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BUSINESS IN PRACTICE:

A SELF-REFLECTIVE JOURNAL AND RETROSPECTIVE ASSESSMENT OF ENIGMA MOTOR'S JOURNEY

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Abstract: This thesis comprises two compelling sections. The narrative seamlessly intertwines personal reflection with a thorough analysis of Enigma Motors, a fictional automotive manufacturer. Spanning six simulation years in the intensive three-week BiP program, it navigates the complex landscapes of strategic management, innovation, and operational intricacies. Enigma Motors adeptly responds to evolving regulations, market dynamics, and changing customer preferences, venturing into electric vehicles and pioneering revenue models. Throughout the journey's challenges and triumphs, it emphasizes the delicate equilibrium between sustainable prosperity, adaptability, and cross-functional collaboration.

Keywords: Business Simulation; Apply Theory In Practice; Personal Reflection; Teamwork; Team Conflict; Automotive Industry; Electric Vehicles; ESG; Sustainability; Strategy Development; Corporate Innovation; Operations; Cross-functional Collaboration.

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1. Personal Reflection

Conflicts inevitably arise within teams, namely due to differences in personalities and communication styles. However, they also present valuable opportunities for personal growth and improved interpersonal skills. With this in mind, this reflective essay analyzes two incidents during my participation in the BiP program.

The first incident, titled "Embracing Authenticity", occurred during our team's forming stage, challenging my unconscious biases and self-doubt. This experience emphasized the importance of encouraging authenticity, trust, and open communication. It also made me aware of the strengths and vulnerabilities of my leadership style, which can either align or clash with individuals, depending on their personalities.

The second incident, titled "To Dialogue or to Debate?" involved a conflict with the COO regarding factory issues and differing perspectives within the team. This incident taught me crucial lessons about emotional intelligence, self-management, and the significance of actively listening to and understanding diverse viewpoints. It underscored the consequences of ineffective communication and the value of striving for effective dialogue.

Analyzing these incidents shed light on essential aspects, including the role of authenticity in building trust, the need for effective communication in conflict resolution, and the challenges posed by varying personalities and biases. More importantly, learning how to build a cohesive team proved to be the program's toughest yet most valuable lesson.

1.1 First Incident: Embracing Authenticity

1.1.1 Incident

During the forming stage of our team, I received information that one of my team members had a reputation for being non-collaborative, impolite, and inclined to disregard other's contributions to the group work. Additionally, based on past professional experiences, I was aware that my

intense personality and excessive perfectionism could hinder team dynamics. While perfectionism can be seen as a desirable trait, being associated with high achievement and ambition, it is also associated with self-criticism and setting unattainable goals, which can lead to anxiety and feelings of inadequacy (McBain 2018).

During the project kick-off, I noticed a mismatch between my initial expectations and reality. Surprisingly, even the team member I anticipated to be uncooperative was quite positive, relaxed, and sociable. Thus, instead of my usual seriousness and focused posture in professional settings, I opted for a more easygoing, fun, and accommodating demeanor.

The Lead Yourself workshop was a critical moment for this incident, as it was when we gained insights into our individual personality types, and it surprised everyone that I possessed a dominant "red" personality. Until that point, I had suppressed my opinions and attempted to be easygoing and the "glue" of the group, filtering certain aspects of my natural leadership style.

As the workload increased and we started engaging in proper tasks, I transitioned from my filtered version to my authentic self. This shift triggered behaviors such as clearly assigning responsibilities and taking charge of briefing and brainstorming. While my intentions were positive, the sudden change overwhelmed some members, and I realized my assertiveness overshadowed others, resulting in comments labeling me as a "red" personality and jokingly appointing me as the CEO. With this imposed responsibility, imposter syndrome came to life, which refers to societal pressure that caused me to self-doubt my own capabilities and fear of being exposed as a fraud, even in the presence of evidence of success (Kay and Shipman 2014).

In response to this realization, I openly addressed the situation with the group. Firstly, I clarified the reasons behind my change in posture, acknowledging that I was not fully myself in an attempt to relate to the group. I opened up about my tendency to lead and my perfectionistic nature. Secondly, I emphasized my concerns about being my authentic self, namely my self-imposed pressure, insecurities, and discomfort with the joke about being the CEO, as it came with

responsibilities I was not comfortable with at that time. This conversation allowed us to go over our strengths and weaknesses as a group and align on the common goal of winning BiP.

1.1.2 Analysis

Numerous factors underpin collaborative intelligence and team efficiency. A pivotal factor involves cultivating a positive group environment that promotes authenticity, a cornerstone for nurturing mutual trust. Moreover, it is vital for team members to feel at ease when expressing their thoughts and concerns, all the while guaranteeing unity in shared objectives and vision through transparent and efficient communication (Visch and Laske 2020). Indeed, the conflict that emerged underscores the effects of lacking these foundations and revealed red flags that underlined team dysfunctions. As discussed by Patric Lencioni, these dysfunctions included lack of trust, as evidenced by my fear of being vulnerable and open about my concerns, and fear of conflict, stemming from my background and unconscious biases (Lencioni 2002).

Furthermore, by openly sharing our thoughts, we were able to create an environment where everyone felt safe. This elevated our motivation and professionalism during the simulation, but also helped mitigate the underlying dysfunctions within the team. However, maintaining this level of openness and collaboration required continuous effort, especially considering the diverse personalities and work methods within the group. Personally, I had to learn how to be true to myself while adapting certain aspects of my personality to engage with some team members. In navigating these challenges, humor played a pivotal role. It allowed me to encourage the team to deliver high-quality work while fostering a positive atmosphere. Infusing lightheartedness into my communication style, while maintaining proper boundaries and respecting cultural differences, promoted open-mindedness and problem-solving skills. This use of "levity" helped me connect with individuals with diverse personalities, ultimately enabling us to strike a balance between achieving our goals and enjoying the process together (Gostick and Christopher 2008).

Moreover, my initial reluctance to be authentic stemmed from my desire to connect with individuals from diverse cultural backgrounds. While Portuguese typically embody a relaxed demeanor, Germans place a strong emphasis on directness. However, I soon realized that the overall atmosphere did not align with the stereotypical German traits I had anticipated. This shed light on the adverse consequences that cultural biases can bring about, as a conflict emerged from my attempt to conform to a stereotype that did not even apply.

Additionally, peer assessment and self-reflection played a vital role in my learning journey. Through this experience, I discovered that my leadership skills and commitment served as inspiration for my teammates, motivating them to give their best. This was acknowledged by the CFO of Enigma Motors, who commented, "Everyone felt like you were the leader, always taking an active role and guiding everyone". However, it also shed light on aspects of my leadership style that require improvement. First and foremost, it revealed the presence of the Dunning-Kruger effect, in which I overestimated my competences in relation to the group assessment (Rzeszucinski 2022) (Appendix 1). Secondly, I realized that my pursuit for perfection and high standards can make others feel inadequate, undermining their confidence and motivation. It became evident that, at times, I acted too swiftly and decisively, unintentionally depriving my teammates of opportunities to actively participate and engage. This emphasized the importance of balancing my ambition with a more nurturing and inclusive approach, to create a space for members to contribute with their unique ideas and talents and promote a sense of empowerment.

1.1.3 Learnings and Reflection

Recognizing these challenges has allowed me to develop a deeper appreciation for the diverse perspectives of team members within a group. Effective teams thrive on the power of synergies, leveraging each other's strengths and compensating for weaknesses to foster a broader knowledge, higher accountability, and mutual support (Noonan Hadley and Mortensen 2022). I have been able to identify areas for personal growth, by learning from individuals who possessed

qualities I lacked. I learned that to achieve collective success, it is crucial to draw inspiration from others' unique strengths while contributing with our own capabilities and ideas.

Moreover, this experience has underscored the importance of self-awareness and reflection. While I became aware of my valuable leadership qualities and communication skills, I also recognized certain insecurities and anxieties within myself. Upon reflection, I have realized that my drive for personal fulfillment sometimes leads me to overshadow others. This can manifest through a serious physical posture and an assertive tone of voice, creating an environment that may be perceived as overpowering. While these traits contribute to my performance in specific settings like sales pitches, they can hinder interactions with introverted individuals or in coaching scenarios in which inclusivity and openness are paramount. According to "The Confidence Code" book, my tendency to dominate others with assertive nonverbal cues stems from a lack of confidence, leading me to seek respect, credibility, and influence through body language (Kay and Shipman 2014). Moving forward, I am committed to utilizing the techniques I learned during the program, such as incorporating lightheartedness into my communication style.

On a personal level, this incident has enabled me to harness conflicts as a source of motivation for my own individual development. I have realized that embracing my authentic self, rather than solely focusing on accommodating different personalities, is of utmost importance. Transparency and authenticity have emerged as essential foundations for successful teamwork. By addressing changes in behavior, sharing fears and desires, and cultivating a safe space for dialogue, we were able to build trust within our team. Furthermore, challenging preconceived ideas and approaching others with empathy has proven crucial.

As I move forward, I will apply these lessons and valuable feedback to pursue collective success in my future endeavors. I will employ my recognized leadership skills in group settings, continually refining my approach to embrace diverse perspectives, foster inclusivity, and inspire others to leverage their unique strengths.

1.2 Second Incident: To dialogue or to debate?

1.2.1 Incident

In the midst of the simulation, our team encountered a conflict centered around the Director of Operations. This conflict arose when we realized that our performance was being hindered by an impending operations problem. Despite our overall success, we faced challenges related to excessive production capacity, high inventory levels, and inefficient utilization rates.

We had a well-defined plan, according to our resources, market preferences, and competitive environment. While the majority of the team supported this plan, the COO had a different perspective. Quarter after quarter, he insisted on creating additional cars to address the persisting issue, growing increasingly frustrated despite our diligent efforts to explain our reasoning.

In Q12, the COO proposed creating a new conventional car, arguing that there was still high demand for Gasoline vehicles. As a team, we engaged in a thorough discussion to evaluate the pros and cons of this proposal. We carefully considered the potential benefits, such as addressing the Operations problem. However, we also acknowledged the drawbacks, including potential CO2 penalties and deviating from our gradual transition to electric cars. Despite presenting these arguments, the COO remained uncooperative, dismissing our perspectives by simply stating that we were not listening to him and that we were "just trying to say why it did not make sense". Recognizing the urgency of the situation, I made the decision to call for a vote, using the "consensus" decision-making approach, urging the team to commit to a decision and move forward, as we felt we did not have the time for "collaborative" decision-making (Gleeson 2012). With a majority of five against one, we chose not to create the conventional car. This further frustrated the COO, resulting in breakdowns in communication.

The conflict persisted for two more quarters, in which his non-collaborative behaviors became evident as he deviated from agreements made within the group and neglected his responsibilities. His attitude grew defensive, and rude, seeking full attention from the rest of the team.

I reached a point at which I felt compelled to collaborate with him in an attempt to restore a positive atmosphere. Thus, I proposed exploring ways to incorporate conventional cars into our portfolio in a way that aligned with our overall strategy. Eventually, we decided to create a Diesel car as a compromise, considering its lower emissions compared to Gasoline vehicles. Although not everyone was fully confident with this decision, we were committed to giving it a try. Unfortunately, the COO's persistence did not diminish, and in the following quarter, he insisted on the creation of a second conventional car. Exhausted and frustrated by the situation, I lost my motivation to engage in further arguments. Realizing the limited time left in the simulation and the COO's aggressive posture, it seemed futile to continue trying to reason with him. Reluctantly, we succumbed to his demands and created a second Diesel car as he desired.

As a result, we went from a leading position to nearly last place in the simulation. The creation of these two cars, driven especially by an attempt to appease the COO, had a detrimental impact on our performance. Upon reflection, it became clear that if we had taken the time to address this issue, instead of succumbing to the COO's pressure, the problem could have been avoided.

1.2.2 Analysis

Reflecting on my role in the simulation, I now realize that there were various aspects of my emotional intelligence that I should have considered. These aspects ultimately led to the escalation and prolongation of the conflict throughout several quarters (Goleman 2006).

