localisation trend and are expected to grow in popularity in manufacturing industries. A network of semi-independent production hubs adds more flexibility to the production network. Companies can also use microfactories to customise products for specific regions or types of buyers.

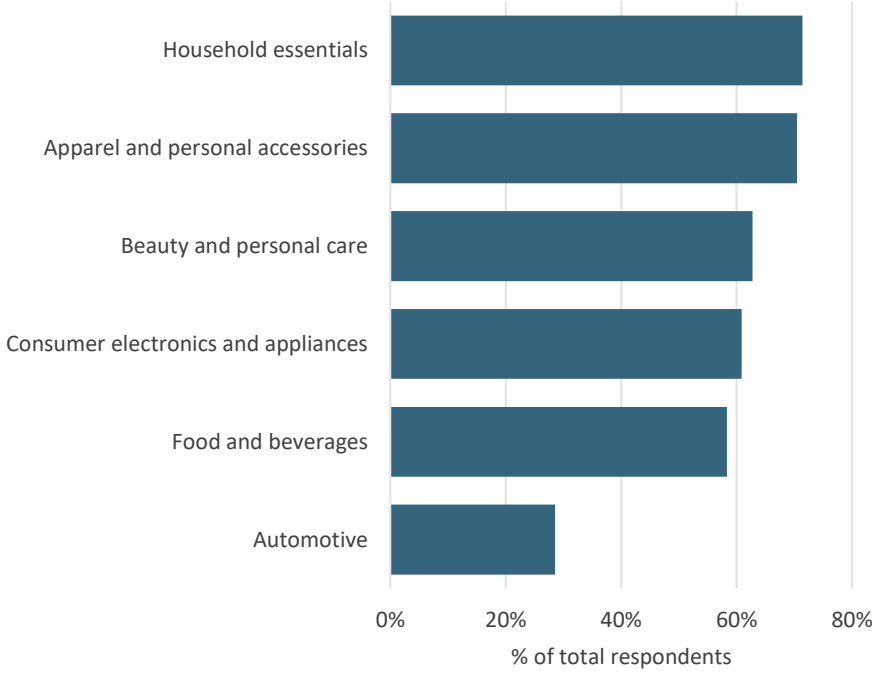
Manufacturers place more focus on e-commerce/omnichannel distribution

During the pandemic, the manufacturing sector was highly affected by shifts in local production such as factory closures, or the implementation of social distancing measures. As a result, many B2B customers made the switch to purchasing goods online, and this trend is to stay. In addition, the global B2B e-commerce market is forecast to increase by 66% over 2020-2025, making e-commerce platforms a worthwhile investment.

Euromonitor International's Voice of the Industry Survey 2021 indicates that the personal accessories, consumer electronics and appliances, and household essentials industries take the lead in focusing on diversifying their product distribution strategy. In contrast, the automotive industry ranks lowest on the list. Many automotive manufacturers have e-commerce platforms in place, but these platforms are not utilised as much as in other industries, because automotive buying processes are more complex and consumers are less likely to purchase cars solely online.

Asia Pacific is the top region for share of companies looking to optimise their e-commerce and omnichannel distribution. The region accounted for over half of global industrial output in 2020 manufacturing output and experienced fast economic recovery from the pandemic.

Share of Companies Looking to Optimise E-Commerce/Omnichannel Distribution by Manufacturing Industry



Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

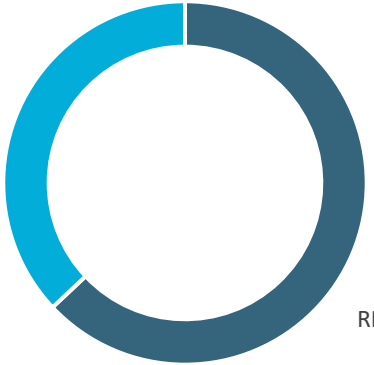
Digital tools enable companies to create new revenue streams

In the long term, digital tools and advanced production methods are predicted to transform the manufacturing sector. Improved data tracking and analysis tools will open up pools of new data. These new data can help to improve product design and help to better understand demand for new products.

New data flows, combined with data analysis tools, can help companies to better plan production, anticipate potential emergencies and perform scenario planning, in turn making the manufacturing process more flexible and resilient.

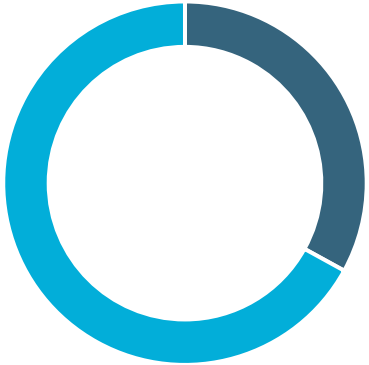
Data itself can be a new currency for manufacturing companies. By leveraging data, companies can expand into new operating segments and create new revenue streams. For example, companies can sell additional services to their clients on how to reduce energy costs, improve logistics or optimise expenditure based on the usage patterns collected. Essentially, this would accelerate the shift to the Manufacturing-as-a-Service concept.

