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Supply Chain Planning and Control

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by

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Abstract

This report demonstrates a quantitative and qualitative evaluation of the planning and control strategy of Toyota and suggests recommendations for improvements. Section 1 describes the competitive strategy of the firm based on the supply chain uncertainties and capabilities. Section 2 discusses the supplier segmentation and purchasing strategy of Toyota, also the resilience measures adopted by the firm during disruptions and uncertainties. Inventory categorization and production analysis based on Pareto law and Linear programming are carried out in section 3. Section 4 is on SWOT and TOWS analysis comprising recommendations provided based on conclusions from sections 2 and 3.

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Section 1

1.1 Introduction

The Supply chain planning and control phase has evolved a lot over the last 50 years. The progression successively evolved from the primitive level of planning from the shop floor echelon to material, then production, operation, and now to the advanced level of strategies inclusive of mitigation and contingency plans (Olhager, 2013). In this paper, we take a hybrid study on the automobile company Toyota to analyse the existing planning and control phase of the firm based on real data. Also, we will discuss the existing practice of the firm in the phase of disruption and uncertainties.

1.2 Strategic Fit and distribution channel of Toyota

To be in a strategic zone of a business a company should have aligned objectives in its competitive strategy and supply chain strategy. This fit is vital for a company to remain in the competitive market and also to understand how to coordinate the product, distribution, supplier, and operational efficiency to cut down costs and boost profit (Chopra, 2019). A company may even collapse due to inefficiency in the strategic fit or due to failure to match the supply chain design and resource with external demand. Under the 3-step model, let us evaluate the degree of strategic fit of Toyota over the years by analysing the demand and supplier uncertainty with the supply chain capabilities of Toyota. Toyota cars have a position in the spectrum of all 4 market segments. Hence, the firm experiences high demand variance. Which accompanies the company to scale its production line to suit different models. Thus, the supply chain distribution channel Toyota is clustered over the different regions of the world, so economic, political, and financial instability in any part of the world has an impact on the supply line of Toyota (Kito et al., 2014). Toyota's production system which follows the lean strategy is the prime capability of the company to achieve the flexibility to gain profit through cost reduction methods. Kaizen the continuous improvement discipline ensures sorting out any inefficiencies in the process of

the company to enhance its performance in every aspect. This continuous improvement helps to attain optimal working within the firm to irradicate the wastage of resources. All the supply chain capability within Toyota becomes an essence to other capabilities to perform well. The "automation within a human touch" developed by Toyota increases their visibility to build quality products with fewer human resources just-in-time (Toyota Motor Corporation, 2019). Thus, this improves their efficiency to control supply chain measures like lead time, pricing, innovation, inventory level so on. Toyota Company has continuously improved its performance in supply chain drivers such as warehousing, logistics, facilities, and information. These drivers help in improving the responsiveness and efficiency of the supply chain to achieve strategic fit. Inventory reduction is the key goal of Toyota achieved by Just-in-time production and purchase technique. To avoid logistics disruption, Toyota has built manufacturing units in every major market around the world. Hence, the company has secured a strategic fit zone that embraces both efficiency and responsiveness in its production and distribution channel.

Section 2

2.1 Kralijic Matrix Modelling

The Kraljic Matrix is one of the most effective ways for supplier segmentation. This model tells which segment is non-critical, critical, and crucial in terms of value and availability. Kraljic Matrix divided its model into 4 phases (Non-Critical, Bottleneck, Leverage, and Strategic) to make the model easier to understand. This classification has received strategic importance for purchase operations in organizations due to its impact on profitability (Glöckner et al., 2005). By developing a strategic relationship with suppliers, you can invest time and resources in relevant capabilities in product development. It has therefore become increasingly critical to develop strategic relationships with suppliers (Gangurde & Chavan, 2016). To develop this relationship, Kralijic's portfolio helps in segmenting the supplier base to understand the level of impact on profit margin.

The overall importance of procurement is based on multiple factors broadly under the value of material and supplier risk, to segment the Automotive company we have framed other score models like service level, lead time, product complexity, relation to the drivetrain, relation to safety components and also the political/economic stability of supplier’s county in the USA. Toyota Motor Manufacturing, Kentucky, Inc. (TMMK) is the largest automobile production facility in the world, owned by Toyota, and can produce 550,000 vehicles and more than 600,000 engines per year. Toyota's purchasing segmentation will be based on TMMK, where we have supplier and component information from Toyota's official press page (Toyota Newsroom, 2016). We calculated the anticipated lead time score based on the distance between the supplier and TMMK. The service level of the supplier is published by Toyota to honour their trust and long-term relation and is incorporated in the score model for the supplier risk scale. Other automobile-related score scales are determined based on general car specifications from different sources.

