Digital Transformation Outlook

Global textile and apparel industry report 2019



Published by WTiN

Supporting partner

CEMATEX

GLOBAL DIGITAL **TRANSFORMATION REPORT**

The Fourth Industrial Revolution foresees a textile and apparel industry centred around increased efficiency and productivity and more agile manufacturing, complete with an evolved, transparent supply chain that meets consumer demands for sustainable, personalised and functional products. Such pressures are forcing supply chains to reinvent themselves and adopt new business models in order to meet the expectations of the Industry 4.0 consumer. The combined global value of digital transformation is expected to exceed US$100tn by 2025. [1]

Questions remain about the best route for businesses to achieve these goals. It is also unclear to many just how far the textile and apparel industry has moved along the road to digitalisation, and how quickly it is progressing. While industries such as automotive have been the subject of detailed study, the complex and dynamic textile and apparel supply chain has largely been overlooked.

To assess the complex and diverse developments in the textile and apparel industry and shed light on the progress being made towards digitalisation, WTiN has carried out the second Global Digital Transformation Survey of the textile and apparel industry.

This publication reports the key findings from the survey as well as detailed analysis of current perceptions of digital transformation, change strategy, organisational modifications, and investment in digital technologies and processes. Moreover, it illuminates the overall impact of digital transformation on businesses to date and the challenges the industry faces, as well as providing insight into the likely future of digital transformation in the textile and apparel industry. The findings are also compared with last year's survey results to fully reveal the progress made in digitalisation and automation over the last year.



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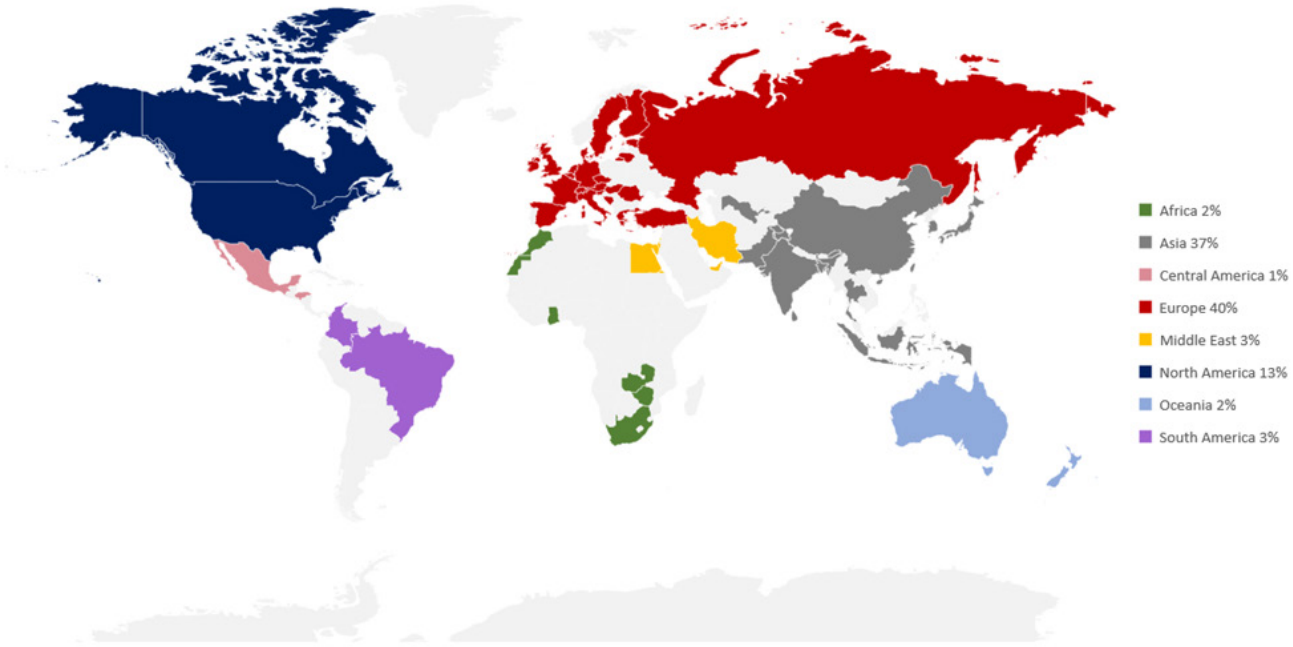

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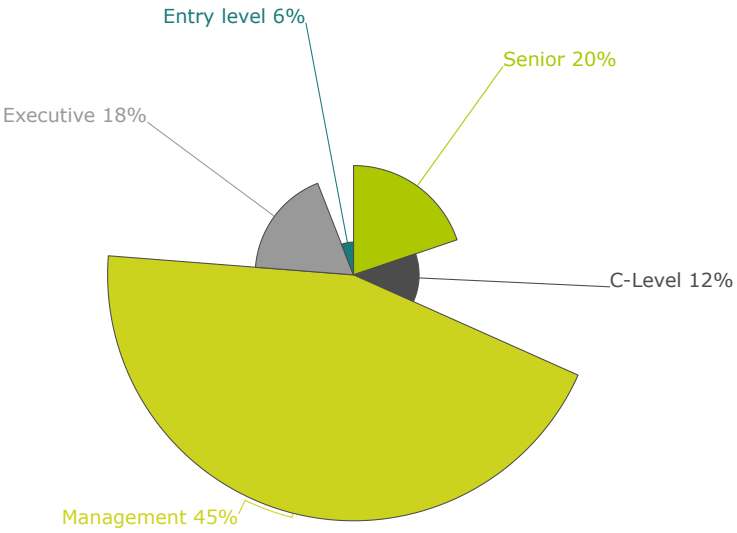
Respondent profile

The Global Digital Transformation Survey 2019 was carried out over June-August 2019. It engaged industry specialists from all areas of the textile and apparel supply chain, covering 55 countries. Among all the regions represented in the survey, the highest percentage share of the respondents was in Europe (40%), followed by Asia (37%) and North America (13%). 176 of these responses came from three key respondent groups: OEMs (technology providers of both hardware and software); Manufacturers (fibre, fabric and apparel producers); and Brands & Retailers. These are the respondents that we carried forward to further analysis, due to their differing but vital roles in the supply chain.

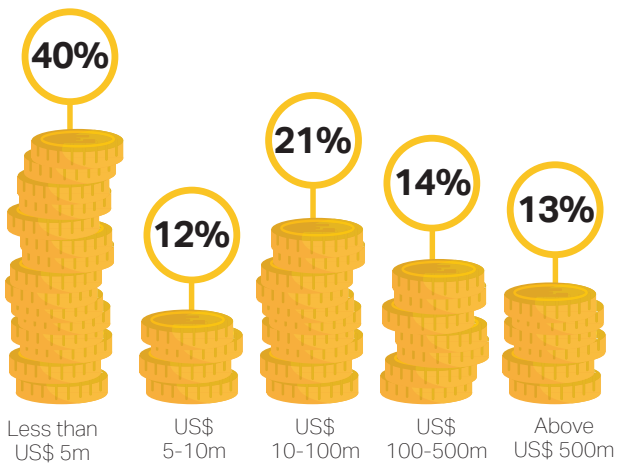
Geographical location



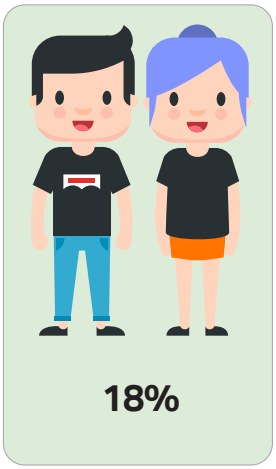
Job function



Size of business

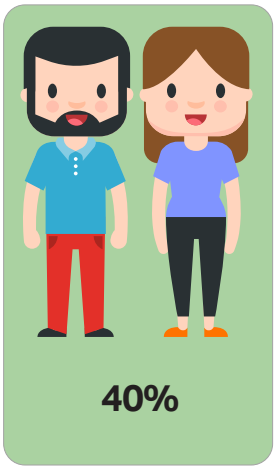


Generation



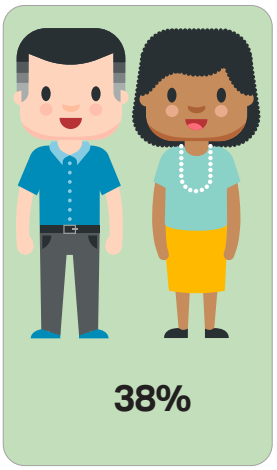
18%

Age 19 - 35 (Millennials)



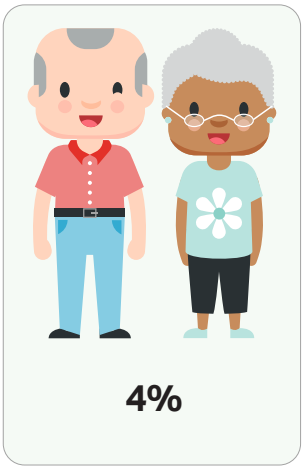
40%

Age 36 - 51 (Gen X)



38%

Age 52 - 70 (Baby boomers)



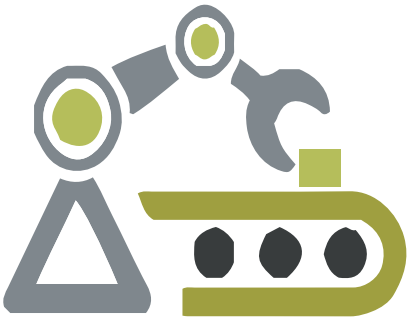
4%

Age 71 or over (Y Generation)

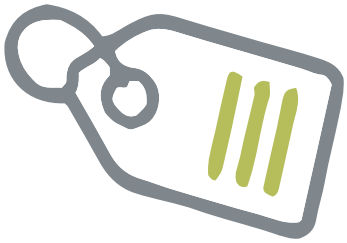
Sector



32%
OEMs



49%
Manufacturers



18%
Brands & Retailers

KEY **FINDINGS**

Despite multiple challenges, there is a more positive outlook for digital transformation compared to 2018

1. Companies adopt a more open stance to digital transformation



1.1 A significant move towards thinking about digital transformation as a present necessity rather than a future ideal

The textile and apparel industry has adjusted its attitude over the past year and now sees digitalisation as a present necessity rather than a futuristic concept.

This is directly reflected in the significantly higher proportion of textile and apparel businesses that have started on the digital transformation journey. Over the last 12 months, there has been an increase of 23% in textile and apparel businesses that are actively engaged in digital transformation – showing that companies have not only started thinking about digitalisation, but are also acting on it. And importantly, companies still not engaged in the process of digital transformation are also now beginning to think of it as a present necessity. In comparison to 2018, of respondents who have not yet embarked on their digital transformation journey, 67% more say in 2019 that they are aiming to achieve digital transformation within the next year.

Sentiment analysis shows a positive industry outlook at +0.56 (on a scale of -1 to +1). By comparing this to last year, it is clear that the industry's attitude to digital transformation has become significantly more positive with a 51% increase in sentiment since 2018.



1.2. Growing enthusiasm among major regions, but with a leadership shift

The growing digitalisation trend is observed across all key regions: Asia; Europe; and the Americas.

Last year, Asia was the geographical front-runner with 71% of respondents having embarked on digital transformation. This year, that figure has risen to 76%. However, Europe now tops the list, with 84% of respondents having embarked on digital transformation; a 36% increase from 2018. Equally, 23% more North American respondents have embarked on digital transformation since 2018. While there are many possible reasons for this, it might be explained by the surge of investment in digital technologies after ITMA 2019 in Barcelona.



1.3 The digital transformation trend increases across all respondent group types

All respondent group types have increasingly engaged in digital transformation, with OEMs still the leading group. This year's results show that 94% of OEMs are in the process of digitalisation, a 29% increase compared to last year. Meanwhile, 71% of Manufacturers have taken steps towards digitalisation, a 25% increase compared to 2018. Similarly, there has been a 16% overall increase among Brands & Retailers that are actively engaged.



1.4 Goals remain consistent, indicating that the industry has a strong focus point

In general, OEMs, Manufacturers and Brands & Retailers have remained consistent across 2018/2019 in their goals for digital transformation. The fact that the goals of digital transformation have remained consistent across all industry groups over the last two years is a positive sign, as it means there is a strong focus point in the industry.

OEMs are still prioritising the launch of new digital products and/or services; Manufacturers, too, have remained consistent in identifying their highest priority as digitising business operations, delivering the exact same result as last year; and Brands & Retailers are still focused on the use of digital channels to interact with customers.

