DATA MANAGEMENT AND ANALYTICS MIS609

ASSESSMENT 2 CASE STUDY REPORT: DATA ANALYTICS FOR ORGANISATIONAL

DECISION MAKING

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**INTRODUCTION**

This work will focus on describing the American automotive company Tesla and its relationship with the field of artificial intelligence and other concepts used in data management.

Topics related to the business model of the company, as well as the evolution of the various products and services offered to the market, will be explored.

Additionally, the obstacles that have come to be presented when implementing different innovative processes and the consequences that these have had as well as the experience of the company when trying to bring specific products to the market that require meticulous regulation due to their unique characteristics and the relevance they have in society.

**TESLA INC**

Tesla is a company of American origin, based in Palo Alto, California, that develops products such as cars, batteries, solar panels, and solar tiles. The company is focused on offering different technological solutions based on the use and generation of electricity in order to reduce our dependence on fossil fuels as a society.

In 2020, Tesla sold the largest number of electric vehicles, making it and establishing it as a benchmark in the automotive market. Complementing the electric vehicle market is Tesla Energy, which is responsible for the installation of photovoltaic systems for solar generation, serving both the private and industrial markets.

Tesla was founded in July 2003 by Martin Eberhard and Marc Tarpening in honor of Nikola Tesla, a famous and controversial inventor and electrical engineer who contributed to the development of the US electrical market.

In recent years Tesla has differentiated itself from its competitors by presenting different innovative products and services around its line of business such as: Autopilot (self-driving cars), Insurance, Robotics and Artificial Intelligence, which make it a company that remains up to date and sets and leads technological trends in the market.

For a few years, terms such as artificial intelligence, machine, data mining, internet of things, among others, began to be used, I felt an attraction to this world, which made me investigate more about it, supporting me in diverse sources such as the internet, magazines. , scientific articles and odd books. While I was informed about the subject, I realized that the not-so-distant future would be based on these technologies as the Internet began to take over our daily lives.

Tesla Inc has differentiated itself by being at the forefront in terms of innovative technologies and engineering as they focused on giving a 360-degree turn to the automotive sector and focused on offering an innovative product, in constant evolution and that extracts to the maximum the benefits of the 21st century technology.

Tesla became known for its business focused on the production and sale of electric vehicles, which to date represent a large part of its business.

The strategy carried out by the Californian company was to first focus on the development of an electric sports vehicle which will provide all the comforts to customers with high purchasing power. The reasoning behind this decision lies in the idea that the first units produced would be aimed at premium customers who would be willing to pay extra for a "collectible" item which would help finance both the operations of the company and the development of new products for a less premium sector. This is how little by little the organization was differentiating itself from the others by releasing new models, each with distinctive characteristics but with the distinction of being 100% electric.

Over time Tesla has taken on the task of expanding its electricity business, this time focusing on the generation part, which represents a lower percentage compared to automobiles but following the mission of the company which is focuses on the transition towards more planet-friendly energies.

**DATA CONCEPTS**

Recent technologies such as artificial intelligence, machine learning, deep learning, business intelligence, business analytics, data mining, etc., are key to Tesla's business model. The company was born with this as a basis and over the years it has developed its own systems that have allowed it to grow to unsuspected levels. Based on this information I will proceed to analyze how the organization makes use of these technologies as well as the possible benefits they bring to consumers.

Artificial intelligence

Since its inception, Tesla cars were developed with its own system which evolved until it became what it is now. Tesla's Autopilot program allows the vehicle to detect and classify the objects around it to carry out actions according to what is previously established in the driving algorithm. This technology makes use of the different cameras and sensors that the vehicle has installed in each part of the bodywork. Using its own chips Tesla has gone a step further in the sector and recently announced the Tesla robot equipped with the same artificial intelligence chip which will aim to replace and help humans in basic tasks or dangerous.

Machine learning

The use of machine learning at Tesla is widely known, it helps the company train its algorithms to improve its artificial intelligence and object recognition services. By having many vehicles that daily generate data, the machine learning system learns from the different scenarios that occur in each customer vehicle, in this way the information from the algorithms is "learning" to distinguish the best steps to follow in certain event.

Big data

Tesla cars generate a huge amount of information every minute which helps the company to make business decisions and continue to innovate in the field. Each vehicle sold sends information about the driving habits of the driver as well as the car to later be processed in the cloud. This type of process can cause doubts about the use of the clients' confidential information; however, the manufacturer indicates that all the data generated from the various sources is kept protected and is not linked to the personal data of the clients.

