Technologies that are revolutionizing the automobile industry (cars)

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Abstract: In today's world, technologies are advancing almost at the rate of biblical. The automotive industry has been constantly using innovative technologies. Several reasons are responsible for where things are today. One of the often unspoken but nevertheless unconsciously still present reality for consumers is that most of which are being paid more to get less. When people buy something new, they usually want more of everything or atleast enough to make them feel good about what they have purchased. This brought the urge for the developers to design cars innovatively with various new features to satisfy the needs and expectations of the consumers. In this paper, the factors influencing the invention of new innovative ideas in designing cars are discussed. The various new advances made now-a-days and some of the advances which could be expected in future (i.e.) around 2020 are discussed. This paper is proposed in order to make the various evolving trending technologies available in cars.

I. INTRODUCTION

The evolution of the car has been driven by the desire to create a semantic frame for speed. Influences such as fashion, makeup and missiles have shaped automobile design since manufacturing began. Over time, changes in lifestyle and culture have changed the semantic meaning of the frame. This time line will help automobile designers understand the markers that influenced the evolution of the automobile, and act as a tool to predict the future of car design. Technology is advancing at a rate that some describe as almost biblical. The automotive industry has been constantly using innovative technologies. In fact, you can say new car technology has entered a whole different world, where every year something unique and incredibly useful takes you by surprise. Many products related to car technology have already been unveiled, but some are yet to strike the marketplace, each of which will revolutionize the car industry forever. Innovative features from the manufacturers are offered on higher-end cars as options and eventually trickle down to less expensive vehicles as cost declines, awareness increases and demand grows. Equipment and features the public takes for granted today -- electric ignition, automatic windshield wipers, power steering, airbags, cruise control and many more -- began life as unexpected advances that dazzled the public.

II. FACTORS INFLUENCING THE ADVANCES IN AUTOMOBILE INDUSTRY

When an automobile is designed, the arrangement, choice, and type of components depend on various factors. The use of the automobile is one factor. Some cars are required only for local driving. These cars are well suited for good fuel economy on short trips, but they are less comfortable to drive at high speeds. A sports car, built for speed, will have enhanced steering and handling abilities, but requires a stronger engine, more fuel, and a more sophisticated suspension system. Other factors in the design of automobiles include the requirements for pollution-control components that have been placed on the modern automobile. Safety features are also a factor in the automobile's design, affecting everything from the braking and steering systems to the materials used to construct the body. The design of the body must incorporate standards of safety, size and weight, aerodynamics or ways to reduce the friction of airflow and appearance .The choice of front - wheel drive allows for a smaller, more fuel-efficient car. But the arrangement of the engine and its relationship to other automobile systems will be different from a rear-wheel-driven car. Today automatic transmissions have advanced to the point of providing as many as eight forward gears, driver-shift options, computerized driver-adaptable shifting and different shifting modes, such as "sport," "touring" and "snow." But in 1940, not stirring the transmission yourself was a radical concept and only well-heeled risk takers pioneered up the extra cash for the new technology. Today's "cutting edge" is tomorrow's "commonplace." Independent suspension for all four wheels improves the automobile's handling, safety, and comfort, but requires a more complex arrangement. Lastly, cost is an important factor in the design of a car. Many features useful for improving the various systems and characteristics of an automobile may make it too costly to produce and too expensive for many people to buy. The design of an automobile, therefore, is a balance of many factors. Each must be taken into consideration, and compromises among features satisfy as many factors as possible. Yet, for all the variety among automobiles, the basic systems remain essentially the same.

III. VARIOUS INNOVATIVE CARS IN MARKET AS OF TODAY

III.1 GOOGLE DRIVERLESS CARS

Google announced its first fully functional driverless car on December 23, which is ready for testing on public roads. Google self-driving cars are any in a range of autonomous cars, developed by Google X as part of its project to develop technology for mainly electric cars. The latest prototype has all the important elements like headlights, steering and brakes. The company has also created a self-driving system with sensors and computers that can be fitted to SUVs like Lexus. This new technology will not only be a breakthrough in tough traffic congestion but sensing technology can also increase road safety. Countries such as the UK and US are working on laws to allow driverless cars. The latest prototype had not been tested in heavy rain or snow due to safety concerns. Because the cars rely primarily on pre-programmed route data, they do not obey temporary traffic lights and, in some situations, revert to a slower "extra cautious" mode in complex unmapped intersections. The vehicle has difficulty identifying when objects, such as trash and light debris, are harmless, causing the vehicle to veer unnecessarily. Google projects will have these issues fixed by 2020.