However, shortage of talent will remain one of the obstacles hindering the shift. Companies will have to find ways to train their employees and successfully use the new technologies. Moreover, the shift to Manufacturing-as-a-Service may require more transparency across production networks and changes in management practices.



63%

OF MANUFACTURING COMPANIES PLAN TO RESHAPE AND IMPLEMENT DIGITAL STRATEGIES



33%

OF MANUFACTURING COMPANIES PLAN TO CONDUCT SCENARIO PLANNING TO ANALYSE AND FORECAST DEMAND

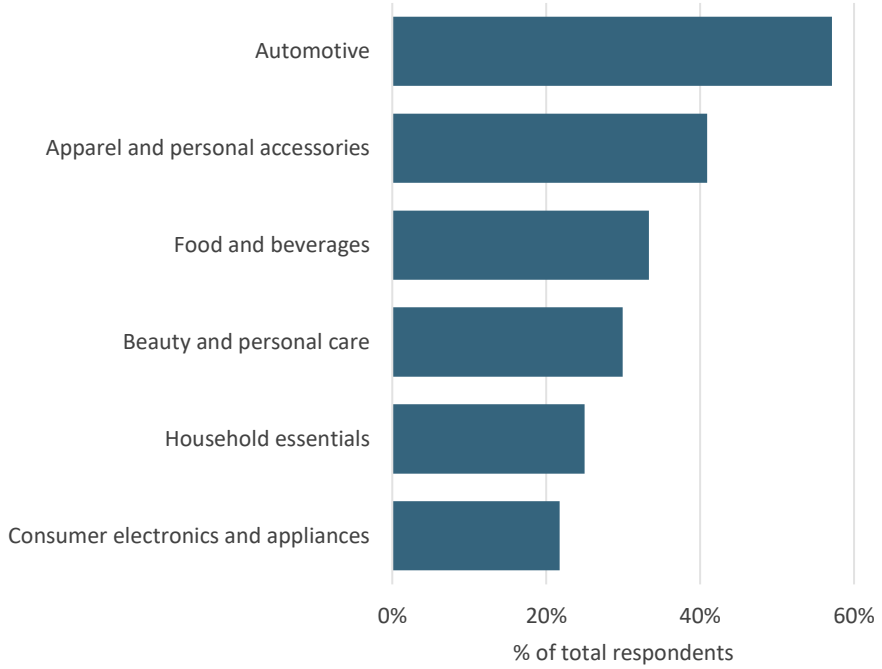
The automotive industry is engaging the most in global scenario planning

It has become increasingly important for companies to scenario plan, analyse and forecast factors that could potentially impact the market and their industry's demand. From Euromonitor International's Voice of the Industry Survey 2021, the automotive industry took the lead in strategic planning to mitigate potential external risks and demand impact.

The automotive industry faced decreased demand for new vehicles during the pandemic, impacting emerging markets the most. However, the industry is forecast to continue recovering into 2021 with a full recovery in 2022. Automotive manufacturers are gradually resolving supply challenges, although below-optimal production capacity levels and shortages in certain necessary materials in the supply chain are still observed.

One of the major ways automotive companies are working to avoid similar disruptions to their production is by reviewing supply chains and scenario planning. Latin America holds the largest share of companies which are conducting more analysis and scenario planning to prepare for potential market impacts, which is especially important being an emerging market, as it can be more vulnerable to market disruptions.

Conduct Global Scenario Planning, Analysing and Forecasting Potential Market Impacts and Demand Impact by Manufacturing Industry



Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

Case study: Shell uses scenario planning to identify post-pandemic opportunities

33% of manufacturing companies globally plan to invest more in scenario planning tools and forecasting demand changes.

Characteristics

- Shell Chemicals' unit producing polymers used digital tools to monitor and plan daily changes in the polymer market.
- The company also involved employees and gathered their feedback on challenges, which helped it to perform more in-depth scenario planning.

Context

- Scenario planning proved to be beneficial for the company during the outbreak of COVID-19. The company was able to monitor daily changes and effectively communicate with its clients.
- Scenario planning also helped test current business plans, identify existing vulnerabilities and spot new growth areas in the post-pandemic world.

Consequences

- Rising geopolitical, environmental and healthcare risks will encourage manufacturing companies to use more scenario planning tools. These help spot potential vulnerabilities in advance and add flexibility to the production network.

