

2022F MIS 710-WS

Group Project 3 – BPR PROPOSAL

Group - 5

**Topic: Material Supply Optimization for Volkswagen
AG**

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SUMMARY-

The main aim of our project is to design a concept to optimize the supply of materials in production plant (cutting systems and the press shop) at Volkswagen Group. For this we use tools of process improvement and Business Process Management.

In consideration of the Volkswagen Production System, the purpose of this report is to develop a strategy to improve the material flow between the cutting system and press shop.

The primary goal was to conduct an actual condition study of the work processes inside the press shop and cutting system, and then prepare a target-concept for the discovered improvements.

The Process Map was an essential approach for identifying the major information such as Management process, Core process, and Support process. The next stage was to conduct a value analysis to determine the information and material flow as well as the Departments' shortcomings. To improve, the basic technique of business process and process optimization were utilized, as well as a goal idea for the identified deficiencies.

INTRODUCTION TO THE BPR PROPOSAL: -

Companies are forced to alter their organizational structures because to "global rivalry, shifting customer expectations, technological advancement, and perpetually shifting markets."

Companies are compelled to continuously enhance and optimize their work procedures and practices as a result of global issues. This calls for an emphasis on organizational structures and processes that should incorporate value-creating activities, as well as increasing consideration of the demands and desires of the current client base.

The analysis and application of effective workflows/processes serve as the cornerstone for a successful orientation and adaption forms.

Process management is the name given to these productive workflows. A cross-structure value-chain is created as a result of the introduction of process management into horizontal organizational structures; here, consideration of customer requirements and customer satisfaction are given weight.

The primary barometer of corporate activities is client expectations. The goal is to keep the client interested in the business and its offerings. To do this, it is essential to create consumer orders and business procedures that are timely, easy, and reasonably priced.

Process management is a tool that aids in creating all organizational, controlling, and planning themes and priorities. This metric enables the objective management/control of the value chain within a business, which leads to process optimization and, ultimately, the satisfaction of client needs.

Overview Of the Organization

Volkswagen AG is an automotive manufacturer, founded in the year 1937 by the German government. Headquarter in Wolfsburg, Niedersachsen, Germany. VOLKSWAGEN AG- in German language AG stands for “Aktiengesellschaft” which is a PUBLIC COMPANY. Volkswagen AG is specialized in building of automobile parts (Engines, Software, Instrumentation). It has operations and production in 124 countries.

Divided into different group of brands

1. VOLUME- • Volkswagen cars
 - Seat cars
 - Volkswagen commercial vehicles
 - CUPRA
 - Skoda auto
2. PREMIUM- • AUDI
 - DUCATI
 - Lamborghini
3. SPORT- • PORSCHE

CORE BUSINESSES-

Volkswagen AG is parent company for the Volkswagen group. Volkswagen AG develops automobiles like passenger cars and commercial vehicles. It also develops components for the group's brands. Volkswagen AG holds direct or indirect interests in AUDI, SEAT, SKODA AUTO, PORSCHE, LAMBORGHINI, TRANTON and other major brands. Not only in the automotive field, but also in the financial services- Volkswagen Financial Services AG, Volkswagen Bank GmbH (Gesellschaft mit beschränkter Haftung) which is known to be a legal entity. Volkswagen AG is also an energy supply company. It generates, sells and distributes electricity as a group together with its subsidiaries.

