LEAN AND OPERATIONAL EXCELLENCE

BST841
INDIVIDUAL REPORT

BUILDING RESILIENCE: A DIGITAL TRANSFORMATION OF ASTON MARTIN'S SUPPLY CHAIN

Blockchain and Cybersecurity to Forge a New Path in This Protectionist Era

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Contents

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Executive Summary

Aston Martin's supply chain is fundamentally out of sync with the demands of today's global market. Repeated supplier failures have triggered five major recalls in just three years, severely undermining the brand's reputation. At the same time escalating U.S. tariffs, now reaching 25%, are stripping revenue from one of its largest markets, exposing deep structural weaknesses in supply chain transparency and the company's ability to adapt to external pressures.

This report proposes a dual digital transformation that is no longer optional, it is needed and vital for survival in this new chapter of volatile protectionist policies:

1. **Blockchain integration** to restore visibility, simplify rules-of-origin compliance, and enable customer-facing digital features such as crash response and verifiable service records.
2. **Cybersecurity reinforcement** to secure connected vehicle systems and safeguard supplier data in a rapidly evolving threat landscape.

The financial case is clear. Due to imposed tariffs, Aston Martin will burn through an average of £130 million annually. A 36-month phased rollout targets high-risk exposure points first and leverages existing partnerships to reduce implementation friction and cost. The goal is not to lead innovation but to regain control in a system that has outgrown its current capabilities.

However, this strategy comes with risks. Blockchain transparency may expose prior supplier misconduct. Shareholder resistance is likely, and supplier pushback is expected. But its market value has collapsed by over 98% since 2018, and the scale of the 2021 bailout is unlikely to be repeated. Another failure will not be met with further investment. This report outlines the last viable option before collapse becomes inevitable.

1. Introduction

Aston Martin (2024) was founded in 1913 by two friends with a shared ambition to create high-performance vehicles that focused on craftsmanship and elegance. Throughout the years, the organisation has earned over 50 class wins across various races worldwide and reinforced its position within British culture through its association with the James Bond series (Aston Martin, 2024b). Despite manufacturing just under 7,000 vehicles annually, Aston Martin operates in over 53 different countries, with around 80% of its vehicles exported to global markets (Aston Martin, 2024).

However, behind the scenes lie growing operational pressures. The UK automotive industry has faced numerous external disruptions. Brexit pushed many suppliers into mainland Europe, increasing logistics costs and complexities. Further exacerbated by the COVID-19 crisis, which wiped out over 42% of vehicle sales (Pitas, 2019; Aston Martin, 2021).

Despite a quick recovery in sales volume post-pandemic, the organisation is surviving on cash injections, operating its sixth year with substantial losses (***Figure 1***) (Aston Martin, 2024). This was caused by five supplier-related recalls in just three years, as well as ongoing component delays that continue to suppress anticipated manufacturing volumes (Shabong, 2024a). The traditional, underutilised digital supply chain possesses a significant weakness in its ability to compete in an industry and an era defined by digital breakthroughs. The lack of digital visibility is no longer a minor competitive flaw but a substantial financial liability.

Section one builds a robust foundation, providing a detailed critical analysis of the business's current digital supply chain position. Section two recognises the need for a digital transformation and discusses how blockchain and cybersecurity can further strengthen a competitive and resilient future position. Lastly, section three examines potential implications, drawbacks and ethical implications of this proposed adoption.