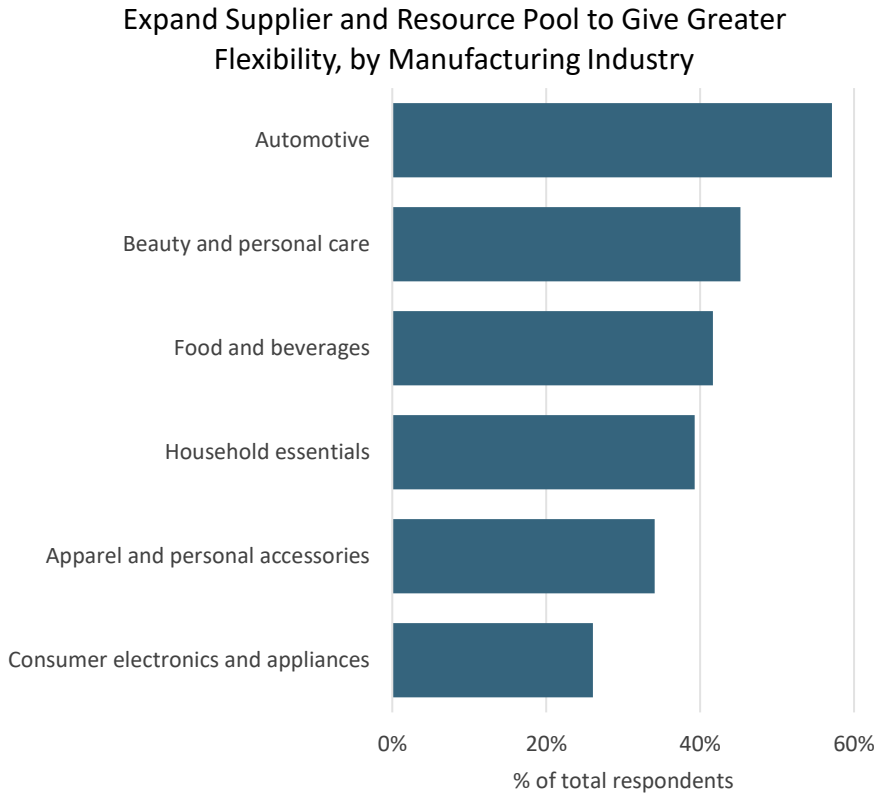
Manufacturing-as-a-Service offers greater flexibility and customisation

Manufacturing-as-a-Service is expected to emerge as a natural evolution of business, enabled by digital technologies. Initially, manufacturing companies focused on producing and selling single items, then started offering rental services and are expected to transition into selling manufacturing services.

Manufacturing-as-a-Service would be a win-win situation for the manufacturer of the product and the buyer of goods. For manufacturers, this would help to reduce inventory costs and better plan raw material purchases. On average, the manufacturing industry globally spends USD437 billion on warehousing services.

Buyers of manufacturing services would also gain from the ability to customise products and shorter delivery times. Moreover, by outsourcing manufacturing services, buyers could reduce investments on machinery and would require fewer skilled workers capable of operating digital tools. Machinery remains one of the highest costs, with manufacturing companies spending USD1.8 trillion in 2020 on machinery and its components.

Manufacturing-as-a-Service would mainly benefit industries with long supply chains and a relatively high degree of customisation required, such as automotive or hi-tech goods. It would enable companies to source custom components and reduce capital costs on machinery.



Source: Euromonitor International Voice of the Industry COVID-19 survey, April 2021

Case study: Gilead Sciences and Pfizer collaborate to speed up production

37% of consumer health companies globally plan to expand supplier and resource pool.

Characteristics

- Pharmaceuticals companies, biotech companies, researchers and government agencies in the US increased collaboration efforts during the COVID-19 pandemic.
- Pfizer announced it will cooperate with Gilead Sciences to manufacture and supply investigational treatment from COVID-19.

Context

- Pfizer will act as a contract manufacturer and will use its production facility in Kansas to manufacture remdesivir for Gilead.
- Collaboration between the companies is expected to speed up production and testing of the new drug. The move also helps to better optimise production capacity.

Consequences

- Contract manufacturing is one of the ways companies can embrace Manufacturing-as-a-Service. Collaboration helps to speed up product development, reduce costs and maintain product quality. Pharmaceuticals companies are expected to accelerate contract manufacturing as demand for healthcare services increases.

Case study: Kaeser Kompressoren – selling desired outcomes to customers

Electricity and energy accounted for 4% of the manufacturing industry's total costs in 2020.

Characteristics

- Kaeser Kompressoren is a supplier of compressed air systems, with clients from energy, transportation, construction and other B2B industries.
- The company changed its business model and started selling air compression services.

Context

- Industrial IoT technology was applied, helping to gather data from machinery and predict maintenance. This helped to reduce unscheduled equipment downtime by 60% and reduce energy costs by 29%.
- By providing desired outcomes to consumers, the company gained a higher market share.

Consequences

- Digital tools will enable manufacturing companies to sell desired outcomes for consumers instead of simply selling final products. This can help them to gain competitive advantage and improve customer loyalty. However, companies will need to better understand customer needs in order to succeed.

