



***Enlightened entrepreneurship: the success of
Elon Musk***

Department of Economics & Business

Chair of Entrepreneurship, Technology and Innovation

Supervisor: *Professor Andrea Prencipe*

Candidate: *Mathias Mair*

ID 180631

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Introduction

The purpose of this thesis is to analyse in depth the strategies, methods and actions that allowed Elon Musk to place himself as a top tier entrepreneur. Starting from the true meaning of entrepreneurship, I moved into taking to account the points in common between Musk and what a nowadays entrepreneur needs to be capable of. I followed by underlining the focal achievements reached in his career and what he might have used to get to reach his goals, mostly his personality traits. At last I demonstrated how he affected the culture of this days and how he rewrote the definition of pathfinder in the entrepreneurial world.

1 What is entrepreneurship?

Entrepreneurship is defined as the process of starting and running a business in a strategic way in order to make a profit from a product or service. It requires the ability to identify opportunities to exploit a market, usually done by a team, sometimes only by one, entrepreneur.

An entrepreneur is a person that creates, manages and develops an economic based enterprise taking risks, usually on himself with his own private assets, but also with the capacity of identifying and evaluate opportunities. Commonly an entrepreneur is seen as a visionary, an innovator and a business leader and they typically are in charge of a commercial undertaking, controlling human, financial and material resources required to exploit a business opportunity. Economist Joseph Schumpeter (1883–1950) stated that the role of the entrepreneur in the economy is "creative destruction"—launching innovations that simultaneously destroy old industries while ushering in new industries and approaches. For Schumpeter, the changes and "dynamic disequilibrium brought on by the innovating entrepreneur ... [are] the norm of a healthy economy."

Entrepreneurs usually operate in a system where government programs and services that promote, support an mentor start-ups are included. Typically a good environment can provide facilities and resources, sometimes even training programs. The currently

most important clusters of leading firms, mostly high-tech, are found in the Silicon Valley, around New York and Boston and also in Singapore and Hong Kong. Since they attract a lot of people each and every year, they just grow exponentially, putting themselves at the top of the chain, also fuelled by top research universities.

1.1 History of terminology and meaning

The term entrepreneur was first used in 1723, today the term entrepreneur implies qualities of leadership, initiative, and innovation in new venture design.

Entrepreneur was defined as an individual who organizes and operates a business as French economist Jean Baptiste Say specified. However economist Richard Cantillon defined it first in his *Essai sur la Nature du Commerce en general* (1755), a book considered by William Stanley Jevons as the cradle of political economy, but with a slight different meaning. Say thought that the figure of the entrepreneur was more as a planner while Cantillon more as a risk taker, as defined by him with those words “someone making decisions about obtaining and using the resources while consequently admitting the risk of enterprise”.

Economist Robert Reich has called team-building, leadership, and management ability essential qualities for the entrepreneur. Historically the study of entrepreneurship reaches back to the work in the late 17th and early 18th centuries of Richard Cantillon and Adam Smith, fundamental to classical economics.

Cantillon was the first to attempt considering entrepreneurship in depth as a concept. He thought that, even if there is a clear distinction between the function of the owner and the function of the entrepreneur, he considers the entrepreneur as a risk taker with the final objective of maximizing the financial return by allocating the resources in such a way to exploit opportunities.

Another way to take in consideration the entrepreneur was introduced by Alfred Marshall, that believed in a multitasking capitalistic entrepreneur. He observed that in

the equilibrium of a completely competitive market, there would not be a place for entrepreneurs as economic activity creators.

In the 20th century, entrepreneurship was studied by Joseph Schumpeter in the 1930s and other Austrian economists such as Carl Menger, Ludwig von Mises and Friedrich von Hayek. The term "entrepreneurship" was coined around the 1920s, while the loan from French of the word *entrepreneur* dates to the 1850s.

According to Schumpeter, an entrepreneur is willing and able to convert a new idea or invention into a successful innovation. Entrepreneurship employs what Schumpeter called "the gale of creative destruction" to replace in whole or in part inferior offerings across markets and industries, simultaneously creating new products and new business models. Thus, creative destruction is largely responsible for long-term economic growth; this idea is usually an interpretation of the endogenous growth theory and this is still a point debated in academic economics.

For Schumpeter, the new industries and the new combination of inputs existing (for example he takes in consideration the advent of the "car" since it was a combination of a horseless carriage and a steam engine) were all results of entrepreneurship. In the "car" example, the innovation did not require any new technology development, instead it was just a simple idea behind the spark that gave birth to the modern auto industry. Obviously this switch between techs was not immediate, but with slow improvements and cost reduction methods (see Ford's assembly chain idea) that took time.

In his theory, Schumpeter considered the capitalist the one bearing all the risk, not the entrepreneur, but they were the people able to shift the production possibility curve to higher levels using their skilful mind set to seek the right innovation

Even if Schumpeter highly contributed to consider the entrepreneur in his theoretical framework, microeconomics of that time thought that resources were able to balance and find each other with a traditional idea of price system and the entrepreneur would just be treated as a small part in the greater scheme of self-balancing resources. In this idea the entrepreneur was just an agent of X efficiency, that is the ability of a firm

to get maximum output from their inputs and its improvement leads to a source of gain from trade (Leibenstein 1966).

In the 2000s, the term entrepreneurship collected a much broader concept of social attitude, in which environment, humanitarian and political goals go alongside with business. It also has been extended to specify a new kind of mind set, a mind able to lead, plan, organize and improve resulting in entrepreneurial initiatives.