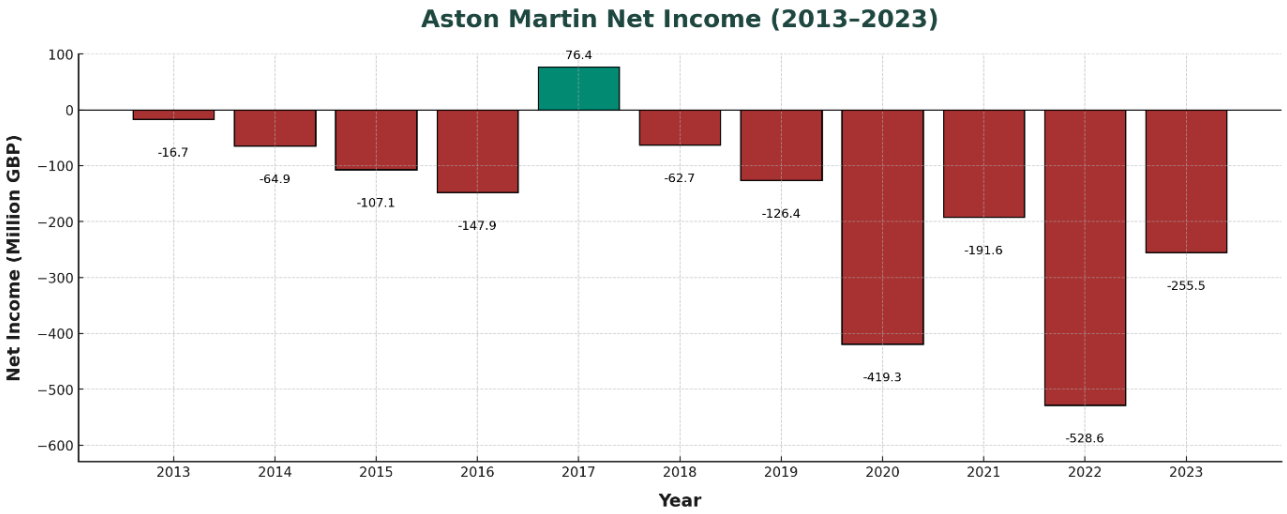

Figure 1: Aston Martin (2013-2023) Profits

2. Current Supply Chain Analysis

Figure 2: SWOT Analysis

2.1 Supply Chain Structure and Internal Operational Complexities

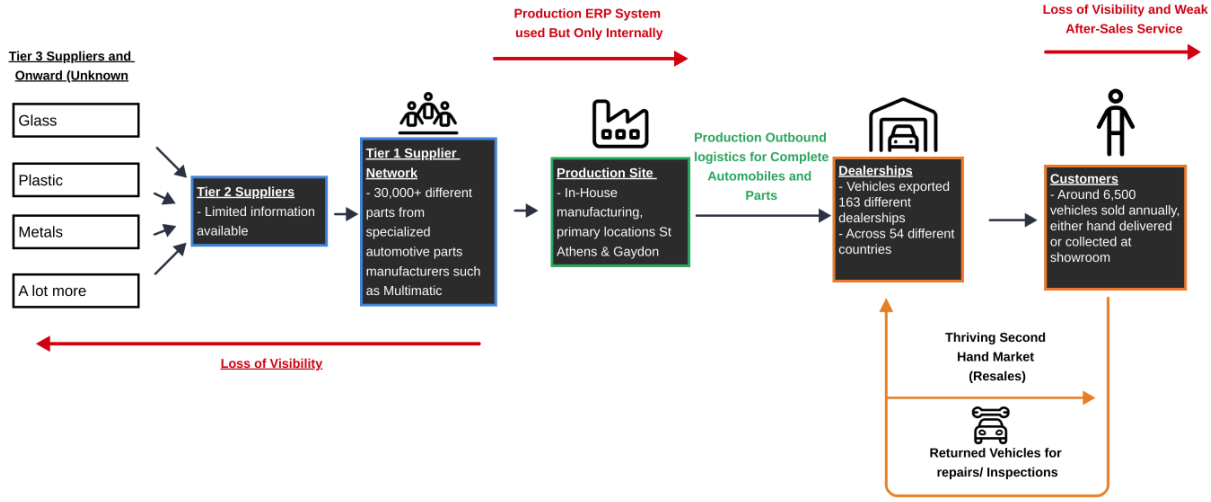

Figure 3: Aston Martin Swot Analysis

In 2018, Aston Martin transitioned from private ownership to a publicly traded organisation to drive growth through external investment and strategic partnerships (Pitas, 2018). ***Figure 3*** showcases Aston Martin's holistic supply chain from raw material extraction to the end consumer. Vehicles are manufactured exclusively in the UK, consisting of two locations in Gaydon and St Athan (Automotive Logistics, 2025). Despite its global reach, Aston only produces around 6,500 vehicles annually and delivers to 163 franchised dealerships in 54 countries (Aston Martin, 2024).

The company operates within the ultra-luxury vehicle market, catering to high-net-worth individuals who seek performance and prestige (Sehdev 2024). It differentiates itself from close competitors such as Ferrari, Bentley and Porsche by maintaining their unique original design features and low-volume limited-availability production, creating a product that is exclusive and highly sought after (Aston Martin, 2025). This reinforces resale value and elevates its status among collectors and enthusiasts. Its competitiveness within F1 racing has further strengthened its position and capabilities to produce performance-oriented vehicles (F1, 2025).

Despite its exclusivity, the relatively low number of vehicles produced poses a significant challenge as economies of scale cannot be fully utilised at this level (Husan, 1997). The monumental, fixed costs associated with developing high-performance, road-legal vehicles, including research and development, testing, and adhering to the legal compliance requirements of different countries, cannot be effectively spread across multiple units (Strategy&, 2023). This inevitably affects the profitability of each car produced. Aston's current operating margin is around -6%, a stark contrast to competitors such as Ferrari and Lamborghini, with around 27% and Bentley, with around 15% (Aston Martin, 2024; Ferrari, 2025; Lamborghini, 2024; Bentley, 2024).

Additionally, Aston Martin employs a make-to-order production system due to its extremely high production costs (WELT, 2025). This provides direct value through a personalised experience with extensive vehicle customisation (Pitas, 2018). This includes colour, carbon fibre details, interior materials, engine sizes and much more, offering a level of personal expression far beyond standard automotive manufacturers (Aston Martin, 2025). It amplifies the sales process into a premium, consultative experience where consumers are invited into Aston's design studios to collaborate directly with brand specialists (Aston Martin, 2024). This immersive journey strengthens emotional attachment and provides a strategic opportunity for Aston to upsell higher-margin options and special-edition trims, boosting the average revenue per unit (Cadena, 2023). Operationally, this approach also mitigates the financial risks associated with unsold vehicles, which can depreciate by up to 50% within the first year, reducing the likelihood of excess inventory losing value on showroom floors (ASF, 2023).

However, this introduces additional supply chain complexities as most vehicles are heavily uniquely configured from the core, eliminating the predictive nature of mass customisation production that competitors utilise (Automotive Logistics, 2025). This places significant pressure and reliance on suppliers to deliver low-volume, high-precision components just in time. Given that over 30,000 parts are required to

assemble each vehicle (KPMG, 2023), even minor last-minute forecasting fluctuations to tier 1 suppliers can trigger the bullwhip effect, forcing upstream suppliers to overcompensate and stretch capacity, often beyond what is feasible (Ehm et al., 2023).

This was made evident in early 2024 when Aston Martin was forced to downgrade its production targets by 14% after late purchase orders caused severe component shortages, disrupting vehicle assembly (Shabong, 2024b; Awasthi, 2025). With lead times ranging from 6 to 9 months and bespoke models taking up to 12 months (Aston Martin, 2024), these disruptions significantly impact delivery scheduling, which in turn affects consumer satisfaction, given the even longer lead times.