2. Digital transformation driven top-down with positive investment going forward



2.1. Senior management continues to propel digital transformation

Like last year, senior management has driven a company's vision for digital transformation, followed by R&D, operations and marketing departments. Primarily, modifications are being applied to customer-facing business structures – a trend that is quite different from that reported in 2018, when the key operational change was in the amendment of standard operating procedures to include new digital technologies. This shows that the industry is beginning to realise that digitalisation is not something that one company can achieve alone but requires close collaboration within the value chain. To achieve this, marginally more businesses are focusing on developing talent internally rather than investing in consultancy.



2.2. Connected devices dominate current investments

Similar to last year, the textile and apparel industry has predominantly invested in the following: connected devices; data analytics; internet of things (IoT); and synchronising bill of materials (BOMs). However, the category that led investment in 2018, cloud computing (64%), has significantly dropped down the list as an investment priority in 2019. Likewise, interest in smart robotics has nearly halved.



2.3. Positive investments going forward

In the next five years, respondents will together invest between US$99m and US$144m in digital technologies or processes and, in the next 12 months, individual respondents are expected to invest an average of US$1m, with overall investment reaching US$24m-36m. This translates to a 20% increase in the expected average investment of individual respondents compared to last year.

3. Key challenges remain consistent across the years



3.1. Technology requirements and investment plans made by OEMs and Manufacturers conflict

Limited commercial solutions for the textile and apparel sector, or high price entry points for some technologies, could delay digitalisation. Notably, there is some discrepancy between the perceived requirements and stated investment plans of OEMs and Manufacturers. Only Brands & Retailers are planning to invest in the technologies that they require.



3.2. Key respondent groups still not fully on the same page

For digital transformation to be successful, all supply chain partners must have common goals. While there is a clear disparity between what Manufacturers say they require and what they are planning to invest in, some of their investment plans do match what OEMs and Brands & Retailers believe Manufacturers require. OEMs and Brands & Retailers now agree that Manufacturers require the most connected devices and smart sensors as one of their top three priorities, and Manufacturers are indeed prioritising investment in smart sensors over the next five years. However, despite this limited agreement, players in the supply chain still have differing points of view.



3.3. Expensive investments and a lack of clear vision remain key challenges

The perceived challenges of digital transformation differ slightly, depending on whether businesses have or have not embarked on their digital transformation journey. For those who have invested, key challenges are a lack of clear vision and leadership, high financial investment requirements and business partners/suppliers/customers that are unable to collaborate. For those who have not yet invested in digital transformation, the main challenges are unclear economic benefits, a lack of clear vision and leadership, high financial investment requirements and a lack of skilled professionals.

Overall, it is interesting that both groups of businesses – those that have and have not embarked on their digital transformation journey – still identify a lack of clear vision and leadership as one of their key challenges, even though they say digital transformation is led by senior management. This could well be related to the speed of change. For example, in the tech industry, by the time a business implements a solution, it is often told that there is a new, better way that should be adopted. This results in a never-ending cycle of change/improvement that can look like a lack of direction from leadership.



3.4. A decline in observed tangible gains

Even though respondent businesses observe measurable improvements this year in the efficiency of business processes, with cost savings and improved lead times for products, fewer tangible financial benefits are observed: 44% of survey respondents report that digital transformation has made a positive impact on operating costs; 36% report the same about revenues; whereas 29% report increased profits.

Looking at efficiency gains across different departments, production/operations, sales and marketing have benefited the most. The most significant drop since last year has been observed in reference to customer service, which ranked as the highest beneficiary last year.

PERCEPTIONS OF **DIGITAL TRANSFORMATION**

Digital transformation becomes reality for the textile and apparel industry

The prospect of digital transformation can prompt a range of responses from industries and businesses, and perceptions of digital transformation are therefore varied across geographies and business types.

In 2018, respondents offered a variety of terms to define their perceptions of digital transformation, including 'challenging, mandatory and critical, yet interesting'. Comparing those results to the key themes emerging from this year's industry sentiment questions, it appears that the majority of participants still consider digital transformation as 'necessary', 'important', 'slow' and 'challenging' and also refer to it as innovative and opportunistic. As the term 'innovation' did not appear prominently in last year's survey results, we might conclude that the textile and apparel industry now has greater awareness of the need to develop and implement innovative technologies in order to successfully embark on the digital transformation journey.

"It is **better to embrace** industry disruption than be the victim of it."

Dr Richard Soley, Executive Director of the Industrial Internet Consortium (IIC) [2]

When compared to last year's results, participants place less emphasis on the word "future". As Dr Richard Soley, executive director of the Industrial Internet Consortium (IIC), notes: "It is better to embrace industry disruption than be the victim of it." It is a maxim that seems to be more widely acknowledged by the industry this year, as digital transformation is accepted as a reality.

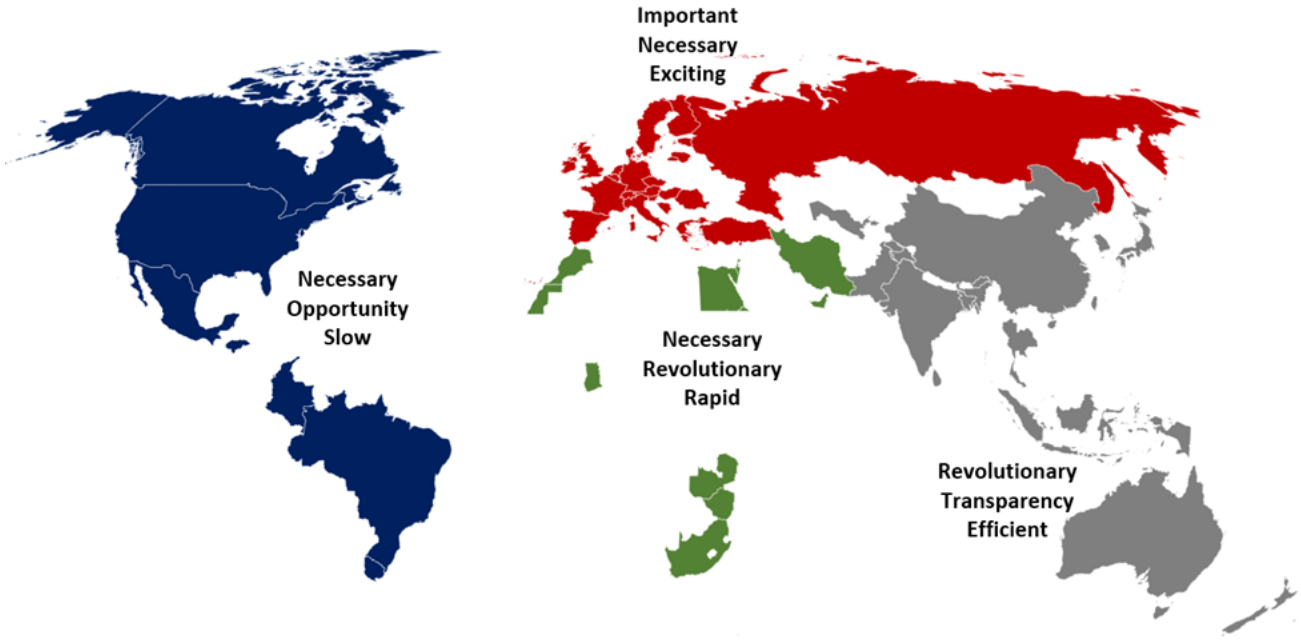
Figure 1 – Global perceptions of digital transformation



All three key respondent groups – OEMs, Manufacturers and Brands & Retailers – equally perceive the necessity of digital transformation. However, more Brands & Retailers note that digital transformation is 'slow' compared to other respondent groups.

Similarly, across different geographies, survey respondents describe digital transformation as "necessary" in most locations, highlighting parity in perceptions of digital transformation across the globe. Exceptions are Asia and Oceania, where digital transformation is more instantly associated with the words "efficient'" and "transparency". This does not mean that digitalisation is not important in Asia. In fact, quite the opposite is true: Asia is a manufacturing hub for the industry, dominating global textile and apparel exports, and productivity gains with minimum waste and supply chain transparency are of particular importance for the companies based in this region. Another interesting finding is that Americans, in particular, perceive digital transformation as "slow".

Figure 2 – Sentiment across geographies



STRATEGY CREATION **AND IMPLEMENTATION**

Over three-quarters of respondent businesses are currently engaged in digital transformation – a 23% increase compared to last year

The positive sentiment about digital transformation is reflected in an increase in the proportion of textile and apparel companies that have embarked on digital transformation. Over three-quarters (76%) of survey respondents' businesses have taken steps towards digital transformation, either by investing in a digital technology or, in some cases, developing an entire strategy. 72% of them are already engaged in digital transformation and have begun implementation of either a parent-company strategy or their own digital transformation strategy. A large proportion of the remaining businesses are on the brink of this step, either waiting to implement a drafted strategy or having invested in a digital technology.

Comparing this to last year's results, it can be concluded that, over the last 12 months, there has been a 23% increase in textile and apparel businesses that are actively engaged in digital transformation. Notably, this positive outlook is driven by participants that have actively started to implement a digital transformation strategy. While there are many possible reasons for this change, it might be explained by the industry's surge of investment in digital technologies after ITMA 2019 in Barcelona.

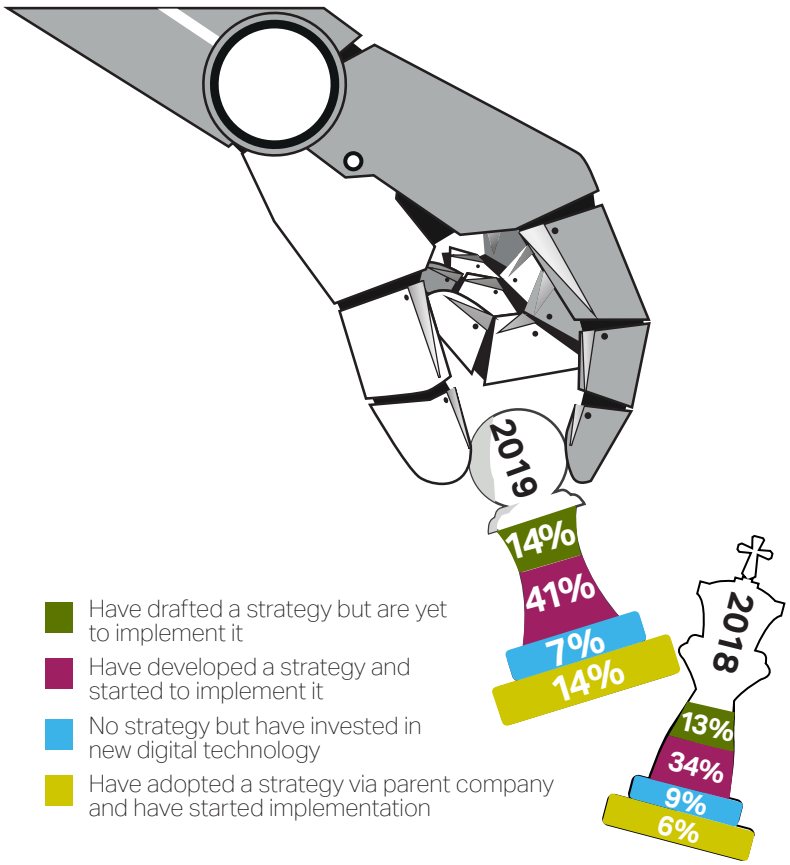


Figure 3 – Share of respondents that have a digital transformation strategy in place/invested in new digital technology

Global movers

Regions fronting the digital transformation of the textile and apparel value chain – based on those who have made digital investments or are in the process of strategising – are Asia, Europe and the Americas.

However, in comparison to last year, when Asia was at the top of the list (71%), the latest survey results show that Europe is now the geographical front-runner, with 84% of respondents having embarked on their digital transformation, translating to a 36% increase from 2018. Equally, 23% more of North American respondents have embarked on digital transformation since 2018.

This may be a consequence of ITMA 2019, with European companies keen to invest in the most innovative technologies. For example, as a result of the textile machinery exhibition, a number of European companies invested in digital printing technology: examples include Poland-based Teofilów, who invested in a second SPGPrints JAVELIN multi-pass inkjet textile printer; and both Spain-based Sedatex and Italy-based DGTEX purchased MS Printing Solutions' single-pass LaRio printer.

Businesses leading transformation

OEMs maintain their lead in commitment to digital transformation. 94% of OEMs have embarked on their digitalisation journey, with 81% having already implemented their own strategy or their parent company's strategy. Comparing this to last year's results, it can be concluded that over the last 12 months, there has been a 29% increase in OEMs that are actively engaged in digital transformation. This was particularly driven by businesses already in the process of strategy implementation, whose percentage share saw an increase of 45%. Since OEMs' top business priority is to supply intelligent solutions for the supply chain, this is a positive sign for the industry, signalling an increased availability of solutions to enable digital transformation for other players in the supply chain.