According to the founder of Global Entrepreneurship Monitor, Paul Reynolds, in the recent years it is becoming a common experience for developed countries citizens to become self-employed, becoming a major driver of economic growth. Those entrepreneurial activities, that can differ substantially depending on the type of business in which they operate, are all leading to the same objective, growth.

1.2 Behavioural patterns in entrepreneurs

The behavioural patterns that define an entrepreneur nowadays are many and common for most theorists' definitions. In the last decade many studies have tried to assess the psychology and traits of entrepreneurs and since entrepreneurship is such a wide concept, it has to be studied from different perspectives. The figure of the entrepreneur is widely observed as an innovator with strong leadership, management ability and a great team building capacity, usually enriched with the talent of a good use of new tech; but one aspect is the one of being a risk taker. An entrepreneur, if asked to put his career on the line for the cause of an idea, is most likely to accept those conditions of financial insecurity because his beliefs are stronger than that. A study of 2014 held at the ETH Zurich showed that entrepreneurs, compared to typical managers, have a higher decision making efficiency and take usually more risks than their counterpart. Also a main trait of entrepreneurs is that they are opportunistic, in the sense that they can notice what others overlook without paying attention to small details and are able to profit from their recognition capacity.

The entrepreneur as an innovator creates a "wave of creative destruction" (as Schumpeter said) responsible for "the doing of new things or the doing of things that are already being done in a new way" by starting a cycle of innovation-hype-imitation-

stability-innovation that repeats itself for each new product/service. Their ability to innovate, introducing new tech, new products or services, increase efficiency in workers productivity, have strong negotiating skills and consensus-forming ability are the core traits for a successful entrepreneur. In contrast to the say that everyone can become an entrepreneur, many academics think that the predisposition could be found directly in the DNA, becoming a matter of genes and an innate ability.

Of course, also the environment and the social composition in which an individual is formed influences significantly its personality, so that when faced with a given situation it can trigger its strengths and weaknesses. Personality is a system that is related to the environment and it seeks explanation to the complex transaction conducted by both, traits and attitudes, a deeply investigated subject by psychologists. According to Jesper Sorensen, peers are one of the greatest influence variable, they stimulate entrepreneurialism by showing that success is achievable, inspiring the thought "If he can do it, why can't I?". Past experiences drive an entrepreneur to what he has become now, so to say his education, if he has been unemployed, if he has faced many problems and how he overcame those problems.

1.3 Communication fundamentals in entrepreneurs

Nowadays successful entrepreneurs need to have a fluent and effective communication skill set within their firm and most important externally, with investors, customers and other firms. They need to communicate a vision to their followers in a proper way for them to really believe in it, to make them feel as the project is just there ready to get taken, making it achievable and giving a sense of purpose and encouraging commitment. Since this is critical requirement for a favourable outcome in the business world, it is needed a charismatic leader that can inspire the masses. Jayson Demers, founder and CEO of AudienceBloom states "You can be the best at what you do, but if you're not communicating effectively with clients, staff and the market, then you're missing opportunities."

And today many entrepreneurs have to communicate face-to-face and many are concerned for the upcoming generation since most of the correspondence is done through emails and text messages. Richard Branson, head of Virgin, says that when it comes to business “the ability to conduct a telephonic and face-to-face conversation intelligently and personably remains an essential asset and only comes with practice. Being capable of confidently holding a conversation is as important as making a confident, strong first impression on someone you want to do business with.”

Nonverbal elements in speech such as the tone of voice, the look in the sender's eyes, body language, hand gestures, and state of emotions are also important communication tools. From a study of the UCLA, 55% of the meaning in face-to-face interactions are conveyed non-verbally, so body language in general is accountable for more than half of an articulation. Body awareness is considered one of the key points in public speaking courses, taking in consideration posture, expressions and gestures and it's not a surprise that those lessons are having a booming increase in demand.

Developing those soft skills are a need for success and for the career an entrepreneur but necessitate time to develop in a proper way.

The last but not least part of communication is listening. Being able to understand the needs, the concerns and the critiques from the counterpart can be a cardinal requisite to have a high customer satisfaction.

1.4 Financing

Entrepreneurs are able to gather resources necessary for their projects if they raise capital in an effective way and this is matter of entrepreneurial financing. After assessing how much is needed for their idea to be ready to go, to grow and to generate a positive cash flow, how to raise this capital is the fundamental question.

The riskiness of starting a business is very high, actually only one out of seven start-ups can be considered successful, so having a sufficient monetary base for eventual expenditures due to problems along the path to the foundation of the business is key.

There are many methods to raise this capital: bootstrapping, friends and family, banks, business angels, venture capitalists, hedge funds and crowdfunding.

Bootstrapping happens when entrepreneurs decide to incur in personal credit debt so that they don't have to share their equity with investors. While bootstrapping involves increased risk for entrepreneurs, the absence of any other stakeholder gives the entrepreneur more freedom to develop the company. Many successful companies, for example Dell Computer and Facebook, started by bootstrapping.

Friends and family usually are the first to whom the entrepreneur asks for help, but it is just adequate enough for a small business, and also it is not recommended because money is considered the number one cause for relationships break-ups.

Banks as above are not really adequate for bigger businesses, but they actually can be a big part in the investing strategy even if usually require a position inside the company for the decision making.

Business angels are affluent individuals who provide capital for a business start-up, usually in exchange for convertible debt or ownership equity. A small but increasing number of angel investors organize themselves into angel groups or angel networks to share research and pool their investment capital, as well as to provide advice to their portfolio companies.

