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INNOVATION AND ENTREPRENEURSHIP
BASICS - AY 2017/2018

Battle Report for battle #04

Car vs. Horses
Transport innovation in the nineteenth century

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1 Introduction

The fourth battle was aimed at analyzing two possible transport systems in the year 1883, so that Mr. Smith could choose in which it is advantageous to invest. The **ToChange** company proposed to invest in a car prototype, promising to create a car that would be used all over the world, while the **Ackerman's Stables** company proposed to invest the money in their company of horses, exploiting a new breed, promising to obtain the monopoly of the horses.

Both groups had to study and analyze the environmental, social and economic state of Britain in that specified year (1883).

The problem faced in this battle was both **socio-economical** and **technological** since the investment on those solutions could affect the number of employees in various fields and could also vary the style of everyday life. Moreover, this choice can also make a great impact on future technologies, thanks to the amount of money and effort being put into the chosen approach.

The first group's purpose of in this battle, as presented in section 3, was to prove that the best transportation device was their prototype of car, by presenting the possible improvements that could be made in the future, explaining the advantages compared to simple horses.

The second group, as explained in section 4, had to prove that their new breed of horse was the best transportation system, by extending the lifespan of horses and making them more tolerant to any deceases.

Mr Smith will decide to invest his money in **Ackerman's Stables**, as he considers this a safer investment. In the last part (section 5 and 6), we will analyze this choice and explain future developments.

2 Scenario

Great Britain, during the nineteenth century, is the birthplace of industrialization. After a successful agricultural revolution, which led to population being able to afford food and manufactured goods, Britain saw its economy grow drastically. Added to an expanding population, natural resources, and overall stability in the country, Britain was able to invest in its industry. The nineteenth century is a period of many scientific researches and discoveries, which influenced fabric manufacturing, communication means (through the appearance of the first electronics) and transportation ways. Although a popular way of travelling is still by using horses, the development steam cars and trains and their popularity show that the British population is ready for new methods of transport.[9]

This is now the year 1883, in England. Mr Smith, a rich British man, wants to invest in the transport business, without having much knowledge about it. To be able to partner with Mr Smith and develop their discovery, two opponent companies are fighting. On one side we have the Ackerman's Stables company, a well-established horse breeder and seller, who discovered a new breed of horse. On the other side, we have the brand-new ToChange company, introducing new

and revolutionary cars.

Before starting the debate, several rules were put in place. The battle is done during the year 1883, thus no reference to progresses or discoveries made after that year should be use to defend or attack a team. The newly discovered horses are faster, stronger, get tired and sick less easily and, thus, live longer compared to normal horses. However they need to rest longer and be taken care of quite often in comparison to cars, which are lower maintenance. The car is a new technology which has the possibility to be improved largely. One car is able to transport the same load as two horses. Both means of transport have the same speed. Among the preparation rules and storyline of the battle, only one point was modified: Mr Smith. The original proposition was that the investor was Henry Ford, however, the personality of Mr Ford and his future are too well-known so the teams were able to detach from it, thus an anonymous investor was a preferable choice for a better equilibrium among the companies.

3 View 1: ToChange, in favour of cars

3.1 How the situation is now

The main questions to be answered in this section, immediately after the scenario has been presented, are the following: "Why should someone (Mr. Smith) invest his money in an automobile company, manufacturing its innovative product? Why should someone (Mr. Smith) risk his own capital in something new, rather than making a more secure investment in a horse company?".

Up to now people have always used horses as means of transport: almost everyone knew how they "worked", and what their qualities and their defects were. So, the choice between cars and horses would seem obvious, but not always what is more obvious is the right one. In fact, if we think about the current situation, we soon realize that we dispose of all we need in order to move forward, to change something that should be changed: the private means of transport.

After the industrial revolution[19] there had been all the favorable conditions to introduce a new system of transport, something improvable over the time, such as the automobile. First of all, the large diffusion of steel, coal, and electricity encouraged the industrial development. In addition, thanks to the scientific and technological progress, new production methods and new work organization methods have been introduced, such as the assembly line, the series production, etc.

All these things made the industry the major force in the economy, so the secondary sector, gradually, acquired more and more importance. The large-scale modern society was born in that period[7]. So, people started moving from the countryside to the towns, which became the beating hearth of the economy thanks to the increase in population. And it was in the cities that the need for a change in the transport system was perceived. Basically, thanks to the steam train and steam-powered buses, introduced in the 19th century,

the public means of transport were born: distances were no longer a problem, traveling was more comfortable, safety and quick. After the industrialization, the United Kingdom reached the point where people living in the cities had to move to another mean of transport.

