Enhancing Productivity and Sales through Effective Management of Kits in the Automobile Aftermarket Supply Chain

Guided and directed – Dr. Pro Sasa Petar -PhD

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A Research Proposal
Presented

by

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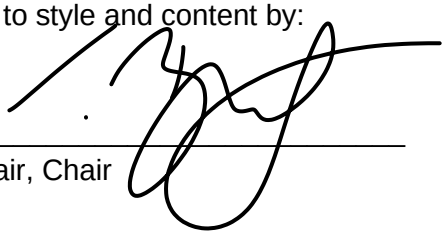

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ENHANCING PRODUCTIVITY AND SALES THROUGH EFFECTIVE MANAGEMENT OF KITS IN THEAUTOMOBILE AFTERMARKET SUPPLY CHAIN

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Abstract

One of the world's most complicated supply chains is the automotive industry. In order to accurately collaborate, this industry has been found to rely significantly on a large number of outside businesses. In the automobile aftermarket supply chain, efficient kit management is essential for optimizing a number of processes. These are also important for precisely increasing efficiency and are crucial for methodically raising client satisfaction. The research aims to analyse and work to improve total kit productivity to boost revenue and improve effective management. The significance of the study is to drive the effectiveness of productivity and sales through the effective management of kit in the automobile aftermarket supply chain. The main significance of the study is to identify the significant importance of kitting to improve overall business sales and productivity within the automobile aftermarket supply chain process. The study has mentioned that Effective kit management within the automotive aftermarket supply chain is crucial for streamlining multiple operations. In this study, it explored that the automobile market supply chain is serving as one of the critical components in accurately ensuring the availability of the several parts which are necessary for maintenance of vehicles. As industries and technology advance, the kitting and assembly sector is poised for significant transformations. To be competitive and embrace innovations, businesses need to foresee and adapt to these upcoming developments. To be competitive in a rapidly evolving industry, companies must implement and utilize efficient kitting and assembly processes. The preparation of the kits is typically characterised as a labour-intensive operation when it comes to kitting, and reducing operating costs requires time savings. Standardisation and packaging, technological integration, supplier coordination, inventory control, demand forecasting, workforce efficiency, cost considerations, and customer expectations are some of the interconnected factors that affect the dynamics of kit management in the automotive industry. The study includes significant impact of kit management on productivity and sales. In the literature review chapter, it reflects appositive approach towards supply chain by improving the effectiveness of kit management supply chain automatically become successful for automobile industry aftermarket products. Kit management consisting different advantages in supple chain in the areas of cost saving, speed and efficiency, quality and accuracy and also performs in error reduction. Inventory management, quality control and demand forecasting are subjected to be significant challenges that have elaborately

identified in the literature review section. They also incorporate the Relationship between supply chain productivity and kit management dynamics within automobile industry. In the literature review chapter, the application of DMAIC application is also mentioned. This framework has been the key source that has accurately facilitated the numerous aspects and provides advantages. Additionally, the chapter also discusses about few methodologies including lean Manufacturing, Stakeholder Theory along with Resources Based View and its applications are also discussed in this study. This research paper researcher is going to conduct a survey process among 101 participants, and the participants were employees/Staff, managers/HR, executives, and customers. These participants have answered the questions that were asked of them during the survey process, and this helps the researcher to depict adequate research findings. On the other hand, researchers have conducted a study by conducting an interview process among 10 people to answer 10 interview questions interview questions. In the phase of qualitative data collection within the study, a total 10 number of participants were selected to participate in a semi-structured interview, and each was guided through 10 interview questions open-ended questions. The usability along with training needs of multiple kit management systems are very significant for accurately ensuring seamless operations and employee efficiency. There are also the requirements or the needs of training for an accurate kit management system. Apart from that, the study has also mentioned that it is essential to provide comprehensive training for different new interfaces of the system and also there is a need to provide training on systems functionality as well as the overall workflows. In addition to that, in this study it has been identified that there are other key areas which are very essential in accurately enhancing the overall effectiveness of the kit management systems by anticipating the requirements of the customer. The primary data analysis findings indicates that the organisations aim to boost sales by implementing different kit management practices, which can also focus on reinforcing these core relational and operational practices. Optimising inventory levels, increasing the dynamic of order fulfilment rates and reducing carrying costs can be achieved through putting in place a strong inventory management system which helps in works with demand projections. Primary data indicates that the automotive aftermarket industry's productivity and sales performance can be further improved through targeted improvements in lead time reduction, supplier and communication and coordination. In addition to that, from the findings of secondary data analysis, it can be known that improvement of the kit productivity that is mainly within the automobile industry in the

supply chain process is specifically focusing on accurately streamlining. The secondary data analysis of the study has also highlighted that accurate forecasting is significant for the business performance. It has been the key area that enhances the business performance in determining accurate quantities regarding several components. The respective research paper has critically analyzed how adopting a strategic management of kit can further positively influence entire supply chain performance. The study has developed appropriate findings from the chapter of data analysis through survey and interview process and literature review that a structured approach towards the development of kit configuration, distribution, and inventory control in the conclusion segment.

Keywords: Productivity, sales, kits, automobile, aftermarket, supply chain, automotive, inventory, forecasting, warehouse, technology, customer, workforce, efficiency, packaging

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CHAPTER 1: INTRODUCTION

1.1. Statement of the problem

Effective kit management that is within the automotive aftermarket supply chain is very crucial for streamlining multiple operations. These are also significant in accurately improving efficiency, and play an essential role in systematically enhancing customer satisfaction. Through accurately grouping several components that are into pre-assembled kits, businesses are able to effectively optimize inventory, decrease any problem or errors, and can also accelerate order fulfilment. These are further leading to cost savings and can also enhance better service for the customer. Effective kit management within the automotive aftermarket supply chain is considered as a strategic approach that delivers several advantages (Vesco, 2023). The benefits are including improved inventory management, streamlined several operations, improved services for the customer and cost savings. Through appropriately implementing a number of kit management practices, businesses are able in optimizing their supply chain and are also able in achieving greater success within this competitive market.

The Key supply chain risks have been exposed during the time of the pandemic situation when automakers have lost an approximately $450 billion even at a global level and well over approximately 5 million units of production of the vehicle has been forfeited mainly due to the shortage of the chip (Flagg, 2024). However, it has been identified that the sector still has not done enough to enhance its resilience relative to the overall electronics market. This is a problem because while the supply chain of the electronics has stabilized, there are multiple variations even within lead times, demand and even pricing by both region and sector. In addition to that, there are new challenges that have directly emerged from different economic and even multiple geopolitical forces. Good aftermarket supply chain management is crucial for businesses looking to boost customer satisfaction, streamline operations, and make a profit. With the global marketplace becoming more complex and customer demands increasing, businesses need to adopt best practices that enable them to face these challenges head-on.

The research problem mainly lies in effectively identifying and addressing the gap that exists in effectively understanding how several effective management practices can particularly enhance both sales along with productivity within a business. This gap is found to be very significant

because while numerous management strategies are considered to affect these areas. At the same time, the nuanced relationship and multiple best practices that are required for maximizing these aspects also remain unclear (Muchiri *et al.* 2023). However, the proposed approach mainly involves a particular multi-faceted strategy, in which a comprehensive literature review, empirical collection of the data collection through specific ways and also statistical analyses are used. These are significant that help to identify multiple key management practices and their overall impact on sales and also on productivity.

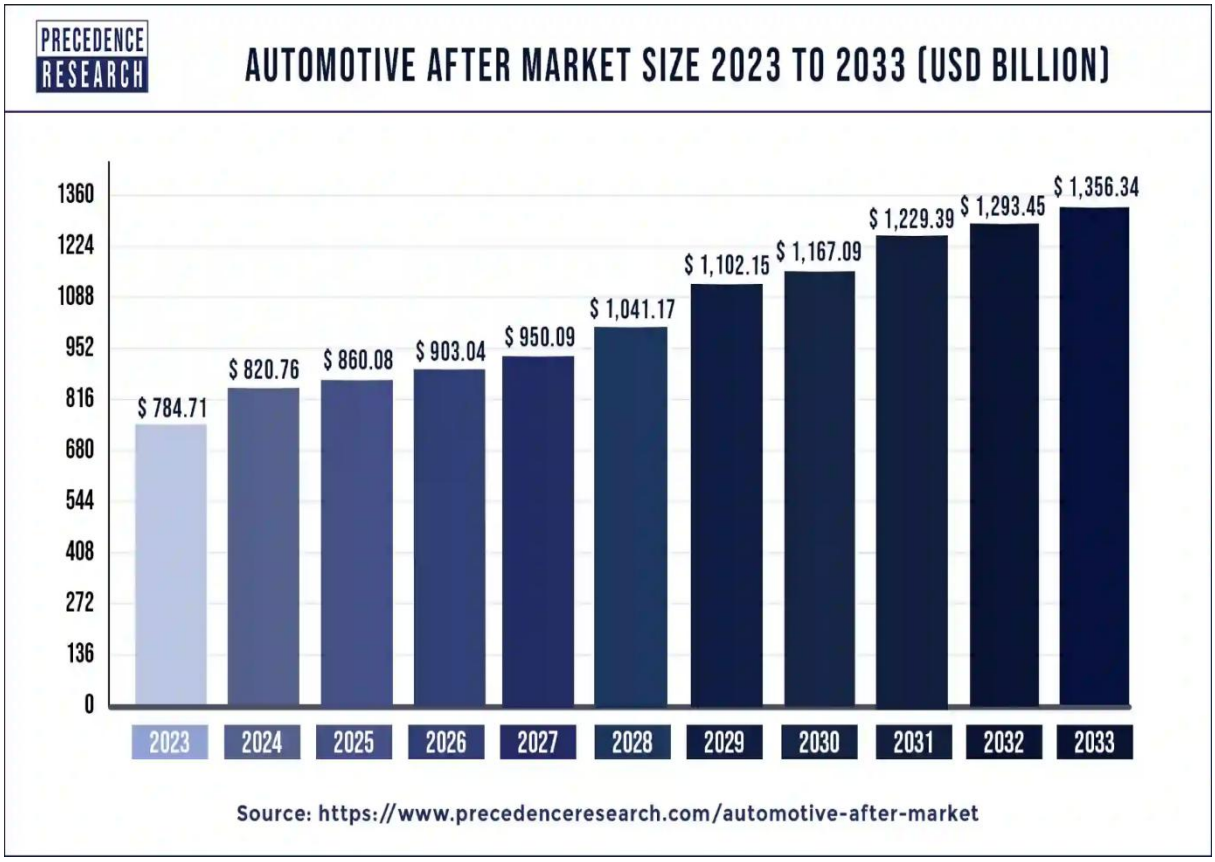

Figure 1.1.1: Automotive Aftermarket Size

(Source: Precedenceresearch, 2025)

It has been identified that the global automotive aftermarket size has been estimated at approximately USD 78 interview questions4.71 billion by the end of the year, 2023.Furthermore it has been predicted to surpass around USD 1,356.34 billion by the end of the year 2033. These are further accurately poised to grow even at a noteworthy CAGR of nearly 5.74% that is mainly

during the forecast period that is from the year 2024 to the end of the year 2033 (Precedenceresearch, 2025). In addition to that, it has been identified that North America directly led the global market with almost the highest market share of approximately 34.95% in the year 2023.

However, by product, the tire segment has accurately registered the maximum market share in the year 2023. While by application, the DIFM segment has been the area that has further captured the biggest revenue share in the same year, 2023. Along with these areas, it has also recognized that by distribution channel, the retailers segment has been the another significant source that held the largest market share in the year 2023 (Precedenceresearch, 2025). By technology, the accurate and multiple genuine parts segments have also been estimated to accurately hold the highest market share in the year 2023.

Effective kitting management that is within the automotive aftermarket can specifically boost productivity and can also boost sales through several aspects. These aspects include streamlining processes, decreasing costs, and also accurately enhancing customer satisfaction. Through grouping parts into several kits, manufacturers are able to accurately minimize any errors, and can also optimize inventory. These are further leading to both cost savings and faster fulfillment. Additionally, a well-managed kitting system is very helpful that can support numerous areas including proactive customer service, customer-centric pricing and these are also ultimately driving both sales and loyalty (Vesco, 2023). Inefficient kit management practices that are mainly including poor inventory control, any inadequate demand forecasting, and also including the lack of integration with multiple customer information systems, result in multiple consequences. These consequences can be seen as wasted resources, lost sales, and also lead to customer dissatisfaction. These are ultimately impacting the profitability along with competitiveness of numerous aftermarket service providers.

The study, that is "Enhancing Productivity and Sales through Effective Management of Kits in the Automobile Aftermarket Supply Chain," mainly aims to appropriately address the challenges or the issue that are associated with the inefficient inventory management and also related to any potential lost revenue within the automotive aftermarket mainly due to any lack of required kitting strategies. Particularly, it mainly seeks to effectively investigate how an enhanced and a

better kitting can be helpful in improving inventory control, decreasing costs. At the same time, how these areas can be helpful in ultimately boosting sales through systematically streamlining processes and also accurately improving satisfaction of the customer.

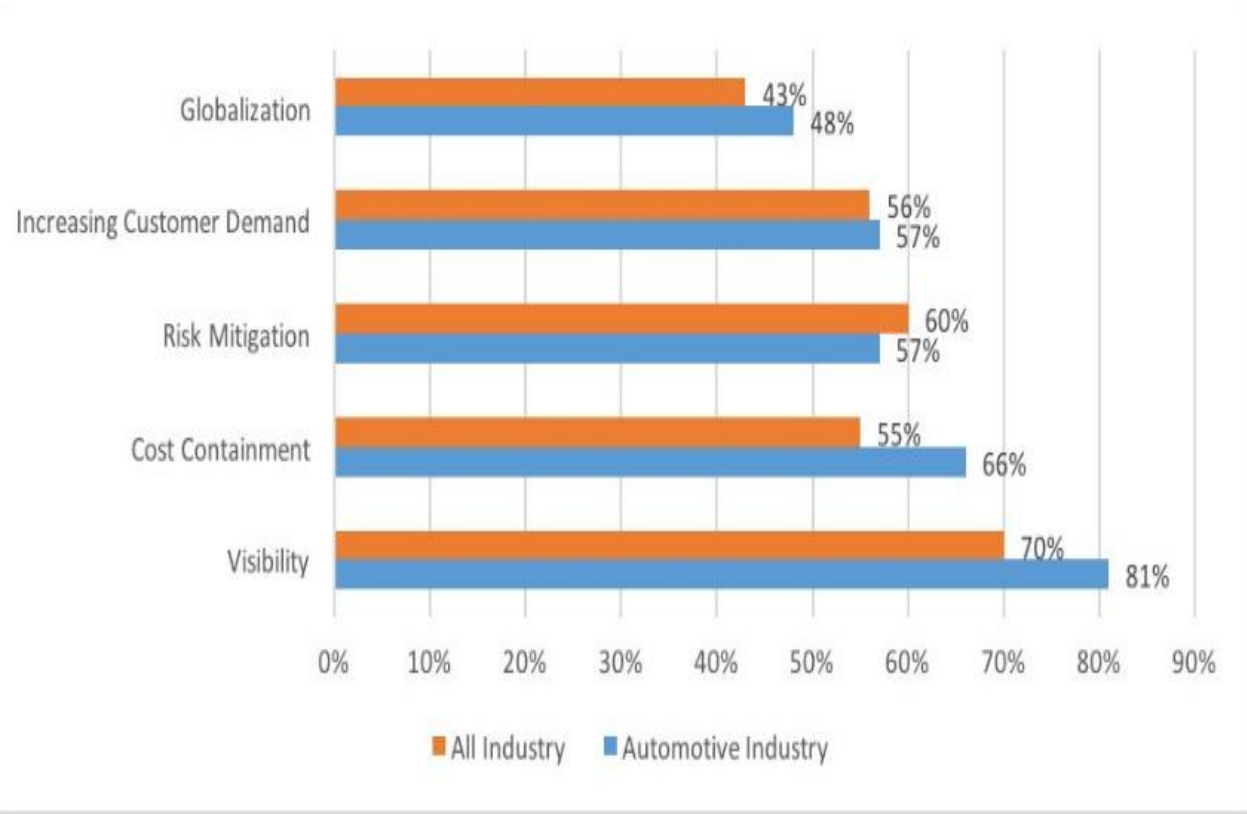

Figure 1.1.2: Supply Chain Challenges

(Source: Newstreaming.com, 2021)

The above image demonstrates several aspects that are ultimately associated with the automotive industry and the other industries. As shown in the given figure, the visibility of the automotive industry is 8 interview questions1% while the visibility of any other industry is 79%, which is less than the visibility of the industry. This is one major supply chain issue that is faced by both the automotive industry and other industries as well. Similarly, the risk mitigation that is associated with the automotive industry is 57% while it is 60% in case of other industries

(Newstreaming.com, 2021). Furthermore, the above given image is also exploring that the increasing demand of the consumer within the automotive industry has been found to be 57% and when it is seen in other countries, then it was around 56%. Globalization has found to be one major issue that is also associated with the supply chain of the automotive industry is also high in comparison with the other industries as it is 48 interview questions% and the other industry has only 43%.

The automotive supply chain has found to be one of the most complex within the world. At the same time, it has been identified that this industry has relied heavily on numerous third-party companies to accurately work together. They work together in order to effectively deliver several required parts that are very essential to complete the processes of manufacturing processes to deliver many products that have high-quality (Mkumatela*et al.* 2023). Additionally, the Automotive supply chain companies are also constantly implementing new technology within their business practices. These are further, allowing them access to many inventories and with the assistance of a global logistics network, products or the goods can be shipped in different parts of the world. However, there are also few challenges that are ultimately associated with the supply chain in the automotive industry.