Venture capitalists make a form of financing that is provided by firms or funds to small, early-stage, emerging firms that are deemed to have high growth potential, or which have demonstrated high growth. Venture capital firms or funds invest in these early-stage companies in exchange for equity.

Hedge funds are investments fund that pools capital from a limited number of accredited individuals or institutional investors and invests in a variety of assets, often with complex portfolio-construction and risk-management techniques.

Crowdfunding is a very recent way of raising capital and is an alternative way for funding start-ups by gathering a large number of individual investors.

2 History of Musk's rise, his life and career

He is worth over 12 billion dollars, has created game changing businesses like Paypal, Tesla Motors and Space X and has been defined as the nowadays real life Iron Man, Elon Reeve Musk, the South African business magnate, engineer, inventor and visionary.

2.1 Early life

Elon was born in Pretoria (RSA) in 1971 from Errol Musk, a South African electromechanical engineer, and from Maye Haldeman, a Canadian model and now dietician. Both his parents are college laureate, Errol in engineering and Maye in dietetics, but they actually met in High School. His paternal grandmother was British, and he also has Pennsylvania Dutch ancestry. His grand-parents, Joshua and Wyn Haldeman, were adventurous and flew the family around the world in a prop plane in 1952. After his parents divorced in 1980, Elon lived mostly with his father in locations in South Africa.

Older brother of his two siblings, Kimbal (1972), and Tosca (1974), he began at the age of 10 to study vividly computer programming and when he was only 12 years old, he was able to sell a video game he created, Blastar, to the magazine "PC and Office Technology" for about 500\$. Already well ahead for his age, Elon was often bullied throughout his childhood by his school companions, in fact he was once recovered in the hospital due to severe beatings. Initially he attended private schools, but then he graduated from the Pretoria Boys High School and immediately moved to Canada in 1989 after obtaining citizenship due to his mother Maye, Canadian born, that followed him with the rest of his children an year later. That year alone in Canada, even if backed-up by his wealthy family, gave him a strong independency, that build up his self-esteem. He was then accepted into Queen's University in Ontario for his undergraduate studies, but after two years he transferred to the University of Pennsylvania and received a Bachelor of Science degree in physics and a Bachelor of

Science in economics. While there, after deciding to stay one more year to continue studying, Elon and Adeo Ressi, a fellow student, rented a fraternity house, using it as an unofficial nightclub. Later in 1995, Musk moved to California to study at Stanford University for his PhD in applied physics and material science, but left after only two days to pursue his entrepreneurial aspiration. He wasn't even 25 yet.

2.2 Career beginnings: Zip2 and PayPal

Elon and his brother Kimbal decided to rent an office which they used as both house and working space to start their own software company in 1995. Zip2, the name of the company, was founded thanks to the money given by their father Errol and began to develop quickly in those years of computer rise.

Zip2 primarily provided and licensed online city guide software to newspapers such as The New York Times and The Chicago Tribune. Elon Musk was appointed the Chief Technology Officer. Zip2 trademarked "We Power the Press" as its official slogan and continued to grow. By 1998, the company had partnered with about 160 newspapers to develop guides to cities, either locally or at full scale. In 1999 it was acquired by Compaq for 307\$ million, Musk received 7% of this sale, earning him 22\$ million.

In the spring of 1999, Elon decided to reinvest 10\$ million by co-funding an online financial services and email payment company named X.com. In 2000, they merged with Confinity, a company that provided similar services, and decided to change the focus of the company to only the money transfer service, calling themselves PayPal.

It expanded rapidly throughout the year driven mainly by viral marketing campaigns until company executives decided to take PayPal public in 2002. Paypal's IPO listed under the ticker PYPL at \$13 per share and ended up generating over \$61 million. Later that year, eBay acquired it for 1.5\$ billion and since Musk was the company's greatest shareholder, he received 165\$ million.

2.3 Space X: the multiplanetary dream

After his cash-out from PayPal, Elon Musk was already thinking on what he was going to do next. He had various ideas in mind, many problems that he wanted to solve not for himself, but rather for the whole humankind. He wanted to do something different and not directly related to the internet, his main field, and decide to begin to explore new projects. As he said in a recent interview for Khan Academy, he was in America, the land of explorers and this gave him the spark to reach out of his comfort zone.

He had three main ideas in mind: first he wanted to make people care more for the environment, make them aware and give them the instruments to pollute less; second point is related to the environment but in a different way. Musk wanted to improve the transportation systems, make them more efficient, not dependent from fossil fuel, and so pointing to electric energy. Third point, he firmly believed that humans, proceeding at this tech improvement rate, would necessarily need to become a multiplanetary species, as an important step in expanding, if not preserving, the consciousness of human life and to do so he wanted to reignite space exploration.

So in 2001, Musk conceptualized “Mars Oasis”, a project to land an experimental greenhouse on the surface of Mars in an attempt to regain public interest in space exploration and to increase the budget of NASA. He decided then to travel to Russia with Adeo Ressi, his college partner, and an aerospace expert to begin a series of meetings to buy rocket that would bring the payload to Mars. Musk wasn’t really considered by the companies for his lack of rocket knowledge and so the first meeting ended without any progress. Musk felt that it was his right to be part of this idea, so he read and studied various books on the subject.

In 2002 the group met again with Kosmotras, and were offered one rocket for 8\$ million, however, this was seen by Musk as too expensive; Musk consequently stormed out of the meeting. On the flight back from Moscow, Musk realized that he could start a company that could build the affordable rockets he needed.