2.2 External Pressures and Supplier Vulnerabilities

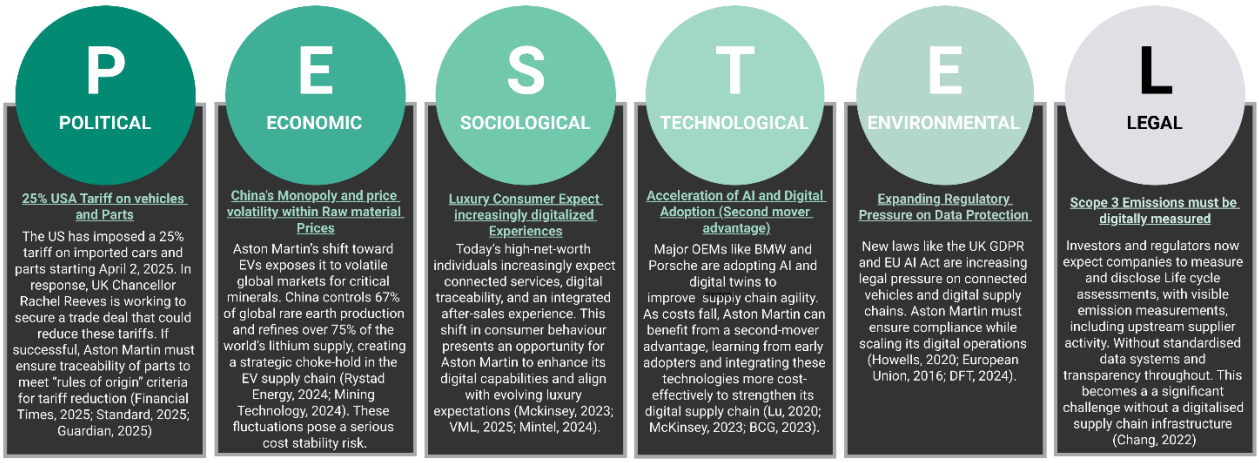

Figure 4: PESTLE Analysis

A barrage of external pressures has recently bombarded Aston Martin's supply chain. One of the most disruptive has been the UK's departure from the European Union in 2020 (BBC, 2020). A populist driven decision aiming to restore sovereignty and legislative independence (Kroenig, 2020). However, this transition marked a significant economic downgrade from full access to the European single market and customs

union to a more limited trade agreement (Financial Times, 2022). This introduced significant non-tariff barriers, including additional customs clearance processes and compliance with new safety regulations (Financial Times, 2022).

Additionally, the organisations were required to comply with new Rules of Origin requirements, ensuring that at least 40% of the vehicles' value originates from either the UK or the EU to qualify for tariff exemptions (WTA, 2023). This shift significantly impacted Aston Martin, as reliance on a network of global suppliers became substantially more complex. The organisation was forced to restructure their suppliers and implement contingency measures to safeguard production continuity, including hiring a dedicated supply chain chief and preparing to fly in critical components at a considerable cost to avoid further delays (Pitas, 2019; Guardian, 2023).

The COVID-19 crisis further exacerbated Aston's operational vulnerabilities and global interconnectedness, as global lockdowns led to border closures and raw material shortages, severely disrupting inbound supply (SHB, 2024). Further exacerbated by temporary factory closures at both facilities halting production entirely (Aston Martin, 2020b). Demand for luxury vehicles also declined (Statista, 2025), forcing the organisation to endure fixed costs while experiencing lower sales. Meanwhile, reliance on smaller specialised suppliers backfired, as many entered administration due to mounting pressures, contributing to a staggering production decline of over 42% in 2020 (Aston Martin, 2021). Losses mounted, totalling a monumental £466 million loss in just a single year, forcing the organisation to raise an emergency rescue package of approximately £500 million to stay afloat (Guardian, 2020).

More recently, the USA has intensified its trade dynamics and announced the imposition of a 25% tariff on all vehicles and parts not manufactured domestically (Guilford, 2025; Whitehouse, 2025a, 2025b). The regulatory landscape remains dynamic and subjected to change. Aston Martin is currently absorbing the full 25%

tariff, as all vehicle production remains based in the UK (Financial Times, 2025). The USA represents approximately 30% of all Aston Martin's vehicle sales (Aston Martin, 2024), posing a major threat to the organisation's strategic accessibility and potential profitability. UK Finance Chancellor Rachel Reaves announced efforts to negotiate a more favourable trade agreement, but this is unlikely due to the US's current protectionist standpoint (ITV, 2025).

Such negotiations will require strict rules of origin requirements to prevent European manufacturers from routing parts through the UK to exploit lower tariffs (Iyoha, 2024). Alternatively, Aston will likely have to be forced to establish production capabilities within the US, reconfiguring its current suppliers in accordance with US tariff exemptions (Evening Standard 2025). Either way, this makes it vital for Aston Martin to achieve full transparency across its supply chain and understand the origin of each component. Without this visibility, Aston could absorb an average of £70,000 in tariffs per vehicle (Times, 2025; Aston Martin, 2024). A financial strain significant enough to truly test the price resilience of even their affluent customer base, shredding any realistic hopes of profitability.

Furthermore, Aston faces mounting legislative pressure to transition towards electrification. Under the UK's Zero Emission Vehicle (ZEV) mandate, 80% of new car sales must be electric by 2030 (Logistics UK, 2022; DfT, 2024). While competitors like Porsche and BMW are progressing rapidly, Aston has yet to release a single EV (Aston Martin, 2024; Shabong, 2024c). This misalignment is critical, particularly as the brand's loyal consumer base remains emotionally invested in combustion performance. Hopeful plans are in place to release the first electric model in 2026 (Edward, 2023).