Benefits of Digital Tools

Benefits of digital technologies

Improved productivity

Efficiency gains

Lower costs

Higher innovation level

Customisation

USD1.3 trillion

IN PRODUCTIVITY GAINS

USD203 billion

GAINS FROM REDUCED PRODUCTION DOWNTIME

10%

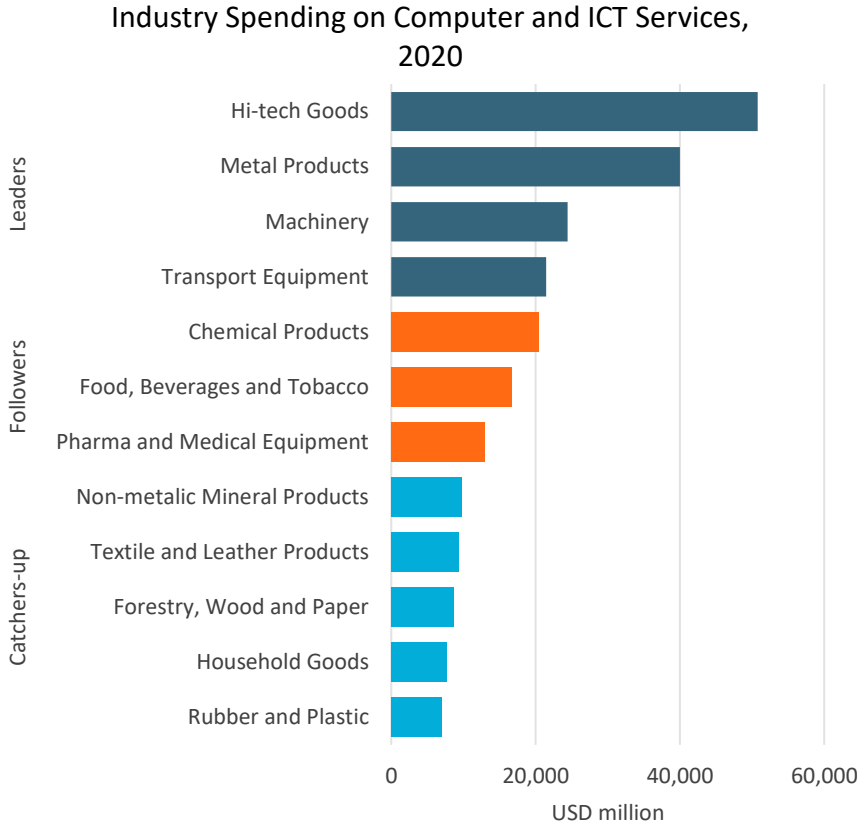
SAVINGS ON TRANSPORTATION COSTS

Streamlined production process can lift production efficiency

Investments into digital tools can help to improve the productivity of a company. Estimates from Germany show that advanced production automation and simulation tools can help to improve production efficiency by 3-5%. If similar results could be achieved on a global scale, total gains in the global manufacturing industry would total USD1.3 trillion per year.

Part of the production gains can be achieved by better planning of the production process. This helps to directly reduce operating and warehousing costs. Moreover, companies can benefit from streamlined production process and time savings. Such gains are difficult to quantify, yet provide far greater benefits in the long term. For example, by using digital tools, companies can test and refine products virtually, resulting in cost savings in R&D, engineering, delivery time and after-sales services.

Improved production efficiency would mainly benefit manufacturing industries with wide product portfolios and long supply chains, although the gains are likely to vary. Industries such as automotive or electronics could benefit the most as they stand at the forefront of the digital transformation. However, digital tools could also benefit manufacturers of food products, machinery or chemical product industries.



Digital tools can help to reduce production downtime

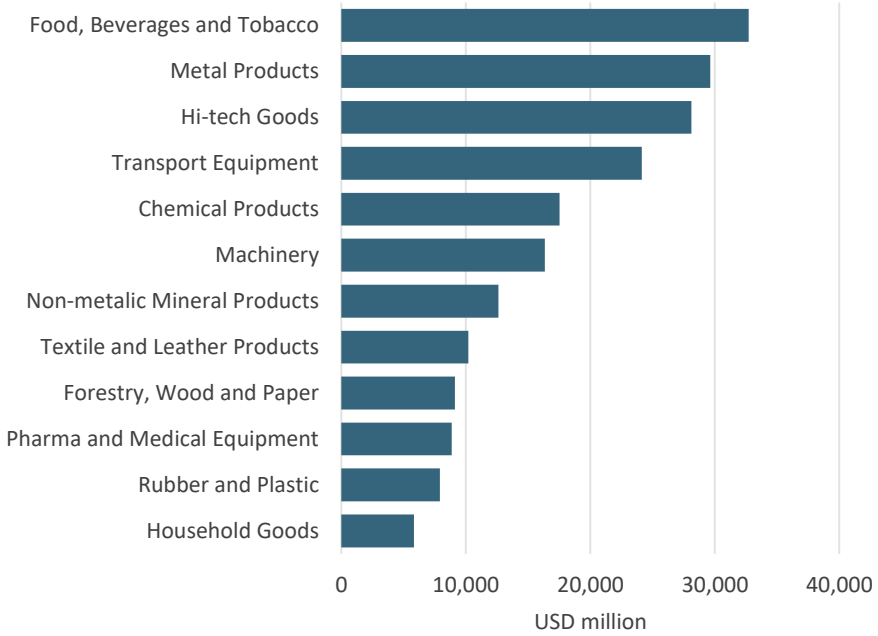
Production downtime is one of the biggest hidden costs for manufacturing companies. Estimates suggest that, on average, manufacturers deal with 100-800 hours of production downtime each year, with results varying between countries and industries.