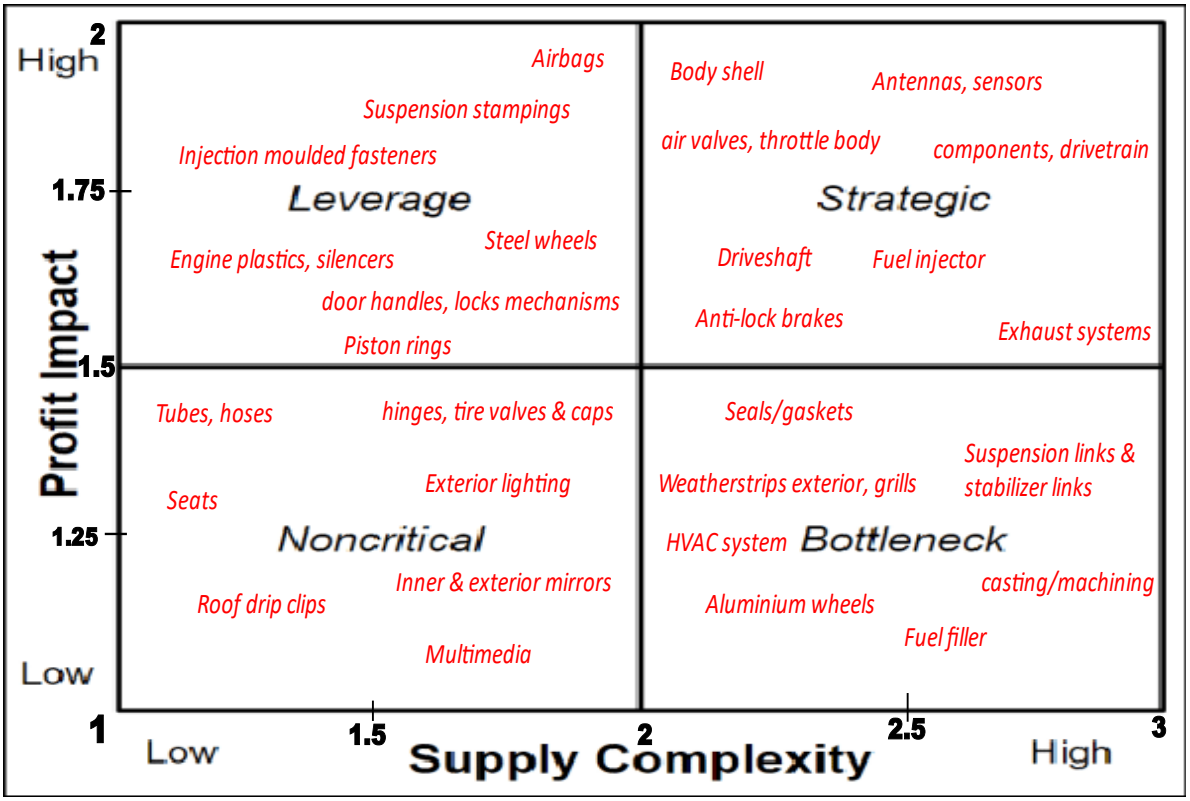
Table :1 Kraljic Matrix score model (Source: author)

		Class	Score
Complexity of Supplier Market	Service Level Source: (Toyota News Room, 2016)	Average Service	**6**
		Excellent Service	**4**
		Superior Service	**2**
	Lead time (Based on distance) Source: (Toyota News Room, 2016)	Above 300 mi	**4**
		Between 100 to 300 mi	**2**
		Below 100 mi	**0**
	Political/Economic instability of supplier county	High	**3**
		Medium	**2**
		Low	**1**
Importance of Purchase	Product Complexity/Customization	High	**2**
		Direct	**0**
	Price of the Product	Expensive	**4**
		Economical	**2**
	Relation to Drivetrain	Higly Related	**3**
		Quite Relevant	**2**
		Not Significant	**1**
	Relation to Safety system	Higly Related	**3**
		Quite Relevant	**2**
		Not Significant	**1**

Table: 2 Kraljic Matrix score distribution on components (Source: author)

