



Global Manufacturing Outlook

**Competing for growth:
How to be a growth leader
in industrial manufacturing**

KPMG International

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Doug has over 30 years of experience both in consulting and industry positions. Currently, Doug leads the delivery of major operational improvement projects across a variety of industrial companies. Doug is also the US Leader for KPMG's Innovation and Engineering service area. Throughout his career, Doug has focused on a broad set of major industrial clients, providing valuable advice in the areas of engineering, operations, outsourcing and IT transformation. Doug's industry experience includes over 20 years at a major aerospace and defense company in various Program Management and IT positions.

"Manufacturers are going to face really fierce competition over every scrap of market share available and there will certainly be winners and losers."



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Tom focuses on supporting industrial manufacturers in their supply and manufacturing strategy, operations turnaround, purchasing and supply base management. With 25 years of consulting experience, Tom's clients represent a broad range of discrete products industries with a focus on aerospace, industrials, construction products and automotive. Tom frequently participates as a panelist and speaker on manufacturing strategy at prominent industry and business conferences.

"Manufacturers must start thinking about how they can add new pools of value to their customers and then leverage all of the technologies at their disposal to rapidly deliver on that value."



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Erich leads KPMG's Global Operations Advisory Practice and Global Operations Center of Excellence. During his almost 20 years of experience, he has been responsible for high profile cross-border programs for a number of Fortune 500 companies in the industrial, high tech, chemicals, healthcare and consumer industries. Prior to joining KPMG, Erich led the Operation Consulting practice of a Big Four firm in Germany and was a partner in Accenture's global Operations / Supply Chain practice. Erich joined the consulting industry following a 12-year career with the German Army where he served as an Electronic Warfare Officer.

"The best way to reduce the risk of supply chain failure is by achieving greater visibility, and managing it cross-functionally deeper into the end-to-end supply chain."



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Methodology

This report is based on a survey of 360 senior executives conducted in early 2016 by Forbes Insights. Respondents, who represented six industry sectors (Aerospace & Defense, Automotive, Conglomerates, Medical Devices, Engineering and Industrial Products, and Metals), were fairly evenly distributed between the Americas, Europe and Asia.

To support the survey data, KPMG International conducted a series of interviews with leading manufacturers around the world. Their experiences, combined with insights from KPMG professionals and sector leaders, provide valuable context for today's manufacturers.

There will be winners and losers

Manufacturers are highly focused on achieving new growth; many expect to be aggressive in their search for new opportunities. Yet with limited baseline growth expected in most markets, manufacturers will need to either invest into new technologies in order to 'grow the pie' or resort to a brutal competitive fight to steal market share away from rivals. The only certainty is that there will be winners and losers.

Focus on growth

Every company wants profitable growth. But according to our data, today's manufacturers are much more focused on driving new growth than ever before.

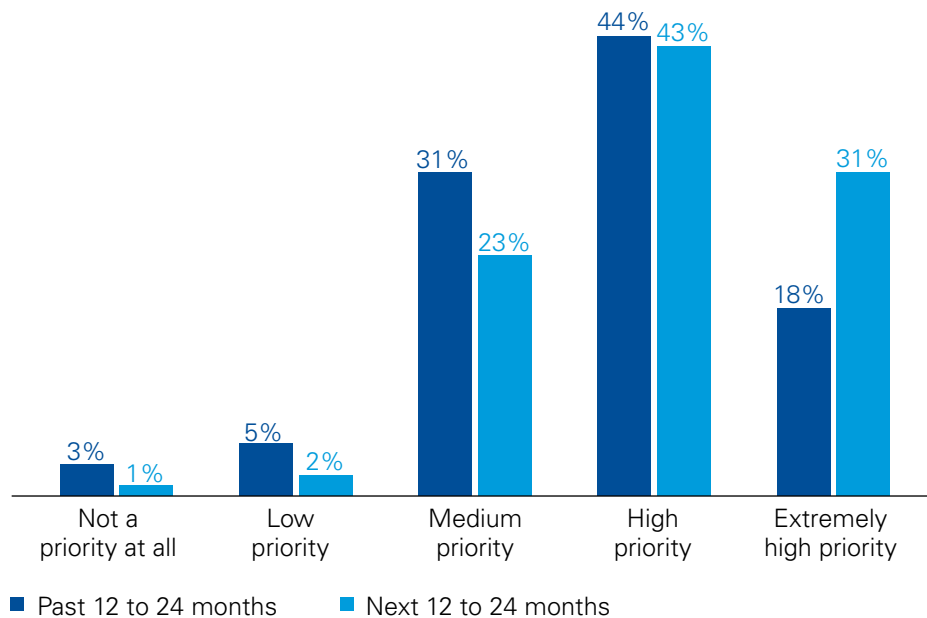
The data tells a compelling story. Whereas 62 percent of respondents said that growth was a high or extremely high priority for their organization in the past, 74 percent said it will be a high priority over the next 2 years; 31 percent said it will be an extremely high priority over the next 12 to 24 months.

Manufacturing executives also seem to recognize that they will need to fight for their growth. Many plan to be rather aggressive in the pursuit of their growth objectives. More than half of the respondents to our survey categorized their growth strategies as 'aggressive' and more than one-in-six said their growth strategy would be 'very aggressive'.

In a trend that plays out across the survey results, Asia showed the highest tendency towards aggressive growth strategies.

Growth becomes an extremely high priority

Please rate the priority for exploiting opportunities for growth (over the past 12 to 24 months and in the next 12 to 24 months).



Note: Percentages may not add up to 100 percent due to rounding.

Source: Global Manufacturing Outlook, Forbes, 2016

Japanese respondents, in particular, reported taking a highly aggressive approach; 41 percent of Japanese respondents said they would be very aggressive, compared to 11 percent of US respondents and just 8 percent of German respondents. More than a quarter of China's respondents also said they would follow a very aggressive growth strategy.

"Anyone waiting for a slow-down in the level of competition coming from Asia will be disappointed," notes Doug Gates, Global Sector Chair, Industrial Manufacturing and Head of Aerospace and Defense. "Asian manufacturers clearly expect to step up their efforts to capture new market share and grow their bottom line and that will mean even stiffer competition going forward."

How they are doing it

According to our survey, manufacturers plan to make significant and often fundamental changes to their business in order to drive future growth. More than 80 percent of all manufacturers said they expect to change the range of products and/or services they offer over the next 2 years. Ninety-two percent said they expect to enter new geographic markets to drive growth.

Eight-in-ten respondents also said that they would enter into new sectors to achieve growth. "We have seen manufacturers make significant investments into new businesses, models and technologies that help them expand their footprint into new sectors," adds

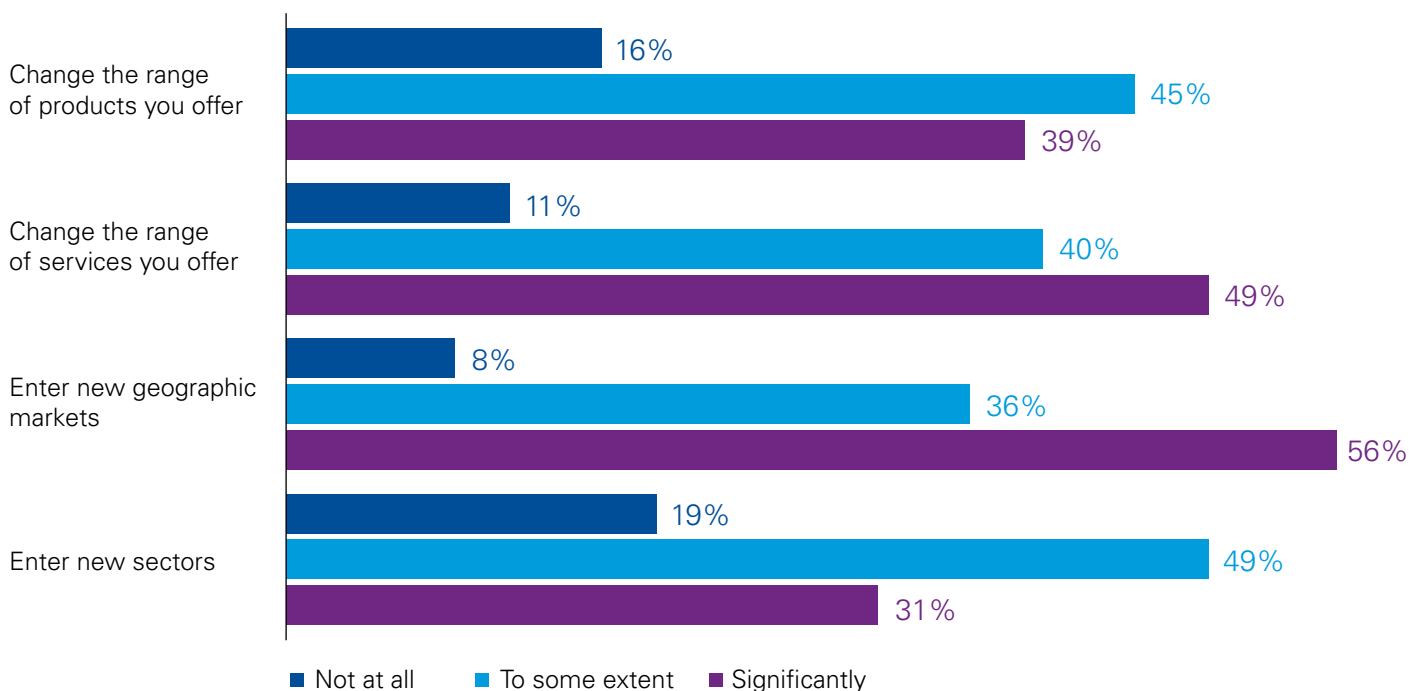
“Anyone waiting for a slow-down in the level of competition coming from Asia will be disappointed.**”**

Doug Gates

Global Sector Chair,
Industrial Manufacturing and
Head of Aerospace and Defense

Manufacturers are making big moves to achieve growth

To what extent will your organization do the following in the next 12 to 24 months?



Note: Percentages may not add up to 100 percent due to rounding.

Source: Global Manufacturing Outlook, Forbes, 2016

Tom Mayor, Principal, Strategy Practice, KPMG in the US. "From automakers investing into mobility platforms to defense contractors investing into commercial cyber security services, manufacturers are looking for ways to remain relevant to their customers while defending against potential disruptors and disruptive business models in their core sectors."