One of the main issues that has been found in the automotive industry is the lack of required visibility. This industry has approximately 8 interview questions1% rate of concern that is compared to approximately 70% of any other business. However, a vehicle that is mainly consisting of nearly 30,000 components have been designed in order to bring the supply chains together that is for consonant production (Newstreaming.com, 2021). However, by effectively focusing on kitting, the study likely seeks to enhance a number of aspects that are going to be mentioned. One major aspect that the study is seeking is improving accuracy of the Inventory. Kitting is very significant that further assists in effectively tracking several inventory levels more even in an appropriate way. This is further allowing for decreasing any errors and also crucial in minimizing stockouts. The study is also seeking to decrease the overall costs of the Carrying.

However, it is possible through effectively optimizing stock levels and by accurately reducing the requirements or the need to individual parts of stock. In addition to that, it also needs to mention that kitting can be the area that can further lower storage and can also handle any

expenses. It is also significant in effectively enhancing experiences for the customer. Along with these areas, the study also seeks to accurately Quicker repair overall turnaround times and also provide the significance of easier access to the necessary right parts (Muchiri *et al.* 2023). These are the key sources that can accurately improve both customer satisfaction and loyalty. This is also sought in Boost Sales and it is through systematically streamlining multiple processes. It also further ensures that all the parts are available, kitting can be the area that can lead to increase both sales and increased profitability also.

The size of the global light duty automotive market aftermath has reached approximately 38 interview questions3 US billion dollars at the end of the year, 222. In addition to that, it has also predicted that the market is expected to grow in the upcoming years and also it will further reach the size of approximately 444 billion US dollars in the year 2025 (Placek, M., 2024). The automotive manufacturers are not always adapting to the constantly changing market. However, there are few specific areas that have been pivotal within the automotive industry and these are braking systems, multiple gauges and also driving assistance.

Apart from these areas, the new developments within the technology and within markets can also be expected to increase from around 17,000 units in the year 2022 to nearly 126,000 units after a few years that is in the end of the year 2030. At the same time, the global battery electric vehicle market has been estimated nearly 359.2 billion U S dollars the year 2002 has been forecasted to reach near;y 68 interview questions1.2 million U S dollar in the upcoming year, 2028 interview questions (Placek, 2024). The automotive suppliers are significant contributors to the automotive profile pool even at a global level. They are providing suppliers for multiple auto manufacturers and are also providing multiple replacement parts that are particularly for the aftermath.

In productivity fiction, the methods that are cost effective are effectively looked upon as significant input and get used to the replica. However, the replica has been strongly deliberated and rooted within the idea notion. It is very essential for the supply chain to be intelligent in order to accurately put up both ambiguity as well as disparity associated with the supply as these are considered as imperative and significant aspects that are concerning regarding performance of the supply chain (Singh *et al.* 2019). At the same time, within supply management, the

information sharing system is very initial and it is largely considered as specific for accurate and even better performance. A supply chain management has accurately included a set of particular connections that are further counting multiple associations, several actions, individuals, many assets and also information.

The automobile market supply chain is serving as a critical component in accurately ensuring the availability of the several parts which are essential for maintenance of vehicles. However, the management which is associated with the kits within this area is presenting a number of issues which are impacting the sales and productivity. Also addressing the challenges are very essential for accurately enhancing and driving the sales within this supply chain. The following thesis mainly aims to accurately explore the different, several technological advancements and also discuss several practices. All these findings are the key source that will help in overcoming all these issues and also helpful in optimizing kit operations and accurately meeting the constant changing demands of the market

1.2. Significance of the study

Kit management is a significant use within inventory management wherein multiple different products are packed together to form a single unit of products known as a kit (Naghshineh, 2024). The respective practice has streamlined the operation through simplification of assembly, reducing the error of picking, and potentially increasing customer satisfaction. Customers also become happy by getting offers on the kit, consisting of a bundle of products. The positive management of kits or bundles with pre-packaging of products performs a crucial role in improving overall sales and productivity of the business or organization (Walsh, 2024). The respective streamlined processes have been effectively reducing errors caused by to finding of single products, and on the other hand, customers become satisfied by getting all items in a single bundle through availing offers. Hence, through the implementation of the kitting process, businesses have been increasing their overall efficiency, reducing the cost of labor and providing a positive customer experience. These approaches lead the business towards achieving higher sales levels and improving revenue growth.

The main significance of the study is to identify the significant importance of kitting to improve overall business sales and productivity within the automobile aftermarket supply chain process.

Effective management of kit within the supply chain process of the automobile aftermarket enhances sales and productivity through operational streamlining, error reduction and process of inventory optimization (Turi, 2024). This phenomenon is done with the help of grouping relatable parts within a kit; the manufacturer can reduce the handling charge time and costs of labor. It leads the business into a faster process of order fulfillment to boost working efficiency. These approaches aim to improve customer experience, and they become positively satisfied by having all items or products related to each other in a single bundle. The respective process enhances faster delivery with having higher range of sales and customer experience.

The kitting management consists of different advantages that help the business to improve the overall sales and business operational productivity (Fatima *et al.* 2024). Reducing errors and streamlining operations is one of the benefits derived through kitting, which is done by combining the components into a pre-packaged kit. The aspects of pre-packaging help the business simplify their overall assembling, sourcing and shipment of parts process. Error reduction and operational streamlining have also been derived with the help of an adequate kitting process for the automobile aftermarket supply chain process. There is a huge chance of error detection during the packaging system of items individually and following the entire supply chain process, thus, kitting reduces errors that have to negative impact on customer retention. However, adopting the kitting process plays a vital role in attracting customers towards the specific automobile aftermarket.

The supply chain of the automotive aftermarket encompasses different flow parts, such as accessories, vehicle services, after they have been sold with their original equipment (Fatima *et al.* 2024). This includes distribution, manufacturing, remanufacturing, installation and retailing of different vehicle parts and their related items. Hence, inventory management has been incorporated within the automobile aftermarket by the kitting system, and this increases operational efficiency of the business. Due to having variations and large parts, the inventory management becomes difficult within the automobile industry. Hence, with streaming, the inventory management process, assisting kits mitigated the overall difficulty. The stock level is managed by automakers effectively, and they keep an efficient tracking system to manage grouping-level parts into kits. These techniques minimize the overall excessive cost of the

inventory process and increase demand forecasting by guaranteeing that the required parts are assembled based on requirements.

The main focus of this study is to elaborate and enhance the overall effectiveness of the management process and develop the number of sales with the help of kit productivity. The quality control improvement within the respective automobile sector derives from the assembly and kitting process (RASIB *et al*. 2025). The manufacturers can inspect components just before they are going to be sent into assembly and provide a guarantee that each part fulfils standard quality. Hence, the entire parts of the finished product improve further with having a complete kit that helps to minimize the possibility of missing parts or any faulty situation. The significance of the respective research paper is to identify the availability of different kits in the marketplace for easy allocation according to customer requirements. However, this is important for the automobile industry to maintain an adequate stock in the market to minimize missing product hazards to meet customer demand.

This can lead to customer dissatisfaction and decrease business growth, and reduce overall revenue. The study is also going to depict the significant approach of kit management practices within the automobile industry, driven by the aftermarket supply chain. The automobile sector saves huge money with the use of the kitting process and also the assembly procedure (Fatima *et al.* 2024). The reduction of production cost has been positively met with the help of cutting manufacturingaspects and labor cost due to handling different parts and assembly through component grouping. However, business save their cost on time and also enhance the overall efficiency of the business through indulging kitting process. Thus, the improvement in efficiency cuts overall labor expenses and provides lesion on the possibility for mistakes, which results in delayed production and expensive rework. It lowers production costs within the automobile industry with the improvement of inventory management aspects and also optimizes entire business operations.

Speed is subject to being a crucial aspect within the cutthroat sector of automation. Hence, by providing customers a guarantee about pre-packaging of each product and a ready-to-run assembly and kitting process, it speeds up manufacturing. The respective speed-ups for assembly and time-to-market cut the time that was needed previously, and prepare all parts during the

manufacturing process. It significantly creates the opportunity for the automobile sector to meet the deadline quickly and also react quickly based on market demand.

1.3. Research Aim and Objective

Research Aim: The research aims to analyse the effects of efficient kit management on overall supply chain productivity and aftermarket sales in the automotive sector.

Research Objective:

RO1: To improve total kit productivity in order to boost revenue and improve effective management

RO2: To implement hassle-free kits management in the automobile sector

RO3: To foster an overly user-friendly and simple to operate production system

RO4: To investigate the existing practices of kit management in the automobile aftermarket supply chain

RO5: To evaluate the relationship between the productivity of the supply chain and efficient kit management dynamics

RO6: To analyse the impact of optimising kit management on the aftermarket performance of sales.

RO7: To access the potential barriers and challenges for implementing an effective strategy for kit management

1.4. Research Questions

RQ1: How to improve total kit productivity in order to boost revenue and improve effective management?

RQ2: How to implement hassle-free kits management in the automobile sector?

RQ3: How to foster an overly user-friendly and simple to operate production system?

RQ4: What are the existing practices of kit management in the automobile aftermarket supply chain?

RQ5: What is the relationship between the productivity of the supply chain and efficient kit management dynamics?

RQ6: What is the impact of optimising kit management on the aftermarket performance of sales?

RQ7: How to assess the potential barriers and challenges for implementing an effective strategy for kit management?

1.5. Limitations, delimitations, and assumptions

Limitations: The study on enhancing productivity and sales through effective kit management within the automobile aftermarket supply chain has been limited through multiple factors. These are mainly including limited availability of the data on usage of kit usage and sales performance. These are also including several issues and difficulty in accurately isolating the overall impact of kit management from many other factors. In addition to these issues there are other limitations as well that include the potential issues or difficulties in accurately generalizing any findings to any other regions or also to aftermarket segments (Siebers *et al.* 2008 interview questions). The findings of the study may not be generalizable to almost all aftermarket segments, as those which are specifically focusing on any specific types of vehicle types or also focused on any specialized parts. Another limitation that exists within the study is limitation of data, challenges associated with generalization. Along with these areas, the effectiveness of kit management may also vary across multiple regions or also within any geographic area that is mainly due to variations.

Delimitations: The aftermarket is considered as a significant market segment, kits can also be a beneficial product line, efficient processes as well as effective inventory management. These areas can also accurately decrease costs, and along with that timely delivery and the overall high-quality parts are also valued by customers. The study is mainly examining the kits management that is mainly within the automobile aftermarket supply chain and is also excluding any components or any kind of other products (Eriksson and Engström, 2021). This is specific and at the same time it is also limiting the finding applicability to any other areas that are associated with the supply chain. The study is also emphasizing the role of multiple areas including IoT

blockchain, predictive analytics and it is also excluding any other technological intervention such as AI. The study is also analyzing data and several trends that are mainly focusing on the several recent advancements and multiple issues and challenges. The research is also involving a particular group of stakeholders in several companies.

Assumptions: The assumptions are highlighting the several foundation premises that are mainly upon which the research has been based. It is assumed that the data that has been provided by the company as well as different stakeholders are reliable, accurate and also the industry representative. This assumption is very essential for the finding while the other assumption is included in technological impact (Eriksson and Engström, 2021). The study is assuming that the IOT adoption and predictive analytics will have significant impact on both sales along with productivity. While the other assumptions are associated with cooperation of stakeholder as it has been assumed that the participants will be able to cooperate and will also provide the required information. This cooperation is very necessary for the research success. The research is also assuming almost a stable market situation and this assumption is also essential for trends and patterns analysis.

1.6. Definition of Terms

DV: Productivity and sales performance

Through comparing the quantity of products and services produced (output) with the quantity of inputs utilised to produce them, productivity is a metric used to assess economic performance. The effectiveness of a sales team in meeting its designated revenue goals is measured by their sales performance. The effectiveness of sales leadership in planning, forecasting, setting goals, and monitoring outcomes for the entire sales organisation across the territory is just as important as the performance of individual sales representatives. Nonetheless, sales personnel may concentrate on selling tasks thanks to streamlined order fulfillment, which enhances their general productivity and performance (Thapa, 2023). A sales team's efficiency and effectiveness in generating income are measured by their sales productivity.

IV1: Inventory accuracy of kits

Inventory accuracy for kits is calculated through comparing kit's physical count in stock to the recorded count in the system of inventory management. It involves making sure that the number in the company's records corresponds to the actual quantity of an item in the warehouse. Although this problem affects many businesses, there are ways to increase inventory accuracy formula keep rates. If kit problems make it to the assembly stage, they can cause expensive delays (Fager *et al.* 2021). For instance, the assembly process may have to halt until the correct parts are delivered on schedule, or the incorrect parts may be put together on finished goods.

IV2: Lead time in kit delivery

Lead time for kit delivery in the automobile industry refers to the time which it takes from the consumer when they place an order for a specific vehicle, like some important components and parts for specific vehicles to when these components are delivered to the product facility. The lead time varies based on factors like supply chain efficiency, material sourcing, and vehicle complexity. Meanwhile, humanitarian supply chains can shorten lead times in their decision-making process in a variety of ways. Since prepositioned goods are located close to their destination, delivery lead times are shortened, and prepositioning itself is an intriguing speculative tactic of what will be needed, reducing order lead times (Kovács and Falagara Sigala, 2021). Even vendor-controlled inventory is utilised, which combines guaranteeing certain product quantities with cutting down on order lead times, all the while separating these from supplier financial activities and subsequent order placements.

IV3: Supplier coordination and integration

A key component of strategic procurement, supplier integration helps manufacturing companies improve their lead-time performance and speed-to-market while reducing the risk of delays in raw materials. Businesses that have a strong supplier integration and procurement strategy are able to reduce production and procurement lead times, which improves manufacturability and shortens the time it takes to sell their products in comparison to their rivals (Chenini *et al.*.2021). Companies are able to introduce their goods and services to the market and make them accessible to consumers more quickly than their rivals because of the shortened supply chain. Strategic procurement and supplier integration are the two primary supply chain categories that

are the subject of this study. Supply chain techniques can help manufacturers reduce supply chain risks.

IV 4: Quality control in kit assembly

The current greatest level of quality in an organisation is "total quality management" (TQM), which takes into account the needs of both internal and external customers, the cost of quality, and the development of systems to plan and support quality improvement. As a component of "Total Quality Management" (TQM), "quality control" (QC) is crucial to meeting technical requirements through inspection using methods like "statistical process control" (SPS), which uses statistical sampling to check in-line quality at the manufacturing level of the shop floor. For guarantee that the quality standards for manufacturing products are met, "quality assurance" (QA) focuses primarily on the pre-production stages, including planning, design, prototyping, etc. The particular requirements of the quality management system are outlined in the "international standard ISO 9001:2015" (Ho *et al.* 2022). To enhance quality performance, numerous businesses have used a variety of techniques and strategies, including TQM, "Lean Six Sigma", "Failure Mode and Effects Analysis" (FMEA), "Quality Function Deployment" (QFD), and benchmarking.

1.7. Background

The automobile industry has been progressing with a vital aspect of integrating the kitting process into their respective supply chain aspects, and it is an essential perspective to boost effective business operations. The automotive kitting consists of packaging and assembling different automotive parts and required components, which are needed for building a specific automobile (Pan *et al.* 2024). This service is considered crucial for arriving at different components in their respective final destination safely and avoiding damages that are costly and also caused by improper assembly. Kitting services help businesses improve their efficiency and perform in reducing wastage by ensuring the phenomenon that all the parts are available in the market at the right time. Within the automotive business, the fitting process is considered one of the important supply chain management approaches which helps equipment manufacturers to fulfill or meet orders efficiently.

Additionally, the kitting services are essential in the area of inventory management as they provide accessible techniques to the business for combining multiple products, considering “Stock Keeping Units (SKUs)” towards a single product (Barry *et al.* 2024). Automotive kitting is significantly used within manufacturing a specific product and also to design following a unique design to develop new products in the market. However, the main motive of this research paper is to derive the important advantages of incorporating the kitting process within the automotive industry and which boosts the overall performance and productivity of the business. There are different benefits accrued from applying kitting into supply chain aspects, and they are efficiency improvement, accuracy improvement, inventory management simplification and reducing wastage. The comprehensive solution of kitting benefited the automobile industry, OEM and played an important role in fulfilling suppliers' parts accurately and efficiently (Zehra *et al.* 2024). This act has been done without risking the cost error to enhance customer trust and customer satisfaction.

Furthermore, the solution of kitting benefited OEMs developing innovative functions for reducing the cost of labor and price related to shipment and also at the same time keeping the warehouse organized to boost accuracy (Saunders *et al.* 2024). Different processes can easily improve kitting solutions in the manufacturing automotive sector, and they are consolidating inventory, creating new SKUs and reducing packaging amount for business. The improvement of accuracy with the help of a kitting solution mitigates common risks associated with employees gathering all components by hand. Hence, the grouped kitting items simplify the overall assembly process and also avoid the over sign danger which occurs without having the right parts. The expenses have reduced with the help of OEMs that thrive through the elimination of workers' need for packaging all individual components. Moreover, the main background of this research paper is to significantly identify a comprehensive understanding of the management practices of kits within the automotive industry aftermarket in the supply chain aspects.