Firstly, according to Thomas Kilmann's conflict-handling modes, I transitioned from a collaborative approach, ensuring we took time to gain the COO's buy-in, to an accommodating mode, in which my assertiveness decreased due to exhaustion and frustration (Brown 2012). If I had anticipated my emotions and subsequent reactions, I could have better handled the conflict.

Secondly, in hindsight, the conflict revealed underlying dynamics within the team arising from differences in personality and communication styles. The COO's blue personality traits required detailed information and a step-by-step rationale to fully comprehend and support our

suggestions. Regrettably, I failed to recognize how my red personality traits (which according to the Insights Group means I prioritize progress and results), overshadowed the need for constructive dialogue. This clash escalated the conflict, as I pushed forward without spending enough time providing the level of detail he required, which heightened his defensiveness. Additionally, I tend to construct reasoning and arguments while engaging in discussions. However, the COO's blue personality favors concision. To ensure that my message would be properly processed, I should have adapted my speech to succinctly present my arguments.

Thirdly, I became so consumed by my negative feelings of frustration that I was unable to effectively handle the distressing situation, offer alternatives, or present counterarguments. My emotional response to the conflict played a role in its escalation. Overwhelmed by the COO's illogical reasoning and behavior, I felt frustrated, helpless, and stuck. I did not feel capable of further engaging in the discussion and moving forward. Consequently, I ended up accepting the creation of the two cars. As proved by the results of the simulation, these types of emotions can impair our cognitive abilities, hinder efficient information processing, lead to impulsive and irrational decisions, and reduce our problem-solving skills (Hughes, Kinder, and Cooper 2019).

Fourthly, this conflict highlighted my lack of social awareness. From my perspective, I believed that our well-reasoned arguments and team consensus would be sufficient for the COO to grasp the situation. However, this inadvertently made him feel threatened and attacked, triggering a defensive response. In retrospect, I now realize the importance of genuinely listening to the COO's concerns, striving to understand his viewpoint, and working collaboratively to find mutually agreeable solutions that address his underlying concerns. Instead of engaging in debates to prove my point, I should have focused on promoting meaningful dialogue and seeking to understand the COO in a non-confrontational manner (Grenny et al. 2022).

Finally, the cycle of negative emotions depleted my capacity to influence others and manage group relationships. I lost my energy and merely went with the flow, failing to foster constructive

dynamics and lacking the drive or willingness to engage in further discussions. Reflecting on my own behavior, I acknowledge that my confidence in the team's support and the validity of my arguments contributed to a sense of arrogance. I failed to recognize that simply pushing forward, as I did by suggesting a vote, without taking the time to address the COO's concerns and develop a collaborative plan, only exacerbated the problem. It became clear that my red personality traits can sometimes impede problem-solving and exacerbate issues if not tempered by careful consideration and effective communication.

1.2.3 Learnings and Reflection

Reflecting on the situation, I now recognize the significance of cultivating an environment that encourages open discussion, even in the face of disagreement. While it may be relatively easy to promote dialogue when everyone shares the same viewpoint, the real challenge arises when differing opinions emerge. In such contexts, there is a tendency to view debate as a threat to our credibility and fear the possibility of losing ground. However, this incident has taught me that effective communication goes beyond presenting arguments; it involves understanding different personalities, adapting our approach to resonate with others, and actively listening to diverse viewpoints. To prevent conflicts from needlessly escalating, we must set aside our egos and make an effort to engage in empathetic discussions, actively listen to both verbal and non-verbal cues, and encourage open and honest communication (Hughes, Kinder, and Cooper 2019).

Furthermore, the conflict highlighted the importance of adapting our dialogue to ensure effective message delivery, considering that people have different ways of processing information. As someone with a red personality type, I acknowledge my tendency to overpower conversations and sometimes, be exhaustive. This experience serves as a reminder for me to pause, organize my thoughts, and strike a balance between providing details while facilitating an incisive discussion. Also, the book "Crucial Conversations: Tools for Talking When Stakes Are High" explores techniques such as using contrasting statements to avoid misunderstandings, addressing

silence with open-ended questions, and engaging in active listening to ensure an effective dialogue (Grenny et al. 2022).

Moreover, reflecting on my leadership position within the group, I realize that certain attitudes I displayed were more focused on achieving outcomes rather than embodying the type of leader I aspire to be. For instance, suggesting a vote and encouraging people to take sides inadvertently created divisions and made the COO feel isolated and less willing to collaborate. While seeking consensus can be a valuable approach to decision-making, it carries various downsides, including the potential for manipulation, power imbalances, groupthink (which occurs when the desire for agreement overrides critical thinking), and diluted accountability (Susskind, McKearnen, and Thomas-Lamar 1999). Moving forward, I aim to become a leader who fosters meaningful discussions and ensures everyone feels their ideas are heard and valued.

Lastly, I learned that when dealing with specific personality types, it can be effective to facilitate a self-reflective process that enables other members to see our perspective on their own terms. This can be achieved through active listening, presenting alternative perspectives, providing a safe space for dialogue, and encouraging a growth mindset (Susskind, McKearnen, and Thomas-Lamar 1999). By finding this balance, I will be able to properly engage with individuals who have different communication styles than my own and ensure everyone feels empowered to share their unique perspectives.

This conflict served as a valuable learning experience for me, emphasizing the importance of recognizing different personality types, actively listening to opposing viewpoints, and investing time in developing a shared understanding. Also, it highlights how anticipating emotions can play a role in managing conflicts. This, coupled with constructive dialogues and open communication, will enable be to lead and collaborate more effectively in group settings.

2. Firm Analysis

Enigma Motors embarked on the BiP having to face various challenges. The release of the United Nations' 2030 Agenda for Sustainable Development served as our impetus to improve ESG standards and adopt a Triple Bottom Line, focusing on Profit, People, and Planet (United Nations 2015a). Also, regulation and an anticipated shift to EVs, projecting a 35% increase in sales from 2022 to 2023, made us reevaluate our portfolio (International Energy Agency 2023).

The firm analysis section offers an assessment of Enigma Motors' strategy formulation, and a deep dive into its implementation over the areas of Innovation and Operations. This section is anchored upon the Strategic Choice Cascade model, which underpins three fundamental stages: setting the company's Direction and outlining its Position (chapter "Strategy") and moving forward with the Activation (chapters "Innovation" and "Operations") (Lafley and Martin 2013). Within the Direction phase, we leveraged the insights from the External and Internal environments' analysis to discern Enigma Motors' SWOT and craft its Mission, Vision, and Values. In the Position phase we outlined our strategic focus and boundaries. Finally, within the Activation realm, we go over the disparities between our initial strategy and its implementation, focusing on Innovation and Operations, alongside an appraisal of our performance, mistakes, and vital interdependencies between departments. We explore the advantages and drawbacks of our pace of R&D, including the transition to EVs and the risky investment in Diesel cars. Moreover, we go over our factory management and how excess production capacity harmed us.

2.1 Strategy: Direction and Position

2.1.1 Direction

2.1.1.1 External Environment: PESTEL

The PESTEL is detailed in Appendix 2. In brief, on the Political stage, on top of trade tensions, the Paris Agreement has shed light on the urgency for sustainability within the automotive

industry, responsible for a staggering 20% of global CO2 emissions (Statista 2023b; United Nations 2015b). Economically, differing regional purchasing powers are evident, with China displaying higher price sensitivity than the USA (Statista 2022). Additionally, recognizing the significance of payment terms, we found it essential to reassess our credit and supplier agreements. Societal trends are reshaping how we view ownership, propelling car-sharing services, which will potentially unlock a 30% revenue boost by 2030 (McKinsey&Company 2016). Technological advancements in EV, connectivity and autonomous driving are also pivotal drivers of customer value. Environmental responsibility is paramount, as well as complying with the Greenhouse Gas Protocol's rigorous standards across scopes 1, 2, and 3 (Ranganathan et al., n.d.). Legally, penalties on carbon emissions and the EU ban on Gas and Diesel cars by 2035 are a clear sign of the industry's impending transformation (European Parliament 2023).

2.1.1.2 Internal Environment: Business Model Canvas

Our Business Model Canvas is provided in Appendix 3. In a nutshell, Key Partnerships encompass suppliers, financing institutions, governments, distributors, and more. Our Key Activities span Sales and Marketing, Car Design, Manufacturing, Development, and R&D, fueled by a commitment to vertical integration. Key Resources evolved from Q4 to Q28, as seen in Appendix 4, and include an experienced managerial team, a global manufacturing network, robust financing capabilities, investments in electrification (and later on connectivity and autonomous driving) and brand awareness that is key to facilitate new model launches. Our Value Proposition focuses on supporting the customer in a phased EV adoption, prioritizing infrastructure, compelling features (particularly in range and connectivity), competitive pricing, and sustainable practices. Customer Relationships emphasize reliability, accessibility, and customer-centricity. Channels include a direct sales network, complemented by multi-channel advertising. Our Customer Segments encompass the mass market, as well as the environmentally conscious and tech savvy upper youth demographic across China, Europe, and the USA. Our

Cost Structure includes raw materials, staff, R&D, advertising, manufacturing costs, amongst others. Revenue Streams primarily flow from vehicle sales, with later contributions coming from car-sharing services and government CO2 reimbursements.

2.1.1.3 Alignment: SWOT

We drew upon our prior assessments to shape our SWOT analysis in Q4.

Our Strengths included factory capacity driving economies of scale, a 30.7% market share in Q4 promoting new model acceptance, a highly motivated workforce (94%), strong workload fulfillment (92%), stable income from conventional vehicles (namely those with less than sixty days of inventory), and a solid 'A-' credit rating supporting our investments.

Regarding our Weaknesses, it is worth noting our comparative disadvantage due to a lag in EVs relative to competitors in Q4. Operational challenges arose, namely inventory accumulation with three car lines and a necessary and costly factory restructuring and expansion that was critical to realize our vision of catering to the mass market. Also, our primarily conventional fleet needed renewal, as it posed emission and maturity challenges, with three lines aging above 8 quarters.

We saw promising Opportunities with Green Bonds for cost-effective financing, car-sharing, emerging technologies, and launching advanced Hybrid and Electric models as a way to foster EV adoption and qualify for government reimbursements. Also, anticipating competitors phasing out conventional cars, we could capture market share alongside EVs' late adopters.

Finally, in terms of Threats, managing a broad fleet risked factory efficiency and could result in short-term debt, a concern amplified as we intended to maintain our initial fleet of maturing conventional vehicles for an extended period, which could strain our resources. Lastly, a gradual transition to EVs exposed us to later competitive and regulatory pressures that could jeopardize the profitability of our strategy in the medium-term, namely with our conventional vehicles.

2.1.1.4 Mission, Vision, Values

The previous insights are outlined in our Mission, Vision, and Values, detailed in Appendix 5.

2.1.2 Position

2.1.2.1 Strategic Focus

Our business-level strategy was to target a broad market and anchor our customer value to differentiation - gaining competitive advantage by elevating our perceived value relative to competitors (Appendix 6) (Barney and Hesterly 2015). Inspired by Volkswagen's plan to introduce ten EVs by 2026, we set a target of launching two cars per year (Horwitz and Goh 2023). This enabled us to offer a diversified fleet and to fill potential demand gaps in the market. In addition, in our pursuit of a blue ocean strategy, we sought to combine differentiation with cost efficiency (Rothaermel 2021). We aimed to reduce costs effectively to offer more competitive prices to customers. While we did have luxury cars in our portfolio, our aim was to expand beyond the perception of being exclusively a premium brand, prioritizing accessibility, and functional features. Our commitment to cost management was evident on multiple fronts, namely our efforts to tune facilities to leverage learning curves and economies of scale/scope.

Our journey toward sustainability, illustrated in Appendix 7, followed a gradual approach to avoid excessive investments that could have strained our Capex (United Nations 2015a). We progressively heightened our commitment to sustainability, with investments chosen based on their potential positive impacts on returns and factory outputs. Our journey started with a modest allocation of 6% of Green Capex relative to our total investments and surged to over 40% by the end of the simulation (Appendix 8). Notably, our dedication propelled us to achieve a Corporate Social Responsibility score of 63.5% by Q28, underscoring our adherence to the UN SDGs.