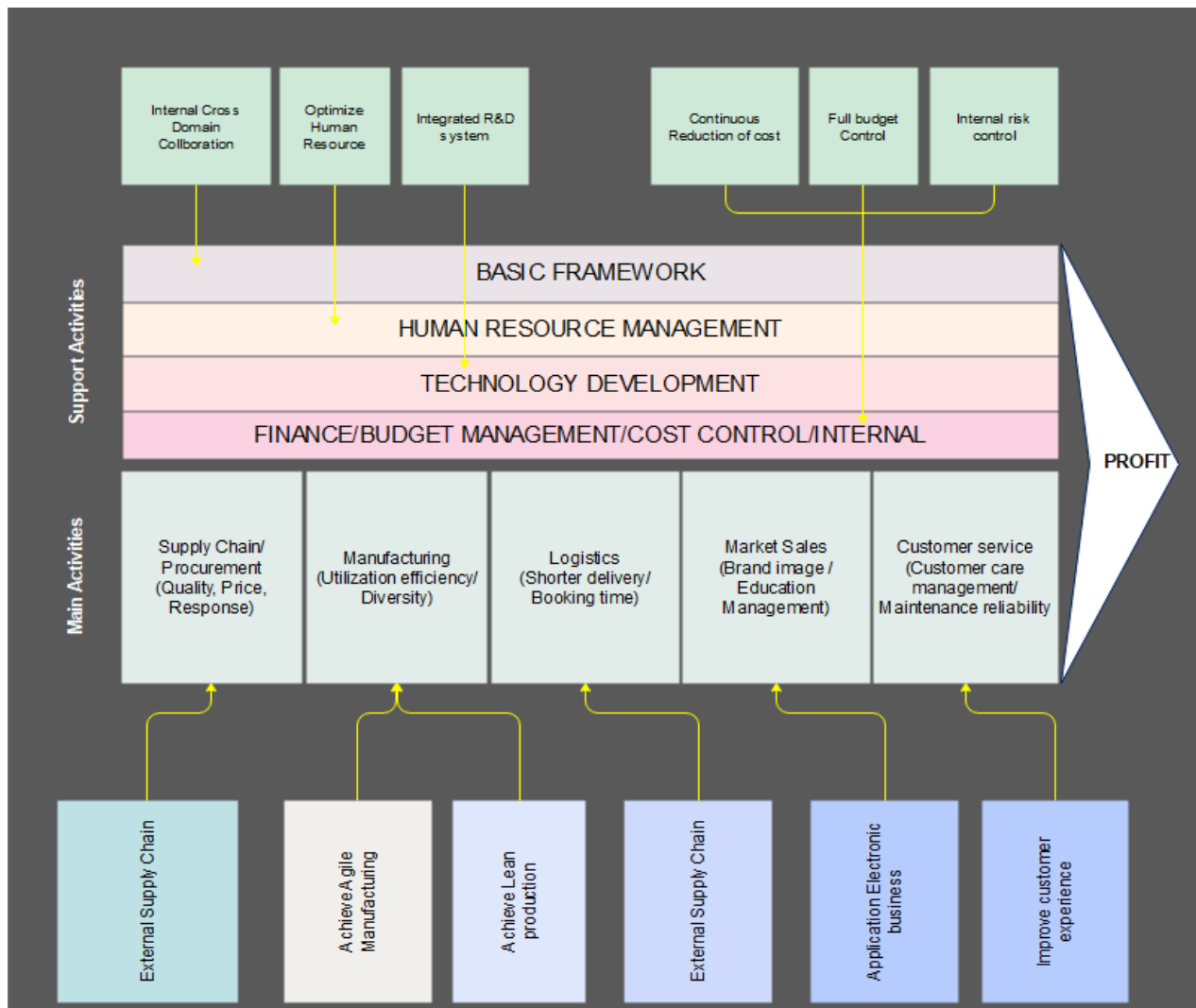
ORGANIZATIONAL STRUCTURE

Management board: - Currently the board of management of Volkswagen AG comprises 9 members. Each board member is responsible for one or more functions within the Volkswagen group. Dr. OLIVER BLUME is the Chairman for the Group. The work of the board of management of Volkswagen AG is supported by the boards of the brands and regions as well as by the other group business units and holdings.

1. **Dr. Arno Antlitz-** he is responsible for the business area finance at group level in the board of management.
2. **Ralf Brandstatter-** member of the board of Volkswagen AG for CHINA region.
3. **Dr. Manfred Doss-** he is responsible for integrity and legal affairs.
4. **Markus Duesmann-** chairman of the board of management of AUDI AG.
5. **Gunnar Kilian-** chairman of supervisory boards of MAN energy solutions, HR
6. **Thomas Schafer-** CEO of Volkswagen passenger cars, member of the Volkswagen AG board of management in charge of the brand group volume.
7. **Thomas Schmall-Von Westerholt-** responsible for technology for automotives at Volkswagen.
8. **Hauke Stars-** functional responsibility for IT, data, Organizational development and process management.

STARATEGY ANALYSIS:

1. TOGETHER 2025 STRATEGY- provide the framework and compass for the Volkswagen group's envisioned evolution from car manufacturer into a world-leading provider of sustainable mobility. It will be fleshed out with corresponding strategies for the group brands to be gradually elaborated over in the future.
2. ACCELERATE- with this strategy Volkswagen focuses on digitalization, software integration and a ramp-up of its electric car campaign.
3. Focuses on developing and marketing electric vehicles to sell more EV's/year. Which gives huge competition for the competitors.



FROM PORTER'S FIVE FORCE ANALYSIS: -

1. Low supplier bargaining power

Volkswagen is a sizable, financially sound business with an international supply chain and distribution network. Volkswagen has suppliers strewn over the globe in diverse locations. Suppliers have little negotiating power because they can always choose to work with different vendors.

The company's necessity for high-quality raw materials and its reliance on long-term partnerships with suppliers, however, provide the suppliers some negotiating leverage.

2. Customer Purchasing Power: HIGH

Today's consumers are knowledgeable. Customers have a wide range of alternatives because there are numerous brands available. Customers have strong negotiating power since businesses invest heavily in their marketing and advertising tactics to draw in every customer.

Due to the unique and customized nature of the products, consumers in the premium car sector of Volkswagen are not price sensitive. VW made 4.8 billion euros in R&D investments in 2017.

3. Moderate Threat of Substitute Products

The threat of replacement products for Volkswagen is significant due to the intense rivalry from numerous manufacturers in the automotive sector. Using railways and buses instead of Volkswagen vehicles is another alternative.

The financial stability and reputation of Volkswagen serve to lessen this threat. Overall, alternative items pose a moderate hazard.

4. Low/Negligent Threat from New Entrants

The Volkswagen Group primarily works in the automotive sector. To compete with already-existing autos and advertise its brand, a new market entry would need enormous cash inputs, resources, and time (Parkin et al 2017).

Compared to well-established corporations like Volkswagen that manufacture in big volumes, a new entrant in the automotive industry would have to spend more to create few units.

5. Industry Rivalry Intensity

HIGH Industry rivalry is characterized by elements including seller concentration, competitor diversity, and product differentiation. Due to fierce but price-tame rivalry from rivals vying for Volkswagen's market share in the automotive sector. Intense advertising and product improvements have resulted from this.

For instance, the Volkswagen Group invested £ 30 billion to begin producing electric cars to meet market demand and remove rivals who use diesel (Attwood 2017).

CURRENT CHALLENGES:

Volkswagen Group faced many challenges in the past

- **Material Wastage:**

The present political controversies around trade tariffs between the US and the EU are the main problem that Volkswagen is currently facing. In June 2018, US President Donald Trump threatened to increase tariffs from the current 2.5% tariff tax, which has been in place since the 1960s, to 20% on all imported cars from the EU (Fleming et al., 2018).

Road to zero is a UK government initiative to phase out gasoline and diesel vehicles by 2040. The UK population started moving away from diesel and gasoline vehicles, which resulted in a 20% total decline in diesel car sales in 2017. (Davies 2017).

Due to the economic effects of Brexit, which have already had an impact on consumer spending, the demand for new automobiles in the UK has decreased (Bolduc 2017). The Volkswagen Group must manage 153 distinct political scenarios because it sells cars in 153 different nations.

- **Economic variables-**

Economic effects frequently accompany political unrest, such as Brexit. High inflation and a drop in consumer spending brought on by Brexit have already reduced demand for new autos (Bolduc 2017). Brexit-driven inflation caused car prices to rise by 5%, making it difficult for buyers to buy new cars (Mulligan 2017). However, in developing nations like China and India, where the cost of manufacture is relatively lower, Volkswagen has a good opportunity of growing its market share.