It depicts several advantages, and among all the advantages, one of the innovative benefits is that it boosts business revenue with the help of incorporating numerous solutions for improving the bottom line. The greater accuracy allows the respective business to achieve a better customer experience to generate maximum sales (Venkataramanan *et al.* 2024). Furthermore, positive customer experience is a vital aspect that matter to make a business successful, and this can be

effectively fulfilled by meeting their needs. Flexibility features have also increased, which allows kitting manufacturing solutions to become tailored based on customer needs and eliminates guesswork and also mitigates difficulties that occur due to the occurrence of a generic solution.

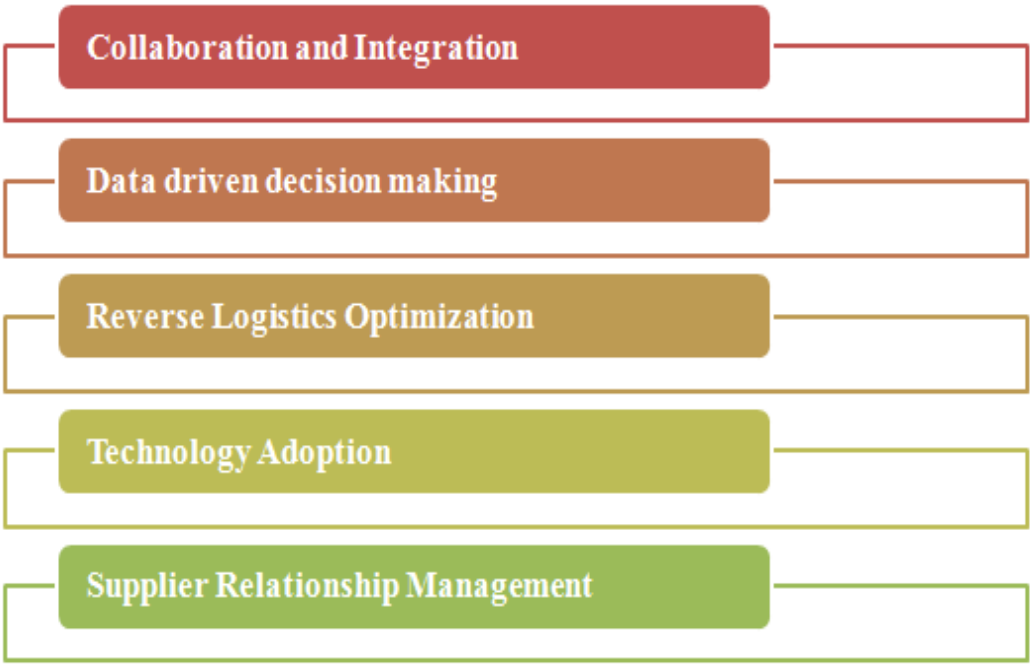

Figure 1.7.1: Successful aftermarket supply chain process

(Source: Self-developed)

The effective management of the supply chain process addresses crucial aspects for aftermarket businesses to thrive in the present generation, with dynamic and different competitive advantages(UsmanIet*et al.* 2024).The ability to deliver components, products and also services to customers at the same time is met by kitting management process. Hence, this is a key aspect that differentiates the respective industry from other industries.

Integration and collaboration:

Integration and collaboration are subjects to be one of the key factors contributing to achieving a successful aftermarket supply chain process and integration across different stakeholders (Huang and Li, 2024). Through the strong relationship fostering with the manufacturer, suppliers, service providers and distributors, the aftermarket business remarkably streamlines operations to ensure a perfect and smooth flow of services and goods.

Decision-making data-driven:

In the digital world, incorporating analytics and data defines an imperative agenda for promoting effective supply chain processes (Adewusi *et al.* 2024). This has worked with the help of harnessing real-time power information, the business of after-market enhances valuable insights towards a pattern of customer demand, performance matrix and inventory level. The respective phenomenon enables businesses to make informed decisions to boost operating efficiency and optimize their overall process of supply chain process.

Logistic optimization in the reverse process:

The after-market supply process often includes product return management, repairing and recycling (Pérez *et al.* 2025). However, the implementation of effective processes in reverse logistics reduces cost and improvesbusiness sustainability. Customer often seeks the brands that have been effectively maintaining sustainability during their business development in the competitive marketplace. The optimization of the reverse logistics process is demonstrated through an e-commerce platform, which streamlines the return system of the management area. On the other hand, with the implementation of the return process seamlessly and also leveraging data analytics for identifying effective trends, businesses can minimize overall return cost and generates positive customer loyalty.

Supplier management relationship:

Development of a strong partnership with different suppliers is considered a crucial approach for the business that operates through the aftermarket to ensure the phenomenon of reliable supply chain (Gregory *et al.* 2025). This is mainly done with the help of working closely with different

suppliers and companies to gain access to superior product quality negotiate terms favorably for improving the entire efficiency of the supply chain. A successful supply chain aftermarket management practice needs a holistic approach to build a positive relationship with suppliers.

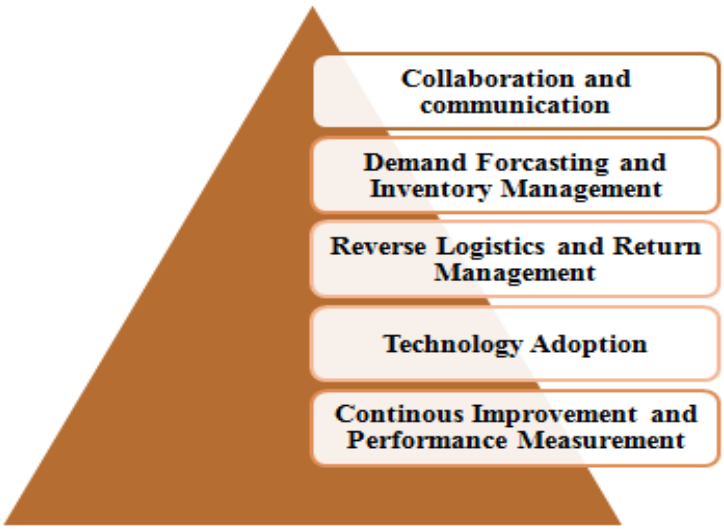

Figure 1.7.2: Best practices for supply chain after-market management

(Source: Self-developed)

The management system of the supply chain is important for the business to achieve positive customer expectations, streamline operations and achieve profitability. The increasing complexity of a global marketplace with rising customer expectations, this become essential for businesses to accept effective practices that help them mitigate head-on challenges.

Communication and collaboration:

The most critical factor within the supply chain process is to develop a positive collaboration with different distributors and suppliers (Vaka, 2024). This involves close coordination among different manufacturers, suppliers, distributors and different service providers for ensuring a seamless coordination with effective product flow and relatable information. The establishment of a storage relationship creates an opportunity to develop communication to foster

opportunities. Communication helps business to generate a clear understanding about business issues. This is important for the business to maintain an effective communication with distributor and suppers to develop a clear understanding about supply chain matter.

Inventory management and demand forecasting:

Demand forecasting on an accurate basis and effective inventory management are subjected to be essential approaches within the aftermarket supply chain process. Hence, through data incorporation customer insights, market trend business enables to foster accurate demand core and this helps them for reducing excessive level of inventory and stock out risk. Advance machine learning and analyzing tool algorithm helps business for identifying management pattern and forecast the demand with a greater precision. However, the implementation of inventory management process with robust approaches minimizes carrying cost.

Additionally, the bag ground of the study is to develop business opportunity with the help of identifying four main pillars. The effective pillars are planning, procurement, operations and quality. These pillars help automotive business to boost their supply chain process with kitting phenomenon. There are several factors that have been impacting or influencing kit management process including economic condition, leadershipmanagement, organizational structure and training (Easa and Blonder, 2024). Italso includes the approaches regarding technological advancement to improve business productivity and overall number of sales. Well-define organization and string relationships are subjected to be significantly vital in order to implement an innovative kitting process within the business. In the economic factors much as inflation and market down, impacts cost of materials and it requires a cost-saving measurement that further affects the efficiency and quality of kitting.

The study also evaluates the important influence of skill development and training for the employees to derive kitting with the supply chain in order to ensure proper accuracy, efficiency and adhere to proper quality standards. Kit management impact on productivity consists both advantages and disadvantages. One of the effective advantages is financial improvement with the help of kitting implementation. However, businesses that have been process with kitting remarkably increase “Average Order Value (AOV).” The maximum number of SKUs is performed to increase sales not only the kit items but also individual items have been

sold(Massaglia *et al.* 2024). Kit implementation reduces error, increases efficiency and optimizes a faster warehouse space. Furthermore, it also leverages with sales advantages such as revenue generation, complementary item highlights and positive customer experience. Apart from that, kit management costs have disadvantages in the areas of inaccurate forecasting, inefficient storage management and disruption in the supply chain process. This also takes a participant in increasing costs due to overstocking, wastage of resources and time and different logistic issues.

1.8 Thesis Structure

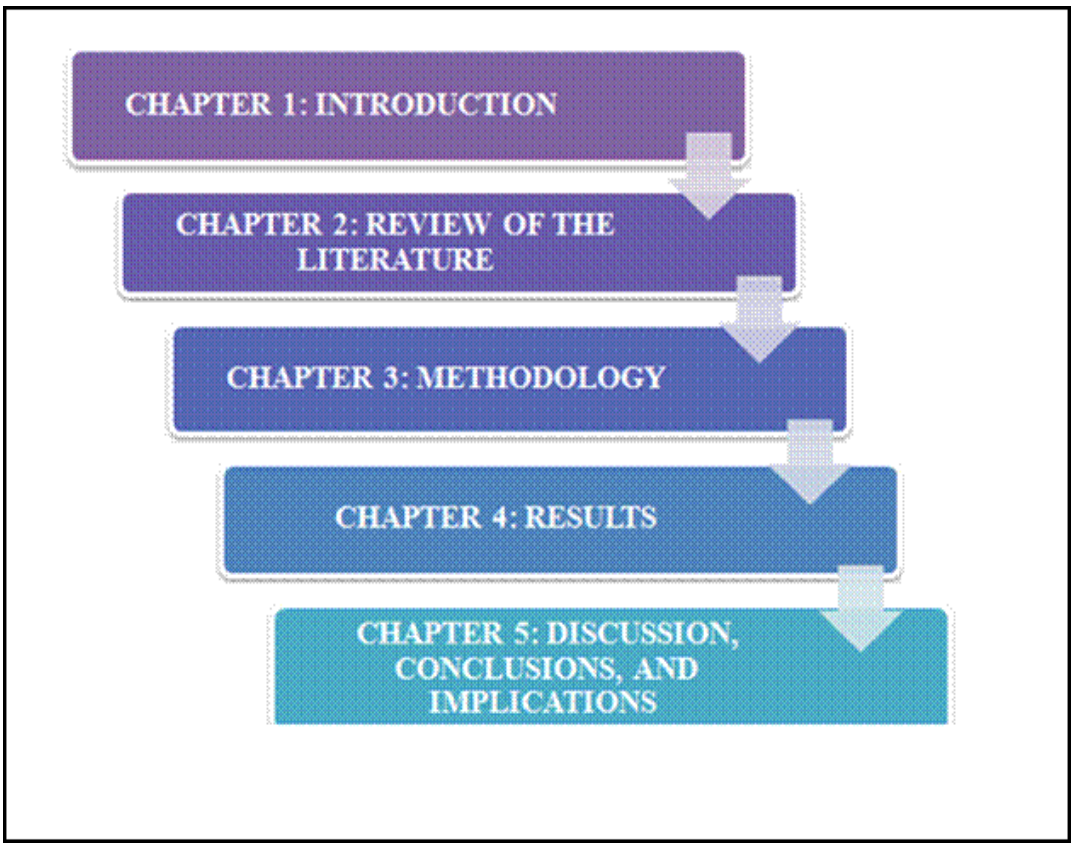

Figure 1.9.1: Thesis Structure

(Source: Self-developed)

1.9. Summary

The chapter introduction consists of several parts which summarise the enhancement of productivity and sales through effective management of kits in the automobile aftermarket

supply chain. Effective kit management in the automotive aftermarket supply chain enhances sales and productivity through improved satisfaction of customers, reducing costs and streamlining the process. Through optimising inventory, kitting and assembly management, the business can improve its overall efficiency, minimise waste and also reduce the cost of labour. The problem statement and background have data on the supply chain management of the automobile industry. This part analyses the aim, objective of the study and defines the terms of the independent variable and the dependent variable of the study and defines the term which allows for the engagement of the factor, which is further discussed in this study. In supply chain management, kitting is the deliberate combining and packaging of separate components to create a new, valuable product or kit. Businesses are increasingly using third-party logistics (3PL) companies to expedite their fulfilment procedures in the fast-paced world of supply chain management.

Chapter 2: REVIEW OF THE LITERATURE

2.1 Introduction

The chapter literature review gathers information regarding the research topic that helps to get ideas about the knowledge and perspective of several authors. In this chapter, it is going to mention what are the main reasons behind the significance of kit management within the supply chain. After discussing the usages and advantages of kit management within the supply chain, this chapter provides an overview of the design along with performance of the kit preparation. There are several factors that have a direct impact on the kit management and the major factors that are affecting the kit management are going to be mentioned in the following review of literature.

In this chapter, it is going to evaluate how practices that are associated with kit management are impacting both productivity and sales. Furthermore, in the following chapters, there will be a discussion on the usage and the application of the DMAI methodologies. In this chapter, it is also gouging to evaluate what relationship exists between supply chain productivity and within multiple kit management dynamics. Additionally, in this chapter, it is going to analyze what are the significant theories that are associated with the study topic and how these can be applied in order to gain positive outcomes. The gaps that exist in the literature will also be mentioned in this chapter.

2.2. Kit Management in Supply Chain

Businesses need efficient kitting and assembly procedures to satisfy consumer expectations, cut expenses, and keep a competitive edge. A streamlined and optimal operation is guaranteed when best practices are put into practice. The kitting and assembly industry is positioned for revolutionary changes as industries and technology continues to develop. Businesses must anticipate and adjust to these future changes to maintain their competitiveness and welcome innovations. In order to remain competitive in a market that is changing quickly, businesses need to adopt and use effective kitting and assembly procedures. Kitting and assembly procedures are essential for satisfying client demands, cutting expenses, and negotiating the intricacies of contemporary business. At first, kits were seen as a special feature of the industry that had a

significant influence on preparedness and humanitarian response efforts (Saïah *et al.* 2023). Nonetheless, kit management was a minor procedure within warehouse management operations, and kit utilisation was exclusive to a small number of firms.

The act of combining several goods or parts into a single unit or package is known as "kitting." Instead of being offered as separate pieces, this package is then utilised in the production process or sold as a whole kit. Kitting can take many different forms, such as putting together a set of products for a subscription box or integrating several parts needed to make a finished product (Vesco, 2023). Kitting's main goals are to expedite the order fulfillment procedure, lower packaging and shipping expenses, and eventually raise customer happiness. Kitting takes place before to assembly in the production process. Before an assembly or sub-assembly is constructed, all of the parts required for it are gathered and arranged. The act of physically assembling the components of a kit into a single SKU is known as assembly.

One inventory management strategy that can help businesses boost sales, cut expenses, and enhance customer happiness is kitting. Through kitting, businesses create a collection of related products that clients may purchase as a single piece. In addition to helping businesses sell slow-moving commodities and lowering warehouse picking and packaging expenses, this frequently raises average order value. The Smart Kit Module (TKit) is a software module used in automotive supply chains that operates on trucks for partial shipments. The Raspberry PI is used to illustrate this package. This kit is in charge of two primary duties. First to regulate the current component of the transportation dynamic at a certain moment. The Raspberry PI and the Bluetooth tags fastened to each component are connected to achieve this. Secondly, to use Oracle to update each part's status regularly (Alsadi *et al.* 2023). The GPS sensor in the TruCert smart kit allows it to retrieve the GPS coordinates for every component at a predetermined time.