In a country where railway system and steam-powered buses already changed the public transport system, why shouldn't we extend all the discoveries also in the private one? Thanks to a Scottish engineer[10], who has developed a new road process construction, cities were provided with smoother, more durable and less muddy roads. Roads were an index of poor hygiene conditions: they were full of horse manure and dead horses were left around the cities. For instance, according to a survey conducted by the government[13], 95% of all diseases-carrying flies breed in horse dung. In addition, this problem extended to the majority of the most populated United Kingdom cities, but also to the smaller ones, for instance in cities like Yorkshire and N.Y, a lot of horses crossed the streets every day, leaving tons of manure a day.

Figure 1: In Rochester (New York) tons of manure upon the streets, due to the big amount of horses used to move around the city.[8]

So, ideologically, the perfect mean of transport would be something which does not leave dirtiness above the streets, which does not depend on horses or other animals and, mostly, which can be controlled by human beings. What we are going to propose is the solution to all these features: the automobile.

3.2 What an automobile is

Automobiles comes from a combination of greek and latin words "autòs" and "mobilis" which respectively mean "by itself" and "moves", so the result is "something which moves autonomously"[1].

The main innovation we have introduced with our product is the replacement of the horse driving force with the engine force. At first glance, right now, auto-

mobiles are similar to baggies, except for the main difference that they are not pulled by animals. The automobile, which has been presented by our company, is a 3-wheel cart driven by four-stroke gasoline engine with a comfortable seat which can be controlled by human beings. It is composed of a steering wheel, which allows drivers to easily turn left and right a carburetor, a water-cooling system, an electric ignition system, and a tubular frame[6].

Up to now, a private vehicle with all these technological features had never been created. Just for right now, the maximum speed that it can achieve is almost the same of a horse.

Figure 2: Prototype of automobile manufactured by our company.[3]

3.3 Opportunities of improvements

Certainly, as far as now, our company is presenting just a prototype. However, our thought is that, thanks to continuous advanced scientific and technological discoveries, we could improve our product over the time. For instance, we would like to achieve more stability and safety, by adding a fourth wheel and developing a new material which is better than wood. Additionally, we would also like to test different kinds of materials in order to make automobiles even more safety in case of crashes, because we are aware that they may happen, and we want to be prepared to these events, making people feel safer rather than be sat on a horse.

As mentioned before, this prototype is provided with a gasoline engine, but, in the future, we would like to exploit alternative solutions in order to develop more efficient engines, maybe by exploiting bio-fuels, for instance something just like horse manure or electricity, given by renewable energy. For the moment, these are just hypothesis and ideas, which could reveal not feasible or not very productive, because is a very difficult matter to understand in which direction the innovation and progress will go. But, actually, our prototype is perfectly working and we are sure that with funds, which would allow us to go on with our researches and projects, we would be able to develop a product which will

revolutionize each single person life.

What we want to point out is that our product could be widely improved, unlike horses which could not, because they are living beings and they could not have the ability to adapt innovation and technical progress. A horse will always be a living being and it could not be "modified": for instance, it would not be able to increase its speed or its autonomy. Surely, thanks to natural selections, such as crossbreeding or similar phenomena, new and better breeds could be discovered, but we are always talking about living beings which cannot be compared to something mechanic, something like our car, in terms of scope for further improvements.

If we think about trains, which are widely used to travel and they have reached safety and stability in the society, what will be able to do with our automobile? We want to underline this aspect precisely, because scopes for further improvements are enough to convince Mr. Smith to choose the better option.

According to this article [16], on one hand there is **innovation** which is, in the strict sense of the word, the first successful commercial transaction of the product or, more generally, the first positive sanction of the user. On the other hand, **inventions** are the ideas, projects, plans, prototypes and also pilot factories, that is all that occurs prior to the first meeting with the user and the judgment which he will pass. So, we need to transform our inventions into innovations and, in order to do that, we need that people agree with our idea and our way to change the private system of transport. Moreover, taking up the expression of C. Freeman, who has made himself as spokesperson for economists in the paper, innovation resembles a coupling process but it is of a particular nature since the two elements brought together – the market and technology-evolve in an unpredictable way.

So now, to be honest, we don't really see the connection between innovation and horses: we are aware that horses have their own market (and probably they will have forever), but they have nothing to do with technology and, especially, with inventions, because it's impossible that someone could develop a new horse prototype.

