

Telematics and its Applications in Automobile Industry

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Abstract— This paper introduces Telematics and applications of Telematics in automobiles and discuss how the Telematics communication will happen. This paper also discuss the role of Vehicle Telematics in Automobile Industry with emerging social and Mobile Technology with practical applications and about advantages and disadvantages of Telematics.

Keywords— Telematics, Vehicle Telematics, Automobile

I. INTRODUCTION

We are currently in the early stages of the next disruptive shift in work and technology, with a powerful economic substance sweeping across industry, as a result of new technologies change is coming at an eternally accelerating pace, predominantly as the futuristic generation comes of age and sees few barriers to the way technology can empower individuals and businesses.

Within the automobile industry, revolution has come gradually and certainly over time. One new technology that has the potential to bring substantial change to all features in Automobile Industry is telematics, with its capacity to monitor vehicle-driving behaviour and communicate back to the user with tremendously rich with real time data.

For some carriers, telematics data provides the basis for understanding how far, how fast and under what conditions a person drives, as well as a substance for more sophisticated data modelling and scorecard development. This ability is fostering new and innovative products that more accurately price risk and attract lucrative new customers.

II. WHAT IS MEANT BY TELEMATICS?

Telematics has been formed by amalgamation two ideas, which are more acquainted Telecommunication and Data Processing. We can then define Telematics as the blending of computers and wireless telecommunications technologies, ostensibly with the goal of efficiently conveying information over vast networks to improve a host of business functions or government-related public services. The most notable example of telematics may be the Internet itself, since it depends on a number of computer networks connected globally through telecommunication backbones.

Telematics can also be defined as Distance Communication (Telecommunication) of codified information processed according to Logic (Data Processing). Data processing is a very sophisticated system of handling information.

This brings into play, fundamentally three elements:

- a. The material likely to be hardware called as tool, the working equipment; it is the computer, the hardware making it up, material and tangible. This hardware is the physical support of information.
- b. The logical one (software) is the direction, the working method; it is the programme, intangible, abstract-logic, made up by a number of elementary instructions which, when they have been introduced in the computer central memory, ensure its performance.
- c. All information can express through a language which the computer must understand in order to be able to carry out the instructions, which are given to it. This language is known as machine-language, and acts as a bridge between the machine and the programme. It consists of a codification which matches the logic concepts of the programme with specific physical phenomena. The transmission of electric signals. Electric signals, then, materialize information.

III. WHY TELEMATICS?

What is the essence of Telematics in Automobile Industry or in any other Industry?

A. Machine Stops:

In any Industry one can monitor a machine for a whole day, with some additional resources able to monitor a machine a week (24*7). Is it possible to monitor a machine (365 days * 24 hrs.) the answer is NO, But by using Telematics it is possible The short story 'The Machine Stops' is a powerful statement about where the world is headed, as people begin to rely on computers more and more for everyday life. For automatic roadside assistance and remote diagnostics. General Motors Corp. first popularized automotive telematics with its OnStar system. Major automakers are equipping new prototype vehicles with wireless-based services controlled by

voice commands. This kind of telematics could enable motorists to perform a variety of wireless functions such as accessing the Internet, reading e-mail, downloading digital audio and video files or obtaining "smart" transportation information. The telematics industry is not limited to automotive applications. Other applications are being studied.

B. Teleworking:

We have moved from the old orderly organized world to a new global, diverse unorganized world. Teleworking saves time and developed for monitoring water and air pollution, for medical informatics and health care, and for distance learning. Many European countries are developing uniform policies to integrate telematics applications into government, business and education.

IV. VEHICLE TELEMATICS

Vehicle telematics have a wide range of applications like real time movement and behaviour of a vehicle can be determined most efficiently. In addition to tracking this telematics will give minute to minute live updates of vehicle. This system not only monitor but also send the data which was monitored which helps to diagnosis a issue and leads to a new technology. The convergence of telecommunications and information processing, the term later evolved to refer to automation in automobiles, such as the invention of the emergency warning system for vehicles. GPS/GPRS navigation, integrated hands-free cell phones, wireless safety communications and automatic driving assistance systems all are covered under the telematics umbrella.

