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The Enigma of Elon Musk: Unraveling the Complexities of His Business Portfolio

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ABSTRACT

This research paper studies how Elon Musk uses different types of company structures to make his businesses unique and successful. We have divided his companies into two groups: those that focus on research and development (discovery-based) and those that focus on mass producing the product and making the maximum number of sales possible (delivery-based). The formula used to achieve the discovery score is the total research and development sales divided by the total sales, whereas the formula for the delivery score is the Net Property Plant & Equipment divided by the total revenue. Based on whichever score is higher, we group them into discovery and delivery-based companies. Examples of discovery-based companies are Neuralink and X (Formerly Twitter), the similarities between them would be that they're both mainly allocating their resources towards research and development rather than the manufacturing and selling of their products. On the other hand, Tesla is a prime example of a delivery-based company that is also in Elon Musk's portfolio. Tesla clearly focuses more on the production and manufacturing side of things as is evident by their market share in the Electric Vehicle industry. (EVBoosters, 2024)

Introduction

If we look at a few of his companies such as Tesla, X and SpaceX. They have a flat organizational structure (Tim Higgins, WSJ 2018), which means that there are very few hierarchy levels between the top management and the employees, leading to a collaborative and empowering atmosphere. This is evident in Elon Musk's business portfolio, a prime example being Tesla as it can be said to be the founding father of this generation of electric vehicles. This not only shows uniqueness in the company but also that the company thrives in ideation, creativity and innovation, or else Tesla would not be where it is at today. For example, if we take the fact that Elon Musk runs some of the businesses he owns in different manners, we could

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further analyze his management techniques on each. Taking two specific companies, Tesla and X (Formerly Twitter) in this case, would remind us that Musk seems to have an interactive type of leadership for Tesla while ensuring personal involvement in products, engineering, and possibly production among other things. Still, the focus in Tesla is on the scaling of production and maximizing the whole process of manufacturing, considering the very high demand for electric vehicles. Yet, if we look at the management style of Elon Musk over X (Formerly Twitter), it is evident that he has made some controversial changes such as big-time layoffs and company restructuring (Srivastava, 2024). There has also been accelerated testing and rollout of new features on the platform, an indication of a more experimental approach, instead of something like what he does at Tesla. (tech2 News Staff, 2019)

If we look at how Elon Musk acts and manages his many companies differently, we can see that in 2015, Musk described himself as a "nano-manager" in an interview with The Wall Street Journal (Baer, 2015). Elon Musk as Tesla's CEO, himself puts in 100-hour weeks and actively participates in solving problems on the factory floor with the staff (Denning, 2024). One Tesla software engineer previously told Insider, "He challenges people and pushes them to do things they don't think they can do and is really great in some ways" (Julie Bort, Linette Lopez, Mark Matousek, 2018). Musk as the cofounder and CEO of Neuralink emphasizes the ambitious longterm goal of merging the human brain with technology which shapes the strategic direction of the company (Knapp, 2019). Since it is one of the most experimental fields in the world, which always demands rigorous research and development, Neuralink uses its team of experts in any discipline, from neuroscience, engineering, and medicine to its employees. His style of functioning has been defined by himself, "Prove me wrong or do as I say" (Jason Aten, 2021). Since taking over the company in October 2022, working as chief financial officer and secretary of X (Formerly Twitter), acted to end work from home for employees; canceled free employee lunches and laid off around 3,700 people which is more than half of Twitter employees (O'Sullivan & Duffy, 2022). The thesis of this paper is that discovery and delivery-based companies usually have very different objectives and the way they operate differ as well. We also dive into how flat organizational structures tend to bring out more creativity and new ideas as compared to a hierarchy, which may be why Elon Musk uses the flat organizational structure for most of his companies.

Introduction to Elon Musk's business portfolio:

Musk has long been broadening the scope of vertical integration to support interrelated, and sometimes controversial, research and technologies across his companies, including battery packs at SpaceX and Tesla, solar energy at Tesla and SolarCity, and artificial intelligence at OpenAI and Neuralink.

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"He basically created an infrastructure of diversified assets that he can combine in different ways to optimize his companies as needed," said Irina Cozma, an organizational psychologist and executive coach. "The most obvious example is battery technology that benefits both Tesla and SolarCity. Another example is the use of the SpaceX campus to start The Boring Company. He creates synergies across these different companies and industries."

