

Digital Disruptions in Automobile World

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Abstract: The pace, at which digital innovations have expanded, has put established organizations at jeopardy. In the automobile industry, digitalization brings new players, shifting the technological spotlight from traditional to IT, enabling consumers to educate themselves in connectivity, mobility, and converting them to ever more valuable source of information. The intent is to expand the knowledge about the rise of the latest technologies that are proving to disrupt the market how to react successfully to these disruptions. In this perspective, it would be prudent to look at how car OEMs can assimilate into newer digital business models and connectivity themes of the future.

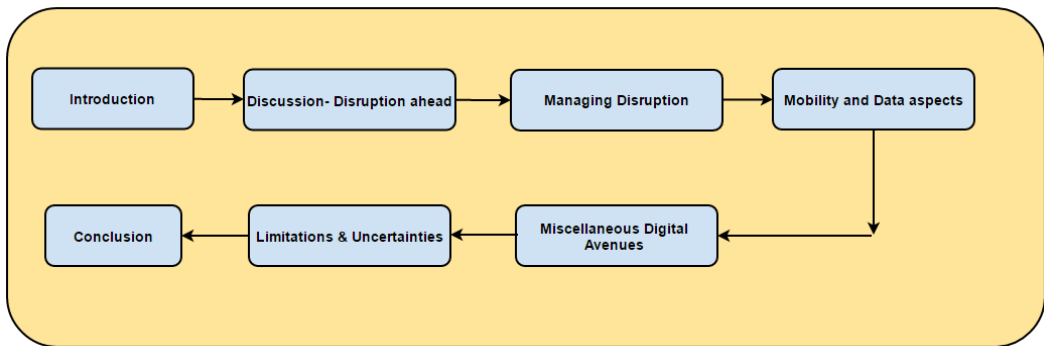


Fig. 1

Introduction

Digital innovation has arrived with supersonic speed in the automotive domain. Cars from last few recent years really look outdated and this pace is not going to slow down anytime soon. This new digital wave is going to do what yesteryears human used to perform duties in the car cockpit. Technological innovation is not foreign to the automotive sector; however, the difference here is the speed at which the changes will happen. This has hastened the entire auto product life cycle. The rules of game has changed and how? With the advent of digital technology, ideas now go from drawing board to product launch, undergo rapidly in few months rather than years, key daily decisions are made on the fly. Big Data access is responsible for this change acting on a technological platform.

Improved manufacturing and production workflows are definitely one of the key elements. However, the brand new digital business model is the real paradigm shift as enabler. The new digitalization in all aspects of the automotive business has promised to be the recent disruption that has threatened to change the entire automotive ecosystem and its components. The business

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tool that it provides as cutting edge is rapidly replacing the yesteryears linear business models in many walks of automotive domain.

One of the most exciting advances in automotive evolution has been connectivity; thanks to technology like GM's in-car concierge and safety system OnStar system which was introduced in the year 1996. This technology has been used by more than 1 billion customer requests. This technology has helped in automatic accident response and vehicle theft recovery, via satellite door unlocks, to vehicle repair diagnostics. It is a lightning fast data gathering machine that GM can use along with Mobileye to create precision maps to be used by autonomous vehicles. The company is also using OnStar's network in its new car-sharing service, Maven.

The focus seems to shift towards tech giants from Silicon Valley, Tel Aviv or Bangalore. As customers want to be connected, relationships are shifting to a much more service oriented and data driven model. As the traditional automotive industry is not yet prepared to step up to this disruptive model, compared to the information and communication technology (ICT), acquisitions and collaborations are call of the hour.

Discussion: Disruption Ahead

Though connectivity is not new to automotive sector, business opportunities in this technology are rapidly growing. As the automotive ecosystem is opening to powerful non-traditional players, digital connectivity is becoming a disruptive trend. Automakers need to determine their focus and identify where they can generate value from this technology; and accelerate the future when it comes to deploying new operating models and capabilities.

Mechanical engineering is soul to the automobile, traditionally. They will need to compete in digital and connected world which are not their forte. Value chains are shifting and the demand for the big data eclipses horsepower, the very business model is changing rapidly. The idea of cars as data generating autonomous machines may shift considerably in the near future. As mobility technologies evolve and vehicles gear and programme themselves to drive autonomously, the key question is, can the soul of car endure the test of time? This is the question that has kept many automobile pundits busy recently.