Using approximately 100\$ million from his PayPal cash-out, Musk founded Space Exploration Technologies or simply SpaceX in June 2002. The newly CEO and CTO

calculated that the raw materials for building a rocket actually were only 3 percent of the sales price of a rocket at the time. By applying vertical integration and the modular approach from software engineering, SpaceX could cut launch price by a factor of ten and still enjoy a 70-percent gross margin, and vertical integration's reason was Musk's belief that reusable rockets couldn't be built with components from pre-existing aerospace suppliers. The first launch of the Falcon 1, name given to remember the Millennium Falcon from Star Wars, costed just 6\$ million, while usually the average cost at that time was about 25\$ million. Musk had been able to lower to a quarter of its actual cost the launch by building the smallest useful orbital rocket instead of risking bankruptcy for his company with a more complex rocket that might have failed.

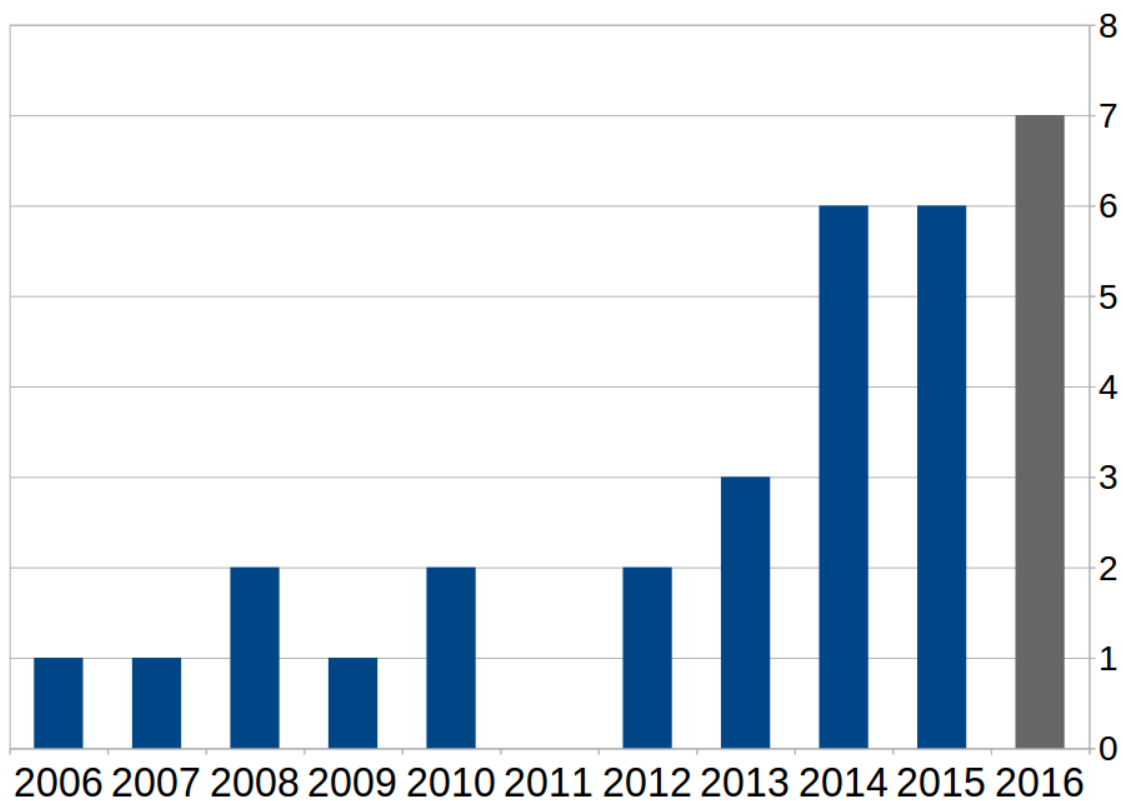
Even if the path was not easy and nearly led the company to failure, in 2006, after Falcon 9, a newly developed rocket, had a successful launch, SpaceX was awarded a contract from NASA to continue the development and test of the SpaceX Falcon 9 vehicle and Dragon spacecraft in order to transport cargo to the International Space Station. In 2008, 1.6\$ billions was the reward NASA Commercial Resupply Services program gave to SpaceX for 12 flights of its Falcon 9 rocket and Dragon spacecraft to the Space Station. Musk was living in great distress, working day and night to solve his company's problems, until with the funds of NASA he was able to focus again of his long term scope, the human colonization of Mars.

On 22 December 2015, SpaceX successfully landed the first stage of its Falcon rocket back at the launch pad. It was the first time in history that such a feat had been achieved by an orbital rocket and it was a significant step towards rocket reusability, lowering the costs of access to space. This first stage recovery was replicated several times in 2016 by landing on an autonomous spaceport drone ship, an ocean based recovery platform. In late 2016 SpaceX intends to launch its Falcon Heavy rocket, which will be the most powerful operational rocket in the world.

In 2015, the company asked permission to the federal government to begin testing for a project that aims to build a constellation of 4000 satellites capable of beaming the Internet to the entire globe, including remote regions which currently have not internet access.

