

Supply Chain and Logistics Innovation Accelerates, But Has Long Way to Go

Descartes Research Report



Introduction

The recent past has highlighted that supply chain and logistics performance can make or break companies and that many supply chains are in dire need of innovation. A recent study by Descartes of 1,000 supply chain and logistics executives in North America and Europe identified that the challenges of the past several years caused more **(57%)** companies to accelerate their innovation initiatives with an even greater amount **(65%)** planning to invest more in supply chain and logistics innovation initiatives in the next two years. But does supply chain and logistics innovation translate to business success, and what role does management support play in both?

Top Level Findings

Below are high-level at-a-glance takeaways from the research



59% accelerated the pace of their innovation over the past 2 years



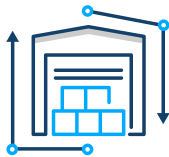
65% plan to increase innovation investment next 2 years



37% listed "Lowering costs/improving reliability" (tie) as top reasons for innovation



87% face obstacles to innovation



24% indicated that WMS was most in need of innovation



43% described their pace of innovation as "ahead of the competition" or "industry leader"



41% listed order fulfillment as their top digitization initiative



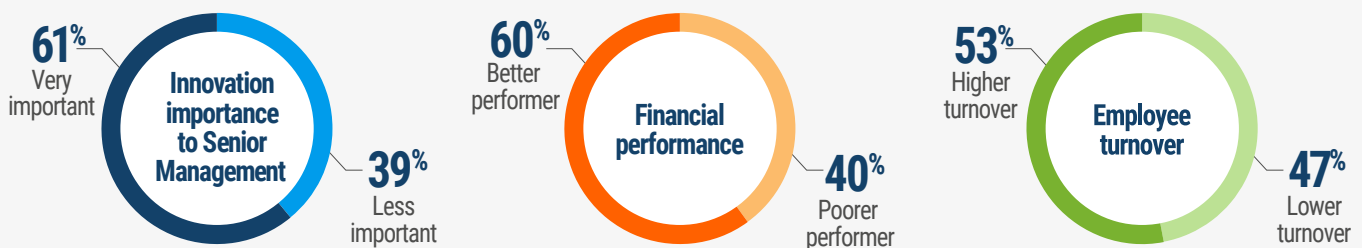
*Over half of the respondents say they use a mix of internal and external resources to develop innovative supply chain technologies **(55%)** and strategies **(52%)**.*

What accelerates—or inhibits—innovation?

One of the goals of the study was to get some sense of the connection between innovation and business health. We wanted to understand how three key factors—management importance, financial performance and employee turnover—enable supply chain and logistics innovation and, conversely, how innovation enables financial success and reduces employee turnover. It was our hypothesis that management importance is a self-fulfilling prophecy; that is, if senior management believe supply chain and logistics innovation is important, it would be reflected in the strategies and actions taken. Similarly, companies with better financial performance would be able to direct more resources toward supply chain and logistics innovation than those with lower financial performance—and better performers would also reap the financial benefit of the innovations they deployed. Finally, we anticipated employee retention to be critical as supply chain and logistics innovation requires deep domain expertise and workforce stability helps build and maintain this level of expertise.

What's the relationship between business performance and innovation?

The study showed the following in terms of management importance, financial performance and employee turnover:



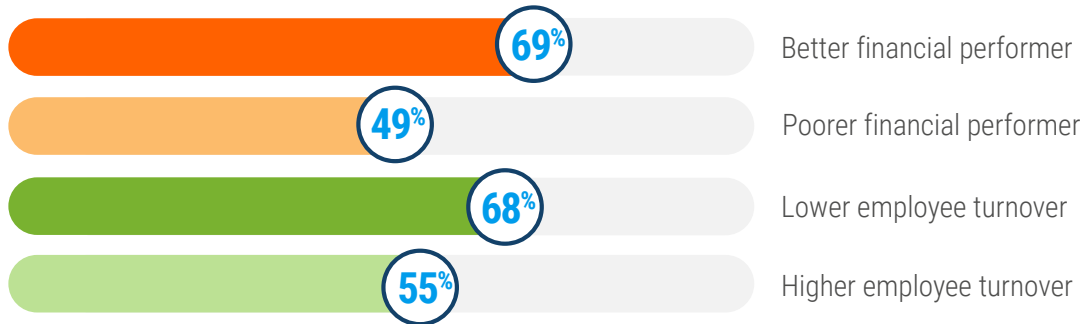
Source: Descartes

We compared responses from these three areas against each other to see if there was any correlation between business success and perspectives on innovation. The results indicated that innovation importance, financial performance and employee turnover do, in fact, have significant impact on each other. A higher level of senior management importance placed on supply chain and logistics innovation goes “hand-in-hand” with better financial performance and lower employee turnover. **Management focus, better financial support and a more stable workforce are critical for accelerating supply chain and logistics innovation. Conversely, a lack of senior management support and financial wherewithal and higher employee turnover are significant inhibitors to fostering innovation.**

Respondents who said that innovation was important to senior management were **20%** more likely to be better financial performers and **13%** more likely to experience lower employee turnover (see Figure 2).

Fig 2: Impact of innovation importance on financial performance and employee turnover

Innovation importance to Senior Management

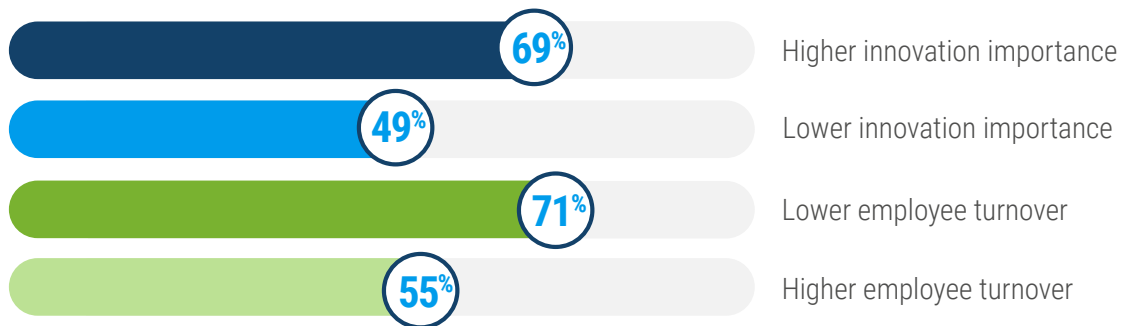


Source: Descartes

Respondents who said they were better financial performers were **20%** more likely to have senior management who believes innovation is important and **16%** more likely to have lower employee turnover (see Figure 3).