- **Social Elements-**

The adoption of car-sharing services like Uber is the biggest trend in the automotive sector. Due to their greater convenience and lower cost of transportation as compared to the high cost of owning a car, ride hailing and vehicle sharing services are becoming more and more popular, which poses a challenge to VW (Gibbs 2017).

- **Technical Aspects-**

The development of technology is essential to an automaker's success. Volkswagen purchased stock in the German Research Center for Artificial Intelligence (DFKI). As consumer preferences change, it is investing in technology to bring more environmentally friendly and safe cars to market. It has made significant investments to make its manufacturing and distribution procedures technologically superior to those of its competitors.

- **Legal Factors-**

Volkswagen paid up to \$4.3 billion in penalties and fines for breaking environmental laws in connection with the 2015 Volkswagen emission crisis (McGee and Lynch 2017). Volkswagen equipped its diesel vehicles with "defeat devices" that made sure they would meet pollution regulations in testing environments, but on the road, emissions for NO exceeded the permitted limits by more than 40 times. Over 11 million vehicles had to be recalled as a result, forcing VW to. This damaged Volkswagen's reputation, which led to lower sales in the years that followed.

- **Environmental Elements-**

Volkswagen now has a chance to expand due to rising public demand for electric vehicles, car sharing services, and the ongoing development of self-driving cars. (Scarpinelli 2017; Silver 2017). Volkswagen has said that WE, its own "zero-emission" car-sharing service, will debut in 2019.

PROCESS INVESTIGATION: -

Process Identification:

The identified improvements and gaps in production plant (cutting room and press shop) are:

1. Push Principle and Batch-size Production
2. High Material Stock
3. Large search effort in the intermediate storage facilities
4. Lack of Transparency between the Processes
5. Long Travel Path between the intermediate storage facilities

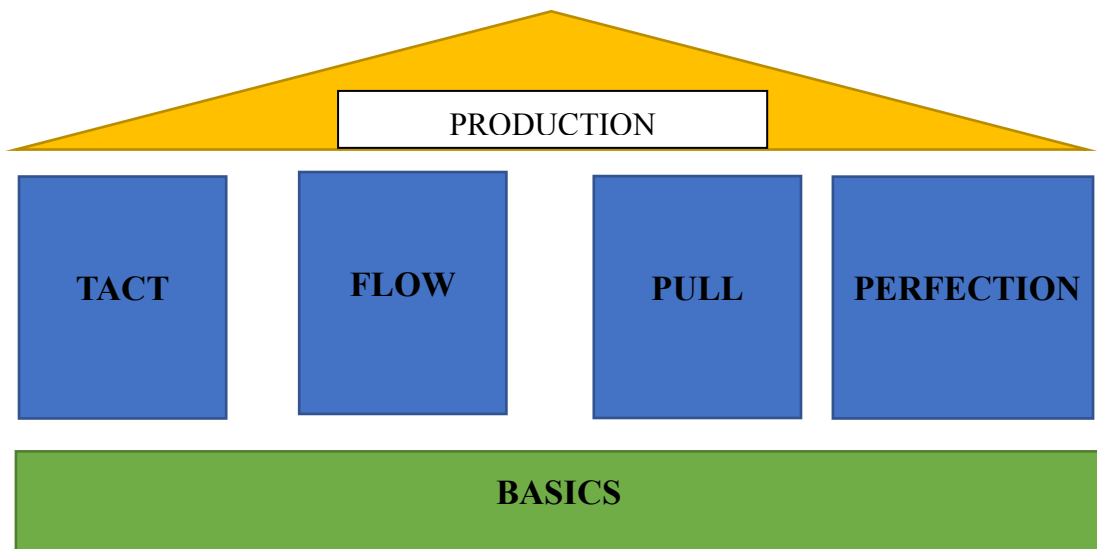
A target concept is created for the above problems faced by Volkswagen.

This project Aim for the Volkswagen Group in Kassel is to **"create a strategy to optimize the delivery of materials between the cutting room or rather cutting systems and the press shop."**

Kassel the second-largest plant in Germany for the Volkswagen Group is the Kassel manufacturing plant. Top components like gearboxes, cast parts, automobile panel bodies, substitution-aggregates, and exhaust systems are produced in the production area, which employs over 15.000 people. Nearly all the Volkswagen Group's production sites get deliveries of the components made at the Kassel production complex.

CURRENT VOLKSWAGEN PRODUCTION SYSTEM: -

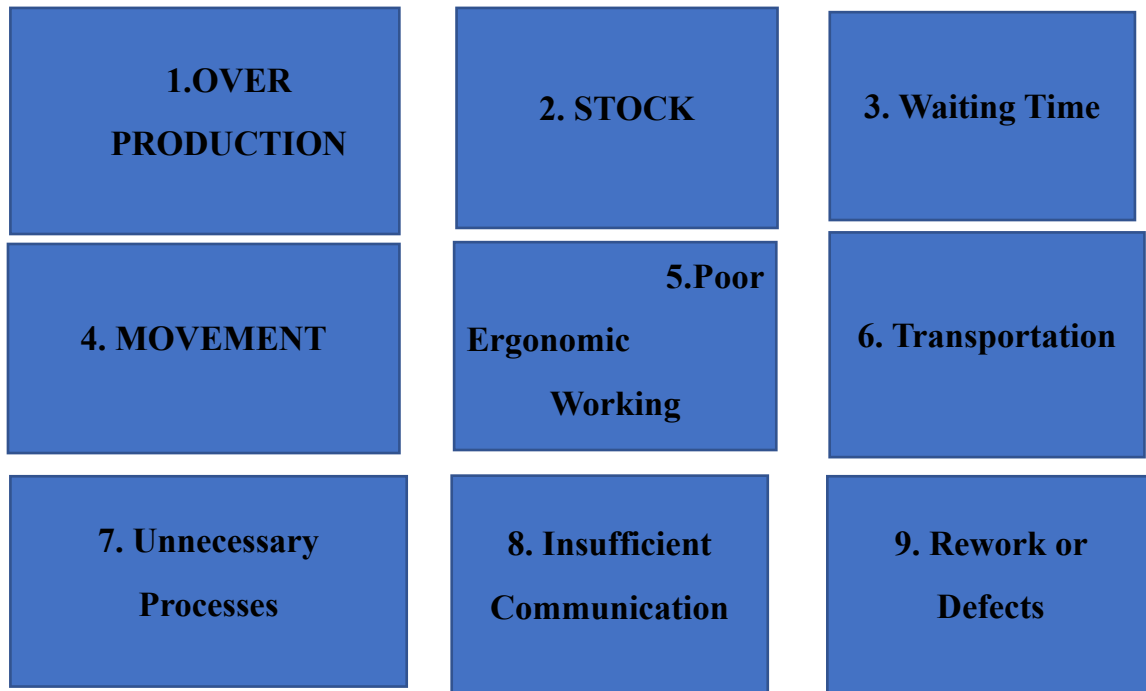
The idea of Volkswagen Production System is value chain-oriented and synchronous Company. All practiced activities should be oriented to value chain and contribute to this. The aim is to abolish non-value chained processes (Nine types of waste). In this context the success is not measured by cost and price; particular significance is attached to the aspect quality. This involves stability of product, process quality and process stability. The Volkswagen Production System corresponds to the structure of a house. The Basics represent the foundation, which ensures the stability of the four pillars: Tact, Flow, Pull and Perfection.