Interestingly, respondents were much more likely to show a strong preference for organic growth to achieve their growth priorities. In fact, respondents were more than 50 percent more likely to note a preference for organic growth over M&A activity (61 percent versus 40 percent respectively). At the same time, Asian respondents reported the highest preference for M&A activity: 56 percent of China's respondents

said they would use M&A to address their company's growth priorities and 53 percent of Japan's respondents said the same.

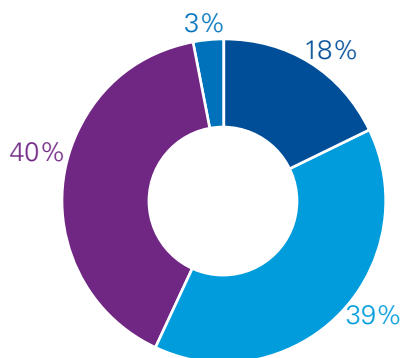
Yet while manufacturers may show a preference for organic growth, our survey reinforces the fact that they are not willing to sacrifice speed. More than two-thirds of respondents said they expect to see results from their growth initiatives in less than 3 years.

"Everyone says they expect to grow their market share and everyone says they plan to be aggressive in their strategies, yet there are no indications that the size of the market is going to increase dramatically over the coming years," says Doug Gates. "There are going to be really fierce competitions fought over every scrap of market share available and there will certainly be winners and losers."

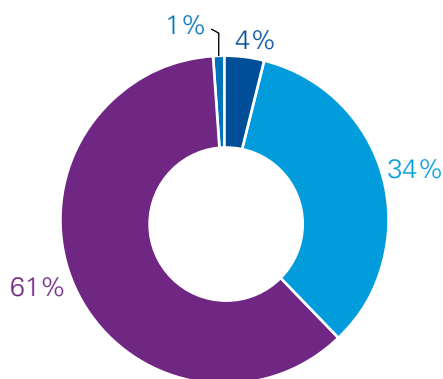
A preference for organic growth

To what extent will you be addressing your company's growth priorities through:

Mergers and acquisitions of other organizations



Organic investment (including increase in R&D)



■ Not at all ■ To some extent ■ Predominantly ■ Don't know

Source: Global Manufacturing Outlook, Forbes, 2016

What's the point?



Manufacturers are optimistic about growth but, without overall market growth, competition will become intense

What did manufacturers say?

- 65% were confident about their company's growth prospects
- 74% said growth will be a high priority for the next two years
- More than 1-in-6 will be very aggressive in their growth strategy

How are leading manufacturers responding?

- Evaluating their customer and business segments, products,

services, regions and channels to understand the elasticity in each of their markets

- Reassessing the long-term market outlook to ensure their business objectives align to future growth opportunities
- Creating a demand-driven and responsive business model that provides flexibility and agility to respond to increased (even unpredicted) demand and market disruptions



The strategic view

By Dr. Nicholas Griffin

Head of the KPMG Global Strategy Group
KPMG International and Partner
KPMG LLP (UK)

KPMG International's Global Manufacturing Outlook has highlighted the challenges faced by manufacturers in achieving new growth.

I believe that sector convergence is setting industries and organizations on multiple collision courses, creating both opportunities and threats in the shape of new markets, channels, technologies, propositions and behaviors. As has always been the case, disruption creates opportunities for those with the vision, will and skill to move quickly.

As the lifespan of business models reduces, the task of allocating capital and generating return on investment is becoming more challenging. Organizations are under pressure to be more agile and efficient with greater control over strategy and operations. This requires more effort to be put into achieving the alignment of financial, business and operating models.

As a result, manufacturers need to be bolder in their agenda, setting clearer growth objectives and more aggressively focused on their innovation strategies. But accelerating growth through innovation requires a clear vision for the future. Leadership needs to understand and better predict trends; the correct portfolio of products, services and markets will need to be identified; and — based on this information — investments into R&D will need to be concentrated on the opportunities that best align with the growth and portfolio ambitions of the organization.

In this environment, the ability to collaborate with new and traditional players will be increasingly important. Disruptive business models tend to use technologies, knowledge and channel strategies from more than one sector and then combine them to create new offers, dis-intermediate, and pull in new customers. Organizations are starting to realize that they do not have the resources, capabilities, agility and risk appetite in-house to create and launch new models.

Speed to market, new ideas and innovative capabilities are likely to characterize the next wave of growth but manufacturers will need to figure out how best to embrace and execute.



In their words:

GE goes digital industrial

Khozema Shipchandler

Vice President and Chief Financial Officer at GE Digital

As industrial manufacturers move toward digitization and data-driven solutions, Larry Bradley, KPMG's Lead Partner for GE, sat down with Khozema Shipchandler, Vice President and Chief Financial Officer at GE Digital to find out how one of the world's most successful manufacturers is preparing for the new era of 'digital industrial'.

Larry: What does 'digital industrial' mean to GE and how is it changing the manufacturing sector?

Khozema: I think it's a recognition that our products increasingly spit out terabytes and petabytes of extremely valuable data which, when harnessed, allow us to provide our customers with increasingly valuable services. So instead of running maintenance on an aircraft engine based on a regular schedule and engineering statistics, we can monitor — in real-time — the operation of that engine and spot the exact point in time when that engine needs servicing. Digital industrial is really about using the information from our products to create real value for our customers.

Larry: Innovation is key to driving new service and business models. How is GE capturing new ideas to drive the digital industrial effort?

Khozema: We are in the process of building out a very robust partner ecosystem that brings together consultants, technology firms, suppliers, regional partners and others to bring new developers to our platform and help us extend our commercial capability across both our existing verticals and those we do not participate in today. We have also established a strong presence in places like Silicon Valley and Boston where we can tap into some of the world's brightest minds and talent.

Larry: GE's leadership has always encouraged change. Has this influenced the transformation to a digital industrial company?

Khozema: We are fortunate enough to have a Chairman-led effort. Our board and our executives understand the importance of building market leadership in industrial internet. We have a CEO of GE Digital who is empowered and encouraged to work horizontally across the business units to share ideas and best practices and to provide guidance, leadership and direction within each of the GE verticals. It really takes commitment from the top and a deep desire to make the change.

Larry: Will digital industrial be the competitive platform of the future?

Khozema: I think digitization offers a profound opportunity for manufacturers to drive massive improvements in their internal operations and bring untapped sources of value to their customers. Those manufacturers that are not able to make the leap will find themselves largely irrelevant in the next 5 to 7 years because people will increasingly look for the value beyond the product. The company that monetizes that first and brings the most value to customers will be the winner.

From humble beginnings as a lightbulb manufacturer in 1892, GE has reinvented itself many times over the past century. Today, the company is once again transforming, this time to become the world's premier digital industrial company.

CHAPTER 02

New geographies coming into view

Maintaining the status quo does not drive growth. Manufacturers will need to do something different in order to win market share in today's environment. Many are focusing on entering into new geographic markets.

Entering new markets

Most manufacturers now recognize that they will need to open up new markets if they hope to achieve significant, above-average, growth. And our survey shows that manufacturers will be stepping up their focus on entering new markets going forward. According to our data, 87 percent of manufacturers said they have taken steps to enter new geographic markets over the past 2 years. Ninety-two percent said they plan to do so over the next 2 years.

"Particularly for sectors like aerospace and defense and automotive, where the forecasts for the mature markets seems to point to slower growth and high pricing pressures, manufacturers really have no choice but to start expanding

into new markets and adjacent sectors for high growth opportunities," notes Mark Barnes, KPMG's Global Head of High Growth Markets.

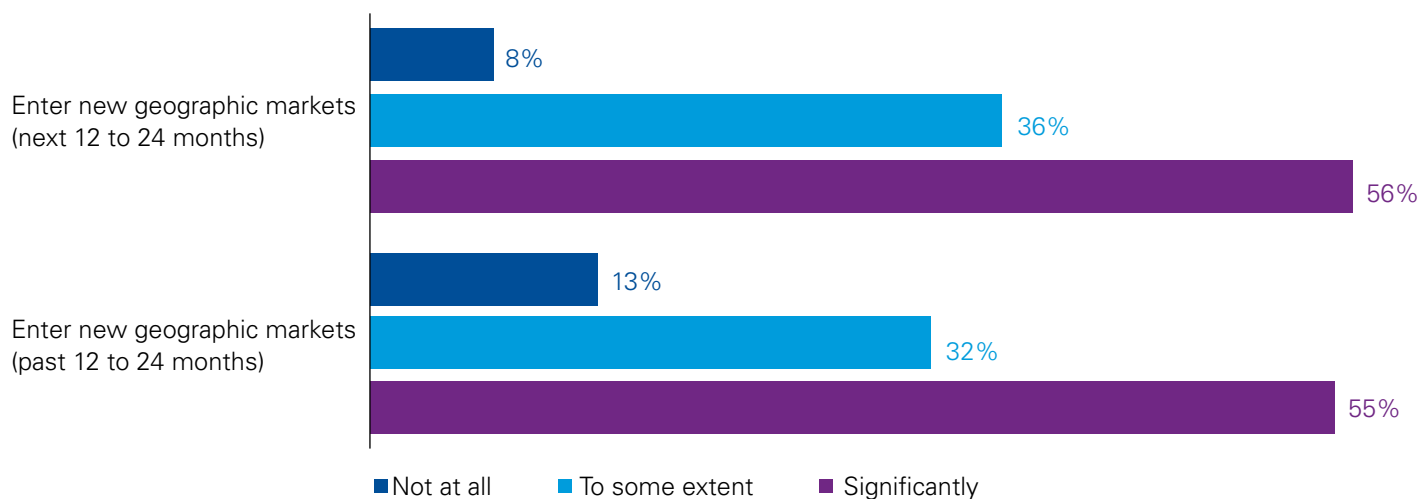
Looking overseas for top and bottom line growth

Gone are the days when overseas expansion was purely a cost-savings strategy. Today's manufacturers are hoping to achieve both top-line and bottom-line growth from their overseas investments.

Cost is certainly still a factor. In fact, 43 percent of all respondents reported that the primary motivation for their foreign investments will be to capitalize on lower cost manufacturing opportunities.