2.1.2.2 Scope and Boundaries

Incorporating principles from the "Staying Power" book, we established a framework characterized by six principles that underpinned our scope and boundaries (Cusumano 2010).

First, we prioritized "Platforms, not just products", aiming for a portfolio of approximately 60% EVs and 40% conventional vehicles by the midpoint of the simulation, and a complete transition

to full electrification by the end of the 6th year. Additionally, we committed to democratizing EVs by providing a comprehensive ecosystem, including full electrification infrastructure by Q11 and advanced technology focused on connectivity and range. Also, we embraced "Services, not just products" by planning to evolve towards a service-based model with car sharing services. We strived for "Capabilities, not just strategy", namely through a vertical integration approach that made replication by competitors challenging and helped us maintain competitive advantage. We adopted a "Pull, don't just push" strategy, gradually transitioning to electrification in line with market readiness. This implied retaining conventional cars throughout the simulation and launching EVs according to the market demand. In fact, Toyota holds a similar viewpoint, believing that not all markets are prepared for a swift transition to EVs (Wayland 2022).

Our "Scope, not just scale" approach emphasized related diversification strategies that hinged on economies of scope and market power. Beyond committing to volumes, we aimed to create distinct models within the same class, capitalizing on shared components to enhance efficiency. Lastly, "Flexibility, not just efficiency" was maintained through multipoint competition. We retained flexibility through our multifaceted offering and geographical coverage. This deterred retaliation by competitors and safeguarded our market share (Haveman and Nonnemaker 2000).

2.2 Innovation: Activation

In the ever-evolving automotive industry, where the imperative of environmental sustainability converges with the transformative wave of EVs, connectivity, and autonomous driving, innovation emerges as the catalyst for sustained growth and competitive supremacy.

Our approach to innovation was grounded in a meticulous understanding of customer preferences and an assessment of their readiness for paradigm shifts. We have adopted a gradual transition to electrification, underpinned by a market-pull strategy (Timsit et al. 2015). This approach was fueled by market-sensing to discern the state of its readiness, subsequently shaping

its attractiveness. Toyota stood as a source of inspiration since, despite its commitment to launching numerous EVs by 2030, it acknowledges that many markets are not yet prepared for a transition to EVs, making it paramount to provide alternatives in the interim (Wayland 2022). Our market-pull strategy was motivated by two factors. Firstly, it leveraged technological evolution to infuse cutting-edge features into our cars, particularly in connectivity and range. This bolstered the vehicles' "value for money" that was key to surmount adoption barriers, as it enhanced its perceived utility beyond its purchase price (Storto 2014). Secondly, it enabled us to glean insights from pioneers, learning from their successes and their mistakes.

In this section, we embark on a comprehensive exploration of the horizons, guiding principles and internal decision-making processes that underpin Enigma Motors' Innovation strategy. Next, we shed light on the outcomes and missteps of our strategic actions during the simulation.

2.2.1 Strategic Principles and Practices

2.2.1.1 Three Horizons of Growth

Three pivotal Horizons outlined in "The Alchemy of Growth" directed our actions (Appendix 9). Horizon 1 focused on short-term profits by optimizing existing conventional vehicles and introducing Hybrids to address current profitability and CO2 emissions. Horizon 2 was our mid-range plan, involving a significant investment in electrification and supporting technologies, driven by the promise of exponential growth and profitability. Horizon 3 addressed emerging trends and long-term growth, including shared mobility services (Baghani 1999).

2.2.1.2 Innovation Guiding Principles

First, our commitment to complete electrification within six years aligned with industry standards, where all major automotive players are committing to neutrality (Motavalli 2021).

The second principle focused on addressing the natural progression of fleet maturity outlined by the technology S curve (Gochermann 2022). This involved advertising during the "introduction",

capitalizing on sales during the "growth" phase, and deciding whether/when to relaunch or create substitutes before the "maturity" peak, to prevent inventory build-up and diminishing margins.

Lastly, to outpace competitors, we aimed to tackle our dynamic capabilities. This included a flexible approach to R&D, ensuring our cars had at least one feature rated higher than its substitute, and organizing our factories to align with prevailing regional preferences. This endowed us with agility to channel resources into seizing emerging opportunities (Teece 2009).

2.2.1.3 Stage Gate Model

The "Stage Gate Model" guided Enigma Motors' internal and cross-functional innovation process (Appendix 10) (Cooper and Kleinschmidt 1993). Stage 1 was about retrieving quarterly insights/data, primarily from the Marketing and Operations departments. Stage 2 regarded assessing go-to-market, seeking to identify supply gaps, and the need for substitutes or relaunch for specific models. The latter served as foundation for crafting analytical business cases conducted by the Innovation department, underpinned by specific assumptions, to assess the viability of new vehicles - an illustrative application of this model can be found in Appendix 11. In Stage 3, Finance assessed business case viability using Free Cash Flows and financial metrics. Stage 4 sought cross-departmental approval, initiating actions like securing Capex and aligning facilities and staff. Stage 5 realized endeavors, with iterative cycles of analytical review and refinement. Finally, car discontinuations were a collaborative effort to maximize asset value, by carefully timing production cessation and offering marketing incentives for inventory clearance.

2.2.2 Execution and Outcomes

We aimed to gradually replace our initial fleet with EVs or upgraded conventional vehicles as they matured. We backed this approach with $9,540M in Capex timely allocated to R&D, 85% of which was executed within the first three years. The latter contributed to our commendable third place in the BiP and a final Value Added of $3,568M (Appendix 12).

Our strategy involved capturing sales in the conventional market for an extended period, which

we did from Q19 to Q23 since we were the sole players in the segment. This included capitalizing on market gaps by relaunching models like the City 75G and Air 135G. These consistent revenue streams enabled us to provide full electrification infrastructure and connectivity Level IV by Q11, prompting EV adoption from the outset (Appendix 13).

Furthermore, our ambition to diversify our vehicle lineup saw successes, but also setbacks, notably launching unsuccessful Hybrid and Diesel models and retaining a too wide portfolio.

Firstly, we may refer to our Compact 100H and Executive 135H to illustrate how we overestimated the value of maintaining a broad car lineup. These hybrids were launched to address CO2 emissions early on, cater to further demand for compacts, and replace our aging Biz car. However, they generated lower revenues than our pessimistic forecasts, which, according to our internal decision-making process, justified discontinuation. Appendix 14 illustrates this, showing a pattern of underachievement in our Compact 100H, exacerbated as the vehicle aged. Regrettably, instead of discontinuing these cars, we kept them until Q22 and Q23, engaging in several attempts to boost demand through advertising and pricing, which only led to these models yielding some of our lowest contribution margins.

Secondly, launching two Diesel cars in Q14 and Q15 based on outdated market data led to a steep decline in rankings, from a top spot in the BiP until Q13, and a 33% reduction in Value Added in Q19 when our second Diesel entered the market (Appendix 12). We applied the Law of Diffusion of Innovations, which emphasizes gradual technology adoption, and launched a Compact and an Executive Diesel, assuming they would meet remaining demand for the conventional segment (Rogers 2003). Acknowledging our error, we ceased both cars and attempted to minimize losses by maximizing asset value at discontinuation.

Thirdly, our portfolio, though diverse (with at least one car per class), began to strain our resources (Appendix 15). Starting from Q15, in addition to revenue losses, our excessive net assets negatively impacted our NOPLAT, which in turn significantly reduced our Value Added

(Appendix 16). It was not until Q21 that we took corrective action, discontinuing our underperforming Air 135G, Compact 100H, and Executive 135H. This move, while originating from different settings, aligns with Mercedes' decision in 2022 to streamline operations to prioritize profitable cars (Schafer 2022).

Moreover, our definition of "premium" evolved with the market, leading us to integrate into our line-up once-considered premium features, like autonomous driving. Although we focused on medium-ranged cars strong on connectivity and range (hence our choice for a high-range "solid-state" battery), our portfolio expanded into feature-rich vehicles. In Q28, our fleet included three premium cars - Convertible E AIV CIV, SUV E AIV CIV, and Lux E AII CIV (Appendix 16).

In conclusion, despite some missteps, we recognize numerous achievements. For instance, our agile response to market gaps through the introduction of the Micro E CV. Also, our gradual transition to EVs, the extended retention of conventional cars, and our focus on surpassing players through enhanced features, played a key role in fueling revenue growth (Appendix 17).

2.3 Operations: Activation

Our aim was operational efficiency and effectiveness, achieved through careful allocation of resources to maximize value to customers. This meant reducing production costs, improving the quality of the outputs produced and ensuring the timeliness of production (Srinath 2022).

Key performance indicators were central to our pursuit of operational excellence. "Factory Utilization" measured resource peak capacity, correlating higher utilization with lower inventory levels. "Days of Inventory" tracked the time a car spent in inventory, with <30 days risking missed sales and >60 days triggering warehouse costs and the potential obsolescence of cars.

In this section, we use the 4Vs framework to delve into Enigma Motors' operational strategy, we discuss our approach to Operational, Strategic, and Societal levels of operations performance, and evaluate our actions and outcomes based on the five Operations Performance Objectives.

2.3.1 Strategic Principles and Practices

2.3.1.1 4Vs Framework

We turned to the 4Vs framework to characterize our approach to Operations (Appendix 18).

Regarding Volume, we focused on high production outputs, emphasizing economies of scale to reduce unit costs. This required a specialized workforce across all production lines and anticipated facility expansions and restructuring to align with our vision of mass production.

In terms of Variety, we aimed for a diverse portfolio to serve a broad customer base. This required a medium to high level of variety in our operations. While high variety can raise production costs, we intended to reduce these by streamlining our operations.

Regarding Variation, we adhered to Lean Manufacturing principles, aligning production with demand forecasts to minimize waste and produce precisely what customers sought. We drew insights from the demand scenarios outlined in our business cases (Appendix 11). This approach, pioneered by Toyota in 1938 through its Just-in-Time inventory system, aimed to mitigate risks associated with excess inventory or underproduction (Connaughton 2021). Yet, it also posed challenges, including the need for ongoing staff adjustments and over-reliance on forecasts.

In the context of Visibility, in the automotive industry, Enigma Motors faced low process visibility due to tightly linked operational processes related to production and factory activities, which were highly standardized. This led to a time lag between production and consumption.

2.3.1.2 Three Levels of Operations Performance

Within the Operations department, our multifaceted responsibilities required cross-functional collaboration to create value on three fronts (Slack 2017). Firstly, the Operational level involved deciding which vehicles to produce and where to produce them, maximizing factory utilization and ensuring staff productivity. We maintained close collaboration with the Marketing department, adjusting advertising and pricing as needed, to address and prevent both out-of-stock and overstock scenarios. Secondly, at the Strategic level, we attempted to maximize the

value of our existing facilities, given the costliness of expansions/restructurings and the potential effects of the learning curve. Thus, once again, we relied on marketing insights into product lifecycles and market evolution, in order to guide our expansions and optimize our factories. The benefits in performance of using marketing information in factory management are supported by empirical data (O'Leary-Kelly and Flores 2002). This enabled us to align factories with country-specific preferences, promptly address maturing cars, and effectively prepare facilities for discontinuations or new models slated for production, in coordination with R&D plans. Lastly, on the Societal level, leveraged by empirical data showing that sustainable practices improve operational performance (namely through cost reductions and efficiency boosts), we conducted green investments across scopes 1, 2 and 3 (El-Khalil and Mezher 2020).

2.3.2 Execution and Outcomes

We adopted the perspective of the Operational Performance Objectives to offer a comprehensive view of Enigma Motors' trajectory, obstacles and deviations from initial strategy (Appendix 19). In terms of Quality, we managed to outperform various competitors by providing full electrification infrastructure by Q11 and ensuring cars had at least one feature rated higher than its substitute. Our commitment to quality extended to our specialized staff across the whole fleet. Regarding Cost, we emphasized a cost-effective "facility layout" compatible with our long-term plans, maintaining multiple facilities for consistent high-volume production and economies of scale (Srinath 2022). Appendix 20 highlights our cost-saving initiatives, showcasing an average production cost reduction of 16% for each car over its lifecycle. The most significant reduction, a notable 54%, was achieved with our mass-produced City 75G. Conversely, we experienced a notable cost increase, driven by a sudden 71% drop in utilization, during Q19 for the Convertible E CII. We also harnessed economies of scope by producing diverse models within the Compact, SUV, and Convertible classes in the same country. These tactics, combined with cautious marketing, resulted in contribution margins largely above 25% amongst the majority of our

models, despite some challenges posed by our Diesel cars and aging models, as we may see from our declining contribution margins between Q15 and Q23 (Appendix 21).