	Supplier Market Risks		Importance of Purchase	
Components	(Service , Lead .T , Instability)	Avg Score	(Complexity , Price , Drivetrain , Safety)	Avg Score
Fuel filler, plastic fuel tank	(6 , 0 , 2)	2.5	(0 , 2 , 2 , 2)	1.5
Large die casting/machining, hot forging	(6 , 2 , 2)	3.25	(0 , 2, 2 , 1)	1.25
Suspension links, ball joints & stabilizer links	(6 , 4 , 1)	3.5	(0 , 2 , 2 , 2)	1.5
Antennas, sensors, wire harness	(6 , 2 , 2)	3.25	(2 , 4, 2 , 3)	2.75
Seals/gaskets	(6 , 4 , 1)	3.5	(0 , 2 , 2 , 3)	1.75
Exterior lighting	(4 , 1 , 3)	2	(0 , 2 , 1 , 3)	1.5
Body shell, assembly stampings, hinges, capsengine plastics	(4 , 0 , 2)	2	(2 , 4 , 1 , 2)	2.5
Suspension stampings, RR suspension arms, assembly stampings	(4 , 0 , 2)	2	(2 , 4 , 2 , 3)	2.75
Seats	(2 , 2 , 1)	1.5	(0, 2 , 1 , 1)	1
Exhaust systems	(4 , 2 , 3)	3	(0 , 4 , 2 , 2)	1.5
Airbags	(2 , 4 , 1)	2	(2 , 4 , 1 , 3)	2.5
Steel wheels	(4 , 0 , 2)	2	(2 , 4 , 2 , 2)	2.5
Charcoal canister, engine plastics, fuel & air valves, throttle body/ISCV/VSV	(4 , 2 , 1)	2.5	(2 , 4 , 3 , 2)	2.75
Multimedia	(2 , 4 , 1)	2	(0, 2 , 1 , 1)	1
Engine plastics, silencers & butyl, blow molding – interior parts, silencers & butyl	(4 , 2 , 1)	2	(2 , 2 , 3 , 2)	2.25
Driveshaft	(4 , 2 , 2)	2.5	(2 , 4 , 3 , 2)	2.75
Roof drip clips	(4 , 2 , 1)	2	(0 , 2 , 1 , 2)	1.25
Door checks, exteriior door handles, door locks & mechanisms	(2 , 4 , 1)	2	(0 , 2 , 1 , 3)	1.5
Body shell	(4 , 0 , 2)	2	(2, 4 , 3 , 2)	2.5
Anti-lock brakes	(4 , 4 , 3)	3.5	(2 , 4 , 2 , 3)	2.75
Injection molded fasteners, injection molding – small	(4 , 0 , 2)	2	(2, 4 , 3 , 1)	2.5
HVAC system, radiator	(4 , 4 , 2)	2.5	(0, 2 , 1 , 2)	1.25
Fuel injector	(4 , 2 , 1)	2.5	(2 , 2 , 2 , 2)	2
Tubes, hoses	(4 , 2 , 1)	2	(0 , 2 , 1 , 2)	1.25
Piston rings	(2 , 4 , 1)	2	(0, 2 , 2 , 1)	1.25
AT components, drivetrain/AT assembly	(2 , 4 , 1)	2.1	(2, 4 , 3 , 2)	2.75
Aluminum wheels	(2 , 4 , 3)	3	(2, 2 , 1 , 1)	1.5
Inner & exterior mirrors	(2 , 2 , 1)	1.5	(0, 2 , 1 , 3)	1.5
weatherstrips, bodyside molding, exterior, grills	(2 , 4 , 2)	2.5	(0 , 2 , 1 , 3)	1.5

Figure: 1 Kraljic Matrix (Source: author)



Toyota collaborates with all of its supply partners to build long-term trust and immune them to engage in innovation and development. Based on the Kraljic analysis segmentation we could conclude that an efficient strategy of Toyota to eliminate the wastage of resources can easily be drawn on the Leverage and Noncritical segment. Since Toyota is a giant global brand, it could be easy for them to penetrate the leverage market and bid the price on its choice. However, Strategic and Bottleneck segments could draw Toyota to the critical point of uncertainties during any disruption like covid-19. Hence, although the price is lower in Bottleneck the supplier risk can weaken the production capacity of the firm, for example, semiconductor shortage.

2.2 The Toyota company's resilience in the face of disruption

Toyota Production System is well known for its just-in-time production strategy and excellence in industrial automation to control waste material and also primarily to regulate supply-based demand. However, Toyota has given relaxation in optimizing the efficiency of the process during certain disruptions caused due to internal and external sources of supply chain risks such as demand variation, supplier disruption, environmental challenges like a disaster, pandemics also including ESG (Environmental Social Governance), and due to process, control of management. This section discusses the supply chain management viewpoint of Toyota, what happened and what actions these companies took. We apply a framework of DHL "delivering pandemic resilience" (DHL Covid-19, 2020) to understand the mitigation and contingency plans they adopted throughout.

Emergency Response Plan

Demand Identification:

Understanding the disruption and demand visibility of an economy is vital in terms of deciding the product design. Toyota has strategically shifted its product design based on the external economic condition of the region. Countries facing an economic crisis with an increase in energy prices, Toyota launched their Hybrid vehicles, which will satisfy both fuel efficiency and economic price range for the customers compared high priced EV vehicles like Tesla (Reeves, 2022). Thus, this reflects the resilient strategy of Toyota by demand identification based on market research during the disruption.