3.4 Why driving a car rather than riding a horse?

First of all, a point which needs to be highlighted is that automobiles, unlikely horses, do not need to rest. Engine needs fuel to work, but it will never be "tired", it will not have need to stop for hours in order to rest. The only thing that needs to be done is to refill the fuel tank, when it is going to be empty. Our purpose, for the moment, is to provide all grocery shops[5] with fuel and, in a second moment, to extend this concept, maybe starting to build special constructions in order to find petrol station directly around the cities (but these are only "assumptions").

Additionally, automobiles are driven by human beings, people who have the strict control of the vehicle. Well, someone could say that cars could break, but we prefer not to talk about this scenario, not because we want to avoid this

topic, but because we would like to improve continuously our product up to reach something with a high-value, settling all possible defects that we would encounter during the production.

Further, horses could go crazy or feel sick, so it is better not to discuss about this, but to concentrate on innovation and it is what we are trying to do. Automobiles are provided with seats, which make journeys bearable and pleasant, respect to saddles. Instead, in order to have pleasant journeys with horses you need at least two ones with a carriage, that is, certainly, more uncomfortable and less convenient. About convenience, the price of two horses and one carriage is more expensive than a car, so, in economical terms, this would be a great advantage.

We are aware that change people mind is not easy and it would be a long process, but positive aspects and preliminary remarks are good enough to try to change. If we just look to possible future improvements, automobiles would seem the vehicle of the future.

3.5 Correlated improvements

About innovation introduced by our product, we have discussed enough and it would be better to concentrate on other improvements, because the change we are going to introduce will be something not correlated only to the automotive industry, but it will affect different socio-economical aspects, for example there will be an increasing number of workers in multiple sectors.

Just think about streets: more and more roads will have to be built and to be continuously maintained. At the moment, just cities are provided, instead peripheral areas or countryside not yet. This will result in an increment of the labour supply, not only in factories but, more generally, also in all the sectors correlated, such as town planning and mechanic.

We also guess that teenagers will be even more fascinated by this sector and in this way they would contribute to reduce the unemployment rate and ignorance through the society.

3.6 In conclusion

Mr. Smith has to decide which is the best industry in which invest his own capital. The choice is between something well known, with a strong market and strong basis, and something new, something that has never been seen before, something that, most likely, could revolutionize the way in which people live.

The choice is far from easy, because unknown factors are a lot, but this is an age characterized by scientific and technological progress and by this point of view, automobiles will offer more and more.

So, agreeing on a future vision for strengthening of the society, the change of the transport system would be something thanks to which Mr. Smith will be remembered in the history, like a benefactor of automobile.

4 View 2: Ackerman's Stables, in favour of horses

Our company is specialized in horses breeding, it's called Ackerman's Stables managed by William Ackerman. The company was founded by his father more than sixty years ago. William has worked with his father since he was sixteen. He started with humble jobs, like stable boy, to reach executive positions. So, in this training time he gained much experience about horses breeding and business management. Some years ago, he became the new manager of the company and today he's bringing an innovative product on the market.

This story begins during a long travel through South Asia where there was supposed to be a new breed horse. This piece of information was given to Mr. Ackerman by his Indian friend who heard it from some merchant convoys. After months of researches finally he found the new breed and he named it "Equus Magnus". It's faster, stronger and more adaptive than every breed in the world.

So Mr. Ackerman brought the entire pack of horses to England at Ackerman's Stables with the goal to obtain exclusive possession of the personal transport in UK.

4.1 Why should Mr. Smith invest in our business?

We want to bring to the attention of Mr. Smith the advantages of our horses concerning their features and their applications.

First, we want to explore the technical features of our breed. It's stronger and faster than any other. The trot speed can reach eighty kilometres per hour compared to the average horse that has maximum speed of fifty kilometres per hour. Its height is around 160 cm, so it's easy to ride even for people not too tall. Its weight is 1000 Kg on average, so it has enough power to pull every vehicle. It gets hardly tired and it's docile, friendly and adaptive. This horse can go everywhere you want. It will not be stopped by rivers, steep paths or mountains, crumbled roads and with its cleverness it'll choose the safest path to follow. In addition, a horse is multi-purpose: you can use it to take a trip, to work in fields or to pull a stylish carriage. Everyone can ride it no schooling is required for the user who'll need just some practice. Horses and humans have worked together for many years and this cooperation will continue for many years to come. We think that people lives will be improve by our horses. It's the 1883 and the horse is a consolidate way of traveling through the country, to work in the countryside and to move around the towns and villages. It's used by at least ninety percent of the population from all social classes.