On a global scale, manufacturing industries can lose up to USD203 billion each year due to lower production volumes caused by production downtime. Moreover, this leads to losses in employee productivity and depleted inventory and can add to employee stress and dissatisfaction levels.

The most common cause of production downtime is faulty machinery, accounting for over 50% of all incidents. Digital tools and sensors in production machinery could indicate the need for maintenance in advance and help to minimise or eliminate losses from production downtime.

Errors in the production process are another hidden cost that manufacturing companies are facing. Faulty machinery or human errors can increase product waste and reduce product quality. Digital production management tools can help to eliminate potential errors by adding more transparency and providing real-time production data.

Potential Losses from Production Downtime* in Manufacturing Industries, 2020



*Note: *Assumption made that the industry faces 100 hours of production downtime per year, 50% of the downtime is caused by faulty machinery and affects one third of the company's operations*

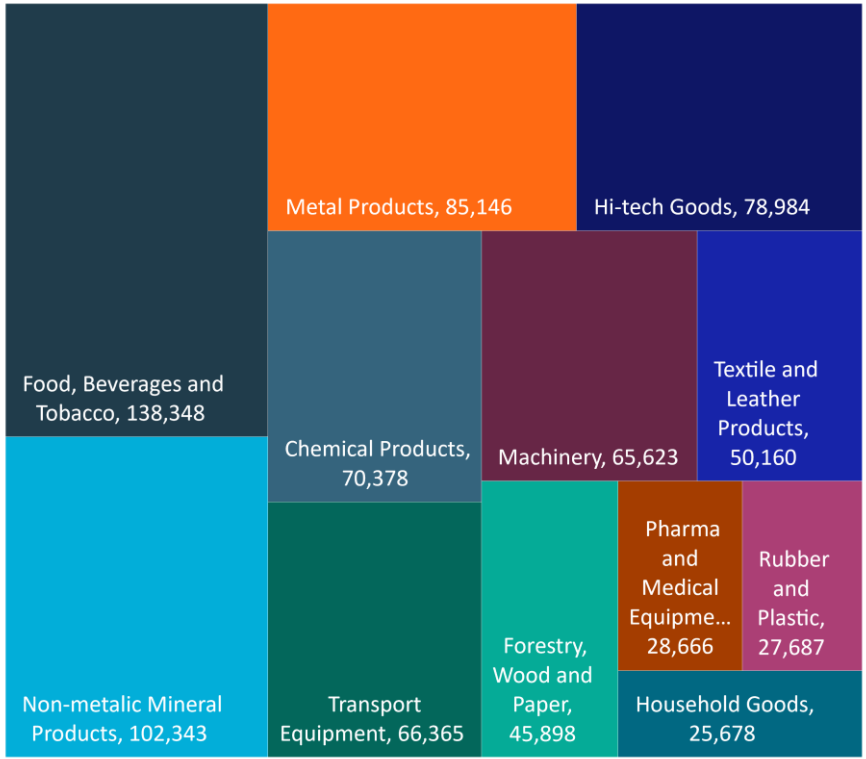
Better supply chain management to reduce transportation costs

In addition to improved productivity, better production planning and order management process can help to reduce warehousing and transportation costs. On average, the manufacturing industry globally spends 3% of its total costs on logistics and transportation services. Estimates suggest that improvements in supply chain and transportation management can help to reduce transportation costs by 10% or USD78 billion.

Logistics simulation and delivery management tools would help to provide savings on transportation. For example, digital copies of goods would allow 3D simulation to determine the best way to organise goods in the shipping container or truck. Advanced digital tools would also allow the addition of a time dimension to the simulation process. This would help companies to add delivery, transportation and production schedules to the system to determine the most efficient transportation network and mode.

Lower logistics costs would mainly benefit food, mineral products, metal products and hi-tech goods industries. However, to fully benefit, companies would need to invest in ICT infrastructure and software tools in order to create the most optimal delivery networks. Moreover, additional training of employees would also be required to fully benefit from new digital solutions.

Spending on Logistics by Industry, USD million, 2020



Case study: Taylor Farms uses digital tools to improve logistics

The global food industry spent USD137 billion on transportation and logistics in 2020.