Sourcing:

Toyota has segmented different sourcing strategies based on the purchase value and supplier risk in different markets. In many firms, multiple sourcing is viewed as a way to lower costs by making suppliers bid against each other. In the case of Toyota apart from the buying leverage, they also gained resilient capabilities from multiple suppliers by promoting them to engage them in competition on innovation and capabilities than on price. (Shih, 2022). As we discussed earlier external risks like demand variation, where people are often trend-driven and

are continuously looking for upgrades and innovation. As a result, the company faces a drastic decline in demand where people will go after models with more specifications and innovation under the same price range. Hence, as a mitigation strategy, Toyota engages its suppliers in continuous innovation which has a significant role in binding resilience against innovation capabilities. Furthermore, multiple sourcing provides a safety net if a supplier runs into trouble. Improved the ability to cope with unforeseen events that may jeopardize capacity.

Procurement:

Against the Lean strategy, the natural disaster experiences revealed the weakness in Toyota's supply chain, and the company later implemented a plan to ensure business continuity, which required suppliers to keep chips in safety stock for two to six months. (Toyota Rivals, 2021). This strategy came in handy during the coronavirus pandemic struck when major Automobile industries stagnated except for Toyota received exclusive buying power of chips from the suppliers.

Allocation:

The supply chain is more flexible when each plant has multiple capabilities, even though redundant production lines are costly (ProQuest, n.d.). Toyota, for instance, is building manufacturing hubs around the world to produce cars for local demand while also ensuring that these plants can manufacture cars for other regions. This support system enables Toyota to supply continuously and overcome any contingency, even if they face any disruption around the world.

IT-enabled supply chain

Toyota Ventures investing in artificial intelligence, autonomy, mobility, and robotics expanding the horizons in the 4^{th} industrial revolution by enabling warehouse logistics automation and artificial intelligence for lean management in material optimization (Marr, 2018). Which in turn enhances the pace and performance of products to withstand any disruption by reducing the lead time and recovery period.

Physical Logistics Infrastructure

Logistics Infrastructure:

Most of the essential suppliers are located in the shortest lead time circle for optimal logistics. Hence, compared to suppliers who are further away, local suppliers are often more responsive (Kito et al., 2014). This aids Toyota in eradicating nearshoring issues where ambiguities regarding political and geographic factors may affect the smooth channel of transportation. Onshore suppliers can transport goods more quickly and can plan a shipment across cities more easily than one across the globe during any unforeseen disruption.

Institutionalized Core Unit

Task Force:

Integrated Risk Management Committee in April 2021 was formed in addition to existing Enterprise committee to verify the level of risk mitigation globally (Toyota Tsusho, n.d.). Toyota identifies the 10 most significant risk items (commodities, credit, business, foreign exchange, fund procurement, human resources and labour, information security, scandals, logistics, and occupational safety/environment), to which they applied "Check 10" consolidated risk management system that clarifies management points for those items. This enables the committee to work pro-actively on any disruptions facilitating the contingency plan for survival of the company.

Section 3

3.1 ABC Analysis of Toyota Models based on 2021 Profit Share

To identify the items that contribute the highest investment for Toyota, let's analyse the ABC analysis based on the Pareto rule on Toyota sales in the UK region for 2021. Using ABC analysis helps to control the working capital of Toyota. The data extracted from the analysis helps to reduce the inventory which contributes the least to the profit turnover rate. Hybrid electric models from Toyota continue to attract a huge following from customers. It is evident from the analysis that category “A" Toyota hybrid vehicles are becoming more trending on roads where government policies are encouraging the gradual shift from fossil fuel to environmentally friendly vehicles which emit fewer greenhouse gases and also people could enjoy both the electric and conventional powered engine control. Toyota Pure electric or plug-in cars are decently pulling the market which we can see in the “B” category where people are still in the dilemma of its reliability in terms of public charging stations, the life of the battery, torque, and other similar things. Many drivers regard hybrids, whether mild, standard, or plug-in, as an eco-friendly alternative to conventional cars. However, some models in “C” category can be altered with existing innovations like facelifts, Hybrid-technology, and even with electric engines.