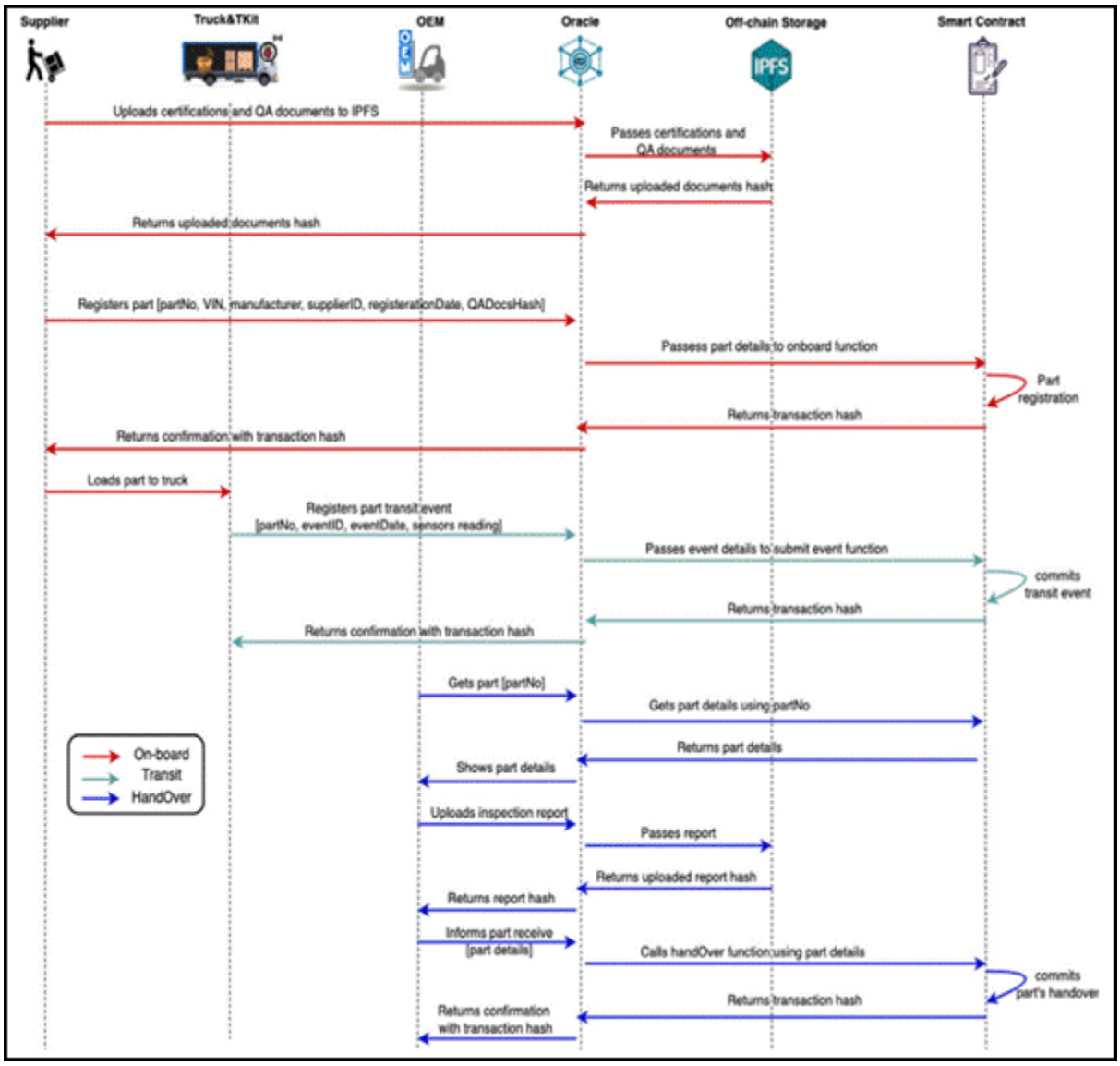

Figure 2.2.1: Sequence of interactions among suppliers, OEM, smart truck, oracle, IPFS and smart contracts

(Source: Alsadi *et al.* 2023)

However, two distinct pieces of software are created to enable the TKit to perform its functions. The first one is in charge of monitoring which components the Tkit is in charge of. This is accomplished by noting each part's part number and the MAC address of the Bluetooth device that is connected to it. After the parts are placed into trucks, these details are noted (Alsadi *et al.* 2023). Three primary functions are handled by the second piece of software, which was created

with Python. (1) establish a connection with the Bluetooth devices on the components, (2) retrieve sensing information from the truck's numerous sensors, and (3) generate a transaction containing the acquired information and send it to the smart contract through Oracles. Kitting can lower expenses and boost sales. It is an effective way to draw attention to products that work well together, which benefits both buyers and retailers by increasing the value of orders. Kitting can also be used by businesses to shift dead stock and slow-moving items.

Manufacturers can employ kitting to expedite and streamline product assembly while making better use of warehouse space. Kitting is the process of assembling a collection of components and raw materials needed to create a particular product in manufacturing. Through doing this, the production crew is guaranteed to have everything they require for the manufacturing process. Kitting can be used by manufacturers in nearly any sector, including electronics, packaged foods, and the automotive industry. For example, the “thermoelectric generation kit” (TEGK) has become a key energy-saving method in the automobile and “internal combustion engine” (ICE) industries (Abdelghany *et al.* 2023). The ability of TEGK to transform thermal energy into electrical output energy is promising. The producer keeps the ingredients for each taste in a kit at its warehouse. The equipped ingredients are automatically sent to the manufacturing plant for processing and shipment when the business receives a sizable order.

Businesses may maximise warehouse space, expedite inventory operations, and properly and promptly fulfill orders with the use of inventory management software. Businesses can organize things into kits, specify a kit price, and automatically update inventory for each individual item in the kit with the help of comprehensive inventory management tools. Every production process at the backend has a number of predictive maintenance units that offer significant product advancement, particularly for “Accessories Manufacturers” (AMs). It created a smart sensor kit that allowed for the instantaneous capture of machine data and guaranteed the safe storage of content on the central cloud for future use (Gopalakrishnan and Kumaran, 2022). Through automatically identifying reorder points, managing safety supplies, and tracking inventory in real time across many locations, top inventory management software also helps businesses reduce inventory expenses while maintaining customer satisfaction. Kitting can help businesses make more money and run more efficiently. In addition, kitting can increase consumer satisfaction by offering a handy assortment of comparable products at a competitive price.

For companies trying to simplify their processes and concentrate on their core skills, outsourcing kitting and assembly services can be a good choice. Businesses can have access to specialist knowledge and resources by collaborating with a reputable kitting and assembly service provider, which guarantees that their kits are put together effectively and expertly. A kitting and assembly service provider's experience, capabilities, quality control procedures, and price structure are all important considerations (RASIB *et al*. 2025). It is also critical to evaluate their capacity to manage the particular needs of your sector, such as handling particular packaging materials or following stringent guidelines. Since warehouse kitting entails overseeing the assembly, storage, and shipment of kits, it is an essential component of the entire kitting process. Efficient warehouse kitting procedures may increase productivity, lower expenses, and boost client satisfaction.

As previously stated, the ability to save shipping and packing expenses is one of the main advantages of kitting. Businesses can reduce the overall size and weight of their shipments and thus their shipping costs by grouping several products together. Additionally, by eliminating the need for separate packaging supplies and personnel, kitting can lower packing expenses. Businesses should think about collaborating with a reputable kitting and assembly service provider to optimize the cost reductions related to kitting. These suppliers might have access to cheaper rates and established relationships with shipping partners, which would save organisations even more money. Kitting can also lower shipping costs by putting effective inventory management techniques into place(Turi, 2024). Businesses can guarantee that they have the products or components needed to assemble kits on hand without requiring expedited shipment or rush purchases by efficiently managing inventory levels.

Additionally, kitting can significantly increase client happiness. Businesses can offer a more individualized shopping experience that meets the needs and tastes of their customers by grouping products together. Increased client loyalty and repeat business may result from this. Kitting can also aid in expediting the order fulfilment procedure, guaranteeing that clients receive their products precisely and on schedule(Walsh, 2024). Better client satisfaction and a favourable reputation for the company may result from this. Businesses can think about collaborating with a kitting and assembly service provider that provides premium materials and bespoke packaging alternatives in order to optimize the advantages of kitting for client

satisfaction. This can help guarantee that kits fulfil client expectations and arrive in superb shape. Businesses can also evaluate the provider's ability to manage industry-specific requirements, such handling specialty packaging materials or following stringent rules. Working with a supplier who is aware of the particular requirements of the company can help to guarantee a fruitful collaboration and the best possible outcomes.

2.3 Design and performance of kit preparation

When there are many different component variations, kitting which refers to supplying the assembly with components in presorted kits—is generally considered advantageous for assembly quality and efficiency. With around 14 million workers and more than 5% of all manufacturing workers worldwide, the automobile sector is a vital source of employment. It generates about 66 million cars annually, including vans, lorries, and buses, accounting for nearly EUR 2 trillion in output and 11.5% of world turnover (gross revenue) (Vieyra *et al.* 2022). On the other hand, Kit preparation is a labor-intensive procedure, and kit mistakes might cause issues during assembly. A variety of component variations are frequently used in mixed-model assembly and efficient material supply is crucial. Here, kitting is a commonly used materials supply approach that entails providing assembly with components in presorted kits, which is often regarded as advantageous when there is a wide range of components. When it comes to kitting, the process of preparing the kits is usually described as labor-intensive, and saving time is essential to minimising operating expenses.

Additionally, human mistakes during manual kit preparation might result in kit defects, which can interrupt and increase assembly costs. According to recent studies, robots can help pickers complete some of the tasks involved in kit preparation, saving time and improving kit quality by lowering the possibility of human error. One efficient way to schedule just-in-time (JIT) material supplies around assembly jobs is through material kitting (Tetik *et al.* 2021). Cobot-assisted kit preparation, or collaborative robots that share workspaces with pickers, has, however, gotten less attention up to this point, and industry uncertainty about the application of cobots in kit preparation is significant. Robotic kit setup and emphasised the three primary parts of the system: the end effector (gripper), the vision system (camera), and the manipulator (robot arm). They found difficulties with robotic kit preparation in their investigation, such as choosing the

appropriate gripper based on component properties and figuring out how to manage extra duties like emptying containers.

In order to allocate SKUs (Stock Keeping Units) in a hybrid robot-worker cell for kit preparation, robotic bin selection of components was modeled. The operator and the robot worked independently, completing various kit components. Although there was no worker-robot collaboration during the work cycle and the robot did not sort the components into the kits, instead placing them on a conveyor, the model took into account how the robot may manage empty containers and interior packaging as well. Governments are working with environmental organisations to promote eco-friendly and sustainable materials through legislation that addresses carbon emissions, recycling, and trash generation (Vieyra *et al.* 2022). Higher production rates may result from kitting's capacity to meet material availability through superior sourcing and logistics. Only the necessary, undamaged materials are given as kits at the appropriate moment when kits are prepared, rather than all materials being delivered in bulk because defective materials can be sorted out sooner (Tetik *et al.* 2021). Generally speaking, a kit of parts is a collection of pre-made parts or modules that may be put together in different ways to produce a product that can be customised.

A mixed-model assembly process using component kits is provided by the kit preparation procedure. The kits are made at a workplace designated for kit preparation that is distinct from the assembly area. Every kit has several parts that come together to form a single finished product. An order batching strategy is used to prepare the kits, thus, several kits are made for each work cycle. There are no specifications about the orientation and placement of the kit's components during assembly. In a kitting system, the operators select the items in a small warehouse and prepare the kits needed during the assembly process. The possibility of using cobots to assist with order batching and kit preparation, where a cobot would handle the sorting and a human would handle the picking (Fager *et al.* 2021). Cobot-supported kitting works better with lower quantities per selected item and offers less outcome variability.

For example, Design automation has been introduced at STM's design offices using ever-more-complex design and simulation tools. Specifically, compared to analog design, digital design provides far more sophisticated assistance for CAD (Computer Aided Design). The design

industry has seen a substantial transformation, which includes designers becoming less skilled. Since there are many steps in the intricate design process, the company's goal is unavoidably to reduce the number of steps and their duration as much as possible. Because of this, STM has created a “process design kit,” which is a collection of software tools that automate as much of the design as is practical (Gaddi and Drahokoupil, 2020). Establishing clear guidelines aligns with the intention to minimise change to cut expenses. STM addressed its needs to CAD supplier businesses like Cadence, Mentor, and Synopsys, which supply around 90% of the design tools, to accomplish this goal.

Manual kit preparation

An operator is in charge of selecting parts from storage and classifying them into kits when kit preparation is done by hand. Information about which parts to pick and which kits to sort them in is provided by a picking information system. Through receiving instructions and verifying actions, the picking information system gives the operator feedback that the components have been picked and sorted accurately. The kit containers are transported by an AGV, which moves between shelves based on the operator's inputs (Fager *et al.* 2021). Instructions are given to the operator regarding which SKU to select components from, how much to select, which kits to put components in, and how many components to put in each kit. Following the selection of an SKU's components, the operator confirms the SKU and provides information regarding the kit containers in which the components must be stored. The operator then groups the parts into kits, one at a time, and verifies a kit once every part has been arranged into it. Until every component has been arranged into kits, this process is repeated.

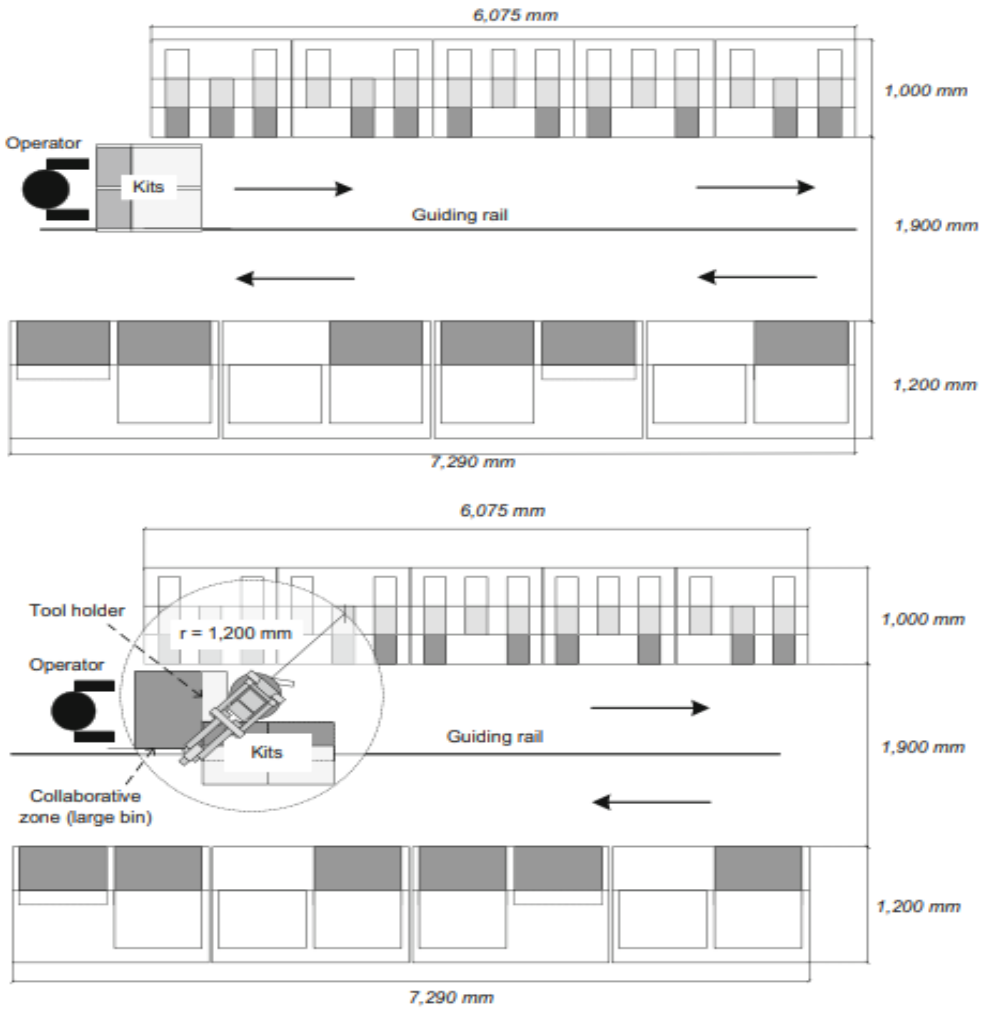

Figure 2.3.1: Overview of cobot-supported (bottom) and manual (top) kit preparation

(Source: Fager *et al.* 2021)

Cobot-supported kit preparation

An operator using a cobot to assist with kit preparation selects parts from the shelves in the same manner as when preparing a kit by hand. But today, after picking, the operator places the entire amount of an SKU in a container that is displayed on the AGV; this is known as the collaborative work sone. The operator can place the entire quantity of an SKU in any of the compartments that make up the collaborative work area. The parts in each compartment are then sorted into kits by a cobot that is placed on the AGV (Fager *et al.* 2021). The cobot is guided by a vision system to carry out its mission accurately, and a camera is positioned above the collaborative work sone to

continuously analyse the sone's contents without requiring the cobot to wait for the analysis to finish. The cobot has a variety of grippers at its disposal to grasp all component variations. It uses a tool holder at its base to adjust its gripper based on the properties of the component.

Performance evaluation of a kitting process

One method of providing supplies to an assembly line is kitting. Kitting gathers the components required for a certain final product into a designated container, known as a kit, before it arrives at an assembly unit, as opposed to distributing parts in containers of equal parts. Because no part inventories must be maintained at the assembly site, kitting reduces the amount of storage space needed there. Additionally, components are positioned correctly within the container to minimise assembling time. Reduced learning time for employees at the assembly stations and improved product quality are two other advantages. Kitting procedures still have to be monitored effectively and on time for the direct participation of employees who use the material batches at work sites (shao *et al.* 2021). Despite being a non-value-added activity, kitting can cut down on the amount of time spent handling goods overall. Tasks like picking and holding parts are indeed completed more quickly. Furthermore, because component kits are delivered to the assembly station together, the operator's total walking time is significantly decreased or even eliminated.

With a lot of moving components, intricate assembly, and stringent quality standards, the automotive industry is renowned for its sise and complexity. Efficient management of components and assemblies is essential for meeting customer requests, maintaining manufacturing schedules, and ensuring superior quality. Optimising these processes can be achieved through kitting and assembly (Turi, 2024). We will look at how the automobile sector gains a lot from the kitting and assembly process in this article, including increased productivity, lower expenses, and better overall performance. In the automotive sector, the kitting procedure helps to improve worker ergonomics and safety. Pre-packaged kits that include all required parts eliminate the need for workers to handle or look for individual parts during assembly. This lowers the possibility of mishaps involving heavy or large components, like slips or falls. Furthermore, well-organised kits enhance ergonomics by lowering strain and the requirement for repetitive actions, resulting in a more secure and comfortable working environment.