Nonetheless, investor confidence has been shattered. Aston Martin's share price has plummeted by over 98% since its 2018 transition to a publicly traded company (***Figure 5***). As one executive bluntly described, "It's a never-ending shit show," capturing the

loss of both capital and trust in the organisation (Bryant, 2025). Aston is unlikely to secure another bailout of that scale. At this point, a digital transformation is no longer about gaining a competitive advantage, it's about stability in this new chapter of volatile protectionist policies. Without a digitally integrated, agile, and traceable supply chain, Aston Martin will continue to face operational setbacks and fall further behind in an industry that's rapidly moving forward. The next section outlines a targeted digital transformation strategy to secure Aston Martin's long-term survival.

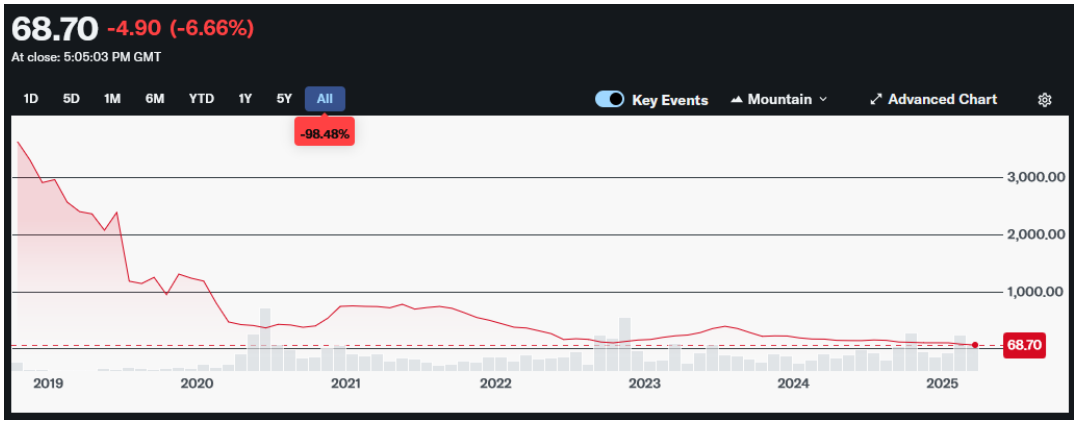

Figure 5: Aston Martin Share Price (Yahoo Finance, 2025)