Figure: 2 ABC analysis on sale report of Toyota 2021-22 (Source: author)

Car Models	Demand (2021-2022)	Showroom Price (£/unit)	Total Sale Value	Percentage	Cumulative	ABC
COROLLA HYBRID	18855	30,945	583467975	19%	19%	A
YARIS HYBRID	28361	20,539	582506579	19%	39%	
C-HR Hybrid	17907	28,389	508361823	17%	55%	
COROLLA HYBRID SALOON	18855	23,259	438548445	14%	70%	
RAV4 HYBRID	11525	35,350	407408750	13%	83%	
AYGO	17,386	14,454	251297244	8%	92%	B
RAV4 PLUG-IN	1563	41,590	65005170	2%	94%	
YARIS CROSS	2585	23,429	60563965	2%	96%	
HIGHLANDER	756	51,874	39216744	1%	97%	
AURIS	1144	16,295	18641480	1%	98%	
PRIUS PLUG-IN	478	32,519	15544082	1%	98%	
CELICA/SUPRA	304	48,129	14631216	0%	99%	
PRIUS	563	23,969	13494547	0%	99%	C
LANDCRUISER	291	43,439	12640749	0%	99%	
CAMRY	290	31,954	9266660	0%	100%	
COROLLA CONVENTIONAL	112	29,610	3316320	0%	100%	
YARIS	86	19,798	1702628	0%	100%	
RAV4	32	34,389	1100448	0%	100%	
MIRAI	10	49,214	492140	0%	100%	
			3027206965			

3.2 Linear Programming

Figure: 3 Linear programming decision variable, objective function, and limitation. Yellow-marked cells are optimized results. The raw material of cars details sourced from morecambemetals.co.uk (Source: author)

Toyota Car LP																
Decision Variable	COROLLA HYBRID	YARIS HYBRID	C-HR HYBRID	COROLLA HYBRID S	RAV4 HYBRID	AYGO	RAV4 PLUG-IN	YARIS CROSS	HIGHLANDER	AURIS	PRIUS PLUG-IN	CELICA/SUPRA				
Qty.	13000	19442	13000	8500	9000	14000	2700	11000	3400	9000	6500	5900	Objective Function			
Profit (£ in Thousan	31	20	28	23	35	14	41	23	51	16	32	48	3034633.33	Thousand GBP		
													Max Profit			
Constraint																
Steel	1.3	1	0.9	1.3	1.5	0.8	1.9	1	1.7	1	1.1	1.3	129522	<=	150000	1 Unit = 1 Ton
plastics	1	1.2	1.2	1	0.6	1	0.9	1	0.8	1	0.5	0.3	110000	<=	110000	1 Unit = 100 Kg
aluminum	1	1	1	1	1	1	1	1	1	1	1	1	115442	<=	120000	1 Unit = 500 Kg
special fibers	0	0	0	0	1	0	1	0	1	0	1	1	27500	<=	60000	1 Unit = 50 Kg
Glass	1	1	1	1	1	0.8	1.6	1	1	1	1	1	114262	<=	120000	1 Unit = 15 Kg
Electricals	2	2	2	2	2	1	3	1	2	2	3	2	215083	<=	300000	1 Unit = 100 ECU
Semiconductors	1.5	1.5	1.5	1	2	1	2	1	2	1	2	2.3	167433	<=	180000	1 Unit = 1500 SC

Figure: 3 Special constraints to regulate the number of models based on the conclusion derived from the ABC analysis model. (Source: author)

Special Constraint															
COROLLA HYBRID	1												13000	<=	13000
C-HR Hybrid		1											13000	<=	13000
COROLLA HYBRID Saloon			1										8500	>=	6000
COROLLA HYBRID Saloon			1										8500	<=	8500
RAV4 HYBRID				1									9000	>=	9000
AYGO					1								14000	>=	14000
RAV4 PLUG-IN						1							2700	>=	2700
YARIS CROSS							1						11000	>=	9000
YARIS CROSS							1						11000	<=	11000
HIGHLANDER								1					3400	>=	3400
AURIS									1				9000	>=	9000
PRIUS PLUG-IN										1			6500	>=	6500
CELICA/SUPRA											1		5900	>=	3000
YARIS HYBRID		1											19442	>=	14000
Luxury Car							1		1			1	12000	<=	12000

Figure 4: Solver Parameters (Source: Excel)