Looking to new markets

To what extent did your organization enter new markets in the past 12 to 24 months, and to what extent does it plan to enter new geographic markets in the next 12 to 24 months?



Source: Global Manufacturing Outlook, Forbes, 2016

Suggesting somewhat of an evolution for India's economy, respondents from India were the most likely to say they would invest overseas in order to lower costs, followed by respondents from the United States.

A smaller — yet still significant — number of respondents (34 percent) indicated that they were investing in order to gain access to new markets, signaling an intention to grow top-line results through new market entry.

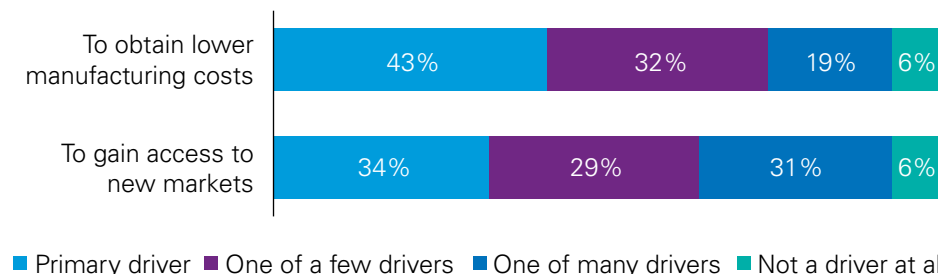


“China’s government has indicated a renewed focus towards encouraging Overseas Direct Investment (ODI) by Chinese companies and China’s manufacturers are therefore looking for opportunities to use their investments to improve access to new overseas markets.”

David Frey
Partner
Markets Strategy
KPMG in China

Reducing costs and capturing new customers

How significant are the following drivers for your international (non-domestic) investments?



Source: Global Manufacturing Outlook, Forbes, 2016

“Manufacturers have gone from a ‘make in China’ strategy to instead gear up for a ‘sell to China’ strategy,” notes David Frey, Partner, Markets Strategy, KPMG in China. “An existing footprint either in or near China is helpful but the reality is that selling to China is not the same as producing there; it takes different skills, capabilities, corporate structures and sales strategies.”

Ironically, while many Western manufacturers are talking about a ‘sell to China’ strategy, it is actually respondents from the emerging markets (India and China in particular) that are most likely to be investing in order to gain access to new markets. Forty-four percent of respondents from China and 47 percent

of those from India said that gaining access to new markets was the primary reason behind their foreign investments.

“China’s government has indicated a renewed focus towards encouraging Overseas Direct Investment (ODI) by Chinese companies and China’s manufacturers are therefore looking for opportunities to use their investments to improve access to new overseas markets,” adds David Frey. But there is a domestic strategy component to this as well. Given the size of the domestic market in China, Chinese manufacturers are seeking to acquire global technology and know-how, while bringing these assets back to integrate into the home market is, in many respects, the end goal.

What’s the point?



Manufacturers are concentrating their focus onto key markets to support growth

What did manufacturers say?

- **56%** said they have significant plans to enter a new geographic market
- **34%** said gaining access to new markets is the primary driver of their international investment strategy

How are leading manufacturers responding?

- Mapping and adapting their products and services against the needs of buyers in key regions around the world
- Aligning with the right relationships and supporting infrastructure to win and sustain business in new markets
- Assessing how to best enable their strategy by building, acquiring or partnering



In their words:

Johnson Controls grows in China

Kim Metcalf-Kupres

Vice President and Chief Marketing Officer
Johnson Controls

As manufacturers refocus on building market share in Asian markets — China in particular — Brian Heckler, Global Lead Partner for Johnson Controls and US National Sector Leader of Industrial Manufacturing, sat down with Kim Metcalf-Kupres, Vice President and Chief Marketing Officer at Johnson Controls to find out how that company is creating new opportunity in new markets.

Brian: What makes China such an important part of Johnson Controls' growth strategy?

Kim: China really epitomizes the macro trends we are seeing around the world — growing urbanization, the rising consumer class and demographics that indicate growth. So both in terms of near-term growth and long-term strategic footprint for a global company, China is extremely important. That is why our investments into China have always been about supporting our Chinese customers rather than creating a base of export. What we produce in the region is intended to support the region.

Johnson Controls is a global technology and industrial leader serving customers in more than 150 countries. In 2013, US-based Johnson Controls announced the opening of a new corporate headquarters in Shanghai, China in 2017.

Brian: What role have joint ventures and partnerships played in achieving your growth strategy in Asia?

Kim: One of the keys to our success in Asia has been the long-term relationships we have been able to develop with both our customers and our suppliers in the region. In some sectors — such as automotive — partnerships are the only real way to enter the market. But even in our battery and HVAC businesses, our preference is to partner with people because of the richness it brings into our business models and the access it provides to the markets we want to serve.

Brian: Last year, you launched a China-based joint venture with Yanfeng, creating the world's largest automotive interiors business. Was that part of your market entry strategy?

Kim: The joint venture with Yanfeng was partly driven by the recognition that the automotive interiors sector was in a state of overcapacity. Rationalization was clearly needed and when we looked at the market we decided that it would not be a strategic focus for Johnson Controls going forward. So we were naturally looking for a partner or an acquirer. Yanfeng had been one of our key suppliers in China and we had a strong relationship. Yanfeng had been developing their capabilities for some time and so we recognized that — through a partnership with them — we could build the strongest interiors company in the world.

Brian: Do you see the potential for more joint ventures and investment into China?

Kim: Johnson Controls has gone through a tremendous amount of transformation over the past 2 years. We have become much more focused about the deliberate choices we make in our business portfolio and what we need to do to win in the businesses we do pursue. China is an incredibly important part of that strategy. I think no matter what manufacturing sector or business you are in, China needs to be part of your strategic roadmap. Whether or not you are investing in China, the reality is that you will certainly be competing with China.



In their words:

A Japanese conglomerate changes the portfolio

Jun Okamoto

Director with KPMG's Japan Strategy Group

As manufacturers around the world look to shape their product portfolios to prepare for growth, Jun Okamoto, a Director with KPMG's Japan Strategy Group sat down with the CEO of a major Japanese industrial conglomerate to find out how Japan's leaders are reinventing their portfolios of products and services.

Jun: How has your company's product portfolio changed over the past 5 years? What is driving that change?

CEO: We have been changing the weights on each of our businesses in our original multi-industry business portfolio, largely due to sluggish product sales, which were triggered by the financial crisis. We sold and exited some of our businesses, which were negatively impacted by such trends.

Jun: Is your organization planning to enter new markets or sectors to achieve your growth agenda?

CEO: We are aiming to expand businesses where we can take full advantages of our capabilities. For instance, we are planning to place greater weight on the bio healthcare business for future investments. We also plan to establish a product platform based on core technologies that we have developed over the last 20 years.

Jun: Do you expect growth to come predominantly from organic or inorganic growth?

CEO: Both. In order to improve competitiveness, we will take on M&As that allow us to acquire new technologies, especially patents, after clarifying the areas which we will work on our own. At the same time, there are already strong competitors in some of the growing markets, and so we consider teaming up with partners who already have market presence in areas that help bridge our own capability gaps.

Jun: In your opinion, what will it take to drive growth for your company going forward?

CEO: Fundamentally, we need to consider whether the conglomerate business model will remain successful in the future. Although global Japanese companies won success by leveraging the attractiveness of their products in the past, it is clear that this is no longer enough to lead us to success in the current business environment.

We believe that success is something that can be achieved with strong management capability focused on capturing untapped business segments and growing such segments at a faster rate than would have been possible through inorganic growth.

Data from KPMG's GMO survey suggests that Japan's manufacturers will invest more into R&D, be more aggressive in their growth strategy and be more focused on growth as an extremely high priority. The majority of Japanese respondents were from companies with revenues of between US\$1 billion and US\$5 billion.

CHAPTER 03

Investing into new products and services

Backed by strong confidence in their growth potential, manufacturers are starting to place big bets on their ability to create new (or at least better) products and services through innovation and R&D.

Changing the product and service portfolio

Expanding market share in new markets is only part of the growth equation for many manufacturers. They also need to ensure that they have the right mix of products and services to balance their risk and capitalize on growth, all while responding to evolving customer demand. According to our data, almost half of all manufacturers plan to make changes to the range of services they offer; around two-fifths said they will change their product portfolio to drive new growth.

Respondents from the US — likely seeking to capitalize on new

technologies and customer demands — were the most likely to indicate a planned change in the range of services they offer, while respondents from Germany were the most likely to say they would change the range of products they offer.

“To create successful products and services, manufacturers need to innovate with their customers, working to understand their full value chain and using that insight to create solutions that leverage their full enterprise capabilities to create real value for their customers,” notes Henk Smit, Partner, Advisory, KPMG in the Netherlands. “That may be manufacturers biggest challenge going forward.”

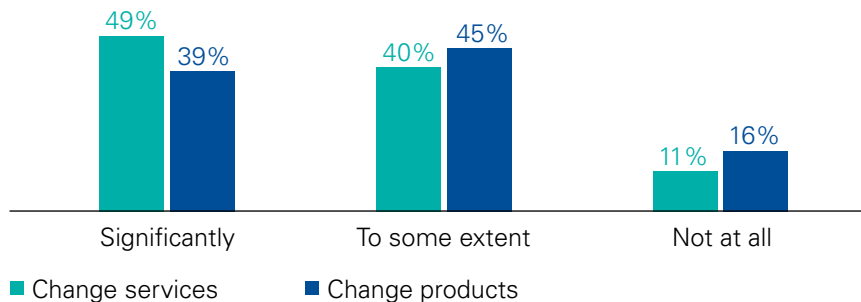
“To create successful products and services, manufacturers need to innovate with their customers, working to understand their full value chain and using that insight to create solutions that leverage their full enterprise capabilities to create real value for their customers.”

Henk Smit

Partner, Advisory
KPMG in the Netherlands

Changing the product and service portfolio

To what extent does your organization plan to take steps to change the range of products or services you offer?



Source: Global Manufacturing Outlook, Forbes, 2016

Our data suggests that, more than ever, manufacturers seem focused on achieving breakthrough innovations and creating entirely new products. In fact, of those that said they had plans to change their product range, more than half (56 percent) said they would make significant investments to launch one or more new products into the market. Thirty-nine percent said they would launch one or more new services.