Flexibility meant swiftly adapting our production lines to match country preferences, facilitating the introduction of vehicles in line with prevailing demand. In Q4, a pivotal moment, we reorganized production to optimize costs and tariffs. Compact cars were directed to Europe, where we leveraged economies of scale to reduce prices, and exportation tariffs to China. In China, we accommodated the preference for growth-stage vehicles like our Executive 135H. In the USA, we focused on premium models, catering to a less price-sensitive and sustainability conscious market. Furthermore, our expansion included reinforcing our presence in the USA in Q5 due to strong EV prospects and expanding into China in Q6 for lower staff and material costs. However, inaccurate demand estimations led to unnecessary expansions to the USA and China in Q9, resulting in underutilized facilities, inventory buildup, and suboptimal capital usage.

The Speed factor was exhibited in our rapid time-to-market – we launched roughly two models per year (Appendix 15). However, a too rapid manufacturing expansion led to over-capacity issues, similar to Toyota's issue in 2019, when it registered a 52% utilization rate (Doval 2019). To address this, we attempted to forcibly fill-in capacity, which introduced challenges like launching less-attractive Diesel models and accumulating an aging fleet. We also attempted to increase sales volumes through significant price reductions for the SUV E CII and Micro E CV in Q15 and Q14, but that only harmed the vehicles' margins (Appendix 21). By Q21, we recognized the adverse effects of this strategy and started ceasing our underperforming models in Q23, Q25 and Q27, thus sacrificing operational metrics to enhance our Value Added score.

Dependability relied on effective KPI monitoring, in particular for factory utilization and days of inventory. Strategies for managing inventory fluctuations involved adjusting advertising, temporarily halting production, or modifying prices. Learning curve effects, where efficiency improves with experience, impacted our operations both positively and negatively (Ungvarsky

2023). As observed, up to Q14, our factory utilization was notably affected by learning curve effects. During this period, we embarked on multiple factory expansions and reorganizations, and introduced several new car models. Consequently, this period coincided with an average quarterly utilization rate of 74%. Furthermore, the challenges related to excessive capacity began to surface in Year 3. This manifested in an average quarterly inventory exceeding 60 days, with notable peaks occurring in Q14 and Q16. Simultaneously, our utilization hovered around 70% each quarter. Some improvements were observed in Year 5 and 6 due to our discontinuation efforts. However, it was not until Q24 that we regained a 100% utilization rate, and by Q27, we managed to keep days of inventory below 60 days on average (Appendix 22 and 23).

Our Environmental initiatives are detailed in Appendix 7. In summary, Year 1's investments focused on cutting costs related to waste, water, and utilities (scope 1 and 2), but were mostly driven by our goal of accessing Green Bonds from the outset. In Year 2, we engaged in ISO14001/EMAS for legal compliance and cost control purposes (scope 1). Only by Year 5, we addressed scope 3 by choosing sustainable suppliers, as, by that time, the initiative was no longer competing for CAPEX with R&D.

2.4 Conclusions and Reflection

Our journey through the BiP program mirrored the dynamic automotive industry, enabling profound insights into the realm of strategic management.

Early on, grasping our SWOT emerged as a pivotal point, serving as the bedrock for our shared vision. As diverse perspectives emerged, our common vision helped us navigate intricate trade-offs. For instance, when confronted with overcapacity, we took the tough decision to relinquish factory utilization in favor of enhancing Value Added and achieving collective success.

Swiftly, it became clear that progress hinged on cross-departmental collaboration and an unwavering commitment to transparent communication and continual monitoring. Reflecting on

our journey, it is evident that each department extended its influence, ensuring that strategies garnered cross-departmental buy-in and involvement. Marketing provided on-the-ground data and detected market trends, while Innovation elicited insights from go-to-market strategies to analytical forecasts. Operations also broadened its influence by providing crucial information on utilization rates and days of inventory, which shaped R&D portfolio requirements and tailored marketing tactics. Finance diligently assessed the viability of investment plans and secured funding, and HR maintained constant contact to ensure that staffing met operational demands.

Market sensing emerged as a crucial facet, although data interpretation presented formidable challenges, exemplified by our experiences with Diesel cars and factory expansions. Remaining attuned to market evolutions underscored the importance of retaining dynamic capabilities. This demanded agile pivots, exemplified by our enthusiastic embrace of autonomous driving features and our rectification of errors, notably our ill-fated venture into Diesel cars. Our market-pull and lean manufacturing approaches underscored the value of agility and adaptability.

Moreover, our Triple Bottom Line investment approach proved rewarding. It facilitated access to green funding and yielded cost-saving benefits and productivity enhancements driven by Operations and HR initiatives. However, the prudent prioritization of R&D investments, coupled with the avoidance of excessive focus on sustainability initiatives in the early stages, propelled a complete electric infrastructure and cutting-edge features early on, which boosted EV adoption.

Nonetheless, our journey illuminated the dangers of a lack of focus. Our simultaneous pursuit of volume and variety in operations frequently presented conflicting objectives. Ultimately, we made the pragmatic choice to concentrate on our most profitable models, discontinuing underperforming vehicles, which enabled us to recover our top three position in the BiP program.

In conclusion, our journey underscores the significance of refining strategic acumen and embracing adaptability, while remaining committed to collective and sustainable success.

3. References

Baghani, Mehrdad. 1999. *The Alchemy of Growth Kickstarting and Sustaining Growth in Your Company*. London: Orion Business Books.

Barney, Jay B., and William S. Hesterly. 2015. *Strategic Management and Competitive Advantage Concepts and Cases, Global Edition*. 5th edition.

Brown, Jennifer Gerarda. 2012. "Empowering Students to Create and Claim Value through the Thomas-Kilmann Conflict Mode Instrument." *Negotiation Journal* 28 (1): 79–91. https://doi.org/10.1111/j.1571-9979.2011.00327.x.

Connaughton, Sue Ann. 2021. "Lean Manufacturing." *Salem Press Encyclopedia*.

Cooper, Robert, and Elko Kleinschmidt. 1993. "Stage Gate Systems for New Product Success." *Marketing Management* 1 (4): 20–29. https://www.researchgate.net/publication/283993873.

Cusumano, Michael A. 2010. *Staying Power: Six Enduring Principles for Managing Strategy and Innovation in an Uncertain World (Lessons From Microsoft, Apple, Intel, Google, Toyota and More)*. Oxford: OUP Oxford.

Doval, Pankaj. 2019. "Unutilised Capacity Haunts Car, SUV Companies as Demand Slows down - Times of India." *The Times of India*, 2019. https://timesofindia.indiatimes.com/business/india-business/unutilised-capacity-haunts-car-suv-cos-as-demand-slows-down/articleshow/69153762.cms.

El-Khalil, Raed, and Mohamad Ali Mezher. 2020. "The Mediating Impact of Sustainability on the Relationship between Agility and Operational Performance." *Operations Research Perspectives* 7: 100171. https://doi.org/10.1016/j.orp.2020.100171.

European Parliament. 2023. "EU Ban on Sale of New Petrol and Diesel Cars from 2035 Explained." European Parliament. 2023. https://www.europarl.europa.eu/news/en/headlines/economy/20221019STO44572/eu-

ban-on-sale-of-new-petrol-and-diesel-cars-from-2035-explained.

Ewing, Jack, and Clifford Krauss. 2023. “Falling Lithium Prices Are Making Electric Cars More Affordable.” *The New York Times*, March 20, 2023. https://www.nytimes.com/2023/03/20/business/lithium-prices-falling-electric-vehicles.html.

Gleeson, Brent. 2012. “4 Ways For Leaders to Make a Decision.” *Forbes*, November 7, 2012. https://www.forbes.com/sites/brentgleeson/2012/11/07/4-ways-for-leaders-to-make-a-decision/?sh=2ea732b64d4a.

Gochermann, Josef. 2022. *Technology Management: Recognizing, Evaluating and Successfully Using Technologies*. Wiesbaden, Germany : Springer.

Goleman, Daniel. 2006. *Emotional Intelligence : Why It Can Matter More Than IQ*. 10th edition. New York: Bantam.

Gostick, Adrian, and Scott Christopher. 2008. *The Levity Effect: Why It Pays to Lighten Up*. Hoboken, NJ, US: John Wiley & Sons, Inc.

Grenny, Joseph, Kerry Patterson, Ron McMillan, Al Switzler, and Emily Gregory. 2022. *Crucial Conversations: Tools for Talking When Stakes Are High*. 3rd edition. New York: McGraw-Hill Education LLC.

Haveman, Heather A., and Lynn Nonnemaker. 2000. “Competition in Multiple Geographic Markets: The Impact on Growth and Market Entry.” *Administrative Science Quarterly* 45 (2): 232–67. https://doi.org/10.2307/2667071.

Horwitz, Josh, and Brenda Goh. 2023. “Volkswagen Plans 10 More EV Models by 2026.” *Reuters*, 2023. https://www.reuters.com/business/autos-transportation/autoshow-volkswagen-plans-10-more-ev-models-by-2026-2023-04-18/.

Hughes, Rick, Andrew Kinder, and Cary L. Cooper. 2019. *The Wellbeing Workout: How to Manage Stress and Develop Resilience*. *The Wellbeing Workout: How to Manage Stress*

and Develop Resilience. Springer International Publishing. https://doi.org/10.1007/978-3-319-92552-3.

International Energy Agency. 2023. "Global EV Outlook 2023: Catching up with Climate Ambitions." www.iea.org.

Kay, Katty, and Claire Shipman. 2014. *The Confidence Code: The Science and Art of Self-Assurance-What Women Should Know*. EPub edition. New York: Harper Business. https://doi.org/10.1007/BF00454887.

Lafley, A.G., and Roger L. Martin. 2013. *Playing to Win: How Strategy Really Works*.

Lencioni, Patrick. 2002. *The Five Dysfunctions of a Team a Leadership Fable*. Jossey-Bass. San Francisco.

McBain, Sophie. 2018. "The New Cult of Perfectionism." *NEW STATESMAN*, May 4, 2018.

McKinsey&Company. 2016. "Automotive Revolution-Perspective towards 2030."

Motavalli, Jim. 2021. "Every Automaker's EV Plans Through 2035 And Beyond." *Forbes*, 2021. https://www.forbes.com/wheels/news/automaker-ev-plans/.

Noonan Hadley, Constance, and Mark Mortensen. 2022. "Do We Still Need Teams?" *Harvard Business Review*, April 26, 2022.

O'Leary-Kelly, Scott W., and Benito E. Flores. 2002. "The Integration of Manufacturing and Marketing/Sales Decisions: Impact on Organizational Performance." *Journal of Operations Management* 20 (3): 221–40. https://doi.org/10.1016/S0272-6963(02)00005-0.

Ranganathan, Janet, Laurent Corbier, Simon Schmitz, Kjell Oren, Brian Dawson, Matt Spannagle, Mike Mcmahon Bp, et al. n.d. "The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard."

Rogers, Everett M. 2003. *Diffusion of Innovations* . 5th edition. New York : Free Press.

Rothaermel, Frank T. 2021. *Strategic Management*. 5th edition. New York: McGraw-Hill

Education.

Rzeszucinski, Pawel. 2022. “Improve Your Business Judgment: Imposter Syndrome Versus The Dunning-Kruger Effect.” *Forbes Technology Council*, June 30, 2022. https://www.forbes.com/sites/forbestechcouncil/2022/06/30/improve-your-business-judgment-imposter-syndrome-versus-the-dunning-kruger-effect/?sh=1b3c285a297f.

Schafer, Markus. 2022. “Mercedes-Benz Strategy Update ‘Economics of Desire.’” LinkedIn. 2022. https://www.linkedin.com/pulse/mercedes-benz-strategy-update-economics-desire-markus-sch%C3%A4fer/.