Meanwhile, 71% of Manufacturers have taken steps towards digitalisation, with 43% already in the process of strategy implementation. In comparison to last year, 25% more Manufacturers have taken steps towards digital transformation.

Brands & Retailers are slightly behind OEMs and Manufacturers, with 55% engaged in the digitalisation journey and 41% in the process of strategy implementation. In comparison to last year, there has been a 16% increase in participant businesses engaged in digital transformation, particularly driven by companies who are in the process of strategy implementation.

Goals of digital transformation

When making their digital transformation journey, companies need to have a long-term vision and determine ambitious but attainable business goals, with milestones to monitor the progress made. [3] According to our survey results, these goals vary significantly across different respondent types. OEMs are prioritising the launch of new digital products and/or services, with 50% indicating this objective. Other key priorities for OEMs are the use of digital channels to interact with customers (13%) and the exploration of new business models (13%). Digitalising business operations, which ranked second last year, has now dropped to third position.

However, interestingly, the research shows that respondent companies that have placed their emphasis on digitalisation of business operations have, in fact, observed the most quantifiable gains. Almost 67% of them have seen a positive or very positive impact on revenues and operating costs. Perhaps this is because it is much easier for a business to measure change in their own business operations than across a wider supply chain of which they are a part. This may indicate an overall approach to digital transformation that sees most companies keen to benefit from all its many facets, but reluctant to contribute to developments that are not wholly within their own business.

Manufacturers, like OEMs, show consistency in the priority they give to digitising business operations. In this, they deliver exactly the same result as last year: 37% list it as their highest goal for digital transformation.

Launching digital products and/or services has become the Manufacturers' second priority, with 18% choosing this answer. In 2018, the use of digital channels to interact with customers came out as the second-highest priority. This latest result is unsurprising and offers an exciting prospect for the remainder of the textile and apparel supply chain. With the surge in availability of automated machinery and smart technologies – such as Shima Sheiki's WHOLEGARMENT – more diverse garment types can be offered as an on-demand service.

Looking at the most successful respondents' businesses, it is clear that Manufacturers prioritising the launch of new digital products and services experience the most positive financial impact. Almost 57% of Manufacturers that focused on this goal experienced a positive or very positive impact on revenues and operating costs.

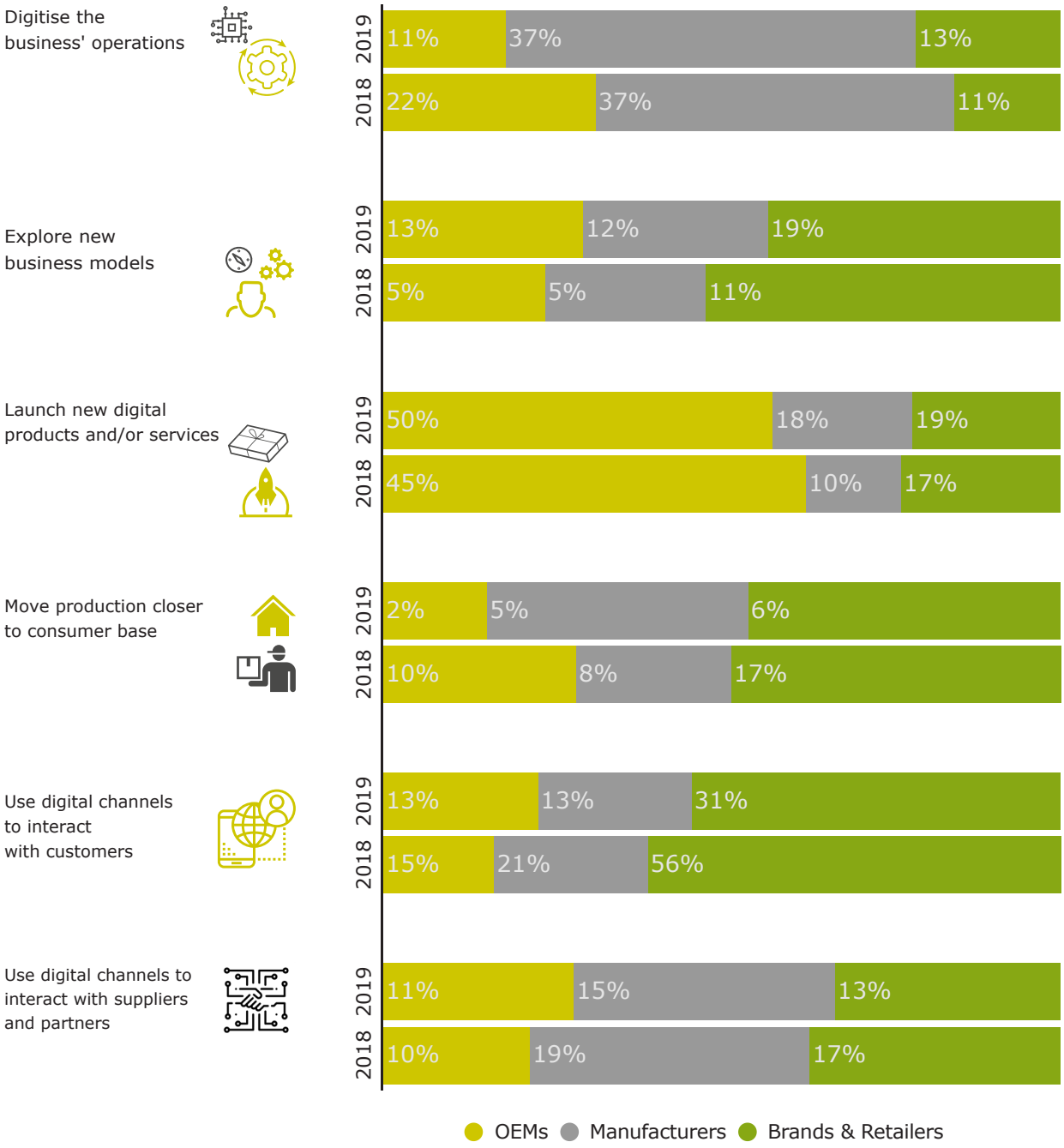
Among Brands & Retailers, in 2018 the majority (56%) were focused on the use of digital channels to interact with customers. Although fewer of this segment (31%) focused on this goal 12 months on, it remains a prominent theme. This is unsurprising, as consumers increasingly look for convenience, speed and personalised experiences, feeding the growth of e-commerce. According to Statista, e-commerce retail sales are expected to account for 22% of global retail sales by 2023, in comparison to 14.1% in 2019, with the apparel sector offering attractive opportunities for digital transformation. [4]

This links directly to the other top priorities of Brands & Retailers, which are digitalised business models (19%) and new digital products or services (19%). Last year the key secondary drivers, all scoring 17%, were: moving production closer to the consumer base; using digital channels to interact with suppliers and partners; and launching new digital products and/or services. It is evident that Brands & Retailers have shifted their priorities to focus more on enhancing the point of interaction with the consumer.

Interestingly, moving production closer to the consumer base has become less of a priority for all respondent groups. While reshoring and nearshoring of production are trends that are much discussed in the industry, only 6% of Brands & Retailers identified this as a goal for digital transformation, and even fewer Manufacturers selected this option (5%). This might seem surprising, as the media has given much prominence to the reshoring of production and to micro-factories, which go hand-in-hand to support the concept of mass customisation.

However, there are several challenges that restrain key players from adopting this model. For example, adopting a reshoring business strategy or a micro-factory business model requires significant investment in a number of Industry 4.0 technologies. Many businesses in the textile and apparel supply chain may see this expensive investment – the complex transition from a traditional supply chain and the establishment of production in a high-cost country – as less than worthwhile, compared with offshoring production to countries where labour is extremely cheap. For this reason, many businesses have placed micro-factories in Asia, within their larger traditional factories, specifically to handle on-demand orders from long-distance customers in the EU or US. In support of this, Adidas recently announced it will move its high-tech Speedfactory technology to Asia by April 2020.

Figure 4 – Goals of digital transformation

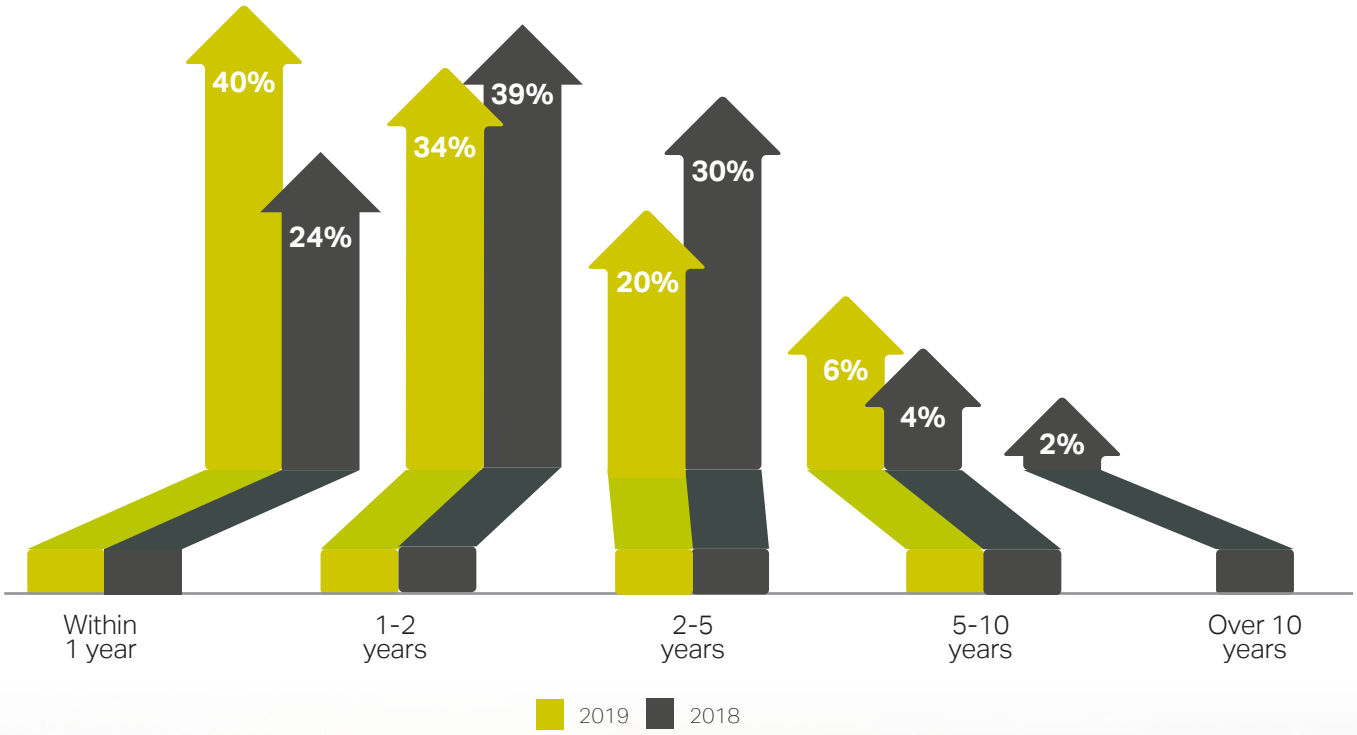


Next movers

Among the respondents that have not yet invested in digital technologies or adopted a strategy for digital transformation, 94% are looking to develop such a strategy within the next five years. While this is only a 1% increase from 2018, there is a significant increase of 67% in respondents aiming to achieve digital transformation within the next year.

As observed above, Brands & Retailers are slightly behind OEMs and Manufacturers in embarking on the digital transformation journey. However, all surveyed Brands & Retailers are aiming to achieve digital transformation over the next two years. Looking at Manufacturers, 91% are aiming to achieve digital transformation in the next five years, with 68% looking at a two-year horizon. Meanwhile, all surveyed OEMs are looking at a strategy from 2019-2024, but only one-third of survey respondents aim to embark on the digitalisation journey within the next two years.

Figure 5 – Strategy timeline for those currently not in the process of digital transformation



ORGANISATIONAL CHANGES AND DEVELOPMENTS

Senior management continues to drive change

Digital transformation is a continuous ongoing journey associated with more than just buying new technologies; it requires companies to transform their organisations. Leadership, people management and changes to both business structure and procedures need to be managed carefully.

"**Digital** is not just a thing that you can buy and **plug into the organisation**."