**ANALYSIS**

The automotive company "Tesla" owes its business mainly to the sale of electric vehicles, a sector that over the years has evolved in several aspects, be it production, distribution, sale to the consumer and technologies around the vehicle. Tesla came to modify different processes and methods, especially those related to the energy used by cars (electricity) as well as the internal technology (software) that currently make a significant difference compared to the competition.

The automotive sector has historically witnessed many problems that, due to their nature, are difficult to remedy, a clear example is road safety.

Deaths from causes attributed to some human error while at the wheel are to attract attention both for their frequency and the severity that these mishaps tend to have.

Tesla, (like other companies) has developed and perfected over time its autonomous driving system called Autopilot, which identifies using cameras (assisted by artificial intelligence), the objects that are around the car and through previously assigned instructions, it carries out specific actions according to each situation that arises on the streets.

Autonomous driving systems are a modern technology that even today is still in a continuous state of improvement. Companies like Google began experimenting with this software in vehicles around 10 years ago and focused on collecting data related to roads and vehicles in order to feed the algorithms with which their artificial intelligence technology benefits. These efforts over the years have begun to bear fruit, today there are many companies that are beginning to implement autonomous navigation systems since within the industry it is clear that it is the next great technological leap in relation to the sector automotive. Tesla, for its part, has not been left behind and with its own artificial intelligence, it collects data from its customers' vehicles and sends it to the cloud to later be analyzed. All this information from both drivers and roads is extremely important for Tesla's future plans, as it gives them a clearer vision of what is working and what needs to be improved as well as giving way to the creation of new products and services. such as insurance tailored to each person's driving style, the creation of a fleet of robotaxis (Uber-style service) or the education and communication of entire fleets on the streets to streamline vehicular traffic.

In recent years Tesla has been the target of much criticism in the press for its Autopilot system. As it is a technology that directly involves the safety of people when driving, it is extremely delicate and vitally important to implement and improve the system constantly, since any error could cause severe damage to users and a high reputational and monetary cost to the company.

It is precisely the safety issue that has generated controversy in some circumstances since Tesla has had to call a certain number of vehicles for review due to failures related to the internal software of the cars, in the same way the issue concerning safety when using Autopilot has caused some controversy in the media due to doubts in the level of autonomy that it can really offer.

Within the world of autonomous cars, there are clear obstacles to consider that involve different actors within the market. Factors such as the lack of regulation in some countries in relation to technologies of this type, the lack of confidence on the part of the consumer when it comes to autonomous driving and data collection as well as the coexistence between non-autonomous and autonomous vehicles within the same areas, represents great challenges for the giants of the sector.

**CONCLUSION**

To conclude, I could say that it is extremely exciting for me to be able to witness the technological changes that are currently taking place. There are so many sectors in which technologies such as: artificial intelligence, machine learning, deep learning, business intelligence / analytics are generating profound changes that I feel fortunate to be able to witness the transformation of entire industries in a brief period of time.

When entering the field of artificial intelligence, we can highlight that its use will impact the business world in diverse ways, how we react, and use it, will be decisive, so that the result creates more value than it destroys. I could highlight and even predict that productivity in general in the following years will increase substantially and, on the contrary, the costs associated with the production of goods and services will drop drastically due to the optimization of value chains and the more effective use of different resources. with which organizations count.

It is of utmost importance to emphasize that just as the implementation of new and disruptive technologies brings clear benefits to society, their adoption and the continuous development and updating they require, reveal the bureaucratic deficiencies that certain regulators sometimes exhibit when dealing with these topics. A clear example is Autopilot, which, since it is a system that directly involves people's road safety, it requires detailed supervision and analysis of its internal procedures as well as the quality of the use of code and artificial intelligence that allow its use.

Unfortunately, in most cases these "quality review" processes take time since they are mostly state-owned entities, the approval or creation of new regulations must follow specific protocols.

By not being involved, and, not having experience in the specific automotive sector, it is a bit difficult for me to be able to give recommendations that do not lack credibility, however, with the professional experience that I have, I could point out that the following actions can contribute to the increase in success of the implementation of these technologies.

**Employees.** Testing new products and services first with company employees, ensuring honest, informed, and robust feedback.

**Small-scale testing.** Making use of the internal data of the company, Tesla will locate the best places, with the best conditions to carry out tests with real clients. For example, testing the car summoning system in rural areas or shopping centers that do not have many people.

**Key hires.** Being a large organization, Tesla could hire people with experience and contacts in the legal area related to auto regulatory entities in order to have a better perspective of the requirements and ways of working of those institutions.

**SOURCES**

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