A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

BUSINESS IN PRACTICE

EXPLORING ACE'S ELECTRIFICATION JOURNEY: A CROSS-FUNCTIONAL BUSINESS REVIEW AND REFLECTIONS ON SELF-DEVELOPMENT

NICK PABST

Work project carried out under the supervision of:

João Miguel Nogueira de Matias, Baptista

09/09/2025

Abstract

The automotive industry is undergoing a profound shift from combustion engines to electric vehicles, driven by regulatory pressure to reduce emissions and the need for innovative forms of mobility. This paper analyzes the electrification journey of the car manufacturer Ace within the Business in Practice simulation using a cross-functional analysis of the innovation, operations, and finance departments. In addition, a personal reflection addresses two noteworthy incidents that happened throughout the three-week simulation. While the analysis highlights the impact of innovation investments and capacity utilization on performance, the reflection underscores the importance of leadership and adaptability in team dynamics.

Keywords

Business Simulation, Automotive Industry, Electrification, Innovation, Operations, Financial Performance, Cross-Functional Management, Sustainability and ESG, Reflective Practice, Leadership, Team Dynamics

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. FIRM ANALYSIS

1.1. Introduction to Ace and the structure of this section

The global automotive industry is experiencing radical change due to significant environmental, technological, and economic forces at an unprecedented pace (Deloitte 2025). One of the major forces is the shift from internal combustion engines (ICE) to electric vehicles (EV). This transition from ICEs to EVs addresses the current energy and climate crisis and secures the future of the energy economy. Road transport directly accounts for about 16% of global CO2 emissions (IEA 2023). In light of this, the European Commission created Regulation 2019/631, which sets a target to reduce emissions from new cars by 55% by 2030 and achieve zero emissions by 2035 (European Union 2023). Yet, addressing such transitions requires more than just technological change.

Firms must develop adaptability, reconfigure their product platforms, and manage financial and operational dependencies (Wells and Nieuwenhuis 2012).

In this complex and evolving landscape, Ace began the *IndustryMasters*® simulation with six models across Europe, Asia, and America, with nearly half its revenue still tied to combustion and hybrid vehicles. To manage the ongoing shift toward e-mobility, the company's new board launched a major transformation initiative. By 2024, EV sales reached more than 17 million units worldwide, representing over 20% of total global car sales. Sales growth slowed slightly between 2024 and 2025; however, improvements in technology, sustainability initiatives, and changing consumer tastes should support continued growth (IEA 2025). Given these developments, Ace enacted a transition away from gasoline to fully electric, zero-emissions vehicles throughout its entire portfolio through a process of innovation-based restructuring and re-alignment of operations. This report analyzes Ace's salient strategic decisions, made in innovations, operations, and financing, in a six-year simulation using academic frameworks, simulation data, and real-world industry comparisons. It also identifies critical missteps, as well

as critical thinking of the decisions, and the cross-functional nature of decisions, underscoring the interconnectedness of business functions in the automobile industry today and the sustained volatility existing in the marketplace.

1.2. Review of Functional Areas: Innovation

For Ace, the innovation department played an essential role in accelerating the transition toward a fully electric vehicle (EV) portfolio. Innovation is defined as the generation of new ideas, products, or processes, and it is a critical component for navigating change within a dynamic business environment (McKinsey & Company 2022). One influential perspective on innovation is Schumpeter's theory of creative destruction, which posits that innovation in technology and market strategy disrupts existing market structures and replaces outdated technologies (Tülüce and Yurtkur 2015). Tesla's introduction of over-the-air (OTA) software updates is a prime example of this, giving them a competitive edge and setting a new industry standard while other car manufacturers were slower to adopt similar innovations (Wu 2023). Although the development of a competitive product portfolio remains central to innovation, reinforcing research and development (R&D) capabilities, refining production processes, and fostering cross-functional collaboration are equally vital (van der Panne, van Beers, and Kleinknecht 2003).

Within this context, the following section critically evaluates Ace's innovation strategy, product development, and R&D activities throughout the six-year simulation, while also examining cross-functional collaboration and identifying key shortcomings.

1.2.1. Innovation Strategy: Laying the Foundation for Electrification

For Ace to transition its portfolio to full electrification, the company had to enter an existing market with new EVs. Literature suggests that critical mass is important for self-sustaining adoption, meaning that a product has penetrated its market sufficiently for the product to have momentum and not rely on significant external force. Rogers, Singhal, and Quinlan (2019)

point out that this critical mass occurs at roughly 10-20% market penetration, marking the transition from early adopters to the early majority (see Figure 1). To reach this threshold, companies must first attract innovators and early adopters, who together represent about 13.5% of the total market. Pamidimukkala et al. (2024) confirm the importance of this segment within the EV market, as it attracts environmentally conscious and technology-driven early adopters.

Ace's innovation strategy addressed this opportunity with a quick and regional approach. The overall objective was to electrify the entire fleet within 3 years by attracting early adopters and building momentum in key regions. This required close coordination with the finance and operations departments to ensure that budgets for R&D investments were available and that production facilities were ready when needed. A study on leadership in electric vehicles shows that companies can gain a first-mover advantage by entering markets early, gaining market share, and shaping the dynamics of the industry before competitors can react (Liu, Boothman, and Graham 2025). To achieve this, Ace offered vehicles that matched regional demand: mid- to high-priced vehicles in Europe and America to align with purchasing power and sustainability preferences, and lower-cost micro EVs in Asia to align with price sensitivity and volume-driven adoption. Tsougkou et al. (2024) emphasize that adaptation to match local market needs significantly enhances performance in multinational contexts.

While Ace's strategy positioned the company as an aggressive first mover, it also implied a degree of managerial short-termism. The firm viewed fleet electrification as an end in itself, rather than as the starting point for an ongoing process of renewal. Despite Ace's significant cash holdings, management decided not to further invest in R&D, assuming that initial innovation alone would sustain future improvements. This short-term performance within the six-year horizon caused Ace to misallocate resources, which reduced the company's ability to compete in the long term. In their concept of the "myopia of learning," Levinthal and March (1993) illustrate that firms that overexploit existing innovations and do not consolidate with

further exploration undermine access to future adaptability in rapidly changing markets. Ace's challenges with innovation stemmed from strategic mismanagement and a myopic approach, rather than from resource constraints. This short-term perspective led to insufficient reinvestment, undermining Ace's ability to sustain long-term competitiveness.

1.2.2. Product Development: Sequenced Product Launch Strategy

Over six years, Ace introduced 7 new vehicles, investing a total of about $6.0B (see Figure 2). Decisions on product launches followed a customer-centric approach, supported by market research and close coordination with the marketing and operations departments to align production with regional demand. The innovation team also evaluated cannibalization risks, where new EVs could reduce profits from existing models, based on portfolio theory (Haynes, Thompson, and Wright 2014). To mitigate this, Ace reviewed contribution margins and life cycle stages to time the introduction of new EVs.

The initial EV launches, Fuego and Fuji, marked a shift from ICEs and hybrids. Fuego targeted the mid-market in Europe, replacing the Business 135H, while Fuji, a minimalist micro-EV for China, embodied Ries' (2011) minimum viable product concept. Discontinuing the hybrid Business 135H reinforced brand coherence and strategic clarity (Yeboah 2023).

By the middle of the third year, Ace had introduced premium EVs, particularly in America, where high margins and existing production capacity supported cost-effective expansion. In Q14, the fleet was fully electrified, cutting emissions to zero (see Figure 3) and advancing the company's carbon neutrality goals.

Although Ace completed its electrification ahead of schedule, the company failed to adequately renew its product pipeline in subsequent years, despite launching the Pico in Q18 as a partial corrective measure. As Danneels (2002) emphasizes, competitive advantage requires continuous renewal, a lesson Ace overlooked, resulting in stagnating sales growth and a weakened market position.

1.2.3. R&D and Sustainability: Driving Innovation for a Greener Future

Ace invested $1.8B in technological innovation (see Figure 4), following a dual-phase approach based on March's (1991) theory of organizational ambidexterity.

In the exploration period (Years 1-3), Ace concentrated on developing innovative capabilities, with most of the investment taking place in the first year. Some of the major investments involved Sodium-Ion Batteries to achieve lower material costs and AI Implementation to make drivers safer, allow predictive maintenance, and provide personalized in-car experiences. Additionally, the Power Charging Network joint venture launched in Year 2 expanded charging infrastructure and illustrated Chesbrough's (2003) open innovation model, which emphasizes external collaboration to accelerate adoption and reduce costs.

From Year 4 onwards, Ace entered the exploitation phase, capitalizing on existing capabilities without making further R&D investments. In hindsight, this inhibited the company's ability to revitalize or differentiate offerings, which led to lower sales and operational inefficiencies (see Figure 5). This finding reflects Ace's managerial short-termism, where initial exploration was not followed by sustained reinvestment, limiting adaptability in later years (Levinthal and March 1993; Marginson and McAulay 2007).

1.3. Review of Functional Areas: Operations

Operations were central to Ace's competitiveness in the premium EV market. As Donald Rumsfeld once remarked, "Think ahead. Don't let day-to-day operations drive out planning." (U.S. Department of Defense 2001). While originating from a political context, this principle captures a central tension in operations management: balancing immediate execution with long-term strategic alignment (Slack, Brandon-Jones, and Johnston 2013). Reflecting this, Ace pursued a distinctive operations strategy shaped by clear performance objectives and trade-offs. The following section evaluates its effectiveness and provides a cross-functional perspective on integration with other key business functions.

1.3.1. Operations strategy: Ace's Premium EV Playbook

Ace's operations approach played a vital role in aligning internal processes and resources with its long-term objectives to support the implementation of its corporate strategy. A clear operations strategy enabled Ace to move beyond short-term concerns, such as inventory fluctuations and immediate cost-control measures, and instead focus on building competitive capabilities that are difficult to replicate (Krajewski, Malhotra, and Ritzman 2021). Ace strategically concentrated on low-volume, high-variety production by employing the 4V framework, which encompasses Volume, Variety, Variation, and Visibility (Slack, Brandon-Jones, and Johnston 2013, 23–27). The company intentionally prioritized this approach to emphasize premium, customer-centric features while maintaining a strong commitment to sustainability (see Figure 6).

This approach aligned with Ace's overarching goal of differentiation in the premium EV segment, where customers value innovation and environmental responsibility and are willing to pay a premium for such attributes (Hertzke et al. 2025). Comparable real-world examples include Lucid Motors, which maintains low volumes to ensure advanced technological features and customization (Lucid Group, Inc. 2024), and Porsche's Taycan line, blending premium quality and flexibility at a smaller scale (Porsche AG 2025).

Ace adapted a flexible and differentiated approach suited for the uncertain EV market. As Tisdell and Seidl (2004) highlight, low-volume production is inherently efficient in niche markets where product differentiation and brand value outweigh the efficiency gains of scale. However, this limits cost advantages from economies of scale in favor of premium pricing and brand strength.

Ace's diverse product portfolio (see Figure 7) increased production complexity, addressed through geographically distributed plants in Europe, China, and the USA for regional

responsiveness. Proactive monitoring of tariffs, regulations, and innovation-driven launches allowed Ace to adapt operations to dynamic market conditions, thereby supporting flexibility.

1.3.2. Performance Review and Implementation of Operations Strategy

The foundation of Ace's operating performance was the trade-off model introduced by Skinner (1969) and later revised by Slack, Brandon-Jones, and Johnston (2013), which argues that organizations must sacrifice some performance objectives to excel in others. In line with this, Ace prioritized quality, flexibility, sustainability, and cost management, accepting trade-offs in areas such as speed of delivery and economies of scale (see Figure 8).

Performance is assessed using key operational indicators, including factory utilisation, inventory levels, and unit costs, to evaluate the results and trade-offs of its strategy. Factory utilization shows if more capacity is needed or if excess capacity should be reduced. Higher utilization spreads fixed costs over more units, lowering unit costs. Utilization near 100% may signal the need for capacity expansion or production limits. In capital-intensive industries such as automotive manufacturing, a rate of 80-90% (Krajewski, Malhotra, and Ritzman 2021) balances responsiveness and asset use. Ace's average factory utilization rate of 90% is in line with this benchmark yet appears exceptionally high compared to the industry average of 67% in mid-2025 (Board of Governors of the Federal Reserve System 2025), suggesting unusually steady demand or aggressive utilization management in strong EV market conditions. However, this stability was disrupted in Q18 when the discontinuation of two models and an inventory buildup decreased utilization to 56%, as illustrated in Figure 9. This demonstrates the vulnerability of flexible operations to forecast errors and portfolio shifts.