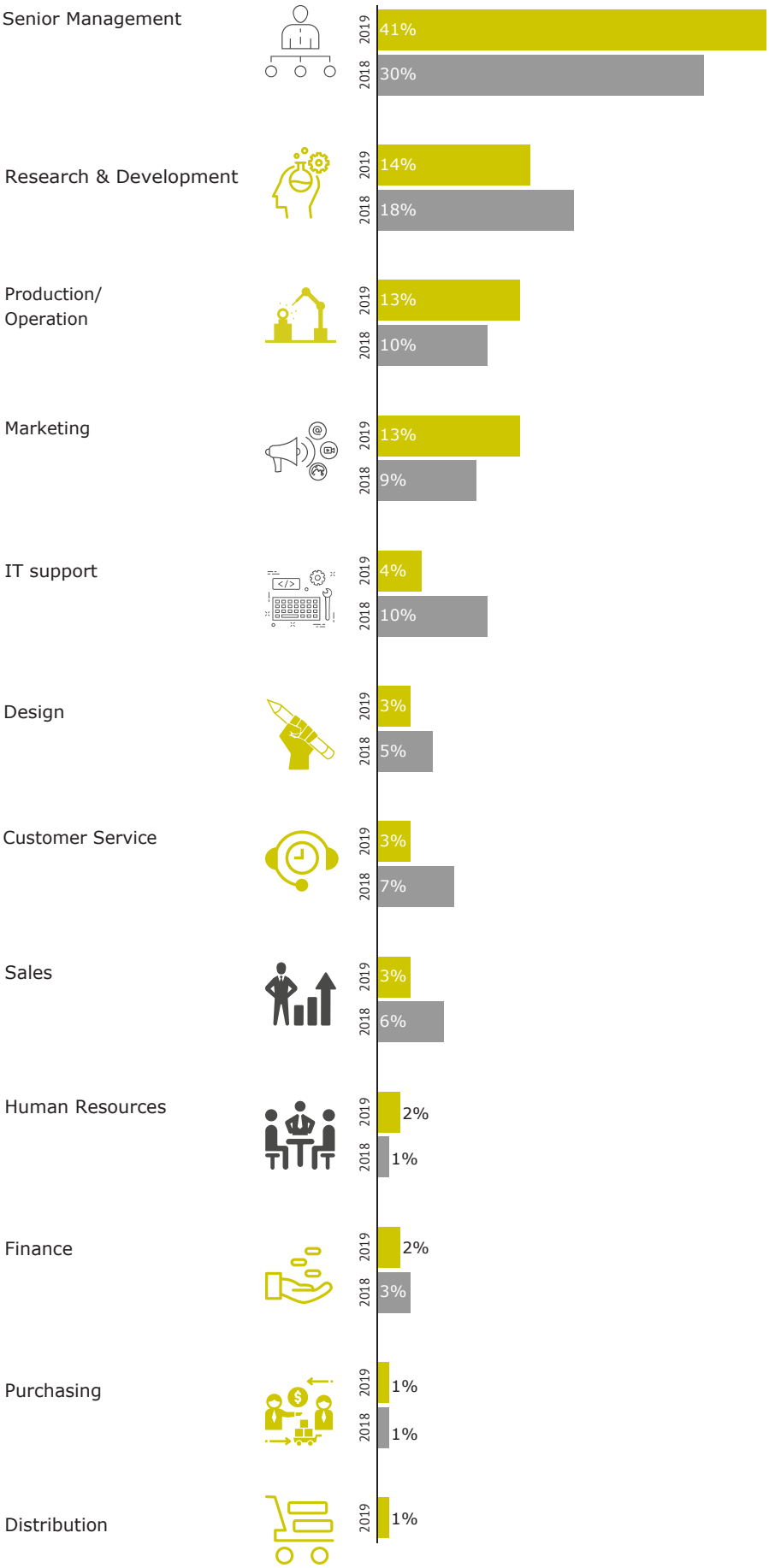
Harvard Business Review [6]

In the Deloitte 2017 Global Human Capital Trends Survey, 88% of respondents said that setting up a business of the future was an important issue; however, only 11% of respondents thought they understand how to do it. [5]

Looking at initiatives towards digital transformation in the textile and apparel industry, respondents report, like last year, that Senior Management drives their company's vision (41%). According to North Carolina State University, digital transformation is the key worry for directors, CEOs and senior executives, which might explain why Senior Management is taking a lead. [7] Interestingly, 43% of respondents whose digital transformation was initiated by Senior Management observe a "positive" and "very positive" impact on revenue and operating costs, and 29% see profit. The second initiator is the R&D department (14%). However, these businesses have observed fewer tangible gains. 32% of these respondent businesses see a positive and very positive impact on revenue, while 36% see the same impact on operating cost, and 24% on profit.

For most OEMs (45%) and Manufacturers (43%), digitalisation is led by Senior Management, a similar result to 2018. Senior Management and Operations (both 20%) are equally the predominant initiators of digital transformation for Brands & Retailers. This is a change from 2018, when R&D scored highest (33%).

Figure 6 – Business department that initiated digital transformation



It is important to also recognise that Senior Management needs certain qualities in order to succeed. According to McKinsey & Company's "Unlocking success in digital transformations" study, Senior Management commitment is a critical factor in initiating the digitalisation journey, and companies might benefit from digitally savvy leaders steering the transformation. [8]

Digital transformation investments

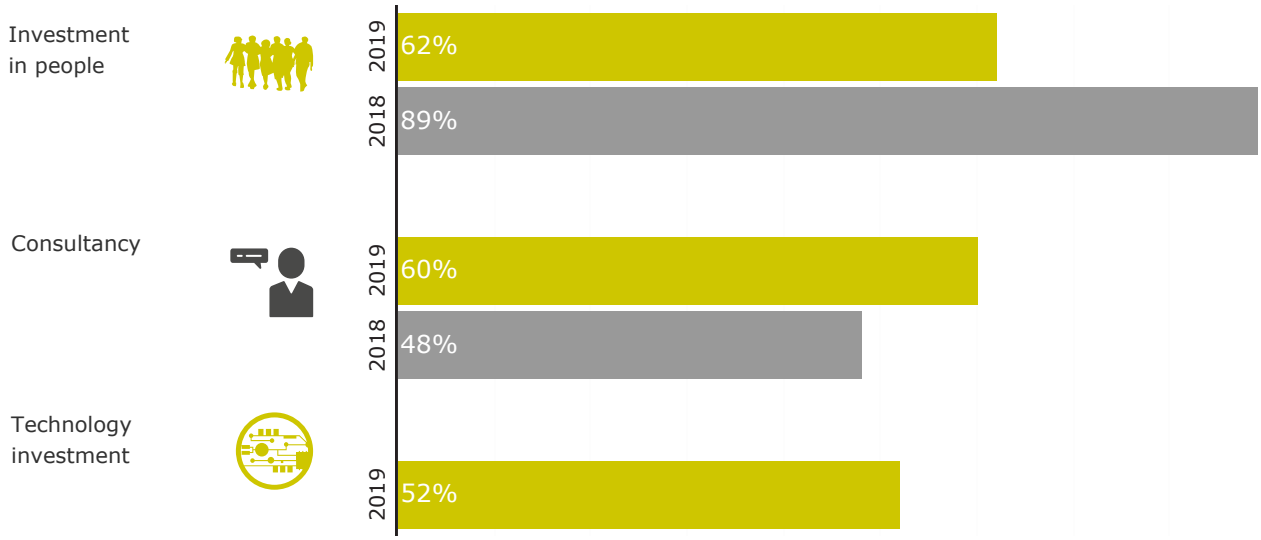
In many organisations, the digital journey cannot progress far without bridging the skills gap. According to the survey results, investment in people through internal promotions, management changes and training, remains a key priority for participant companies (62%), despite a decrease in this percentage from 89% in 2018. This is unsurprising, as digital transformation is expected to transform current jobs and create new positions requiring new skills. Focusing on internal investment in people also seems to be a positive development for the overall textile and apparel industry. Harvard Business Review suggests that working with people internally, who have the best understanding of what works and what does not in a business's operations, can help to lead organisations through a successful digitalisation process. [9] Similarly, according to McKinsey & Company's "Unlocking success in digital transformations" study, one of the key success factors in digital transformation is building talent and skills throughout the company. [8]

An example of a company that has recognised this need is Hugo Boss Textiles Industries. According to Joachim Hensch, managing director: "We are a people-heavy industry and we will always be a people-heavy industry." Hugo Boss trains both staff and management to be ready for the cultural shift that they need to be successful throughout their Industry 4.0 journey and beyond.

Notably, only slightly fewer respondent businesses prefer to work with consultants (60%), followed by reliance on technology investments (52%) – a new category for 2019. Including of this last category was to a large extent driven by the need to take account of ITMA 2019 in Barcelona. With ITMA being a quadrennial event, many companies may have planned 2019's budget with a view to purchasing technologies at the show. One example is the purchase of EFI Reggiani's inaugural single-pass BOLT inkjet printer by Zaman Textile Mills Pvt Ltd.

Investment in people is particularly strong among Manufacturers (50%), followed by OEMs (36%) and Brands & Retailers (14%). Interestingly, while Manufacturers prioritise the development of talent internally (50%), OEMs lean towards working more with consultants (39%), whereas Brands & Retailers favour technology investments (16%).

Figure 7 – Digital transformation investments



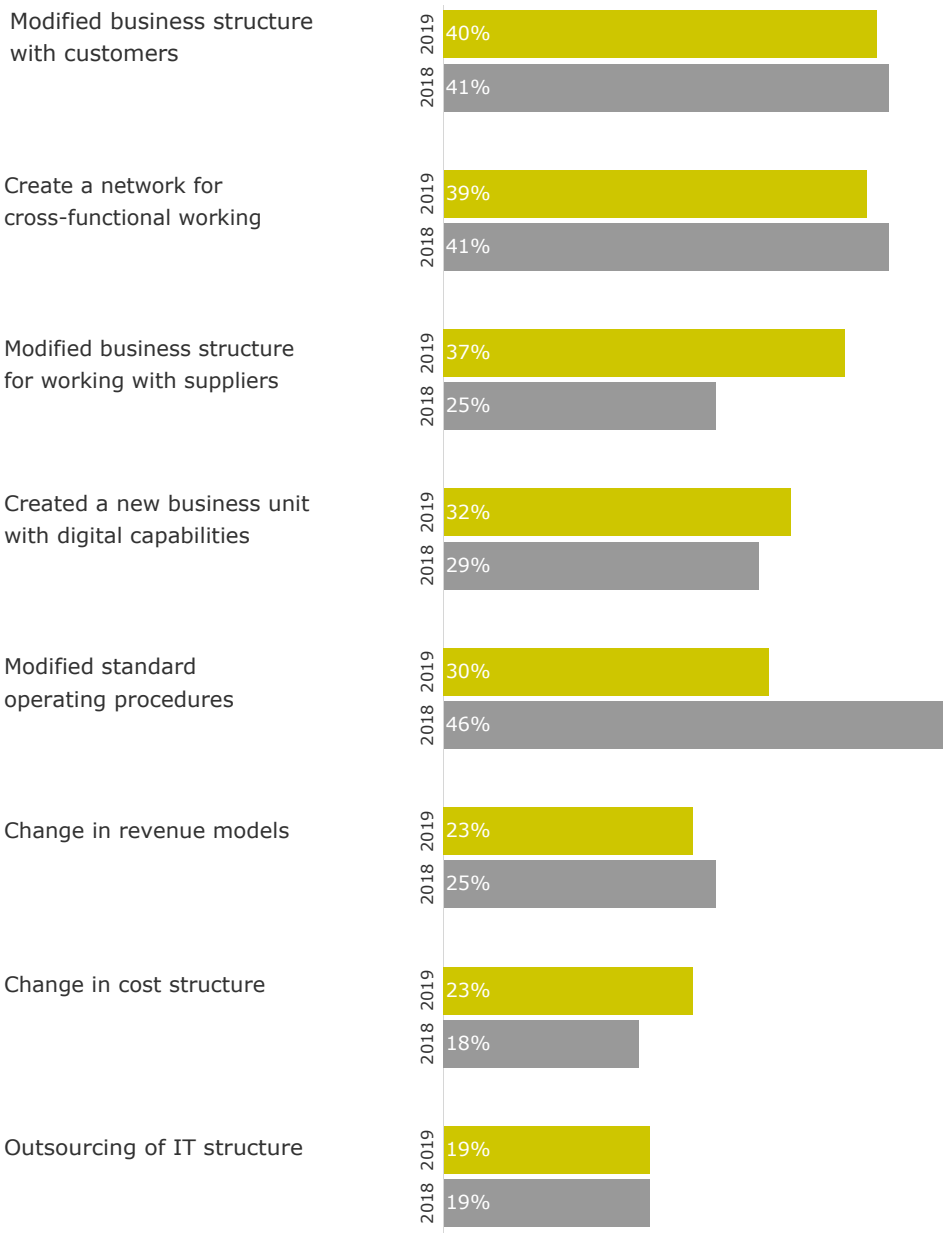
Structural changes

Digital transformation also profoundly changes business operations. In an effort to achieve digitalisation goals, the industry needs to work collaboratively and become more relational in its way of doing business. This principle requires modified business structures for working with customers, recognised by 40% of respondents. This is closely followed by creating a network for cross-functional working across different teams (39%) and modified business structures for working with suppliers in a more relational way (37%).