Characteristics

- Taylor Farms is a supplier of fruit and vegetables, providing products to the largest supermarket and fast food chains in the US.
- The company relies heavily on timely and efficient product distribution.

Context

- To improve the logistics process, Taylor Farms collaborated with Redwood to create a custom application that helps to schedule trucks and automatically determines loading time.
- The new tool helped to increase the utilisation of trucks and increase customer satisfaction.

Consequences

- As companies are aiming to localise production and make supply chains more resilient, transportation management tools will become more important. Companies relying on cold storage, such as food companies, or just in time delivery, such as automotive companies, could gain the most from improved logistics processes.

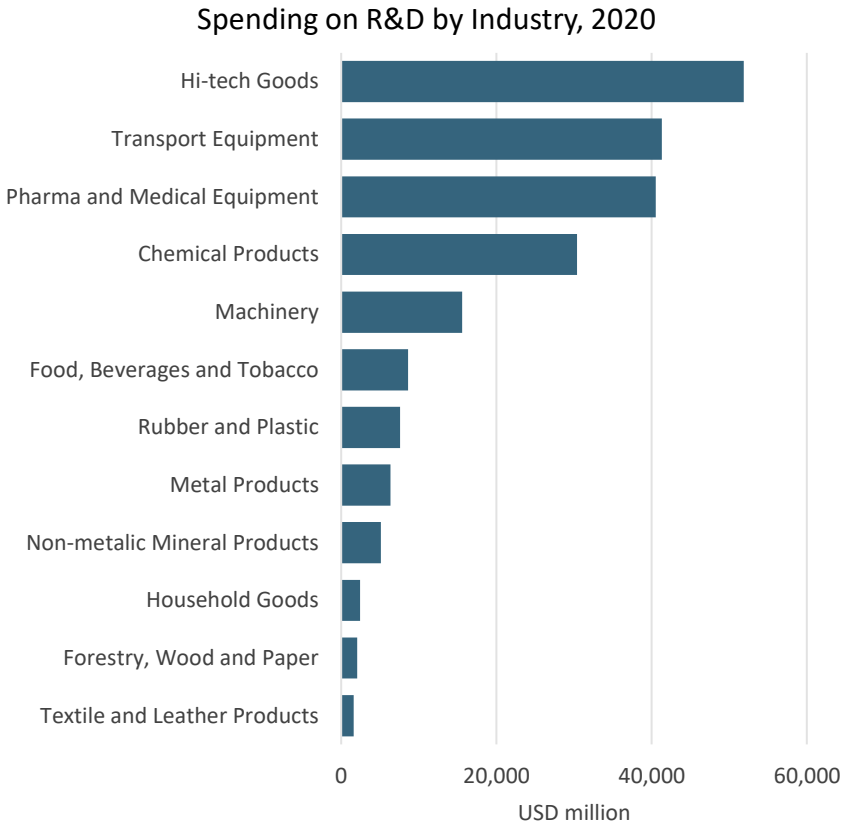
Higher innovation level to help drive revenue growth

Intense competition in the global manufacturing sector drives the need to innovate and develop better products. Manufacturing companies spent USD213.5 billion on R&D in 2020, slightly lower than USD218 billion in 2019.

Digital tools already play a crucial role in the innovation process, with companies investing heavily in project management tools or design software. However, new data analysis and management tools can help to extract more knowledge about the markets and customers. The creation of 5G network and IoT tools can also help to better learn how customers are using products and improve the product design.

Higher innovation levels can also help companies to better withstand unexpected shocks. For example, research from the European Commission's Joint Research Centre shows innovative companies faced a drop in performance that was only half that of non-innovative ones during the outbreak of the COVID-19 pandemic.

Understanding the markets and the end consumer is increasingly important to companies as the shift to e-commerce accelerates and companies aim to improve communications with clients. For example, 40% of companies in the Voice of the Industry April 2021 survey indicated the aim to improve client communication.



Case study: Caterpillar’s machinery simulation

30% of companies globally plan to accelerate investments into digital tools.

Characteristics

- Caterpillar is using digital simulation models which help test machines used in mines.
- The simulations enable a wide range of specific events and errors that help to test the machinery and train operators.

Context

- Simulators provide the company with real-time data and give immediate feedback to the engineers on product design and qualities.
- Customers also gain an opportunity to test the equipment before making the buying decision and any equipment goes into production.

Consequences

- Virtual simulators are anticipated to gain ground in the manufacturing industry as they help to speed up product design, train technicians and users. Virtual tools are primarily useful for automotive, machinery, and aerospace companies.

Case study: Philips Lighting uses tracking system

52% of companies globally increased remote tech capacity during the COVID-19 pandemic.

Characteristics

- Philips Lighting designs and sells commercial lighting systems to clients. The company is also using a digital tracking system in its products.
- Assuming the client agrees, Philips tracks the hours of lighting equipment use, motion in the room, dimming level and other features.