But Janine Woodcock, an international executive coach, sees Musk as a cautionary tale. "Yes, he has achieved great success, however, his behavior - micromanaging his teams and projects and working extraordinary hours ... should make investors and shareholders very wary of the longevity of this type of leader," she said.

Moreover, Musk's on-going controversies - from the cost of launching the Starlink network to a lawsuit on the Tesla and SolarCity merger - will eventually unravel whether Musk's leadership style is one to emulate.(Kim, 2019)

More in depth information about some of Elon Musk's companies:

SpaceX:

SpaceX has been at the forefront of space exploration, with advancements in rocket technology and human spaceflight. Key innovations include the development of reusable rockets like Falcon 9 and Falcon Heavy, which have significantly reduced launch costs. The company has also developed the Crew Dragon spacecraft, designed for human transportation, and is working on the Starship, which is a fully reusable spacecraft for interplanetary travel. (Eric Brown | MIT Industrial Liaison Program, 2023)

SpaceX's long-term goals include further reducing space transportation costs, establishing a sustainable human presence on Mars, and enabling interplanetary travel. By achieving these objectives, SpaceX aims to change space exploration forever and make it more accessible to humanity.

Since its founding, SpaceX has undergone a significant transformation, evolving from a primarily government focused launch provider to a diversified and spread-out space technology company with multiple revenue streams.

Key changes include expanding its customer base beyond NASA to include a mix of government and commercial clients. (Contrary Research, 2024) This has had a positive impact on SpaceX such as increasing its market reach and revenue streams. Another significant change is reusable rocket technology. The development and implementation of reusable rocket technology such as

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the Falcon 9 and Falcon Heavy, have improved and simplified the economics of space launch, reducing costs and increasing accessibility.

SpaceX has also introduced new business lines, the most notable one being the Starlink satellite internet constellation, (Starlink, 2024) which provides high-speed internet access to underserved areas, further expanding their business and product line. Human Spaceflight is also something the company has expanded into, including contracts with NASA for astronaut transportation and potential commercial space tourism ventures. (Contrary Research, 2024)

Neuralink:

Neuralink is a company which deals with neurotechnologies; they mainly focus on the creation of brain machine interfaces (BCI). (Neuralink, 2024) It has progressed with unprecedented ultrahigh bandwidth BCIs as well as the minimally invasive neurosurgical robots. Such products and discoveries might be able to alter the approach and progress in treatment regarding neurological diseases, and improve cognitive ability in human beings.

Neuralink would essentially treat neurological disorders and also enhance human cognitive capabilities through the merging of human brains and artificial intelligence. Once the goals of Neuralink become a reality, quality of life aspects for the victims of neurological disorders should improve and allow them to perform certain actions in a better manner. (McFadden, 2024)

Neuralink was founded in 2016 and primarily deals with the development of BCIs. Being still fundamentally at the research and development stage, it has gained FDA approval for human clinical trials of its product. (By Rachael Levy, Marisa Taylor and Akriti Sharma, 2023) The business model of Neuralink is still based on BCI technology development with potential medical and consumer fields.

Tesla:

Tesla has been the first mover in the electric vehicle industry and has led its way toward sustainable transportation. It has innovated advanced battery technology, autonomous driving capability, and much more. (Antoniochagoury, 2024) Its products include luxury SUVs and sedans part of the electric vehicle category.

Tesla is believed to be the first mover of electric vehicle movement. The long-term goals of Tesla include world leadership and acceleration of its transition to sustainable energy, the expansion of its product line and its development of autonomous driving technology (Tesla, 2021). Ultimately, these goals should give way to a better future in more sustainability and change in the automobile industry. Although the core elements have been retained, the business

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model of Tesla has undergone a major transformation since its inception. This change includes expansion from the original Roadster into mass market vehicles, luxury sedans and SUVs, and plans for trucks and commercial vehicles introduced recently. (Hyunjoo Jin and Joseph White, 2024) The company changed the theme of the market from a luxury car market to the inclusion of a much broader market made up of mass market consumers.

What kinds of structures are most suitable for creative businesses? Why?