2.4 Factors Influencing Kit Management

Influential kit management dynamics play an important role in streamlining the aftermarket supply chain of the automobile sector, as they influence sales and productivity. Complexity of the aftermarket supply chains includes managing the vast amount of tools, accessories and parts needed for vehicles repair and maintenance. It demands a highly responsive and coordinated strategy for kit management. There are different interrelated factors that influence the dynamics of kit management in the automobile sector, including standardisation and packaging, technological integration, supplier coordination, inventory control, demand forecasting, workforce efficiency, cost considerations and customer expectations. One of the most significant factors is the variability of demand. A monitored element is said to be “complying” if all requirements or recommendations are satisfied and no action is needed to improve the element's condition (Kapitonov, 2022). If the checked element's state does not at least partially satisfy the standards established for this workplace, it is said to be “not compliant”.

Aftermarket automobile is characterised through fluctuating and unpredictable patterns of demand that are often influenced through consumer behaviour, vehicle aging and seasonality. A dynamic of accurate forecasting demand kits maintains when they include parts with different rates of usage and lifecycles, as it is important for the availability of components without any form of overstocking that can be tie up through warehouse spaces. However, certain vehicles that have been changed from gasoline to LPG require slight modifications to their electrical system connectivity, ignition settings, and engine parts. Others employ converter kits that are compatible with different engine types according to their characteristics, volume, and suction capacity (Kivevele *et al.* 2020). Inadequate demand for the forecast also led to dynamics like excess inventory and stockpots, as both of them negatively influence the satisfaction of the customer and sales. This allows the data-driven demand planning to be a crucial aspect of effective kit management.

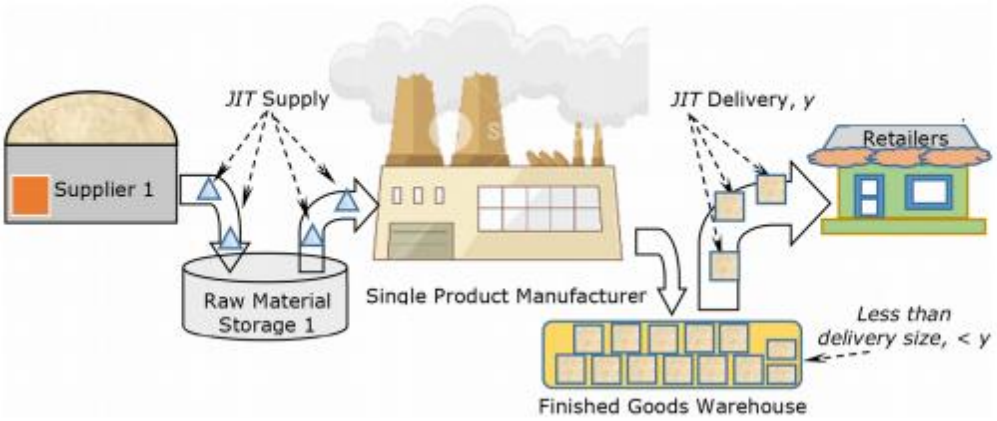

Figure 2.4.1: Just in Time (JIT)

(Source: Biswas and Sarker, 2020)

The just-in-time (JIT) model adopted to reduce the holding costs, however it need high levels of supply chain coordination and visibility. Inventory inaccuracies, delays in the replenishment and misaligned stock levels disrupt the entire assembly process of the kit, causing delays in the delivery service and potentially lost sales. Through coordinating material delivery with the production schedule, the Just-In-Time (JIT) principles lower inventory levels while increasing productivity and lowering storage expenses. Buffers and inventory systems are absent from JIT manufacturing systems (Biswas and Sarker, 2020). Automotive makes substantial use of JIT techniques in their production process. When needed, it`s essential parts—such as screens and processors—are delivered to construct the plant, avoiding inventory building and lowering holding costs. Although the JIT approach requires the supplier to schedule his production following the buyer's demands to keep sero inventory, the supplier ends up carrying enormous stocks to deliver a restricted number of shipments. They present an iterative method for minimising the piecewise convex function that represents the generalised total inventory cost model.

Another affecting factor is the relationship management of the suppliers, however, kits also compel the companies to source from different vendors, and any form of inconsistency from any supplier can also halt the whole assembly of complete kits. For mitigate these issues, different aftermarket businesses invest in the automated replenishment algorithms and advanced inventory

management systems, which use real-time data to optimise the levels of stock. Upstream supplier partnerships, in addition to downstream relationships, offer crucial connections that enable the use of other supply chain procedures and are acknowledged as significant precursors to several performance facets (Hasen *et al.* 2021). Over the past few years, the nature of supplier relationships has evolved to the point that buyers frequently look to form strategic alliances with suppliers rather than maintaining a distance from them.

Managing a responsive, transparent and strong relationship with the suppliers is important, as it helps in involving collaborative planning, strategic sourcing, regular audits and vendor rating systems. Due to greater reliance, the purchasing firm's performance may be impacted by the competency and performance of its suppliers. Consequently, issues like inadequate quality and missing shipping dates could arise. However, for some businesses, the supplier's performance or competence can lead to improved quality and the incorporation of cutting-edge technology by including the supplier early on. Suppliers can participate earlier in the product design process to help make it more cost-effective, provide alternative ideas, select the best technology, and assist with design evaluation (Saragih *et al.* 2021). Technologies including “Enterprise Resource Planning” (ERP), “Internet of Things” (IoT) and “Radio Frequency Identification” (RFID) help in enabling seamless tracking, control and monitoring, kit components of the supply chain. Digital platforms offer a real-time insight into the production scheduling, inventory status and shipment tracking, thereby enhancing decision-making dynamics, reducing errors and improving coordination.

However, managing a responsive, transparent and strong relationship with the supplier is important, it involves collaborative planning, regular audits, strategic sourcing and vendor rating dynamics. Whereas a long-term partnership and contract with the suppliers helps in offering flexibility in the cases, reduces the lead times and ensures a proper and consistent quality. Additionally, automation in assembly and warehousing and as barcode scanning, robotic picking and automated sorting, helps speed up the process of kitting, ensures consistency and accuracy and reduces human error in kit configuration, which directly helps boost productivity. In the current global economic environment, the use of digital technology in manufacturing is becoming more and more significant. Over the past ten years, manufacturing companies have been investigating the use of new digital technologies in their production and supply chain

management (SCM), such as the IoT, big data analytics (BDA), and artificial intelligence (AI) (Saragih *et al.* 2021). The application of BDA and AI to the real-time data gathered from IoT devices and data from other supply chain operations has the potential to produce substantial economic value.

Through a network of interconnected organisations, supply chain management (SCM) encompasses the management, control, and enhancement of material and information flows between initial suppliers and end users. According to Yang *et al.* (2021), these technologies are thought to be a promising way to enhance supply chain operations like planning, scheduling, logistics, and procurement. IoT has been widely used in transportation and manufacturing facilities to track and trace logistics and warehouse operations, as well as to monitor the production process. It could assist businesses in better managing supplier relationships, identifying inventory issues, forecasting customer wants, and allocating resources optimally. In addition to altering processes and products, these new digital technologies are also transforming value chains, updating business models, and having an impact on industrial structures.

The packaging and standardisation of the kits also impact the efficiency of kit management. One new consumer demand in the packaging sector is customisation. Businesses must deal with greater diversity, less potential for cost reduction, and limited reusability of current solutions. As a result, businesses need to resolve the conflict between the requirements to lower costs and expand product diversity. One viable strategy for accomplishing this is the modularisation of assembly groups. Thus, it is necessary to build standardisation principles holistically to fit the particular purpose (Stechert and Hübner, 2024). If this is taken into account, it is anticipated that the modularised assembly groups' thorough documentation will lower the quantity of design flaws that result in extra time and expense during assembly. The goal is to identify any mistakes made during the initial assembly, fix them, and then utilise the assembly group for the subsequent project. Additionally, documentation makes it possible to reuse pre-existing solutions with minimal searching.

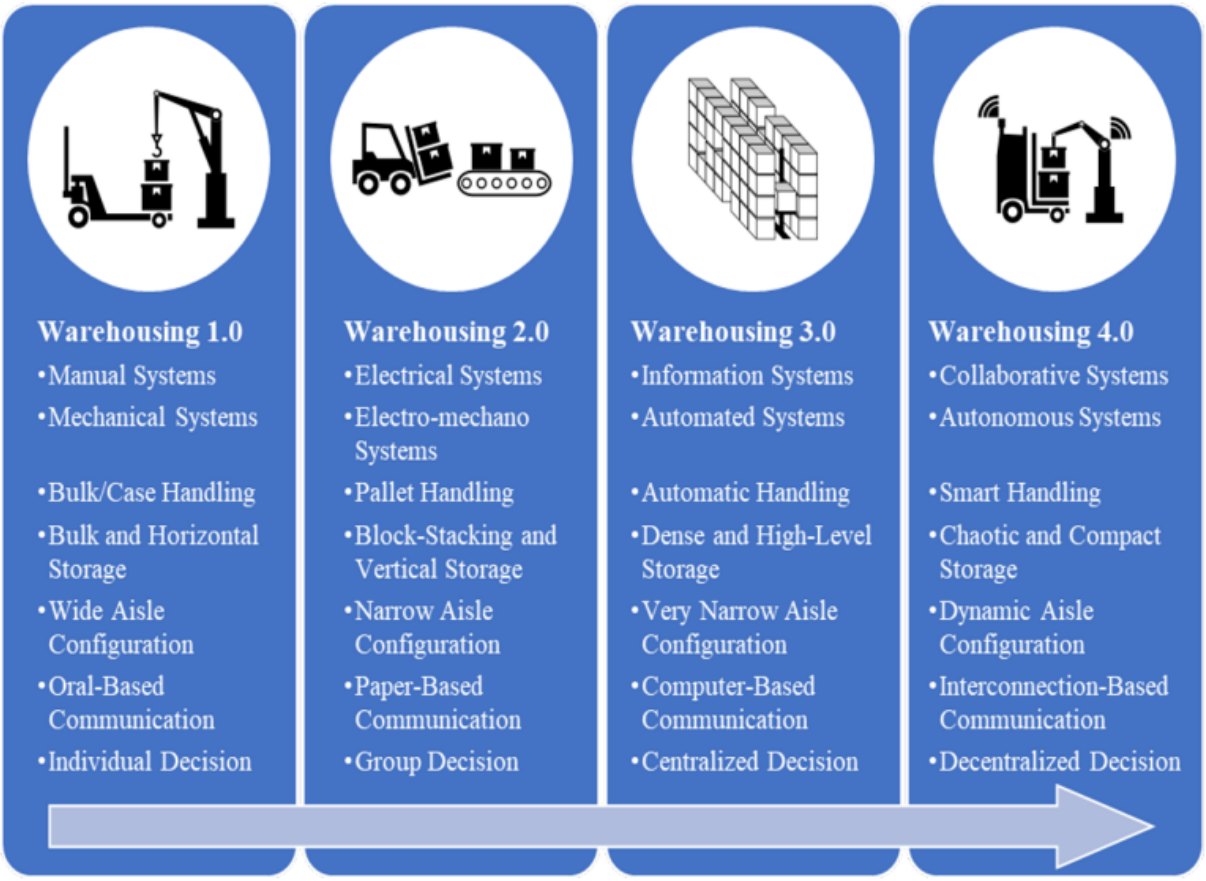

Figure 2.4.2: Evolution of warehouse

(Source: Tutam, 2022)

From the perspective of customer-centric, anticipating and understanding the requirements of the customer is important for successfully kit managing the dynamics. Expectations of customers on fast delivery, quality packaging and accurate orders have helped foster the need for precision and agility in handling kits. Any form of mismatch between the expected and delivered kits leads to reputational harm, returns and dissatisfaction. New technologies can fulfill the increased demands of supply chain integration, which include flexibility in real-time data sharing, response time, and rapid management (Tutam, 2022). Supply, production, and distribution in the supply chain may be the areas where Industry 4.0 concepts and technology have the biggest effects. However, the organisation's manufacturing processes may undergo structural modifications.

The creation and incorporation of cutting-edge information and communication technologies into supply chain management is a component of Industry 4.0. Motivating a smart chain of products and processes along the value chain is the primary goal. Advances in analytics and machine learning (ML) have made it possible for businesses to examine their operational data nearly instantaneously and utilise the findings to close gaps and minimise revenue losses, which in some industries can reach 10% (Tutam, 2022). The fourth industrial revolution can provide everything from driverless transportation to smart ports, smart warehouses, and smart containers.

2.5 Impact of Kit Management on Productivity and Sales

The process of kitting is subject to the phenomenon of assembling different products and components towards a pre-packaged set. This pre-packaged product set consists of different offerings to improve the overall productivity of the supply chain process. Kitting derives different benefits in the supply chain in reducing labour cost, fulfilling orders faster, enhancing accuracy and performing in streamlining the inventory management process (Li *et al.* 2025). It also emphasized with grouping different items, errors have been minimized through kitting, reducing shipping and packaging costs, and finally improving overall work efficiency. However, this particular approach helps the automobile industry to boost its total supply chain productivity and increase the number of sales as compared with other industries present in the marketplace. There are different advantages that the automobile industry has been experiencing with the help of adopting the kitting process, and they are

1. ***Cost saving***

Kitting is the process that consists of different essential products that are required as a combo to fulfil a task, and it helps customers to easily purchase without thinking much, hence, it improves the number of sales of the organization. However, with the implementation of the kitting process, organizations have achieved different benefits, and cost savings is one of them (Şenaras *et al.* 2025). The cost saving of the supply chain includes lower cost, lower cost of packaging and reduced overall shipping costs. The pre-assembled kits minimize the requirement of packing and kicking, helping them to save both time and labour cost. Kitting combines multiple items to form a single kit, hence significantly reducing the action in pick-up and also pack-up for each order. However, it does not require much labour to complete the task to complete in time. Additionally,

with the implementation of kitting, errors have been minimized with the aspects of pre-packaging approaches of items, and it mitigates the chances of considering the wrong item and also forgetting to take the necessary part. Thus, the respective action is emphasized by minimizing error while supplying products and increasing overall works accuracy effectively. It also found that with the implementation, organizations reduce time spent on picking products individually and allow workers to focus more on their respective tasks to boost productivity.

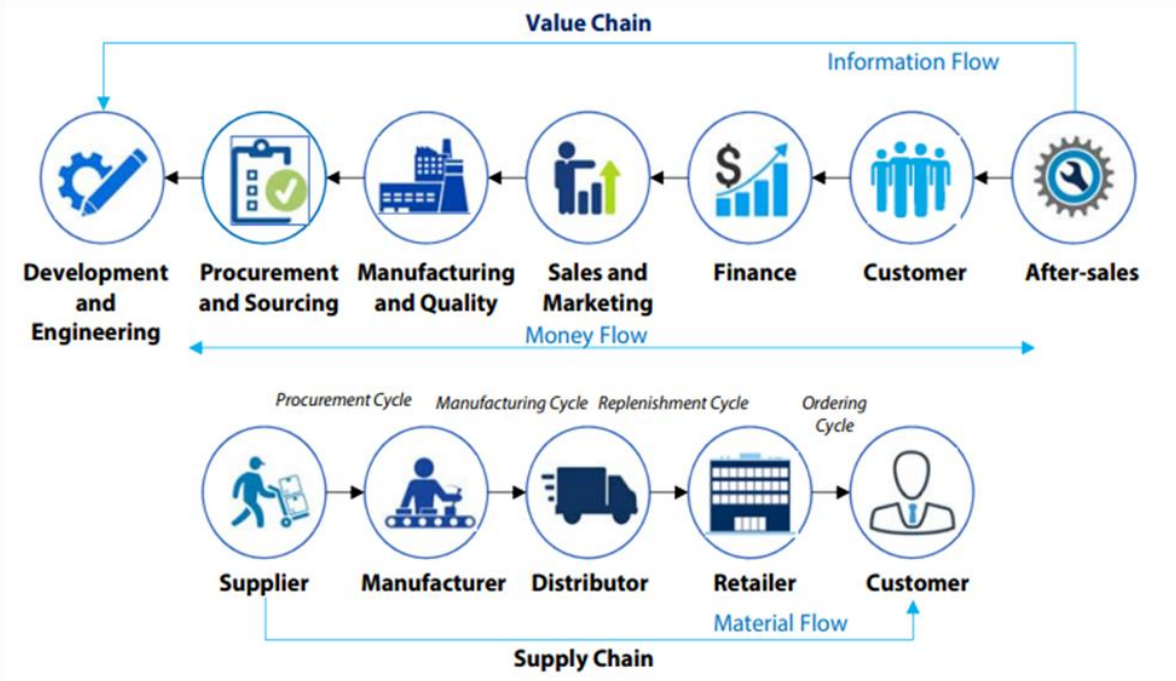

Figure 2.5.1: Automotive Aftermarket

(Source: Satish and Mahendra, 2025)

2. Speed and efficiency

Kitting streamlines the fulfilment of orders and faster and enables delivery and shipping. Hence, with the help of improving the overall working system automobile industry achieves productivity and growth in generating revenue. Kitting has been consistently of effective importance as it is the subject to be the core benefit and idea used in the automobile business process to make it a more profitable strategy (Banala, 2025). However, kitting is known as one of the most important strategic tools used by businesses to improve work productivity comprehensively. It improves

overall product value and also encourages positive customer loyalty. Kitting involves several aspects of providing real-time updates, cost reduction in the supply chain process, and simplifying tracking and labelling of products. It also increases the order amount average and enables categories for cross-selling to boost customer loyalty and customer satisfaction. The organization's efficiency has increased when different SKUs have merged towards one; total number of inventory has decreased. For instance, kitting takes part in increasing business efficiency with the help of its effective territory management and making it simpler for customers to make decisions while purchasing different products.