In the lower classes:

- The farmers use it to pull plough, to pull carts loaded with food, seeds or woods.
- The labourers need it to move large weights and it's needed in factories in general.

In higher classes:

- The aristocrats and the royalties use it to symbolize their place in the society, in sports like polo, racing and in war.

- Bourgeoises use it to move around town to pull carriages.

The lower classes need stronger horses that can pull heavier loads and that don't get tired and sick so easily. On the other hand, higher classes look for having better appearance and more intelligent horses. They need stronger animals as well.

Our horses satisfy the various needs and they could already monopolize the market as there aren't valid competitors.

The only disadvantage is the consistent cost of breeding such powerful animals as they take three to four years to grow up and be ready to meet every need of the market. However, we can deal with that as the waste produced during their younger years is considered a high-quality fertilizer.

We're going to base the price on the social classes: the more beautiful and intelligent is the animal, the higher the cost will be. On the contrary the uglier but still strong exemplars will be affordable to the poorest farmers.

After the first few sales of the adult exemplars we would be completed repaid of the investment. So, we can affirm that the percentage of our success is very high as we considered all the variables of the environment and we confident to obtain exclusive possession for the personal transport.

4.2 Why we are against the cars

After have discussed the thesis of the horses, it is necessary to discuss the antithesis of the cars, which means underline the negative aspects of the cars. This is necessary to show the economic risk in a such investment. In the previous section it has been said that the horses investment is a case of **uncertainty** because it is possible to compute the probabilities while the cars investment is a case of **ambiguity**. This because is not possible to compute the probabilities since it is an invention and nothing is yet known about the car. In addition to not knowing the probability of success, it is also plausible to think that it is low, therefore a risky investment.

Now let's try to explain why it is such a risky investment, explaining the negative aspects of the cars.

First of all, nobody knows anything about the cars: how to use it, costs, maintenance. Everyone and also the investor could think, rightly, that the cars could have a high cost to buy and to maintain. Then why someone should invest in a factory that produces something that will be difficult to sell? Moreover, there are only prototypes of the car without a stable product. The problem is especially on the engine, which is very unreliable.

But this is not the only problem: the cars need suitable roads, because at the moment there are the so called Macadam roads [12]. Macadam is a type of road construction, composed by crushed stone or small angular stones, compacted thoroughly. They are adequate for horses and carriages or coaches, but they are very dusty and subject to erosion with heavy rain, for this reason not suitable

for cars. In order to improve it, people could think to have to pay more taxis to the country. An other time, why should the people want the cars? The roads are not the only thing missing, just think about the petrol station and refueling network or specialized mechanics.

Another important problem: it is necessary to establish different rules. Who can drive it? It is necessary to define the age, if courses are needed to be enabled as driver. Furthermore, the way in which the cars can be used, i.e. all the road rules.

Moreover, the cars could scare the people and it is easier to cause a car accident than a horse accident. Especially in 1883, a car accident can hurt people very seriously, considering the few protections provided by the cars. We can report the first car accident, caused by a steam-powered automobile in 1869 [15]. A person was thrown out of the car because of a tight curve, dying under the wheel of the car. This is just the first example, but many others followed as for the train accident. Here [11] is reported a list of rail accidents before 1880. This list of train accidents is an example of the disasters that can cause technological means, such as the car.

Furthermore, many would complain about the smell from the exhaust gas [17], which together with the fumes of the industries would be unpleasant. As explained by Charles Dickens, in his description of Coketown in 1854, it is already known that the fume from factories darken the sky and the cities [18]. The cars would just aggravate the situation.

And with all the positive consequences of the industrialization we should also think about the negative aspect, for example the child exploitation[14] and the numerous accidents in the factories[4].

4.3 Final consideration

As explained previously, the investment on horses is a secure investment, which would lead to the monopoly of horses, being our stable equipped with the best horses. Why would anyone choose to invest their money in a risky investment? It does not make sense. This is just what every person would think, especially in those times, since it is well known that people are not risk taker.

Another critical point to reflect on is the difficulty that the machine could have to enter in a market dominated by horses.