In comparison to last year's results, when modification of standard operating procedures (SOPs) ranked the highest (46%), it is clear that flexibility in the form of close collaboration and cross-functional working have become more important this time around. The importance of close collaboration can be easily understood when looking at industry disruptors, such as Amazon, which is revolutionising the textile and apparel industry's retail and manufacturing landscape. Undoubtedly, it is important for businesses to learn from Amazon's success and implement similar tactics. However, as many businesses do not have the financial power of Amazon, the key to keeping pace in this rapidly evolving market is to collaborate.

Driving these results are OEMs who, in particular, prioritise modified business structures with customers (52%), while Brands & Retailers (54%) are focused on modified business structures with suppliers, and Manufacturers (37%) prioritise cross-functional working.

Figure 8 – Operational changes made following digital transformation



DIGITAL TECHNOLOGY **INVESTMENTS**

Connected devices dominate investments to date

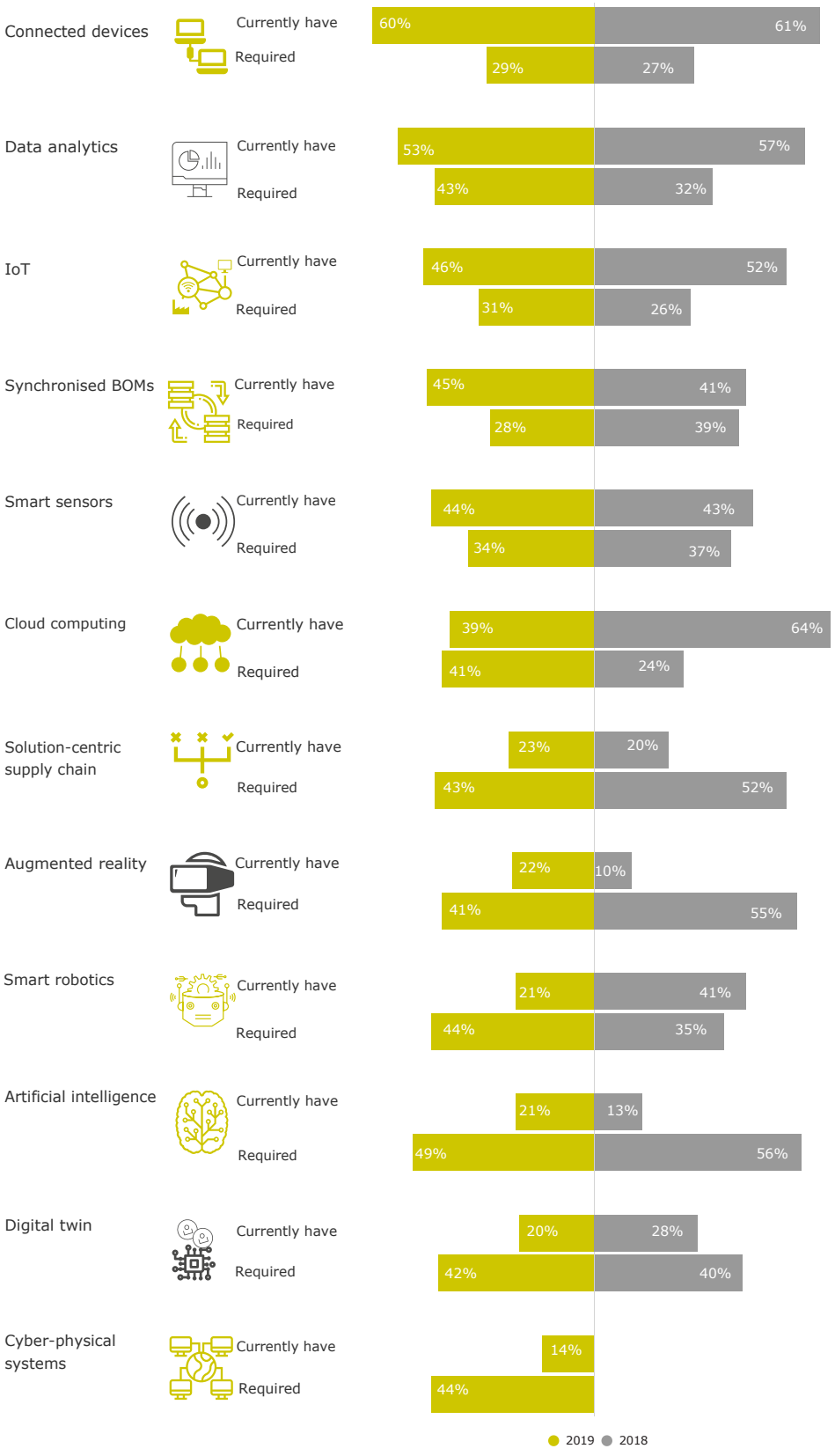
For collaboration to be seamless across the textile and apparel industry, strategic investment in new digital technologies, tools and methods is essential. To date, survey respondents have predominantly invested in connected devices (60%), data analytics (53%) and IoT (46%) (Figure 9). In combination, these technologies enable businesses to collect, harness, store and use valuable supply chain data to inform business decisions and enhance working relationships. However, the leading investment in 2018, cloud computing (64%), has significantly dropped as an investment priority in 2019. One explanation of this could be the fact that its adoption has become ubiquitous. The transition of large sections of businesses' computing infrastructure to the Cloud has already taken place or is under way, so it is no longer seen as an investment priority, just part of the "normal" budget. Likewise, interest in smart robotics has nearly halved, which implies that companies realise that even though some technologies are available, the range is limited and adoption rate may be slow.

Similarly, like last year, while only a small percentage of respondents' businesses have invested in artificial intelligence (AI), this is the technology that the industry says it requires the most.

Notably, there is discrepancy between the stated requirements and the investment plans. While participants report that the top three requirements are artificial intelligence (49%), smart robotics (44%) and cyber-physical systems (44%), they plan to invest the most in smart sensors (39%), data analytics (26%) and IoT (24%).

Looking at the trends among different respondent groups, only Brands & Retailers

Figure 9 – Digital technologies and business processes that the textile and apparel industry have invested in and require



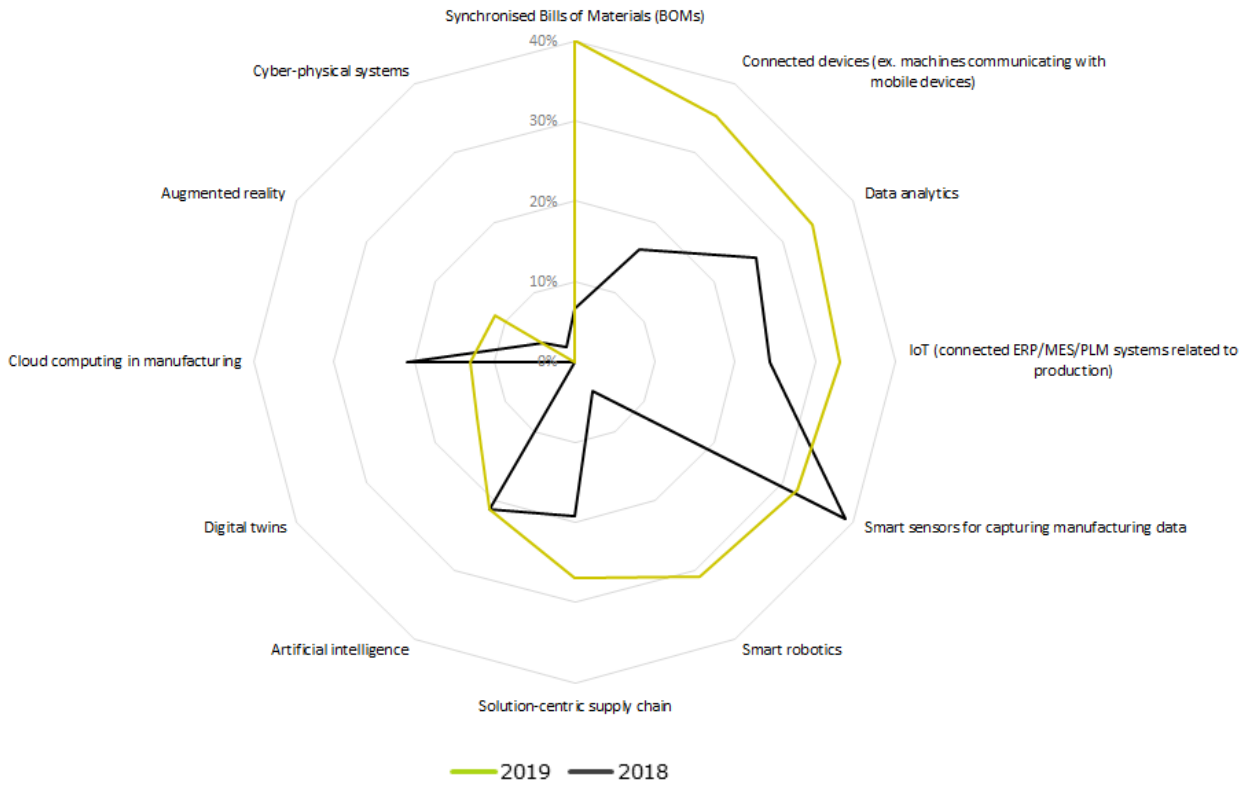
are planning to invest in the technologies that they require the most. Their key requirements are artificial intelligence and cyber-physical systems equally, with 42%, and cloud computing, smart robotics, smart sensors, and augmented reality equally, with 33%. Other planned investments are smart sensors (50%), smart robotics (25%) and artificial intelligence (20%).

OEMs reported that their top three requirements moving forward are data analytics (40%), artificial intelligence (40%) and a solution-centric supply chain (43%), whereas they said they plan to invest the most in IoT (38%), smart sensors (30%) and connected devices (27%). Meanwhile, Manufacturers claim that their top three requirements are artificial intelligence (58%), smart robotics (56%) and cloud computing (54%), whereas they plan to invest the most in smart sensors (41%), data analytics (30%) and cloud computing (25%), meaning that only cloud computing investment matches their requirements.

The fluctuation in technologies that the industry desires to invest in is not surprising in an emerging field. Publicity around new technologies might mean they receive more attention in any given year. Later, high price entry points or the limited applicability of commercial solutions can mean attention is diverted elsewhere.

Interestingly, all respondent groups prioritise investment in smart sensors. One explanation could be that smart sensors are the ultimate foundation for digital transformation – without this technology, other solutions, such as connected devices, cannot function. Gartner's Hype Cycle for Emerging Technologies, 2019, shows that smart sensors are currently stalled in the 'Trough of disillusionment,' and it is expected to take two-to-five years until the technology reaches the 'Plateau of productivity', a point at which the technology has matured and been widely adopted, which correlates with the respondents' plans to invest in this technology within the next five years. [10] Technology maturity and investment decisions can therefore be seen to be closely aligned.

Figure 10 - Percentage of respondents investing in technologies or business processes within the next five years



Perceived requirements

OEMs and Brands & Retailers were also given the opportunity to report on which technologies they believe Manufacturers (respectively, their customers and suppliers) require. It appears that OEMs and Brands & Retailers now share more in the way of agreement about Manufacturers' requirements, compared to 2018, when they were on a completely different page. While Brands & Retailers hope Manufacturers will adopt smart sensors (73%), a solution-centric supply chain (55%), connected devices (45%) and cloud computing (45%), OEMs encourage Manufacturers to invest in data analytics (66%), smart sensors (54%) and connected devices (49%). This means both of these respondent groups agree that Manufacturers require connected devices and smart sensors as two of their top three priorities. Sensors are fundamental to Industry 4.0 manufacturing technology, while connected devices can vastly improve communication and data transparency within the supply chain.