"Nine types of waste" are among The Basics. These include

1. excessive output
2. excess inventory
3. waiting times
4. movement
5. poor ergonomic work conditions
6. transportation
7. unnecessary procedures
8. poor communication
9. rework/defects.

Waste is everything that does not contribute to value addition.



Work processes contain a value-added element and waste. The 9 types of waste help to recognize and to reduce waste within work processes. So, the reduction of waste supports the reduction of the main driver “lead time”.

The methods of detection: Prior to beginning, you must conduct a thorough process observation during regular work hours, in the workshop, or by filming, observing, and capturing the actual situation. Use of a waste recording sheet, visualization, a walking way-diagram, information flow, taking pictures, and videography are a few examples.

The next step is to classify the various waste types.

Elimination of waste by using problem-solving techniques.

- Supplying goods, services, and information faster or in greater quantity than the current internal or external consumer has asked constitutes waste through overproduction.
- Numerous other types of waste are concealed by enormous quantities of material or WIP stock created by overproduction, excessive lot sizes, and island optimization of safety stock.

- With the aid of the 9 forms of waste, an actual condition analysis was carried out in the cutting and pressroom at Volkswagen Group in this context to identify the non-value-added operations.

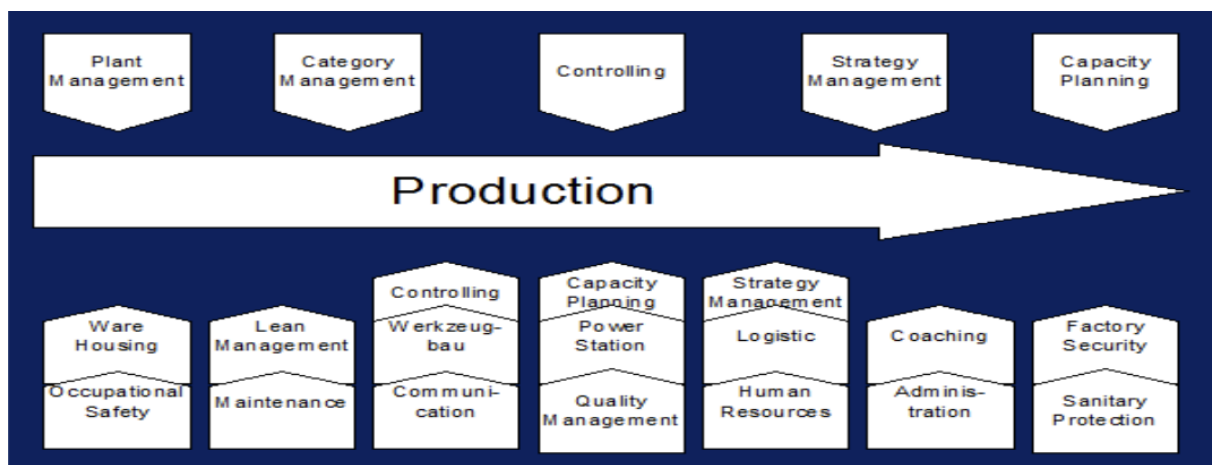
DESCRIPTION OF THE PROCEDURE FOR DETERMINATION OF ACTUAL CONDITION-ANALYSIS

The description of the management processes, core processes, and support processes forms the basis for the actual condition-analysis. The pressroom process will be explained in terms of information, production, and material processes. The existing condition will be demonstrated, examined, and evaluated through multiple on-site inspections and employee interviews. It should have been possible to identify the weak links in the value stream or process sequence.

The Press Room at Volkswagen Group: -

The press room is organized in six subsections:

- Cutting System and Step press shop
- Short-grob press shop
- Transfer press shop
- Hot stamping
- Laser Park



CURRENT SITUATION ANALYSIS AT VW PLANT: -

The value stream starts with an order of automobile, directly at customer. Raw materials to produce press parts are Coils, which are 4 km long steel sheets. These have a weight of between 0,8 and 30 tons. In total at the cutting room contains nine cutting systems. Each system has a specific external diameter which must accord with the internal diameter of the coil. Within two hours the ordered coils are transported with a truck from supplier / steel producer to the cutting room. Parallel to the transport coils are cut in lot-size and to metal sheets by push principle. Fully processed coils, which had been metal blanks, are stacked on top of each other and bundled by two employees. After these, the bundled metal blanks are transported and placed to intermediate storage. From intermediate storage these metal blanks are delivered with forklift to the press shop. There they get a final form. Furthermore, metal blanks are ordered by supplies, which cannot be cut after the desired dimension. This bought metal blanks are saved as well at the intermediate storage as well. The metal blanks which are to be stored, transported by the outgoing goods to the external clients. The external clients use this for their purpose or cut the rectangle metal blanks to B-pillar-shaped metal blanks and then they are transported back to intermediate storage. The whole process (cut, transform etc.) ends with the transport of the press part to warehouse.

