

Supply Chain 2023/24 MOD007698 Tri 1 – 011 Assignment

All names, company details are fictional and are not real companies.

Introduction

RevEnerAuto Power has developed a power control system for electric vehicles, and due to their innovative design, they have become market leaders in terms of higher energy efficiency and power recovery. The company was founded by two engineers, Ethan Anderson and Olivia Patel, who previously worked in the aerospace industry. Through a fortuitous encounter with an engineer from South Korea, they started the business. With a combination of personal and venture capital funding, RevEnerAuto Power has grown to a team of thirty members located across different global locations.

Initially, the company focused on producing products for custom vehicle conversions in Europe, starting at a production rate of 100 units per month and gradually scaling up to 2000 units per month. Major automotive manufacturers such as Toyota, VW, and BMW have expressed interest in RevEnerAuto Power's products and have sent RFQs (requests for quotations) to the company. However, as the company has expanded, the management board recognizes the need for changes in their operations, as they are still operating like a small company and facing various challenges today.

As an external consultant, you have been hired to review RevEnerAuto Power's overall supply chain and develop a well-defined improvement plan. Your objective is to address the company's operational issues and provide clear recommendations for enhancement.



Current situation

RevEnerAuto Power's headquarters is located in California, while their engineering team is based in South Korea, and suppliers are spread across the globe. Since its establishment in 2018, the company's founders, Ethan Anderson and Olivia Patel, have primarily focused on research and development without facing significant pressure to meet delivery deadlines. As the company has grown, there is a prevalent office joke that "there is always tomorrow"

when it comes to product delivery, indicating a lack of urgency. Additionally, with the company's expansion, an organized organizational structure is lacking.

In the past, RevEnerAuto Power has won several small-scale projects; however, they have not employed any formal supply chain methodologies. As a result, late delivery of products has caused financial losses for the company. One of their products consists of various components sourced from different suppliers worldwide, each with varying lead times. While many products come from suppliers in China, RevEnerAuto Power sometimes purchases components from other sources due to delivery pressure. Two long-term suppliers, who happen to be friends of Ethan, frequently fail to deliver products on time, and the quality of their products is deteriorating. This quality issue was recently discovered when a batch of products had to be returned due to faulty wiring harnesses and poor quality assembly. This incident led to a recall of 500 vehicles by the customer, and RevEnerAuto Power had to bear the costs of reworking them. Returning the faulty modules to the manufacturing centre in Spain has been a challenge, and despite several months, most of the modules remain unreturned and were eventually discarded. This incident has tarnished RevEnerAuto Power's desired image as a provider of zero-emission vehicles.



Another significant challenge faced by the company in 2022/2023 has been the global semiconductor shortage, which has severely impacted RevEnerAuto Power's ability to produce PCBs (Printed Circuit Boards). Sourcing certain microprocessors has become difficult, leading to product redesigns, high piece prices, or ordering large quantities with lengthy lead times, sometimes stretching up to six months or more. This poses a considerable problem for the company, particularly when supplying major global OEMs.

With recent expansion, RevEnerAuto Power has been strategically opening offices in close proximity to customers and suppliers. For example, a customer in Germany, near Frankfurt, is an electric vehicle startup producing 5,000 city vehicles annually. Similarly, a London-based company manufactures 2,500 small electrical autonomous pods for airport use. Additionally, various other suppliers contribute to an additional 8,000 product sales per year. There is currently a plan to open offices in Tokyo, Mumbai, and Shanghai to meet future demand within these markets. This will mean the company will need to consider shipping parts to these markets in the future.



The German office is currently focused on sales within Europe, which can be frustrating for other offices as new orders suddenly emerge with significantly shorter delivery times than the standard three months.

Furthermore, one of the engineers in South Korea has developed their own sales and ordering systems, but feedback suggests that the system is overly complex, functions incorrectly, and contains several software bugs, resulting in missing orders. Most orders are sent via email, lacking a formal tracking system, which creates difficulties for the manufacturing manager in Spain who is attempting to align all orders.