If we look at what kind of structures are most suitable for a creative business we may find the following: Hierarchy is harmful to the idea generation phase of innovation i.e. a system in which members are ranked according to status or authority may not be the best fit when it comes to creativity and innovation of that particular organization. However, hierarchy may be helpful during times such as the screening or selection phase of idea creation. (Dongil D. Keum,a Kelly E. Seeb, 2017)

Reason of organizational structure being harmful to innovation may be due to the difficulty of observing real regents at different phases of the innovation process, since ideas formed and not selected are invisible to the organization itself. While it can be harmful it can also be beneficial during the idea selection phase through reducing bias towards promoting the selection of one's own ideas. (Dongil D. Keum,a Kelly E. Seeb, 2017)

The structure most suitable for creativity seems to be organic organizational structures which are characterized by decentralized (dispersion or distribution of functions and powers) decision making and more flexible roles which includes a wider span of control. These are said to be more conducive to innovation rather than the typical organizational structure. For example, Jansen et al. (2006) studied the financial performance of new product offerings in the banking industry and found that centralization had negative effects on radical innovations (mobile banking), but for incremental innovations (automated teller machines) only centralization had a negative effect. Which shows that organic organizational structures (decentralized) are beneficial for innovation. (Dongil D. Keum,a Kelly E. Seeb, 2017)

Musk's public arguments for flattening were good:

"As part of the reorg, we are flattening the management structure to improve communications, combining functions where sensible and trimming activities that are not vital to the success of our mission." (Champy, 2023). But actions and certainly Tesla's troubles-raised questions about how much one manager can do and how flat a company's management structure can get (Eddy & Ewing, 2024). Most of Musk's major companies, including Tesla, X (formerly known as Twitter), and SpaceX, are flat in structure, with virtually few hierarchical levels between top management and employees. This creates an environment of teamwork and empowerment. This

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structure makes these companies excel in things such as ideation, creativity, and innovation. To add, Tesla's electric vehicle dominance of the industry sets it apart as a prime example of the delivery-based company.

Tesla manufactures much of its ingredients in-house through vertically integrated manufacturing, by controlling its supply chain to make the supplied products cheaper (Verpraet, 2020). Its concern in the delivery side is in the side of production and manufacturing, as in the delivery score formula: Net Property Plant & Equipment divided by total revenue focuses on their part in the scalability of production and maximization of the process manufacturing.

On the other hand, discovery-based companies such as Neuralink and X mostly spend much on research and development as presented in the formula for the discovery score which is total research and development sales divided by total sales. The mission of Neuralink, merging the human brain with technology, entails seriously making efforts through a multidisciplinary group of experts (Neuralink, 2024). He has also duplicated X, formerly Twitter, a company that has taken an all-out exploratory style, the speed of testing and launching new features, a big structural overhaul, such as layoffs and prohibition of any remotely work (Conger et al., 2023).

Another Musk-supported enterprise, SolarCity-a company that markets solar energy generation systems, selling from door to door-used features of flat structuring to enable its ability to make decisions quickly. There was PayPal, another company Musk had investments in from the early days, which also was structured similarly and flat, non-hierarchical, with technical ability above experience, as explained by one of its first COO's, David O. Sacks. This helps facilitate fast decision-making and collaboration. As time passed, however, PayPal became an increasingly functionally organized company with clear divisions in consumer payments, merchant services, and innovation-which is more characteristic of tall organizational structures that include balancing efficiency with oversight.

How does this translate to Elon's business portfolio?

Elon Musk's business portfolio comprises many successful companies such as Tesla, X (formerly Twitter), SpaceX, The Boring Company, PayPal etc. If we look at a few of his companies such as Tesla, X and SpaceX. Most of them have a flat organizational structure (compared to his delivery driven business they have lesser hierarchy relatively) (Prime, 2023), which means that there are very few hierarchy levels between the top management and the employees, leading to a collaborative and empowering atmosphere.

In some cases, there may be differences as to how flat and tall a company may be. For example, Tesla is relatively taller as compared to Paypal, even though Tesla follows the flat organizational structure, when you compare it to PayPal there are lesser barriers to the top management in

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PayPals organizational structure (Organimi, 2024), (/entity/gennaro-Cuofano, 2024). Overall conveying the idea that both styles of organizations do work but when we look at Elon Musk's business portfolio, he tends to lean towards the flat organization structure.