5 Reconciliation

5.1 Results of the battle

At the end of the discussion between the ToChange company that supported the cars and Ackerman's Stables that supported the horses, Mr. Smith decided to invest his money in the horse company hoping to increase his capital. The reasons for his choice are several. The main difference between the two parties lies in the great diversity in the security of the investments. In the case of

horses, the investment is safer because the horses are ready for sale, they are known by the population that considers them a fast and safe way to travel. The cars company instead proposed the development of a prototype that gave less security to the investor due to the probability of failures.

Going in details, on one hand the Ackerman's Stables horses are a good investment because they are better than normal horses in every aspect, they are ready for the market and they have the enormous advantage of being already known. Furthermore, horses are less expensive than cars and therefore much more accessible. During the battle, indeed, the Ackerman's Stables company explained their very special horses can be used for different tasks and the economy relies on horses to do a lot of works. Furthermore, they have proposed to widen their market through the production of carriages and other things related to the use of horses.

On the other hand, by investing in the ToChange company the investor would gave the possibility to the company to start a research path for the development of a prototype. This first step could have been subject to failures. Moreover, if everything went well, surely there would be problems for the introduction on the market. The car was not known by the population, it was less versatile than horses, more expensive and the road network was not at an acceptable level. Moreover, during the discussion they said that they would raise the market for many suppliers, for example, tires, ignitions, speedometers, batteries, and carburetors and repair shops, parking, gasoline filling stations. Then cars company thought that their business model is preferable to invest money and to be profitable.

At the end, Mr. Smith decided to invest in Ackerman's Stables company as their business model was the safest.

5.2 Future of horses

In the years following his investment, Mr. Smith and the Ackerman's Stables studied, bred and raised numerous of those new horses to sell them in the whole Great Britain. To reduce the costs of his stables, Mr. Ackerman decided to mainly breed the horses he had discovered and breeding less the others. Since the cost of these new horses were high due to them being purebred, Mr. Ackerman, after discussing with Mr. Smith, tried to breed the Equus Magnus with other breed of horses. The results were horses slightly better than the old breeds, but still inferior to the Equi Magni. It was decided that such horses would still be interesting to sell at a lower price than the purebreed.

Once the market of Great Britain was conquered, the following target was Europe and the colonies. Political tension were important, thus it was more difficult to sell the horses in most European countries. With the help of Mr. Smith's friends in different countries, however, horses started to sell in Italy and in Germany. Other countries started to get interested after hearing about those fantastic horses and Ackerman's Stables was able to sell across Europe. Numerous customers were also found in the colonies, mostly for the mixed breeds.

Those horses being so popular and benefits increasing, Mr Smith decided to

invest in horse equipment and carriages, so they would be more comfortable and easier to use for the customers. However he definitely noticed that the horse's manure were produced in high amount, and, as ToChange had explained it, the situation became unsanitary. Even if it could be used for the field, most owner of horses used the manure of their own horses and did not need the one from the Ackerman's Stables. When visiting the World Exposition from Paris in 1889, Mr Smith discovered that ToChange had developed cars with biofuel. He found the idea interesting and that it could be a solution to the company problem. He thus decided to contact ToChange and its investors, to suggest them the idea of using the manure from Ackerman's Stables to power their cars. Ignoring the past, an agreement was found between the two companies: Ackerman's Stables would sell all of their manure to ToChange to create biofuel for their cars and be their primary resource.

The cars actually became more popular over the years, without concurrencing to much the horse market at first. The horses were used to work in the field, to keep the livestock or to travel in difficult environment, which the cars could hardly do. While the cars gained in popularity, because of the interest and curiosity in science growing from the society and the overall investment put into the new industries, cars still tended to have technical issues. Thus, horses were also often used to help people whose car had broken down or was stuck, by pulling them. The Magni Equi were also used for sports, games and circus, being faster than normal horses and less easily tired, they could be used to entertain crowd for hours. Armies also used them in majority for their incredible capacities, especially at the start of the first world war, but the use of big engines inspired by cars became slowly prominent on the war fields.

Around 50 years after the presentation in front of Mr. Smith, Magni Equi, and horses in general, started to be less and less popular. Customers were more interested in cars which were an incredible novelty. The horses were mainly used by the poorest people as a transport mean, while richer people used them only as entertainment.

5.3 Future of cars

The outcome of the very first car prototype's presentation did not discourage the engineers of ToChange: they worked hard and eventually they found other investors, even if with less economic power. The development of new features went on at a high rate, focusing on both security improvements and better performances.