Process Value Analysis:

SAILENCE WORTH MATRIX –

<u>SALIENCE</u>		<u>WORTH</u>	
	ASSETS	LIABILITIES	
IDENTITY	Parent for many brands		
PRIORITY	Material optimization		
BACKGROUND		Wastage of materials	
MANDATED			

Process Objectives: Our five main objectives for our process are:

1. **Complexity Reduction-** In today's operations, automotive OEMs and suppliers encounter considerable complexity along the value chain. End to End optimization reduces this complexity by considering millions of constraints and factors at once to assess technology platforms and components according to their strategic and financial worth.

The automobile sector has identified complexity management as a crucial area for improvement. While current strategies, including model platforms (like Volkswagen's MEB, MLB, and MQB platforms), might minimize complexity at the level of a product variant, there are still additional sources of complexity present across the value chain. The use of specialist production methods that may go unused, lengthy setup times for treatments, and disproportionate overhead to

meet stringent client quality criteria are a few examples from the manufacturing industry

Making- Optimization covers all manufacturing and assembly locations with automotive-specific, detailed bills of raw materials and equipment. The model dynamically right sizes and optimizes the footprint, the product-to-site allocation, capacity and capability investments. Optimization provides granular cost breakdown for all variable costs, such as site and equipment costs. Costs which are allocated based on activity by production times.

2. **ASSESS INVENTORY OPERATIONS-** Examining of the inventory management process in order to determine its state. Identifying the problem and discussing with each stakeholder their roles in the process, obstacles they face, and improvements can be made to make the job more effective and study the interworking relationship between different units in the process.

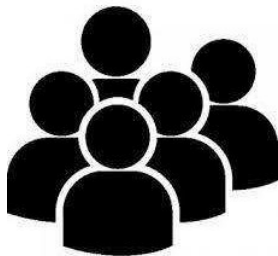
Comparing the brand's inventory practises with the other industry leader's brands.

3. **Developing inventory management plan** - This is the main step for our process where we want to focus more on the ideal inventory management plan. Were we want to lower the carrying cost of inventory metric, which is the expenses incurred on sorting inventory. Segmentation of inventory into raw materials, work-in-process and finished products.

4. **Outsource business Activities** - Volkswagen plants manufacture its parental brands within its in-house. So here we want to outsource the manufacturing of parent brands from out of its plants. So that it can optimize the inventory materials.

Performance Measures:

Customer Success Metrics (KPIs)



Customers



Employees



Safety & Integrity



Competitive Profitability

Customers: This goal dimension focuses on clients' various needs and tailor-made mobility solutions.

Employees: Workforce that is skilled and committed is necessary for long-term success. By providing equal chances, hope to increase their drive and sense of fulfilment.

Safety and Integrity: Complying with laws and regulations and establishing secure processes are the process' main goals.

Competitive Profitability: Investments that are made with the goal of creating profitable growth, enhancing competitiveness, and operational excellence across all company operations.

- The main Identity for the Volkswagen group is that it is a parent company for leading brands like Audi, Lamborghini, Seat, Ducati, Porsche. So, the brands will be the main assets for the VW Group.
- Material Optimization is set to priority and as an asset, so that it will be the major focus for the asset growth for the VW group.

AS-IS Process Stakeholders:

specify owners, participants, and customers of your process.

Outside Stakeholders: Customers, suppliers, investors, and among others, are dedicated to ensuring the company's survival and are interdependent.

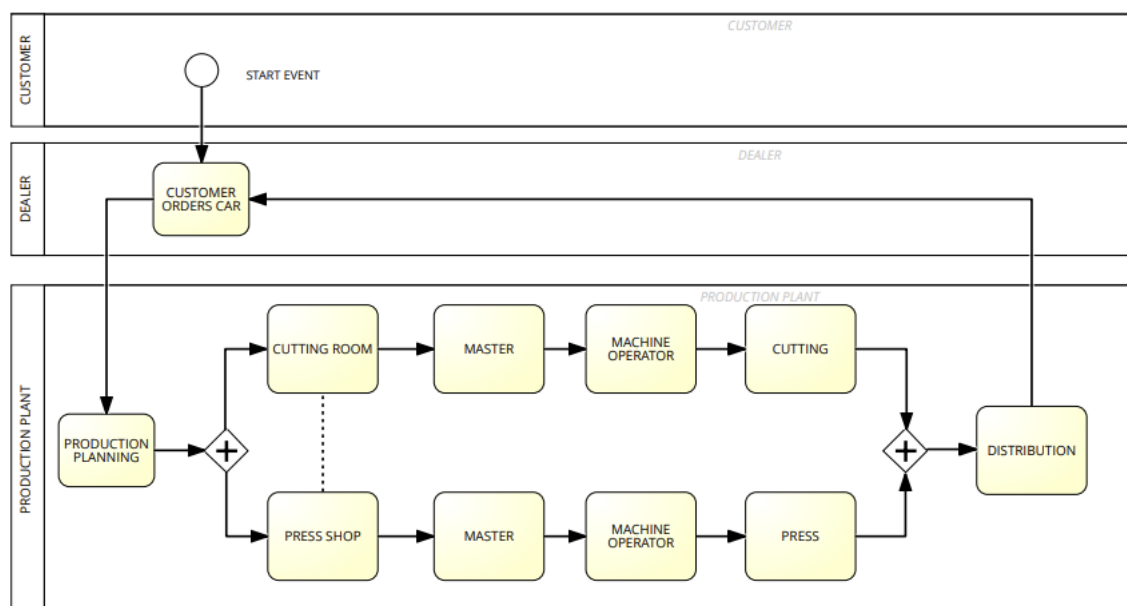
Inside Stakeholders: Board, managers and Employees are linked and committed to guaranteeing the business's survival.