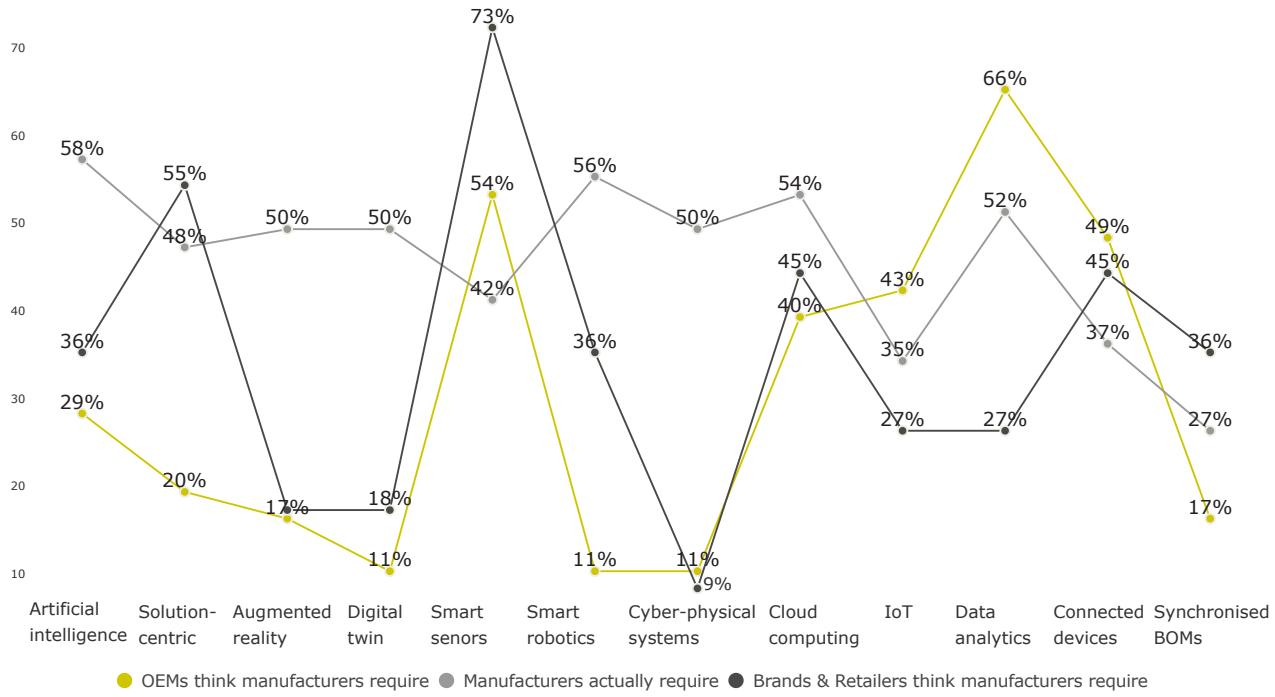
That said, Manufacturers' stated requirements are still different from those suggested by OEMs and Brands & Retailers. They cite artificial intelligence (58%), smart robotics (56%) and cloud computing (54%).

One interesting finding, however, is that even though Manufacturers have not reported smart sensors as a high priority, this is the technology they are planning to invest the most in over the next five years. Similarly, the second and third technologies that Manufacturers plan to invest in are data analytics and cloud computing, which also match their needs as perceived by either OEMs or Brands & Retailers.

These results suggest there is clear disparity between what Manufacturers believe they require and what they are planning to invest in, but these investment plans do match what OEMs and Brands & Retailers believe Manufacturers require. Bridging this gap of understanding and communication is an important shift for the industry during its digital transformation journey, as the emerging Industry 4.0 technologies and business models require the coming together of the supply chain to enable connected, optimised processes.

"A key challenge for many industries is that Industry 4.0 requires the coming together of the supply chain in order to **enable connected** and **optimised processes**"

Figure 11 – Perceptions of technologies or business processes required by Manufacturers



Big data analytics

The efficiencies gained from the use of technologies, processes and business models that support the concept of Industry 4.0 are primarily based on the effective management of data, including accurate collection, monitoring and analysis.

Whilst data can bring multiple benefits for companies, managing data is a complex and challenging prospect for any business, especially larger connected businesses in the middle of complicated supply chains – like many of those in the textile and apparel industry. The most difficult part of data management is ensuring that all employees are effectively and accurately collecting, managing and analysing data, and also ensuring that the data is entered into the correct software systems – another challenging element if the software systems are not integrated. Lack of integration is a common barrier, with organisational data presented in inconsistent formats from multiple sources.

Data can be classified as retrospective (historical data), real time (live data) and predictive (a mixture of retrospective and real time that enables software systems to generate predictive data). Businesses that have progressed the most in their digital transformation journey will have access to predictive analytics. This currently applies to 25% of those respondents who have invested in digital transformation. When compared to last year's results, where 18% of participants were using predictive analytics, it can be concluded that the industry has significantly developed its data analytics capabilities.

It could be considered that OEMs are the most digitally advanced respondent group, with 31% of those who have invested in data analytics harnessing predictive datasets. 22% of Manufacturers also have access to predictive analytics, whereas Brands & Retailers are only slightly behind Manufacturers, with 18% of participants focused on predictive datasets.

Moreover, across all respondent groups, data analytics is currently being used for more efficient manufacturing (47%), operations planning (46%) and improved product quality (43%); this is similar to last year, with the only clear difference being that fewer participants are using data analytics for the optimisation of overall business planning or for more efficient manufacturing (Figure 12).

In contrast, the areas where businesses are aiming to use data analytics capabilities in five years' time are: optimisation of overall business control (45%); optimisation of overall business planning (42%); and demand planning (36%).

An important improvement is that demand planning has become one of the key areas in which businesses are aiming to use data analytics in five years' time. This is a huge step forward for the industry because the use of accurate data analytics for demand planning can provide multiple business benefits, such as inventory reduction, accurate forecasting and accurate inventory management, which in turn deliver a more profitable business. What is more, accurate data analytics, both in demand planning and forecasting, is a major driver in operations planning – continuously the area of highest use when it comes to data-driven decisions.

Figure 12 – Level of advancement of data analytics capabilities

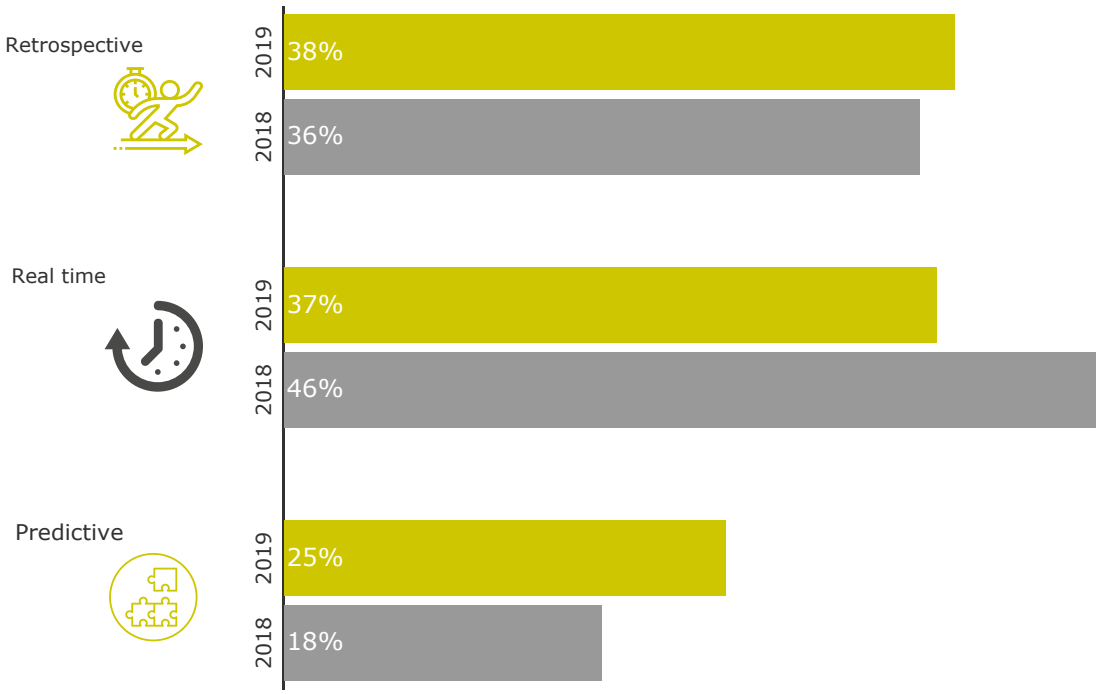
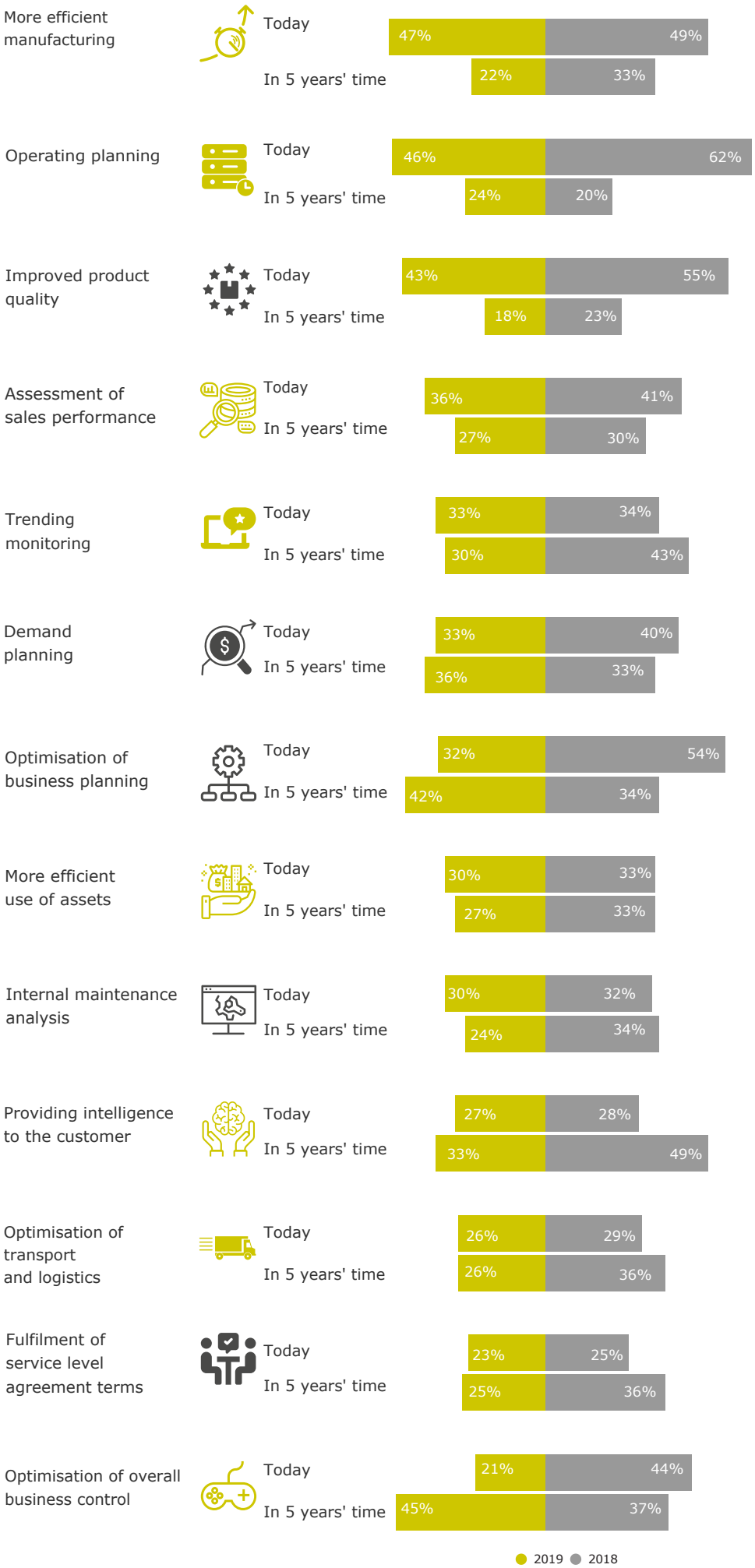


Figure 13 – Areas where data analytics capabilities are employed today and in five years' time



Total investment and ROI

In the next five years, respondents will together invest between US$99m and US$144m in digital technologies or processes (Figure 14). And, in the next 12 months, individual respondents are expected to invest an average of US$1m, with the overall investment reaching US$24-36m.

If these results are compared to those recorded in 2018, when an expected average investment was US$837k for the next 12 months, it is clear that there is an immediate 20% increase in the expected average investment of individual respondents.