The first big improvement came out after noticing that horse falls were very dangerous: many people died from those falls even before the discovery of Equus Magnus, which are even faster, causing worse falls. The engineers thought that not having a solid anchor keeping the body in a stable position was the cause. This led to the introduction of seat belts, stripes of leather which kept the passenger safely anchored to the vehicle. Also those new prototypes had a complete roof, to keep drivers and passengers dry even in rainy days.

Efficient roadways became much needed because of the industrial revolution's requirement of fast transports: roads became smoother, allowing carriages to travel at a higher speed. ToChange took advantage of this situation which was improving the safety of car's trips and they exploited advertising of their product along busy streets and driving through cities.

The growth of industries brought even more benefits to ToChange. The chain production spread among factories in the last years of the century so car's production became faster and cheaper and could be spread in more countries easily, unlike horses transportation. Also thanks to the technological progress the gears and all the mechanical parts started to be more and more precisely crafted: this caused a big improvement in reliability.

Another exploit ToChange engineers found was using the waste produced by horses (even the ones from Ackerman's Stables) as a source for the biofuel: biodiesel was discovered the very same year of the first presentation (1883) by Rudolf Diesel [2], and ToChange hired him to develop a working engine for cars, which was presented at the World Expo in Paris in 1889.

Those facts led to improvement a wide range of sectors. Builders were required for the maintenance of roadways and to improve the transportation network; gasoline stations were needed to fill fuel tanks; new factories rose to answer the demand from the market and car workshops were built to answer the need of repairs (creating a new job for which workers needed to be instructed). Miners had an improvement in their working condition, which caused them to be even more productive. Colonists found big petroleum reserves in Africa and this led to the birth of the first big petroleum companies. The introduction of cars brought a brand new market, which was soon linked to previous sectors, but also a general growth of the world economy.

Later on people started also to be more involved in education: this big opportunity was exploited by ToChange setting up schools for people to get patents and have the chance to learn to drive properly reducing all the risks and increasing the spreading of cars. Also books and journal articles were written on this new technology, in the first years considering it awkward, but appreciating it more and more with its spreading.

The process was slow at first, but finally with gradual improvements and with the chain production lowering the prices the new mean of transport became the main one: around 1930 there were more cars than horses. This was not the arriving point for ToChange's engineers, but a starting one: the growth of the company allowed more and more development of new technologies (for example the extension of cars to industrial transportation gave birth to trucks), a process which is going on even in recent times.

6 Conclusions

The company named Ackerman's Stables, introduced the improved horse breed, claimed that the horses sold by their company would fall sick less often and provide same autonomy (same speed) as cars. However, the time consumed

(extra time needed for horse to rest in between) and discomfort in horse carts was often considered as one of the main drawbacks. In addition, the manual effort involved in driving a horse cart and feeding the horse on regular intervals was frustrating at times.

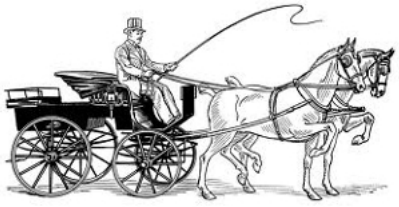
In the year 1883, with the industrial revolution came the invention of motor vehicles like cars. Seeing the positive sides of a car, it was innovated to make it possible to travel longer distances in less time and make the travel more comfortable as compared to travelling in a horse cart.

There were gasoline cars on road by 1896 and very comfortably people drifted from horse carts to horseless cars. There were industries coming up for gasoline mining, road construction, etc. Within few decades, horses were replaced by cars.

Crude oil and it's by products (one of it is gasoline) were seen as one of major inventions in the 19th century. People were fascinated and spellbound to make use of this new invention to ease their life and travel. But, what was overlooked was the impact this innovation was going to bring in the future.

Gasoline will have a significant impact on the environment, both in local effects like smog and in global effects like climate change. More importantly, gasoline being non-renewable in nature, will build a huge gap between demand and supply of it many decades later.

Back then in the year 1883, no one would have emphasized or even knew what shared economy is. With the learning's from the battle and the course, we understand how shared economy could bring incredible revolution on the product, commodity, businesses and society in general.



In the 19th century, when horses were the primary mode of transport, there came along the stacks of horse dung everywhere. Apart from using this horse dung in the farms as manure, it could have been used to make biofuel as well. People were aware of biofuel, its generation, and its benefits and was used regularly in daily life. However, its use for supplying energy to engines to drive cars was not something which was thought of. This section was yet unexplored during the battle, keeping in mind the year 1883. Therefore, this leaves the space for future discussion on the shared economy in this area.

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