S No.	Outside Stakeholders	Description
1	Consumers	Every purchase they make helps the business, and each one also reveals which goods and services it should invest more on.
2	Suppliers	Suppliers are interested in the company's excellent performance because it guarantees them regular orders and prompt payments, which keeps them in business.
3	Creditors	Creditors, such as banks, have a stake in the company even if they are not typically active in operations.
4	Owners	The owner is in charge of developing budgets and sales projections – and ensuring that the company meets them. The owner may invoice clients, collect overdue accounts, keep the accounting system up to date, and reconcile bank statements.
5	Government	As a result, the government's ownership in enterprises is reflected in taxes and GDP. Each country has its own labour laws and employs internationally recognized labour rules to ensure employee wellbeing.

S No.	Inside Stakeholders	Description
1	Board / Policy makers	The major function is to evaluate the general direction and strategy of the firm. The board creates a policy-based governance system for the company based on the articles of governance.
2	Managers	Before purchasing any goods for a specific department, managers must communicate with the department's personnel to determine what they believe they are missing.
3	Employees	Employees have a direct stake in the company since they earn money and are entitled to a variety of rewards, which might be monetary or non-monetary.

AS IS PROCESS DESIGN: -

This is the current Information flow in Volkswagen Plant.



Opportunity Identification –

1. Elimination of waste
2. Optimized and standardized transport routes
3. Pull process and visualization
4. Cost reduction
5. Quality enhancement

Re-engineering Proposal –

Business Process Reengineering involves changing business processes in a fundamental way. The objective is to eliminate waste, reduce cycle times, and improve accuracy and quality.

Opportunity Selection:

- This analysis focuses on the press-150 and the cutting systems (coil-cutting system, metal blank-cutting system (MBCS), and band cutting system (BCS)) that these presses provide.
- The purpose of this project is to provide "a concept to optimize the supply of materials between the cutting systems and the press shop" at the Volkswagen Group.
- The Volkswagen manufacturing facility in Kassel is the Volkswagen Group's second biggest in Germany. Top components such as gearboxes, cast parts, automobile panel bodies, substitution-aggregates, and exhaust systems are manufactured in the manufacturing area, which employs over 15.000 people. The components manufactured at the Kassel plant are transported to nearly all of the Volkswagen Group's production plants.
- Business Process Management (BPM) methodologies or Process Improvement technologies will be employed for this aim.

The goal is to eliminate non-value chained procedures. In this setting, success is assessed by aspects other than cost and price, with a focus on quality. This includes product stability, process quality, and process stability.

Solution Creation:

Possible optimization potentials at cutting room and press room:

1. PUSH and PULL- PRINCIPLE:

The Volkswagen Manufacturing System states that production should begin after the pull system. This comprises value change orientation and the pulling process, which ensures lean practices. The downstream process in the pull-principle only receives the components it need from the upstream process. In addition, the upstream process only generates what the downstream process needs.

In contrast, the press shop uses the push concept for material control. The findings demonstrate that the downstream process can also take the metal blanks from the upstream process (cutting room), which is not always the case. The production takes place in lots, which is one explanation.

- The production of goods in lots has an impact on the company's flexibility, lead time, and material availability.

The Volkswagen Production System states that it's critical to avoid the "production after push" approach, achieve high levels of process stability, and provide quick responses.

As a result of the pull principle's contribution to reduced material stocks, investments, and control effort, lead times and costs are kept to a minimum.

Finally, the pull concept shall be used for press shop production.

Reengineering Principle for lot production:

Control Work Release - the “small lot” & “complete kit” concepts, load balancing. The manufacturing of items in lots affects the company's flexibility, lead time, and material availability.

2. TRANSPARENCY:

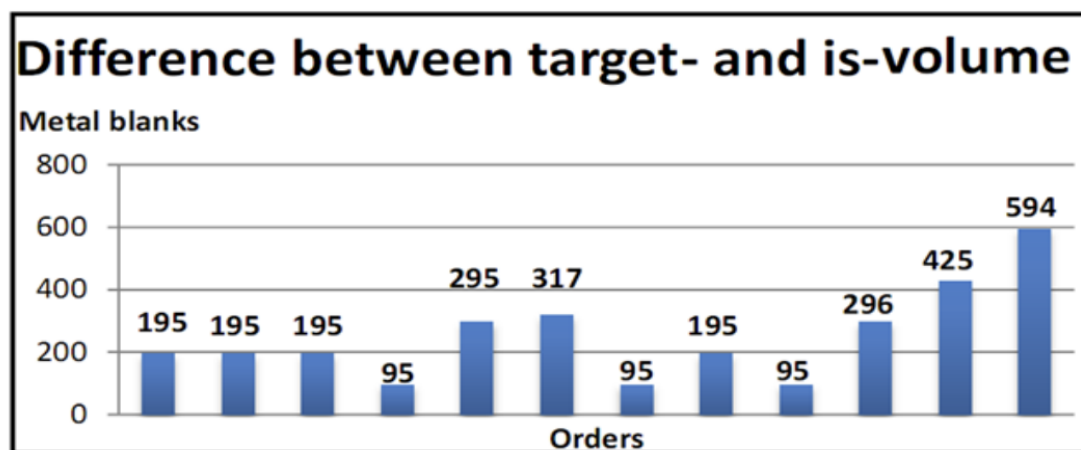
The Volkswagen Production System's target set is: "With Visual Management, we can make all processes transparent. This makes all departures from the norm easier to see. One can quickly determine the Production Volume and whether an unexpected event occurred. The upstream and downstream coordination needed to be strengthened. Consequently, there is confusion between value-creating **and non-value-creating** operations, which indicates that there is an interface issue.

Reengineering Principle for Transparency -

Coordinate & Integrate: With Visual Management, we can make all processes transparent. This makes all departures from the norm easier to see. The cooperation between upstream and downstream needed to be improved.