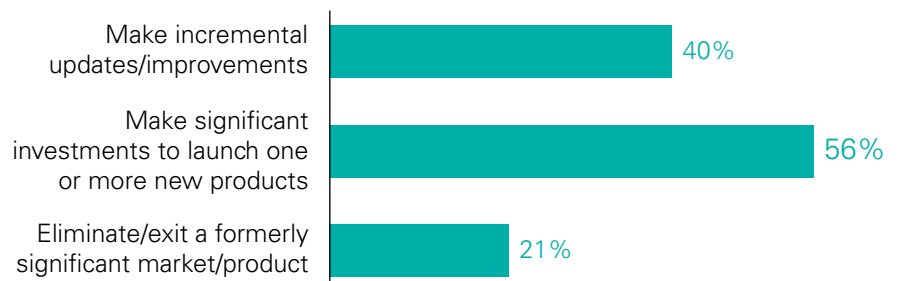
“New products and services must be driven by need rather than a desire

to showcase a new technology; manufacturers must start by thinking about how they can add new pools of value to their customers and then leverage all of the technologies at their disposal to rapidly deliver on that value,” notes Tom Mayor.

At the same time, around four-in-ten respondents expect to be able to achieve their growth objectives by making incremental improvements to their existing product and service lines. Some markets — such as

Betting on the new and improved

How do you plan to change your range of products?



Note: Respondents were permitted to select multiple answers.

Source: Global Manufacturing Outlook, Forbes, 2016

Germany and India — report a higher focus on incremental improvements versus new product development. One-in-five also expects to eliminate a formerly significant product or service line, presumably to focus their product portfolio and free up cash for new endeavors.

“We are seeing manufacturers — particularly conglomerates — shift their revenue streams from short-term product sales to instead focus on longer-term service contracts,” noted Henk Smit. “But to create successful services, manufacturers will need to fulfil three new roles for their customers: the business integrator that creates solutions for unique customer problems, the systems integrator that offers a seamless solution with existing technology, and an operational service provider role that maintains and manages the solution.”

A massive boost to innovation

Whether investing in incremental improvements for existing products or inventing entirely new products and services, what is clear is that manufacturers recognize an urgent need to increase their investment into innovation and R&D. Indeed, based on our data, it seems that some manufacturers plan to ramp up investment significantly in the hope of securing a competitive advantage in the future.

If respondents’ expectations come to fruition, the amount of investment about to flow into R&D and innovation will be staggering. More than one-in-five (21 percent) of all respondents said they expect to spend more than 10 percent of revenues on R&D

over the next 2 years. Almost half — 49 percent — said they would spend 6 percent of revenues or more.

“We are working with many organizations to develop strategic growth plans for investment in connected products and to launch multiple, parallel efforts to prototype smart, networked products, services and business models,” notes Tom Mayor. “In many markets, including automotive, heavy industrials, medical devices and smart buildings/ smart infrastructure, it is clear today’s developments in sensors, communication and cognitive computing will unlock huge consumer value. Our experience suggests that product manufacturers will be the winners of the introduction of IoT (Internet of Things) and the leaders will see huge growth potential.”

When compared against the respondents’ reported investment into R&D over the past 2 years, it seems that some sectors — conglomerates and the automotive sector in particular — expect to ramp up investment significantly. Whereas just 38 percent of conglomerates reported spending more than 6 percent of revenue on R&D in the past 2 years, 60 percent now say they will spend at that level. The automotive sector expects a similar jump — from 36 percent who said they had invested more than 6 percent in the past to 53 percent who said they will invest more than 6 percent in the future.

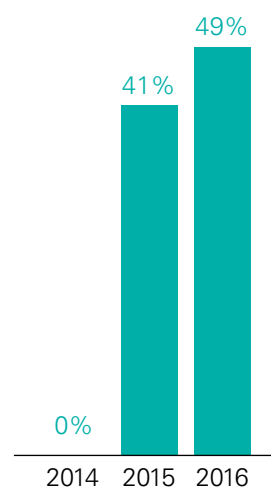
Once again, the emerging markets — Asia in particular — returned the highest investment expectations. Sixty-one percent of respondents from China said they would spend more than 6 percent of revenues on R&D and innovation; 53 percent of respondents from Japan and 50 percent of those from India said the same.

Rising competition for innovation: A look back at R&D spending expectations

How have R&D investments changed over the years? The Global Manufacturing Outlook has been tracking manufacturers investment intentions for more than 3 years. Our data shows that no company expected to invest more than 6 percent of revenues into R&D in 2014. But investment expectations skyrocketed in 2015 and seem set to continue to grow in 2016.

Yearly comparison

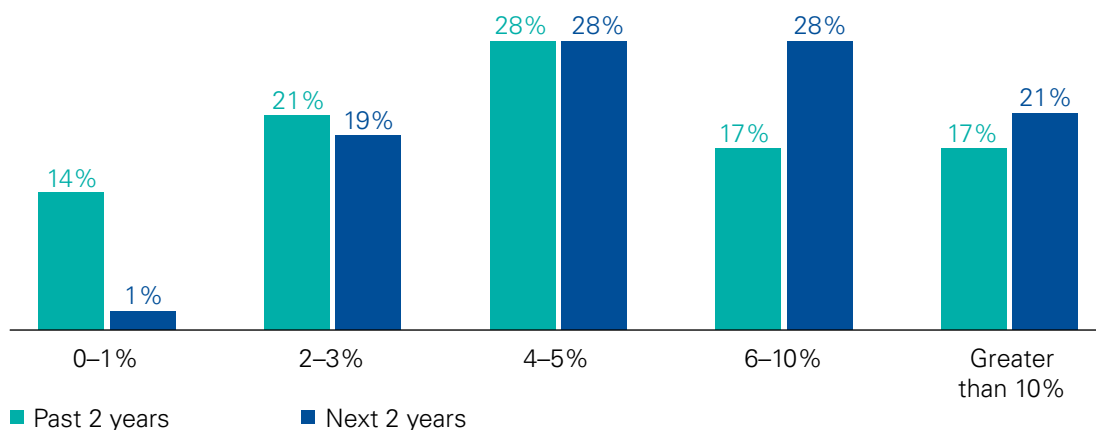
Percent of respondents saying they will spend 6% or more of revenues on R&D over the next 2 years.



Source: Global Manufacturing Outlook, Forbes, 2016

Investment into research and development (R&D) to skyrocket

In your best estimate, what percent of revenue did your organization spend in the last 2 years on R&D/innovation? What percent of revenue does it plan to spend over the next 2 years?

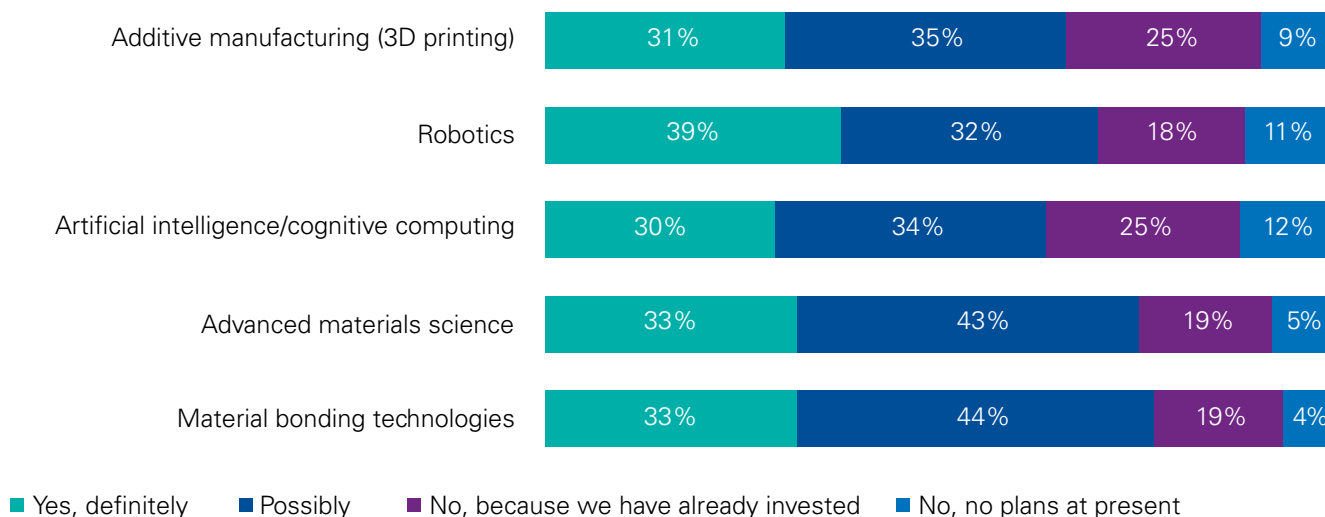


Note: Percentages may not add up to 100 percent due to rounding.

Source: Global Manufacturing Outlook, Forbes, 2016

Integrating new manufacturing technologies

In which of the following manufacturing technologies will you be devoting a significant amount of investment in R&D funds over the next 12 to 24 months?



Note: Percentages may not add up to 100 percent due to rounding.