As we looked at in the previous question, we came to a conclusion that organic organizational structures were the best to foster innovation and creativity. This is evident in Elon Musk's business portfolio, a prime example being Tesla. Tesla is said to be the founding father of this generation of electric vehicles (Trainer, 2022), this not only shows uniqueness in the company but also that the company thrives in ideation, creativity and innovation, or else Tesla would not be where it is at today.

Tesla uses a flat organizational structure, which consists of decentralization and there being lesser hierarchy. Its success may be owed to this as being the first movers in the luxury EV market would have been difficult to come through a typical organizational structure. (Tim Higgins, *WSJ* 2018)

Taking some of Elon Musk's companies and calculating their discovery and delivery scores to classify them into discovery and delivery driven companies:

This section of the paper will allow us to take a look at the discovery and delivery scores of various companies which are part of Elon Musk's business portfolio. The calculations have been made using a specific formula mentioned below and the data has been taken from the income statements and balance sheets of the respective companies. For private companies whose data is not public, data from their close competitors have been taken.

Using the discovery and delivery scores we will analyze some of the companies further in detail with respect to their scores. Additionally, a chart has been presented in which there is a visual representation of each company's discovery and delivery scores, which can be used to compare one company with another in terms of the scores.

Company	Discovery Score	Delivery Score
Tesla	4.1%	42%
Neuralink	38.4%	0%
X (Formerly Twitter)	38%	26%

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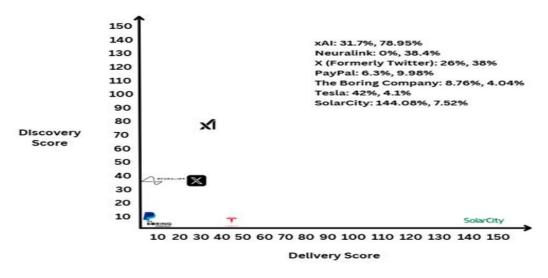
xAI	78.95%	31.7%
SolarCity	7.52%	144.08%
Paypal	9.98%	6.3%
The Boring Company	4.04%	8.76%

Formula used to calculate discovery score: R&D sales / total sales

Formula used to calculate delivery score: PPE/Total revenue

Whichever score is higher, the company becomes part of that classification. For example, Tesla's discovery score is 4.1% and delivery score is 42%, hence Tesla is a delivery-based company.

A discovery score of a company tells us how focused they are on the research and development side of things whereas a delivery score tells us how focused they are on delivering the product itself rather than emphasizing much on research and development. So naturally a discovery-based company would be a company that focuses more on research and development whereas a delivery-based company is a company that focuses more on production and manufacturing. To find the discovery score of a particular company, we look at the research and development sales divided by the total revenue multiplied with one hundred. For the delivery score we look at the net PPE divided by the total revenue



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Digging deeper into a few of Elon Musk's companies with respect to their discovery and delivery scores:

Tesla:

Tesla is an automobile company that manufactures electric vehicles. It is known to be the first mover in the electric vehicle industry (Trainer, 2022) which has led the change to sustainable transportation to the public. Tesla's goals are to further develop autonomous driving technology and increase the amount of sustainable transport in the world; they currently produce products such as luxury SUVs and sedans, while having plans to produce trucks and commercial vehicles in the future. (CNBC, 2024)

They set themselves apart from other companies in the industry by focusing on autonomous driving technology (Metz et al., 2022). If we take Tesla as an example their discovery score is 4.1% whereas their delivery score is 42%, this tells us that Tesla allots their resources to product development and manufacturing far more than research and development. Tesla's higher delivery score can also tell us how ambitious they are towards their production and share in the market. For instance, in 2021 Tesla produced 339,000 electric vehicles followed by Toyota who produced 54,000 plug-in hybrid electric vehicles, which is more than six times the next highest production number. (Capitalist, 2023)

In 2020 Elon Musk stated that Tesla's aim is to produce 20 million electric vehicles by 2030, which is all the more reason to have a much higher delivery score than a discovery score (Vajariya et al., 2024). Although they later backed out of the initial statement a few years later, one could assume that for that time period they would have made plans and taken action to increase the production of electric vehicles.