Musk stated in June 2016 that the first unmanned flight of the larger Mars Colonial Transporter (MCT) spacecraft is aimed for departure to the red planet in 2022, to be followed by the first manned MCT Mars flight departing in 2024. He has expressed his interest in someday traveling to the planet, stating "I'd like to die on Mars, just not on impact." To achieve it, Musk plans to establish cargo flights to Mars, getting the first delivery there by 2018. A rocket every two years or so after that could provide a base for the people arriving in 2025 after a launch in 2024. Musk believes that by 2035 at the latest, there will be thousands of rockets flying a million people to Mars, in order to enable a self-sustaining human colony.

Figure 1: *Rocket launches per year operated by SpaceX*



Source: Wikipedia article on SpaceX launches

2.4 The transportation adventure: Tesla Motors

Tesla Motors was founded in 2003 by Martin Eberhard and Marc Tarpenning. The name is of course inspired by Nikola Tesla, a Serbian inventor that wanted to change the world at the beginning of the XX century.

Elon Musk was the controlling investor in the first financing round in 2004 and became a chairman in the board of directors as well as an fundamental actor in the operations thanks to the 7.5\$ million spent in the project. He truly believed in Tesla and wanted to change the public opinion over electric cars. The primary goal was to start with a premium, high-end vehicle, to catalyse the attention and attract affluent investors, as to emulate typical technological-product life cycles and initially enter the automotive market with an expensive. As the company, its products, and consumer acceptance matured, it had to move into larger, more competitive markets at lower price points.

After having consulted on the strategy, there had been other rounds of investment were Musk contributed substantially, always leading in the capital invested and able to attract friends in the tech community as Sergey Brin and Larry Page, but the actual first model wasn't yet in production. In 2008, following the financial crisis, Musk assumed leadership and became CEO, avoiding bankruptcy by firing 25% of Tesla employees. The Tesla Roadster came out in 2006, but just as a prototype, and finally in 2008 the production began and Musk had decision making for the product design at a detailed level.

The Roadster is an all-electric sports car that was able to raise 187\$ million, but wasn't sold as much as wanted, just 147 cars. The awareness in the market was spread. Many people were finally understanding that electric cars were not just slow and boring cars, but could also attach to their environment-friendly etiquette the emotion that could give a real sports car. Later on in 2009, the next model of Tesla was announced, the Model S, bringing a huge wave of hype for Tesla, so much that Daimler AG decided to acquire 10% of Tesla, giving them the boost needed continue develop the model S.

In June 2009, Tesla had is turnaround. First it was approved the receiving of a low interest loan of 465\$ million by the United States government as an incentive to

produce non-polluting vehicles and to further develop the battery technology. Then, at the end of the month, the 29th, Tesla Motors launched its initial public offering (IPO) raising 226\$ million for the company. After Ford Motor Company in 1956, Tesla was the first American car maker to go public.

It was time for the company of Palo Alto to proceed to the next model in its business strategy. After the low-volume high-price Roadster, it was the Model S time with its mid-volume mid-price. Finally the delivering of cars began in 2012.

Model S was a huge success for Tesla, so much that car market competitors began feel the pressure and began to enter in the alternative-fuel market. They were amazed on how a small Californian start-up, run by people who knew nothing about car business, had such success. In order to allow quick charge for the new Model S, Tesla began to build a network of fast charging stations, that had to be spread all over to allow costumers a quick and efficient way to charge in case of long journeys.

The business was running good, Tesla had many collaborations with other car makers (Mercedes, Smart, Toyota) and decided to make available to everyone their patents. The reasons expressed for this stance included attracting and motivating talented employees, as well as to accelerate the mass market advancement of electric cars for sustainable transport. In the same year, Musk reduced his salary to one dollar. And, similar to Steve Jobs and others, the remainder of his compensation was in the form of stock and performance-based bonuses.

In 2015 it was the turn of the Model X to be put in production. Still being a mid-volume mid-price vehicle, but aiming at the SUV market. Well accepted after his first days, Tesla wanted to become a company with almost 100% of vertical integration, controlling all the supplies needed for their cars. That's why they decided to establish in Nevada, the GigaFactory, an immense industrial site completely focused in the production of batteries. The plant, with the cost of about 5\$ billion, would employ 6,500 people and reduce Tesla Battery costs by almost 30%. The state of Nevada helped to make this come true through a 1.3\$ billion tax incentive.

In March 2016, Tesla revealed his latest model, Model 3, the high-volume low-price car that Musk wanted to be named Model E, but was negated by the fact that Ford already owned that copyright. Musk wanted the first three models to spell S-E-X but settled with "S3X". However, the digit "3" will be stylized like three horizontal bars, making it indistinguishable from the "E" in Tesla's logo.

Apart from Musk's strange naming criteria, Model 3 has been the biggest one week launch of any product ever. Tens of thousands of people were reported waiting in lines to reserve their spot. During the Model 3 unveiling event, it was revealed that over 115,000 people had reserved the Model 3 prior to the event. As of April 7, 2016, one week after the unveiling, Tesla Motors reported over 325,000 reservations, more than triple the 107,000 Model S cars sold by the end of 2015.

The cash in of the company has unprecedented records. Musk announced plans for other projects, even in other vehicle categories; he is continuously improving the autonomous driving experience and enlarging his partnership deals with other companies. Up to now Musk owns 22% of Tesla and it is the project that occupies him the most.