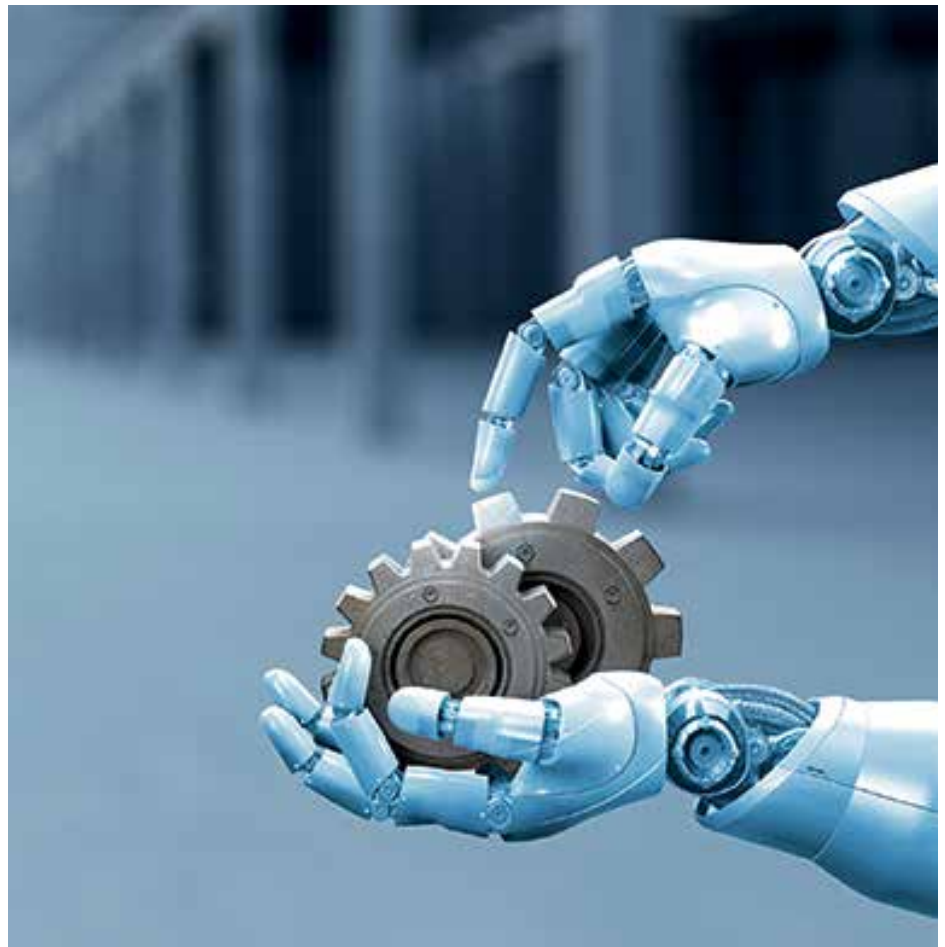
Source: Global Manufacturing Outlook, Forbes, 2016

Taking the manufacturing floor high-tech

Customer-facing innovations are only half of the technology story for many manufacturers. Our survey suggests that manufacturers are also placing significant investment into improving their adoption and utilization of technology within their operations. For example, 25 percent of our survey respondents said they have already invested into 3D printing and additive manufacturing technologies. An equal number said they have already invested into Artificial Intelligence (AI) and cognitive computing technologies.

The use of robotics on the manufacturing floor is also likely to attract significant investment. In fact, almost two-fifths of our respondents said they will definitely be channeling significant amounts of their R&D investment towards robotics over the next 2 years.

“Taking advantage of advances in robotics, 3D printing and AI is critical to driving greater efficiency, lowering costs and improving safety for many sectors and particularly niche suppliers,” notes Harald von Heynitz, Head of Industrial Manufacturing, KPMG in Germany. “But it is not just about performance and efficiency; investments into new



manufacturing technologies are also a way to enhance agility, flexibility and speed to market when designing and launching new products and services.” For example, many manufacturers

now leverage 3D printing to create prototypes overnight rather than spending days retooling.

What's the point?



Investment into R&D will be massive as manufacturers start to compete on innovation and new products/services

What did manufacturers say?

- **56%** said they will make significant investments to launch one or more new products
- **21%** said they will spend upwards of 10% of revenue on R&D over the next 2 years

How are leading manufacturers responding?

- Ensuring their corporate planning process provides the visibility

needed to make R&D investment decisions with a view of the best return for the entire enterprise

- Developing and building innovation processes that prioritize speed, quality and margin
- Leveraging the value of unique / disruptive technologies, partners and thought leaders in accelerating their innovation and return on R&D investment



In their words: **Caterpillar drives innovation with smart iron**

Brad Halverson

Group President and CFO of Caterpillar Inc.

With technology and innovation rapidly changing the manufacturing business model, Kathy Hopinkah Hannan, Global Lead Partner for Caterpillar Inc. at KPMG in the US, talked with Brad Halverson, Group President and CFO of Caterpillar Inc. to learn more about how the 90-year old manufacturer is using technology to drive new growth opportunities.

Kathy: How is technology and innovation changing the way Caterpillar serves its customers?

Brad: Caterpillar is reimagining the way our customers work through digital technology and innovation – combining diesel and data to disrupt ourselves before others can disrupt us. We intentionally allocate resources to products and services that make our customers more money than they could make with our competitors, and deliver the most economic value to our shareholders through our operating and execution model. That allows us to reinvest our earnings back into the business and continually increase the value we bring to customers.

Kathy: To what extent does Caterpillar partner with technology firms and non-traditional players to drive its growth agenda?

Brad: We're using several different approaches to discover, test and launch new technologies alongside external experts and third parties. One of our most successful approaches has been the establishment of Caterpillar Ventures, a team that focuses on identifying emerging technologies that could help us solve customers' problems. We have already made several investments, and there's a strong pipeline. Ultimately, we recognize that when we combine our 90-year history of innovation with external viewpoints from startups, we can really add a lot of value.

Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial turbines and diesel-electric locomotives. The company is focused on developing and refining advanced technologies to help make equipment more productive and efficient.

Kathy: How has technology and innovation changed the way Caterpillar has approached its markets?

Brad: If you consider that 5 years ago hardly any heavy equipment was connected with telematics, but today Caterpillar has about 400,000 connected machines, engines and locomotives worldwide... we see great opportunity for growth in technology-driven information, data analytics and services that surround the iron we manufacture.

Kathy: What role will data, analytics and digital technology play in Caterpillar's growth strategy?

Brad: We believe that digital tools and data analytics are an important part of our value proposition as we use the data from our products to create even more value for our customers. This value creation can come in many forms... like designing better productivity into our machines or working with customers to improve their machine operators' efficiency through data coming back from our products.

CHAPTER 04

Leveraging the supply chain for growth

With manufacturers focused on entering new markets and creating new products, ensuring the supply chain is ready for growth will be a top priority. However, manufacturers will first need to focus on improving their supply chain visibility and flexibility if they hope to reduce the risk of partnering with new suppliers and creating new value chains.

Low visibility, high risk

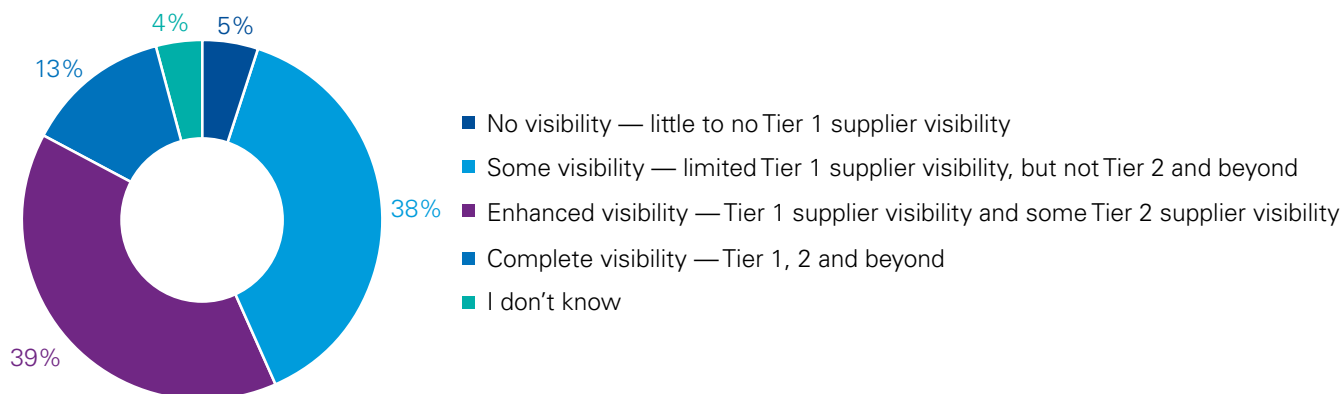
With much now riding on their supply chain's ability to meet new demands and growth expectations, many are increasingly worried about an unexpected supply chain failure. In fact, when asked what posed the greatest risk to their growth agenda, supply chain failure ranked third, behind only economic disruption and market disruption (two factors that, arguably, are outside of their direct control). Thirty-seven percent of all respondents ranked supply chain failure as a 'significant' risk.

The fact that manufacturers worry about supply chain risk is not entirely surprising. Just 13 percent of our respondents said they have 'complete' visibility past their Tier 1 suppliers and into their Tier 2 and beyond. About two-fifths reported 'enhanced' visibility, giving them full transparency into their Tier 1 suppliers and into some Tier 2 suppliers. Forty-three percent admitted they had either limited or no visibility at all into their supply chain.

"The best way to reduce the risk of supply chain failure is by achieving greater visibility, and managing it cross-functionally deeper into the end-to-end supply chain," notes

Lacking visibility

How much visibility of supply and capacity information do you have across your suppliers and logistics partners?



Note: Percentages may not add up to 100 percent due to rounding.

Source: Global Manufacturing Outlook, Forbes, 2016

Erich L. Gampenrieder, Global Head of Operations Advisory with KPMG International. “The fact that so few manufacturers can claim complete visibility suggests that much more will need to be done, particularly for those with ambitions of expanding into new international markets and adjacent segments where supply chains may be untested.”

Setting priorities for growth

Our survey suggests that manufacturers are taking fundamental steps to enable operational improvements across their supply chain. When asked which operational enablers they would focus on over the next 2 years, three key areas emerged: supply chain analytics, cost-to-serve and creating alignment to corporate strategy.

However, according to our data, supply chain priorities may vary

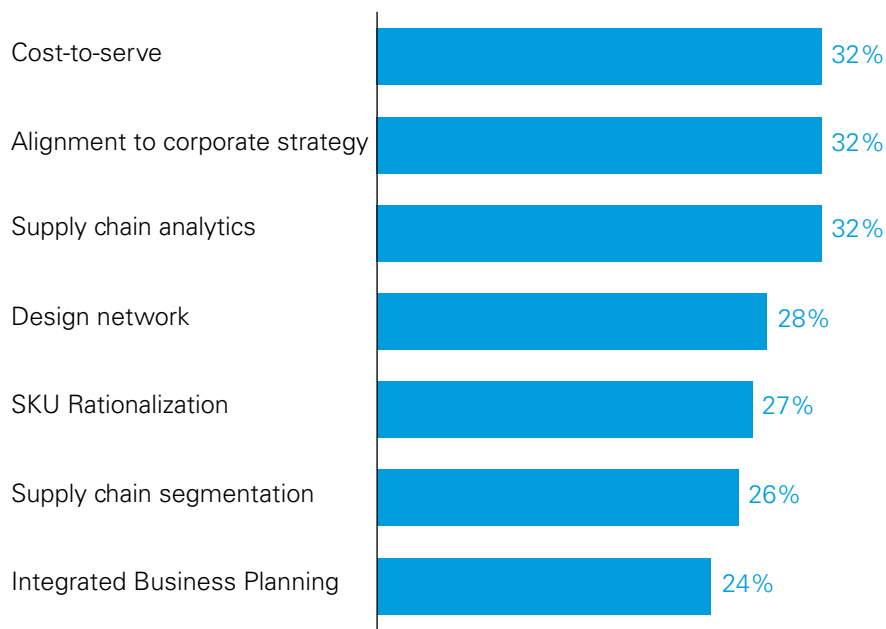
by sector. Respondents from the automotive and metals sectors, for example, reported a higher focus on cost-to-serve; aerospace and defense respondents are prioritizing network design; conglomerates are focused on improving alignment to corporate strategy. And everyone — particularly engineering/IP firms and conglomerates — is prioritizing supply chain analytics.