Manufacturing

The company recently purchased a small manufacturing facility near Madrid, Spain, in response to the high volume of sales orders within Europe. This facility has the potential to serve as a central manufacturing location. Situated on a new industrial park, it boasts excellent access to trains and motorways, facilitating interconnections across Europe. Additionally, there are future prospects for a train route from China to Spain, reducing shipping time to just 15 days. Furthermore, a large port facility located 20 km away provides additional logistical advantages.

However, RevEnerAuto Power's manufacturing facility is currently facing challenges in achieving full operational capacity and meeting the fluctuating demands of sales orders. Carlos García, the head of manufacturing, is struggling to effectively manage suppliers and orders due to varying lead times and frequent delivery failures. To cope with the demands, the company often resorts to air freighting parts from China, incurring significant costs of over \$5000 per shipment. This has raised concerns among the US management board as it erodes overall profits.

Similar challenges arise in outgoing deliveries, as RevEnerAuto Power relies on a US logistics partner called TransNet Logistics for global shipments. While they were initially reliable, recent years have witnessed instances of late deliveries to end customers and even lost products. One major incident involved a complete pallet being dropped, resulting in extensive product damage. As a result, RevEnerAuto Power had to work over a weekend to replenish stock and ensure timely delivery to the end customer.



Future eWaste legal implementations

Across the globe, future e-waste legal regulations are evolving to hold Original Equipment Manufacturers (OEMs) and suppliers responsible for the end-of-life management of electrical products. This shift reflects the growing recognition of the environmental impact posed by e-waste and aims to ensure proper disposal and recycling practices. However, it is important to note that the landscape might change further in the future due to increasing consumer environmental pressure.

Within RevEnerAuto Power, the team is actively concerned about the potential impact of these regulations on their reverse supply chains. As the responsibility for managing e-waste is extended to OEMs and suppliers, it raises important considerations for RevEnerAuto Power's logistics processes. The company must carefully evaluate the implications of these regulations on their current operations, supply chain partnerships, and overall sustainability initiatives.

One major concern lies in the logistics process itself. With evolving e-waste regulations, RevEnerAuto Power must assess whether to outsource the logistics process to specialized service providers or bring it in-house to maintain better control and compliance. Both options have their advantages and drawbacks, requiring a thorough evaluation of costs, expertise, infrastructure, and regulatory compliance requirements.



Future opportunities

There is a tremendous opportunity for RevEnerAuto Power to supply products to a Tier 1 automotive company that is anticipating a significant demand of 10,000 products per year. This partnership has the potential to provide a substantial boost to RevEnerAuto Power's business and market presence. The Tier 1 automotive company operates manufacturing

facilities across the globe, including prominent locations in China, North America, Europe, and even Africa (as part of a long-term plan).

However, before any supplier agreement can be established, it is crucial for RevEnerAuto Power to address several issues that were identified during a recent audit. The audit revealed multiple problems that need to be resolved to ensure a smooth and successful partnership. These issues could range from manufacturing inefficiencies, quality control concerns, logistical challenges, or even compliance and regulatory gaps.

Addressing these problems is of paramount importance to establish a strong foundation for the supplier agreement. RevEnerAuto Power needs to evaluate and improve its manufacturing processes, implement stringent quality control measures, enhance supply chain management, and ensure compliance with industry standards and regulations. By effectively addressing these concerns, RevEnerAuto Power can build confidence and demonstrate its commitment to delivering high-quality products in a timely manner.

Furthermore, it is essential for RevEnerAuto Power to align its operations with the specific requirements and expectations of the Tier 1 automotive company. This may involve understanding their production timelines, quality standards, delivery schedules, and any other specific demands unique to the automotive industry. By tailoring their approach to meet these requirements, RevEnerAuto Power can position itself as a reliable and valued supplier.

Interview feedback

Please find the outcome of interview with the head of engineering within RevEnerAuto Power

Supply chain methodologies and processes are crucial for the efficient and effective movement of goods and materials within our organization. However, I must admit that we are currently facing some challenges in this area.

One of the major challenges we face is the lack of standardized methodologies and processes across our supply chain. We have multiple departments and teams working independently, often using different systems and approaches. This lack of cohesion leads to inefficiencies, communication gaps, and a lack of visibility into the overall supply chain.