Effective inventory management encompasses strategic decisions regarding purchasing, distribution, and logistics to ensure the timely and cost-efficient availability of materials (Silver, Pyke, and Thomas 2016), thereby directly affecting storage costs, obsolescence risk, and supply chain agility. Hendricks, Singhal, and Zhang (2008) note that announcements of excess

inventory are typically followed by negative stock market reactions, underscoring the critical importance of effective inventory management for firm performance. A key performance metric for Ace was days of inventory outstanding (DOI), which measures how quickly inventory is converted into sales. Automotive industry targets typically range from 55 to 65 days (S&P Global Mobility 2022) but vary widely. Fully EV makers like Tesla reported 15 days in Q4 2023 (Tesla, Inc. 2024), while BMW averaged 73 days (BMW AG 2024), illustrating the agility gap between EV specialists and traditional original equipment manufacturers (OEMs).

Over the six-year period, Ace's DOI fluctuated significantly, peaking at 67 and 69 days in Q8 and Q17, respectively, reflecting overproduction relative to demand (see Figure 10). These peaks stemmed from overestimated demand for new models such as the Bromo, capacity expansions, and reluctance to adjust pricing strategy. Extended holding periods tied up capital, raised risks, and reduced responsiveness, while swings in production increased unit labour costs by spreading fixed expenses over fewer vehicles. In Q18, reduced output pushed unit labour costs to $32.71k, underscoring the sensitivity of labor cost efficiency to production scale (see Figure 11).

1.3.3. Sustainability in Operations: Balancing Emission Reductions and Cost Control

Research demonstrates that incorporating sustainability into operations improves efficiency, quality, and delivery performance while maintaining long-term competitiveness (El-Khalil and Mezher 2020; Esfahbodi, Zhang, and Watson 2016, 354). Reflecting this, Ace invested $1.8 billion over six years in initiatives across all three greenhouse gas (GHG) Protocol scopes, reinforcing environmental responsibility and competitive differentiation (see Figure 12). In the early years of the simulation, the company prioritized reducing Scope 1 and 2 emissions, resulting in a 52.3% reduction in carbon emissions for Scope 1 and a 71.4% reduction for Scope 2 (see Figures 13 and 14). After, the company shifted its focus toward Scope 3 investments to

reduce upstream and downstream value-chain emissions (see Figure 15). Nevertheless, crucial investments such as the ISO 14001/EMAS certification were postponed due to cost reduction measures, which were prioritized over additional sustainability investments in the later years. Ultimately, Ace's prioritization underlines the inherent trade-offs of the company's low-volume, high-variety strategy.

1.3.4. Cross-functional Review: Aligning Operations with Key Business Functions

To achieve its operational objectives, Ace's operations management collaborated closely with the other departments. Turkulainen and Ketokivi (2012) state that cross-functional integration among key departments, such as operations, marketing, and innovation, enhances coordination, information flow, and overall performance.

Demand volatility posed a significant challenge. Although marketing forecasts guided production, inaccuracies and innovation delays created instability that disrupted operations. This instability increased HR costs due to rapid staffing changes and required financial resources to offset inefficiencies.

Sustainability initiatives also highlighted interdependencies. Operations needed new workforce capabilities to deliver Scope 1–3 emission reductions, which HR supported through sustainability skill development.

Finally, achieving a balance between cost and flexibility required a joint effort. HR bore the $1.1 billion expense of staffing adjustments, while Finance evaluated the long-term viability of operational trade-offs. Through this interplay, operations could only achieve flexibility without undermining cost efficiency.

1.4. Review of Functional Areas: Finance

The finance department was crucial for Ace in allocating resources, managing risks, and maintaining strategic flexibility during the transition phase. In particular, in times of change, such as major strategic shifts or growth requiring high capital expenditure, the finance

department plays an important role in balancing short-term liquidity needs with long-term value creation (Myers 2001). Thus, the following review examines Ace's financial position, liquidity, working capital management, capital structure, and the use of green bonds.

1.4.1. Financial Performance Analysis of Ace: From Stagnation to Recovery

Ace's financial performance over the six-year period was shaped by its strategic decision to pursue rapid fleet electrification, a move that necessitated substantial operational restructuring. This transformation placed pressure on revenues, which nevertheless grew from $18.24 billion in FY2024 to $25.28 billion in FY2030, corresponding to a compound annual growth rate (CAGR) of 5.59% (see Figure 16).

However, from FY2024 to FY2027, the company experienced stagnating revenues and declining profitability. Early EV launches, such as the Fuego and the Fuji, entered an immature market and required time to achieve substantial growth. Meanwhile, net income declined from $2.84 billion to $1.35 billion due to restructuring inefficiencies and increased costs. Revenues temporarily increased by 19% in FY2027 compared to FY2026 (see Figure 16), primarily due to the popular Bromo and Nevado models. Together, these models generated nearly $7 billion in sales, accounting for almost one-third of total revenues. Although revenues rose significantly in FY2027, profitability continued to decline, with net income falling to $1.13 billion. This highlighted that top-line growth did not translate into sustainable financial performance.

These difficulties intensified in FY2028, when suboptimal receivables management delayed payments, charging infrastructure remained insufficient, and the discontinuation of the still-profitable 4x4 E reduced revenues by $2.5 billion and profit contribution by $565 m. Together, these factors pushed net profit margins down sharply from 15.6% in FY2024 to just 4.1% in FY2028 (see Table 1).

Following this downturn, Ace recovered from its net profit margin in the two last years, resulting in a net profit margin of 14.98% in FY2029 and 13.42% in FY2030 (see Table 1).

Compared to major automotive companies, which achieved a median net profit margin of around 6% in FY2024, Ace's margin appears rather exceptional (see Table 2). This margin improvement was predominantly driven by the company's American premium EV models, which achieved an average net profit margin of 36.16% in FY2029 and FY2030. Furthermore, the Pico, the most recently launched vehicle, contributed over $2 billion in profit, thereby further contributing to the recovery in revenue and profit growth over the past two years. By the end of FY2030, Ace had successfully transitioned from a period of initial stagnation and deterioration in profitability to a more robust and resilient business model, exhibiting a recovery in net profit margins.

1.4.2. Liquidity and Working Capital Management: Robust Ratios, Weak Utilization

Effective liquidity and working capital management are crucial for maintaining business operations and meeting short-term obligations, especially in capital-intensive and cyclical industries like the automotive sector in which Ace operated (Hill, Kelly, and Highfield 2010). Ace's liquidity position remained strong throughout the simulation. The current ratio fluctuated between 7.0x and 16.0x (see Table 3), far above the benchmark range of 1.5x and 2.0x, reflecting a strong solvency position, but also indicating inefficient asset utilization (Van Horne and Wachowicz 2010). A comparison of the ratios to industry benchmarks for 2024 reveals that the median values of current and quick liquidity ratios for major automotive producers, such as Tesla, Toyota, and BMW, are 1.3x and 1.0x, respectively (see Table 2). The cash ratio, the most conservative measure of asset liquidity, fluctuated between 3.0x and 11.0x (see Table 3), while the benchmark median was 0.3x (Ross, Westerfield, and Jordan 2018). Such high cash ratios are indicative of underutilized liquidity, suggesting missed opportunities for investment or shareholder distribution. However, this discrepancy is also mainly attributable to the simulation's constraint that restricted the possibility of incurring short-term debt. In reality,

automakers like Tesla, Toyota, and BMW make sufficient use of short-term financing to balance a working capital position and consequently have more efficient liquidity structures. Consequently, while Ace maintained robust liquidity, the presence of excessive reserves and inventory surpluses indicated inefficiencies in deployment, suggesting missed opportunities for investment or shareholder distribution.

Complementing the liquidity analysis, Ace's working capital management improved considerably, as reflected in the declining Cash Conversion Cycle (CCC), which shortened from 108 days in FY2024 to just 68 days in FY2030 (see Table 4). According to Figlioli et al. (2024), a shorter CCC enhances liquidity and profitability by reducing the time in which cash is tied up in operations. Ace accomplished this primarily by sharply reducing Days Inventory Outstanding (DIO) from 95 to 29 days, through improved demand forecasting and reallocating production flexibly (see Table 4). Days Sales Outstanding (DSO) remained stable at 44 to 65 days, reflecting consistent receivables management and tactical adjustments to customer credit terms. During the initial investment-intensive phase, the customer credit terms were tightened to ensure liquidity. Starting from Q24, the payment terms were extended to 40 days to grow revenues. Meanwhile, Days Payables Outstanding (DPO) decreased to just 9 days in FY2030, which is significantly lower than the industry average of 56 days (PwC 2022). Ace's large cash reserves and limited investment activity during the final years of the simulation supported this tightening of supplier terms.

1.4.3. Capital Structure: From Debt Utilization to Deleveraging

Capital structure decisions were central to Ace's financial strategy, as they determined the balance between debt and equity to fund operations and new investments. Companies can generally raise new capital either through debt or equity. Ace followed the Pecking Order Theory (Myers and Majluf 1984), prioritizing internal financing over external sources in order to minimize information asymmetries and avoid unnecessary dilution of ownership. For

instance, in Q16, Ace discontinued two declining models, the 4x4 E and the Sport E, to free up capital for investment in a new car launch rather than taking on external debt. While the Pecking Order influenced Ace's preference for internal financing, the Trade-off Theory emphasized the need to balance the tax shield benefits of debt with the risks of financial distress, particularly as electrification demanded capital-intensive investments (Modigliani and Miller 1958). Brusov and Filatova (2023) state that an optimal capital structure aims to maximize firm value while minimizing the Weighted Average Cost of Capital (WACC). Ace targeted a debt-to-equity (D/E) ratio range of 0.7-1.0, leveraging interest tax deductibility while staying within an acceptable risk limit. In reality, the company's D/E ratio fluctuated between 0.94 and 1.14 until deleveraging through leveraged share buybacks in Q18 and Q23, which reduced the ratio to 0.5 by FY2030, lowering leverage risk but potentially underutilizing debt's tax shield benefits (see Table 5). Ace executed leveraged share buybacks, which served as a capital structure tool to return cash to shareholders, signal undervaluation (Ikenberry, Lakonishok, and Vermaelen 1995), and optimize WACC (Brav et al. 2005).

A further key guide for Ace was the Interest Coverage Ratio (ICR). The firm aimed to maintain a coverage ratio above 4.0x, which is a level typically associated with investment-grade safety to ensure low borrowing costs, enhance financial stability, and maintain investor confidence amid fluctuating market conditions. Ace's interest coverage ratio ranged from 3.67x to 15.74x (see Table 5). A temporary dip below the 4x level indicated exposure to higher borrowing costs, yet overall levels remained consistent with investment-grade stability, thereby supporting low financing costs and investor confidence (Frank and Goyal 2009).

1.4.4. Green Bonds: Combining Capital Efficiency with Sustainability Goals

Aside from conventional loans and equity, Ace issued green bonds for investments that qualified as sustainable. The company extensively used them, as the proceeds are dedicated to environmentally sustainable projects (Broadstock and Cheng 2019). This decision was

motivated by both environmental and financial benefits, since green bonds not only supported sustainability objectives but also provided cost advantages. Green bonds typically carry lower yields than conventional bonds, a phenomenon known as the "Greenium," whereby investors accept lower returns in exchange for financing sustainability-driven projects (Karpf and Mandel 2018). By leveraging the Greenium, Ace reduced its cost of capital (3% rate) while simultaneously reinforcing its positioning as a sustainable premium EV manufacturer, creating cross-functional benefits for its brand and stakeholder relations. This strategic prioritization allowed Ace to increase its Green Capital Ratio to over 95% by Q28 (see Figure 17), as evidenced by $12,873 million in outstanding green bonds. Additionally, its Green Capex Ratio surpassed 58% during the same period (see Figure 17).

1.5. Conclusion: Balancing Short-Term Success with Long-Term Adaptability

In conclusion, Ace's transformation involved moving from a portfolio of combustion and hybrid vehicles to a fully electric, zero-emission fleet and positioning successfully in the premium EV sector. At the end of Year 6, Ace achieved its electrification objectives, returned to profitability, and established a solid liquidity position.

However, during the last several years of the simulation, Ace experienced multiple setbacks, including inconsistent innovation, an outdated product portfolio, increasing operations complexity, and concerns about market competitiveness. Although the company successfully achieved its goals to transition to an electric fleet, this transition was simply the first stage of a longer process of systematic renewal. Continuous renewal is the only way in which Ace can remain relevant in the market and solvent as a firm.

Moreover, Ace's experience emphasizes the necessity of cross-functional integration, as decisions related to innovation, operations, and finance directly impact one another. This interdependence underscores the importance of effectively managing the connection between functions to ensure strategic alignment and successful implementation.