3. MATERIAL STOCKS

Target for this purpose is the actual production in lot size at press shop leads to high material stocks in the intermediate storage (Nine types of waste). The cause is that the target volume for the cutting-orders cannot be respected because coil is oversized. Hence, a bigger lot size is produced than planned.



This requires that the employees must search for the required metal blanks to continue working. This prevents the removal of metal blanks in FIFO (first in first out). Furthermore, the number of metal blanks which exist at Intermediate storage does not match with the number of metal blanks in the IT-Systems. So, there are residues of metal blanks at intermediate storage.

Reengineering principle for Material Stocks:

Empower workers -The material stocks component process can be rationalized that the employees must search for the required metal blanks to continue working.

4. FIFO Principle and Repacking Processes:

The Flow-Job: Principle's The Flow-Principle states that the material flow and information flow should stream by customer time. This requires that we arrange all processes and activities in accordance with the production stream and distribute them to each work location in accordance with customer-time. Working with Single-Piece-Flow, supported by Visual Management, and direct distribution to the downstream process allow us to identify quality issues and monitor the quick disconnect of those issues.

Investigations led to the discovery that the Fifo-principle cannot be used to treat metal blanks further. In this sense, the issue is that environmental factors, such as pollution or obsolescence, might have an impact on the steel. Corrosion may happen. and must therefore be thrown out. In order to access the necessary blanks, the employee must also repack the metal blanks. The issue here is that the intermediate storage is full of blanks and mismatched blanks are stacked on top of one another, preventing the employee from having a straight entrance. The ideal additional processing should follow the Flow-principle in the VW Production System. On the other hand, problems regarding quality can be avoid.

5. Searching Efforts and Travel Paths:

Employees are required to find the necessary metal blanks, as was already described. This entails a considerable time and financial investment. Since moving oneself implies that one is not constantly working, according to Taiichi Ohno, "the movements of employees have to be coupled with value chain movements. Working entails advancing a procedure in order to complete the works.

Lack of transparency, material availability, and the search effort all contribute to lengthy transport routes. The staff members must travel between the many warehouses while studying the blank.

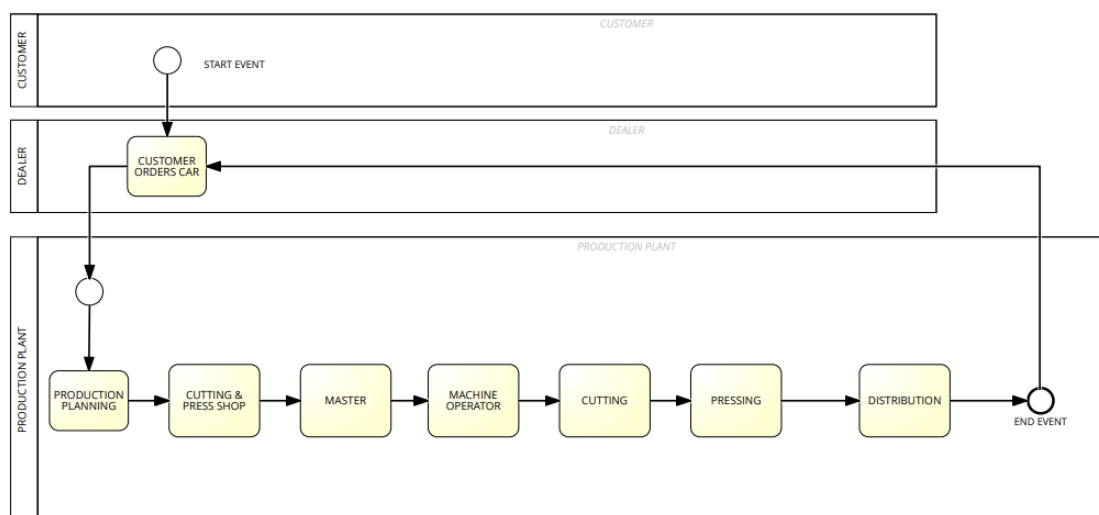
Nine different categories of waste can be used to determine the effects of inefficient operations and transportation. By employing standard procedures, the Pull principle, or by avoiding overproduction, this waste can be eliminated.

Principle for Searching Efforts and travel path:

Relieve Bottlenecks - Concentrate first on bottleneck processes/activities where this waste may be avoided by using regular procedures, the Pull principle, or avoiding overproduction.

TO-BE Process Design -

The updated Information Flow (Re-Engineering)



Change management analysis:

In accordance with the working objectives, in this section the following points will be discussed.

- 1. Elimination of waste**
- 2. Optimized and standardized transport routes**
- 3. Cost reduction**
- 4. Quality enhancement**

Our aim is to work out the possible optimization potentials in consideration of the objectives and methods of Volkswagen Production System. The method “Nine types of waste” has already shown which activities cause waste. So, long travel paths or research on material represent nonvalue creating activities. Accordingly, Volkswagen PS shall different possible optimization potentials works out and a concept for a better and more efficient supply to production shall developed. The results of the cause analyses showed that a high potential for optimizing the production planning and control exists. In this part, according to that, target-concept for a sustainable production-program will be prepared.

First, the production of irregular/uneven week lot shall happen in a continuously week lot. Using a continuously week lot the production will be consequently, and this has a positive effect on material stocks. Furthermore, the production-program shall be reorganized for the street 150, (this shall follow in the future for the other cutting systems), implemented by one person.

This means that one person must plan both the cutting room's production of metal blanks and the press shop's manufacture of metal blanks. As a result, the interface issue can be optimized and information gaps can be avoided, resulting in improved communication.

Many beneficial solutions can be transferred to other regions and levels with the use of this production-program planning. This optimization strategy makes sure that the amount of material on hand is minimal and in line with demand.