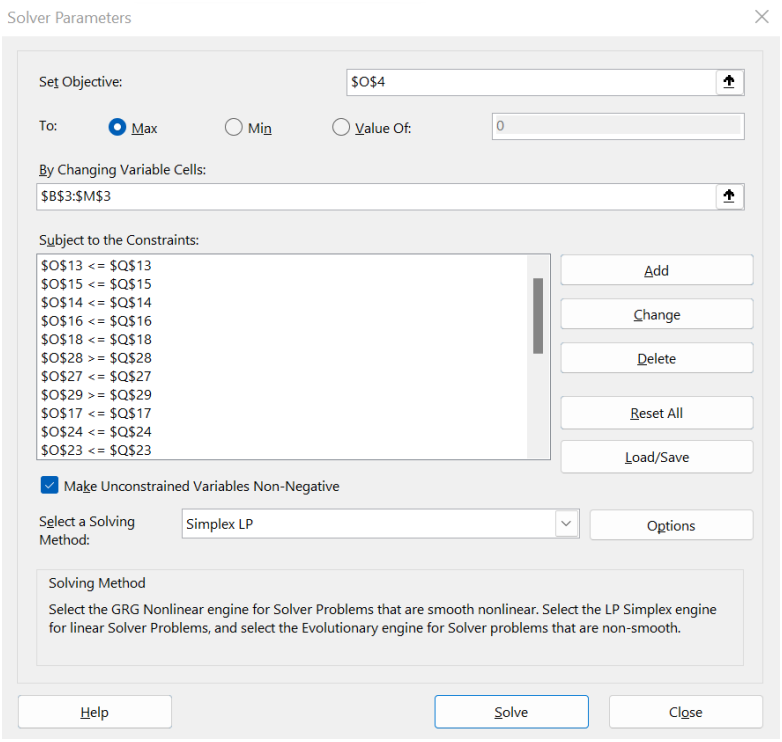


Table: 3, (Source: author)

Linear Programming Implication	
Objective function (Maximization)	• $\sum x_{(i = 1 \text{ to } 12)} * y_{(j = 1 \text{ to } 12)}$ • Where x is the car models and y is the price of the respective models (see figure 2)
Production Constraint	• Sum of all Car Models $X_{(1\text{-}12)}$ <= 120000
Material Constraint (Source: morecambemetals, 2022)	• Steel <= 150000, 1 Unit = 1 Ton • Plastics <= 110000, 1 Unit = 100 Kg • Aluminum <= 120000, 1 Unit = 500 Kg • special fibers <= 60000, 1 Unit = 50 Kg • Glass <= 120000, 1 Unit = 15 Kg • Electricals <= 300000, 1 Unit = 100 ECU • Semiconductors <= 180000, 1 Unit = 1500 SC
Demand Constraint (Source: media.Toyota, 2022)	• Corolla Hybrid <= 13000 • C-HR Hybrid <= 13000 • 6000 <= Corolla Hybrid Saloon <= 8500 • Rav4 Hybrid >= 9000 • Aygo >= 14000 • Rav4 Plug-In >= 2700 • 9000 <= Yaris Cross <= 11000 • Highlander >= 3400 • Auris >= 9000 • Prius Plug-In >= 6500 • Celica/Supra >= 3000 • Yaris Hybrid >=14000
Special Constraint	• Luxury Car <= 12000 nos
Maximized Profit	**3034633 Thousand GBP**
Note: Non–negative constraints are applied in the solver.	

Based on the previous analysis it is clear that hybrid technology and electric vehicles are the leading innovations in the global market. So, to maximize the profit share of Toyota cars in the upcoming year 2023 considering the trend, the optimal production scale using material limits could be calculated using Linear Programming. We will consider car models from the A and B categories of ABC analysis for the production line (See figure 1). Also concerning the analysis review, we have maximized the production for certain models like Yaris Hybrid and Aygo based on the sales report from Toyota (Toyota Achieves, 2021). Based on the average sales of Toyota cars in the UK, we have assumed the production limit for the UK market to be 120,000 cars. Other material constraint information (see figure 2) was gathered from car manufacturing material articles and related sited. Cars valued above 40 thousand GBP are bracketed under luxury cars and have reduced their production line compared to economic cars based on the figure from the sales report of Toyota 2022 (Toyota Model, 2022). The objective of Linear Programming is to find the number of different model cars to be produced to maximize the profit, considering the limitations in material and production line capacity of the company. Since a major part of Toyota cars in the UK are imported from different locations across the globe, we consider the production capacity for UK Market based on the average sales in the previous years. Also, the material consumption for manufacturing different Toyota models is based on the general assumption of vehicle specification from the Toyota official website. (For ref. The optimal number of cars to be produced is given in figure 2)

Section 4

4.1 SWOT Analysis of Toyota

Companies tailor business strategies by analysing their capabilities in the market space. Thus, understanding their scope plays a significant role in the fields of marketing, customer relation, service, product design, and other related fields. SWOT analysis acronym for strength, weakness, opportunity, and threat, this method helps in evaluating the qualitative measures involved in an organization (Gurl, 2017). By analysing the SWOT matrix, we will able to locate areas of your business that are performing well, threats and weaknesses.