Hence, Ace's transformation offers valuable lessons. First, it is essential to recognize that transformation demands bold strategic decisions and ongoing investment in R&D focused on long-term goals. Second, an organization must be aligned at all levels to effectively transition from strategy to execution. While this review focuses on innovation, operations, and finance, a more comprehensive and accurate understanding of Ace would require an examination of the marketing, human resources, and strategy departments as well.

2. SELF-REFLECTION

2.1. Introduction

"Self-reflection enables us to witness our own stories as they unfold. In doing so, we begin to understand ourselves better." (Brown 2020). During the intense Business in Practice (BiP) simulation, I experienced a number of challenging and emotionally demanding situations that took me outside of my comfort zone. These experiences proved extremely helpful for understanding my leadership behavior, interpersonal dynamics, and decision-making under pressure.

To reflect on these experiences, my analytical approach was guided by the Critical Incident Technique (CIT) developed by Flanagan (1954). This technique offers a structured way to identify and examine key moments of behavioral importance. A statement often attributed to John Dewey (1933) describes this perspective: "We do not learn from experience; we learn from reflecting on experience."

In the following, I will critically reflect on two incidents that occurred during the three-week programme and which represented a personal turning point for me. The first incident centers on a lost client pitch at the very beginning of the simulation. This incident showed personal weaknesses in building a connection with the client, particularly in high-pressure and unexpected situations. The second incident demonstrated a positive leadership behavior after the unexpected departure of our marketing manager. Both of the incidents were relevant for

critical analysis, as they impacted the overall team dynamics and were crucial for my personal development.

2.2. First Critical Incident: The Pitfalls of Scripted Delivery in Dynamic Interactions

2.2.1. Description

The Year 1 round of decisions was approaching, and everyone in our team was eagerly awaiting the start of the BiP simulation. Beyond the start, it was also the day of a crucial sales pitch. We had the opportunity to win a client that would generate $768 million in gross profit. Although the number of winners was not specified, it was clear that only the most outstanding pitches among the 14 teams would succeed.

The day before, Professor Miguel Pinto Fernandes held an insightful sales workshop in which he shared his insights on what makes a compelling sales pitch. Inspired by the workshop, our team got together to decide who should present the pitch. After considering each team member's strengths and the upcoming second pitch, we chose a three-person team: a finance manager, an innovation manager, and me as the operations manager. After selecting the team, we gathered ideas for the pitch but struggled with a clear structure. To address this, each member prepared a draft overnight, and the following morning, my version was chosen as the most compelling. Consequently, I was assigned to present it.

The next day, I started the pitch by introducing the team and delivered my memorized script smoothly, despite feeling nervous. While the delivery went well, the client's reactions indicated a lack of engagement. Nevertheless, I chose to stick to my planned presentation rather than adapting to their responses.

During the Q&A session that followed, the client seemed irritated and posed a series of unexpected questions. We struggled to build a genuine connection, which left the client unconvinced about our business. As a result, we did not win the client.

2.2.2. Response

When my teammates chose me to deliver the sales pitch, I had mixed feelings. On the one hand, I felt honoured because my team trusted me to prepare thoroughly. On the other hand, I knew that my fear of public speaking would make the situation stressful and challenging.

As I walked into the room, my anxiety intensified, and I stuck tightly to my memorized script as a shield. The delivery itself went quite smoothly, as my focus was on accuracy. Although I noticed the client's disengagement, I stuck rigidly to the script, afraid of making a bigger mistake or appearing unprofessional.

By the time we reached the Q&A session, there was still no real connection with the client established, which made the atmosphere feel somewhat uncomfortable. Although my teammates were eager and willing to help, the questions that followed were difficult to answer for them as well, due to the poor engagement during the pitch. The client's questions indicated confusion and dissatisfaction, causing me to fall into a defensive mode where I put on a fake smile and kept my facial expressions calm while answering questions with quick, vague responses rather than addressing the core of their concerns. As the client's dissatisfaction grew, I felt my confidence slipping away and struggled to remain composed.

Consequently, I did not ask the customer any follow-up questions, did not address their problems, and maintained a formal tone. Even in this open exchange, I failed to build rapport, and the interaction remained distant and formal. This inability to connect left the exchange feeling transactional rather than relational, reinforcing the client's disengagement.

2.2.3. Analysis

In retrospect, the incident revealed a clear pattern in my response to pressure. My nervousness caused me to focus intently on my own performance and led me to stick strictly to the script. Instead of adapting to the client's reserved attitude, I emphasized precision and control. This reaction is consistent with my *Insights Discovery*® profile (see Figure 18), which indicates that

my dominant Cool Blue preference drives me toward accuracy, structure, and careful preparation (see Figure 19). In many contexts, this is a valuable strength, but in this situation, it became a limitation. By sticking too closely to the prepared structure, I overlooked the human component of the pitch, which would have been extremely valuable for closing the client.

My fear of public speaking heightened this defense mechanism, manifesting through symptoms such as sweating, a rapid heartbeat, and an overwhelming focus on “getting everything right”. Research indicates that anxiety in such situations restricts attention, making individuals less responsive to signals from others (Eysenck et al. 2007). This is exactly what happened. I sensed the client pulling away, but I was not able to adapt quickly enough to respond.

My past experiences contributed to this fear. During high school presentations, I often blushed at unexpected moments, which felt like an uncontrollable public sign of weakness. Although I have tried to manage it, this memory is still deeply rooted within me and resurfaces whenever I have to speak under pressure. Studies confirm that self-perceived blushing can greatly increase social anxiety (Nikolić et al. 2015). In my case, these memories intensified the pressure I felt and caused me to focus too heavily on control rather than connection.

The Q&A revealed the cost of this approach. Due to my lack of client engagement during the pitch, the client's questions seemed dissatisfied and almost confrontational, which made it even more difficult for my teammates and me to answer their questions. Instead of turning the Q&A into an open dialogue, I responded with vague, defensive answers. This reflects what Butler et al. (2003) refer to as “expressive suppression”, maintaining outward coolness at the expense of warmth and responsiveness. From the client’s perspective, this probably reinforced the impression of distance and lack of empathy.

Moreover, the incident highlights a mismatch between the demands of a sales interaction, which depends on adaptability and relational engagement, and my tendency to seek security in preparation. Franke and Park (2006) emphasize that adaptive selling, which tailors delivery to

the client's reactions, is significantly more effective than rigid scripts. This rigidity limited my adaptability and prevented my teammates from stepping in effectively. Without a genuine client connection, their efforts appeared reactive and reinforced the distance. What began as my defense mechanism ultimately had collective consequences, revealing a skills gap: I prioritized accuracy and structure, but needed to build adaptability, engagement, and confidence under pressure.

2.2.4. Learnings and Future Actions

This incident was very valuable to me, as it taught me that preparation alone is not enough, particularly in situations that require adaptability, presence, and emotional connection. My strong need for structure and accuracy, which shows my Cool Blue personality, gave me initial confidence. However, I have learned that in high-stakes situations, such as the pitch, it is not only the delivery that matters. Even more important is how effectively you can connect with the audience.

Reflecting further, I realized my fear of public speaking is rooted more in the anxiety of unpredictability and a lack of control over what might happen next, rather than the act of speaking itself. Recognizing this helps me understand why I stuck to the script despite noticing the client's reactions. According to Bodie (2010), an effective way to manage public-speaking anxiety is by prioritizing audience engagement rather than concentrating on self-monitoring. For me, this means consciously practicing flexibility instead of trying to perfect every detail.

Another important insight is the value of "adaptive communication". The incident showed me that dialogue and responsiveness are often more persuasive than perfectly crafted arguments. Meaning that I need to learn to step outside of my comfort zone by asking questions earlier, improvising when necessary, and showing curiosity about the needs of the other side.

Looking ahead, I want to consciously put myself in similar speaking situations instead of avoiding them. This way, I can reduce some of the fears associated with past experiences and

build resilience. Gallego et al. (2021) show that repeated exposure to feared scenarios, combined with reflection, gradually reduces anxiety responses. I intend to implement this by volunteering to give presentations in group projects, consciously practising improvised interactions, and asking for feedback afterwards.

2.3. Second Critical Incident: Stepping Up After the Loss of the Marketing Manager

2.3.1. Description

It was the morning before the start of the third year of the simulation, just one day after we had lost an important client pitch. Although this setback was still fresh, we entered the new year of the simulation with optimism and renewed determination to drive positive change. However, we faced an even greater challenge. Our marketing manager unexpectedly decided to withdraw from the BiP program due to personal reasons.

As the only person responsible for the marketing department, his departure meant that we lost all direct expertise in this area. The incident's timing complicated the situation further, since it occurred just before the decision-making round of the third year. Due to time constraints and the lack of a clear replacement plan, we needed to quickly determine how to redistribute the marketing manager's responsibilities.

As an immediate measure, one of the innovation managers was reassigned to marketing, as the department had two managers while marketing now had none. This rapid change enabled us to continue the simulation with a new marketing manager in place. However, as the situation evolved, our new marketing manager openly told us she was struggling with the complexity of the decisions she now had to manage. This required other team members to temporarily take on additional responsibilities.

2.3.2. Response

When our marketing manager informed us that he was leaving the BiP programme due to personal reasons, I felt both surprised and worried. I started to question how we would proceed,

particularly because I had heavily depended on close collaboration with the marketing manager for my operational decisions. Without their input, I felt uncertain and mentally overwhelmed. My confidence in making informed choices about production planning, inventory levels, and aligning with demand forecasts began to weaken.

At first, I was hesitant to participate in discussions because I feared I might lead the team in the wrong direction. This uncertainty was due to the lack of sufficient information for our operations planning, which made me second-guess the decisions within my own department. However, my perspective changed when I noticed the newly appointed marketing manager struggling. I could see the pressure she was under, as I had experienced a similar sense of pressure earlier that day.

From that point, I took a more active role to support her and to restore stability within the group. I developed a simplified Excel tool that visualized pricing and demand data, which gave us a clearer basis for marketing decisions. Beyond providing support to the new marketing manager, this initiative also helped the entire team regain direction and confidence after the disruption, thereby strengthening our ability to work together under pressure.

2.3.3. Analysis

The unexpected loss of our marketing manager before the third-year decisions disrupted both the team structure and my confidence as operations manager. This state of despair encouraged me to confront my feelings and assume a leadership role. Such a turning point reflects a shift toward distributed leadership, where authority is not held by one individual but shared among team members based on situational needs (Gronn 2002). Although I lacked specific marketing skills, I started discussions to assist the marketing manager, developed a decision-making tool, and helped to restructure the team. Raelin et al. (2025) describe this type of behavior as "Leadership-as-Practice," where leadership arises from everyday responses to challenges rather than formal roles, which aligned with my support for the new marketing manager. Beyond

supporting the marketing manager, my actions helped redistribute responsibilities and restore cohesion after the departure of a colleague whose calm and thoughtful “blue” profile had stabilised the team (see Figure 19). West (2012) emphasizes that role flexibility and shared responsibility are crucial for maintaining performance under pressure. Furthermore, Mathieu et al. (2008) emphasize that teams experiencing disruption depend on collective cognition, particularly shared mental models and strategic consensus, to align their understanding of tasks, roles, and priorities. This allows them to maintain coordination and effectiveness. In this sense, my contribution went beyond aiding one colleague to reinforcing the group’s collective resilience. This broader team impact influenced my reflection and behavior, leading me to reconsider my initial hesitation.

My decision to take on a leadership position stemmed from reflecting on my initial behavior, which Schön (1992) termed reflection-in-action. When confronted with the marketing manager’s challenges, I moved from passive reflection to immediate action. This aligned with Wilson’s (2008) perspective on reflection as a forward-looking process that facilitates learning and adaptation under pressure. Creating the Excel model illustrated this approach, although it simplified decisions and could not substitute for the lacking marketing expertise. In hindsight, I also recognize that I could have stepped in earlier rather than waiting until the new marketing manager voiced her struggles. These limitations highlight that my leadership was valuable but also reactive and incomplete.

Teammates received my actions positively, as reflected in my peer and self-assessment. I rated myself a 4 out of 5 on “Interacting with Teammates,” while my team members gave me a 5 out of 5 (see Figure 20). This discrepancy shows that I judged myself more harshly than my teammates, focusing on hesitation while they valued my actions, which exposed a blind spot in underestimating my impact.

At the same time, I must acknowledge that my contribution was not without risks. Acting without marketing knowledge could have led to oversimplifications, and while my teammates valued my initiative, the underlying expertise gap remained. This suggests that confidence must be paired with seeking the right input, not just stepping in.