Expected Outcome -

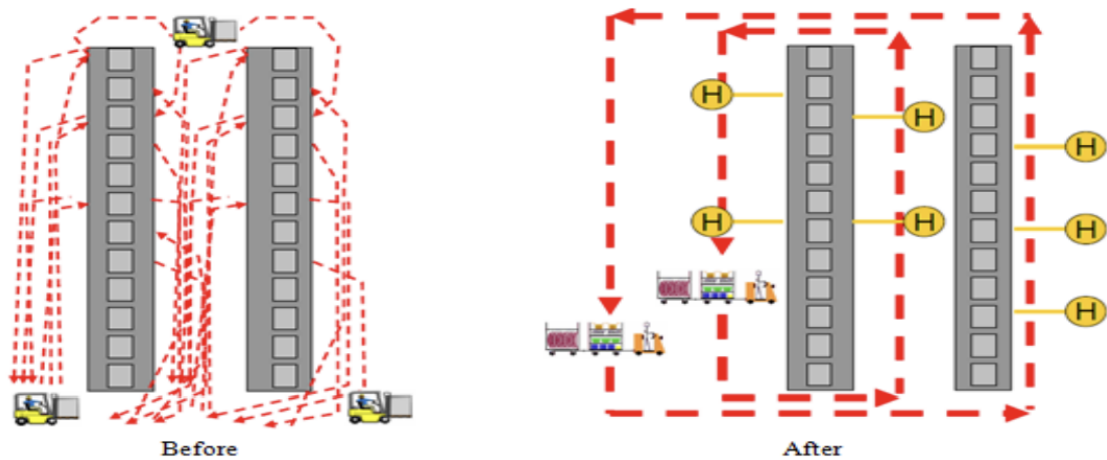
Clocked Route-Transport-

According to Volkswagen Production System at Press-150 the discovered waste, such as material stocks, transport etc.

An important component of the material supply for Press-150 will be improved through the optimization of the material flows and the elimination of intermediate storage. It is required to establish a definition of a standard in order to accomplish this. The standard in this instance is a route's schedule.

Furthermore, early measurements of deviance from the norm are particularly beneficial (non-compliance of timetable). It is essential that the pull-principle is present at the press shop in order to introduce a lift truck operator.

A shorter route shall be used in place of the current transit route between Coil4 and Press-150.



NEW TRANSPORT PATH: -

These are more efficient and more timesaving than the old route. Because the production material will be transported directly, from MBCS, Coil4 and BCS, without intermediate storage, to the staging area of Press-150. The changeover on the new route is beneficial as the employee does not follow up the metal blanks for the production because they have a permanent parking space. With the help of this new path the Volkswagen Group can save 120,71 km per year.

Transport-time of the new travel path			
Route	Length in meter	Voyage out in seconds	Return journey in seconds
Coil4 → press-150	132	69,1	68,67

Hence it is possible to - The Prevention revert the development of residues- so the Coil-size is equal to the lot-size of press-150 150. - The intermediate storage of press-150 can be removed and at press-150 can be the metal blanks of actual and following production/manufacturing set.

	BEFORE	NOW	SAVING
Drive in Summary	231,19 KM	110,48 km	120,71 km
Drive to BZA	40,18 KM	0 km	40,18
Workhours/emp	23,43 h: Stock-BCS 20,00 h: Stock-MBCS	32,03	20,21 h
I n t e r m e d i a t e	847,8 Square meters	50 Square meters	797,8 Square

Conversation of manufacture from push to pull-principle:

Through this, it is possible to reduce material stock, improve process stability, speed up processing, and save money by cutting down on material wait times. Small amounts will be used to produce the material stock so that it can be handled and made in accordance with client demand and Perfect timing.

Increasing the transparency:

The communication between interface Departments can be improved by enhancing transparency and mutual understanding between cutting system and press shop, for example, through visualization of metal blanks.

Additionally, the communication across interface Departments can be improved with the use of visualization management (Volkswagen Production System) by making material stocks easily accessible.

Reducing the material stock:

The material stock is a waste, according to nine different categories of waste. In cutting systems, the portion of value-added activities can be boosted by lowering the metal blank stocks. In addition, the stock that is now in circulation contains 750.00 metal blanks, with daily production of 150.000 cut metal blanks. Due to a lack of space and partially noticed new orders, the internal guidelines of the 1,5-Shift before further processing (press store) cannot be realized.

Improving the fifo-principle and unpacking processes:

The implementation of fifo is not possible because of the limited material stock available. Further, the metal blanks have been repackaged to make it possible to access the required metal blanks. The search effort is enhanced when traveling a long distance. With the use of visual management, it is achievable. Therefore, there is a fixed assignment of metal blanks to the locations of the material supply.

Perfection of coil ordering and size:

The actual ordering of coils does not occur close to or promptly before they are manufactured. So, it makes sense to order these quickly and according to lot size. Therefore, the remaining metal blank is avoided.

For this reason, an optimization proposal was put out to address the apart shortage step by step.

All told, a new design for a new route and a clocked-route-transport was put into practice between the cutting room and the press shop. As a result, huge material inventories are avoided and a just in time supply is made available. High material stock will also be eliminated in accordance with those in charge of ordering and shipping optimization, and at press-150, just one person will design and oversee the production order.

Project Plan –

Project Stakeholders:

- Dealer-sale agent
- Plant-Production line
- Plant-Operators
- Plant- manager
- Suppliers

Project Timeline:



- **Planning begins-** initial stage of project
- **Project structuring and conceptual design phase-** plant update documentation and update designs are confirmed.
- **Plant acquisition meet with investors-** after finalizing the design and documentation work, will meet with the investors for the mobilization of materials from one plant to another.
- **Development begins-** after acquiring funds and design, plant upgrade/development begins.
- **Ready to begin plant production-** the plant is ready to start its production.

Project Cost Analysis:

Cost of Project Materials- For the minimal usage of funds, we in this project want to combine the material cutting house and pressing shop at the same location.

The main cost associated with this process is shifting the machinery from pressing shop to cutting shop or vice versa. Only transportation and a little place update is required for the plant.

Project Staff Compensation- As there will be an operator and employee's exchange from one plant to another, we can minimize the operators and employees associated for the production lines.

Cost of Equipment and Tools- No new equipment purchases are done. Because we only linking the two production houses to one. Cutting room and press shop.

Plant Expansion- For shifting of cutting room materials to press shop, there need to be a plant expansion.