Fig 3: Impact of financial performance on management importance and employee turnover

Better financial performers



Source: Descartes



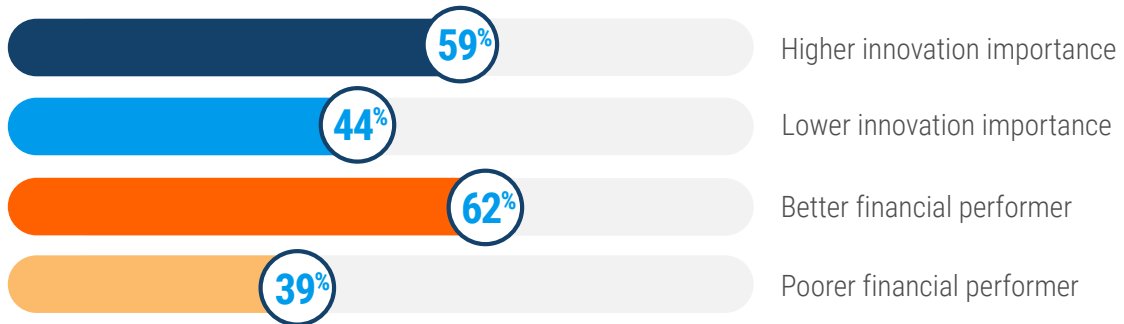
A higher level of senior management importance placed on supply chain and logistics innovation goes “hand-in-hand” with better financial performance and lower employee turnover.



Respondents who said they had lower employee turnover were **15%** more likely to have management who believes innovation is important and **23%** more likely to have better financial performance (see Figure 4).

Fig 4: Impact of financial performance on management importance and employee turnover

Lower employee turnover



Source: Descartes

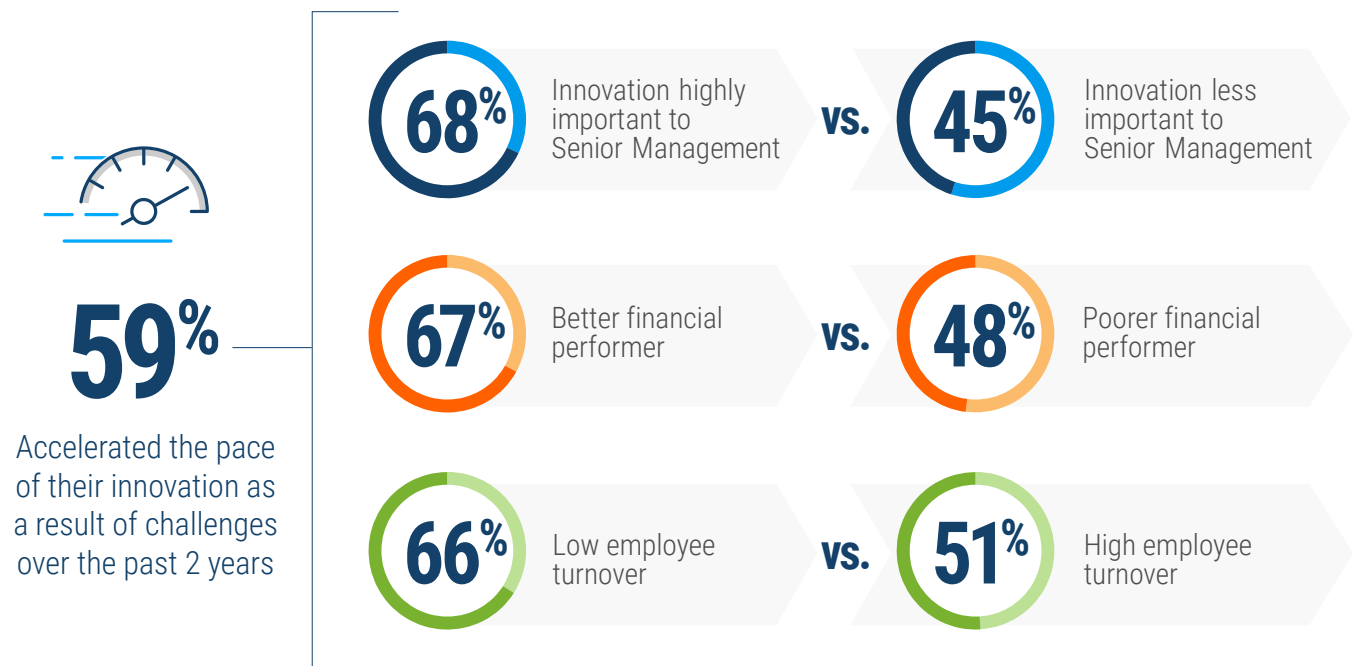


Over half of the respondents (**53%**) describe their company's employee turnover as "better than average".

What's driving innovation?

From dramatic shifts in demand to supply chain disruptions to labor shortages, the past two years have forced many companies to become more agile and rethink their supply chain and logistics strategies, tactics and technologies. The study showed that the majority of respondents (**59%**) said their company accelerated the pace of innovation as a result of the challenges in the past two years. This is the case for those companies who: had senior management support for innovation as very important (**68%**), were better financial performers (**67%**) and had lower employee turnover (**66%**). There was a significant gap in supply chain and logistics innovation acceleration for companies who: had senior management views on innovation as less important (**45%**), were poorer financial performers (**48%**) and experienced higher employee turnover (**51%**).

How has the past two years of supply chain and logistics challenges driven innovation in your organization?