3. Digital Transformation Proposal

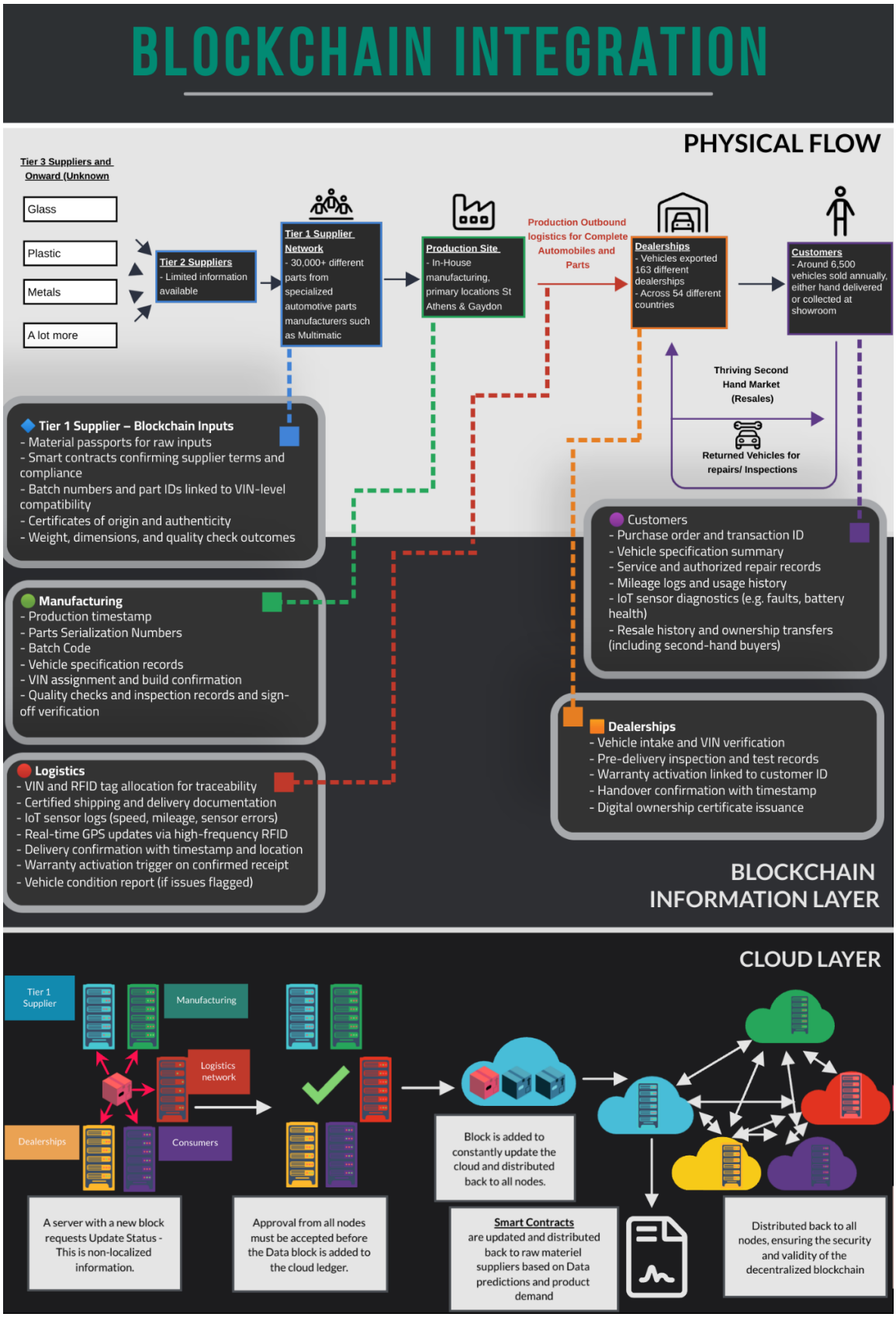

Figure 6: Aston Martin Proposed Blockchain Integration

This proposal recommends a dual digital transformation strategy to turn the identified SWOT opportunity into a competitive advantage. Blockchain integration will simplify rules of origins compliance and capitalise on consumers' rapidly growing demand for digitally enhanced vehicles, while urgent investment in cybersecurity will supplement this digital position. Decarbonisation is excluded, as Aston Martin is already progressing with EV implementation (Ingram, 2025). Instead, this proposal aims to stabilise and navigate their current position within this politically dynamic future.

3.1 Blockchain-Enabled Supply Chain Traceability

Despite having an ERP system in place, Aston Martin's digital infrastructure remains heavily siloed, with limited transparency across suppliers already causing significant damage (Ambasna, 2024). Within the past three years, Aston has faced five vehicle recalls due to supplier-related quality issues, including a major case where counterfeit plastic was used in the accelerator pedal (Klayman, 2014; DVSA, 2025). This not only poses a significant risk to customers' safety but also severely impacts the brand's reputation and amounts to substantial revenue losses (Ahsan, 2013). In a market defined by exclusivity and trust, these oversights are simply unacceptable (Mintel, 2024).

Addressing this, ***Figure 6*** illustrates how blockchain will be introduced to encompass five key actors, including tier 1 suppliers, internal production, logistics operators, dealerships, and customers. Each player will contribute key data, enabling real-time traceability through a digital twin (Saberi, 2019). Suppliers will upload material passports and batch IDs, directly linking part origins to VINs. Production logs will confirm assembly events and component integrity. Downstream, dealerships will trigger warranty activation, and customer servicing will be recorded in a shared vehicle history ledger (Kamble, 2023).

Blockchain smart contracts will also be used, allowing customers' orders to be directly linked to suppliers (Saberi, 2019). Once a consumer confirms an order, a self-executing code linked to the vehicle model and chosen specification can automatically trigger supplier orders within contractually agreed limits (Taherdoost, 2023). This direct input-output information chain can significantly reduce complexities and forecasting errors, providing direct real-time demand visibility to suppliers, avoiding last-minute order changes by Aston Martin (Christidis, 2016). This gives suppliers time to meet demand, creating a more streamlined and predictable pattern based on actual consumer orders rather than Aston Martin's forecasting capabilities (Kamble, 2023; Wang, 2022)

Moreover, Aston Martin faces a strategic dilemma to either increase price and create an even less competitive vehicle in their most dominant market, which will inevitably mount to even more losses, or to shift production capabilities abroad and restructure its entire supplier base to create US tariff-exempt vehicles (Guilford, 2025; Awasthi, 2025b). Both options carry significant financial and operational risks. Critically, this transition will require full transparency over the origin of components to comply with rules of origin protocols, a capability the company's current digital systems are not equipped to deliver (Cui, 2019).

Blockchain technology presents a strategic solution to ease this transition. By enabling real-time traceability of each component and production input, blockchain ensures regulatory compliance with rules of origin requirements across Aston Martin's complex supply chain (Cui, 2019; Wamba, 2020). Smart contracts can further support supplier restructuring by automating and accelerating the drafting of potentially thousands of new supplier agreements (Saberi, 2019). This level of transparency not only simplifies supplier onboarding but also mitigates the risk of non-compliance origin parts penalties.

However, in today's globalised supply chain, even American-made vehicles are rarely 100% domestically made (WSJ, 2025). Suppliers worldwide possess different capabilities and strengths, a direct replacement for all 30,000 vehicle components in a single country is unrealistic (KPMG, 2023). Blockchain can enable a hybrid supply model where verified US parts are prioritised to reduce the tariff burden. But Inevitable global suppliers with specialised capabilities should remain integrated under transparent tariff compliance for each specific component. Traceability ensures the vehicle avoids the full 25% tariff applied to the entire value (Whitehouse, 2025). This approach enables Aston Martin to remain price-competitive with US-assembled vehicles, which are also partially affected by tariffs due to their reliance on globally sourced parts (WSJ, 2025).