Manufacturers are also investing into new and improved technologies in order to enhance the performance of their supply chain operations. Sixty percent of respondents said they are looking to invest into demand sensing technologies and capabilities over the next 2 years. Fifty-six percent are exploring investment in supply chain analytics tools and skills.

However, it is the rapidly-emerging field of IoT (Internet of things) that seems set to draw the most investment and interest from supply chain leaders and

Key enablers for tomorrow's supply chain

Which of the following operational enablers are your highest priority in the next 12 to 24 months?



Note: Respondents selected top two options

Source: Global Manufacturing Outlook, Forbes, 2016

executives. Led by respondents in the UK and US, technologies and tools to support IoT emerged as the top investment priority globally.

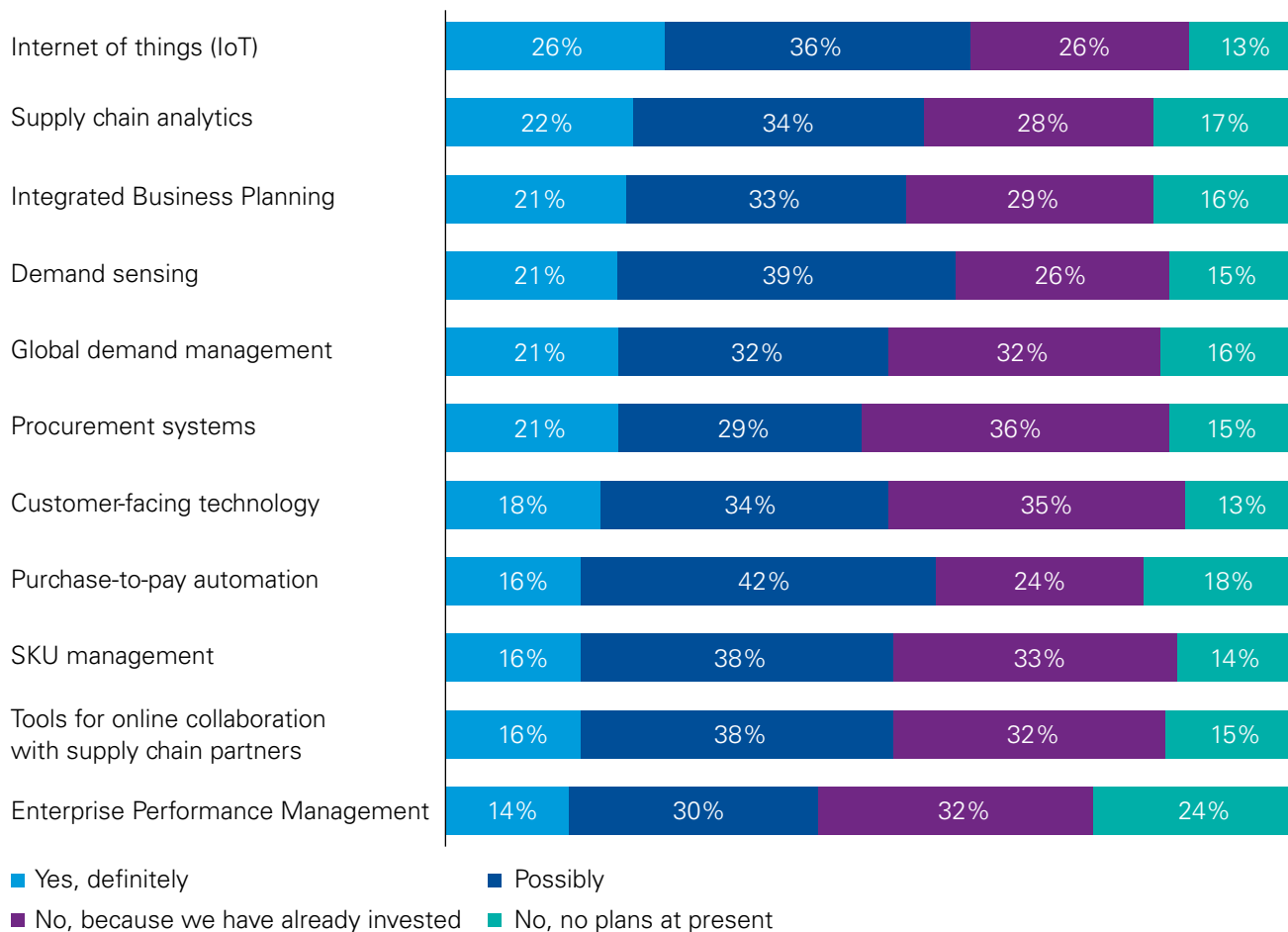
"IoT is going to be a critical component of growth for manufacturers, both as a way to improve the value of their products by embedding sensors and connectivity, but also as a way to monitor, manage and improve the supply chain," notes Erich L. Gampenrieder. "The entire basis of Industry 4.0 rests in machines talking to machines; this is every bit as much about improving performance in the supply chain as it is about gaining market share. In fact, done right, IoT could be a key enabler of supply chain visibility."

Similarly, when asked to choose their highest digital priority between mobile, cloud, Data and Analytics (D&A) and social, it was D&A that emerged as the highest priority. Given that everything from sensors through to procurement systems now rely on some level of D&A, investments in this area will be key as manufacturers strive to harness the value in their data.

"Companies looking to bring more value to their customers are not stopping with D&A from sensors," adds Doug Gates. "They are exploring cognitive computing to make those machines 'smarter' for their owners with the promise of freeing up valuable human capital for more value-add work."

Putting technology to work in the supply chain

Do you have plans to invest in any of the following systems or technologies in the next 12 to 24 months?



Note: Percentages may not add up to 100 percent due to rounding.

Source: Global Manufacturing Outlook, Forbes, 2016

What's the point?



Lack of visibility is increasing the risk of supply chain disruption which can dramatically impact business performance

What did manufacturers say?

- **37%** ranked supply chain failure as a significant risk
- Just **13%** have complete visibility into their supply chain

How are leading manufacturers responding?

- Continuously evaluating their performance and related risks within the supplier network to understand the financial and operational impacts of risks

- Addressing cross-functional components to develop a programmatic approach to supply chain risk
- Identifying any new risks that may exist and then planning their mitigation as they extend their supply chain to achieve global growth
- Setting up third party governance programs, controls and resources to reduce cost, improve performance, manage disruption and ensure compliance within contractual and regulatory obligations



Sector insights



Doug Gates

Global Sector Chair, Industrial Manufacturing and Global Head of Aerospace and Defense
KPMG in the US

Aerospace and Defense



Despite economic concerns in the emerging markets

(which may impact air traffic forecasts and therefore aircraft sales) and defense budget concerns in the mature markets, the aerospace and defense (A&D) sector seems highly optimistic about their growth potential.

And rightfully so. The A&D sector has — overall — taken many of the right steps to back up their optimism. As the data in this report shows, A&D companies expect to ramp up investment into R&D significantly over the next 2 years as they prepare to take advantage of new growth opportunities and new technologies to enter into new markets and geographies.

A&D organizations have also been taking active steps to break into new markets, in some cases to take advantage of cost efficiencies but — more often — to get closer to their new customers in Asia and the Middle East. But they are taking a conservative approach to manage their risks: joint ventures and partnerships are the predominant entry strategy, allowing Western A&D organizations to gain experience in new markets without betting significant capital.

However, some caution is advised. Entering new markets and adjacent segments will require A&D organizations to take on new (and often untested to Western standards) partners and suppliers. Notwithstanding the fact that A&D organizations seem particularly confident in their supply chain's ability to meet their growth expectations, some may find that — without improved visibility into their lower-level suppliers — their growth plans are stymied by failures in the supply chain as local value-chain players struggle to meet the OEM's global standards and expectations.

With focused investment going into new products and markets, a 'relatively' conservative approach to risk and dynamic entry strategies for the emerging markets, the A&D sector has every reason to be optimistic about growth over the medium to long-term. Of course, the economy notwithstanding.

- **64%** of A&D respondents said they are confident or very confident about their company's growth prospects
- **20%** said they will spend 10% or more of revenues on R&D over the next 2 years
- **73%** are optimistic that their supply chain is prepared for growth



Ken Seel

Global Head of Conglomerates
KPMG in the US

Conglomerates



Disruption is certainly a challenge for today's conglomerates.

But it has also proven to be a massive opportunity.

Yes: as multinationals with interests in multiple sectors and markets, conglomerates are suffering from the same headwinds faced by manufacturers around the world. Those with interests in energy have been hit by turbulent energy prices; those with interests in mining and mining equipment have been hit by the crash in commodity prices; and those operating in regulated sectors have faced a massive increase in regulatory requirements.

What has delivered the most success to conglomerates in the midst of disruption has been a stronger ability to define and focus on a specific 'field of play' — achieving a better understanding of the relationship between the products they offer and the geographies they are focusing on. As a result, we are seeing conglomerates become much more specialized in certain areas and shedding markets, products and segments that may not meet their long-term growth and profit targets.

The reality is that conglomerates have long led the sector in creating new business models and specializations; the shift from products to services was largely driven by conglomerates such as GE, Philips and others. As these leaders continue to evolve — GE into 'digital industry' and Philips into healthcare — they will form significant new opportunities for suppliers and deep competition for traditional manufacturers.