Source: Descartes

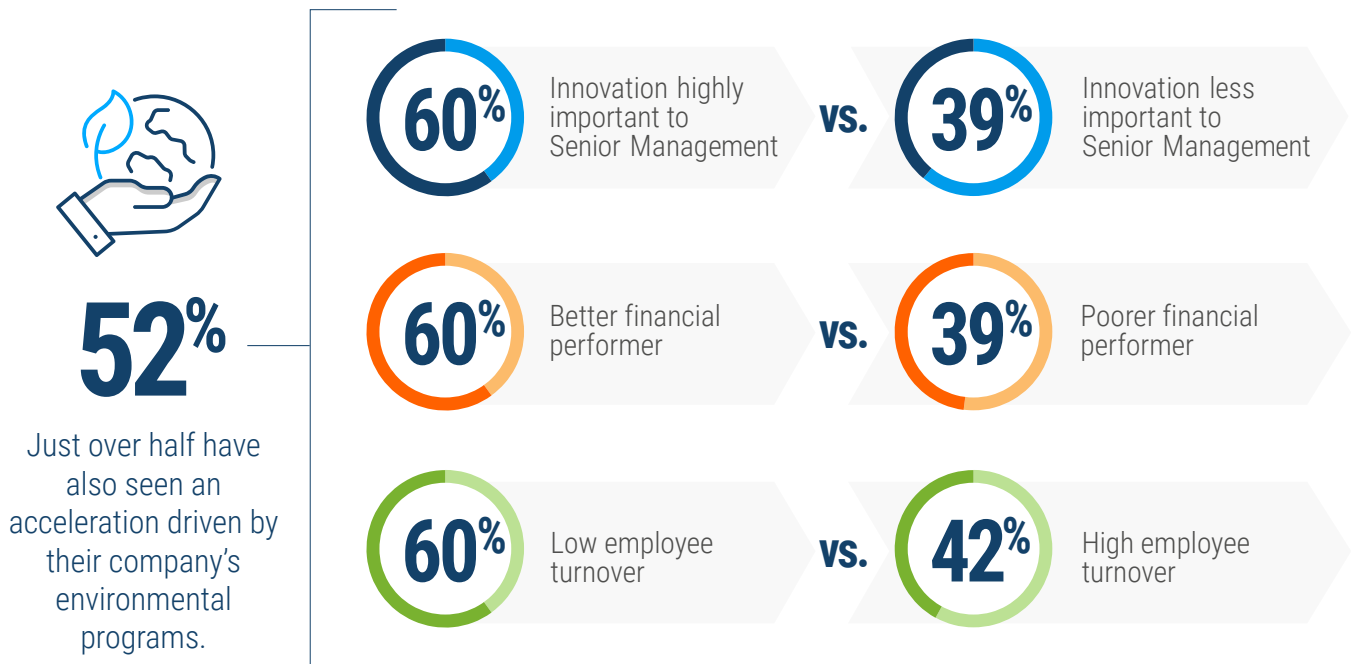


The past two years have forced many companies to become more agile and rethink their supply chain and logistics strategies, tactics and technologies.

Innovation and the environment

Company environmental programs, government mandates and consumers are challenging supply chain and logistics professionals to rethink product flows and transportation modes and were noted as factors accelerating supply chain and logistics innovation for just over half (**52%**) of respondents. Environmental programs were a greater accelerator for companies that believe supply chain and logistics innovation is very important (**60%**), are better financial performers (**60%**) and experienced lower employee turnover (**60%**). Environmental programs were less of an accelerator for companies that regard innovation as less important (**39%**), had poorer financial performance (**39%**) and experienced higher employee turnover (**42%**).

What is the impact of your company's sustainability/environmental impact programs on your supply chain and logistics innovation?



Source: Descartes

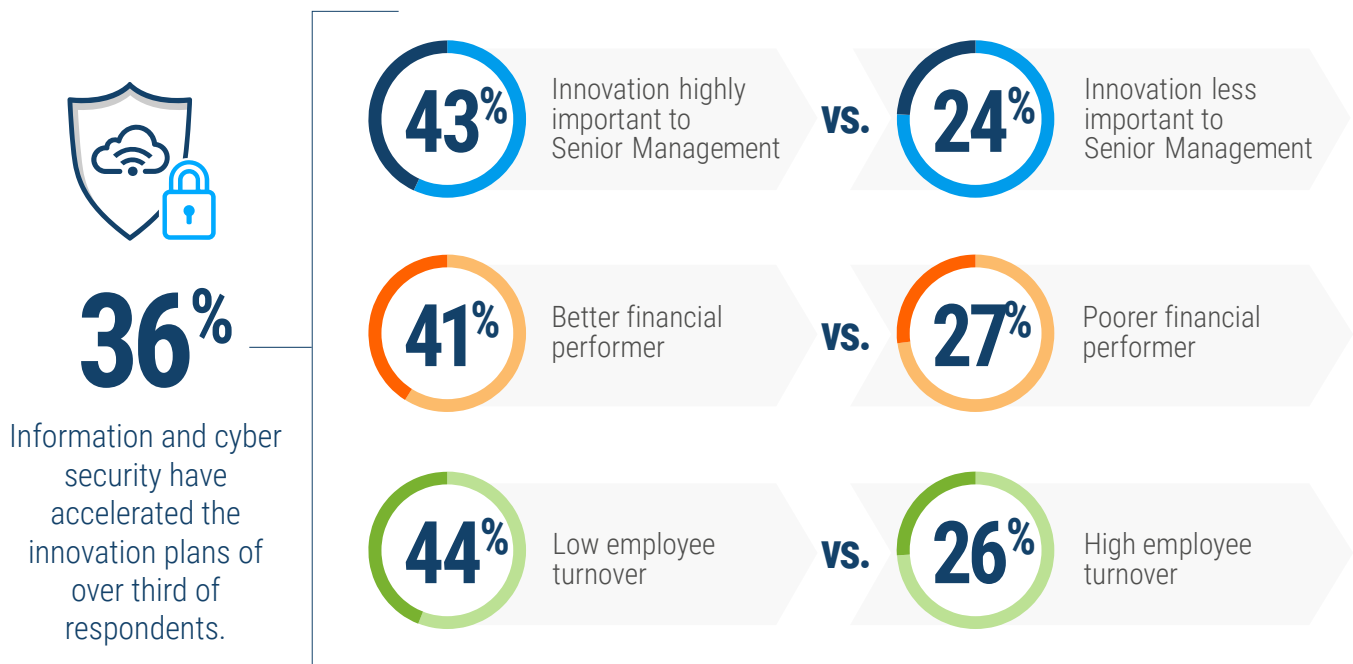


55% have a defined ESG strategy, but only **30%** also have an action plan and funding in place.

Increasing importance of cyber security

Cyber-attacks have been increasing dramatically, shutting down supply chain and logistics operations, exposing legacy bespoke technology and forcing the need to rethink business processes. Information and cyber security were an innovation accelerator for just over one-third of the respondents (36%). Again, there was heightened attention for information and cyber security as a supply chain and logistics innovation catalyst for companies where management believes innovation is very important (43%), companies who are better financial performers (41%) and those with lower employee turnover (44%). Information and cyber security programs were less of an accelerator for companies where management believes innovation is less important (24%), who are poorer financial performers (27%) and who experience higher employee turnover (26%).

Has information or cyber security impacted your supply chain and logistics innovation plans?



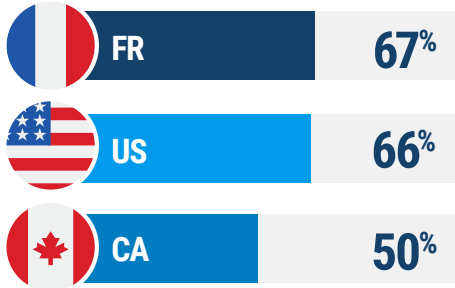
Source: Descartes



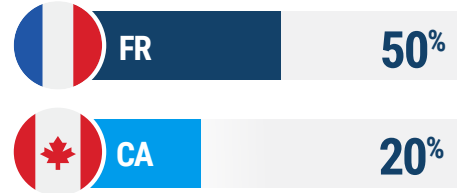
Information and cyber security have accelerated the innovation plans of over one in three companies.

