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DRIVING TO GET AHEAD WITH AI

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"Under those leather seats and purring powerful engines, vehicles are actually turning into sophisticated computers on wheels. Telematics has already made our vehicles safer, keeps us from getting lost, puts roadside assistance at our fingertips, routes us around accidents, automatically charges our electric vehicles when rates are cheapest and now also gives fleet vehicles information about vehicle and driver performance. Today, autonomous vehicles are the logical progression.

Driving this is a force that's altering the course of the human journey and creating a more connected, smarter world where software learns to mimic human behavior and respond to the context of the environment meaningfully. This is the force of Artificial Intelligence. And its massive impact will spill over to reverberate through related industries including logistics, transportation, aerospace, insurance and even manufacturing."

– An Infosys viewpoint

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INTRODUCTION

When it comes to examples of digital technology disrupting business, the flying car is hard to beat. Optimistically predicted to become reality in the early 2020s, the car will very likely disrupt both the automotive and the aerospace industry.

While autonomous travel is the most celebrated use case for Artificial Intelligence (AI) in the aerospace and automotive space, AI in the form of machine learning and predictive analytics is playing an important role in a number of other priority areas, such as passenger safety, preventive maintenance and customer experience. Both industries are making sizeable investments in the technology: a research firm, which studies human-technology interaction, forecasts the automotive sector will spend as much as US$14 billion on AI in 2025. And recently, Boeing HorizonX (the venture capital arm) announced it was investing in AI and machine learning company, SparkCognition.

As part of its study *Amplifying Human Potential: Towards Purposeful Artificial Intelligence*, Infosys commissioned independent research to investigate the approach and attitudes that senior decision-makers in large organizations have towards AI technology and how they see the future application and development of AI in their industries. As part of the research, 10 industries were surveyed, including Retail, Fast Moving Consumer Goods (FMCG), Utilities, Financial Services, Healthcare, Pharmaceuticals and Life Sciences, Manufacturing, Telecoms, Automotive and Aerospace, and the Public Sector.

The following offers a closer view of the findings specific to the automotive and aerospace sectors.

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AUTOMOTIVE AND AEROSPACE PLAYERS ARE READY AND WILLING

The automotive and aerospace industry is quite upbeat about AI, with 57 percent of its representatives agreeing that it is fundamental to organizational strategy. Our research also found the business to be quite mature in the journey to AI adoption, second only to pharmaceuticals and life sciences. The respondents also believe that employees are well prepared to implement and use AI: 66 percent say their organizations' employees have the development skills, while 60 percent say the same thing about both security and implementation skills. In each of these measurements, the automotive and aerospace industries are ahead of the average of all 10 industries surveyed.

But the reality is that AI implementation is clearly a work in progress, with only about 17 percent of the organizations having deployed it fully. Another 55 percent have deployed it partially, but say that it is working as expected, increasing productivity, automating processes and tasks, and bumping up revenue.

The drivers of deployment are well balanced between competitor advantage (28 percent), executive-led decision (26 percent), and a particular business, technical or operational problem (26 percent).

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What are the key drivers for your organization in implementing (or planning to implement) AI technologies?

Automate IT processes	64%	**Increase revenues**	46%
Boost employee productivity	58%	**Increase innovation**	46%
Cost savings	56%	**Improve go-to-market time**	46%
Automate business processes	52%	**Improve customer experience**	42%
Augment employee knowledge and skills	50%	**Improve decision making**	40%

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AI FOR EFFICIENCY AND SAFETY

Deployment is predominantly in data-driven initiatives. 75 percent of the respondent organizations are investing primarily in big data automation. Next in line are predictive or prescriptive analytics (62 percent), machine learning (57 percent), databases of expert knowledge (38 percent) and neural networks (32 percent).

Aviation and automobile companies know that data can add tremendous value to the business as well as help them overcome their biggest challenges. Keeping the complex manufacturing, supply chain and autonomous systems up and running is a key priority that is benefiting from data. Airbus, for example, analyzes data from its factories to spot manufacturing process variations and assembly line issues well before they escalate. Automobile manufacturers have been using data analytics to optimize operations for years; now, they are looking at leveraging machine learning to create self-adapting and self-defending security systems for cars as early as next year.

Few things are more important to aerospace and automotive companies than safety. Research, over the years, clearly indicates that almost all road accidents are a result of driver error. Now, major carmakers from Japan, Germany and the United States are exploring the use of facial analytics and emotion recognition technology to monitor a driver's cognitive awareness and attention to driving to avert accidents.

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AI FOR CUSTOMER EXPERIENCE

We mentioned earlier that competitor advantage was an important driver of AI adoption for the aerospace and automotive sectors. One way of building that advantage is to use AI to improve customer experience, just like the below mentioned companies are doing.

General Motors is building a revolutionary cognitive mobility platform. Cars fitted with it will be very aware of their surroundings and also interact better with the driver and nearby facilities. This is made possible by machine learning, which analyses data to make smart and contextual decisions. For example, if it senses low fuel, it will locate and pre-activate a pump close by and allow the driver to pay from the dashboard itself. It can also order coffee to be picked up while driving through or build a personalized radio station based on the driver's taste in music.

Airbus is leveraging social media to improve passenger experience. It listens to what flyers are saying about the journey – not just the flight, but also before and after – to develop and market new products.

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What benefits has your organization experienced from the use of AI?