Looking ahead, expect to see conglomerates place more focus on shaping their portfolio of products and — where possible — incorporating new technologies that make their products more efficient, more reliable and more valuable to users.

- **17%** of respondents from conglomerates said they will be very aggressive in their growth strategy
- **47%** said they are highly focused on cost and performance
- **60%** will spend more than 6% of revenues on R&D over the next 2 years



Eric Damotte

Global Head of Metals
KPMG in Spain

Metals



Unfortunately, metals and mining companies are unlikely

to enjoy much respite from a challenging market environment any time soon. Slowing growth in developing markets (long the main driver of metals sector growth) is not only dampening demand for metals products, it is also sharpening the overcapacity woes in mature markets such as Western Europe and the United States, as well as in the developing economies — most importantly — China.

As a result, many Western metals manufacturers — steel producers in particular — continue to face growing competition from lower-cost markets. China has promised consolidation to address their massive oversupply challenge, but it will take time for this to translate into any reduction in the quantity of exports landing in Europe and other parts of the world each day.

Trade barriers and protectionist measures have quickly been set up in many markets in an attempt to protect domestic production. But, for the most part, these have only served to slow the free flow of metals products across markets and create deep uncertainty for metals producers overall.

Metals and mining organizations will also need to continue to grapple with uncertainty and disruption from regulation — particularly environmental regulation — as all markets (mature and developing) start to set more stringent emissions regulations and policies. This will have a direct impact on metals organizations themselves, as well as on some of their customers who operate in high-emission industries.

One positive sign is the increasing focus on innovation and partnerships across the sector. Metals organizations are no stranger to non-traditional competition (just think of how the introduction of alloys and new aluminum products is changing the dynamics for steel producers) and many recognize that they will need to innovate if they hope to remain relevant and valuable to their core customers.

Over the long term, things will improve. New products will drive new growth opportunities. China will (if promises are kept) cut oversupply. Structural global overcapacity will eventually be addressed, which will help reduce the fierce competition in the sector. And economic growth should return to the developing world. How metals executives manage the interim period however, will determine much over the coming years.

- **43%** of metals organizations said they will make investments to launch one or more new products
- **77%** will make cost and performance a high priority this year
- Economic downturn was cited as the number one risk to growth



Sector insights



Dieter Becker

Global Sector Chair, Automotive
KPMG in Germany



Chris Stirling

Global Sector Chair, Life Sciences
KPMG in the UK

Automotive



In the automotive sector, winning companies will be nimble, future-oriented,

and prepared to invest in new technologies, new talent, and new strategic alliances. New technologies are coming from every direction, so auto companies have to broaden their radar to keep pace. In the future, horsepower may matter less than processing power.

For companies to thrive in this new environment, they must solve what we identified in a recent report as the 'clockspeed dilemma'.¹ On the one hand, car companies must obey a pace — a clockspeed — required of capital-intensive manufacturing businesses. But now they must also embrace a far faster clockspeed — actually, multiple faster clockspeeds — that result from new players entering the ecosystem, from technology giants to start-ups.

To succeed in this environment, we believe that the auto industry must reconcile these two different rates of change. It must act as if it were simultaneously in two worlds, moving at two different speeds. And this, in turn, will require the auto industry to institutionalize a faster-paced innovation capacity that dovetails with its current clockspeed.

If the auto industry can get this right, we expect to see a bright future for the sector overall. Stunning innovation — particularly in the convergence of autonomy, connectivity and mobility — are transforming the industry and the way we live our lives.

But this will require virtually every aspect of the automotive business to change, from how cars are designed, produced and built to how they are marketed and sold — all the way through to the underlying economics and primary demand drivers.

Disruption may be unnerving, but we firmly believe that there has never been a more exciting time to be part of the automotive industry.

- **43%** of automotive respondents said they will make significant investments to launch one or more new services into the market
- **22%** will spend 10% or more of revenues on R&D over the next 2 years
- **62%** will place significant investment into IoT

Medical Devices



Facing continuous regulatory change and a slowdown

in global economic growth, medical device manufacturers are fighting to improve both their top and their bottom lines. In both respects, innovation will be key to success.

Medical device manufacturers will need to quickly become more agile, responsive and innovative, particularly given the continuously shifting regulatory environment and increasingly fierce competition from non-traditional players such as Apple and Google. This will require a closer focus and better understanding of the consumer. And it will require greater flexibility in their supply chains.

Many medical device organizations are also struggling with the rising cost of labor — not only on the manufacturing floor but also as they start to compete more fiercely for talent that combines both industry knowledge and future-focused skill sets — and this is having an impact on the bottom line.

The fact that 42 percent of medical device respondents said they would invest significantly into robotics is therefore not surprising: by automating the manufacturing floor, medical device organizations can shift their salary budgets towards retaining the right talent to support future growth. Robotics will also help them achieve improved flexibility and speed to market in their operations.

To achieve both top line and bottom line growth in this environment, medical device organizations will need to remain focused on improving agility, particularly in the areas of supply chain management and innovation.

- **55%** of Medical Device respondents said that inorganic investments would drive their growth strategy
- **58%** cited the cost of labor as significant factor impacting growth
- **42%** will place significant investment into robotics

¹ <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/04/auto-clockspeed-dilemma.pdf>



Mark Barnes

Global Head of High Growth Markets
KPMG in the US

High Growth Markets



You don't have to be a rocket scientist to know that manufacturers

are looking to India, China and ASEAN as their next growth opportunity. All three markets, if you count the 10 countries that make up ASEAN as a single market, will continue to serve as global economic growth engines for the foreseeable future.

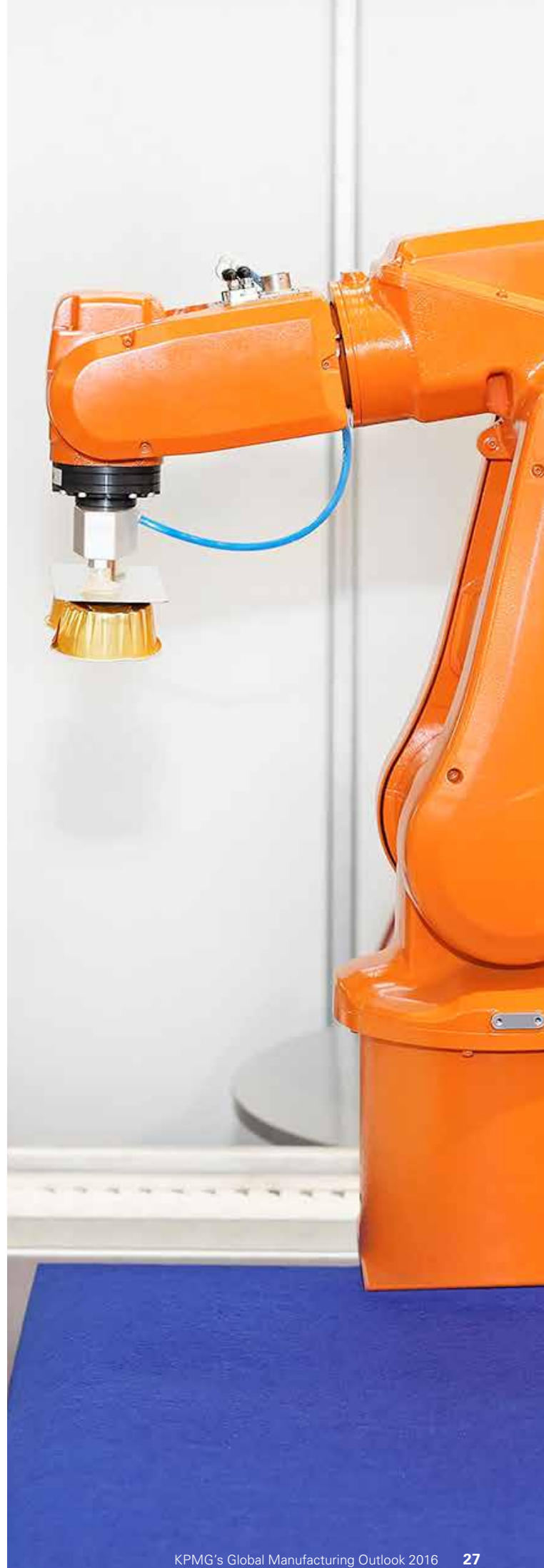
Traditionally, these markets have been viewed solely as low-cost manufacturing destinations, an opportunity for large multinationals to manage their bottom line. Increasingly however, we are seeing the boardroom conversations shift to focusing on the markets themselves.

- **China** has long been a market that manufacturers want to 'sell to' rather than just 'manufacture in'.
- **India's** continued strong growth and massive population offers myriad opportunities for manufacturers looking to grow their market share and top line.
- **ASEAN**, contrary to the notion above, is far from a single market yet and strategies for the countries that make it up are diverse: manufacturers want to sell to countries like Singapore, but they want to take advantage of low-cost centers in Vietnam, Indonesia and the Philippines. Manufacturers, therefore, will need to carefully consider their investment strategy for each market on a case-by-case basis.

This is not only a truism for ASEAN; it is also good advice for any manufacturer engaged in (or considering) an emerging market strategy. Each market is significantly different — ASEAN is made up of 10 different countries with different tax incentives, costs and infrastructure; Africa is made up of 54 vastly different countries — and manufacturers would be ill-served taking a 'common' strategy to different emerging markets.

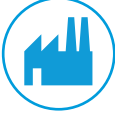
Our experience suggests that the most successful companies are those that create a unique, yet very robust and dynamic strategy for each market, taking into account political, economic, cultural, social and regulatory realities on the ground, to ensure they are maximizing their investments to the fullest.

- **38%** of companies with existing investments in India will add significant new investment over the next 2 years
- **37%** of those with investments in China will add significant new investment
- **28%** of those with investments in Africa said they would decrease investment over the next 2 years



Two big questions about growth

We asked each of our sector and country leaders the following two questions. Here are their answers and their contact information.