Supply chain innovation by region

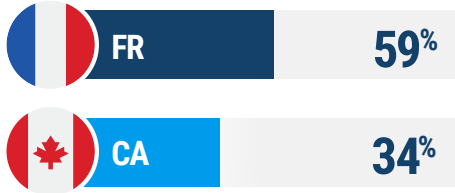
How have organizations in specific countries accelerated their supply chain and logistics innovation?



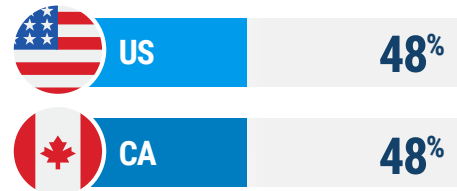
Two-thirds of French (67%) and U.S. companies (66%) have accelerated their supply chain and logistics innovation, compared to only 50% in Canada.



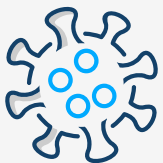
France noted the highest level of acceleration on supply chain and logistics innovation from information and cyber security (50%) while Canada noted it had the least impact on innovation (20%).



French companies are leading in terms of acceleration due to environmental programs (59%) while Canadian companies rank the lowest at (34%).



In the U.S. (48%) and Canada (48%), inflation was noted as the top negative impact on innovation.



*Some external factors are negatively impacting supply chain and logistics innovation: COVID (36%) and inflation (34%) were noted as having the most adverse impact.**

* Senior management importance, financial performance and employee turnover did not influence the negative impact of COVID and inflation on supply chain and logistics innovation.



How important is technology to innovation?

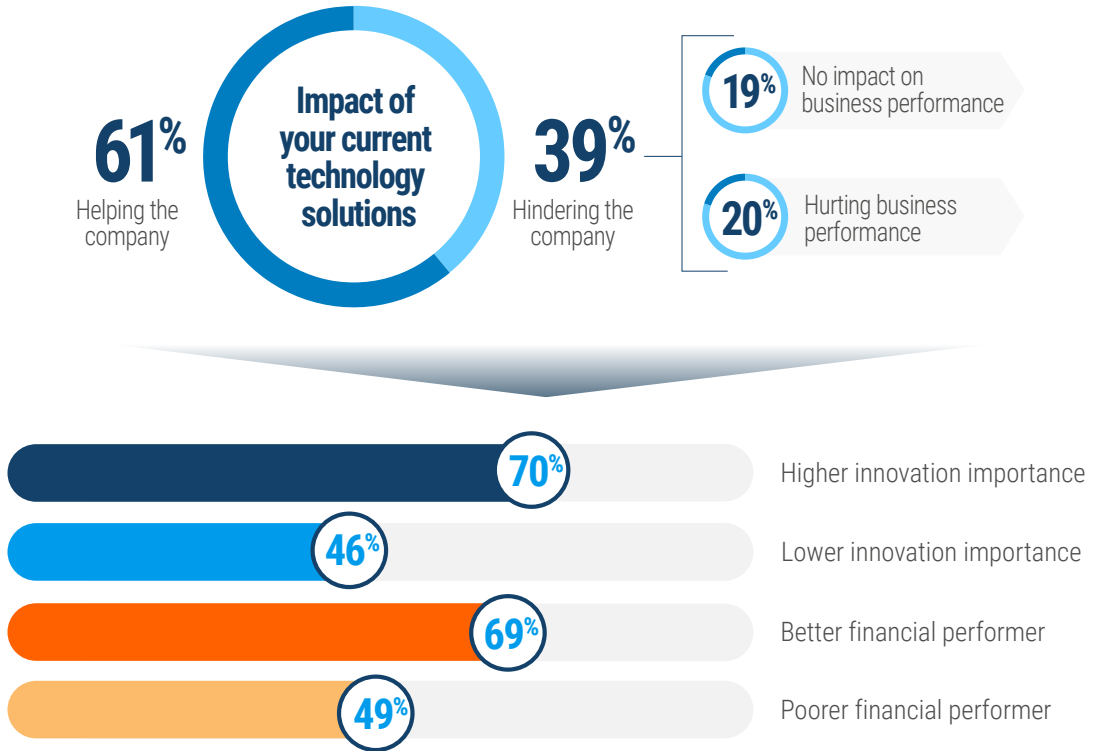
Technology solutions have become closely associated with supply chain and logistics innovation. For many companies, technology is a differentiator, but others have not gained any significant benefits from their deployments. According to the study, **61%** of respondents said their current supply chain and logistic technology solutions are helping the company, not hindering it. This leaves **39%** that have experienced either no negative impact at all from their supply chain and logistics technology solutions, or no negative impact. Specifically, **19%** have not seen any impact from technology on business performance and **20%** believe technology solutions are actually hurting business performance. Unfortunately, a lot of factors can dictate success for supply chain and logistics technologies that have nothing to do with the technology solution itself. The study did reveal, however, that the positive impact of logistics and supply chain technology solutions rises (**70%**) when senior management considers innovation very important and the company has better financial performance (**69%**). Conversely, the positive impact decreases when senior managers consider innovation less important (**46%**) and the company has poorer financial performance (**49%**). The results are almost self-prophecy. Experience says that management that places importance on innovation or doing well financially is most likely getting the most out of their supply chain and logistics technology solutions.



According to **61%** of the respondents, their current supply chain and logistic technology solutions are helping the company, not hindering it.

How important is technology to innovation? (cont'd)

How would you describe the impact of your current supply chain and logistics technology solutions on your company?



Source: Descartes

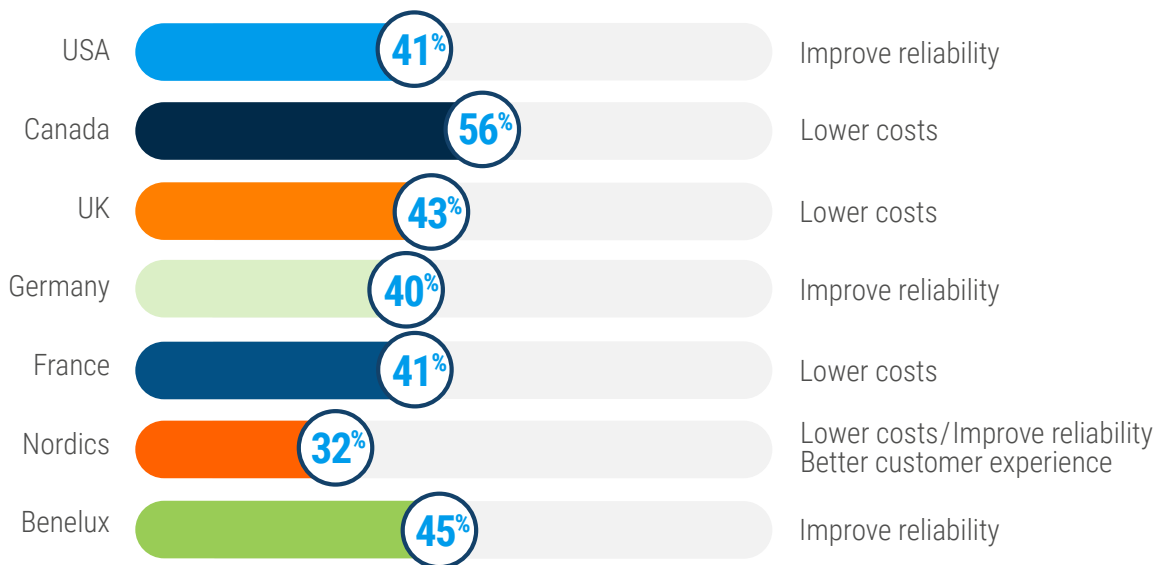


16% of American and Nordic respondents indicate that supply chain and logistics technology solutions have helped their company become an industry leader.