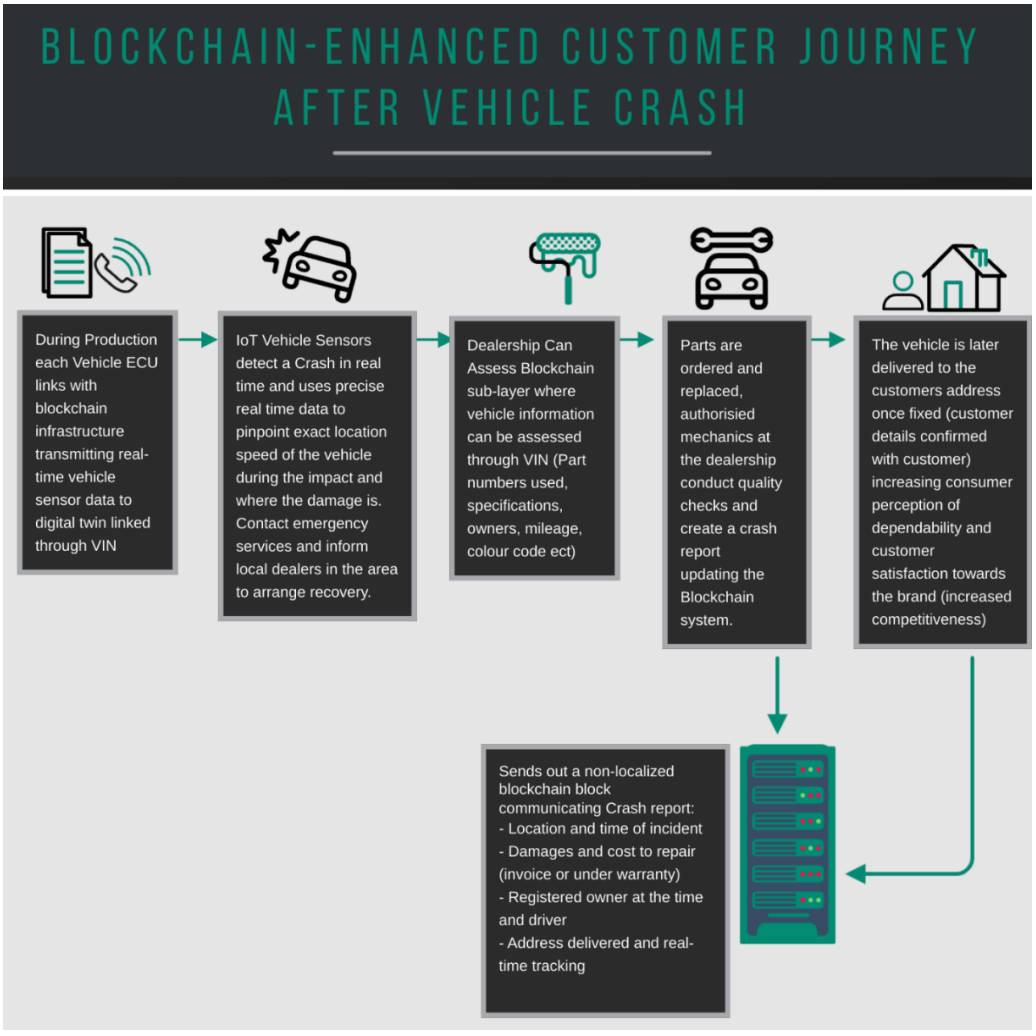

Figure 7

The organisation recently launched a digital customer-facing interface in partnership with VML, aiming to enhance users' online experience (VML, 2025). However, the platform remains limited, lacking integration with real-time vehicle data (Anderson, 2025). By embedding IoT vehicle data into blockchain systems, Aston can create a secure historical record of vehicle vital information that is often tampered with, such as mileage, service records, and authentic component status (Saberi, 2019; Lu, 2020; Kamble, 2023). Customers could access a transparent service history, receive predictive maintenance alerts, and track orders key features already offered by mass-market competitors but overlooked by Aston Martin (Strategy&, 2023).

Nonetheless, Aston should go above simply matching competitors. ***Figure 7*** shows how blockchain IoT data can further strengthen its front-end customer service capabilities. Crash sensors can automatically trigger a local emergency response, providing precise real-time location and notifying nearby dealerships for recovery (Kumar, 2020). Repair centres can later access the blockchain-logged data and retrieve vital information, such as the parts used and their colour codes, allowing for remote assessment without the need to manually disassemble the vehicle completely (Kumar, 2020). Purchased repaired parts can be fed back into upstream forecasting, enhancing predictive analytics (Bi, 2023). This can be used to further boost competitiveness by providing a more digitalised vehicle or even creating an additional value stream offering this additional service as a premium.

3.2 Cybersecurity Architecture and Digital Trust

As Aston expands their digital presence through blockchain and customer-facing platforms, it becomes increasingly vulnerable to cyberattacks. As vehicles grow more digitally connected, cyberattack risks increase substantially (ETAS, 2024). Within the automotive industry, cyber incidents have increased by over 380% in the past four years, with the average breach costing $3.4 million (IBM, 2024; Cameron, 2023). Aston

Martin's fragmented ERP system, weak current consumer platform and high-end customer pool make it a prime target for cyberattacks (McKinsey, 2024; Janker, 2024). Unlike larger rivals, the organisation's current position makes it extremely vulnerable, lacking the current capabilities or finances to absorb such threats without severe consequences or even bankruptcy.

To address this issue, a multi-layered cybersecurity architecture is proposed. This begins with embedded endpoint protection within connected vehicle systems, enabling early threat detection at the ECU level (McKinsey, 2024; Janker, 2024). However, the greatest vulnerability often lies within internal supply network (Melnyk, 2022). Externally, a zero-trust framework must be applied to suppliers and third-party access, enforcing strict authentication and role-based privileges to prevent lateral movement across systems in the event of a breach (Melnyk, 2022). To preserve data security, each actor will be granted access only to their authorised layer of the blockchain network.

Blockchain will complement this architecture by functioning as an immutable audit layer, verifying firmware updates and access attempts across the network. Its decentralised structure mitigates risks associated with centralised databases, offering traceable, tamper-resistant logs that are critical for over-the-air update integrity and supply chain authentication (Saberi, 2019). Importantly, even older vehicle models that are digitally connected to the blockchain are susceptible to breaches (Janker, 2024). To tackle this issue Aston should only connect vehicles that currently possess the digital capabilities to securely connect to the blockchain ledger, older models that cannot hold these defences should not be integrated (El-Rewini, 2020).