III.2 AUTOMATED MANUAL TRANSMISSION

An automated manual transmission (AMT) doesn't have a clutch pedal. There's only an accelerator and a brake pedal, just like a regular automatic. And if you leave an AMT in D mode, it basically performs like an automatic transmission -- all you have to do is worry about when to start and when to stop. Accordingly, some AMT drivers may actually believe they're driving a traditional automatic. But there are some important differences that informed car shoppers should be aware of. For background, there are two types of AMTs: single-clutch and dual-clutch. Single-clutch AMTs are older, lurch-prone and generally unpleasant; the good news is that only the smart for two and some exotic sports cars use them. Dual-clutch AMTs, on the other hand, are designed to eliminate lurching, and the best units provide incredibly quick yet perfectly smooth shifts. Most AMT-equipped cars use dual-clutch technology. AMTs also tend to yield better fuel economy and acceleration than regular automatics. The reason is that AMTs are more efficient; that is, they allow more of the engine's energy to flow directly to the wheels. For the same reason, stick-shifts have historically edged automatics in both categories. The magic of the AMT lies in its ability to combine the fuel economy and performance of a true manual with the everyday convenience of an automatic.

III.3 SMART CARS

The design concept for the company's automobiles began at Mercedes-Benz in the early-70s and late-80s. After brief backing by Volkswagen, the first model was released by Daimler-Benz in October 1998. Several variants on the original design have been introduced, with the original being the "Fortwo". Cars After smart phones, we will soon have smart cars around. In June 2014, Google launched its 'Android Auto', telematics software that can be connected to car dash board for infotainment. It also enables the driver to access GPS, maps, streaming music, weather, and a host of other applications. A slew of carmakers including Abarth, Acura, Alfa Romeo, Audi, Bentley, Chevrolet, Chrysler, Dodge, Fiat, Ford, Infiniti, Jeep, Kia, Maserati and Volvo will offer Android Auto in their cars. Earlier, at the Geneva Motor Show in March, Apple announced its 'Car Play' software, which allows devices running on the iOS to function with built-in display units of automobile dashboards. Carmakers like BMW, Daimler, JLR, Honda and Hyundai have installed it in their cars. Infotainment manufacturers like Pioneer & Alpine too have shown interest in Car play from Apple.

III.4 FLYING CARS

A practical flying car would have to be capable of safely taking off; flying and landing throughout heavily populated urban environments. However, to date, no vertical takeoff and landing (VTOL) vehicle has ever demonstrated such capabilities. To produce such an aircraft would require a propulsion system that is quiet, to avoid noise complaints, and has non-exposed rotors so it could be flown safely in urban environments. Additionally, for such aircraft to become airborne, they would require very powerful engines. Many types of aircraft technologies and form factors have been suggested, such as ducted-fan and tilt rotor vehicles, but most previous designs have suffered from problems; ducted-fan aircraft tend to easily lose stability and have difficulty traveling greater than 30–40 knots, while tilt rotors, such as the V-22 Osprey, are generally noisy. Yes, it's true the vehicle you are seeing above can fly. It is known as the 'AeroMobil 3.0' and it is the first automobile that can actually fly. As you can see, the vehicle carries qualifies from both an airplane and automobile perspective. It can fly and land in almost every airport in the world and can fit in any standard parking space and gasoline station. Sure, the idea of a flying car is nothing new, as the first one was built back in 1917. It was known as the 'Curtiss Auto plane' but unlike the AeroMobil 3.0, it couldn't actually fly. If anything, it could hop. Since then, many manufacturers have tried to create automobiles that can fly, but have suffered disappointed for years. Nevertheless, with the introduction of AeroMobil 3.0, you can say the days where you see cars flying in the open air aren't very far away. In fact, the first flying car is going for sale in 2015.