2.5 The transportation adventure: Hyperloop

In August 2013, Elon Musk revealed a concept he had idealized for some time. His project was about a high speed transportation system that would use pressurized capsules travelling inside tubes with reduced pressure powered by air compressors, similar to the old post office sorting system. The mechanism for releasing the concept was an alpha-design document that, in addition to scoping out the technology, outlined a notional route where such a transport system might be built: between the Greater Los Angeles Area and the San Francisco Bay Area. Musk decided to establish the foundations of his concept and create design competitions for students and others to build Hyperloop. This proposal would make travel cheaper than any other transportation system for long distances. The alpha design was proposed to use a partial vacuum to reduce aerodynamic drag, which it is theorized would allow for high-

speed travel with relatively low power, with certain other features like air-bearing skis and an inlet compressor to reduce air drag. The alpha design document estimated the total cost of an LA-to-SF Hyperloop system at about 6\$ billion. With the help of engineers of Tesla and SpaceX, the track for testing is under construction.

Developments in high-speed rail have historically been impeded by the difficulties in managing friction and air resistance, both of which become substantial when vehicles approach high speeds. The Hyperloop concept would eliminate these obstacles by employing magnetically levitating trains in evacuated or partly evacuated tubes, allowing for speeds of thousands of miles per hour. Nowadays there are many proposed routes for the Hyperloop system and Musk is working in collaboration with many countries to achieve this goal. Also, as if he didn't know it, if Hyperloop would be a success it would also be the perfect transportation system for a future Mars colony.

2.6 Solar City and Open AI

Solar City was founded in 2006 by two brothers, Peter and Lyndon Rive, on the suggestion of a concept by Elon Musk, their cousin, now chairman and largest shareholder. Their idea was simple: installing solar panels would decrease the effects of global warming, a concept stressed deeply by Musk. The company grew enormously already in the first year thanks to a marketing campaign without equal and to the many advantages offered to the customer. In 2007 it was already the market leader in California and in 2013 the second largest solar installation company in the United States. Since his three companies were doing so good, Tesla, SpaceX and Solar City, Elon wanted to put them under a same roof with each one covering the shoulders of the other. So in 2016, SpaceX acquires 90\$ million of Solar City stock while Tesla formally submitted a merging contract with the reason that integrating Tesla batteries and solar power would be a perfect composition. As of now Musk owns 22% of Solar City.

Open AI is a research company created by Elon Musk in 2015 specialized in the development of artificial intelligence. There is a great concern of Musk about AI

because he thinks that it would become a very powerful tool that the humans would probably not be able to counteract unless with specific rules set in the programming of the system. His idea is to make it available to everyone in a safe and beneficial way, without letting privates or governments be able to use it power for illicit tasks. In a famous interview of 2015 with Bill Gates, the two magnates were asked their opinion on AI risks by Baidu CEO Robin Li.

Li: Recently, you (Musk) have said that artificial intelligence's advances are like summoning a demon. That generated a lot of hot debate. Baidu chief scientist Andrew Ng recently said during an interview that worrying about the dark side of AI is like worrying about overpopulation on Mars. How would you address that?

Musk: First I think that is a sort of radically inaccurate analogy and I know a bit about Mars. The risks with digital AI, I want you to understand that it wouldn't be at human level but superhuman almost immediately, way beyond anything we could imagine. A more correct analogy would be if you compare it to nuclear research with its potential of a very dangerous weapon. You see, releasing the energy is easy, containing it safely is very difficult. So the right emphasis should be put on AI safety. We should put vastly more effort in AI safety than in advancing AI in the first place, because it may be good or may be bad, and if it is catastrophically bad, it could be the equivalent of a nuclear meltdown. So I'm not against advancement in AI, but I think we should be extremely careful. If that means taking a bit longer to develop it, then I think it would be the right trail. We shouldn't be rushing headlong into something we don't understand.

Li: Bill (Gates), I know you share similar views with Elon, but is there some difference between you and him?

Gates: I don't think so. I mean he actually put some money (referring to Open AI) to get going on this, and I think it's absolutely fantastic. The basic point that Elon has made is that we have a general purpose learning the algorithm that evolution has endowed us with and it is running in an extremely slow computer (referring to our brain) with a very small memory size. So believe me, as soon as this algorithm, taking experience and turning it into knowledge, is implanted it will not be clear when it will

be at human level, because it will be at the superhuman level almost immediately, because with that learning algorithm he just goes on the internet and reads all the magazines and book and things like that. We have essentially been building the content base for super intelligence. So trying to say that it is not a problem, that really makes me disagree. How can people not see how huge of a challenge this is?

In this interview all the concern for AI is depicted in simple words with powerful meaning. Some scientists, such as Stephen Hawking and Stuart Russell, believe that if advanced AI someday gains the ability to re-design itself at an ever-increasing rate, an unstoppable intelligence explosion could lead to human extinction and this is exactly what Elon Musk is afraid of.

Currently Open AI is being backed up by various entrepreneurs of big companies such as Amazon, LinkedIn and PayPal and operated by high profile staff recruited by major companies such as Google, Microsoft and Facebook. It aims to carefully promote and develop open-source friendly AI in such a way as to benefit, rather than harm, humanity as a whole.

3 List of Musk's keys to success

There are many indicators that can help predict the rate of success of an entrepreneur excluding his personality traits that we already discussed. Many studies have shown that a pattern in those indicators can be found. Of course, the possession of this characteristics is not a determinant to be an entrepreneur ready for success, but we know for sure that they help to achieve such scope.

The way an entrepreneur approaches to the external and internal settings of his company reveal the methods and strategies he is capable of using. For example, the method by which he aims to establish growth and survival strategies can allow us to consider his risk awareness. If he invests a lot in human resources, by recruiting talented employees and teaching them to all aim to the same range of goals and not to just think about profit, he will have a mind-set more appropriate to work in team and exercise his leadership. Also he should surround himself of contradistinct people, differentiating by gender, race, beliefs, so to diversify the way of thinking of his team in the broadest way possible.