The impact is significant. Without standardized methodologies and processes, we experience delays, increased costs, and a higher risk of errors or discrepancies. It becomes difficult to track and trace the movement of goods, leading to reduced transparency and accountability. This can negatively affect customer satisfaction, increase the risk of stockouts or overstocking, and hinder our ability to respond quickly to market demands.

Firstly, we need to establish a clear framework and set of standardized methodologies that are applicable across all departments involved in the supply chain. This includes creating guidelines for inventory management, procurement, transportation, and warehousing. By implementing consistent processes, we can streamline operations, reduce errors, and improve overall efficiency.

Secondly, we should invest in technology solutions that enable end-to-end visibility and automation. This could involve implementing an integrated supply chain management system or leveraging emerging technologies like blockchain or Internet of Things (IoT) devices. Such technologies can provide real-time data, enhance traceability, and facilitate seamless collaboration among stakeholders.

Lastly, it's crucial to prioritize training and education for our employees. By providing comprehensive training on the newly established methodologies and processes, we can ensure widespread adoption and understanding. This will empower our workforce to effectively execute their tasks and contribute to a more efficient supply chain.

Implementing standardized methodologies and leveraging technology in our supply chain processes will result in several benefits. We can expect improved inventory management, reduced lead times, and enhanced responsiveness to customer demands. By optimizing our supply chain, we can minimize costs, improve resource allocation, and achieve a competitive edge in the market. Additionally, the enhanced traceability and transparency will increase customer trust and satisfaction, which are vital for long-term success.

Consultancy report

Your role is to define a suitable supply chain strategy for RevEnerAuto Power, considering some of these items but you are free to expand on your own ideas and solutions. Please note this is not a question and answer assignment, you must define a suitable strategy for this case study.

Marking criteria

Scenario Analysis - Describe the current situation with the given case study, what are their current capabilities for supply chain management and detail the opportunities for future growth of the company.(20%) [Learning outcomes L1, L2, L4, L5, L6]

Supply chain strategies - Define how the case study organisation could establish a global supply chain, making reference to **one** supply chain theory such as Porter's value chain, SCOR model, etc. and the impact on the company structure. The strategies could include references to the following [Learning outcomes L2, L5, L6] .(30%)

- Consider the case study global supply chain operations i.e. manufacturing, suppliers, engineering center
- The advantages and disadvantages to outsourcing key sections of supply chain
- Identify key supply chain risks and how these risks can be managed
- Benefits and disadvantages Agile Vs lean Vs Hybrid supply chain strategy
- Impact of future technologies in sharing information throughout the supply chain.
- Impact on future eWaste regulations and reverse supply chains

Conclusion and recommendations - Provide a clear set of recommendations defining your ideas how to establish a supply chain, based off your academic research.(30%)
 [Learning outcomes L3, L5]

Academic Rigour - Your assignment should clearly include the academic insight, i.e. the concepts and the supporting references involved, indicated in the report and listed in the references and bibliography.(10%)

Appendix A

Bill of material for product

Component	Volume	Supplier	Lead Time (weeks)
Microcontroller	500	ABC Electronics	4
Power Supply Unit	300	XYZ Components	3
Memory (Flash and RAM)	1000	Global Semicon	6
Analog-to-Digital Converter	200	Innovate Tech	2
Digital-to-Analog Converter	150	ElectroCorp	5
Communication Interface	400	ConnectX	3
Input/Output (I/O) Pins	600	Elex Connect	4
Clock Generator	250	TimeTech	2
Voltage Regulator	350	Power Systems	3
Capacitors	1200	CapaTech	4
Resistors	800	ResiPro	2
Inductors	100	InductoCorp	3
Diodes	400	DiodeX	4
Transistors	500	TransTech	5
Voltage Reference	100	VoltSource	2
Crystal Oscillator	150	CrystalTech	3
PCB (Printed Circuit Board)	700	PCB Solutions	6
Connectors	600	Connex	4
Heat Sink	200	CoolTech	3
Enclosure/Casing	300	EncloSure	2