Slack, Nigel. 2017. *The Operations Advantage: A Practical Guide to Making Operations Work*. London : Kogan Page.

Srinath, K. 2022. *Production and Operation Management*. Bengaluru : Laxmi Publications Pvt Ltd.

Statista. 2022. “China’s Rise to Economic Superpower.” Statista. 2022. https://www.statista.com/chart/27688/chinas-share-of-global-gdp-vs-the-us-and-the-eu/.

———. 2023a. “Electric Vehicles - Worldwide.” Statista. 2023. https://www.statista.com/outlook/mmo/electric-vehicles/worldwide.

———. 2023b. “Transportation Emissions Worldwide - Statistics & Facts.” Statista. 2023. https://www.statista.com/topics/7476/transportation-emissions-worldwide/#topicOverview.

Storto, C. Io. 2014. “A ‘value for Money’ Framework to Study Product Competitiveness in the Automotive Market.” *Journal of Engineering Science and Technology* 7.

Susskind, Lawrence E., Sarah McKearnen, and Jennifer Thomas-Lamar. 1999. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement*. Thousand Oaks, Calif : SAGE Publications, Inc.

Teece, David J. 2009. *Dynamic Capabilities and Strategic Management Organizing for*

Innovation and Growth. New York : Oxford University Press.

Timsit, Jean-Philippe, Annick Castiaux, Yann Truong, Gerard A. Athaide, and Richard R. Klink. 2015. “The Effect of Market-Pull vs. Resource-Push Orientation on Performance When Entering New Markets.” *Journal of Business Research* 68 (9): 2005–14. https://doi.org/10.1016/j.jbusres.2015.02.014.

UL Research Institutes. 2022. “Environmental Impacts of Lithium-Ion Batteries.” UL Research Institutes. March 16, 2022. https://ul.org/research/electrochemical-safety/getting-started-electrochemical-safety/environmental-impacts.

Ungvarsky, Janine. 2023. “Learning Curve Theory.” *Salem Press Encyclopedia*.

United Nations. 2015a. “THE 17 GOALS | Sustainable Development.” United Nations. 2015. https://sdgs.un.org/goals.

———. 2015b. “The Paris Agreement | UNFCCC.” United Nations - Climate Change. 2015. https://unfccc.int/process-and-meetings/the-paris-agreement.

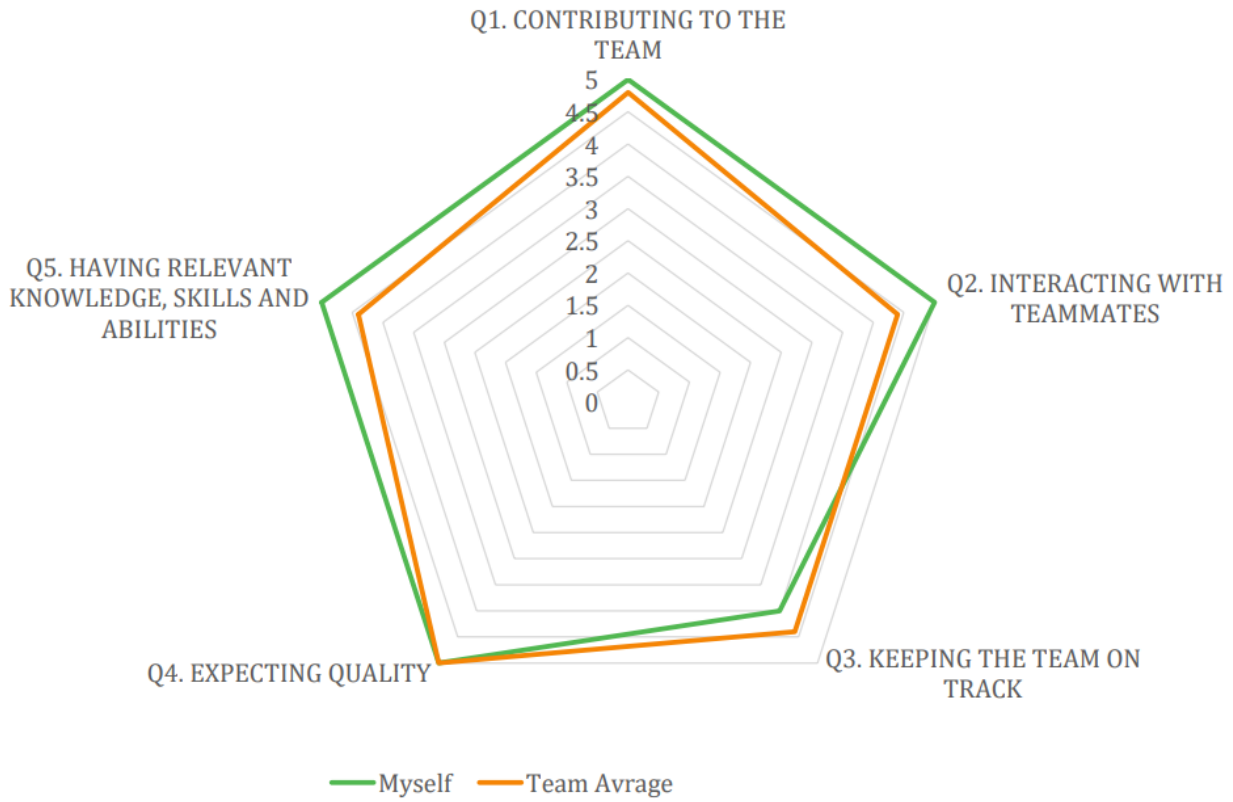
Urban Access Regulations. 2023. “Low Emission Zones EU.” Urban Access Regulation. 2023. https://urbanaccessregulations.eu/.

Visch, Jan, and Otto Laske. 2020. *Practices of Dynamic Collaboration - A Dialogical Approach to Strengthening Collaborative Intelligence in Teams*. Cham : Springer. http://www.springer.com/series/10101.

Wayland, Michael. 2022. “Why Toyota – the World’s Largest Automaker – Isn’t All-in on EVs.” CNBC. 2022. https://www.cnbc.com/2022/09/13/why-toyota-the-worlds-largest-automaker-isnt-all-in-on-evs.html.

4. Appendix

Appendix 1: Peer and Self-Assessment (Shared by the BiP team)



Appendix 2: PESTEL (Own Illustration)

POLITICAL	- The Paris Agreement is a pivotal binding international climate change treaty that influences the automotive sector - the second-largest carbon-polluting industry, contributing to 20% of global CO2 emissions (United Nations 2015b; Statista 2023b). - Trade tensions between USA and China, introducing tariffs and affecting pricing.
ECONOMICAL	- While direct access to market-specific price sensitivity data was unavailable, our inference from prevailing market preferences, such as China's inclination towards low-range city cars and the USA's preference for luxury models, coupled with China's burgeoning economic status vis-à-vis Europe and the USA, led us to ascertain that China was more price-sensitive, whereas the USA exhibited a lower sensitivity (Statista 2022). - Payment terms are an ongoing trend in the industry and have a key role in enhancing competitiveness. They encompass both customer credit and supplier terms.
SOCIAL	- Urbanization patterns steered a shift towards car-sharing services, a trend anticipated to unlock a 30% additional revenue potential by 2030 (McKinsey&Company 2016).

	- Growing societal emphasis on sustainability further accentuated the pertinence of electric vehicles (EVs) as a more ecologically mode of transport and spurred players like Enigma Motors to proactively address the United Nations' sustainable development goals (Statista 2023a; United Nations 2015a).
TECHNOLOGICAL	- Technological advancements are also crucial in driving cost reductions for EV batteries, enabling a potential decrease in the vehicles' selling prices (Ewing and Krauss 2023). - Democratization of connectivity and autonomous driving technology enhance the attractiveness of switching to electric vehicles.
ENVIRONMENTAL	- Environmental factors, delineated within the Greenhouse Gas Protocol, mandated rigorous standards for emissions accounting and reporting across scopes 1, 2, and 3 (Ranganathan et al., n.d.). - Environmental drawbacks associated with lithium-ion batteries acted as a potential barrier to EV adoption, heightening the urgency for industry players to adopt sustainable practices and align with evolving market expectations (UL Research Institutes 2022).
LEGAL	- Enforcement of government penalties on carbon emissions. - Combat against air pollution through regulatory measures such as low emissions zones and restrictions in urban access in Europe (Urban Access Regulations 2023). - Looming EU ban on the sale of Gas and Diesel cars by 2035 underscored the industry's imminent transition towards environmental neutrality (EU ban of gas and Diesel).

Appendix 3: Business Model Canvas – Snapshot of Q4 (Own Illustration)

KEY PARTNERS	- Component suppliers; Financial entities offering green bonds and loans (to note that early investments in sustainability aimed at securing green funding); Government collaborators offering CO2 goal subsidies and potential charging network investments; Distributors; Etc.
KEY ACTIVITIES	- Sales and Marketing; Car Design; Manufacturing; Development; R&D; Driven by a commitment to vertical integration.
KEY RESOURCES	- Experienced managerial team (4 managers per car line and roughly 71k employees). - Global manufacturing footprint (7 factories across China, the USA, and Europe). - Robust financing capacity and favorable credit rating. - Early investments in electrification (63% completion). - Brand trust/awareness (key to fuel facilitate new model introductions).

VALUE PROPOSITION	- The Value Proposition we offer strikes a balance between customer support and industry evolution. Our phased approach to EV adoption includes introducing hybrid cars followed by creating a complete electrification infrastructure and launching competitive EVs for the mass market, thus mitigating barriers for customer adoption. - We prioritize accessibility and innovation, ensuring our vehicles cater to a diverse array of segments. We strive for "value-for-money", providing competitive pricing alongside compelling features, particularly in range and connectivity. - Sustainability aligns with UN SDGs, but our commitment to prudent investments ensures sustainability without compromising contribution margins and selling prices.
CUSTOMER RELATIONSHIPS	- Our track record of quality cars instills trust and reliability. - Widespread availability and favorable credit terms enhance accessibility. - Our proactive market research underpins our customer centricity and enables us to anticipate trends and introduce models/ features aligned with customer preferences.
CUSTOMER SEGMENTS	- Mass market all across China, Europe and USA, spanning a high volume of consumers with diverse backgrounds and preferences. - Targeting the upper youth segment, characterized by medium to high purchasing power and a penchant for environmental consciousness and technological features.
CHANNELS	- Direct sales network; Print, TV campaigns, and point-of-sale advertising
COST STRUCTURE	- Car components; Raw materials; Personnel costs and training; R&D; Marketing and advertising; Fixed costs with manufacturing facilities and headquarters; Etc
REVENUE STREAMS	- Vehicle sales (primary stream); Post-sale services; Future car-sharing services; Government reimbursements for CO2 mitigation.

Appendix 4: Evolution of Enigma Motors' "Key Resources" (Own Illustration)

BEGINNING OF THE SIMULATION Q4	**END OF THE SIMULATION** Q28
- 71.000 factory staff - 7 factories across China, the USA and Europe - Credit rating "A-" - 63% completion of Electrification Infrastructure	- 130.000 factory staff - 13 factories across China, the USA and Europe - Credit rating "AA" - 100% completion of Electrification Infrastructure - Connectivity Level IV - Autonomous Driving Level IV

Appendix 5: Mission, Vision, Values

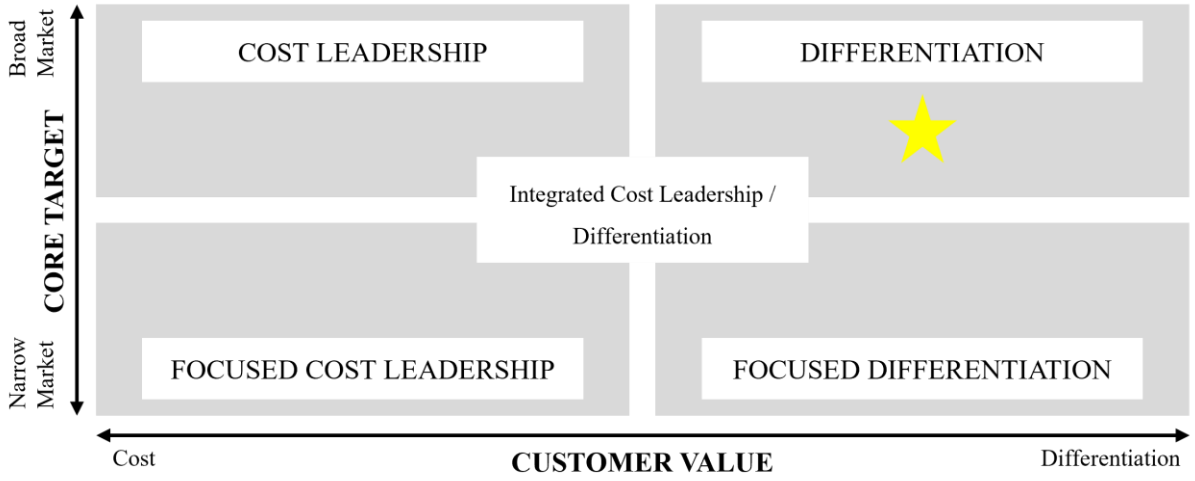
Mission - To empower a future where accessible EVs, complemented by the right infrastructure and cutting-edge technology, inspire individuals to embrace sustainable mobility and an eco-conscious future, at their own pace.