Sector leaders	What is the greatest threat to growth in your industry sector?	What are companies in your sector doing differently to drive growth?
 Aerospace and Defense	Doug Gates Global Head of Aerospace & Defense KPMG in the US dkgates@kpmg.com	“Slow emerging market growth and defense budget constraints” “New, creative and collaborative business models”
 Conglomerates	Ken Seel Global Head of Conglomerates KPMG in the US kseel@kpmg.com	“Regulation and geopolitical issues” “Understanding their field of play”
 Metals	Eric Damotte Global Head of Metals KPMG in Spain edamotte@kpmg.es	“Slow economic growth” “Innovation to protect the business”
 Automotive	Dieter Becker Partner, Global Head of Automotive KPMG in Germany dieterbecker@kpmg.com	“Disintermediation at the customer interface” “New business models based on ubiquitous connectivity”
 Medical Devices	Chris Stirling Partner and Global Chair, Life Sciences KPMG in the UK christopher.stirling@kpmg.co.uk	“Regulatory change” “Life-changing innovation”
 High Growth Markets	Mark Barnes Global Head of High Growth Markets KPMG in the US mbarnes1@kpmg.com	“Economic uncertainty” “Untethered entrepreneurship”

Full biographies of our sector and country leaders can be found here: www.kpmg.com/gmo

Country leaders	What is the greatest threat to growth in your country?	What are companies in your country doing differently to drive growth?
 UK	Stephen Cooper Partner, Head of Industrial Manufacturing KPMG in the UK stephen.cooper@kpmg.co.uk	“Economic uncertainty” “Recycling IT cost out-takes into new technology”
 US	Brian Heckler US National Sector Leader, Industrial Manufacturing KPMG in the US bheckler@kpmg.com	“New world competition” “Strategic portfolio management”
 Japan	Osamu Matsushita Partner, Deal Advisory and Head of Industrial Manufacturing KPMG in Japan osamu.matsushita@jp.kpmg.com	“Disruption by new competitors” “Focusing on detail to drive differentiation”
 China	Alex Shum Partner, Audit and Head of Industrial Manufacturing KPMG in China alex.shum@kpmg.com	“Overcapacity and rising labor costs” “Overseas investment and home-grown innovation”
 India	S.V. Sukumar Head of Strategy and Operations KPMG in India sukumarsv@kpmg.com	“Poor infrastructure” “Applying D&A across the enterprise”
 Germany	Harald von Heynitz Head of Industrial Manufacturing KPMG in Germany hheynitz@kpmg.com	“Disruption in export markets” “Manufacturing floor automation”

Key takeaways

Manufacturers are optimistic about growth but, without overall market growth, competition will become intense

Manufacturers are concentrating their focus onto key markets to support growth

Investment into R&D will be massive as manufacturers start to compete on innovation and new products/services

Lack of visibility is increasing the risk of supply chain disruption which can dramatically impact business performance

How are leading manufacturers responding?

- Evaluating their customer and business segments, products, services, regions and channels to understand the elasticity in each of their markets
- Reassessing the long-term market outlook to ensure their business objectives align to future growth opportunities
- Creating a demand-driven and responsive business model that provides flexibility and agility to respond to increased (even unpredicted) demand and market disruptions

- Mapping and adapting their products and services against the needs of buyers in key regions around the world
- Aligning with the right relationships and supporting infrastructure to win and sustain business in new markets
- Assessing how to best enable their strategy by building, acquiring or partnering

- Ensuring their corporate planning process provides the visibility needed to make R&D investment decisions with a view of the best return for the entire enterprise
- Developing and building innovation processes that prioritize speed, quality and margin
- Recognizing the value of unique/disruptive technologies, partners and thought leaders in accelerating their innovation and return on R&D investment

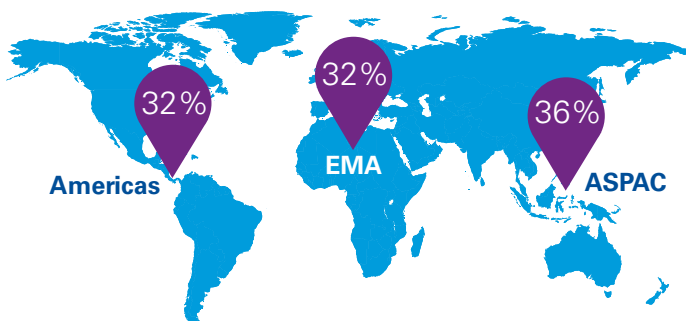
- Continuously evaluating their performance and related risks within the supplier network to understand the financial and operational impacts of risks
- Addressing cross-functional components to develop a programmatic approach to supply chain risk
- Identifying any new risks that may exist and then planning their mitigation as they extend their supply chain to achieve global growth
- Setting up third party governance programs, controls and resources to reduce cost, improve performance, manage disruption and ensure compliance within contractual and regulatory obligations

About the survey

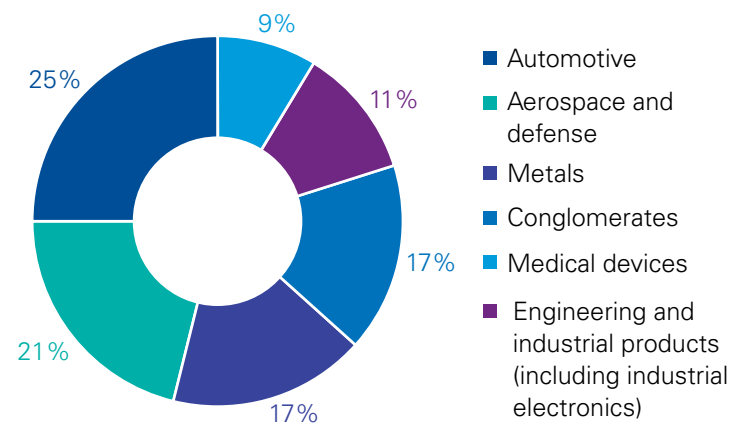
The Global Manufacturing Outlook (GMO) 2016 is based on a survey of 360 senior executives, conducted by Forbes on behalf of KPMG International, completed in early 2016. Respondents represented six industries: Aerospace & Defense, Automotive, Conglomerates, Medical Devices, Engineering and Industrial Products, and Metals.

All respondents included in our survey held Director-level or C-Suite roles within their organization and 43 percent represented organizations with more than US\$5 billion in annual revenue. Respondents were distributed fairly evenly between the Americas, Europe and Asia.

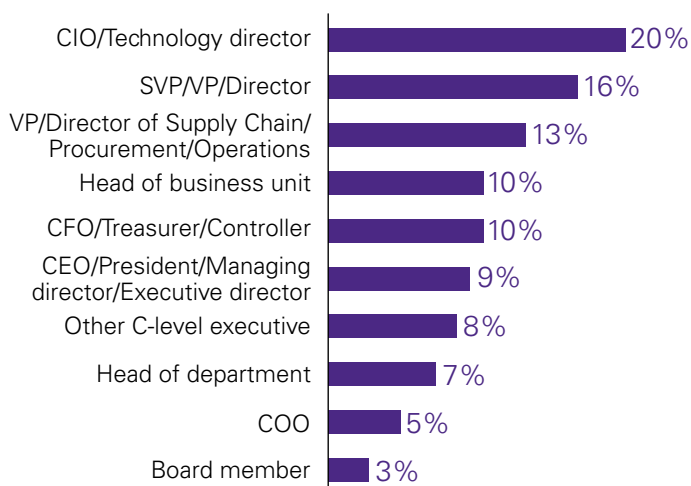
Where are you personally located?



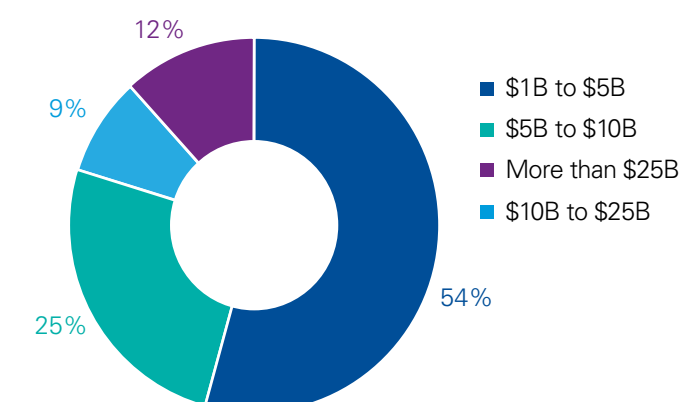
What is your primary sector within the manufacturing industry?



Which of the following best describes your title?



What are your organization's global annual revenues (in US Dollars)?



Note: Percentages may not add up to 100 percent due to rounding.

Source: Forbes survey, January 2016.

Related Industrial Manufacturing publications



The Clockspeed Dilemma (November 2015)

Innovation in the automotive industry will transform the very nature of transportation and change people's lives along the way. But this kind of innovation is also really hard. Most organizations do not embrace imaginative solutions to problems. In fact, they stifle them.



Demand-driven supply chain 2.0 — a direct link to profitability (May 2016)

This report examines how companies can provide an improved customer experience and outpace the competition by upgrading to a demand-driven, responsive supply chain that meets customers' needs; and outlines steps to help our clients achieve a new level of customer responsiveness.



Global Automotive Executive Survey (January 2016)

The KPMG Global Automotive Executive Survey is an annual assessment of the current state and future prospects of the worldwide automotive industry.



Global Aerospace and Defense Outlook (Coming July 2016)

This annual publication reviews the key findings from KPMG's Global Aerospace and Defense Outlook 2016, based on a survey of A&D organizations around the world. The report focuses on the challenges, key issues and future strategies facing the industry.



Growth and Uncertainty: Highs and lows in the Aerospace and Defense sectors (April 2016)

This research whitepaper analyzes the state of the A&D industry, highlighting the economic trends and landscape while providing KPMG insights on these findings.



Global Metals and Mining Outlook (New! Coming July 2016)

KPMG's Metals and Mining global leadership comes together to explore the results of KPMG International's survey of Metals executives and explain how shifts in the metals and mining sector will drive change in the mining industry.



REACTION — The future of chemical conglomerates and demand-driven supply chains (April 2016)

This edition of *Reaction* magazine focuses on supply chain and operations, and how a demand-driven, pull approach focused on real-time updates on customer demand, and backed by deep visibility across the supply chain, can help companies keep pace with change in today's chemical industry.



Germany's The Factory of the Future (Coming soon)

What do you need to do to be sustainable on volatile, fast-moving and customer-driven markets? To keep pace with ever quicker product lifecycles, shorter order lead times and growing product variants? The key term is called Industry 4.0. KPMG's Factory of the Future guide sets out to give you information and concrete support in order to successfully meet the challenge of Industry 4.0.



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