In sum, this incident highlighted the importance of taking ownership, but it also exposed some clear limitations in my approach. My support was reactive, my solution only partially addressed the marketing gap, and I could have acted sooner. These shortcomings emphasize that leadership involves not only courage and initiative but also the ability to anticipate challenges and recognize when to seek the expertise of others. Recognizing these limits created the foundation for the lessons I drew from this incident.

2.3.4. Learnings and Future Actions

Firstly, this incident taught me that being a leader takes courage. Stepping up during uncertain times is important to the team. I had never viewed myself as someone with natural leadership skills. However, the situation analysis revealed that the ability to lead is not innate, but rather developed by actively acquiring the necessary skills. Behavioural research also underscores this point, showing that leadership qualities are not inborn but are based on observable and learnable behaviours (Derue et al. 2011). In this regard, the leadership workshops led by Professor Miguel Pinto Fernandes throughout the BiP program further reinforced this view. These sessions helped me build awareness of attributes that leaders embody, such as empathy, communication, and confidence (see Figure 21), and encouraged me to put these into practice in a real team setting.

Secondly, this experience highlighted the importance of self-awareness and adaptability to me, which are necessary leadership skills. I realized that moving from uncertainty to action not just required knowledge but courage. Recent research shows that courage in uncertain situations, often referred to as "everyday courage", is a trait that distinguishes resilient leaders who are willing to make bold decisions despite uncertainty (Budak 2025).

Looking toward the future, I aim to intentionally seek team roles that challenge me beyond my comfort zone and promote adaptive leadership in team dynamics. While these moments may feel uncomfortable at first, I learned that they are invaluable for personal growth. Therefore, in future teamwork, I plan to take on leading roles from the very beginning, consistently encouraging my team to reach its full potential.

2.4. CONCLUSION

The critical reflection on the two incidents revealed important lessons about my strengths and weaknesses in interpersonal collaboration, as well as in situations requiring initiative and direction. The first incident showed that my Cool Blue preference for structure, precision, and control can become a weakness in high-pressure and unpredictable situations. In these moments, human connection and empathy are essential, and my focus on control can make me appear rigid and unapproachable. In contrast, the second incident illustrated that in familiar team settings, where I feel a strong connection to both my team and the environment, I exhibited my leadership abilities by stepping up to provide the team with structure and support during challenging times.

In conclusion, this critical reflection on my behaviour has shown me that self-awareness and feedback from peers are extremely valuable for my future development as a leader. Leaders with low self-awareness often display destructive behavior, whereas those with high self-awareness are regarded as effective and highly valued team members, according to Da Fonseca, Myres, and Hofmeyr (2022).

Looking ahead, I seek to develop a future professional career where I strive to be a supportive and confident leader. Therefore, I will pursue opportunities that expose me to high-pressure and unpredictable situations similar to those in the BiP simulation.

REFERENCES

BMW AG. 2024. *BMW AG Financial Statements 2024*. Report. Munich: BMW AG. https://www.bmwgroup.com/en/report/2024/downloads/BMW-AG-Financial-Statements-2024-en.pdf

Board of Governors of the Federal Reserve System. 2025. "Capacity Utilization: Motor Vehicle Manufacturing (CAPUTLG33611SQ)." *FRED, Federal Reserve Bank of St. Louis*. Published May 15, 2025. https://fred.stlouisfed.org/series/CAPUTLG33611SQ

Bodie, Graham D. 2010. "A Racing Heart, Rattling Knees, and Ruminative Thoughts: Defining, Explaining, and Treating Public Speaking Anxiety." *Communication Education* 59 (1): 70–105. https://doi.org/10.1080/03634520903443849

Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely. 2005. "Payout Policy in the 21st Century." *Journal of Financial Economics* 77 (3): 483–527. https://doi.org/10.1016/j.jfineco.2004.07.004

Broadstock, David C., and Louis T.W. Cheng. 2019. "Time-Varying Relation between Black and Green Bond Price Benchmarks: Macroeconomic Determinants for the First Decade." *Finance Research Letters* 29: 17–22. https://doi.org/10.1016/j.frl.2019.02.006

Brown, Brené. 2020. *The Gifts of Imperfection: 10th Anniversary Edition*. New York: Random House.

Brusov, Peter, and Tatiana Filatova. 2023. "Capital Structure Theory: Past, Present, Future." *Mathematics* 11 (3): 616. https://doi.org/10.3390/math11030616

Budak, Alex. 2025. "6 Ways to Practice Everyday Courage." *Harvard Business Review*, August 5, 2025. https://hbr.org/2025/08/6-ways-to-practice-everyday-courage

Butler, Emily A., Boris Egloff, Frank H. Wilhelm, Nancy C. Smith, Elizabeth A. Erickson, and James J. Gross. 2003. "The Social Consequences of Expressive Suppression." *Emotion* 3 (1): 48–67. https://doi.org/10.1037/1528-3542.3.1.48

Chesbrough, Henry William. 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.

Da Fonseca, Sharon, Hugh Myres, and Karl Hofmeyr. 2022. "The Influence of Self-Awareness on Effective Leadership Outcomes in South Africa." *South African Journal of Business Management* 53 (1): 1–10. https://doi.org/10.4102/sajbm.v53i1.2720

Danneels, Erwin. 2002. "The Dynamics of Product Innovation and Firm Competences." *Strategic Management Journal* 23 (12): 1095–1121. https://doi.org/10.1002/smj.275

Deloitte. 2025. *2025 Global Automotive Consumer Study*. January 2025. Deloitte Insights. https://www2.deloitte.com/insights/us/en/industry/automotive/global-automotive-consumer-study.html

Derue, D. Scott, Jennifer D. Nahrgang, Ned Wellman, and Stephen E. Humphrey. 2011. "Trait and Behavioral Theories of Leadership: An Integration and Meta-Analytic Test of Their Relative Validity." *Personnel Psychology* 64 (1): 7–52. doi:10.1111/j.1744-6570.2010.01201.x

Dewey, John. 1933. *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process (Revised edition)*. Boston: D.C. Heath and Company.

Discovery Yourself. 2025. "What Is Insights Discovery?" Accessed September 1, 2025. https://discoveryourself.com/what-is-insights-discovery/

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

Esfahbodi, Ali, Yufeng Zhang, and Glyn Watson. 2016. "Sustainable Supply Chain Management in Emerging Economies: Trade-Offs between Environmental and Cost Performance." *International Journal of Production Economics* 181 (1): 350–66. https://doi.org/10.1016/j.ijpe.2016.02.013

European Union. 2023. *Regulation (EU) 2023/851 on CO_2 Standards for Passenger Cars and Light Commercial Vehicles*. *Official Journal of the European Union*, L 111, 26 April 2023, 1–26. https://eur-lex.europa.eu/eli/reg/2023/851/oj/eng

Eysenck, Michael W., Nazanin Derakshan, Rita Santos, and Manuel G. Calvo. 2007. "Anxiety and Cognitive Performance: Attentional Control Theory." *Emotion* 7 (2): 336–53. https://doi.org/10.1037/1528-3542.7.2.336

Figlioli, Bruno, Rafael Moreira Antônio, Rafael Confetti Gatsios, and Fabiano Guasti Lima. 2024. "Influence of the Cash Conversion Cycle on Firm's Financial Performance: Evidence from Publicly Traded Firms in the Latin American Context." *Accounting & Finance* 64 (3). https://doi.org/10.1111/acfi.13220

Flanagan, John C. 1954. "The Critical Incident Technique." *Psychological Bulletin* 51 (4): 327–58. https://doi.org/10.1037/h0061470

Frank, Murray Z., and Vidhan K. Goyal. 2009. "Capital Structure Decisions: Which Factors Are Reliably Important?" *Financial Management* 38 (1): 1–37. https://doi.org/10.1111/j.1755-053X.2009.01026.x

Franke, George R., and Jeong-Eun Park. 2006. "Salesperson Adaptive Selling Behavior and Customer Orientation: A Meta-Analysis." *Journal of Marketing Research* 43 (4): 693–702. https://doi.org/10.1509/jmkr.43.4.693

Gallego, Ana, Louise McHugh, Markku Penttonen, and Raimo Lappalainen. 2021. "Measuring Public Speaking Anxiety: Self-Report, Behavioral, and Physiological." *Behavior Modification* 45 (6): 824–51. https://doi.org/10.1177/0145445521994308

Gronn, Peter. 2002. "Distributed Leadership as a Unit of Analysis." *The Leadership Quarterly* 13 (4): 423–51. https://doi.org/10.1016/S1048-9843(02)00120-0

Haynes, Michelle, Steve Thompson, and Peter W. Wright. 2014. “New Model Introductions, Cannibalization and Market Stealing: Evidence from Shopbot Data.” *Manchester School (1463-6786)* 82 (4): 385–408. doi:10.1111/manc.12024

Hendricks, Kevin B., Vinod R. Singhal, and Rongrong Zhang. 2008. “The Effect of Operational Slack, Diversification, and Vertical Relatedness on the Stock Market Reaction to Supply Chain Disruptions.” *Journal of Operations Management* 27 (3): 233–46. https://doi.org/10.1016/j.jom.2008.09.001

Hertzke, Patrick, Patrick Schaufuss, Philipp Kampshoff, and Timo Möller. 2025. “New Twists in the Electric-Vehicle Transition: A Consumer Perspective.” *McKinsey & Company*. April 22, 2025. Accessed August 14, 2025. https://www.mckinsey.com/features/mckinsey-center-for-future-mobility/our-insights/new-twists-in-the-electric-vehicle-transition-a-consumer-perspective

Hill, Matthew D., G. Wayne Kelly, and Michael J. Highfield. 2010. “Net Operating Working Capital Behavior: A First Look.” *Financial Management* 39 (2): 783–805. https://doi.org/10.1111/j.1755-053X.2010.01092.x

Ikenberry, David, Josef Lakonishok, and Theo Vermaelen. 1995. “Market Underreaction to Open Market Share Repurchases.” *Journal of Financial Economics* 39 (2–3): 181–208. https://doi.org/10.1016/0304-405X(95)00826-Z

International Energy Agency (IEA). 2023. *World Energy Outlook 2023*. Paris: IEA. https://www.iea.org/reports/world-energy-outlook-2023

International Energy Agency (IEA). 2025. *Global EV Outlook 2025*. Paris: International Energy Agency. https://www.iea.org/reports/global-ev-outlook-2025

Karpf, Andreas, and Antoine Mandel. 2018. “The Changing Value of the ‘Green’ Label on the US Municipal Bond Market.” *Nature Climate Change* 8 (2): 161–65. https://doi.org/10.1038/s41558-017-0062-0

Krajewski, Lee J., Manoj K. Malhotra, and Larry P. Ritzman. 2021. Operations Management: Processes and Supply Chains. 13th ed. Harlow: Pearson.

Levinthal, Daniel A., and James G. March. 1993. "The Myopia of Learning." *Strategic Management Journal* 14 (S2): 95–112. https://doi.org/10.1002/smj.4250141009

Liu, Chang (Charo), Stella G. Boothman, and John D. Graham. 2025. "The Rise and Recent Decline of Tesla's Share of the U.S. Electric Vehicle Market." *World Electric Vehicle Journal* 16 (2): 90. https://doi.org/10.3390/wevj16020090

Lucid Group, Inc. 2024. Lucid Technology & Manufacturing Day. Newark, CA: Lucid Group, Inc. https://ir.lucidmotors.com/static-files/46807963-ff30-4395-9ceb-234c40a94fc5

Macrotrends. 2025. "Macrotrends." Accessed September 1, 2025. https://macrotrends.net/

March, James G. 1991. "Exploration and Exploitation in Organizational Learning." *Organization Science* 2 (1): 71–87. http://www.jstor.org/stable/2634940

Marginson, David, and Laurie McAulay. 2007. "Exploring the Debate on Short-Termism: A Theoretical and Empirical Analysis." *Strategic Management Journal* 29 (3): 273–92. https://doi.org/10.1002/smj.657

Mathieu, J., M. T. Maynard, T. Rapp, and L. Gilson. 2008. "Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse into the Future." *Journal of Management* 34 (3): 410–76. https://doi.org/10.1177/0149206308316061

McKinsey & Company. 2022. "What Is Innovation?" *McKinsey & Company*. December 20, 2022. https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-innovation

Modigliani, Franco, and Merton H. Miller. 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review* 48 (3): 261–97. https://www.jstor.org/stable/1809766

Myers, Stewart C. 2001. “Capital Structure.” *Journal of Economic Perspectives* 15 (2): 81–102. https://doi.org/10.1257/jep.15.2.81

Myers, Stewart C., and Nicholas S. Majluf. 1984. “Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have.” *Journal of Financial Economics* 13 (2): 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Nikolić, Milica, Cristina Colonnesi, Wieke de Vente, Peter Drummond, and Susan M. Bögels. 2015. “Blushing and Social Anxiety: A Meta-Analysis.” *Clinical Psychology: Science and Practice* 22 (2): 131–53. https://doi.org/10.1111/cpsp.12102

Pamidimukkala, Anil, Sharareh Kermanshachi, Justin Rosenberger, and Gabriel Hladik. 2024. “Barriers and Motivators to the Adoption of Electric Vehicles: A Global Review.” *Green Energy and Intelligent Transportation* 3 (2). https://doi.org/10.1016/j.geits.2024.100153

Porsche AG. 2025. Press & Analyst Call H1 2025. Stuttgart: Porsche AG. https://a.storyblok.com/f/274296/x/688b7596ea/h1-2025-presentation-1.pdf

PwC. 2022. *Automotive Working Capital Study 2022*. Frankfurt am Main: PwC. https://www.pwc.de/de/automobilindustrie/automotive-working-capital-study-2022.pdf

Raelin, Joseph A., Marian Iszatt-White, Brigid Carroll, Lucia Crevani, Brandon W. Kliewer, and Jennifer L. Robinson. 2025. “Introductory Article: Next Generation of Leadership-as-Practice: Reconceptualizing Change.” *Journal of Change Management* 25 (1): 1–10. doi:10.1080/14697017.2025.2457334

Ries, Eric. 2011. *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business.