Vision - We envision a future where we dismantle obstacles to electrification and design vehicles to suit diverse needs. We are dedicated to seamlessly merging technology and infrastructure, ushering in a new era of mobility that champions sustainability and accessibility.

Values

- Democratization - We are committed to making electric mobility universally accessible. We provide a diverse range of solutions tailored to different backgrounds, offer flexible financing options, and take efforts to drive down costs to keep prices accessible, while upholding innovation and not compromising quality.
- Green Commitment - We shape the future through ethical and sustainable practices, strong partnerships, and ongoing enhancements. We uphold human rights and diversity, continually advancing our sustainability efforts and driving efficiency across the organization.
- Industry Evolution - We lead the automotive industry's transformation with innovative electric vehicle technologies and solutions. By investing in infrastructure and offering exciting features, we enhance the customer experience and drive the transition to electrification.
- Customer Focus - We actively engage with customers' needs, preferences, and feedback, integrating them into our product development and service offerings to create exceptional experiences.

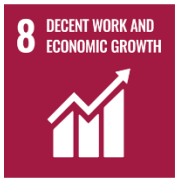
Appendix 6: Business-level Strategy (Adapted Illustration) (Barney and Hesterly 2015)



Appendix 7: Tackled UN SDGs from Q4-Q28 (Own Illustration) (United Nations 2015a)

Sustainability policy and awareness training to all our managers (HR initiative)

Investments in scope 2 – energy efficiency; install solar panels (Operations initiatives)



Improved employee satisfaction, reaching 98.6% at the end of Q28, through wage incentives, training and managing workload (HR initiatives)

Investment in "solid state expensive" battery; Full Electrification Infrastructure by Q11; Level IV connectivity and autonomous driving by Q11 and Q17 (Innovation initiatives)

Improved diversity metrics by roughly 7% points to up to 43.7%, through our manager hiring process (HR initiatives)

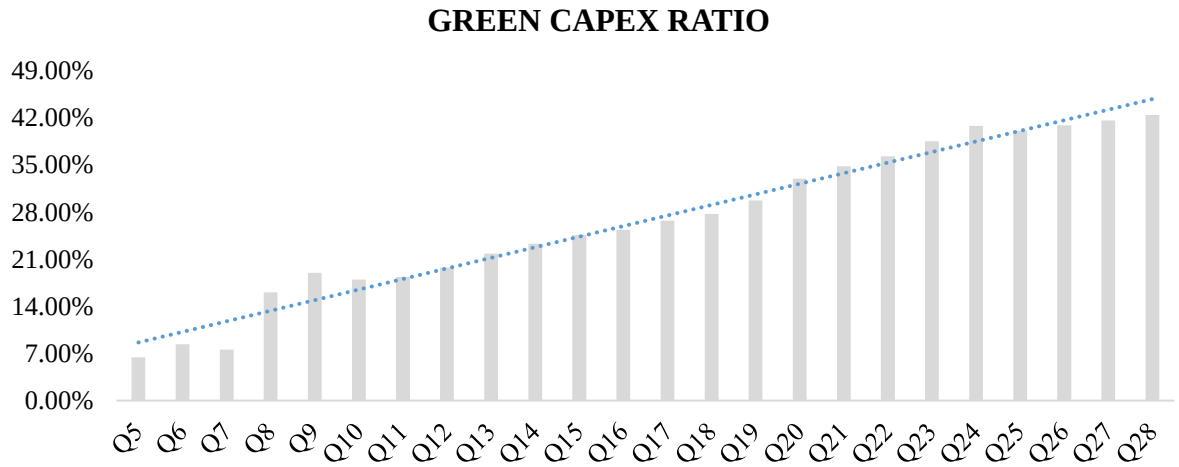
Acquisition of a car sharing company (Innovation initiative); Investments in scope 3 – choose sustainable supplier (Operations initiative)

Investments in scope 1 – water consumption and waste reduction; ISO14001 / EMAS (Operations initiatives); Creation of a sustainability policy (HR initiative)

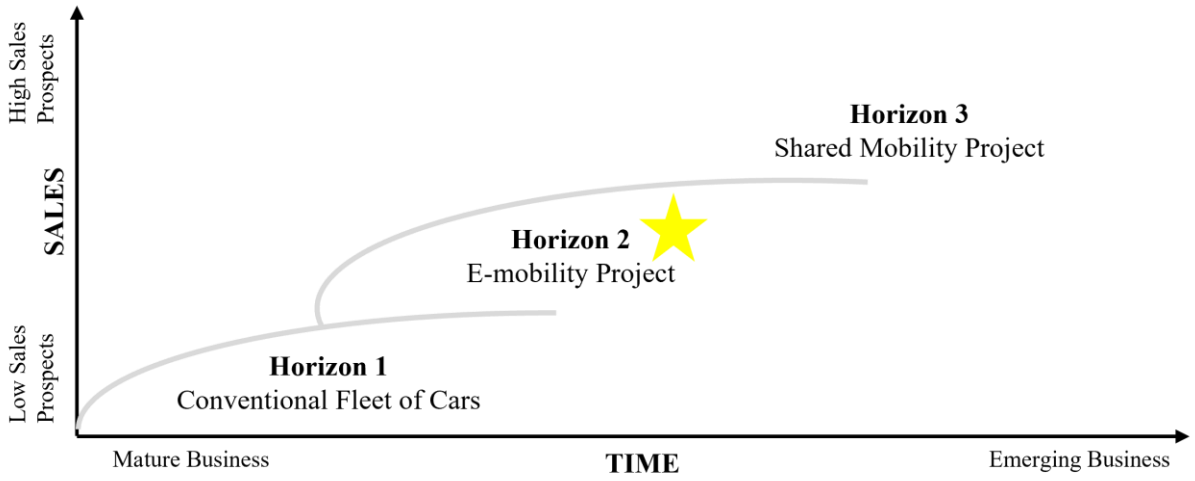
Reduction of fleet CO2 emissions to 0 by Q24 (Corporate initiative)

Investments in scope 1 – water consumption reduction (Operations initiative)

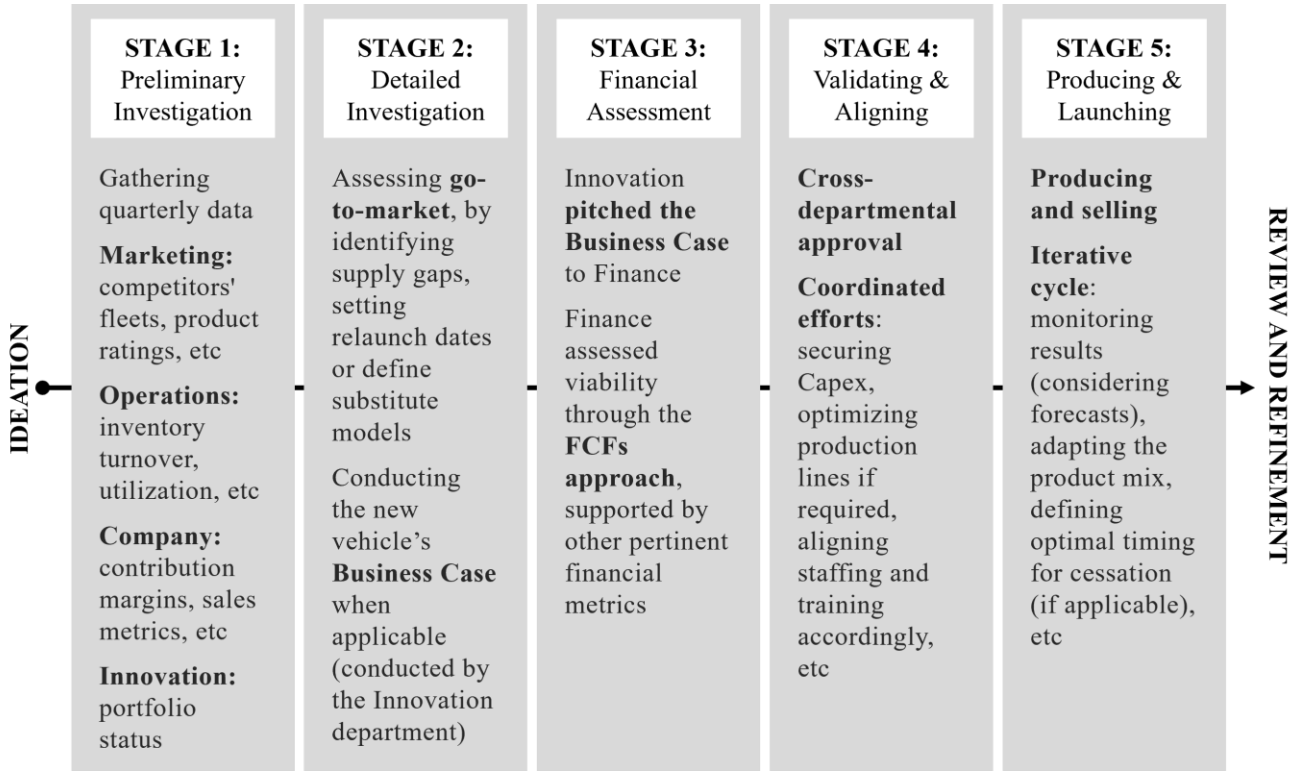
Appendix 8: Green Capex ratio (Own Illustration with Industry Masters' data)



Appendix 9: Three Horizons of Growth (Adapted Illustration) (Baghani 1999)



Appendix 10: Stage Gate Model (Adapted Illustration) (Cooper and Kleinschmidt 1993)



Appendix 11: Business Case - SUV E AIV CIV (Own Illustration)

	Q23	Q24	Q25	Q26	Q27	Q28
Executive E CV						
Sales Price	$70,000	$68,600	$67,228	$65,883	$64,566	$63,274
Sales (Optimistic)	7,500	13,200	14,520	14,738	14,959	15,183
Revenues (Optimistic)	$525M	$906M	$976M	$971M	$966M	$961M
Sales (Pessimistic)	7,500	9,600	10,560	10,718	10,879	11,042
Revenues (Pessimistic)	$525M	$659M	$710M	$706M	$702M	$699M
Actual Revenues	$443M	$822M	$869M	$948M	$1,023M	$1,107M

Assumptions

Sales – Sales units in Q1

Sales (Optimistic)	7500	Bug in the simulation – we sold 7500 units in the first quarter (Q1) regardless of the car/facility.
Sales (Pessimistic)	7500	

Sales – Sales growth rate in Q2

Sales (Optimistic)	10%	We applied these rates to a proxy, that we used to estimate sales for the second quarter (Q2). The proxy was usually a comparable car from a competitor.
Sales (Pessimistic)	-20%	