The entrepreneur is required to relate in a perfect harmonious way with the market, targeting untapped markets with a possibility of high growth, trying to impact as much as possible the industry by using one or more competitive advantages that the firms has.

Exploiting the market is a difficult task, but with a high capital intensity, a small average incumbent firm size and the capability of ensuring the availability of required materials, the fundamental indicators are there.

Also having a clear idea of what type of clients one is aiming at, if business-to-business or business-to-consumer, and seeking a congruency with the culture of the society, looking for the defectless design organization that the public is willing to accept through a strong marketing research.

3.1 Main points of his philosophy

During his many interviews, Elon Musk has slowly showed his unique way of thinking and his approach to problems.

The first of his key points is that he never gives up, and even if it sounds like a commercialized advertisement, he is not willing to leave a project until he has reached a precise goal that he self-imposed himself. In an interview regarding his first three consecutive rocket exploding, almost bringing SpaceX to immediate failure, the journalist asked if he ever thought about giving up. Musk simply replied with a no, he should have been dead or completely incapacitated to do so.

The simple yet fundamental advice Elon gave to an audience of graduated students was to get involved in work with a positive attitude, trying to really like what you do, because, even if you are the best of the best, there is always a chance of failure. It is important to be liking what you do, because if you don't, life is too short. If people are driven to think about their job even when not actually working, you know you really like it.

Many times Musk has encountered people that tried to discourage him from starting his own company. He once told an anecdote when he was starting SpaceX about how one of his good friends collected a whole series of videos of rockets blowing up and made him watch those, he just didn't want Musk to lose all of his money. People are doing those things that seem unlikely to succeed, but if he actually listened to discouraging comments, Elon wouldn't have achieved anything after his PayPal adventure.

In another encounter with a high school diploma audience, so prevalently students, Musk made this inspiring speech: "Now is the time to take risk, you don't have kids, as you get older your obligations increase, once you get a family, you are taking risk not only for yourself, but also for your family as well. It gets much harder to do things that might not work out, so now is the time, before having to deal with those obligations, so I encourage you to take risks now, do something bold, you will not regret it."

“Do something important” those words are the mantra of Elon Musk, he always had in mind, since he was a high school student that he wanted to change the world. A journalist in an interview about Tesla Motors asked: “How did you think you were going to start a car company and be successful at it?” Musk reply: “Well I didn’t really think Tesla would be successful, I thought we would most likely fail, but we could address the false perception of people that an electric car had to be ugly and slow and boring like a golf cart” Journalist: “If you didn’t think the company would be a success, why did you try?” Musk: “If something is important enough, you should try, even if the probable outcome is failure.” This statement clarifies that people have to really believe in what they do to succeed in their life.

The phrase “Focus on signal over noise” has many implication in Musk’s world. He says that to many companies get confused, they spend money on things that don’t actually make the product better. For example at Tesla, Musk has never spent any money on advertising, they put all the money in R&D, manufacturing and design are as good as possible, and Elon thinks that’s the way to go. “For any given company, just keep thinking: are this efforts, that people are expecting, making a better product or service, and if they are not, stop those efforts.” Simple rules that nowadays are applied by a small percentage of firms and a factor overlooked by the most. Also having a great product/service is key. Musk :“Be sure that whatever you are doing it’s a great product or service, it has to be because if you are a new company, unless you are in a new industry or an untouched market, and enter in an existing and large marketplace against big competitors, then your product or service needs to be much better than theirs, it can’t be a little bit better, because then if you put yourself in the shoes of the consumer, you have to ask yourself, why would I buy this instead of a trusted brand unless it makes a big difference. So lot of times an entrepreneur will come up with something that is just slightly better and it can’t be like that, it has to be a lot better.” The path has to be found and it has to be a much more efficient one, it’s the only way to win over big competitors.

For the team management, Musk wants to surround himself of the most talented people. His Human Resources recruitment system is very strict. He is always on the search for problem solvers. He stated: "When we interview someone to work in my companies, I ask him tell me about problems you have worked on and how you have solved them, and if someone was really the person that solved it, they will be able to answer multiple level, they will be able to go down to details, if they weren't they will get stuck and you understand that it isn't really the person who solved it, because anyone who has struggled hard for the problem never forgets it." This treatment of course attracts even more talents, because they see it as challenge, and attracting great people is the most important thing since, depending on how talented and hard working the group of workers is, how they are focused cohesively in a good direction is the determinant of the success of the company. So to build a great team, entrepreneurs have to do everything possible to get those people and keep out the non-productive ones.

The last advice that can be extrapolated from Elon Musk's philosophy is that people need to work hard. Nothing is given and a talent without hard work is just a wasted one. Musk words about this subject are: "Depending on what you want to do, especially if you are starting a company you have to work super hard, so what does super hard mean? When my brother Kimbal and I were starting our first company, instead of getting an apartment, we just rented a small office and we slept on the couch, we showered at the YMCA, and we had one computer, so the website was up during the day, and I was coding it at night, seven days a week, all the time. I briefly had a girlfriend that period, and in order to be with me, she had to sleep in the office. So work hard like every waking hour, that's the thing I would recommend if you are starting a company. So if you do simple math, if someone else is working 50 hours and you are working 100, you will get twice a done in the course of the time of the other company."