The average expected payback period across all respondent groups remains consistent, with the majority of survey respondents (43%) this year stating between two and five years (Figure 15). According to PwC, the outcome of completing a digital transformation will be very rewarding; however, businesses should expect long, complex and expensive processes. Therefore, in order to get something which is worth the invested money, it is critical for businesses to actively plan and monitor the investments and, in turn, develop and implement metrics for measuring digital ROI. [11] Going forward, it is anticipated that it will be easier to measure ROI, as there are some ROI calculators and metrics under development to encourage investment by the textile and apparel industry. An example is the Collaborative Robots ROI calculator by Robotiq.

Figure 14 – Average investment rate over the next five years

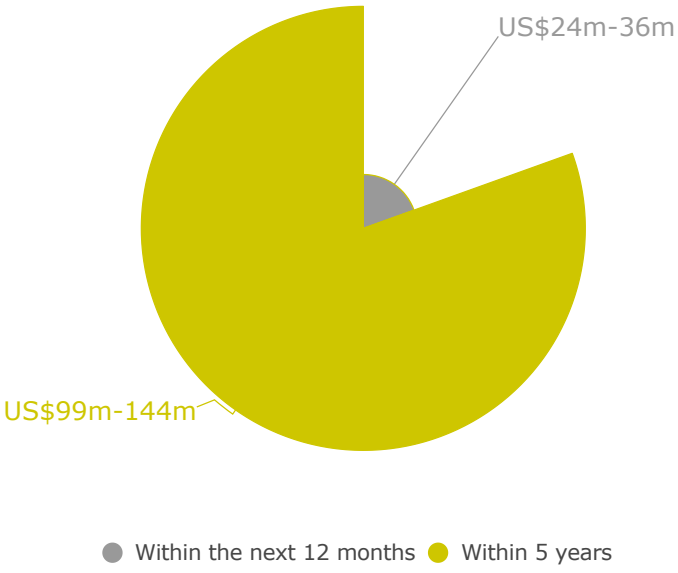
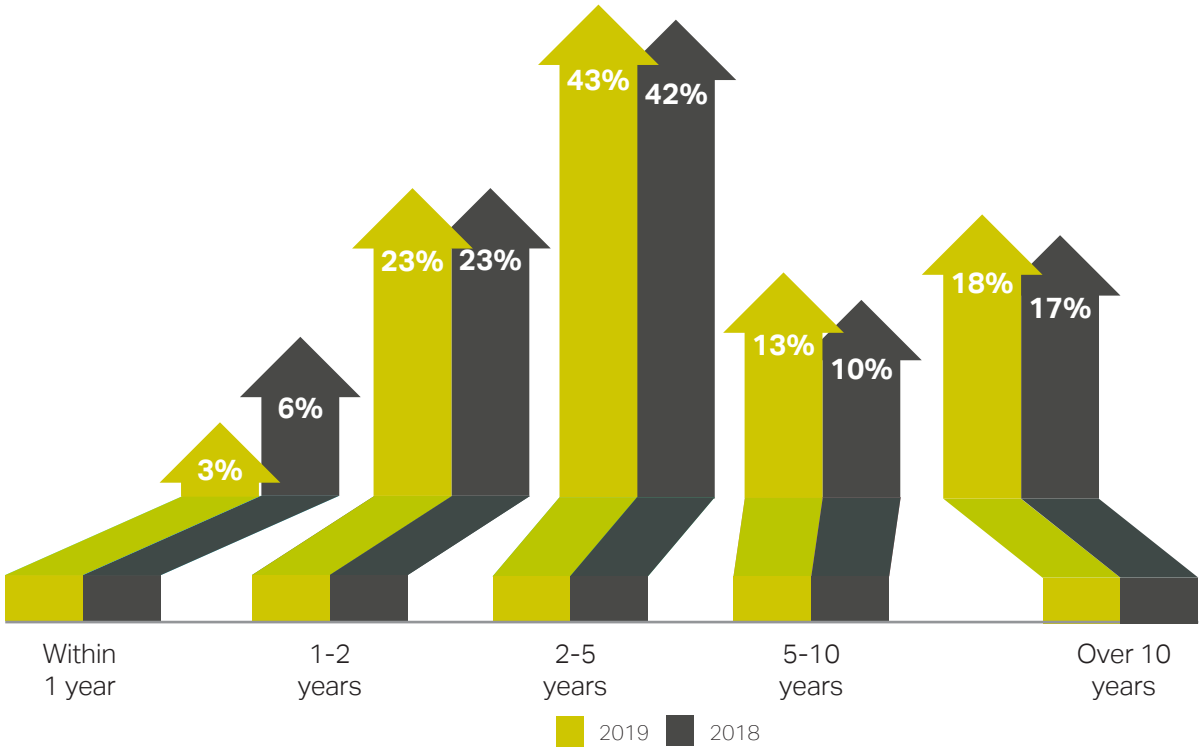


Figure 15 – Expected ROI time on technologies and adjusting business processes



ASSESSMENT OF **CURRENT IMPACTS**

While the measurable improvements observed increased efficiency, cost savings and improved lead times, there is a decline in tangible financial gains

Digitally transforming a business by implementing innovative technologies can deliver multiple business benefits across all departments. Monitoring these benefits is extremely important for organisations in the process of embarking on a digital journey and in everyday working life. One of the issues that many businesses are not aware they are facing is the failure to record every benefit – simply because what defines a benefit is unclear. Many companies only recognise a benefit if it has a financial figure attached to it. However, benefits also come in the form of time and resources saved, which in some cases also accrues to a significant financial benefit. It is vital to identify and record ROI, whether it is being achieved directly or indirectly.

According to the survey results, the most measurable improvements for all respondent groups since the beginning of their digital transformation have been in increased efficiency of business processes (42%), cost savings (40%) and improved lead times for products (37%) (Figure 16). Comparing this to last year's results, it is clear that the measurable improvements have remained consistent over the two years, the only slight difference being that the 2019 respondents ranked improved lead times for products higher than increased customer satisfaction.

Driving these results are OEMs and Manufacturers, who identify these three specific measurable improvements as the most significant in 2019. Brands & Retailers equally reported that cost savings and improved lead times for products are two of the highest measurable improvements, with increased customer satisfaction finishing in third place.

Digital transformation this year appears to have delivered greater benefits to Production/Operations (44%), Sales (39%) and Marketing (38%), compared to 2018, where the biggest beneficiaries were Sales (50%), Customer Service (50%) and Research & Development (46%). The most significant drop since last year has been observed in Customer Service, which ranked the highest last year.

However, looking long-term, efficiency gains are expected to be seen across all business departments in the next five years, with Customer Service (36%), Production/Operations (29%) and Research & Development (28%) seeing the greatest efficiency gains (Figure 18).

Figure 16 - Percentage of respondents seeing measurable improvements from digital transformation



Figure 17 – Efficiency gains from digital transformation

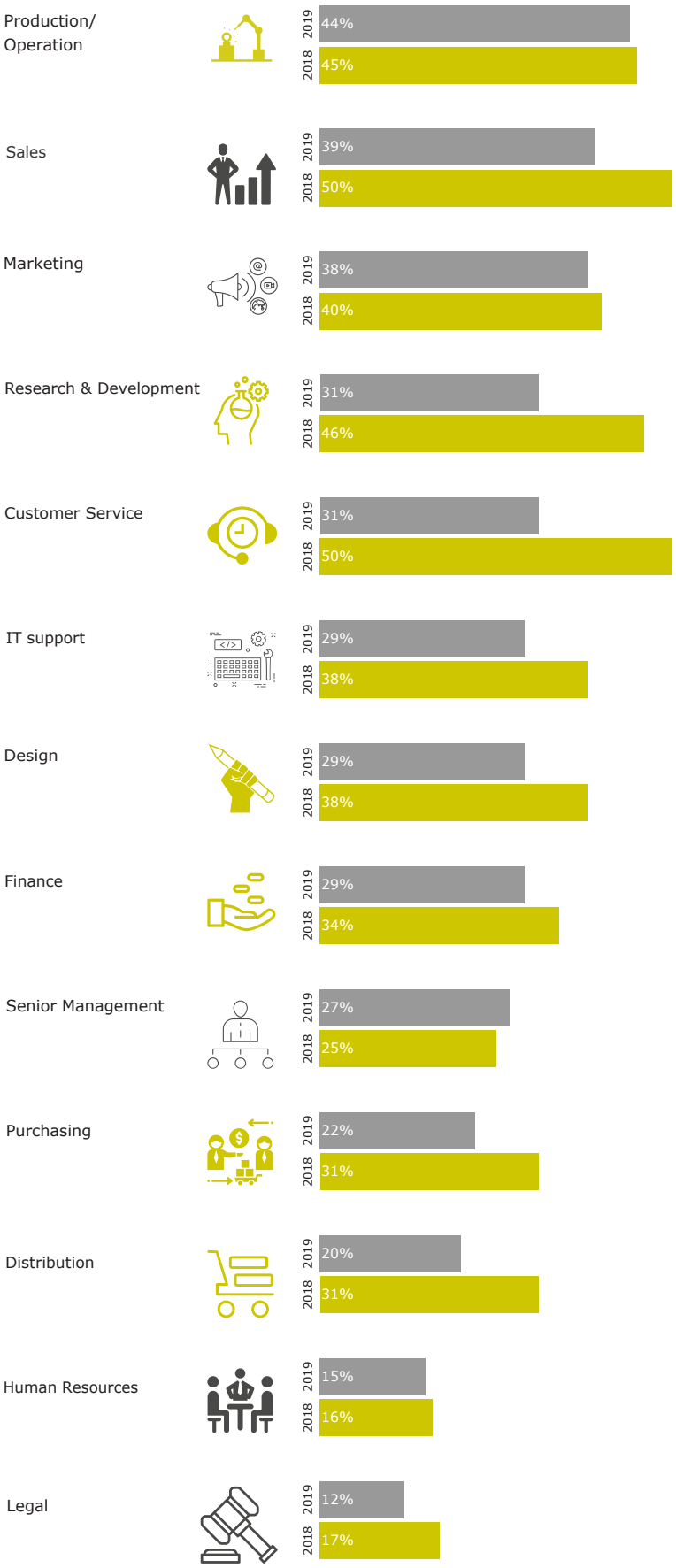
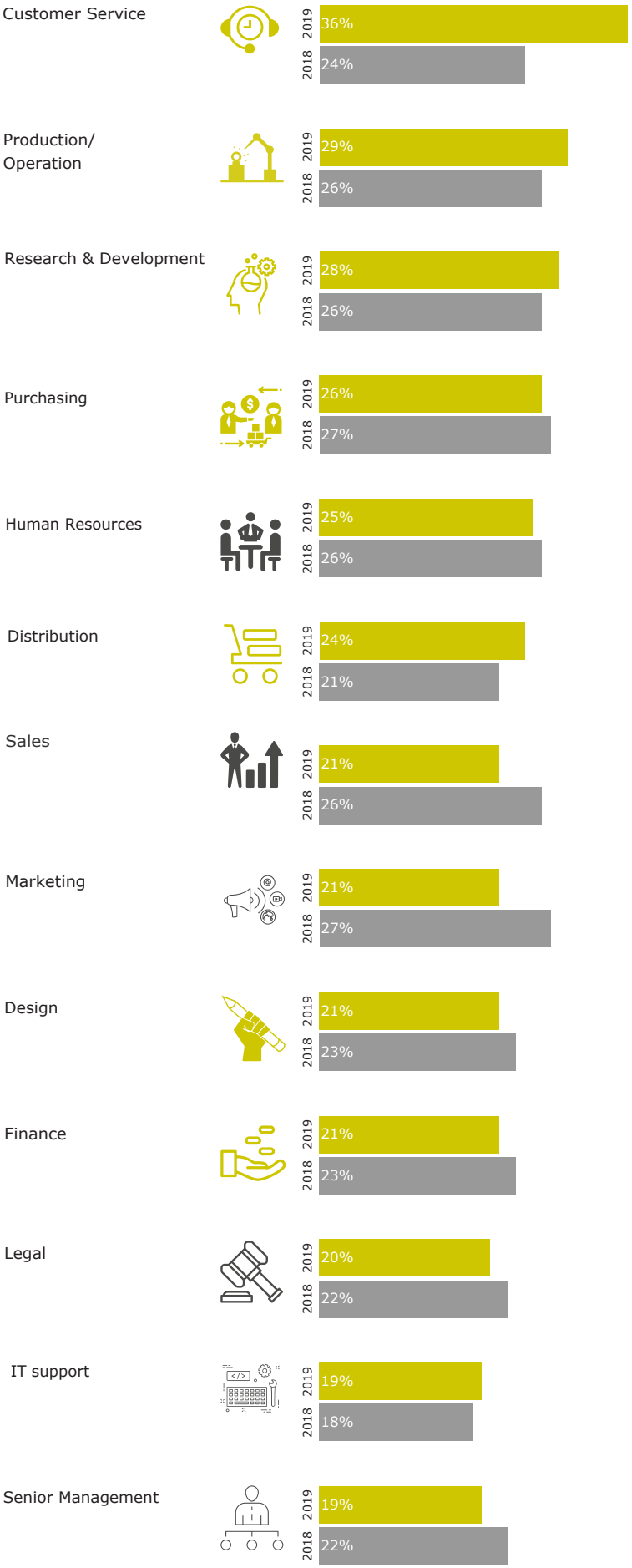