Why innovation is important

The expectations for supply chain and logistics innovation change over time and are highly influenced by recent and current experiences. The results of the study reflect this, in that lowering costs (37%) and improving reliability (37%) were cited as the main reasons today why companies are innovating their supply chain and logistics operations. The impact of management importance, financial performance and employee turnover on these findings was negligible. Better customer experience was the third highest response (27%) although, in this case, there was some difference based on financial performance: 30% for better financial performers and 22% for poorer financial performers. While the environment is an important accelerator for many respondents, it wasn't cited as a primary reason; the highest it ranked was as the third priority from respondents in France (27%) and the Nordics (26%).

What are the primary reasons you are innovating supply chain and logistics?



Source: Descartes



*In the U.S. specifically, **71%** of senior managers believe supply chain and logistics innovation is very important, compared to only **48%** in the Benelux region.*

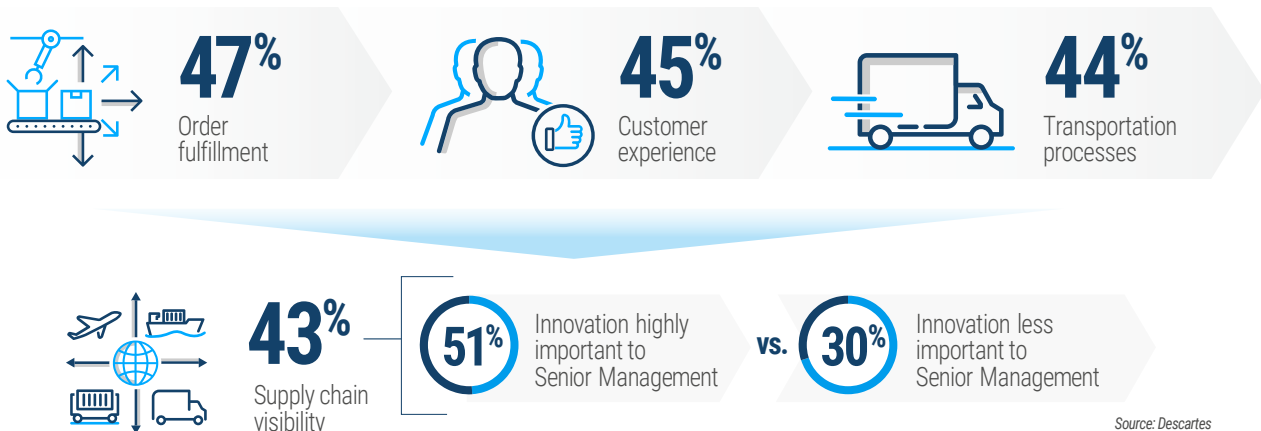


What innovations are companies deploying and how far along are they?

Digitization efforts are closely aligned with supply chain and logistics innovation because they're about transforming company performance in ways that allow customers to see the positive difference. Supply chain and logistics operations are very extensive, so it's highly unlikely that companies would have digitization programs that address the entirety of their operations. The study identified the top digitization initiatives companies have focused on as order fulfillment (47%), customer experience (45%) and transportation processes (44%). There was little difference in the results when evaluating management importance, financial performance and employee turnover.

Supply chain visibility was the fourth most important digitization effort (43%); however, there was a significant difference in results for senior management who thought supply chain and logistics innovation was very important (51%) compared to those who believe supply chain and logistics innovation was less important (30%).

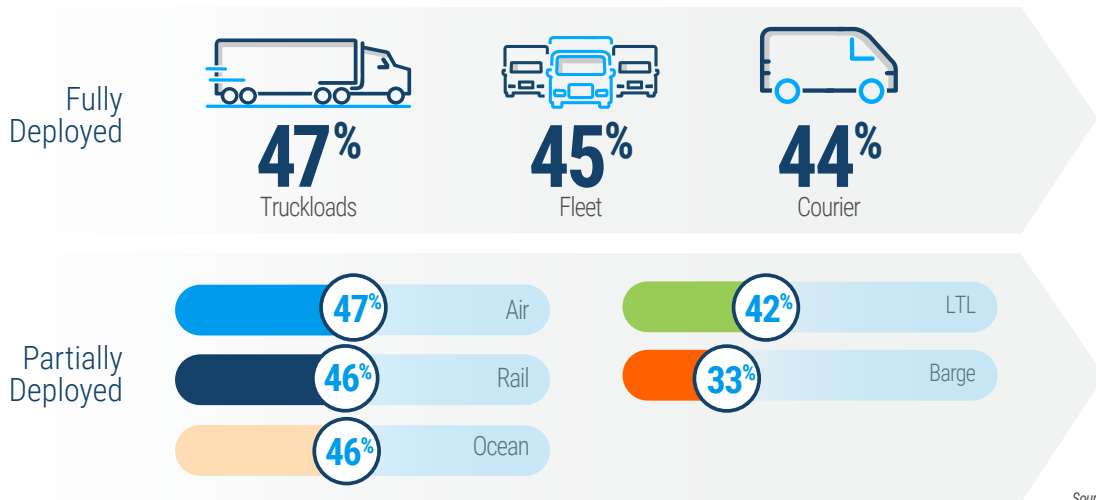
Top digitization initiatives



The application of supply chain visibility

For management who believe innovation is very important, given the significant disruptions of the last several years, supply chain visibility has become extremely important to manage supply chain and logistics performance. Advanced tracking of truckload transportation (**47%**) was the top fully deployed innovation followed by fleet (**33%**) and courier (**32%**). Supply chain visibility is, however, rapidly maturing as between **35%** and **43%** of the respondents across all modes (i.e., truckload, fleet, courier, air, rail, ocean, LTL and barge) cited technologies in pilot or partial deployment.

Which of the following transportation modes makes use of advanced tracking in your operations?