Increase in productivity	57%	**Cost savings**	38%
Automate processes and tasks	49%	**Ability to identify new revenue streams**	32%
Increase in revenue	45%	**Faster resolution of business problems**	30%
More informed business decision making	45%	**Increase in innovation**	26%
Predictive/prescriptive analytics	43%	**Expansion of employee knowledge and skills**	23%
Ability to design and test new ideas with customers	43%	**Attracting new highly skilled employees**	17%
Faster delivery of new products and services	40%	**I am not aware of any benefits**	0%

Survey respondents clearly recognize the benefits AI will bring to customers. Most say it will dramatically improve engagement; about 60 percent believe it will result in speedier resolution of issues while a similar proportion say it will result in new and improved products and services and easier access to them all.

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AI FOR DRAMATICALLY CHANGING THE BUSINESS

In what must be considered a real understatement, only 42 percent of the automotive and aerospace respondents say they expect AI to disrupt their business. The reality is that it will most certainly do so. We already spoke of autonomous vehicles, like driverless cars, including those that fly. While cars must learn some more about anticipating the behavior of other drivers on the road or interpreting weather conditions before they can go driverless, they are quite ready to assist drivers with AI-based features, such as automatic braking, collision avoidance, pedestrian and cross-traffic alerts, and intelligent cruise control.

An important development awaiting the automobile industry is vehicle-to-vehicle connectivity. Automobiles will be able to talk to each other to make road traffic safer, for example, by warning other autos to stay out of the way of a speeding vehicle.

AI will also rewrite the rules of allied businesses, such as automobile insurance. Tech firm Nauto, BMW iVentures, Toyota Research Institute, and Allianz are working together to develop a cloud-based deep learning solution for improving fleet management, logistics and driver safety. The platform will track drivers' alertness and driving patterns to help fleet operators run their vehicles safely and insurance firms to determine the right premium for each driver.

When it comes to the application of AI technology, is your organization training or planning to train employees about the benefits and use of AI?

Currently doing	60%	**No plans to do**	6%
Planning to do in next 12 months	21%	**I don't know**	2%
Planning to do but not within next 12 months	11%		

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ETHICS AND AI

With the prospect of flying cars and autonomous aircraft come pressing ethical concerns. For example, what should a driverless car do when a child suddenly steps into its path if braking hard means endangering the safety of its passengers? Concerns also abound around job security, worker safety, and data privacy in the time of AI.

In your opinion, what challenges/concerns do you think your organization's employees have related to the adoption of AI?

Issues around safety of data	49%
Safety of end users working with AI systems	45%
Impact on human dignity (i.e. sense of self-respect and self-worth)	43%
Reduction in wages	42%
Uncertainties about human oversight of intelligent machines	38%
Increased impact on privacy	34%
Concerns over the openness of algorithms (i.e. the right to be explained by having an AI system justify its decision-making process)	34%
Job losses	28%
Do not face any challenges or concerns related to the organization's adoption of AI	8%
Don't know	4%

SOURCE: AMPLIFYING HUMAN POTENTIAL - TOWARDS PURPOSEFUL ARTIFICIAL INTELLIGENCE

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When asked about their top ethical concerns regarding AI adoption, 49 percent of the respondents from the automotive and aerospace industry mention data safety, 45 percent cite safety of AI system end-users, a similar proportion list impact on human dignity and reduction in wages, while 38 percent say they are worried about the uncertainty associated with human oversight of intelligent machines.

Since AI adoption and its impact on jobs is inevitable, it is critical that the industry also undertakes retraining and reskilling of impacted employees to create an optimal environment for coexistence of people and technology. Half the automotive and aerospace respondents surveyed report that they plan to redeploy workers replaced by technology within the same organization, while another 38 percent say they plan to retrain those workers for a new role or area of the organization; both numbers equal or exceed the average for all industries taken together.

Such ethical concerns must be understood and carefully considered for AI to be not just successful, but purposeful. Just over a third of the respondents agree that ethical concerns can pose a barrier to adoption, and 40 percent say these concerns could compromise the effectiveness of AI in their organizations. Somewhat worryingly, only 40 percent say their organizations have "fully considered" these concerns.

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CONCLUSION

Automakers and aerospace companies continue to move toward digital systems that offer greater insight, flexibility and scale and at the same time are pressured by the need to cut costs, protect margins and respond more rapidly to market trends among other things.

The two sectors are beginning to see the tremendous potential of leveraging big data, prescriptive analytics, machine learning and other tools and techniques supporting AI. Consequently, they are readying themselves for these technologies. While most companies (68 percent) are spending time and resources preparing their IT divisions, half (51 percent) also report they are "building AI into company ethos" and developing knowledge and skills internally (45 percent). In fact, the industry is well ahead of others in training employees about the benefits and use of AI: 60 percent of the respondents' organizations are already doing this, compared to the overall average of 43 percent.

But the most important step is to develop the right mindset about AI and see it for what it is. At present, the perception of AI is tending to the extreme, conjuring up scenarios of robots rendering people redundant or worse. While AI will certainly automate many jobs to improve efficiency and experience and add value in other ways, ultimately its role is to serve human interests. AI, though capable of doing a great many "mechanical" things better than people can, is still a long way off from matching human beings at things that are innately human, such as being creative, discovering hidden problems, or innovating with ideas and abstract notions. It is exceedingly important for the industry to recognize this truth so it can set the right expectations around AI adoption and utilize the technology to perform routine tasks that are better off automated while deploying the freed up workforce in more purposeful pursuits. This way the aerospace and automotive sectors will be able to exploit AI to amplify value for their organizations and their people.

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