Figure 18 – Efficiency gains expected from digital transformation investment in five years' time

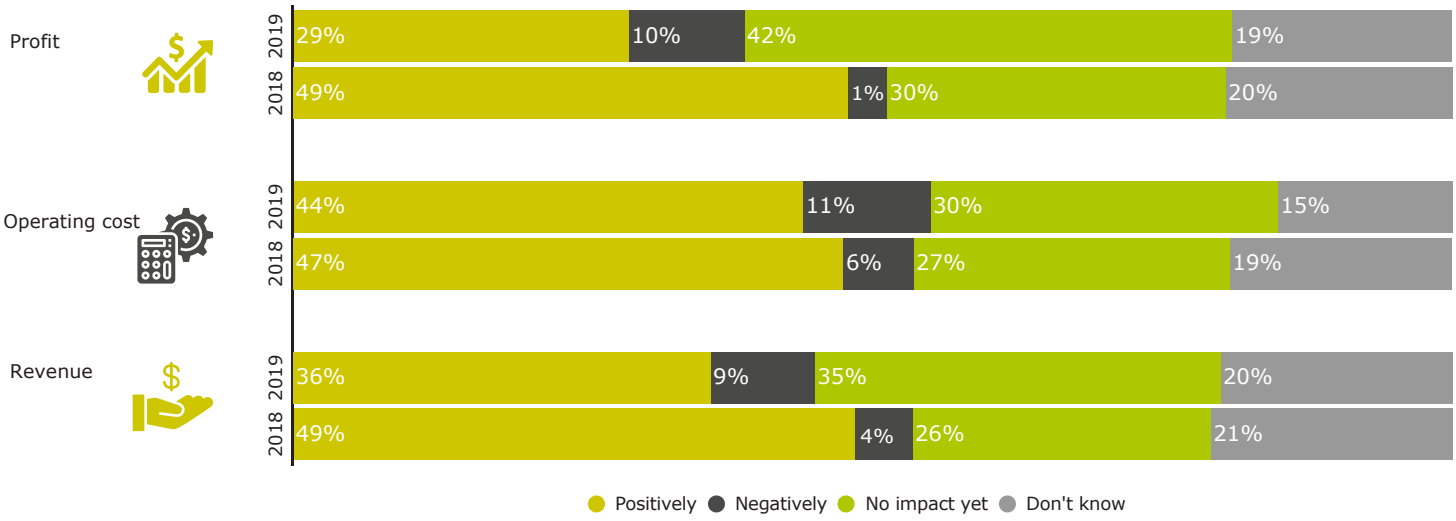


Bottom-line benefits

Looking at the direct financial impact of digital transformation on a business, 44% of survey respondents reported that digital transformation had made a positive impact on operating costs, while 36% reported the same about revenue, and 29% reported increased profits. While this is still a positive result considering the high cost of initial investment and short-term disruption to business operations, compared to last year's results fewer financial benefits have been observed overall. One explanation could be that, as digital transformation becomes more ingrained and ubiquitous throughout a company, perceptions of its value might be reduced.

As discussed above, expected ROI is between two and five years, so companies may be required to change their mindset and wait longer to see substantial gains.

Figure 19 – Financial impacts of digital transformation



CHALLENGES OF **DIGITAL TRANSFORMATION**

Lack of clear vision and leadership is a major obstacle

While digital transformation brings tremendous opportunities, the journey is also associated with several challenges for organisations. Notably, different challenges are recognised by companies that have embraced the digitalisation journey, compared to those that have not yet embarked on digital transformation. This suggests the interpretation of "challenges" differs, depending on how risk-averse a company is with regard to digitalisation.

In order to realise the true potential of investing in digital transformation, businesses need to first overcome a number of obstacles. For those who have invested, key challenges are a lack of clear vision and leadership (39%), high financial investment requirements (37%) and business partners/suppliers/customers unable to collaborate (37%).

Notably, in this group, while OEMs (39%) are primarily concerned about their inability to collaborate with different players, Manufacturers see both a lack of skilled professionals (43%) and a lack of clear vision and leadership (43%) as the key obstacles. And while Brands & Retailers share the same belief that a lack of clear vision and leadership (45%) poses a challenge, they also believe that high financial investment (45%) is problematic.

Comparing these results to last year, among those who have embarked on a digital transformation journey, significantly fewer respondents (31%) say a lack of skilled professionals a key challenge – this obstacle was ranked the highest in 2018 (51%). As previously noted, many of the respondent businesses prioritise investment in people, which could explain why the industry considers it less of a challenge.

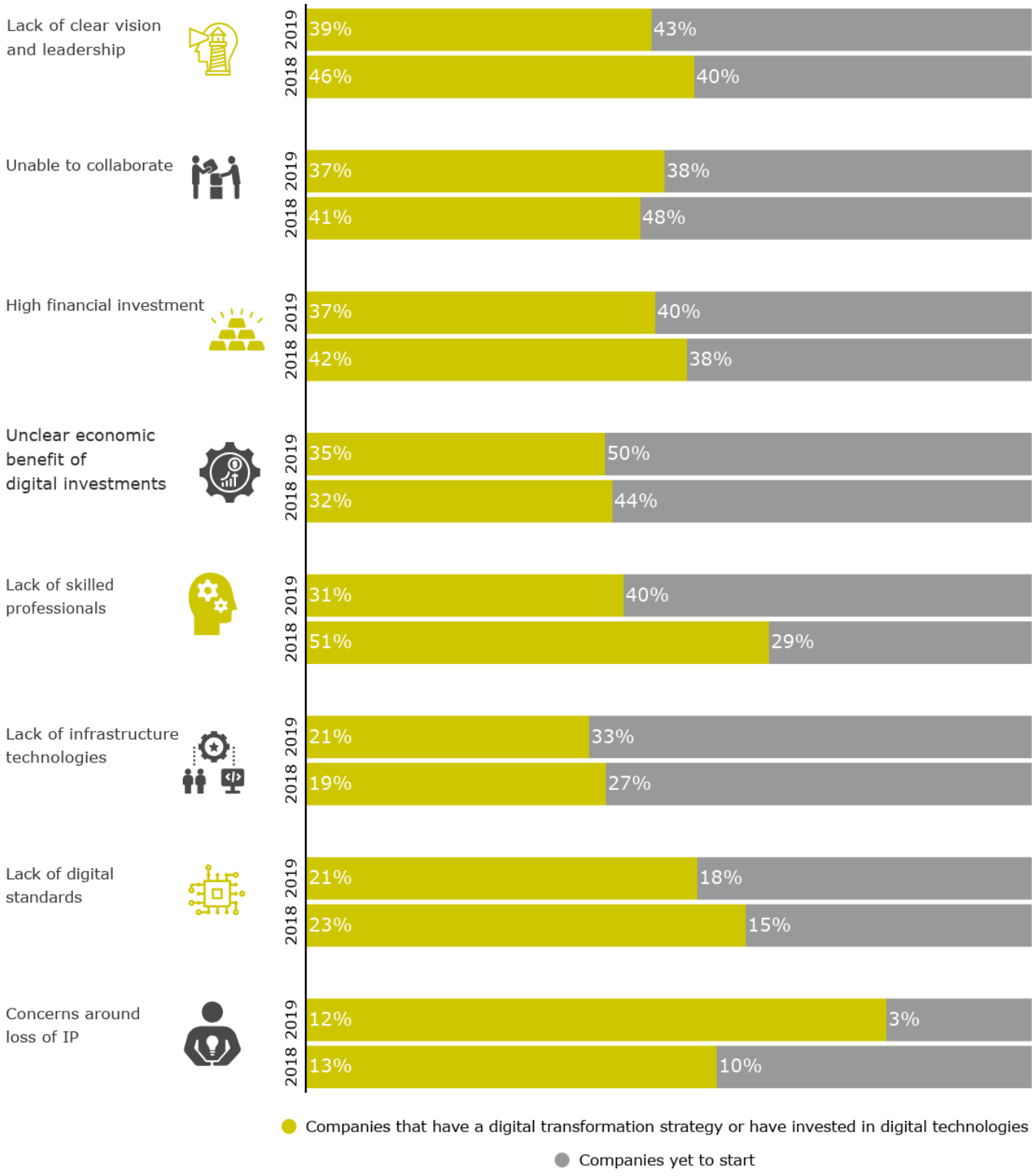
For those who have not yet invested in digital transformation, challenges are mainly posed by unclear economic benefits (50%), a lack of clear vision and leadership (43%), high financial investment requirements (40%) and a lack of skilled professionals (40%).

The main concerns for Brands & Retailers in this group are unclear economic benefits (38%), lack of basic infrastructure technologies (38%) and the inability to build successful partnerships (38%). Similarly, OEMs identify business relations as the biggest challenge (67%). In contrast, Manufacturers are more worried about unclear economic benefits (58%).

In comparison to last year's results, among those who have not yet embarked on digital transformation, fewer respondents find business partners/suppliers/customers being unable to collaborate as a key challenge (38%) – this was ranked the highest in 2018 by 48% of respondents.

Overall, it is interesting that both businesses that have and have not embarked on their digital transformation journey still find a lack of clear vision and leadership as one of the key challenges in 2019 – even though senior management remains the leader of digital transformation. This is concerning, as clear vision and communication are critical to making the right decisions. According to Harvard Business Review, "Digital technology affects every company differently, but it tends to create or destroy value in four critical areas of the organisation: customer engagement, digital products and services, operational performance, and preparing for disruptive new business models. Developing a clear point of view on the opportunities or threats in each area will suggest which capabilities need the most attention and where to concentrate investment." [12] However, the challenge associated with a lack of clear vision and leadership might be linked to the speed of change. For example, in the tech industry, by the time a business implements a solution, it is often told that there is a new and better way that should be adopted. This results in a never-ending cycle of change/improvement that can look like a lack of direction from leadership.

Figure 20 – Challenges to digital transformation amongst both companies that have started their journey and those that have not



INDUSTRY **FORECAST**

Positive outlook for digital transformation

Even though the industry faces numerous challenges, respondent sentiment towards digital transformation can be considered quite positive. Using natural language programming to analyse respondents' comments on how they see the industry in the year 2030, the overall industry sentiment concerning digital transformation is positive, at +0.56 on a scale of -1 to +1.

Comparing this to last year, it is clear that despite the challenges, the industry's attitude to digital transformation has significantly improved, with last year's results returning overall industry sentiment of +0.37. Even though the previous score does not appear to be a ringing endorsement, it still portrayed the industry at the time as being generally upbeat about digital transformation. Looking at the responses to the rest of the survey, the improved sentiment reflects an increase in the number of textile and apparel businesses that have embraced the digital transformation journey. This result also supports the findings from KPMG's Global Manufacturing Outlook 2018 study, which suggests that 95% of the CEOs believe that the Fourth Industrial Revolution is an opportunity and not a threat. [3]

It is anticipated that increased positivity around digital transformation will be achieved going forward, primarily due to the millennial effect. This year, only 17% of all respondents are millennials – a 1% increase on last year. However, it is anticipated that millennials will constitute three-quarters of the workforce by 2030. [13] This means that the percentage share of this respondent group will increase as this generation steps into more senior business roles. As millennials are considered more tech-savvy than other generations, because they were raised during the era of the Internet, they are more likely to make a positive impact on the various challenges the industry currently faces.

In McKinsey & Company's "Unlocking success in digital transformation" study, almost 70% of participants indicated that their organisations' top teams had experienced change during the transformation – led by the management team bringing in new leaders, familiar with digital technologies. [8] With the key challenge to digital transformation currently identified as the lack of clear vision and leadership, it is likely that new millennial leaders will enable successful transformation.

"The survey shows that ITMA 2019 has brought **a new wave of exciting products** and **innovative technologies** that have made digital transformation a reality within the textile and apparel supply chain," says Cornelia Buchwalder, Secretary General, CEMATEX

Figure 21 – Sentiment analysis for 2030



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