4. Impact Analysis

4.1 Implementation Challenges

As a publicly traded company, Aston Martin must initially overcome internal resistance to justify large-scale digital investments. Blockchain's benefits are more tangible and, therefore, easier to propose (Chang, 2022). However, cybersecurity benefits are largely invisible, operating in the background. Their value is invisible until a breach occurs, at which point the damage is irreversible (Patterson, 2024). Convincing shareholders to back a non-immediate return while also requiring significant restructuring of current processes will be a major challenge.

Externally, blockchain will require suppliers to meet new compliance standards and undergo audits for cybersecurity compliance and readiness (Monrat, 2019). Aston's supplier relationship is largely relational rather than transactional, prioritising long-term quality supply and paying a premium (Aston Martin, 2024c). Inevitably, there is a chance that some specialised suppliers may resist participation due to concerns over "intellectual property". They may fear sharing data or permitting audits could expose their proprietary process and weaken their competitive advantage (Ghamat, 2021). In some cases, suppliers fear that Aston may bypass them entirely and opt to source directly from their Tier 2 suppliers (Ghamat, 2021). This leaves Aston with a difficult trade-off. Either to support their transition or replace them to protect network integrity. For a luxury brand that possesses sensitive consumer data worth billions and is on the verge of bankruptcy, Aston doesn't have a choice. Security should not be optional, and no compromises should be made.

4.2 Ethical Risks

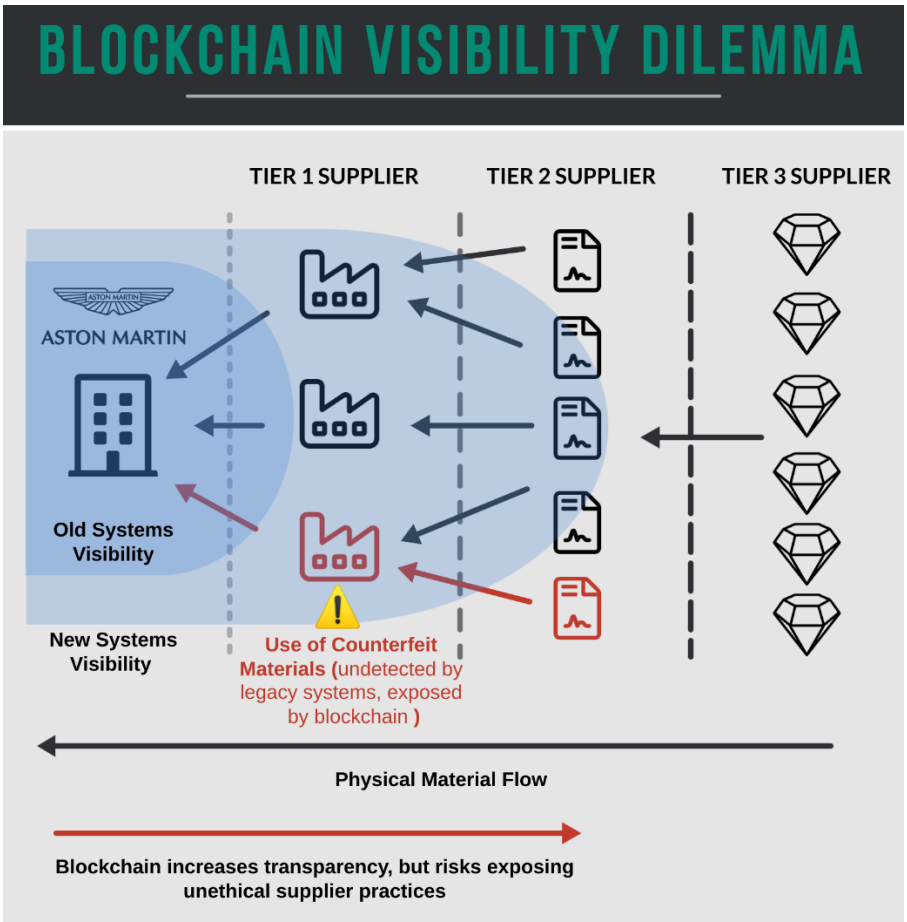

Figure 8

While blockchain enhances transparency and reinforces consumer trust when handled ethically, it also amplifies scrutiny (Saberi, 2019). It exposes Aston to previously hidden issues or unethical practices, such as non-compliant labour standards or the use of counterfeit materials in previous models (Agrawal, 2021) (***Figure 8***). If such concerns do occur, the organisation has the responsibility to disclose them transparently and address them swiftly. Failing to do so, and more importantly knowingly putting customers in danger will result in even more substantial regulatory penalties (Gov, 2022). Ultimately, the risk lies not in the exposure itself but in how the organisation chooses to act when such truths are uncovered.

Additionally, embedding IoT sensors into vehicles introduces risks around customer data and confidentiality (Chanal, 2021). Information such as real-time location and driving behaviour will be recorded, potentially making it accessible to law enforcement or insurance providers. For a performance brand, this will concern spirited drivers. Such data must comply with international data protection laws (Howells, 2020; European Union, 2016). Crucially, customers should have the option to provide informed consent and retain the ability to update their data collection preferences at any time, including after the vehicle is resold to a new owner (EU, 2016).

4.3 Feasibility

Blockchain and Cybersecurity are widely used in the automotive sector but neglected by Aston Martin. The organisation can leverage second-mover advantage to avoid early mistakes made by first movers (Hoppe, 2000). By learning from the implementation pitfalls of competitors, the company can accelerate integration and avoid the costly trial-and-error approach. Additionally, strategic partnerships, particularly with Mercedes-Benz, which owns 20% of the organisation, can provide access to advanced R&D capabilities (Aston Martin, 2020a). These partnerships support the development of establishing the digital infrastructure, reducing development cost and time.