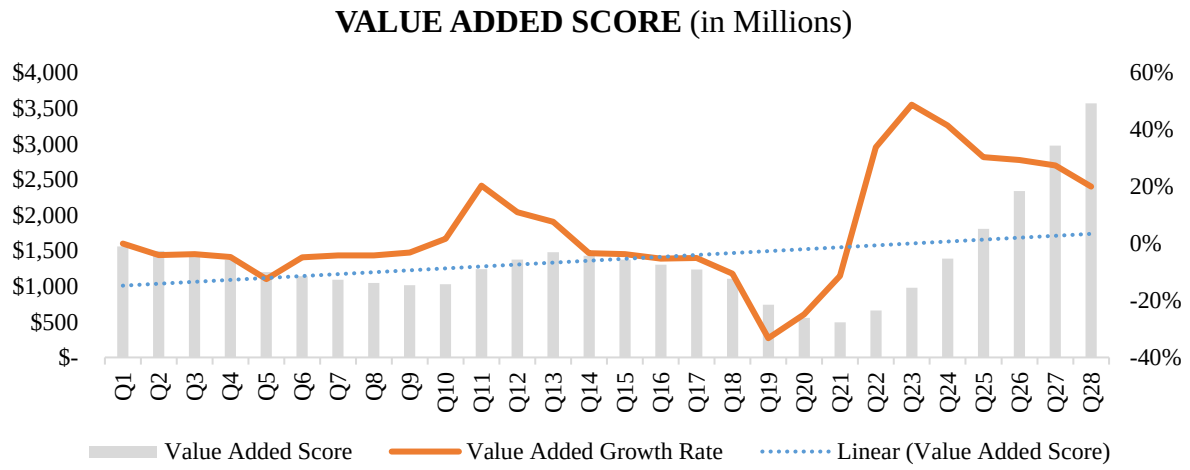
Sales – Sales growth rate from Q3 until maturity (according to product lifecycle)

Growth	10%	Q3
Maturity	2%	Q4 until Q11
Decline	-2%	Q12 until Q13

Price – Price growth rate from Q2 until maturity (assuming gradual price cuts)

Price	-2%	Price was set in the first quarter (Q1) based on Industry Masters' proposed price. Then we applied this rate to the remaining quarters.

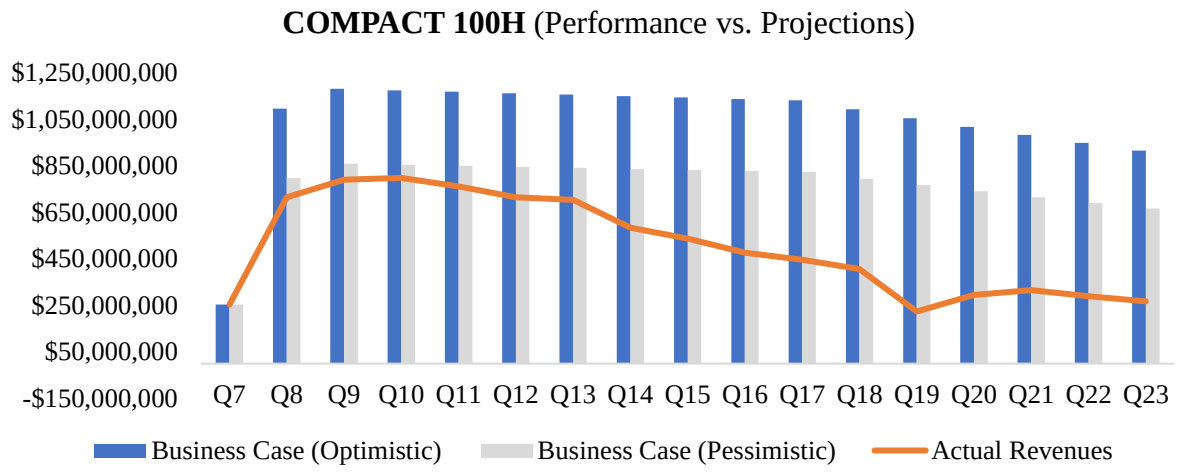
Appendix 12: Value Added Score (Own Illustration with Industry Masters' data)



Appendix 13: Portfolio of Technologies (Own Illustration)

	Capex	Start	Launch
Electrification			
E-drive Modules	$600,000,000.00	n/a	Q7
Home Charging	$300,000,000.00	Q7	Q9
High Power	$200,000,000.00	Q10	Q11
Connectivity			
Connectivity	$250,000,000.00	Q4	Q5
Infotainment	$160,000,000.00	Q5	Q7
Big Data	$150,000,000.00	Q7	Q9
Cross-Platform	$200,000,000.00	Q9	Q11
Autonomous Driving			
Parking	$500,000,000.00	Q9	Q11
Driver Assistance	$250,000,000.00	Q11	Q13
Cloud	$300,000,000.00	Q13	Q15
Infrastructure	$400,000,000.00	Q15	Q17

Appendix 14: Compact 100H Evolution (Own Illustration)



Appendix 15: Portfolio of Vehicles (Own Illustration)

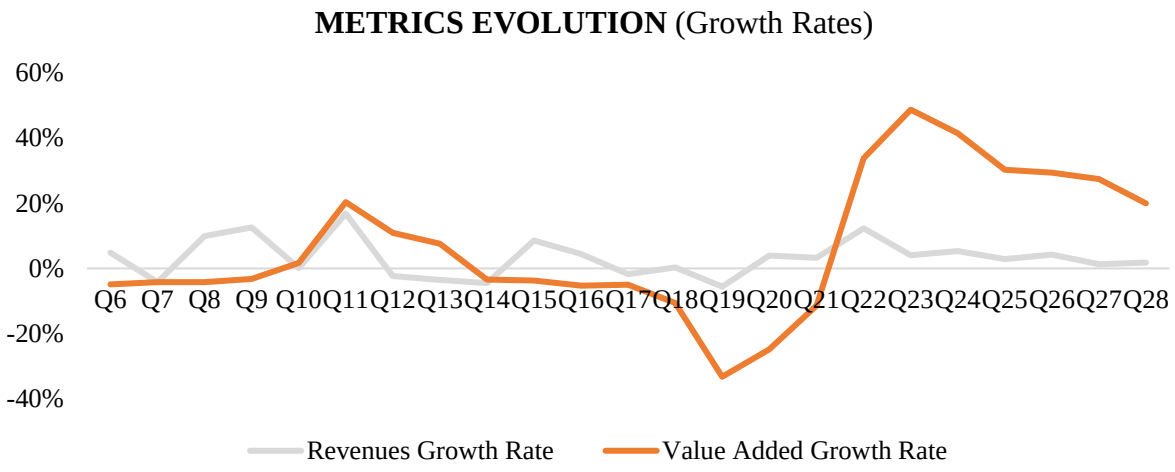
Vehicles' Timeline

	Launch	Relaunch	Discont.
City 75G	n/a	Q9	Q18
Air 135G	n/a	Q8, Q14	Q22
Biz 135D	n/a	n/a	Q15
4x4 100D	n/a	n/a	Q9
Lux 225H	n/a	Q12	Q16
Compact 100H	Q6	n/a	Q23
Executive 135H	Q7	n/a	Q22
Convertible E CII	Q9	Q23	n/a
SUV E CII	Q9	Q23	n/a
Executive E CV	Q13	n/a	n/a
Micro E CV	Q13	n/a	n/a
Lux E AII CIV	Q15	n/a	n/a
Compact Diesel	Q16	n/a	Q19
Executive Diesel	Q18	n/a	Q19
Compact E AII CIV	Q18	n/a	n/a
Convertible E AIV CIV	Q21	n/a	n/a
SUV E AIV CIV	Q22	n/a	n/a

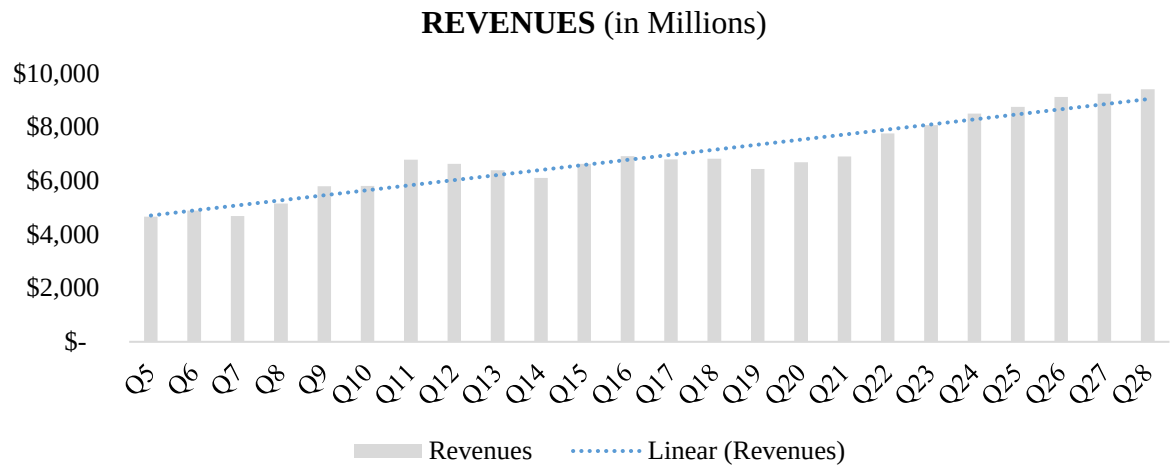
Vehicles' Characteristics

	Class	Motor	Design	Engine	Safety	Extras	A. D.	Con.	Range
City 75G	Comp.	Gas	Urban	75KW	8AB	Entert.	n/a	n/a	n/a
Air 135G	Conv.	Gas	Elegant	135KW	D. A.	Navig.	n/a	n/a	n/a
Biz 135D	Execut.	Gas	Elegant	135KW	12AB	Entert.	n/a	n/a	n/a
4x4 100D	SUV	Diesel	Offroad	100KW	4AB	Radio	n/a	n/a	n/a
Lux 225H	Luxury	Hybrid	Elegant	225KW	D. A.	Navig.	n/a	n/a	n/a
Compact 100H	Comp.	Hybrid	Elegant	100KW	D. A.	Navig.	n/a	n/a	n/a
Executive 135H	Execut.	Hybrid	Elegant	135KW	12AB	Entert.	n/a	n/a	n/a
Convertible E CII	Conv.	Electric	n/a	n/a	n/a	n/a	I	II	Short
SUV E CII	SUV	Electric	n/a	n/a	n/a	n/a	I	II	Ext.L.
Executive E CV	Execut.	Electric	n/a	n/a	n/a	n/a	I	IV	Ext.L.
Micro E CV	Micro	Electric	n/a	n/a	n/a	n/a	I	IV	Long
Lux E AII CIV	Luxury	Electric	n/a	n/a	n/a	n/a	II	IV	Ext.L.
Compact Diesel	Comp.	Diesel	Elegant	100KW	D. A.	Navig.	n/a	n/a	n/a
Executive Diesel	Execut.	Diesel	Elegant	135KW	A. C.	Navig.	n/a	n/a	n/a
Compact E AII CIV	Comp.	Electric	n/a	n/a	n/a	n/a	II	IV	Long
Convertible E AIV CIV	Conv.	Electric	n/a	n/a	n/a	n/a	IV	IV	Ext.L.
SUV E AIV CIV	SUV	Electric	n/a	n/a	n/a	n/a	IV	IV	Ext.L.