Table 4: SWOT Matrix Source: (author)

Strength	Weakness
• Efficient R and D team, continuously developing innovative features for the automotive world. • Leaders in Hybrid technology with the highest sales record. (*Auto*, 2009) • Exceptional Resilience strategy • Lean management and continuous improvement (Sudhakaran, 2020)	• Technology gap, compared to a futuristic competitive company like Tesla, engineers found Toyota falls behind 6 years of technological advancement. • Rigid Hierarchy, where orders come from the top level and workers have restricted space for creativity. (Sudhakaran, 2020)
Opportunities	**Threat**
• Scope to leverage the cloud and AI technology to advance the innovation in futuristic automotive. • Nanomaterials application • Investments in flying car projects and holding of subsidiary brands like Lexus. (TMK, 2019)	• Threat from the competitors Volkswagen and Tesla. • Environmental, social, or governance (ESG) risks and other disruptions mitigation strategies with lean management. • Economic crisis (Sudhakaran, 2020)

4.2 Recommendations and Conclusion driven TWOS Analysis

As an extended variant of SWOT, the TWOS analysis approach evaluates the Threats, Opportunities, Weaknesses, and Strengths of Toyota Automotive Company with a wider view incorporating suggestions and proposals. Which helps to build a relevant strategy using the relation between the above measures. Unlike SWOT, TOWS could recognize and match the internal and external factors to draw relevant strategic decisions (Oxford college, 2018). Thus, based on our findings both quantitative and qualitative models let us draw Strategic approaches and devise recommendations on what direction the company has to move using TOWS analysis.

Table 5: TOWS and Conclusion (Source: author)

Strength and Opportunities (SO) We intend to formulate a strategy that frames the opportunity for business gains using the existing strength of Toyota. From the resilience overview of Toyota, we have seen how efficiently Toyota met with different supplier disruptions like Covid 19 semiconductor shortage and nearshoring mitigation strategies, and so on. Thus, the existing opportunity for Toyota in the AI and data-centric investment by Toyota ventures could employ a competitive strategy against other rivals. By ensuring better visibility of Toyota's supply chain on a global level to forecast any uncertainties to be prepared for any contingencies. Based on the SWOT analysis, we know that Toyota's investments in research and development (R and D) are at the top-notch among similar firms. Hence, the scope to leverage innovative technologies like Nanomaterial and flying car projects will determine the future phase of the company to withstand the era of technological advancement.
Weakness and Opportunities (WO) Toyota is an automotive giant, and from the data-driven finding of our report, it is quite visible that their signature in their management skills like "Zero wastage policy" (TMC, 2019), supplier trust, and a spectrum of models to suit different customer segments make Toyota among the top list of car manufacturers. The most critical and turn-off Toyota presently facing is the technological gap that exists when compared to futuristic competitors like Tesla. Hence, Toyota needs to extend its capabilities to compete against the futuristic segment as well.

Strength and Threats (ST) All the heated discussions involved around Toyota's threats stand around the outdated technology, however, Toyota cars are globally well known for their agility and manoeuvrability. Where they have secured the trust of their customer for the promises they made in terms of longevity of performance in budget and luxury segments. Thus, trust in the brand allows them to exist in the cream of the automobile industry as one of the high-resale value car producers in the world (Gorzelany, 2021).
Weakness and Threats (WT) Concerning the organizational structure of Toyota discussed in the SWOT approach, the hierarchical power of regional heads will damper the flexibility and creativity of the firm, the company believes this approach to be a key to resilience and continuous growth in the business. Hence to wider their scope, Toyota holds subsidiaries like Lexus, Ranz, and Daihatsu to specialize in certain technology or market to facilitate their creative space (King, 2019).

Reference List

1. Shih, W. C. (2022, November 15). What Really Makes Toyota's Production System Resilient. Harvard Business Review. https://hbr.org/2022/11/what-really-makes-toyotas-production-system-resilient
2. Toyota's Semiconductor Chip Stockpile Makes Rivals Jealous. (2021, March 12). CarBuzz. https://carbuzz.com/news/toyotas-semiconductor-chip-stockpile-makes-rivals-jealous
3. A Supply Chain View of the Resilient Enterprise - ProQuest. (n.d.). Www.proquest.com. https://www.proquest.com/docview/224969684?pq-origsite=gscholar&fromopenview=true
4. Kito, T., Brintrup, A., New, S., & Reed-Tsochas, F. (2014). The Structure of the Toyota Supply Network: An Empirical Analysis. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2412512
5. Risk Management | Toyota Tsusho. (n.d.). Toyota Tsusho Corporation. https://www.toyotatsusho.com/english/sustainability/governance/riskmanagement.html
6. Toyota Achieves Historic Top Ranking for UK New Car Sales in September. (2021, October 5). Toyota Media Site. https://media.toyota.co.uk/toyota-achieves-historic-top-ranking-for-uk-new-car-sales-in-september/
7. The Raw Materials of Cars | What Can & Can't Be Recycled? (n.d.). Retrieved December 11, 2022, from https://www.morecambemetals.co.uk/the-raw-materials-of-cars/#:~:text=It%20should%20come%20as%20no
8. Toyota Achieves Historic Top Ranking for UK New Car Sales in September. (2021, October 5). Toyota Media Site. https://media.toyota.co.uk/toyota-achieves-historic-top-ranking-for-uk-new-car-sales-in-september/
9. History by Model Toyota Passenger. (n.d.). Retrieved December 12, 2022, from https://media.toyota.co.uk/wp-content/uploads/sites/5/pdf/Toyota-Passenger-Vehicles-Sales-Figures-March-2022.pdf
10. Glöckner, H.-H., Pieters, R., & De Rooij, W. (2005.). LogForum IMPORTANCE OF THE KRALJIC MATRIX AS A STRATEGIC TOOL FOR MODERN PURCHASING. http://www.logforum.net/pdf/3_1_1_05.pdf