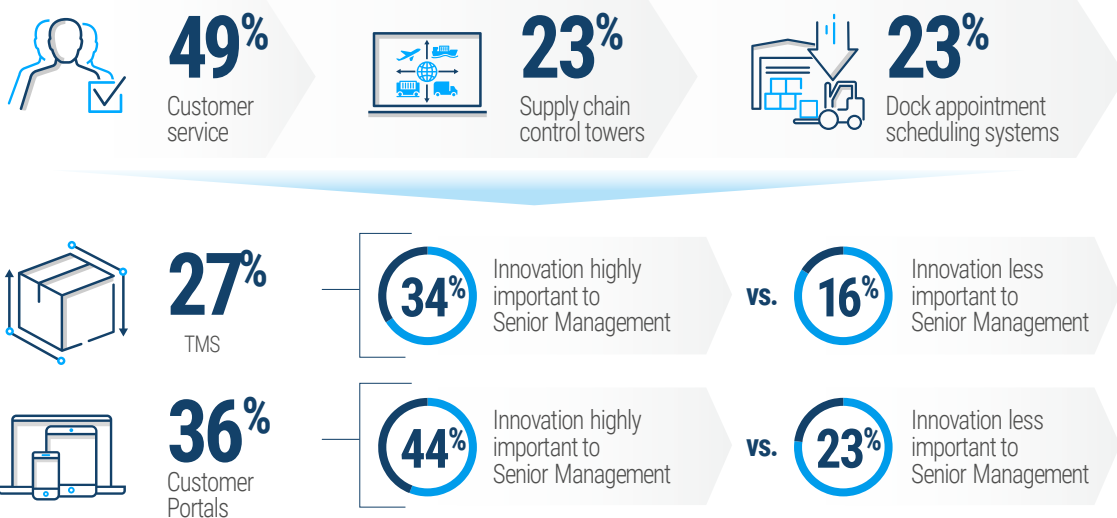
Source: Descartes



Real-time shipment tracking

Almost half (**49%**) have already fully integrated real-time shipment tracking into their customer service solution, followed by integration with customer portals (**36%**), transportation management systems (TMS, **27%**), supply chain control towers (**23%**) and dock appointment scheduling systems (**23%**). For fully deployed TMS integration with real-time shipment tracking, there was a significant difference between those who said senior management believes supply chain and logistics innovation is very important (**34%**) and those who think it's less important (**16%**). The same was true for real-time shipment tracking integrated with a customer portal, with senior management who regard innovation as very important at **44%** compared to **23%** for those who regard it as less important.

Has your organization integrated real-time shipment tracking into your enterprise solutions?



Source: Descartes

Competition is also shaping supply chain and logistics innovation. The top competitive innovation respondents cited was real-time shipment location (**27%**) followed by electric or alternative vehicles for more sustainable delivery (**23%**), digital customer experience (**22%**) and robotics to improve fulfillment capacity (**21%**). The impact of management importance, financial performance and employee turnover on these findings was negligible.

What supply chain and logistics innovation is the competition doing that you most wish your company was doing?



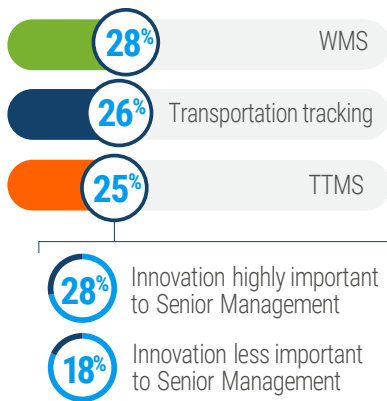
Source: Descartes

Where companies are applying innovation

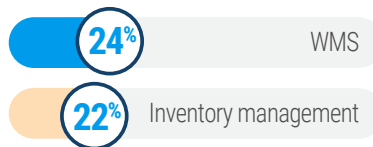
The answers to three questions paint a picture of where companies believe they are most innovative in their supply chain and logistics operations, where they had the greatest need for innovation and where they will focus innovation for the next two years. In general, no one area dominated the results for the state of innovation today and future focus. In some cases, such as warehouse management systems (WMS), the same area simultaneously topped the list of the most innovative parts of the business and the list of those having the greatest need for innovation.

- Over a quarter of respondents feel their companies are most innovative with their WMS (**28%**) and transportation tracking (**26%**). TTMS was third (**25%**); however, this figure rose to **28%** for those who said senior management believe supply chain and logistics innovation is very important and declined to **18%** for those who said senior management believe it less important.
- WMS (**24%**) was also cited as the top area with the greatest need for innovation followed closely by inventory management (**22%**). There was little difference by management importance, financial performance or employee turnover.
- For the next two years, the top focus areas for innovation were customer experience (**25%**), TMS (**24%**) and WMS (**23%**). Customer experience was the highest priority for manufacturers, retailers and distributors, but the fourth highest priority for carriers and logistics services providers. TMS was the highest priority for carriers and logistics services providers, but the fourth highest priority for manufacturers, retailers and distributors.

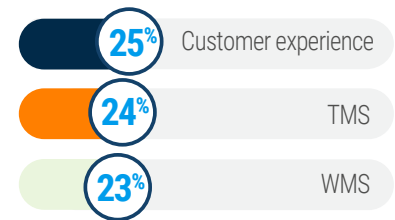
What areas in your organization are the most innovative today?



What areas of supply chain and logistics technology in your organization are in the greatest need for innovation?



Where is the greatest innovation focus for your organization in the next 2 years?



Source: Descartes



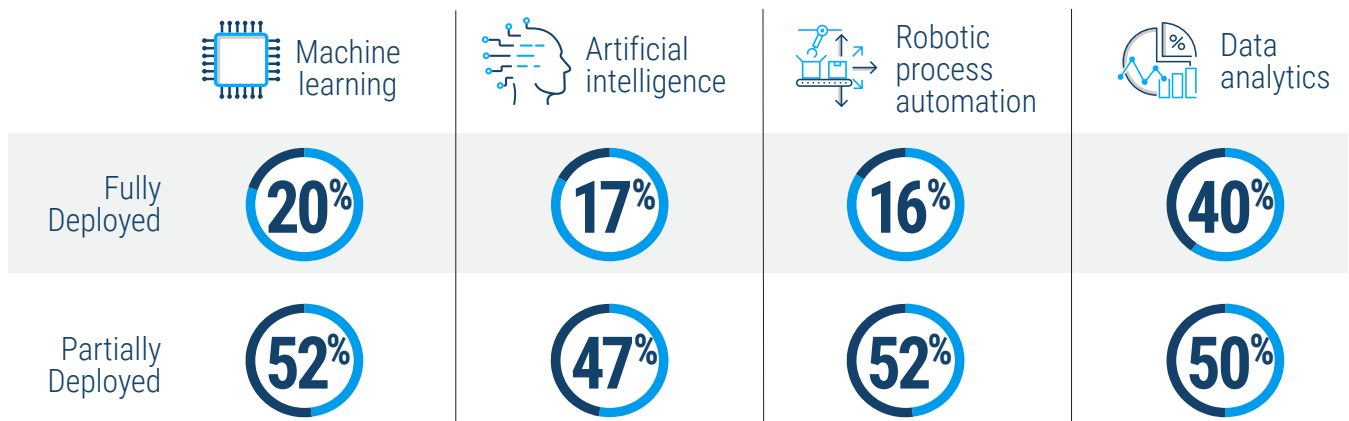
Over one in five companies feel the need to innovate their WMS (**24%**) and inventory management (**22%**).