3. Quality and accuracy

The implementation of kitting within the automobile aftermarket supply chain process improves the overall accuracy of supplying products with minimum errors (Columbine and Seder, 2025). As the pre-assembled products minimize human error risks in the time of packaging and picking the right products business become successful. The quality control has also improved as kitting allows for much easier checks in quality control at different stages of the respective process of supply chain management process. This phenomenon plays a role in increasing customer satisfaction more accurately to achieve greater fulfilment, leading towards customer satisfaction. The process of kitting consists of several stages in determining adequate products kept in kitting, developing the workflow of kitting, assigning SKUs, assembling kits and shipping the kits. SKUs have emphasized providing a new bundle of products with a unique number within the respective database. Hence, despite being independently of packaging derives from a single item for selling.

Figure 2.5.2: Automotive Aftermarket

(Source: Chen *et al.* 2025)

4. Reduces error

The implementation of kitting strategy in the automobile aftermarket business in supply chain aspects differs with different benefits, and one of the most effective benefits is that it significantly takes part in minimizing human error (Rad *et al.* 2025). The minimisation of error makes the overall supply chain process more accurate and error-free. This happens due to the fact of having less chance of getting each product individually to pack and mistakenly picking the wrong product instead of the required product. This is also an advantage for the e-commerce platform specifically due to the fact of giving more access to retailers to have extra SKUs. Manufacturers are able to precisely limit errors and optimise inventory by combining parts into many kits. Kitting lowers errors that have a detrimental effect on customer retention since there is a significant likelihood of error discovery when packaging things separately and throughout the supply chain process.

5. Packaging cost reduces

The packaging cost from suppliers has reduced with the help of kitting. All products have packages with a constant uniform uniform-sized container in an individual manner. Packaging cost reductions with the help of either combining products in a big container or shipping into their own bigger size container (Şenaras *et al.* 2025). It contains more packaging material compared with deriving these into a large size of kit and is significantly integrated into its respective SKUs. Due to the implementation of kitting aspects, it reduces packaging dimension, consistent with the reduction of packaging filler, tape and different materials. This has also been identified that shipping a fitted package is considered less risky instead of shipping a different standard package, pick and packaging. Kitting also reduces storage costs with the help of combining entire products into kits. This becomes possible of reducing the cost of storage required in the warehouse and the distribution system.

Different types of issues have also been identified in kitting within the automobile aftermarket supply chain process, and they are

1. ***Resources allocation***

Kitting while incorporating in the supply chain process faces several challenges in different areas within managing its quality control, inventory management, space requirements and costs for setup initially (Şenaras *et al.* 2025). However, among all the challenges resource allocation process with the recruitment of dedicated resources, straining potential labour considered crucial approach. It also requires time for operating inventory and picking order management aspects. Thus, it is managed with the help of deriving a careful plan to balance the overall workload comprehensively.

2. ***Initial costs for setup***

The implementation of kitting within the supply chain involves the investment in different equipment, such as packing stations and barcode scanners. The cost is also emphasised by providing staff with adequate training to make the overall work more efficient and reduce errors. Moreover, businesses that run on a tight budget tend to implement kitting initially to improve business productivity in the competitive market.

3. ***Space requirements***

The aspects of the kitting session required a particular space that addresses these creatures' issues in creating optimum facilities (Jawabreh *et al.* 2025). The efficient layouts of warehouse processes are subjected to be crucial for avoiding disruption and also other operations. However, the requirements of space create significant challenges for businesses to make the kitting process effective.

4. ***Inventory management***

Managing the inventory aspects is also another important issue for both the approaches of individual components and pre-packaging kits. However, a system of inventory management and a robust warehouse is required or essential to maintain positive accuracy.

5. ***Quality control***

Quality control is another issue that ensures an accurate and consistent kit assembly, and it is considered a challenging task to achieve with minimal error (Díaz *et al*. 2025). Thus, if there is any mistake, this can lead to customer dissatisfaction, and rigorous checks for quality control become essential. It is common to encounter issues in assembling kits consistently and properly, to boost customer satisfaction for the business in the after-market supply chain process.

6. ***Demand forecasting***

Forecasting demand of different kitting items is the sent step of the supply chain in a new session can become challenging and lead towards issues related to out-of-stock or overstocking (Ben Abid *et al.* 2025). Demand is significantly increased on customer need according to seasonal aspects, hence, it creates difficulty for the business to understand the accurate demand of kits in the market, and it also causes customer dissatisfaction. The automobile industry, with its aftermarket products, faces difficulties in escalating costs, as kitting includes additional costs for packaging, labour costs and storage approaches. This needs to be managed more carefully with the help of the entire cost optimisation and analysis. The other issues have also arisen in the area of overproduction of kits. If the kit becomes outdated and the demand for that specific kit decreases refers towards the risk associated with obsolescence. The issues related to scalability are associated with rapid business growth, and it may perform for a lack of scalability in the existing process of kitting leads to a reduction of flexibility and bottlenecks.

7. Labour shortage

Labour shortage is expected to be one of the common issues in the supply chain process, and it can also exacerbate the challenges of kitting (Rainer *et al.* 2025). Different types of strategies help businesses to mitigate these challenges and improve business productivity. The effective strategies are being implemented in the automation sector with the use of barcode and robotic scanners for streamlining the entire kitting process.***WMS software*** implementation within a system management of the warehouse helps improve pick path optimization and the inventory tracking system. Providing training to the team that manages kitting ensures a consistent packaging and provides adequate brakes for preventing bottlenecks. The implementation of rigorous checks for quality control improves overall work productivity and accuracy. The development of rigorous forecasting for demand models is an important fact that is derived through the usage of market insights and historical data to predict demand for the future.

2.6 Relationship between supply chain productivity and kit management dynamics

Supply chain management is subject to be a significant aspect of the network that includes individuals, resources, organizations, technology and activities in the development of products for sales (Waseem and Yusoff, 2025). The supply chain consists of each action from sourcing different raw materials towards the end of delivery, including different stages such as manufacturing, storing and distributing the product to the customer end and providing positive customer services. Different steps have been configured with sourcing the raw material for the automobile industry, refining raw materials towards basic parts, combining these parts into a product, sales, delivery of the product and customer support. The supply chain process is an oversight for each information, material and finance when they move from the supplier end to the manufacturer and further wholesaler.

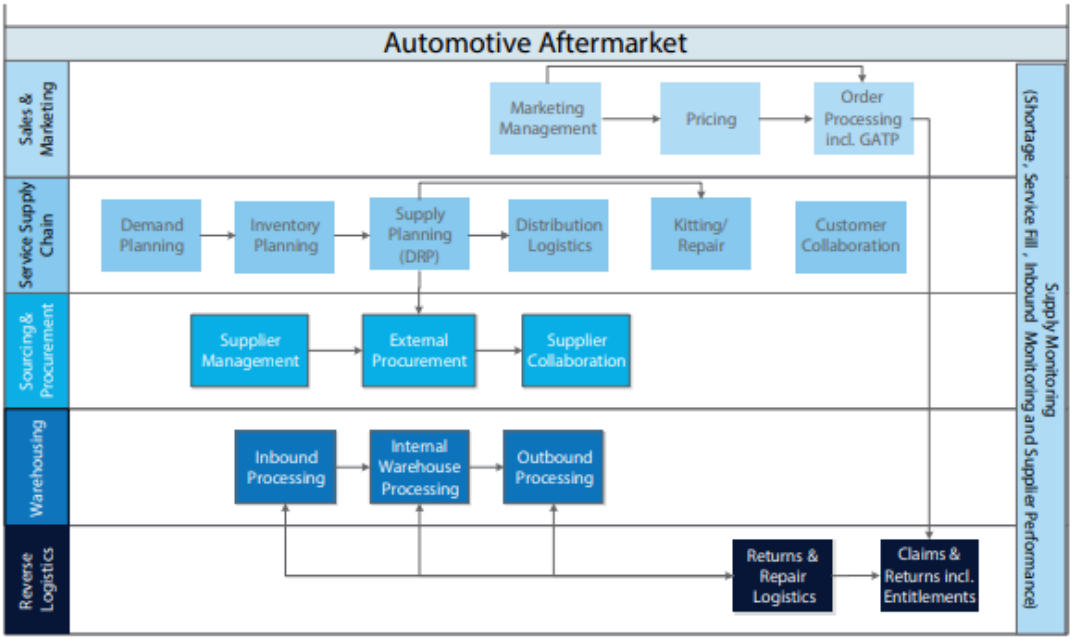

Figure 2.6.1: Automotive Aftermarket

(Source: Satish and Mahendra, 2025)

However, these three steps are considered as the main flow of product, information flow and lastly finance flow. These aspects are derived with the help of incorporating three parts, and they are strategies, operations, and planning. Supply chains have processes with best practices to adopt their spend growth and achieve scale in the global marketplace. Fulfilment and kitting enhance overall business effectiveness and efficiency regarding the approaches of inventory management (Rad *et al.* 2025). It includes inventory management, distribution and order processing within the supply chain process. Kitting significantly refers towards the remarkable process of packaging, grouping, and assembling different individual items towards ready-to-ship kits. However, these kits often seek to compromise the required components to develop final product and to facilitate a particular important task.

The typical kitting endowments with the services of bundling several products towards making unified aspects of the SKU (stock keeping unit). The respective practices help in reducing shipping and handling costs and also help in minimizing relevant picking errors (Bardan, 2025). Fulfilment is considered a complete process for receiving a particular order, further processing it,

and also picking the required product from inventory, shipping, packing and delivering the respective order towards the customer. This encompasses each aspect from inventory and warehousing management to shipping logistics and providing positive customer service. It also ensures the phenomenon of order processing while maintaining an accurate and efficient approach. The incorporation of kitting and also fulfilment is considered a synergistic aspect for managing orders and products in a streamlined manner. Through coupling the respective processes, the automobile aftermarket business enables for creation more customer-centric and efficient supply chain.

The productivity of the supply chain and management, and kit management are considered as intertwined (Teece, 2025). An efficient management of kit involves managing and organizing the components of a particular service and product, impact directly in the productivity of the supply chain. Appropriate kit management helps minimize waste, lead time has also been reduced and increases entire operational efficiency. These approaches bring operational efficiency and lastly achieve a higher productivity while deriving supply chain processes for the business within the automobile industry to sell its aftermarket products. However, kit management has a positive impact on the productivity of the supply chain in the areas of ***reducing inventory and waste costs*****.** Poor management of the kit leads towards the aspects of overstraining of different components and creates a shortage of other products. It results in a huge cost of inventory management and leads to obsolescence due to the wastage potential. Thus, appropriate kit management enables the right component to be available based on the right time, minimizes waste and also reduces cost related to holding inventory.

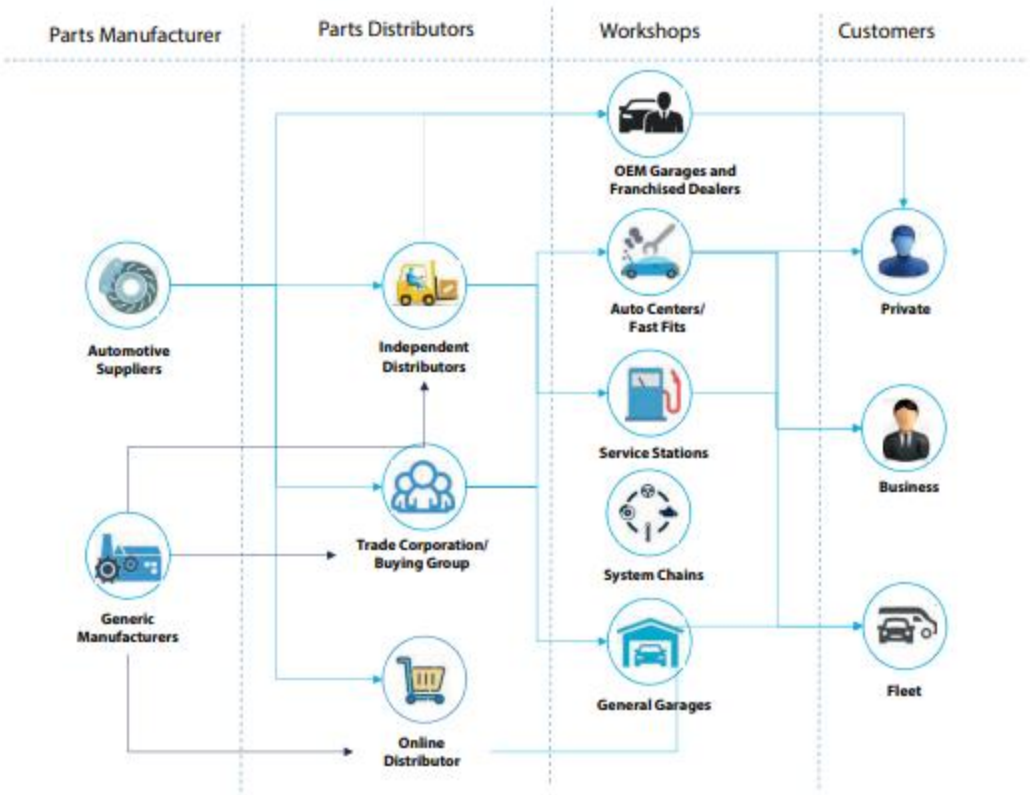

Figure 2.6.2: Automotive Aftermarket

(Source: Satish and Mahendra, 2025)

An effective kit management process with a faster production and assembly process. The production becomes streamlined, and this leads towards a shorter time for leading and faster delivery to the respective customers (Ardolino *et al.* 2025). Supply chain management with the help of kitting products improves work efficiency and also reduces labour costs. However, well-managed kits consist of an efficient flow of work and reduce requirements for labour. As the components are available easily and are properly accessible, the production streamlines effectively and leading towards shorter times to lead times and, at the same time, faster delivery to different customers. Moreover, the increasing efficiency of the business of automobile aftermarket business enhances the overall performance of their supply chain aspect within the marketplace. Thus, customer can easily get their product without facing difficulties related to out of dates of out-of-date products and out of storage and this which leads to positive customer satisfaction.

Customer satisfaction is one of the fundamental aspects on which a business depends, and the business must look after customer satisfaction (Rehman *et al.* 2025). Kitting creates a positive approach towards automobile aftermarket products by consisting of different offers and all essentials in one place. There is a positive relationship among supply chain aspects and kitting management process I terms of maintaining reliability and quality during business development. Hence, consistent and accurate management of the kit ensures that entire components are available or present in the definite or correct quantity. This reduces the risk associated with errors and also detects defects during the time of production process. It leads to a positive approach towards maintaining more quality of products and attaining more reliability with the supply chains.

Improvement of better tractability and visibility is also another approach that is actively pursued by the business through a positive relationship between kit management and supply chain (Zimmermann, et *al.* 2025). The management system of Kit leverages visibility of real-time into the levels of inventory and usage of components. The respective visibility allows positive demand forecasting, inventory management proactively and increases tractability across the entire supply chain process.

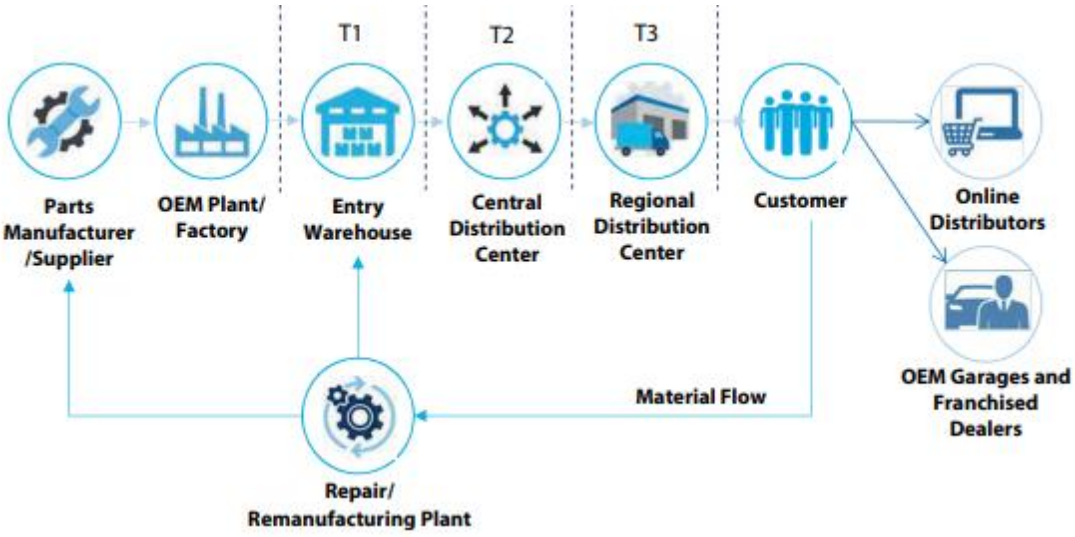

Figure 2.6.3: Automotive Aftermarket

(Source: Satish and Mahendra, 2025)

Kitting is managed by deriving multiple components and combining them towards greater kit efficiency. There are different steps included while kitting, and they are accessed in kitting inventory, preparing assembly areas, gathering individual components, assembling kits, quality control and packaging of kits (Zhou *et al.* 2025). The process also includes updating kit inventory, integrating with the fulfilment process, and lastly deriving monitoring and optimization. The very first step is to access the kitting inventory and, before assembly, processing with a close evaluation is the need for kitting and if there are any product lacking an additional inventory needs to be ordered on time. Organizing an appropriate space to derive the kitting process, consisting with en tire necessary tables, tools and other equipment, seeks effective assembly.

