

Shifting towards e-mobility

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Global statistics reveal that world populations have grown exponentially, but have the supporting services and infrastructure grown in proportion to cater for this? The answer is no.

In terms of transport, we find more households having a higher number of vehicles, resulting in an increase in the number of vehicles on road networks. A trend towards independence, status and flexibility has further increased vehicle sales. The supporting infrastructure has not grown in proportion to support this increase in vehicles and thus congestion is experienced with an increase in frustration for consumers and, in turn, an impact on the environmental ecosystem in which vehicles are running while being stationary in traffic. The result is poor air quality and, in turn, decreased life expectancy over time. The global clamp down on emissions has been an ongoing topic with further stringent measures being imposed for vehicle manufacturers.



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Emissions regulations challenging

Automotive technologies have been forced to fast-track towards improved systems to reduce emissions, however existing conventional petrol and diesel systems have a limit in operations, and high emissions regulations are proving to be challenging for these existing systems. Interim solutions include stop-start technology, as well as improved engine technology for emissions reduction. This has now allowed market entry for alternative propulsion options which include biogas, fuel cell, and batteries, also including hybrid options of each until such technologies are viable on a commercial scale.

Mobility options

Through these frustrations, challenges and technological advancements, we now find ourselves in a revolution with a shift in mobility options for consumers where technology has embraced this at full force. The world has become connected with mobile phones at the forefront of this revolution where each aspect of consumers' daily activities have become connected. The transport industry has embraced this in all forms, providing interfaces to users for increased options. Micro-mobility options have linked consumers from residential or work locations to public transport systems through to sharing platforms

such as bicycles, non-motorised transport and, of recent, car sharing, which is now on the uptake - the zero cost of ownership and flexibility being the main driving forces. Mobile applications provide ease of information and reservation for each of these services.



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Shift towards e-mobility

In terms of electric mobility (e-mobility), which includes electrically propelled systems from electrically assisted wheelchairs, e-bicycles, e-scooters, e-motorcycles, e-yachts, personal mobility e-vehicles, micro-mobility e-vehicles, electric cars and buses, we find an endless list shifting towards the trend. Each of these systems requires advanced development for technology platforms, mobile applications, web services, which all improve user access to each and provide opportunities across the various sectors. The value chain of each service begins with energy generation including renewable energies, smart grid integration, charging infrastructure, component and battery technology, connectivity, service and recycling, each of which provides new business opportunities for each supporting aspect of e-mobility. We find that the base technologies required in electric vehicles is already being used with trending features in existing conventional vehicles such as crash avoidance, lane keeping, smart cruise control automated parking, infotainment connectivity, as well as new developments towards self-driving vehicles. All the systems of Anti-lock Braking System (ABS), electric power steering and drive-by-wire throttle facilitate intelligent algorithm development for ideal electronic control systems of the entire vehicle.

Mobile energy storage

Advanced systems for charging of each platform includes wireless charging, which includes both stationary parking as well as dedicated lanes on highways for electric vehicle charging (in United Kingdom), and automated battery swap stations for electric buses (in China). Electric vehicles also provide the benefit of mobile energy storage as their battery packs are generally large in capacity, so charging can be done in one location and, in a remote location, energy can then be fed from the vehicle into a supplementary device like an energy-efficient household or directly into the grid network itself (vehicle-to-grid).

So we now find ourselves embracing this revolution in the transport industry which certainly provides new business opportunities for various sectors, where interoperability between each technology and service needs to be at the forefront of sustainability. The transport sector is merging into the connected world as well, forming part the smart world. Consumers, and more so automotive enthusiasts, will certainly be faced with exciting times in vehicle technologies that are being released.

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