Context

- The tracking system provides Philips with valuable data on how customers are using the product. Based on this, the company can improve product design or offer custom products.
- Consumers also benefit as they can better track and manage energy usage and predict servicing intervals. Motion detection also offers new marketing opportunities for retailers.

Consequences

- Digital tracking tools are expected to gain more ground as companies are aiming to better understand clients' needs and improve products for specific uses. The systems have a wide array of applications and can be used in manufacturing, services or retail industries.

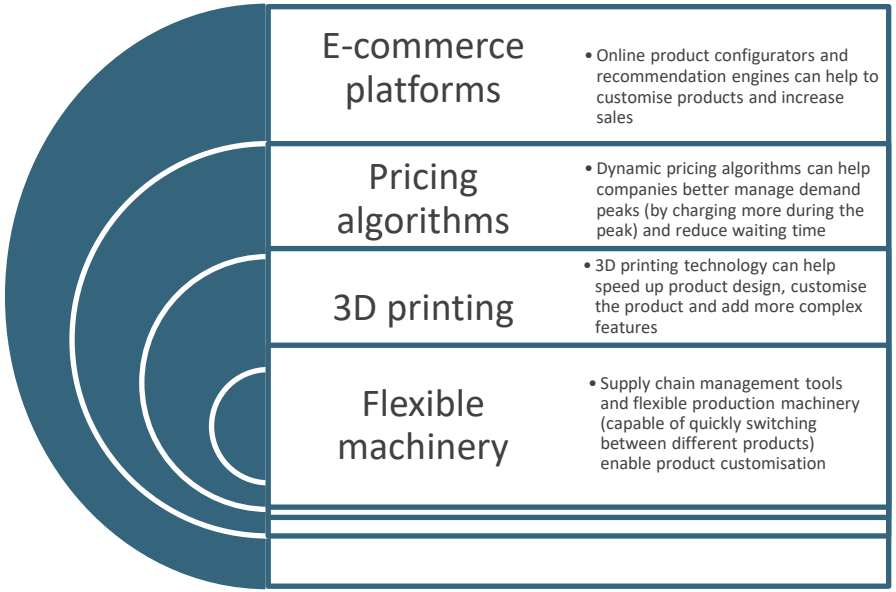
New production methods enable product customisation

Product customisation is one of the benefits that digital and production automation tools can help to achieve. By customising products, companies can better meet the needs of consumers and increase sales. Research suggests that customers are willing to spend up to 20% more on custom products. As consumers increasingly shift to e-commerce channels, the customisation trend is expected to accelerate. According to Euromonitor International's Lifestyles survey 2021, 58% of consumers globally seek curated experiences that are tailored to their personal tastes.

The availability of data analysis tools, e-commerce platforms and new manufacturing methods, such as 3D printing or robots, can help companies achieve a manageable cost level for customisation efforts and scale up production.

Product customisation is currently the most widespread in industries with a high share of household purchases, such as apparel, food products or healthcare services. Industries selling big-ticket items, such as cars or domestic appliances, also increasingly allow buyers to customise their products. These trends are expected to gradually shift into the B2B market as well. This would benefit suppliers of plastic products, chemical goods, mineral products and similar input materials used in a variety of manufacturing industries.

Tools Enabling Product Customisation



Case study: Ford's AI-equipped robots for flexible manufacturing

31% of manufacturing companies globally plan to accelerate investments into automation tools.

Characteristics

- Ford is using industrial robots equipped with AI software from Symbio.
- The robots are used at the Livonia transmission plant, supplying components for the Bronco, Escape, Edge and other models.

Context

- Transmission assembly is a complex process that typically requires manual work. This also challenges workers' safety as operators need to handle heavy components manually.
- By using Symbio technology, Ford managed to gather data and adjust robots to handle heavy components. This also added more flexibility to the assembly line.

Consequences

- Flexible manufacturing equipment, such as collaborative robots, are expected to continue gaining more ground in manufacturing industry. This helps companies to customise products and improve production efficiency. An ageing workforce will also put pressure on employers to invest in advanced production machinery that can work alongside workers.

Potential Challenges and Recommendations

Passport

Potential challenges in digital transition

Short planning horizon

Companies and employees typically focus on day-to-day activities and short-term goals. A short planning horizon hinders transition and adoption of digital technologies as it requires longer planning cycles and benefits are not immediate.

Overreliance on technology

When planning investments into digital tools, companies often start with popular technologies such as IoT, machine learning or artificial intelligence. This leads to more complex integration of new systems into an existing landscape and underutilisation of the technologies the company already has.

Insufficient data analysis

Digital tools can help to extract pools of new data. However, lack of sufficient data analysis tools and understanding of how to leverage this data makes it more difficult to extract full value from new technologies.

Internal resistance

Integration of digital tools into existing business models often requires changes in management and corporate culture. This can increase stress on workers and lead to resistance to new technologies.