Innovation and advanced computing technology

Advanced computing technology has been touted as the next wave of supply chain and logistics innovation. When looking at full deployments, with the exception of data analytics (40%), most advanced computing technologies such as machine learning (20%), artificial intelligence – non machine learning (17%) and robotic process automation (16%) are still in the early stages of full production use. When looking at pilots or partial deployments, however, there is a lot of advanced computing technology activity in supply chain and logistics operations: robotic process automation (52%), machine learning (52%), data analytics (50%) and artificial intelligence – non machine learning (47%).

Which advanced technology innovations are currently being employed by your company?



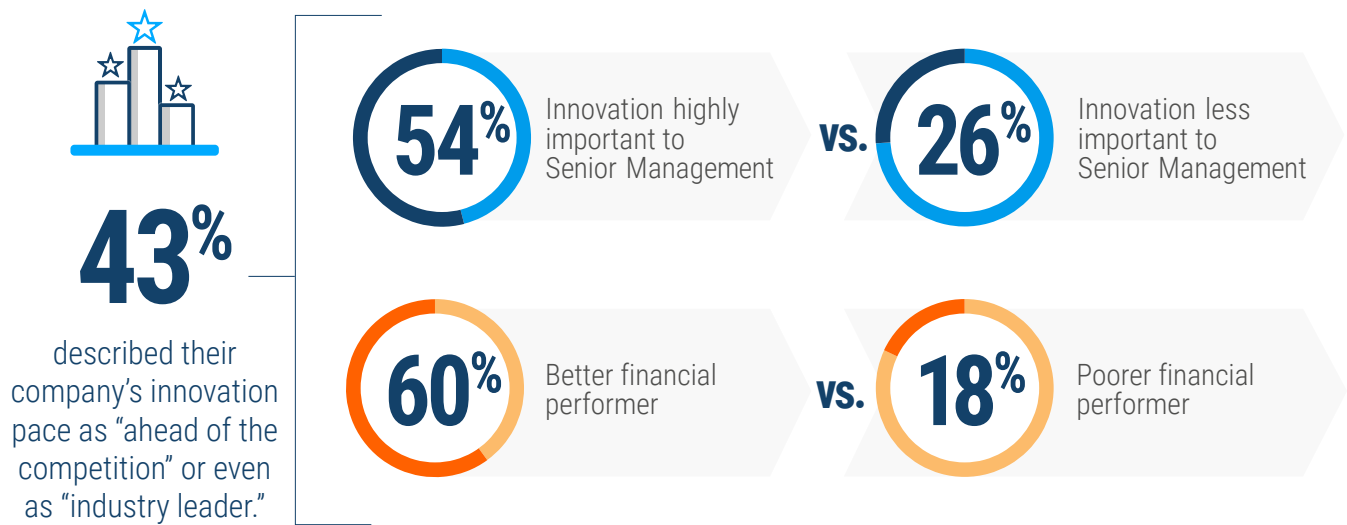
Source: Descartes

What inhibits the pace of innovation?

Innovation of any kind requires change. Because they are under constant pressure to adapt to changing market conditions, the pace of innovation is extremely important for supply chain and logistics organizations to stay ahead of competitive pressures. More than two-in-five respondents (**43%**) described their company's innovation pace as "ahead of the competition" or even as "industry leader." Only **12%** believe their company is not keeping up with the pace of supply chain and logistics innovation in their respective markets.

Senior management importance and financial performance weigh heavily on the pace of innovation in supply chain and logistics. Of the **43%** who described their pace as ahead of the competition or industry leading, **54%** indicated senior management believe supply chain and logistics innovation is very important compared to **26%** for those who believe it's less important. For the same group (**43%**) of respondents, **60%** indicated they were better financial performers compared to only **18%** who had worse financial performance.

How would you describe the pace of supply chain and logistics innovation at your company?



Source: Descartes

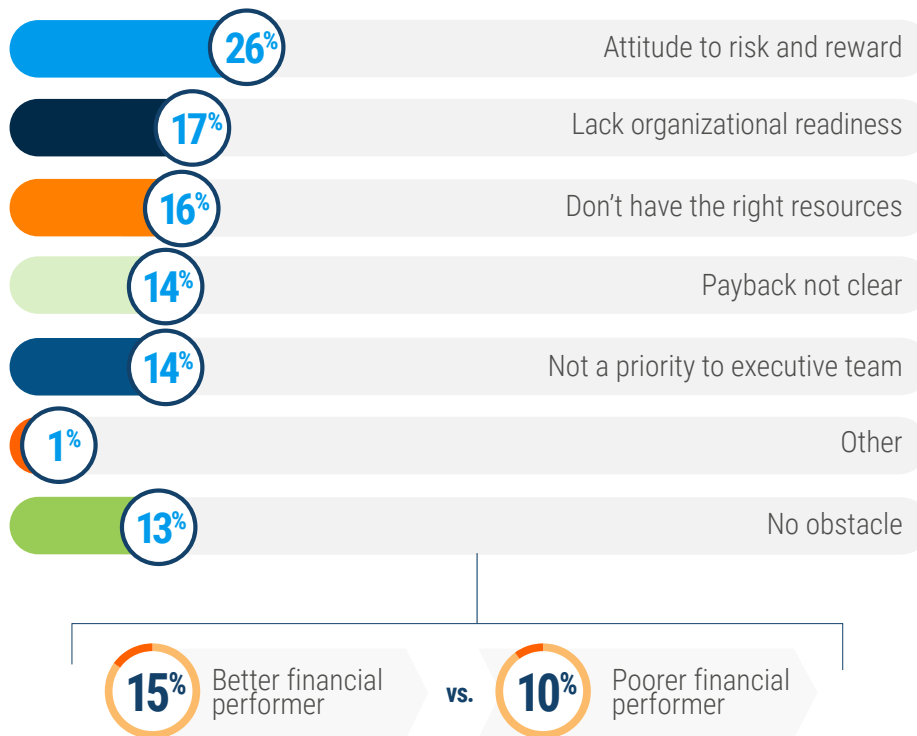


Respondents in the Nordics (**50%**) and U.S. (**48%**) were more likely to regard their company's pace as "ahead of the competition" compared to only **28%** of U.K. respondents.