It is the combined application of Telecommunication and informatics in wireless technology. Emad Isaac, CTO of Rand McNally defines Telematics as "The potential for collection, aggregation, and storage of pertinent data that can be digested locally, or post-processed remotely." While this definition suggests a more universally applicable technology as a superset of M2M (Machine to Machine) connectivity, and as part of an "intelligent network of connected things", the term is typically associated with the vehicle market.

V. TELEMATICS COMMUNICATION

Basically the telematics communication use GPS/GPRS as a medium of communication. An electronic device will be inserted in vehicle which has an GSM modem. The modem is configured with an software application likely to connect to an external servers. The communication between modem and server will happen by using Telecommunications via Cell Towers. This communication is two way communications as shown in figure 1. The device inserted in vehicle will maintain a connection to server and sends the real time data of the vehicle to server. It depends on the software application used by the industries according to meet the requirements of customers. As SIM card is inserted into the device there is a

scope for Congestion which leads disconnection of vehicle. As GPRS is used their will be a minimum speed required to send the data to server end. Main drawback is vehicle may not connect in no network areas. In near future the entire Automobile industry will round around this new Technology.

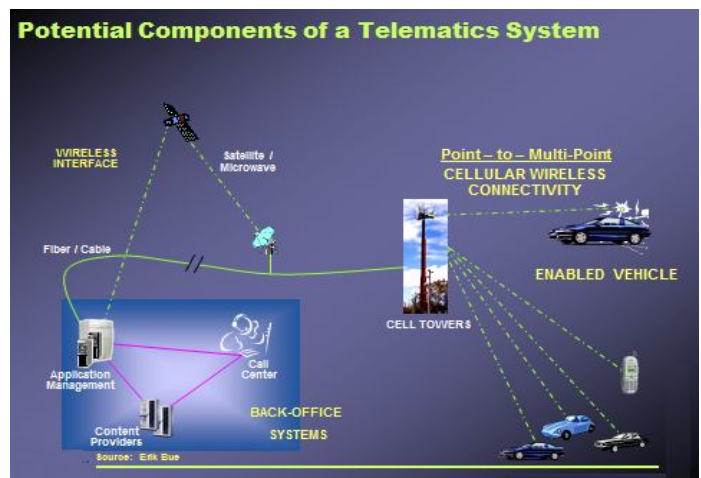


Fig: 1 showing elements present and how communication happens?

VI. PRACTICAL APPLICATIONS OF TELEMATICS

Vehicle Telematics can help in increasing demand for automobile which indirectly cause for the growth of automobile industry. Some practical applications of vehicle telematics include:

A. Trailer tracking:

In today global market, customer may asks you, "Where is my delivery?" By using the application of Vehicle Telematics called Trailer tracking one can answer him with real-time location and distance the cargo is from his facility. Hence, Trailer tracking can be defined as a technology of tracking the current location and position of a vehicle's trailer unit, with a location unit fitted to the trailer and a method of returning the location and position of Trailer with data via mobile communication network or geostationary satellite communications.

B. Vehicle Tracking:

All your automobiles - be it your truck in your fleet, bus in your fleet, private vehicles, security vehicles, and even two wheelers - all can be tracked by you remotely sitting in your office/home, and wherever you are ! is it possible really? The answer is simply YES. But how using the advanced technology that come in to existence known as Vehicle telematics. This is attained through a combination of GPS/GSM receiver and transmitter installed in the vehicle. This kind of technology frequently used by transportation and delivery businesses that send out large fleets of vehicles and

products. Delivery trucks, taxi companies and maintenance companies all can use sophisticated electronics to track workers and plan out important and sometimes complicated routes. These devices enormously increase efficiency and cut down on losses caused by human error, so more companies will most likely be willing to spend a tiny additional on a tracking system for security.



. Fig:2 showing loop of Tracking system

C. Container Tracking:

The container tracking system allows us to locate the actual location of the container and determine the time spent in any place of congestion. By using vehicle Telematics one can made easy to tack container in more accurate and precise manner. This Tracking is almost similar to trailer tracking system using GPS/GSM modem as in built in Containers. By using Container tracking there is a great possibility in increasing the security of the Container and also reschedules the movements of the container depending upon the customer requirement.

D. Cold store:

By using innovative and advanced wireless network technology, cold storage monitoring can achieved. By using the telematics system through integration of Sensors, it can measure the temperature and humidity conditions and provides the real time data. It also helps to know the current temperature. It sends second to second monitor data, which is also used to analyse the varying of temperatures from time to time. This a key practical application of Telematics.