Rogers, Everett M., Arvind Singhal, and Margaret M. Quinlan. 2019. “Diffusion of Innovations 1.” In *An Integrated Approach to Communication Theory and Research*, 3rd ed., edited by Don W. Stacks, Michael B. Salwen, and Kristen C. Eichhorn, 20–35. New York: Routledge.

Ross, Stephen A., Randolph W. Westerfield, and Bradford D. Jordan. 2018. *Fundamentals of Corporate Finance*. 12th ed. New York: McGraw-Hill Education.

S&P Global Mobility. 2022. “Automotive Inventory.” S&P Global. September 18, 2022. https://www.spglobal.com/mobility/en/research-analysis/automotive-inventory.html

Schön, Donald A. 1992. *The Reflective Practitioner: How Professionals Think in Action*. London: Routledge. https://doi.org/10.4324/9781315237473

Silver, Edward A., David F. Pyke, and Douglas J. Thomas. 2016. *Inventory and Production Management in Supply Chains*. 4th ed. Boca Raton, FL: CRC Press. https://doi.org/10.1201/9781315374406

Skinner, Wickham. 1969. “Manufacturing—Missing Link in Corporate Strategy.” *Harvard Business Review* 47 (3): 136–45.

Slack, Nigel, Alistair Brandon-Jones, and Robert Johnston. 2013. *Operations Management*. 7th ed. Harlow: Pearson Education.

Tesla, Inc. 2024. *Q4 2024 Update*. Report. January 24, 2024. Tesla, Inc. https://digitalassets.tesla.com/tesla-contents/image/upload/IR/TSLA-Q4-2024-Update.pdf

Tisdell, Clem, and Irmi Seidl. 2004. “Niches and Economic Competition: Implications for Economic Efficiency, Growth and Diversity.” *Structural Change and Economic Dynamics* 15 (2): 119–35. https://doi.org/10.1016/S0954-349X(03)00002-X

Tsougkou, Eleni, John W. Cadogan, Nathaniel Boso, Ian R. Hodgkinson, João S. Oliveira, Tommi Laukkanen, Nahid Yazdani, and Vicky M. Story. 2024. “International Product Adaptation and Performance: A Systematic Analysis of the Literature and Agenda for Future Research.” *Journal of World Business* 60 (1): 101597. https://doi.org/10.1016/j.jwb.2024.101597

Tülüce, Hasan S., and Ahmet Kamil Yurtkur. 2015. “Schumpeter’s Theory of Creative Destruction: A Study of the Automotive Industry.” *Procedia - Social and Behavioral Sciences* 207: 620–26. https://doi.org/10.1016/j.sbspro.2015.10.146

Turkulainen, Virpi, and Mikko Ketokivi. 2012. “Cross-Functional Integration and Performance: What Are the Real Benefits?” *International Journal of Operations & Production Management* 32 (4): 447–67. https://doi.org/10.1108/01443571211223095

United States Department of Defense, Historical Office. 2001. *Public Statements of Donald H. Rumsfeld, Secretary of Defense, 2001*. Washington, DC: Historical Office, Office of the Secretary of Defense.

Van der Panne, Gerben, Cees van Beers, and Alfred Kleinknecht. 2003. “Success and Failure of Innovation: A Literature Review.” *International Journal of Innovation Management* 7 (3): 309–38. https://doi.org/10.1142/S1363919603000830

Van Horne, James C., and John M. Wachowicz. 2010. *Fundamentals of Financial Management*. 13th ed. Harlow: Pearson Education.

Wells, Peter, and Paul Nieuwenhuis. 2012. “Transition Failure: Understanding Continuity in the Automotive Industry.” *Technological Forecasting and Social Change* 79 (9): 1681–92. https://doi.org/10.1016/j.techfore.2012.06.008

West, Michael A. 2012. *Effective Teamwork: Practical Lessons from Organizational Research*. 3rd ed. Chichester, West Sussex: Wiley-Blackwell. https://download.e-bookshelf.de/download/0000/5962/42/L-G-0000596242-0026941836.pdf

Wilson, John P. 2008. “Reflecting-on-the-future: A Chronological Consideration of Reflective Practice.” *Reflective Practice* 9 (2): 177–84. doi:10.1080/14623940802005525

Wu, Shuaiying. 2023. “Analysis of the Core Competitive Advantage of the Auto Industry: A Case of Tesla’s Business Model.” *BCP Business & Management* 36: 419–25. https://doi.org/10.54691/bcpbm.v36i.3494

Yeboah, Asiamah. 2023. “Innovation Process Model: An Integration of Innovation Costs, Benefits and Core Competence.” *Cogent Business & Management* 10 (1): 2176445. https://doi.org/10.1080/23311975.2023.2176445

APPENDICES

A. Figures

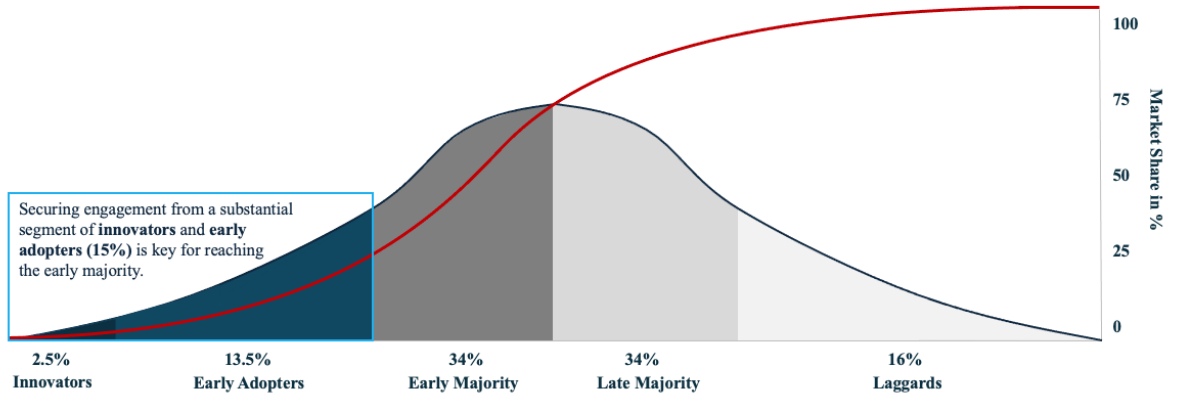

Figure 1: Diffusion of Innovations Model showing adopter categories (bell curve) and cumulative market share (S-curve).
Source: Own illustration based on Rogers, Singhal, and Quinlan (2019).

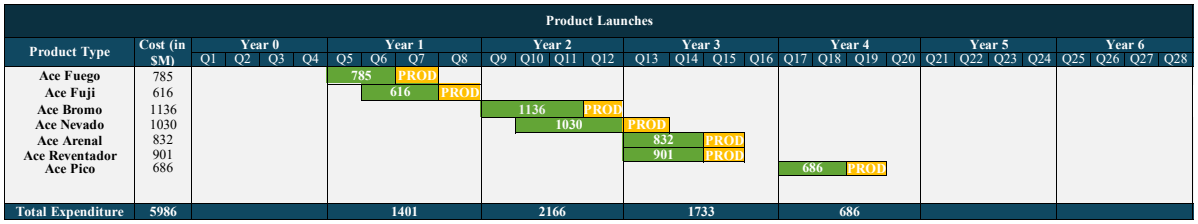

Figure 2: Product launch timeline with associated costs (in $M) over six years.
Source: Own illustration.

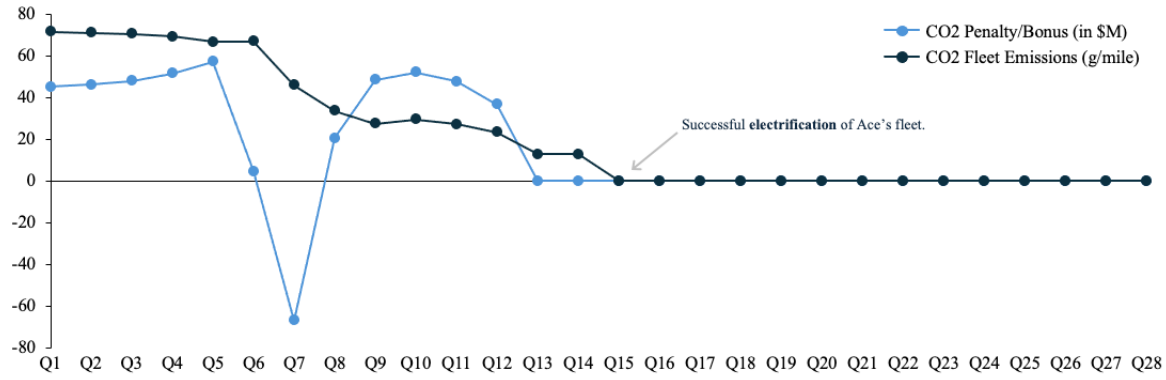

Figure 3: CO_2 fleet emissions (g/mile) and penalty/bonus (in $M) over time.
Source: Own illustration using data from the BiP Industry Master's Simulation.

R&D Investments																											
Type	Cost (in $M)	Year 0				Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28
Sodium-ion Batteries	250					250																							
AI Implementation	500						500																						
Next Gen E-Drive Modules	300							300																					
V2V Communication	200								200																				
Power Charging Network JV	500									500																			
Total Expenditure	1750					1250				500																			

Figure 4: Research & Development (R&D) launch timeline with associated costs (in $M) over six years.
Source: Own illustration.

Company	Launched Cars	Electro Car Ratio	Product Investments	Innovation Investments
VoltEDGE	9	100%	$20,518M	$1,650M
Enovia	10	100%	$16,904M	$2,600M
eNOVAtIon	10	100%	$11,145M	$2,600M
Flash	8	100%	$12,845M	$2,600M
Ace	**7**	**100%**	**$12,810M**	**$1,250M**
Evlv3rs	13	100%	$14,465M	$950M
EvoMotion	12	100%	$16,308M	$2,050M
TransMotive	7	100%	$13,129M	$2,200M
FCM Auto	11	100%	$17,333M	$1,250M
NovaMotive	8	100%	$12,933M	$1,250M
Evola	12	100%	$16,832M	$2,600M
OLYM	9	100%	$13,814M	$2,350M
NXBO	7	100%	$12,086M	$2,600M
LYNX	11	100%	$15,229M	$2,600M

Figure 5: Number of launched cars in comparison to Ace's competitors, including electro car ratio and related investments.
Source: Own illustration using data from the BiP Industry Master's Simulation.