Autonomous driving is modifying the thinking about the car design and engineering. These futuristic cars look very different than what they seem today. More and more it has started looking like lightweight connected mobile living rooms that are made out of composite materials that are strong and light weight. If mobility becomes a common service, it may ring in end to the car ownership. Some of the prophecies are to fulfill the requirements of how a car can work in future service, namely, "mobility as a service" powered by a mobility provider. This mobility provider requires a connection over the cloud where the passengers provide their requirements for being transported, and the mobility provider will coordinate this. It does not stop here; it's for transporting commodities as well. In the look ahead, it won't matter whether we transport people by planes, trains or automobiles, we can combine all of this and call this "combo-traffic".

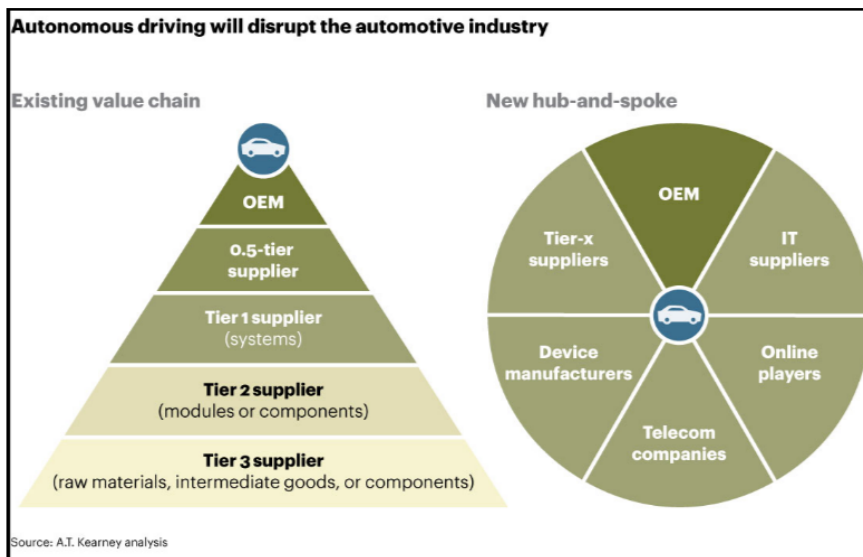


Fig. 2

There are three things taking place in parallel:

The first is power train of the car. It will change from traditional combustion engine-driven systems to mechatronic systems.

Next, we will go from human operated cars to the functionality of autonomous behaving cars.

Other changes we see coming is behavioural shift in thinking. Society will not like to pay 100 per cent for a car when they use the car only say 20 per cent over their lifetime. They run the car 20 per cent, and the car stands still over its lifetime 80 per cent. Idea is to not possess or own but receive it as service. Customers would want to be transported by a good transport system. Fun by driving will be passé'. They would want to have fun by being transported. This is a completely different thinking.

Autonomous driving will come into picture as it is the next generation path all over the world, we are driving toward.

Question remains then—what is the role of mobility? Autonomous cars will be used by the mobility providers as on demand service eliminating the need to own the cars by the end customers. The mobility providers will look at the big data and with the help of data analytics will be able to predict the travel needs and pattern and accordingly offer the transportation service at a very economical fee. And, based on this business, now the pathbreaking evolution will start. This has an impact on the car manufacturers, because this mobility provider is now the contact to the end-customer. The customer is “service buyer” and not car buyer anymore. The below picture depicts the futuristic overall data generation and flow picture.