F. Satellite Navigation:

Satellite Navigation in the perspective of Telematics can defined as safely guiding a vehicle to an unknown place to reach destination safely In general to have a paper map inside the car and let to know where we are and the destination we are supposed to reach is not quite easy to find immediately. But by using a GPS navigation system it is very easy to know the destination, where we are and the landmarks around at a glance. The system will also guide by displaying the route

map along with the distance between starting point and destination. This system will definitely help in overcoming the basic problem individuals facing when travelling to a new place.



Fig:3 GPS Navigation system inside vehicle

G. Wireless Vehicle Safety Communications:

Car safety and road safety can achieve by using Wireless vehicle communication. Wireless vehicle communications have an inter vehicle communication. Communicates vehicle to vehicle which are built with electronic device. These electronic devices aid the purpose of exchanging safety information like road hazards and the locations and speeds of vehicles, over short range. Bu using telematics vehicle to vehicle, vehicle to infrastructure and infrastructure-to-infrastructure communication is possible. These medium of communications play a vital role in wireless vehicle safety communications and emergency warning system. Further, in near future, Vehicles may directly connect to the other Cars and trucks with the wireless system as mode of medium. When vehicles inter connection, exist when the vehicle moving in conveys, if brakes applied in the first vehicle automatically all the vehicles moving behind will slow down. This kind of technologies will enormously decrease road accidents. This system will also able to locate any accidents occur in short range of distance which lead to decrease traffic problem. To make all these miracles to come into existence needs some basic engineering efforts.

H. Vehicle mileage capture:

Vehicle mileage capture is another important application of vehicle Telematics where it sends the total distance travelled by vehicle and history of the vehicle where it has been. Although Vehicle mileage capture uses similar Technology used in Track and trace but ideologically both are two different. This system is capable of monitoring of journey and total distance coved. This application is also used to diagnosis if any problem occurred in vehicle.

J. Intelligent Vehicle Technologies:

Intelligent vehicle Technology is an attempt to provide a solution to traffic accidents, potential dangers and congestion. Many of the developed nations put a great focus on road safety and vehicle safety over the decades. Because of many efforts, this technology came in to existence as an application of vehicle telematics. This intelligent vehicle technology includes communication between vehicle to vehicle and vehicle to infrastructure vice versa. This system also equipped with emergency warning system. This system helps in indicating drivers that if there is any risk in changing lanes which leads to collisions on a busy highway. But these kind of communication can happen to a short range of distances. There is no doubt in saying this that the future of automobile industry is with Intelligent Vehicle Technologies.

VII. ADVANTAGES AND DISADVANTAGES OF TELEMATICS

A. Advantages of Telematics:

The benefits of telematics are wide, as developing technologies collect an extensive amount of data beyond mileage. This information can be used to create value-added services, while increasing pricing accuracy, reducing claims leakage, reducing loss costs and, therefore, lowering expenses. Areas of greatest impact and potential redesign include:-

- Improve customer service
- Low acquisition cost
- Reduce operating expenses
- Fraud reduction
- Reduce unauthorized usage
- Stolen vehicle recovery
- Pricing accuracy/adequacy
- Improved renewal retention
- Improved liability determination
- Improved accident investigation facts
- Reduction or elimination of towing charges
- Automated repair processing
- Increase fleet safety and security
- Go Green

B. Disadvantages of Telematics:

Automotive telematics is the idea of integrating Automobiles as completely as possible. Automotive telematics includes putting cellular services, GPS/GPRS systems, weather displays, and many other technological ideas into Automobiles to serve all the desires of a Customer. While these are a great idea in theory, there exist a few disadvantages to a totally integrated Automobiles. A few disadvantages are as follows:

- Cost
- Tracking

- Functionality
- Distraction
- Identification of Error

VIII PARTING THOUGHTS

- A. Telematics represents a significance but complicated opportunity.
- B. There are many ways to create value in telematics, many of which have yet to be fully exploited.
- C. The “winners” in telematics, as well as the ultimate potential of the industry, is yet to be determine

IX. CONCLUSION

For some carriers, telematics data provides the basis for understanding how far, how fast and beneath what conditions a person drives, as well as a foundation for more sophisticated data modelling and scorecard development. This ability is fostering new and innovative products that more accurately price risk and attract profitable new customers.

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