The next step is gathering individual components in terms of picking the required product from the shelves of the warehouse, utilizing the kitting inventory process for tracking or identifying accurate product collection for the development of kitting in the automobile industry. However, it reflects a significant relationship between supply chain and kitting that, if the kitting is been done accurately, the overall supply chain automatically becomes efficient and effective (Benares *et al.* 2025). The efficient management of kit is subject to being a key driver for effective supply chain productivity. Hence, if the kit management is not done well and accurately, the entire supply chain system fails drastically, and the business faces losses. Through the optimization of organisational components, waste reduction and also led time improvement tale a huge part in improving the performance of the supply chain for the business, and this increases business growth and achieves success.

However, this is the fact that kit management leverages with the specification of improving supply chain performance of the business and making the customer satisfied by getting their required products on time in the marketplace. In the case of the automotive business, the kitting process is known as an essential approach to improve business effectiveness in the supply chain process (RASIB *et al.* 2025). These aspects help the business in “original equipment manufacturing (OEMs).” Furthermore, with the positive management system of kitting in aftermarket automobile products, the industry has become able to achieve success by comprehensively managing the supply chain process. The improvement of features related to flexibility allows the solution of manufacturing kitting to become tailored based on the specific

requirement, eliminating difficulties and guesswork that occur when considering a generic solution to achieve success in the automobile industry.

2.7 Explore the Application of DMAIC Methodologies

DMAIC is referred to as one of the significant methods that are crucial in systematically optimizing, enhancing, and also accurately securing processes and any designs that are associated with the business. Furthermore, regarding this methodology, the author has also mentioned that The DMAIC improvement phase is one essential key component that is related to the Six Sigma tool. In addition to this, it has also been identified in the study that DMAIC has almost the same function as Plan-Do-Check-Action and is also related to the seven-step method as proposed by Juran and Gryna that are effectively solver tools of the problem (Jou *et al.* 2022). The main aim of DMAIC is to effectively adopt to enhance the process of production, appropriately devoting to the diminishment of the particular number of several non-compliant products and also reducing the overall cost of production.

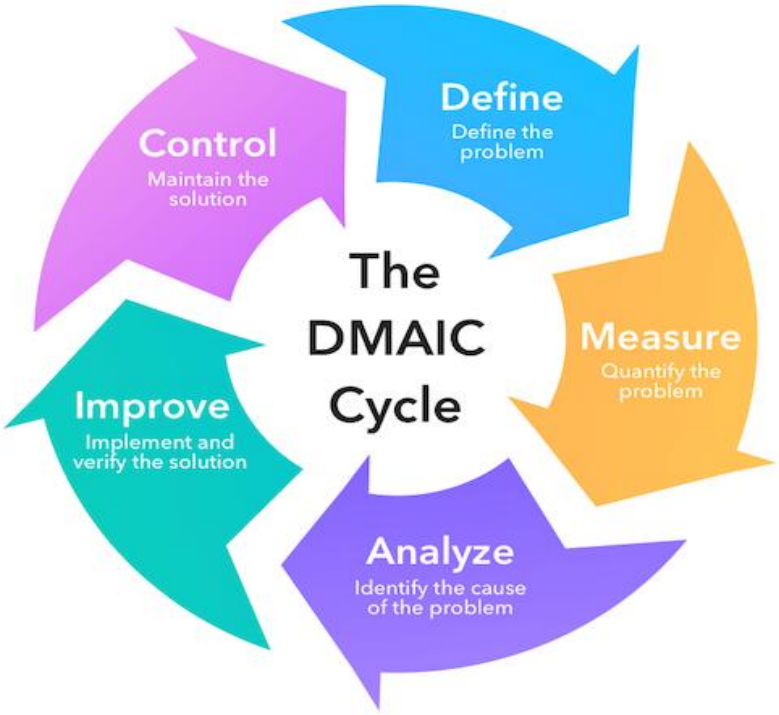

Figure 2.6.1: The DMAIC Cycle

(Source: Sixsigma-institute.org, 2025)

The DMAIC methodology has the ability to accurately enhance productivity along with the sales even within the automobile aftermarket supply chain. It is possible through effectively streamlining multiple processes that are ultimately associated with the kit management. Through accurately focusing on the few specific aspects that include Define, Measure, Analyze, Improve, and Control phases, DMAIC is significant and helps in effectively identifying any inefficiency. In addition to that it also helps in accurately measuring recent performance, pinpointing any root causes, and assisting in implementing solutions (Mittal *et al.* 2023). Along with these advantages, this is also essential in appropriately establishing controls to sustain any improvements. All these activities further assist in leading to decreased waste, faster processing times and it also directly leads to enhanced quality, and directly increased sales. However, by applying this methodology that is to the kit management, organizations can able in optimizing their supply chain

Another study has mentioned that DMAI is considered as the significant problem solving framework or also a significant methodology that has been employed within LSS. This is mainly used for improvement of the process, recognizing the main reasons, evaluating and analyzing the data and also implementing numerous solutions. These are done by this framework in order to enhance several processes that already exist. Along with these advantages, the DMAIC methodology has the ability to accurately enhance the operational efficiency and also help in enhancing BI in a significant manner (Trubetskaya *et al.* 2024). Existing issues and problems are accurately enhanced with the assistance of this method as it helps to recognize the main reasons and causes behind the issues. It further helps to implement the required solutions that are needed to solve the issues and help in improving the several processes that assist in decreasing the rejection rate.

There are many studies conducted on the application of DMAIC, among them one has mentioned that this approach has been very suitable in appropriately decreasing several forms of waste that are mainly involving a high inventory associated with the work in process. This is further related to the company and also with almost a complex flow of work at organizations. In this study, it has been recognized that DMAIC has been mainly inspired by Deming practices as we; as the

PDCA “Plan, Do, Check and Act” cycle (Rifqi *et al.* 2021). It has also been recognized in the study that DMAIC can also be operated in a systematic manner even without the reference to the six sigma method or approach. The DMAIC cycle can also be exploited in order to accurately enhance the supply chain and also within another reference to effectively analyze the main reasons of the failure of the circuit breakers within any particular distribution system.

There are several advantages of DMAIC and its application to help in getting effective solutions in dealing with any issues. It has been identified within the study that this framework has been the key source that has accurately facilitated the numerous aspects and provides advantages. These mainly include data-driven decision making, processing the required optimization, and also facilitating long-term sustainability. All these are key areas that are further effectively ensuring a well-structured approach that is mainly to the implementation of the Lean 4.0 (Gomaa, 2025). The phases that are ultimately associated with this framework are ultimately asserting in applying the required steps to solve the problems in a significant manner.

There is one other study that mentioned that DMAIC is a well structured process of problem solving that has been used within Six Sigma Projects. The DMAIC method that is mainly in Six Sigma has been indicated as a systematic approach to effectively solving many existing problems. Several tools and different techniques that have been encompassed within this method are the key sources that play an essential role in effectively facilitating the organization to enhance their process by appropriately using an interdisciplinary approach (Clancy *et al.* 2023). At the same time, this is essential in enhancing the capability modeling aspect that is further presenting the requirements to consider any needs for the business, any information technology and operations in order to enhance improvements and implement necessary technologies.

2.8 Theoretical Underpinning

Figure: Lean Principles

(Source: Self Created)

Lean Manufacturing

Lean manufacturing is particularly based on a specific principle associated with manufacturing that has a direct impact on the system of production within the firms. Lean manufacturing theory which is mainly within the context of the study on "kit management in the automotive aftermarket supply chain" mainly focuses on accurately minimizing waste. At the same time it also helps in effectively maximizing value to systematically improve efficiency and productivity (Twi-global.com, 2025). Furthermore, it also assists in optimizing processes, reducing costs, and directly assisting in appropriately enhancing customer satisfaction through streamlining multiple operations. These are also possible by effectively implementing a just-in-time approach that is to the inventory.

This approach is significant in highlighting the importance of eliminating any inefficiency and is also helpful in decreasing costs. These are the key sources that ultimately assist in providing savings for a particular product or any service with the help of the supply chain to the customer. These are the areas that assist in enhancing productivity and are also helpful in increasing sales as it is allowing the firm to establish a strong and positive relationship with the customers (Ahab *et al.* 2024). This theory is based on the process of production that is mainly based on the ideology that is associated with maximizing the overall productivity while also reducing any waste.

The automotive manufacturing industry has been one of the most active industries in today's scenario that are prioritizing continuous improvement strategies that are for reduction of cost and also for enhancing the product quality in order to compete within the sector. LM has been further enforced within both personal as well as public industries and it mainly encompasses several techniques that are crucial in attaining any leannes in the organizations (Singh and Singh, 2020). Implementing this approach within the organization, the firm will be able in conveying the overall advantages and is also serving multiple activities that are related to the value saving. Hence, LM can be the crucial part in effectively boosting the overall performance of their companies and can increase its productivity as well as sales also.

Resource-based view (RBV)

The Resource-Based View (RBV) framework is very effective that can help in effectively enhancing productivity and also sales within the automotive aftermarket supply chain through giving a particular focus on different internal resources and capabilities of the firm. Through identifying and also by accurately managing all these resources, specifically those which are strongly related to kit management, companies are able to create a sustainable competitive edge. These are further leading to enhanced overall efficiency and also ultimately increased sales. The RBV theory is very effective and has effectively highlighted the significance of managing multiple internal resources and capabilities in a significant way. However, it is the responsibility of the managers to systematically allocate resources (Ozdemir *et al.* 2023). This is essential as it can help in building and strategically enhancing unique capabilities even in the supply chain while accurately aligning them with the overall goal or objective of the organization.

RBV can be applied within kit management in several ways. Resource RBV is essential that it effectively emphasizes identifying and effectively developing VRIN “valuable, rare, inimitable, and non-substitutable resources”. In the context of kits, this could involve specialized manufacturing processes. It also helps in Strategic allocation of the required resource allocation (Ferreira and Ferreira, 2025). In addition to that it also assists in gaining a competitive edge as it is accurately managing resources and also effectively developing multiple unique capabilities, companies are able to effectively gain a competitive edge that ultimately leads to higher sales and a higher market share within the aftermarket.

Along with these areas, RBV possesses the qualities that play an essential role in promoting innovation through systematically encouraging the development of multiple new products and several essential processes. However, within the aftermarket, this could be very beneficial as it involves developing a number of new kit options (Vitorino Filho and Moori, 2020). Furthermore, through focusing on many internal capabilities, RBV can also help in systematically streamline processes, decrease any costs, and can also improve overall efficiency even within the supply chain. These are helpful in increasing both productivity and profitability. These are helpful in building and also enhancing the capabilities within the supply chain and accurately aligning all of them with the objective of the organization.

Stakeholder Theory

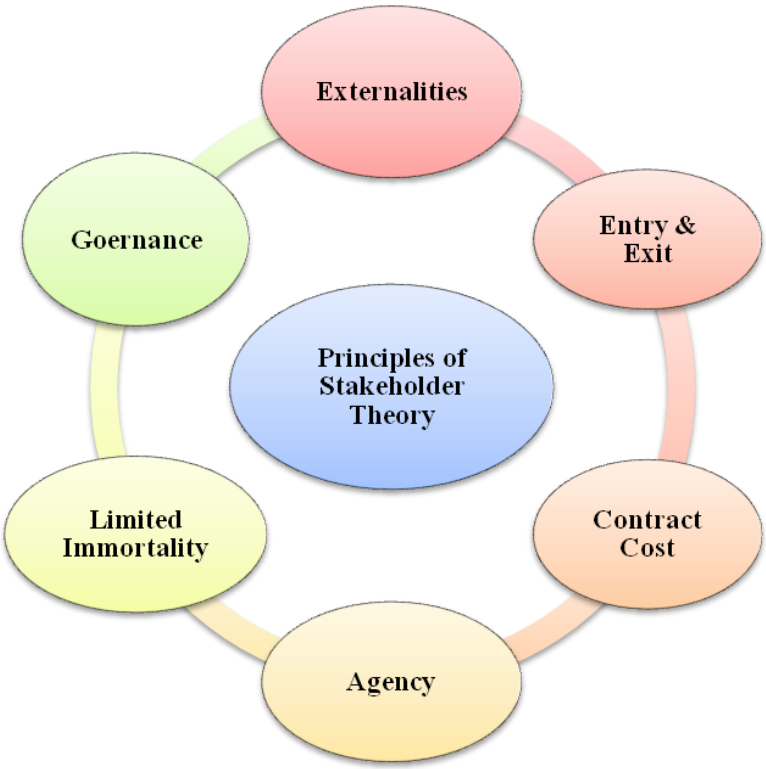

Figure: Principles of Stakeholder Theory

(Source: Self Created)

Stakeholder theory, within the particular context of the automobile aftermarket supply chain, is considered as crucial for systematically enhancing productivity and sales within the organizations that is through strategically promoting effective kits management. Through getting a clear knowledge and understanding and also by prioritizing the overall requirements and the expectations of several stakeholders, organizations can systematically optimize relationships. Through doing so, organizations are also able to improve communication, and accurately foster collaboration. These are further leading to more efficiency along with beneficial kit management. However, a stakeholder theory is significant and provides a particular framework for systematically managing the supply chain of the automobile aftermarket through focusing on the many relationships and overall needs of almost all the parties that are involved (Baah *et al*, 2022). Through accurately prioritizing engagement of stakeholder as well as stakeholder collaboration, companies will be able to enhance productivity of the firms.

The techniques and the aspects that have been portrayed within the stakeholder theory are very beneficial for the organization and these are also helpful in improving sales, and accurately building even sustainable and beneficial business models. At the same time, through understanding the overall expectations along with the needs of multiple downstream stakeholders who are mainly involved retailers as well as end-users, kit manufacturers are able to optimize inventory levels. Along with these areas, these key aspects are also allowing for reducing waste and ultimately leading times (Durugbo, 2020). Furthermore, gathering feedback that is from the customer on kit performance and also its usability can be essential and it can also inform future kit design and development. All these are essential and become the main reasons in improving customer satisfaction and accurately driving repeat purchases.

2.9 Conceptual Framework

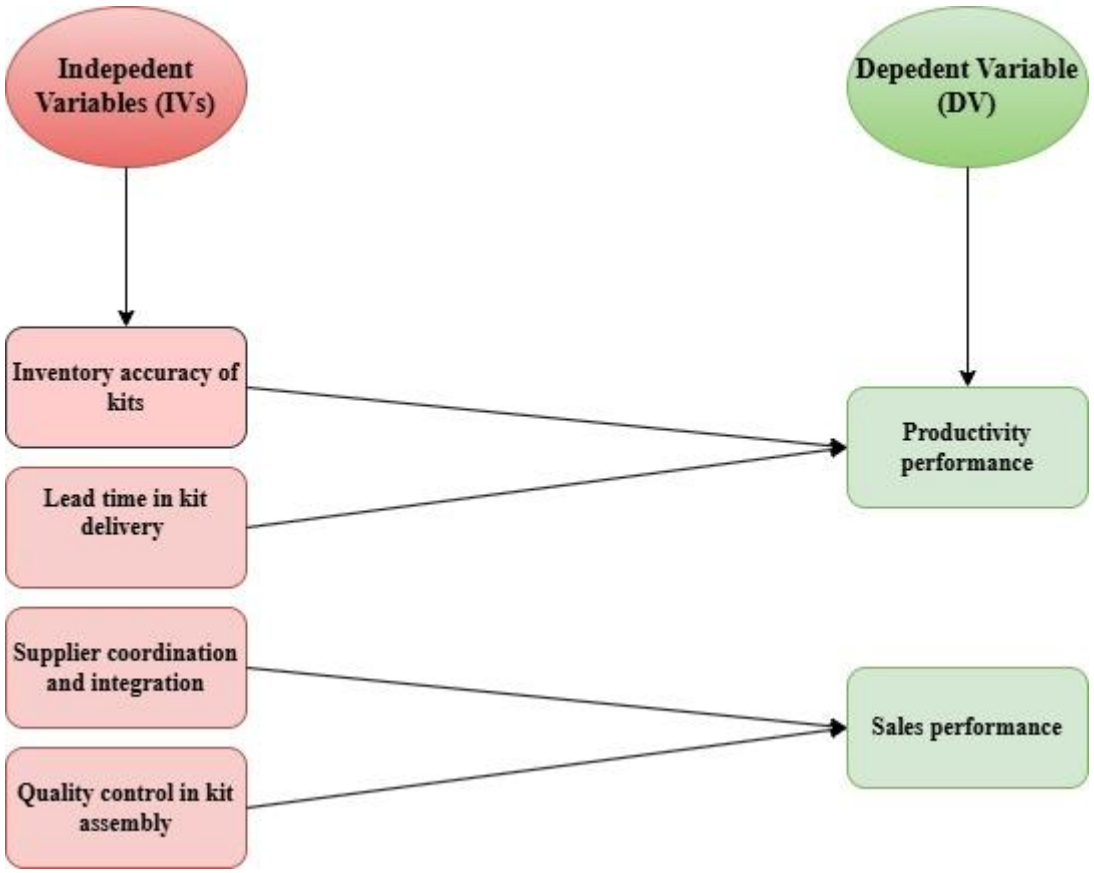

Figure 2.9.1: Conceptual Framework

(Self-developed)

2.10 Literature Gap

Few gaps have been identified within the literature and these gaps are further highlighting the requirement for any other study in the future. There is the existence of multiple existing literatures that are particularly on aftermarket supply chains and inventory management, the particular focus on kit management along with its relationship with these outcomes are found to be almost limited. There is limited research that can accurately show how effectively managing multiple kits within the automobile aftermarket supply chain can enhance both productivity and sales (Durugbo, C.M., 2020). It has also recognized that there is the availability of multiple studies that are providing information on general supply chain management and also provide the overview of the aftermarket service literature. However, there is a lack of required focused research on the particular nuances related to kit management. It includes how it has direct impacts on sales, productivity, and also the impact on the overall aftermarket ecosystem.