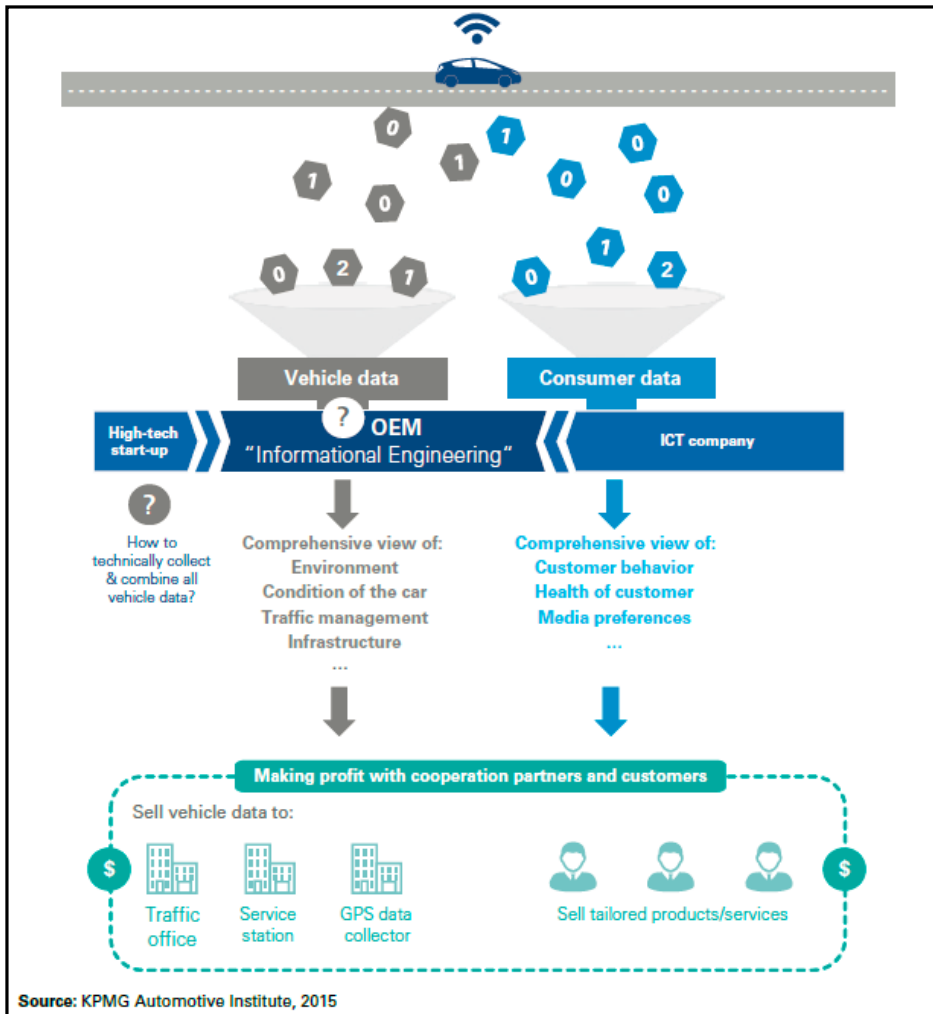


Fig. 3

Managing Disruption

With the omnipresent digitalization, customers will be asking for more and more slick technologies in the car cockpit and surrounding vehicle. In order to cater to these changing demands, the traditional car manufacturers have to be alert enough to be service-oriented, meeting the demands as well as making earnings through the services provided. The mindset will be changing for the OEMs from the product feature based focus to the consumer oriented service providers. There is this mix of OEMs who would like to be in the comfort zone of manufacture feature-based cars and sale it to the traditional customers with the age old proven work techniques.

However, this space will eventually evaporate and the new business model of adapting the direct customer relationship with high level of service with the power of the ICT like technologies, sell the entire connectivity package as service to the end customer. There are various other scenarios possible in the new order. One of them is the traditional OEMs will be contractors to the ICTs like Google and Apple of the day. Other option is for OEMs to completely revamp and reinvent just like Ford is trying to do having started Ford Mobility Centre in Silicon Valley.

Mobility and Data Aspects

Prime input to the mobility is the consumer data. The entire concept of mobility hinges on the data patterns and its utility by harvesting. Currently, this is just a data and has no intelligence to it proving to be useless. However, this will change soon with many avenues to predict the behavioural patterns converted to the requirements and eventually leading to the economical solutions. That is where the race begins to grab that all important fuel that runs the mobility engine. There are many considerations here.

- **Data Ownership:** Customers think the data should be owned by them as they are the authors originating the data. However, since the cars are the place where the data is generated, it becomes all that easy for the car producers to claim the ownership. They may as well offer lucrative deals to get their hands on the data with the carrot of providing convenient service at a very affordable price.
- **Data Security:** The all important data floating around cannot be open to all. There needs to be secured channels that transmit it to the proper databases avoiding hacking. The nervousness of the end customer can be well understood and cannot be undervalued. Becoming customers trusted data hub should be the first and foremost priority of the OEMs.
- **Reward Programs:** More and more customers would like to sell the data at a premium. Moot question would be who to trust more. Traditionally, ICTs are the most trusted partners whom the customers trust the most rather than any other third party. The reasons are plenty. The rewards and the points system rewarding the data usage are the best with the ICTs. The long term recurring business also provides them with elite memberships and some cool gains. It is eventually the forces in the ICT which are predicted to compete for that share.
- **Demographics:** Studies and experiences in the industry so far point out that the emerging economies such as China, India and Thailand has customers who are more progressive about allowing access to this data versus the western users. The consumers in the growing economies could lead the way to the more bold reward programmes paving way for the path-breakers.

Miscellaneous Digital Avenues

There are other digital avenues that we all should be aware of while considering this topic.