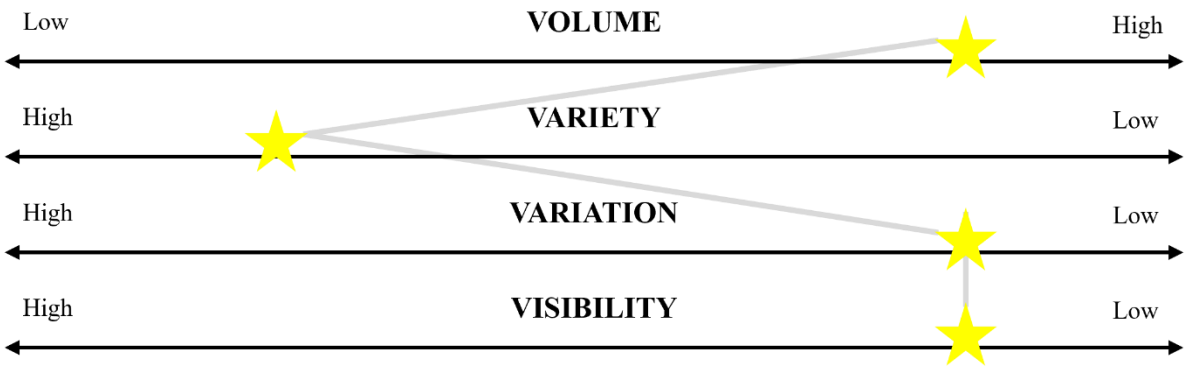
Appendix 16: Revenues and Value Added (Own Illustration with Industry Masters' data)



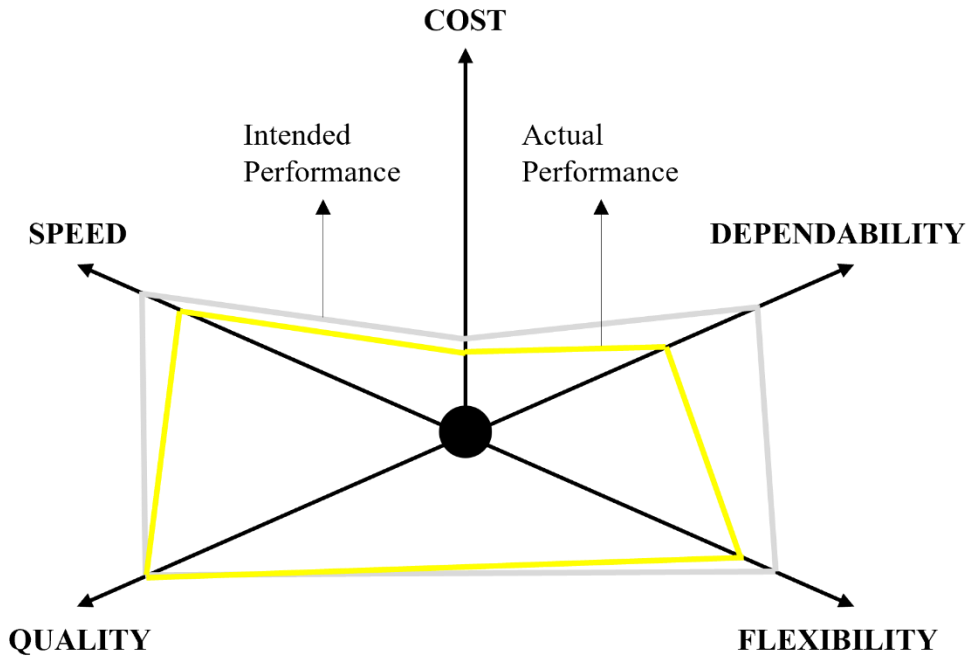
Appendix 17: Revenues (Own Illustration with Industry Masters' data)



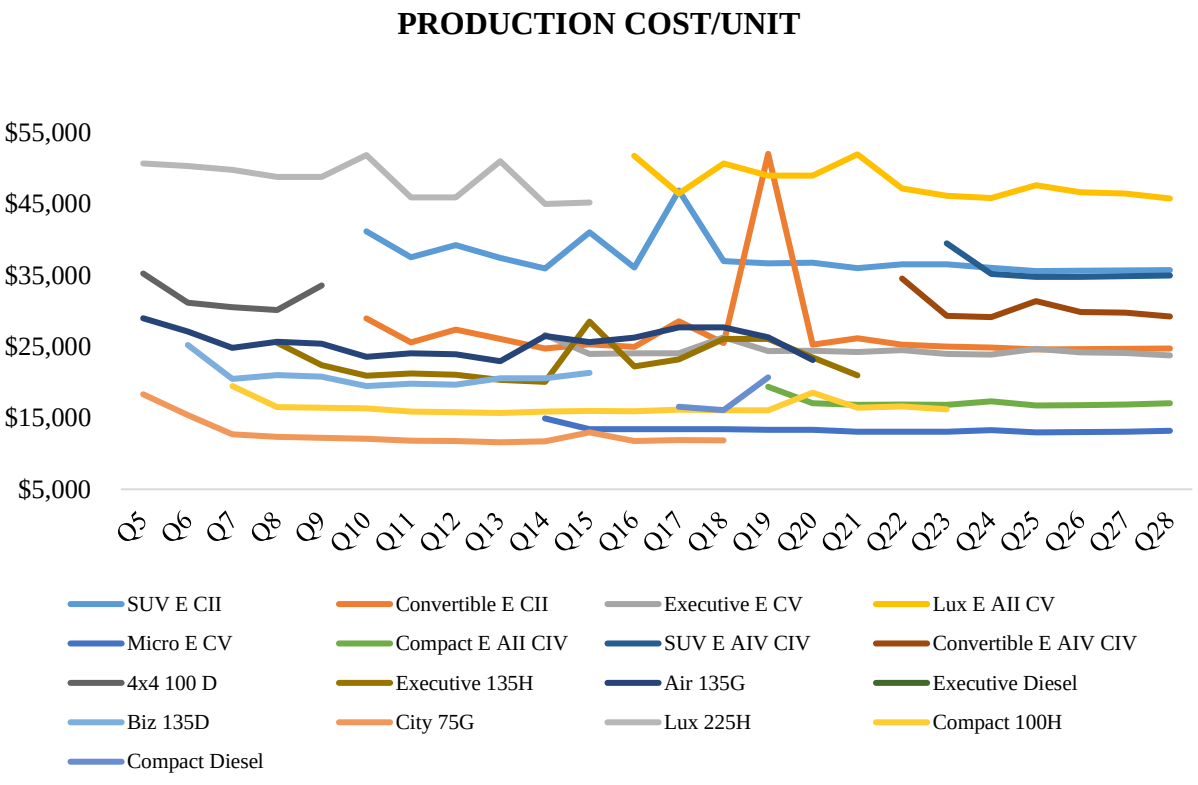
Appendix 18: 4V's Framework (Own Illustration)



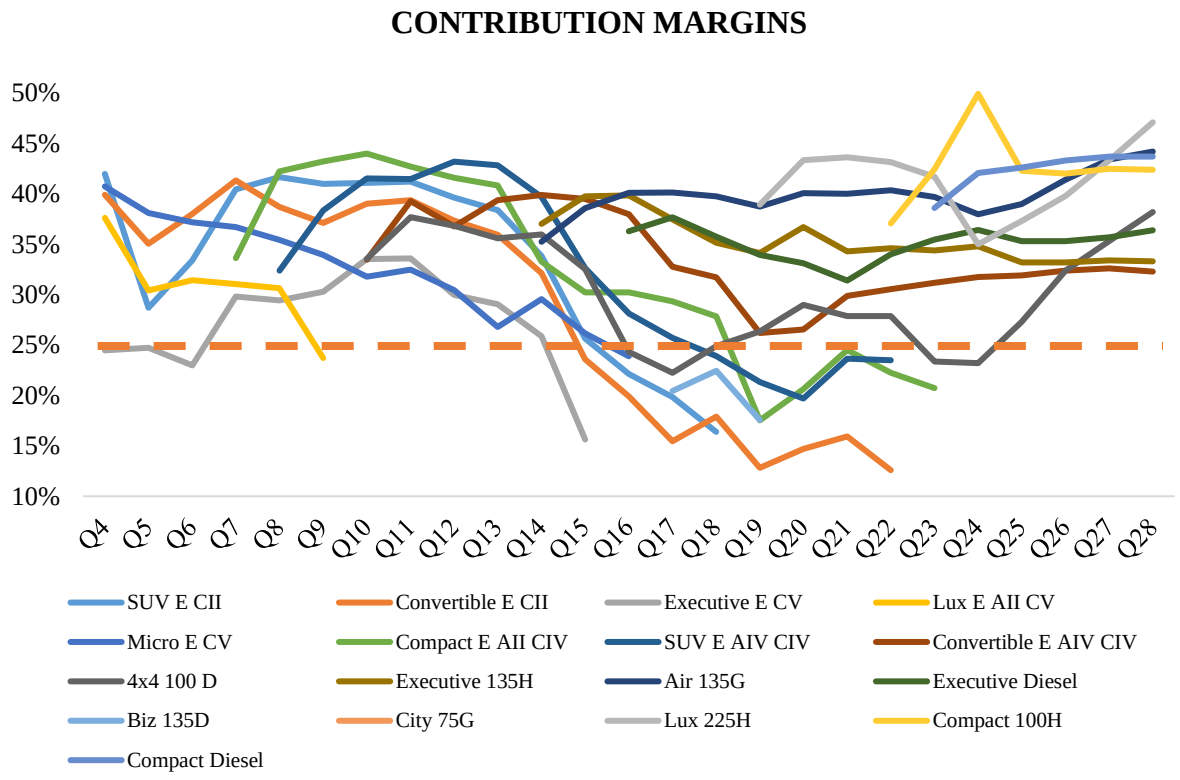
Appendix 19: Operations Performance Objectives - Polar Diagram (Own Illustration)



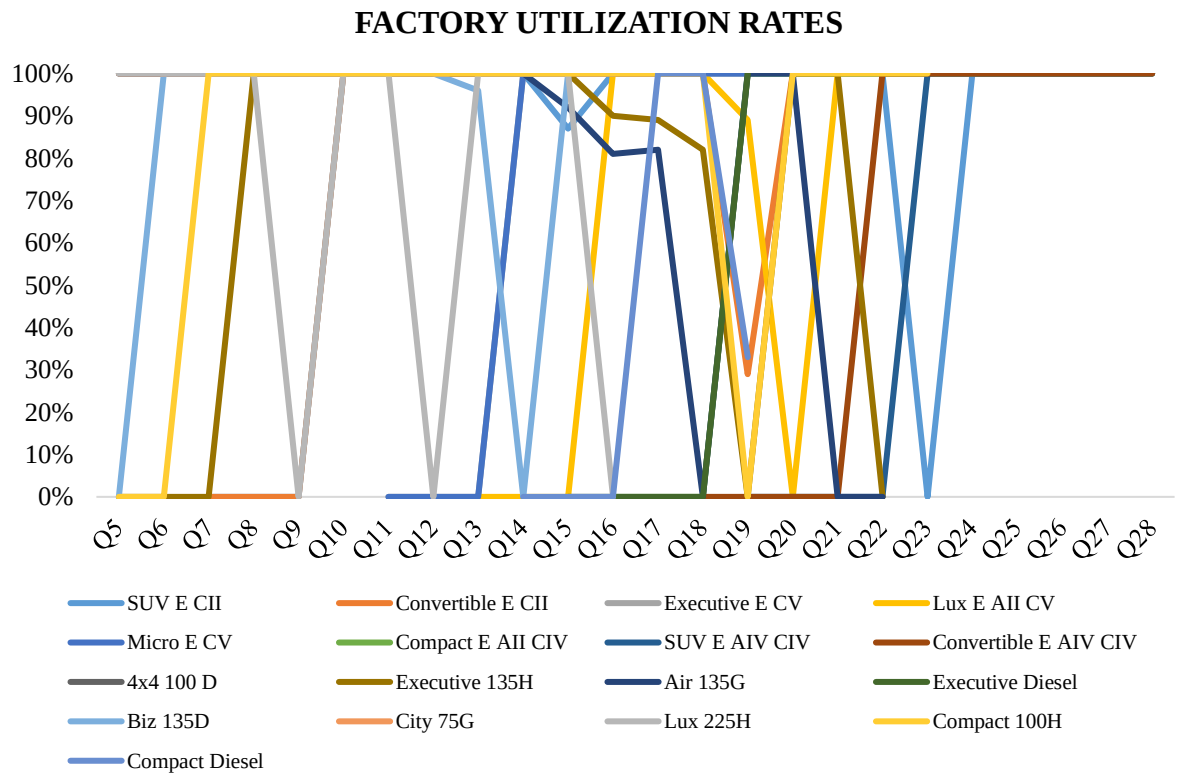
Appendix 20: Production Cost/Unit (Own Illustration with Industry Masters' data)



Appendix 21: Contribution Margins (Own Illustration with Industry Masters' data)



Appendix 22: Factory Utilization (Own Illustration with Industry Masters' data)



Appendix 23: Days of Inventory (Own Illustration with Industry Masters' data)