Talent shortage

Companies can face shortage of skilled workers which can lead to increased costs of digital tools and delays in implementation. The need to retrain existing workers also increases costs and makes it more difficult to calculate return on investment.

How companies can overcome challenges in digital transformation

Perform scenario planning

Scenario planning can help to identify existing vulnerabilities and opportunities in an existing business model, helping to spot areas where digital tools would bring the most benefits.

This can also help to expand the planning horizon and spot new trends that will reshape the business in the long term.

Integrate data

Digital tools can help to extract new data and information on product design, production bottlenecks, consumer behaviour and other areas.

However, the value is limited if the data analysis is not integrated into all lines of business. Cross-sectional analysis helps to analyse data in broader view and spot new potential.

Engage with employees

Engagement with workers, proactive decisions and clear communication on the long-term goals are critical to the success of digital transformation.

Companies that successfully applied digital tools involved workers in the process (through surveys or other channels). This helped to better understand existing problems and reduced internal resistance.

Leverage existing technologies

Companies already have a wide array of technologies in use that can be leveraged in digital transition.

Investments into digital platforms that are based on existing software can simplify digital transition, reduce employee training costs and reduce internal resistance.

Conclusion

The outbreak of the COVID-19 pandemic hit the supply chains and manufacturing industry particularly hard. Now, the manufacturing industry stands at the forefront of digital transformation which is set to improve business resilience to future shocks.

Digitisation of the manufacturing process offers significant opportunities for companies that successfully manage the transition. Digital tools can help to transform product development costs, improve operational efficiency, create new revenue streams and make the work environment more secure and less stressful.

63%

of manufacturing companies plan to reshape and implement digital strategies

10%

predicted savings on transportation costs thanks to new technologies

USD1.3 trillion

expected productivity gains from improved production methods

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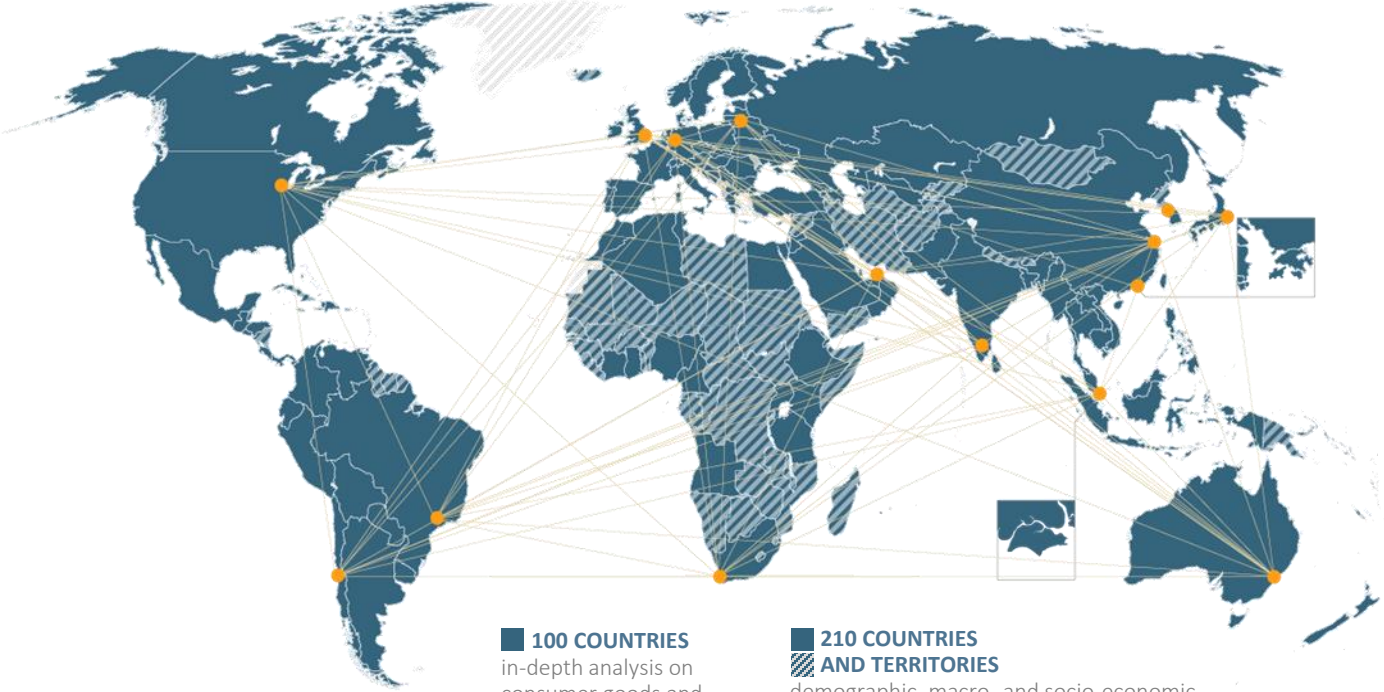

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