3.2 Family, philanthropy and awards

He tries as much as he can to be a pillar for his family. Musk met his first wife at Queen's University, Justine Wilson, and had six sons (Nevada, Griffin, Xavier, Damian, Saxon and Kai), unfortunately the first born died still a baby. He divorced in 2008 and in 2010 remarried with Talulah Riley, English actress. After many break ups and rejunctions, in 2016 Musk became officially divorced.

Elon Musk has demonstrated himself to be an amazing entrepreneur as well as a kind hearted person. Even if he is involved in many activities and has acquired a great fortune over the years, placing him in the 100 richest people on Earth, he deeply focuses in philanthropy.

He is chairman of the Musk Foundation, which goal is to provide solar power energy systems in disaster areas. He obviously involved Solar City to donate energy to Coden, Alabama, a city destructed by a hurricane. In 2011, the foundation was able to donate 250.000\$ toward the city of Soma, Japan, devastated by a tsunami. In 2014 he donated 1\$ million to the Tesla Science Center, a museum dedicated to Nikola Tesla, while in 2015 he gave 10\$ million to the Future of Life Institute to run a global research program aimed at keeping artificial intelligence beneficial to humanity.

Elon Musk won numerous awards in his career and here are the most relevant:

- In 2006 he served as a member of the United States National Academy of Sciences Aeronautics and Space Engineering Board
- R&D Magazine Innovator of the Year for 2007 for SpaceX, Tesla and Solar City
- Inc. Magazine Entrepreneur of the Year award for 2007 for his work on Tesla and SpaceX
- 2007 Index Design award for his design of the Tesla Roadster

- American Institute of Aeronautics and Astronautics George Low award for the most outstanding contribution in the field of space transportation in 2007/2008 for his design of the Falcon 1, the first privately developed liquid-fuel rocket to reach orbit
- National Wildlife Federation 2008 National Conservation Achievement award for Tesla Motors and Solar City
- The Aviation Week 2008 Laureate for the most significant achievement worldwide in the space industry
- National Space Society's Von Braun Trophy in 2008/2009, given for leadership of the most significant achievement in space
- Automotive Executive of the Year in 2010 for demonstrating technology leadership and innovation via Tesla Motors (youngest ever)
- Elected by Time Magazine as one of the 100 people who most affected the world in 2010
- The world governing body for aerospace records, Fédération Aéronautique Internationale, presented Musk in 2010 with the highest award in air and space, the FAI Gold Space Medal, for designing the first privately developed rocket to reach orbit
- Named as one of the 75 most influential people of the 21st century by Esquire magazine
- Recognized as a Living Legend of Aviation in 2010 by the Kitty Hawk Foundation for creating the successor to the Space Shuttle
- In 2010, elected to the board of trustees of the California Institute of Technology
- Elected 10th most popular space hero by the Space Foundation
- Forbes put him in the 20 American most powerful CEOs under 40 years
- In June 2011, awarded with the Heinlein Prize for Advances in Space Commercialization with 250.000\$

- In 2011, honoured as a Legendary Leader at the Churchill Club Award
- In 2012, awarded with the Royal Aeronautical Society's highest award: a Gold Medal
- 2012 recipient of Smithsonian magazine's American Ingenuity Award in the Technology category
- 2013 winner of Fortune's business person of the year for SpaceX, Solar City, and Tesla
- In 2015 he was awarded IEEE Honorary Membership
- As of 2015, Musk serves on the board of advisors of Social Concepts, Inc.
- In 2016, The Drive, a division of Time, named Musk the most influential person in the car business and as the second most influential person in the automotive tech sector

Elon Musk was also named honorary doctor in Design from the Art Center College of Design, in Aerospace Engineering from the University of Surrey and in Engineering and Technology from Yale University.

Apart from his serious side, Elon Musk is also deeply considered by the popular media for his humour and willingness to get involved even in seemingly bizarre projects.

He made several cameos in movies (Thank you for smoking, Iron Man 2), TV series (The Big Bang theory, DC legends of tomorrow) and animated series (The Simpsons, South Park) mostly interpreting himself, but this demonstrates the love he is getting by the media, as well as the idolization that he is getting by his fan base. Musk has been nowadays renamed "The real life Iron Man" and he is of course not rejecting this denomination.

4 Conclusion

Elon Musk has shown to everyone his real capacities as entrepreneur throughout all his career. He has brought his projects to shine each and every time, but of course he is not the only one to have done so. The group were he actually started has been renowned the PayPal mafia, that is the group of founders and former employees of the company who have since founded and developed additional technology companies (Tesla Motors, LinkedIn, Matterport, Palantir Technologies, SpaceX, YouTube, Yelp, and Yammer) and that seems a bit strange taking also into account that three of them are now billionaires (Musk included). So the question can be: how is it possible that such a restricted number of people have been able to obtain fame and fortune starting all from the same point? An instantaneous reply can be that, after the selling of PayPal, everyone received an enormous cash inflow, perfect to start a new company. Second point that can be made, is the timing. In that period the Internet had begun to grow at a fast and steady pace. Everyone involved into technology in general received many gratifications. Another point in common is that, all this entrepreneurs, before having worked together and shared ideas and thoughts, have had a very good education and started with a basic fundamental of knowledge of the IT businesses. Those could all be valid explanations, but there is something we can't evaluate: the mind-set.

The personality traits of Elon Musk are something that distinguishes him from the masses and, as we already discussed deeply, his strong will pushed him further and further so to rise and become what he is today, a successful, hard working and enlightened entrepreneur.

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