A simplified cost-benefit analysis (***Figure 9***) highlights the financial rationale for the proposed transformation. Estimated implementation costs for blockchain and cybersecurity infrastructure total approximately £13 million, while annual tariff exposures exceed £130 million at current sales volumes (Aston Martin, 2024; McKinsey, 2023). Representing a potential 10x return on investment from tariff avoidance alone within a single year, excluding additional gains from reduced recall rates and new revenue opportunities through data-driven vehicles.

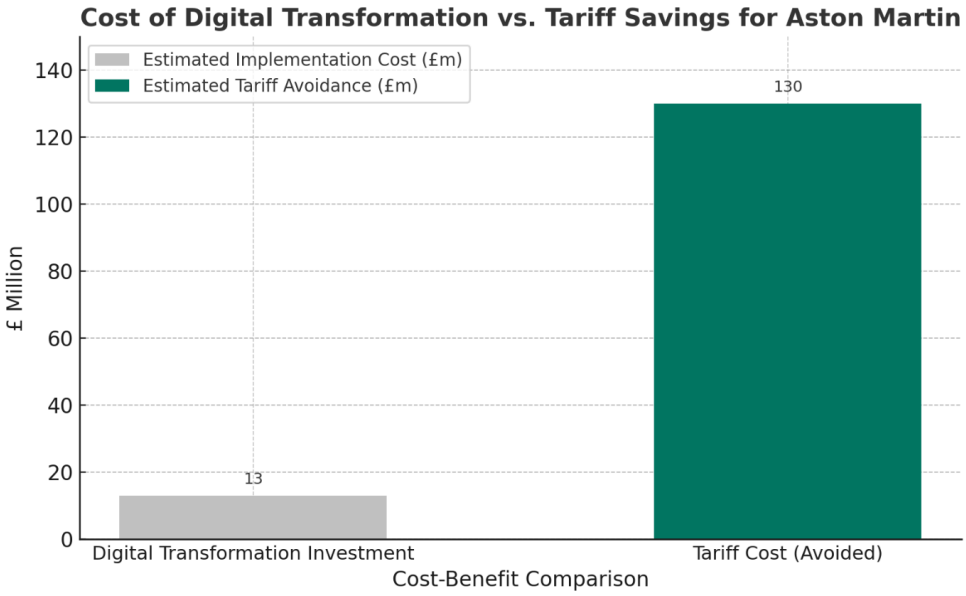

Figure 9: ROI Overview

5. Conclusion

To conclude, this report highlights the urgent need to update Aston Martin's digitally lacking infrastructure, which has resulted in multiple vehicles being recalled. The company has faced numerous forecasting led manufacturing delays and has become unresponsive to external threats, which have left the organisation crippled, critically vulnerable and struggling to remain financially competitive.

The proposed blockchain and cybersecurity integration offers a pathway to stabilise its current position, enhancing transparency and security throughout and unlocking additional customer-facing values. While the benefits are significant, the strategy is not without its challenges, including stakeholder resistance and ethical considerations surrounding data privacy and potentially exposing previously unknown ethical practices.

Aston Martin's next steps include establishing strategic partnerships to accelerate system development, auditing supplier readiness and piloting in target regions before wider rollout (***Figure 10***). This transformation is the foundation upon which Aston Martin

must build its defence against U.S. tariffs and secure its survival in a radically shifting global market.

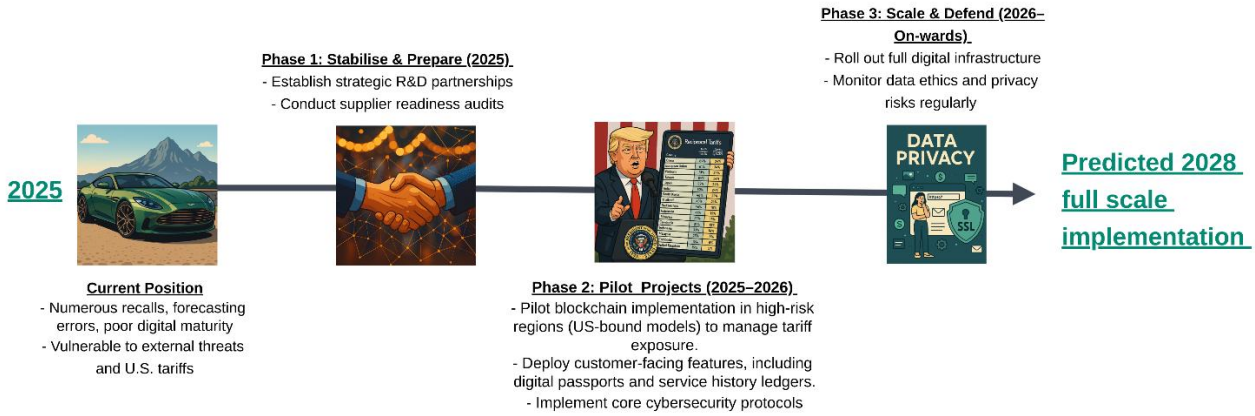

Figure 10: Implementation Roadmap

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Appendix

Figures, cover page and graphs all created by writer (C21084397) (Excluding Figure 5)

As of date this was written, US Imposed a 25% tariff on all automotive vehicles and parts not manufactured within the US. No originating content percentage was discussed, and it was said to be applied on the value of all parts individually. Aston has yet to release a statement

1. *Data used for Figure 1*

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
2	Net Income (Million GBP)	-16.7	-64.9	-107.1	-147.9	76.4	-62.7	-126.4	-419.3	-191.6	-528.6	-255.5	
3													
4													