- **Digital Buying:** Customer focussed business systems such as e-promotions, e-commerce rewards and loyalty points, service contracts for loyal customers are drawing a big portion of the MIS budget. Investments in digital marketing, social media such as twitter/ face book/ Google plus etc, cell phone device usage and managing a bundled customer experience are also gaining momentum. Use of digital technologies help gaining and retaining consumer base. The virtual world used to mock up car dealership using the business simulators help e-dealerships to simulate the buying patterns and *modus operandi*. Additional services are sold as bundled solutions in addition to the regular insurances and warranty during the selling events. These changes in the buying experience are giving rise to a bunch of Gen 'Z' service providers who provide a comprehensive service menu anything from wallet or luxury parking to VIP pavilion tickets, and from bars and coffee shop seating to preferred airline and restaurant bookings.
- **Digital Manufacturing:** With the advent and emergence of the digital manufacturing tools, there is a significant improvement in the way things are happening in this domain. The smartness of the plant operations has made the life of plant floor operators and engineers much simpler. There is integration of machine-to-machine communication with the concept of connectivity by the RFIDs and various mechatronic controllers that can be remotely controlled. Factories are operated from remote counties enabling a larger management control reducing immense manpower cost, improved maintenance patterns, decrease in energy waste and shrunk timelines in building factories. These are called as Digital Factories of the future. Usage of robots in not only production lines, but envisaged use for maintenance and much smarter tool room activities has relieved immense pains and costs involved. Added intelligence due to the manufacturing digital simulations using the reverse engineering techniques replicating plants from the developed world to the emerging economies has helped manufacturing industries and has opened the floodgates for various possibilities.
- **Digital Product Development:** Car manufacturers can improve the design and development along with the physical prototypes replaced by 3D printing mockups that are faster and stronger. By using the customer habits captured via big data while driving the redundant designs will be shown door soon due to the closed loop feedback system due to the connectivity driven by the digital data. Maintenance and recalls will be alleviated greatly based on the smartness to predict the issues due to the forecasting models based on the database generated by the day-to-day consumer usage and maintenance patterns that could be build as business models in the dealership. Various slick technologies are evolving using the gaming techniques used in conjunction with the

mechanical softwares that enables foolproof designs. This approach of design for consumers stepping up from design for manufacturing will help industry resolve many pain points for a better customer experience.

- **Digital Supply Chain:** The main benefit from interconnecting the supply chain is reduction in cost via a better managed SCM process. In the past, the supply chain has been depicted as long lead times in a complicated workflow. Digitalization will reduce dollar cost and speed supply chain transparency through continued allied system integration, data collection and big data analytics. It has promised to shrink the number of deficiencies and accelerate the entire process of part design, production and delivery. Mostly the integration will be achieved through the cloud, where everyone in the chain will be accessing the very same data, resulting in flexibility and stability in the system.

Social media monitoring across the supply chain can more quickly identify component quality breakdowns where a supplier rather than the vehicle manufacturer would have to redesign, rebuild and resupply a part. The exploding growth of data from the connected Internet of Things throughout the supply chain will demand new skills for workers and managers.

- **Health and Wellness:** The evolution of new business models arising from industry convergence will look more feasible than a standalone approach. For example, the convergence of healthcare players and car manufacturers is expected to expand, with health, wellness and wellbeing becoming a brand separator beyond connected and self-driven cars.

Limitations and Uncertainties

The speed at which the evolution is happening has made the pundits sit upright and take notice of the possible winners; who will be the major players in the connectivity and who will have more influence to disrupt the market. The safe prediction was that the technological powerhouse will come and dominate this space. However, the subtle knowledge of cognitive number crunching and analysis to the facial recognition technologies would proceed further. To translate these gaps into dollar value, engineers need to realize that smart car solutions transcend way beyond a simple vehicle option. Rising in the connected car domain needs a totally innovative business mind, which concludes immense changes in strategy, thinking, culture, and execution across the entire company.

- **Key Players Success/ Failures:** Dominant players such as Apple and the Google are expected to cause the stir. They would likely come up with state-of-the-art applications that will compete in the messaging, music, voice commands and data gathering software tracking the customer behaviour and solution to cater to these needs. Carplay, Siri, iTunes, Android Auto etc. are examples.

- **Rise of Specialization:** Exponential expansion in the digital information in the customer facial expressions tracking devices, remote control of cars using telematics and sophisticated mechatronics giving rise to the specific companies catering to these special needs. This infers that the traditional IT players may not be the ones who will dominate the space but it could be someone else who could rise above others.