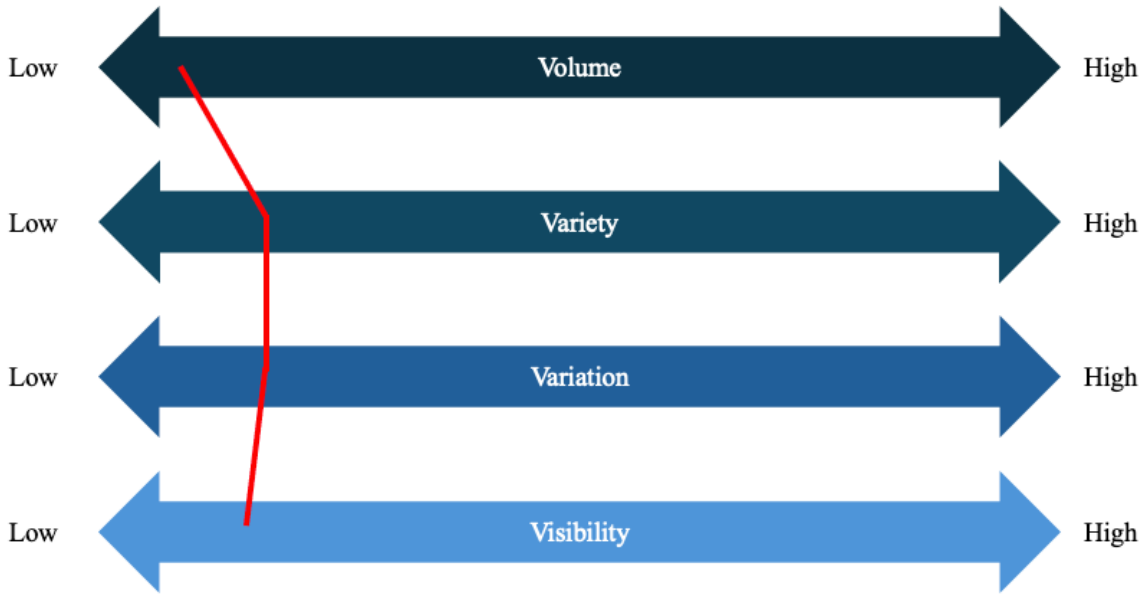

Figure 6: The 4Vs model of operations management, showing Ace's operations in terms of volume, variety, variation, and visibility.
Source: Own illustration based on Slack, Brandon-Jones, and Johnston (2013).

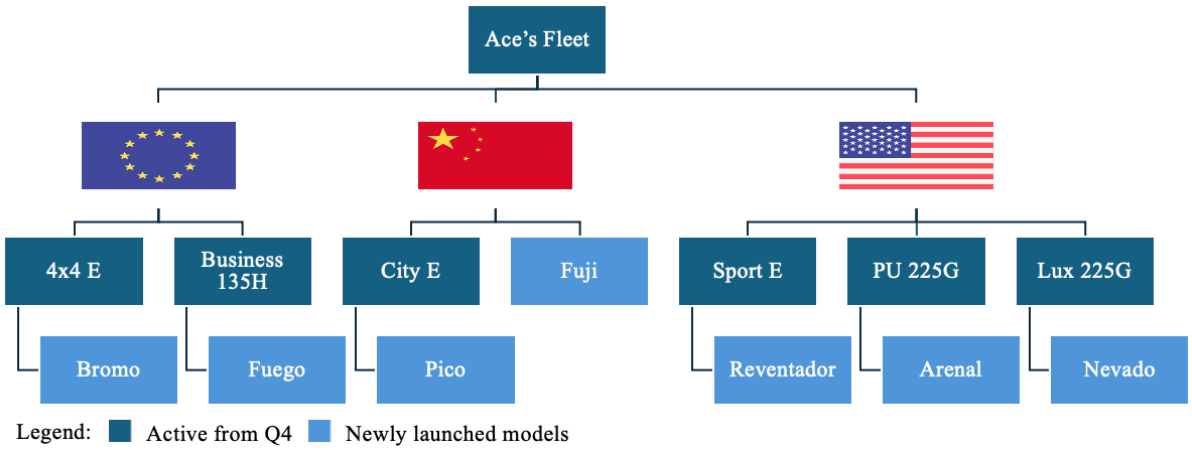

Figure 7: Overview of Ace's fleet by production country, showing active models from Q4 and newly launched models.
Source: Own illustration using data from the BiP Industry Master's Simulation.

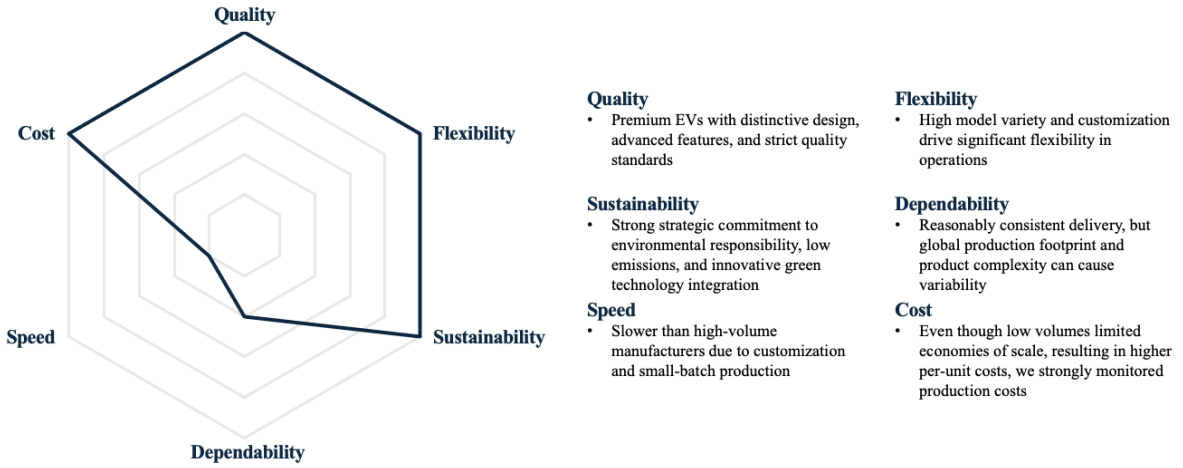

Figure 8: Ace's performance objectives in operations management, evaluated across the 6 Operational Trade-offs
Source: Own illustration based on Slack, Brandon-Jones, and Johnston (2013).

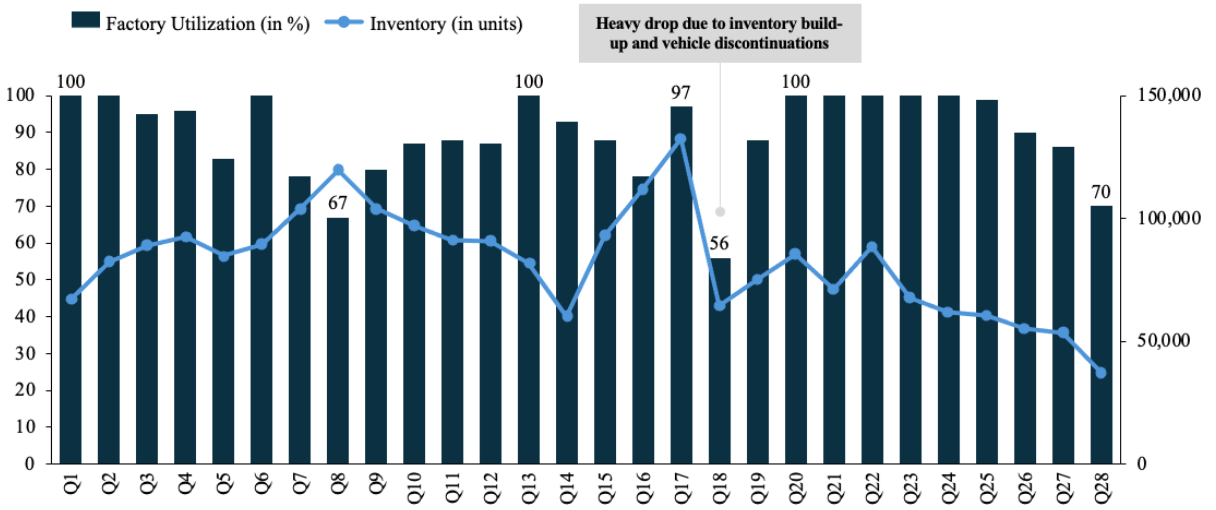

Figure 9: Factory utilization (in %) and inventory levels (in units) across simulation quarters, highlighting the drop due to inventory build-up and vehicle discontinuations.
Source: Own illustration using data from the BiP Industry Master's Simulation.

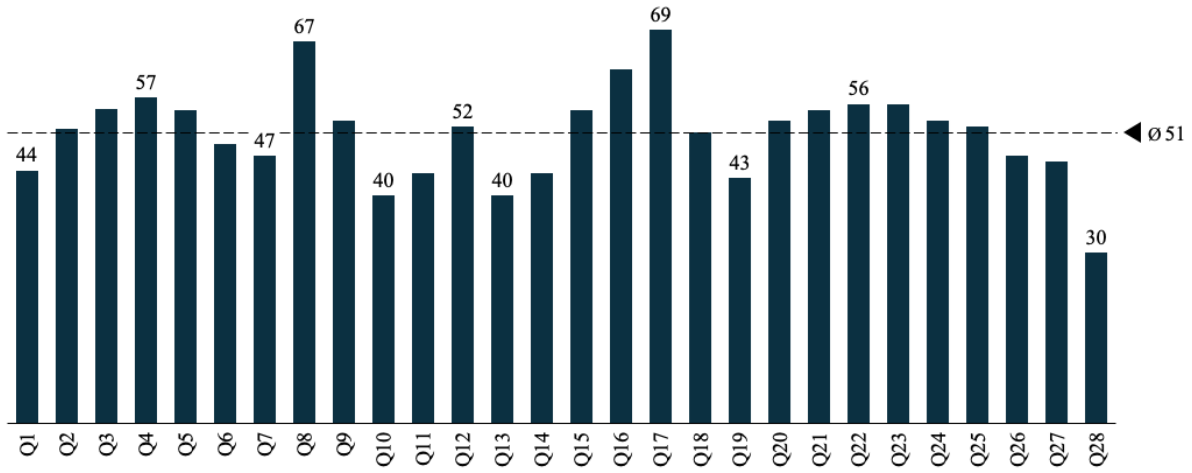

Figure 10: Ace's average Days of Inventory (DOI) across simulation quarters.
Source: Own illustration using data from the BiP Industry Master's Simulation.

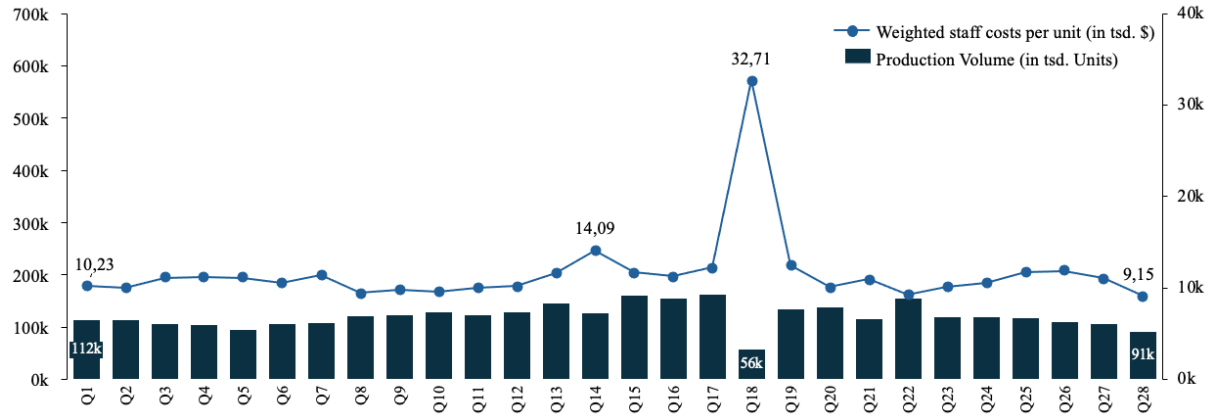

Figure 11: Relationship between Ace's gross production volume (in thousand units) and average staff cost per unit (in thousand $) across simulation quarters, highlighting the cost spike in Q18.
Source: Own illustration using data from the BiP Industry Master's Simulation.

Sustainability Investments																													
Investment Type	Technology	Cost (in $M)	Year 0				Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28
Production Investment (Scope 1)	Water Consumption Reduction	200								200																			
	Waste Reduction	400											400																
	ISO14001 / EMAS certificates	500																											
Energy Investments (Scope 2)	Energy Efficiency Investment	150											150																
	Install Solar Panels	250															250												
	Energy Management System	100																											
Supply Chain Investments (Scope 3)	Offset Supplier CO2	45.54													19	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
	Sustainable Supplier	20																	20											
	External Battery Recycling	200																				200								
Total Expenditure		1804.38					100				650				163				427				282				182			

Figure 12: Sustainability investments in operations across Scope 1 (production), Scope 2 (energy), and Scope 3 (supply chain) during the simulation period.
Source: Own illustration.