Inhibitors to innovation

Culture, preparedness and a number of other factors can inhibit supply chain and logistics innovation. According to the study, inhibitors were pervasive as **87%** of respondents said they faced obstacles. The greatest inhibitor to supply chain and logistics innovation was cited as attitude to risk and reward at **26%**. Interestingly, not a priority (**14%**) was the fifth answer behind lack organizational readiness (**17%**), don't have the right resources (**16%**) and payback not clear (**14%**). This means that almost half (**47%**) had not done their homework prior to getting approval to move innovation programs forward. Financial performance did have some impact on the number of respondents who indicated there were no obstacles to innovation with better financial performers seeing an increase from **13%** to **15%** while poorer financial performance dropped from **13%** to **10%**.

What is your company's greatest inhibitor to supply chain innovation?



Source: Descartes

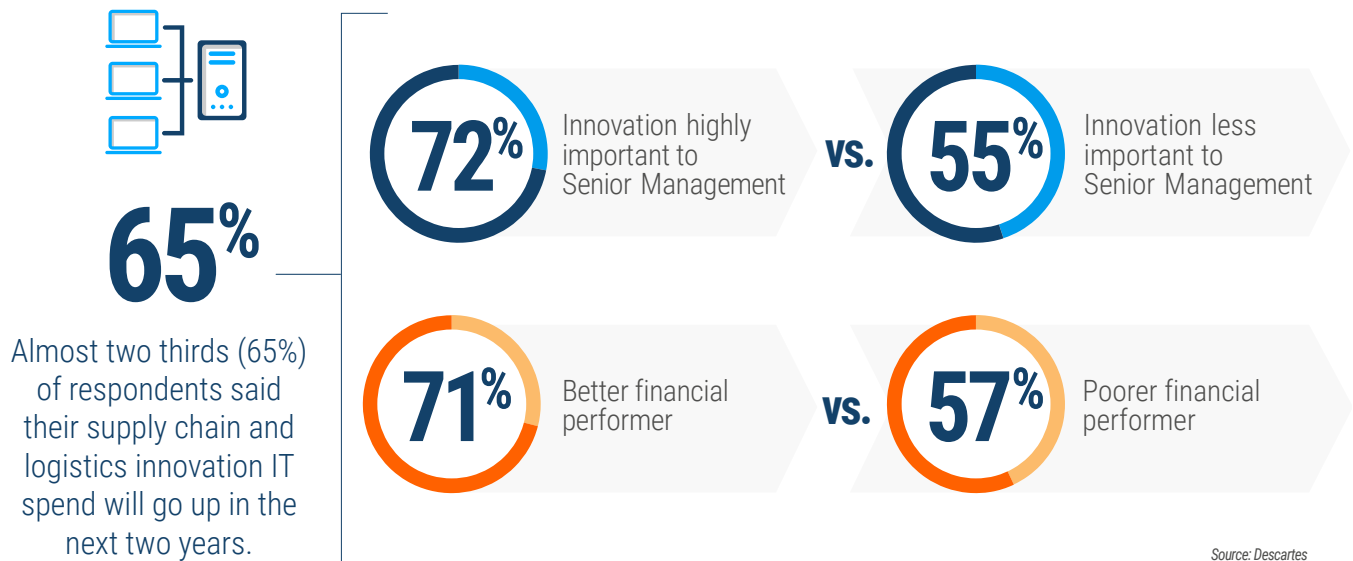


*The greatest inhibitor to supply chain and logistics innovation was cited as attitude to risk and reward at **26%**.*

Are companies investing in innovation?

Supply chain and logistics innovation requires investment in people, technology and time. Almost two thirds (**65%**) of respondents said their supply chain and logistics innovation IT spend will go up in the next two years. This number increased to **72%** for those whose senior management believe supply chain and logistics innovation is very important and decreased to **55%** whose management believe it less important. There was a similar difference when looking at financial performers with an increase to **71%** for those who are better financial performers and a decrease to **57%** for poorer financial performers. These numbers are fairly consistent with the view of the increasing importance and pace of supply chain and logistics innovation in general, and with heightened senior management recognition and better financial performance to be able to invest more.

How will your supply chain and logistics innovation IT spend change over the next 2 years?



Most companies develop and implement innovative technologies (55%) and strategies (52%) through a mix of internal and external resources.



Conclusion: Innovation builds a foundation for future success.

The light shone on supply chains in the recent past has highlighted that supply chain performance can make or break companies. The need to innovate supply chain and logistics operations has moved to the forefront of many C-level agendas out of competitive necessity or the recognition that top performing supply chains provide competitive differentiation. The results of this study point to the accelerated pace of innovation that's underway in supply chain and logistics operations, and how management importance, financial performance and employee turnover can impact innovation. There's clearly a lot of supply chain and logistics innovation underway but, for many companies, they're early in their journeys, especially with the use of advanced computing technologies.

What has also been in the spotlight is that supply chains are "aging" more rapidly than ever. Given highly evolving market dynamics and the demands put upon supply chain and logistics organizations, standing still is not a viable option. **Companies need to think about supply chain and logistics innovation as an evergreen program to remain competitive or industry leading, not only as a project to fix a supply chain performance problem.**



The results of this study point to the accelerated pace of innovation that's underway in supply chain and logistics operations, and how management importance, financial performance and employee turnover can impact innovation.

Supply chain and logistics innovation at Descartes

Because supply chain and logistics are constantly evolving disciplines, a history of innovation is central to the long-term success of leading logistics technology solutions such as Descartes' offerings. We believe that true innovation should deliver fundamental performance improvement for our customers. Our formula for innovation is simple: we treat it as a never-ending journey that only happens through hard work every day and fostering a culture that seeks to go beyond incremental change. We are able to go beyond because we combine our deep domain expertise with close work with our most visionary customers and advances in computing technology. This is why we are able to lead the digital reinvention of freight forwarding and customs and freight brokerage, turn home/last mile delivery into a competitive weapon for our retail and distribution customers and enable small-to-midsize ecommerce companies to rapidly scale their fulfillment operations to meet growing demand.

To learn more about how Descartes' innovative supply chain and logistics solutions can make a difference to your business go to <https://www.descartes.com/who-we-are/contact-us>.

About Descartes Systems Group

Descartes (Nasdaq:DSGX) (TSX:DSG) is the global leader in providing on-demand, software-as-a-service solutions focused on improving the productivity, performance and security of logistics-intensive businesses. Customers use our modular, software-as-a-service solutions to route, schedule, track and measure delivery resources; plan, allocate and execute shipments; rate, audit and pay transportation invoices; access global trade data; file customs and security documents for imports and exports; and complete numerous other logistics processes by participating in the world's largest, collaborative multimodal logistics community. Our headquarters are in Waterloo, Ontario, Canada and we have offices and partners around the world.

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Uniting the People & Technology That Move the World.