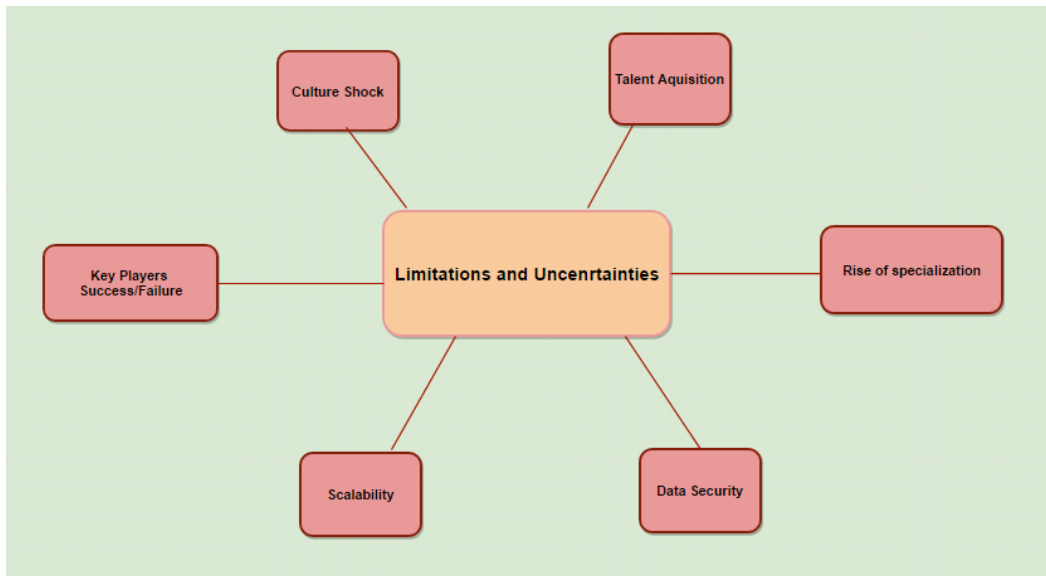


Fig. 4

- **Culture Shock:** This is the most talked about thing in the HR world. It will be difficult to absorb this change easily. The traditional methods will fall apart and a new generation will rule the key positions in the organization leading to the conflicts. Younger players could rule the roost leading to the unrest; that is very common in the IT world but uncommon in the mechanical world of automotive. There would be immense need of counselling and coaching the hard-to-change minds, howsoever valuable resources they may be. The meltdown in the year 2008-09 had seen the exodus of the talent which was hard to replace in the coming years after the automobile recession. It will be prudent to learn from the history and gear up for the future shocks. Organizational changes, large shakeups may be needed to make the conventional organizational structures nimble for the faster launches with higher pace.
- **Talent Acquisition:** The same old talent may not be able to sustain the pace of newer inventions that are needed to fulfill the digital wave. Various hirings and trainings will be the call of the day to meet the challenges posed.

- **Data Security:** The hackers are on the prowl for the data and beware! This is the new age threat that could be making the car manufacturers with the digital and connected world work overtime to thwart the challenge. The repercussions of a car remote controlled and hacked by the advanced hackers is not out of realm of reality. The companies and the OEMs providing the technologies are having sleepless nights and this topic has been brought up by the common customers as a challenge. However, the way credit card companies gained the confidence of the consumers, this challenge will also be overcome, says the experts.
- **Scalability:** While technology is an essential requirement for digital transformation, it is not sufficient. IT systems must be scalable, both within organizations and their collaborators. Compatibility with each other to protect consumer experience across all platforms, networks and devices is of prime importance. Flexible enterprise architecture aided with agile, rapid and robust backend systems are required. It needs to be understood that apps can only operate as well as the infrastructure allows them to.

Conclusion

Recalibrating car maker's distribution and sales/ marketing channels in order to match the digital bazaar is not easy, disruptive, and not cheap. Large changes in the OEM value chain, internal workflows, and dealer partnerships are essential. As consumers and new competitors go the digitalization route, automakers have to get competitive in this space. Ones that develop comprehensive and robust state of the art digital sales & marketing capabilities will position themselves to encash a new generation of buyers who are expected to do e-business. The ones that miss this boat will hinge their futures to the reducing and scarce quantity of digitally less savvy customers.

We're enjoying a tsunami of incredible digital innovation that's going to be still more awesome and happen fast and furious. It may seem difficult, but the traditional auto companies can establish a rapid invention research capability to go with their current one, as the innovation engine suggests. If they manage to seamlessly integrate their inventions with their huge organizations, they will be able to meet the variety of quicker and broader timelines that this new generation is asking. Relativity of time will soon be a reality. It is an exhilarating and power-packed time. The correct, smarter and appropriate strategies will take a company in the winning direction in the unpredicted and uncertain but exciting future.

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