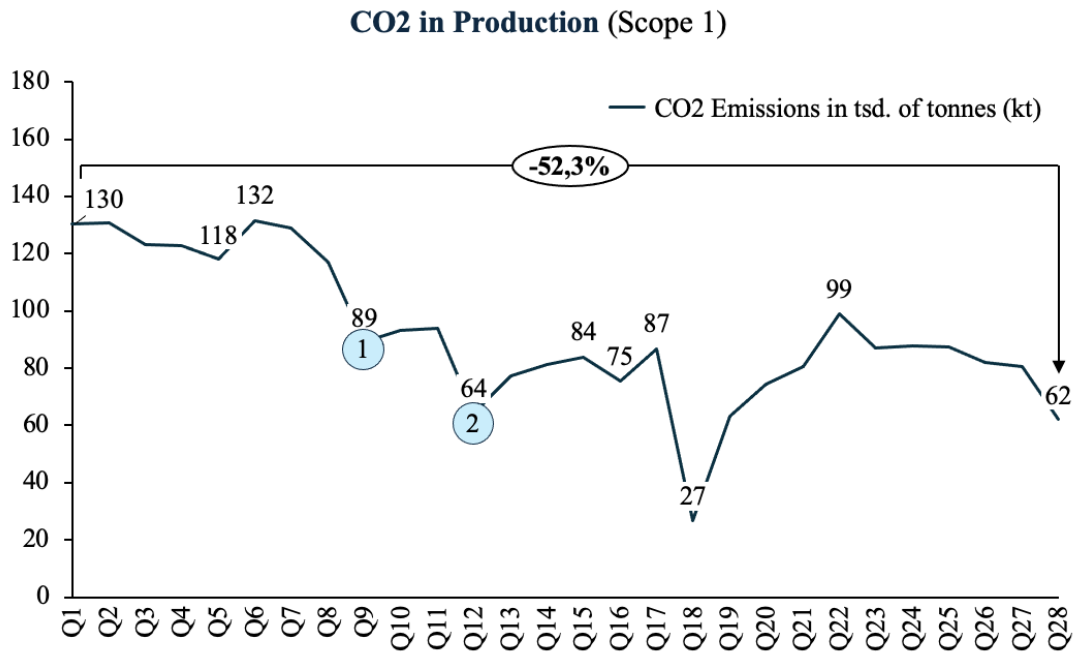

Figure 13: Development of Ace's CO_2 emissions across Scope 1 (production)
Source: Own illustration using data from the BiP Industry Master's Simulation.

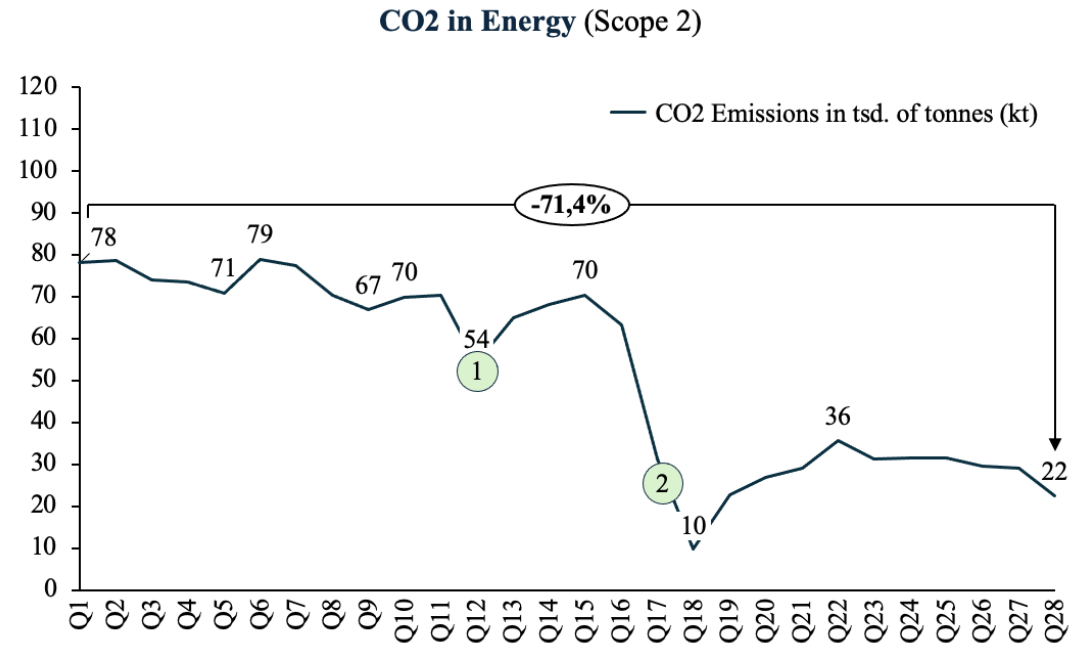

Figure 14: Development of Ace's CO_2 emissions across Scope 2 (energy)
Source: Own illustration using data from the BiP Industry Master's Simulation.

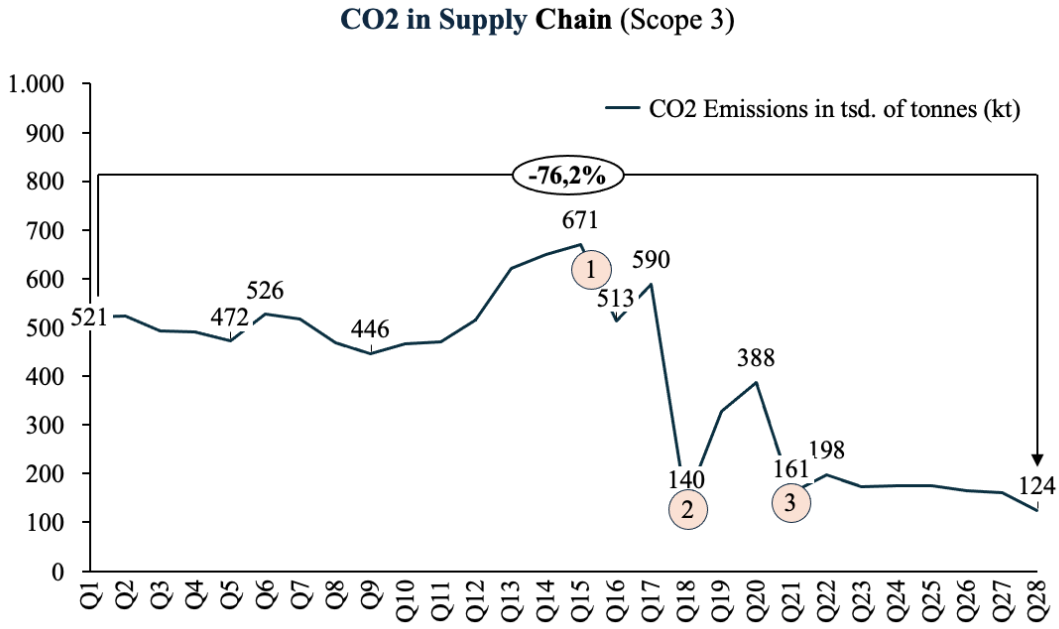

Figure 15: Development of Ace's CO_2 emissions across Scope 3 (supply chain)
Source: Own illustration using data from the BiP Industry Master's Simulation.

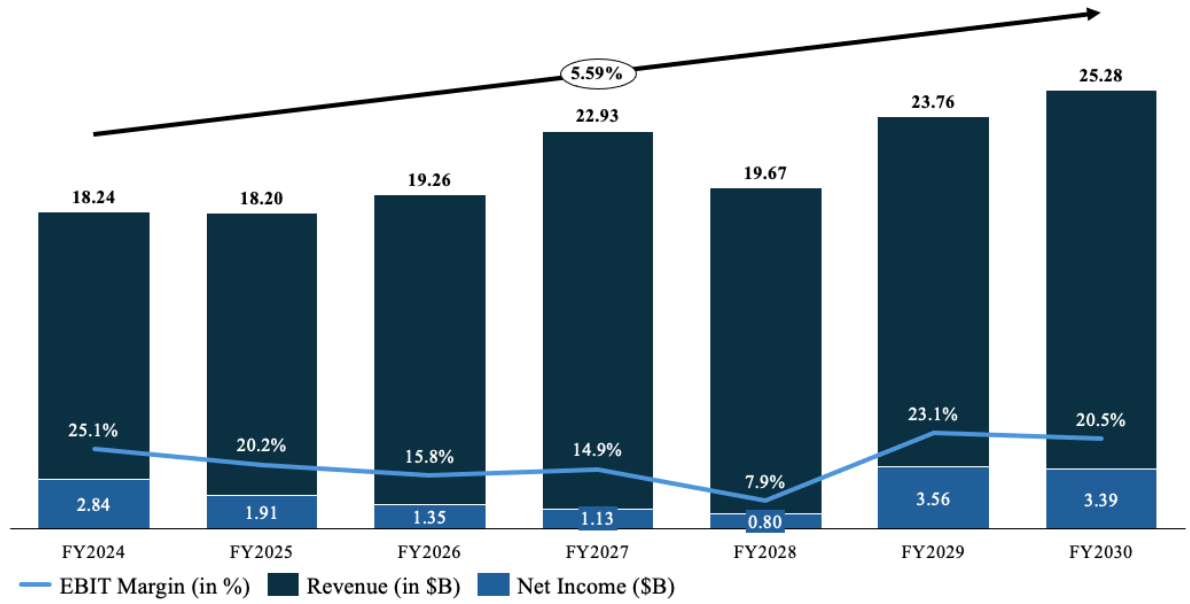

Figure 16: Development of Ace's revenue, net income, and EBIT margin from FY2024 to FY2030, including a compound annual growth rate (CAGR) of 5.59%.
Source: Own illustration using data from the BiP Industry Master's Simulation.

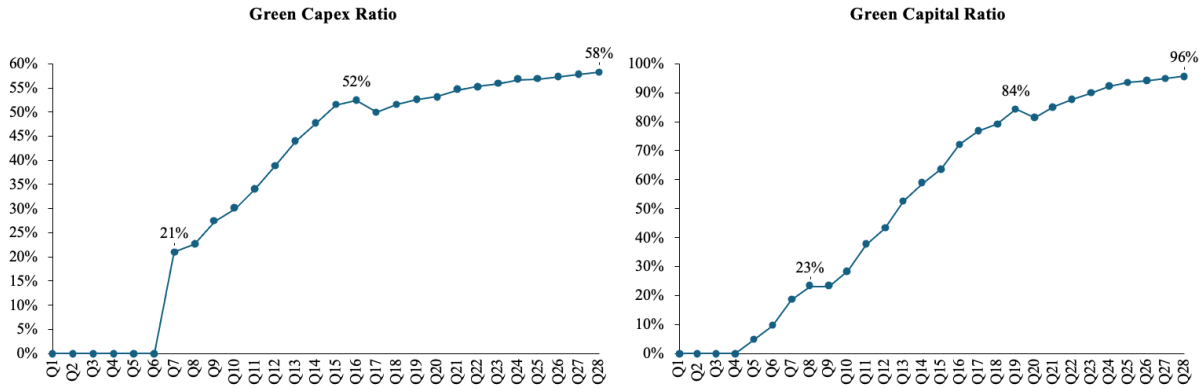

Figure 17: Development of Ace's Green Capex Ratio and Green Capital Ratio over the simulation period (Q1–Q28).
Source: Own illustration using data from the BiP Industry Master's Simulation.

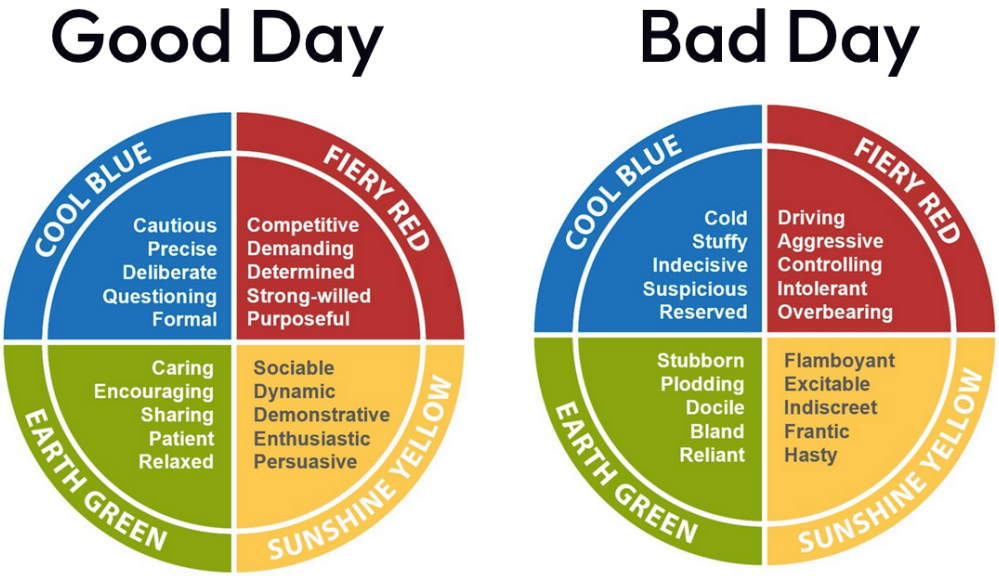

Figure 18: Personality traits of Insights Discovery colour types, highlighting positive behaviours on a "Good Day" and potential challenges on a "Bad Day."
Source: Discovery Yourself. 2025. "What Is Insights Discovery?" Accessed August 15, 2025. https://discoveryourself.com/what-is-insights-discovery/

Figure 19: Team Ace's personality profiles, showing my position compared to team members. Results based on the Insights Discovery assessment conducted during the Business in Practice (BiP) leadership workshop by Miguel Fernandes.
Source: Own illustration based on the Insights Discovery test.