III.5 VEHICLE-TO-VEHICLE COMMUNICATION (V2V)

Vehicular communication systems are networks in which vehicles and roadside units are the communicating nodes, providing each other with information, such as safety warnings and traffic information. They can be effective in avoiding accidents and traffic congestion. The main motivation for vehicular communication systems is safety and eliminating the excessive cost of traffic collisions. According to World Health Organizations (WHO), road accidents annually cause approximately 1.2 million deaths worldwide; one fourth of all deaths caused by injury. Also about 50 million persons are injured in traffic accidents. If preventive measures are not taken road death is likely to become the third-leading cause of death in 2020 from ninth place in 1990. V2V (short for vehicle to vehicle) is an automobile technology designed to allow automobiles to "talk" to each other. The systems will use a region of the 5.9 GHz band set aside by the United States Congress in 1999, the unlicensed frequency also used by Wifi. V2V is currently in active development by General Motors, which demonstrated the system in 2006 using Cadillac vehicles. Other automakers working on V2V include BMW, Daimler, Honda, Audi, Volvo and the Car-to-Car communication consortium.[7] V2V is also known as VANETs (vehicular ad hoc networks). It is a variation of MANETs (mobile ad hoc networks); with the emphasis being now the node is the vehicular. In 2001, it was mentioned in a publication that ad hoc networks can be formed by cars and such networks can help overcome blind spots, avoid accidents, etc. Over the years, there have been considerable research and projects in this area, applying VANETs for a variety of applications, ranging from safety to navigation and law enforcement. In April 2014 it was reported that U.S. regulators were close to approving V2V standards for the U.S. market, and that officials were planning for the technology to

become mandatory by 2017. PKI (public key infrastructure) is the current security system being used in V2V communications.

III.6 ENERGY-STORING BODY PANELS

As an improvement to solar technology in cars, energy-storing body panels store heat energy from sunlight and serve as a source of power for the vehicle. These body panels will be able to store energy faster than conventional batteries. They are made of carbon resin and polymer fiber, reducing a vehicle's weight by up to 15 percent. Toyota is currently working on lightweight energy storing panels that are predicted to come into production after 2020.

III.7 CONNECTED CARS

Connected cars are a giant smartphone on wheels. These cars allow you to perform every function a smartphone can, but through your vehicle. The car is pre-installed with a SIM card and offers numerous telematics services and remote diagnostics. According to recent studies, there will be more than 170 million connected cars on the road by 2020. Each one of these technologies will revolutionize the car industry in the coming years. So, what new car technology did you find the most interesting? Let us know your comments below and share this article with others!

III.8 NEXT-GEN ACTIVE SAFETY FEATURES

Active safety features such as adaptive cruise control and collision warning have been available for quite a long time. However, with the increased use of technology, it was not long before next-gen safety features such as super multi-view head-up display and hands-off adaptive cruise control were introduced. The head-up display will be visible on the windscreen and will show turn-by-turn navigation arrows, and potential road warnings all virtually. It will even allow separate displays for passengers for them to input destination within the GPS, so that you aren't distracted while driving. The hands-off adaptive cruise control allows drivers to maintain a safe distance from other vehicles and keeps the car in the center of the lane, without requiring you to touch the steering wheel.

III.9 NETWORKED CARS

Networked Cars are a new technology in the automobile industry. These are autonomous electric pods that are both highly personalized modes of transportation, and electric 'taxis-for-hire' that can talk to each other. A networked car can share its availability, speed, and location with other vehicles via wireless communication. Therefore, if you need to get somewhere all you have to do is just call for a network car via your smartphone. The vehicle will arrive at your location and will ask you to enter the destination, after which it uses real-time traffic and GPS to calculate the best route. The vehicle can recalculate if necessary and is predicted to be used in large cities around the world in 2020.

IV. CONCLUSION

Thus the various advances and the innovative technologies made in the automobile industry with regard to designing cars are discussed. Each one of these technologies will revolutionize the car industry in the coming years. Auto designers today, use all parts of the car to express a personalized semantic frame for individual lifestyles. Speed is not the only factor designers are trying to convey and overcome in their automobiles. We are moving into a time of more awareness of environmental factors and cars that reflect a gentler lifestyle and aesthetic.

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