11. Gangurde, S. R., & Chavan, A. A. (2016). Benchmarking of purchasing practices using the Kraljic approach. Benchmarking: An International Journal, 23(7), 1751–1779. https://doi.org/10.1108/bij-01-2015-0011
12. Toyota Suppliers Recognized for Superior Performance At Annual Event. (2016, March 16). Toyota USA Newsroom. https://pressroom.toyota.com/toyota-suppliers-2016-awards/
13. Gurl, E. (2017). SWOT ANALYSIS: A THEORETICAL REVIEW. Demo.dspacedirect.org. https://demo.dspacedirect.org/items/a94ef210-25e1-4399-b93e-54930f2ba37f
14. Marr, B. (2018). The Amazing Ways Toyota Is Using Artificial Intelligence, Big Data & Robots. Forbes. Retrieved December 15, 2022, from https://www.forbes.com/sites/bernardmarr/2018/11/09/the-amazing-ways-toyota-is-using-artificial-intelligence-big-data-robots/?sh=5cd6b94a3863
15. Sudhakaran, A. (2020, December 13). Toyota SWOT Analysis 2021: Quick Reference Guide. Pestleanalysis.com. https://pestleanalysis.com/toyota-swot-analysis/
16. OXFORD COLLEGE OF MARKETING. (2018, June 24). TOWS Analysis: A Step by Step Guide - Oxford College of Marketing Blog. Oxford College of Marketing Blog. https://blog.oxfordcollegeofmarketing.com/2016/06/07/tows-analysis-guide/
17. King, K. (2019, November 4). List of Toyota Partnerships and Subsidiaries. Toyota of North Charlotte. https://www.toyotaofnorthcharlotte.com/blog/list-of-toyota-partnership-and-subsidiaries/
18. Gorzelany, J. (n.d.). These Are The Vehicles Returning The Best Resale Values For 2021. Forbes. Retrieved December 15, 2022, from https://www.forbes.com/sites/jimgorzelany/2021/03/05/these-are-the-vehicles-returning-the-best-resale-values-for-2021/?sh=52db0c837e29
19. Olhager, J. (2013). Evolution of operations planning and control: from production to supply chains. International Journal of Production Research, 51(23-24), 6836–6843. https://doi.org/10.1080/00207543.2012.761363
20. *Copaṛā (2019). Supply chain management strategy, planning, and operation (Seventh ed.). Pearson.*
21. Kito, T., Brintrup, A., New, S., & Reed-Tsochas, F. (2014). The Structure of the Toyota Supply Network: An Empirical Analysis. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2412512

22. Toyota Motor Corporation. (2019). Toyota production system. Toyota Motor Corporation Official Global Website. https://global.toyota/en/company/vision-and-philosophy/production-system/
23. 10 Top Selling Hybrid Cars. (2009, April 9). HowStuffWorks. https://auto.howstuffworks.com/fuel-efficiency/hybrid-technology/top-selling-hybrid-cars.htm
24. Reeves, F. (2022, September 6). Most fuel-efficient cars including Vauxhall, Toyota and more. Express.co.uk. https://www.express.co.uk/life-style/cars/1665227/petrol-diesel-record-prices-most-fuel-efficiency-family-cars-vauxhall-toyota-peugeot
25. DELIVERING PANDEMIC RESILIENCE HOW TO SECURE STABLE SUPPLY CHAINS FOR VACCINES AND MEDICAL GOODS DURING THE COVID-19 CRISIS AND FUTURE HEALTH EMERGENCIES. (2020). https://www.dhl.com/content/dam/dhl/global/core/documents/pdf/glo-core-delivering-pandemic-resilience-2020.pdf