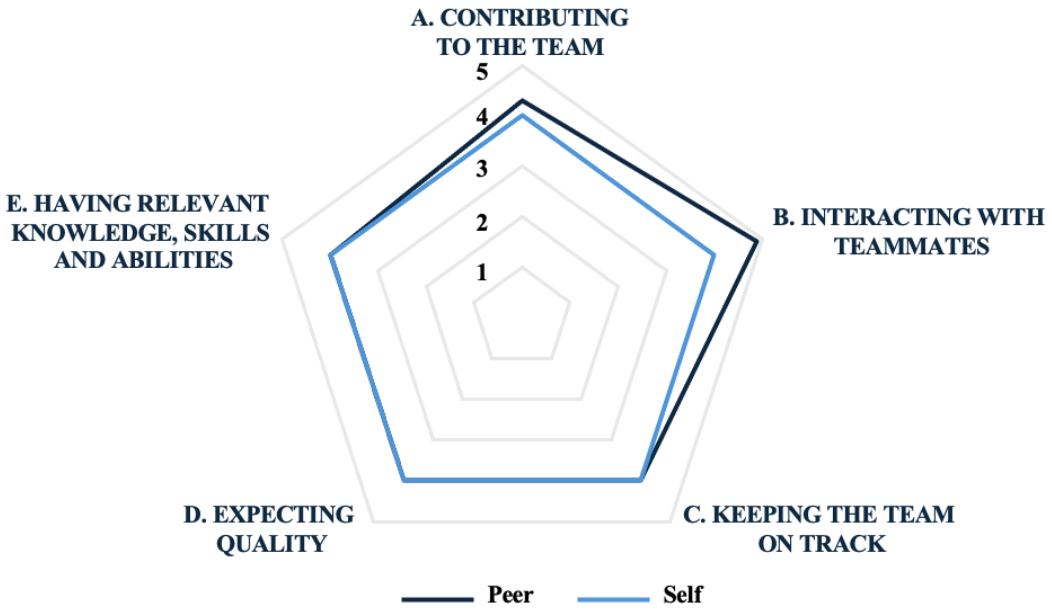

Figure 20: Business in Practice – Self- and Peer Assessment of Nick Pabst's performance in Ace's team.
Source: Own illustration using data from the BiP Industry Master's Simulation.

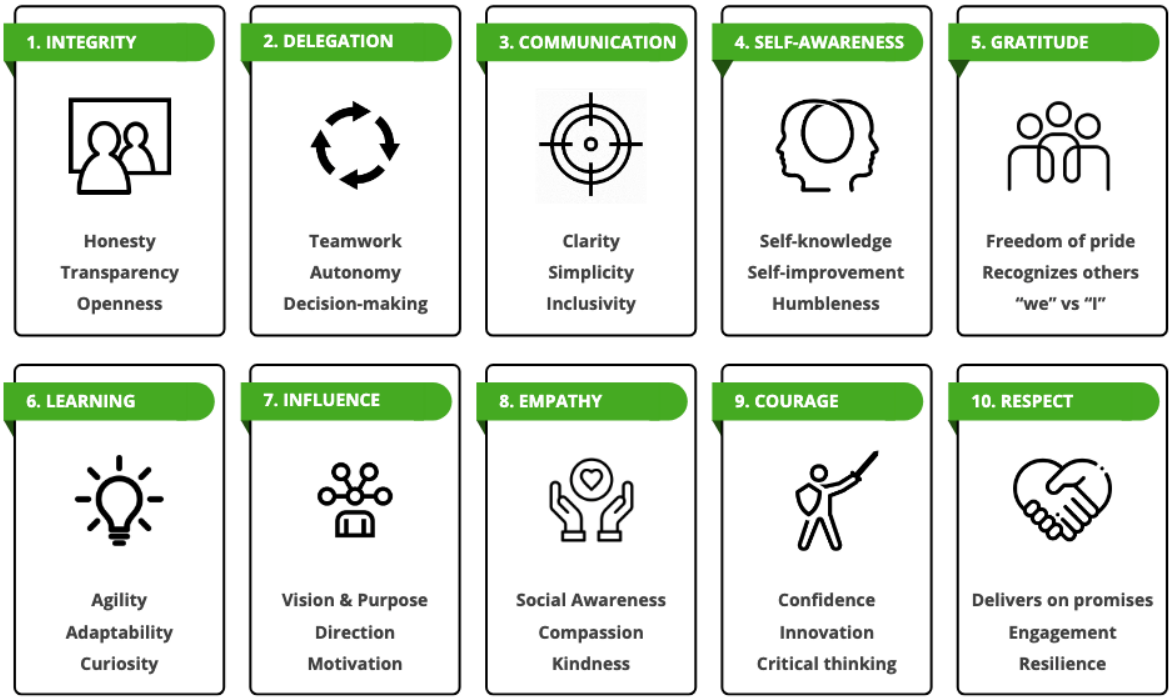

Figure 21: Key characteristics and qualities of leaders
Source: Leadership Decision Making Workshop – Professor Miguel Pinto Fernandes

B. Tables

Profitability from Operations							
In thousands $	2024	2025	2026	2027	2028	2029	2030	CAGR
Revenues	**$ 18,235,129**	**$ 18,208,651**	**$ 19,264,006**	**$ 22,925,056**	**$ 19,667,838**	**$ 23,762,368**	**$ 25,278,986**	**5.59%**
Gross Profit	**$ 7,004,084**	**$ 6,879,054**	**$ 6,880,631**	**$ 8,473,592**	**$ 6,325,448**	**$ 10,202,510**	**$ 10,409,472**	**6.83%**
Gross Margin	*38.41%*	*37.78%*	*35.72%*	*36.96%*	*32.16%*	*42.94%*	*41.18%*	1.17%
EBITDA	**$ 6,376,969**	**$ 5,768,237**	**$ 5,510,923**	**$ 6,373,918**	**$ 4,355,752**	**$ 8,558,140**	**$ 8,438,169**	**4.78%**
EBITDA Margin	*34.97%*	*31.68%*	*28.61%*	*27.80%*	*22.15%*	*36.02%*	*33.38%*	-0.77%
EBIT	**$ 4,570,529**	**$ 3,677,463**	**$ 3,037,467**	**$ 3,406,533**	**$ 1,562,861**	**$ 5,477,352**	**$ 5,173,940**	**2.09%**
EBIT Margin	*25.06%*	*20.20%*	*15.77%*	*14.86%*	*7.95%*	*23.05%*	*20.47%*	-3.32%
Net Income	**$ 2,837,950**	**$ 1,914,905**	**$ 1,348,083**	**$ 1,128,614**	**$ 796,284**	**$ 3,558,713**	**$ 3,391,655**	**3.02%**
Net Profit Margin	*15.56%*	*10.52%*	*7.00%*	*4.92%*	*4.05%*	*14.98%*	*13.42%*	-2.44%

Table 1: Ace's profitability from operations (FY2024–FY2030) with margins and CAGR.
Source: Own illustration using data from the BiP Industry Master's Simulation.

Profitability from Operations of Large Automakers									
In thousands $	Tesla	Toyota	BMW	Mercedes	Volkswagen	Gerneral Motors	Ford	Renault	Median
Gross Margin	17.86%	20.77%	30.47%	22.43%	20.80%	12.49%	12.43%	17.46%	**19.32%**
EBIT Margin (operating profit)	7.24%	11.87%	10.77%	11.37%	7.80%	6.82%	4.65%	6.14%	**7.52%**
Net Profit Margin	7.30%	10.96%	7.09%	9.30%	4.80%	3.83%	2.50%	4.01%	**5.95%**
Current Ratio	2.03x	1.19x	1.29x	1.26x	1.31x	1.13x	1.18x	1.24x	**1.25x**
Quick Ratio	1.61x	1.03x	0.8x	0.93x	0.94x	0.97x	0.85x	1.03x	**0.96x**
Cash Ratio	1.27x	0.48x	0.16x	0.31x	0.29x	0.28x	0.26x	0.56x	**0.3x**

Table 2: Profitability ratios of large automakers (Tesla, Toyota, BMW, Mercedes, Volkswagen, General Motors, Ford, Renault) with industry medians.
Source: Macrotrends. 2025. "Macrotrends." Accessed August 10, 2025. https://macrotrends.net/

Liquidity Ratios							
In thousands $	2024	2025	2026	2027	2028	2029	2030
Liquidity Ratios							
Current Ratio	**8.31x**	**10.56x**	**15.66x**	**7.87x**	**11.69x**	**7.41x**	**23.56x**
Quick Ratio	**5.85x**	**7.49x**	**12.23x**	**5.6x**	**7.93x**	**5.3x**	**20.25x**
Cash Ratio	**2.83x**	**4.29x**	**7.99x**	**2.67x**	**4.07x**	**2.15x**	**11.15x**

Table 3: Ace's liquidity ratios (FY2024–FY2030).
Source: Own illustration using data from the BiP Industry Master's Simulation.

Cash Flow Management							
In thousands $	2024	2025	2026	2027	2028	2029	2030
Cash Conversion Cycles	**108**	**126**	**84**	**105**	**91**	**88**	**68**
DIO	**80**	**95**	**56**	**77**	**64**	**64**	**29**
Inventories	2,459,111	2,955,642	1,887,958	3,029,470	2,322,985	2,371,440	1,190,797
COGS	11,231,046	11,329,597	12,383,375	14,451,464	13,342,390	13,559,859	14,869,515
DSO	**61**	**62**	**44**	**62**	**44**	**54**	**47**
Receivables	3,035,286	3,079,317	2,334,455	3,909,566	2,381,221	3,526,474	3,272,324
Revenues	18,235,129	18,208,651	19,264,006	22,925,056	19,667,838	23,762,368	25,278,986
DPO	**33**	**31**	**16**	**34**	**17**	**30**	**9**
Payables	1,002,590	962,588	550,346	1,333,800	616,973	1,121,807	359,457
COGS	11,231,046	11,329,597	12,383,375	14,451,464	13,342,390	13,559,859	14,869,515

Table 4: Ace's cash conversion cycle (FY2024–FY2030).
Source: Own illustration using data from the BiP Industry Master's Simulation.

Capital Structure Ratios							
In thousands $	2024	2025	2026	2027	2028	2029	2030
Debt-to-Equity	**1.01x**	**1.14x**	**1.05x**	**1.02x**	**0.94x**	**0.94x**	**0.50x**
Total Debt	12,024,692	14,795,515	14,342,730	14,387,892	12,979,193	13,327,693	8,109,779
BV Equity	11,936,499	12,966,684	13,630,258	14,048,331	13,788,021	14,110,214	16,145,207
Net Debt-to-Equity	**0.28x**	**0.38x**	**0.49x**	**0.49x**	**0.64x**	**0.36x**	**0.10x**
Net Debt (Total Debt - Cash)	8,187,785	9,702,661	9,396,165	9,498,453	9,851,589	9,789,177	3,743,506
Market Value Equity	28,868,700	25,379,550	19,010,950	19,503,225	15,343,646	27,051,579	37,066,995
Interest Coverage Ratio	**8.85x**	**7.10x**	**5.12x**	**6.60**	**3.67x**	**13.92x**	**15.74x**
EBIT	4,570,529	3,677,463	3,037,467	3,406,533	1,562,861	5,477,352	5,173,940
Interest Expense	516,194	517,629	592,793	516,320	425,312	393,356	328,718

Table 5: Ace's capital structure ratios (FY2024–FY2030).
Source: Own illustration using data from the BiP Industry Master's Simulation.