With Tesla, Elon Musk displays a very interactive and hands on leadership style of management. He is personally involved in many aspects of the company such as product development, engineering and design. He is known for pushing for rapid innovation and also for creating ambitious deadlines which develops a culture of urgency and high expectations among the employees of Tesla (Ali, 2024). Elon Musk employs a flat organization structure for Tesla which facilitates direct communication and collaboration for members of the company, which allows for quick decision making and faster improvements on products.

Neuralink Corporation:

Neuralink is a neurotechnology firm which focuses on the development of brain-computer interfaces (BCIs). They have taken steps to create ultra-high bandwidth BCIs and minimally invasive neurosurgical robots (Musk; NeuralinkNeuralink et al., 2019). Neuralinks work have the

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potential and scope to improve and revolutionize the treatment of neurological conditions and further enhance human cognitive abilities. Taking Neuralink as an example, their discovery score is 38.4% and delivery score is 0%, this clearly shows how Neuralink is dedicated towards research and development rather than product manufacturing.

Since BCIs deal with medical aspects such as neurology and brain development, there is an immense amount of research to be done before anything goes into production or testing. Neuralink simply cannot mass produce their product without conducting deep research for long periods of time, which is why Neuralink's discovery score is relatively high and its delivery score is 0%.

As they're still in the research and development phase and their product is not on the open market yet, they are not allocating resources towards the mass production of their product and rather allocating a large majority of their resources towards research and development.

Elon Musk is playing the long game with Neuralink as he believes in its long-term vision. Musk emphasizes their goal at Neuralink of merging the human brain with technology; this goal shapes the strategic direction of the company led by Musk (Knapp, 2019). He has also created a very research driven environment at Neuralink, unlike Tesla which mainly focuses on the production of their product. This environment is due to the fact that Neuralink operates in a very experimental field that requires extremely rigorous research and development, which may also mean that the company's pace is often slower if compared to other companies that Musk owns such as Tesla or SpaceX which already have working products in the field.

X (Formerly Twitter):

X (formerly Twitter), is a social networking and media platform designed to let people express their thoughts/feelings as well as share news. Since Elon Musk took over X, he has emphasized on making the platform a place which respects free speech as well as his goal to make X a global hub for news and content creation (Ap, 2024) (Lewis Mitchell Professor of Data Science; Director et al., 2024). He has introduced initiatives such as the ability to purchase the 'blue checkmark' on X which funds and allows for creators and influencers to financially benefit from the content they put out on X (Naaz, 2023).

X spends a lot of time and resources on research and development, trying to understand how people use the platform and what they want from it. This is evident as they have a discovery score of 38% whereas a delivery score of 26%, this shows that their main focus is towards research and development and already improving the current product they have rather than trying to expand their range of products.

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If we compare the discovery and delivery score for a company like X with another one of Musk's companies such as SolarCity (discovery score: 7.52%, delivery score: 144.08%). We can clearly see how a company that focuses on research and development such as X differs from the discovery and delivery scores for a company such as SolarCity which focuses more on the production of their products rather than aspects such as research and development.

Since Elon Musk took over X (Formerly Twitter) in 2022, he has made his fair share of controversial changes to the company. These include large labor layoffs and restructuring of the company, including firing the previous CEO of the company and appointing a new one as per his wishes (Livemint, 2024) (McCallum, 2023). Musk also pushes for experimentation with new features which means rapid testing and deployment of new features on X, which reflects a more experimental style of management as compared to his measured development cycle at Tesla. (Caleb Naysmith, 2024)

Conclusion:

In conclusion, we learn that delivery and discovery-based companies usually have different objectives and goals in regard to their product and way of operation on a day-to-day basis. Delivery based companies usually focus on the production side of things for their product and try to produce and sell as much of their product as they can, whereas discovery-based companies usually focus on the research and development side of their product.

We also look at how more creativity and freedom of ideas are encouraged in a flat organizational structure as there are lesser hierarchy levels between top management and the employees of the company. Which is why most of Elon Musk's companies employ the flat organizational structure, further developing a more collaborative work environment.

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