In addition to these gaps there's also a requirement for more empirical studies. The studies need to accurately examine the overall practical impact of the practices associated with kit management on sales figures. The practical impacts on other aspects such as lead times, costs of inventory and also on the customer satisfaction within the aftermarket need to discuss(Maure and Kramer, 2025). Furthermore, The accurate integration of multiple technologies including AI, data analytics, numerous e-commerce platforms in kit management processes within this area are also not adequately revealed within the literature. However, Understanding how the usages and the applications of the technology can be helpful in enhancing kit assembly, optimizing inventory tracking, and also enhancing sales automation is one significant area for future research.

2.11 Summary

The chapter has reviewed multiple studies and provided a sound knowledge of kit management and supply chain. Kit management within the supply chain is helpful in streamlining work, decreasing errors, and also helpful in saving costs. The chapter has provided knowledge regarding the design and performance of the kit preparation. It has been analyzed that the factors such as culture, leadership, technology, training and other factors are directly impacting the kit management within the organizations. It has been recognized in this chapter that kitting can

directly lead to increased productivity and also lead to enhanced efficiency in business operations. The application of DMAIC methodologies have also been discussed in which it has been identified that the DMAIC approach is suitable in e enhancing multiple existing approaches and aspects. Few theories including Lean Manufacturing, Resources Based View, Stakeholder Theory have been mentioned in this chapter along with its application.

CHAPTER 3: METHODOLOGY

3.1. Introduction

The chapter methodology will provide the overview of the data collection methods that are used for the study "enhancing productivity and Sales through effective management of Kits within the automobile aftermarket supply chain. The chapter discusses the major sources from where the data and the information are gathered for the study. In this chapter, there is the sound knowledge on the research design that is used in the study. Additionally the chapter will provide an overview of the population and the samples that are essential for the study. The processes and the methods that are effective for the study will be mentioned in this chapter. The data collection method as well as instrumentation techniques in this study are also discussed in this chapter. The reasons and the effectiveness of the chosen methods for the study are also evaluated in this way as to why the particular method is suitable for the study.

There are a few step procedures that are used in this study in order to make the study more informative, meaningful and a significant source of reading that assists in providing the overview of the kit management, supply chain, and other associated terms. Furthermore, in this chapter, there is a discussion on the limitations related to data analysis. Along with these areas, it is essential for the research to maintain a set of ethics in order to manage the guidelines. The ethics that are strongly connected with the participation of the human subject in the study are also discussed in the given chapter.

The study will follow ethical guidelines that allow them to deal with the security of the participants who are actively involved in the study. In addition to that, there are few inclusion as well as exclusion criteria in this study and this will also be managed throughout the whole study. There are usage of multiple sources and ways among which the study is following a specific set of guidelines and employ particular resources that are mentioned in this chapter as well. This chapter is very significant in proving the overall view and also accurately explores the methods of data collection, different techniques, and other ways that are used in the study.

3.2 Research philosophy

Methodology is considered a significant approach that refers to developing theoretical and systematic aspects for comprehensively conducting the study (Schreiber and Cramer, 2024). This is an outline of a detailed plan for conducting the research paper and the different tools and techniques used in the paper. The research methodology chapter consists of different tools and techniques, and among all the tools, research philosophy helps researchers to depict adequate outcomes based on the given subjective manner effectively. The main motive of research philosophy is to deal with different natures, sources and also helps in developing knowledge. However, research philosophy helps researchers to maintain a framework that helps them to form the process of conducting a research paper according to ideas based on reality and knowledge nature. It also defines a significant amount and procedure to follow while collecting data for the research paper, and examines and implements the most crucial.

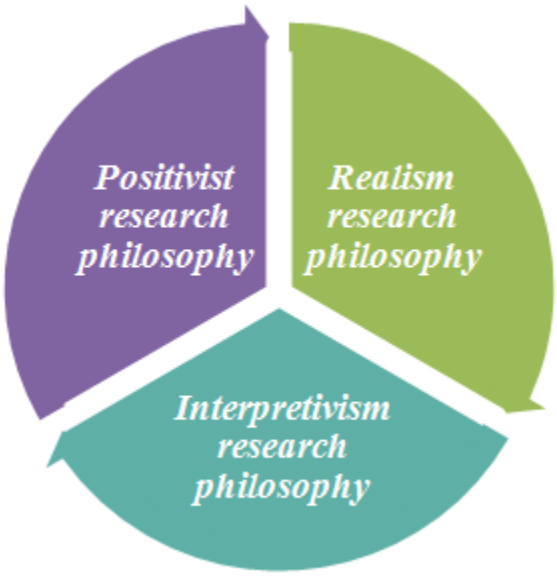

Figure 3.3: Research philosophy

(Source: Self-developed)

The research philosophy is effectively consists of three parts, and they are ***positivist research philosophy, realism research philosophy and interpretivism research philosophy*** (Ali, 2024)**.** The positivist research philosophy is considered a philosophical approach that depicts the use of different systematic methods, specifically quantitative ones, to study a topic. It depicts that reality is objective and that it can be effectively measured and also observed for deriving knowledge according to objective observation and empirical evidence. On the other hand, realism research philosophy is defined as a philosophical perspective which posits objective existences based on reality independent of human perception. It also reflects the phenomenon that the world exists underlying the mechanism and structure which causes for observed phenomenon. However, the realists seek to uncover the underlying mechanism to explain the process of the generation of observable events.

Apart from that, interpretivism research philosophy is a significant philosophy which remarkably emphasizes the understanding of subjective meaning and also the interpretation of individual ascribe according to their respective experience within a social context. It is mainly a qualitative approach that remarkably focuses on people's lived reality and the process of making sense of the social world.

Justification of the chosen research philosophy:

The research paper has proceeded with the selection of ***positivist research philosophy and interpretivism research philosophy*** to develop the study by incorporating an effective subjective manner. One of the key characteristics of positivist research philosophy is empiricism, as positivism believes the phenomenon that knowledge is derived primarily based on observation and experience of different people instead of institutions and subjective interpretation (Elneil Hamdan Abdala and Elnadeef, 2025). The positivist research essentially strives for objectivity and aims towards the minimization of researcher biases and influence during the research paper development. Furthermore, positivism often seeks to utilize quantitative methods for the study with the help of deriving surveys, statistical analysis and also experiments for collecting data and analyzed information followed with an ethical manner. However, with the use of qualitative data, researchers can collect information based on real-life findings among different people about the

effectiveness of kit management in the supply chain process to improve business productivity and sales within the automobile industry.

Interpretivism recognizes the fact that reality does not process subjectively but is effectively shaped through individual perception, cultural context and experience. It also helps researchers to assume knowledge and its meaning that they are not fixed, instead, they are created through effective social interpretation and interaction. Interpretivism research philosophy helps researchers to derive qualitative value based on different articles and journals available in Google Scholar in a subjective manner. The respective philosophy depicts context as important according to the experience and meaning of the given topic to interpret effectively. Interpretivism process with different advantages in the area of excelling the meaning and interpretation individuals attach based on their experiences. It allows for a more holistic understanding of social phenomena and goes beyond surface-level observation.

3.3 Research approach

Research approach is one of the most important tools or techniques used by researchers to develop the study strategically to evaluate the research problem by the given subjective matter (Prisoner, 2024). It encompasses the significant method that is used for collecting, analyzing and interpreting data. Thus, the research approach provides a systematic plan to evaluate findings appropriately. The usage of a research approach is crucial to the study as it provides more reliable, valid and insightful research outcomes. Furthermore, the research approach has been derived with three main parts, and they are the ***inductive research approach, the deductive research approach and the mixed research approach.*** The inductive research approach process with a significant method wherein the researcher starts from observing specific information or data and then derives broader theories or generalizations. Hence, with the usage of an inductive approach, research goes through specific observation about the data findings and then proceeds towards pattern recognition to develop a comprehensive theory.

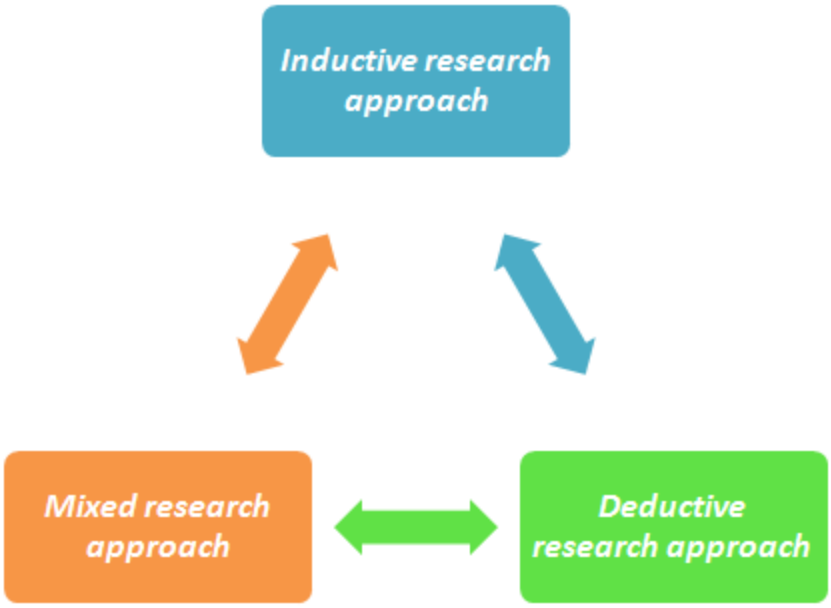

Figure 3.4: Research approach

(Source: Self-developed)

The deductive research approach starts from a hypothesis or theory and then tests it with the help of specific observations and data findings. One of the key aspects of the deductive approach is that it is based on theory testing instead of developing it (Fife and Gossner, 2024). This approach is often used in the study, while quantitative data needs to be interpreted with numerical values. Finally, a mixed approach process with the phenomenon of combining both of these approaches to identify effective data insights about productivity and sales enhancement through kit management approaches within the automobile industry.

Justification of chosen research approach:

The ***mixed-methods approach*** is used for the study and research aspect, is subject to the combination of both quantitative and qualitative approaches within a particular study for achieving a more nuanced and comprehensive understanding of a research problem. The respective research approach leverages with strengths of each method for addressing research questions that are complicated and overcoming limitations to depict study findings effectively.

The qualitative methods include focus groups or interviews, which seek to explore remarkable themes and develop in-depth experience with the help of statistical analysis and numerical data (Susanto *et al.* 2024). The combination of both these approaches helps researchers to depict a holistic understanding of a particular phenomenon and explore both the "why", which is qualitative and the "what", which is quantitative. Mixed method helps researchers to interpret different research questions to address more effectively.

Moreover, researchers have achieved different advantages with the usage of mixed method approach while underrating about the effectiveness of the kit management process to make it more reliable to achieve customer satisfaction within a competitive marketplace. Data validity and data triangulation have been achieved with the help of multiple methods for the validation of different findings. Both the approaches of quantitative and qualitative research incorporate their results to strengthen the overall understanding of supply chain productivity to achieve success within the automobile industry. Stakeholder engagement has significantly improved by allowing diverse data collection and perspective methods (Ebekozien *et al.* 2024). This leads the research paper to become more impactful and relevant for the study. The mixed approach helps researchers to get more flexibility for research design, facilitating the triangulation to find validation for the study.

3.4. Research design

Research design is a significant plan responsible for outlining the effective process of research conduction, including the significant process of collecting and analyzing data (Karunarathna *et al.* 2024). It is considered a key part of the research process and also helps ensure the research validation and an effective answer to the research question. The main purpose of including the research design within the research paper is to set a purpose to guide the entire research process and to outline the answer to those research questions. This phenomenon is important for analyzing and gathering information, and also for delivering an adequate motive for conducting the study. Research design includes three main parts and they are ***exploratory, explanatory, and descriptive research designs.*** The exploratory design of research methodology is a significant research approach used by the researcher at the time when they do not have prior knowledge or a limited idea about the research problem. The main goal of this design is to identify or investigate

deeper into the given subjective matter. On the other hand, explanatory design has a process with the aim of explaining the significant causes behind the relationship or phenomenon among different variables. Descriptive research design focuses on describing research characteristics accurately about the specific situation and population. The research design of the study is exploratory where both primary and primary qualitativedata will be used. The primary research will involve collecting overall new data from multiple resources. In this study, the study begins with primary qualitativeresearch which is primary qualitativequalitative data that helps to gain the background of the study. It helps to save both cost and time and in-depth study regarding the study which has already been done. Primary research assists in providing first-hand data with the assistance of the surveys. This research design is significant and has been used to accurately explore the best practices (Pinho Santos and Proença, 2022). In addition to these areas, this combined approach helps in providing the knowledge that further assists in recognizing issues and challenges. This design also helps in providing the areas that help to gain a clear understanding regarding the impact of several approaches that are associated with cost, sustainability along with efficiency.

Justification of chosen research design:

The study has focused on ***descriptive research design*** as it is the most effective approach for investigating the impact of kit management on its productivity, and also to improve sales within the automobile aftermarket industry. This design has crucially aligned with the research objective and nature that seeks to describe systematic current practices through the identification of trends and relationships among business outcomes and operational efficiency in the context of real-world supply chain processes (Villamin *et al.* 2024). It helps the researcher identify appropriately about research observation, explanation and documentation. In the context of research, the usage of descriptive research design is justified for both primary qualitativeand primary data analysis processes. The primary information or data has been collected with the help of a structured survey process and a semi-structured interview.

This offers identifying insights into different participants and their respective experiences to reflect and identify answers for the research questions. Choosing a descriptive research design also provides support for identifying trends, patterns and correlations. However, it reveals the

facts of consistent learning among the higher accuracy of the kit and enhancement of customer satisfaction or else faster time for service and increasing conversion of sales. Thus, the respective insights are subjected to be valuable in taking effective decisions for the implementation of practical changes within supply chain practices.

3.5. Population and sample

In the research paper, population refers towards a group of people or selected people from whom effective answers are going to be collected to conduct the study through the use of a survey. It helps researchers to get different people's opinions about a particular matter, and further, based on the analysis researcher comes to a decision or finds answers that are need to be find to derive the study. However, in this research paper researcher is going to conduct a survey process among ***101 participants, and the participants were employees/Staff, managers/HR, executives, and customers.*** These participants have answered the questions that were asked of them during the survey process, and this helps the researcher to depict adequate research findings. On the other hand, researchers have conducted a study by conducting an ***interview process among 10 people*** to answer ***10 interview questions***. For collective effective data that reflects the characteristics of the diverse population, the respective research paper employs a sampling method with a non-probability purposive sampling method.

The respective techniques allow researchers to select participants intentionally to who are involved in the operation of kit management directly. They also possess experience and knowledge that is relevant to the research objectives. The sampling is derived through two main components, and they are ***quantitative sampling, which is the survey process, and qualitative sampling, which is interviews.*** A total of 101 respondents was based on the need for obtaining a meaningful and statistical sample size by considering time constraints and resources. The respective number constitutes sufficient or enough to conduct inferential and descriptive statistical analysis, which enables researchers to identify trends, patterns and relationships among the efficiency of kit management and its outcome as a sales performance and productivity of the aftermarket supply chain process.

Furthermore, the survey has been distributed through an electronic stratified mix among the professionals from several levels and organizational roles to ensure representation among the

supply chain. This was done with the use of a structured questionnaire that is closed-ended as per the 5-Likert scale to facilitate response consistency and ease of analysis. This survey aims to collect information on the factors that include kit accuracy, inventory control, and downtime for kit issue, customer satisfaction and entire operational efficiency. In the phase of qualitative data collection within the study, a total ***10 number of participants*** were selected to participate in a ***semi-structured interview,*** and each was guided through ***10 interview questions open-ended questions***. The respective participants have remarkably been selected with the help of a purposive sampling process according to experience years, expertise and kit relation involvement related to the process of decision-making approach within their organization. Interview participants have been drawn through different supply chain tiers to ensure diversification of insights. The aim of the qualitative components for capture nuanced perspectives about the challenges emphasized with kit management, case experience based on real-life and operational improvement suggestions.

3.6. Data collection process and instrumentation

Data collection is subject to being a systematic process for gathering data or information based on specific variables to answer test hypotheses, research questions, and to evaluate outcomes (Karunarathna *et al.* 2024). It defines the effective process of data collection that helps researchers to interpret further for appropriately identifying study findings. The respective section has outlined a comprehensive approach that is taken to gather and analyses both the phenomenon of primary quantitative and secondary qualitative data collection processes. However, the data collection process consists mainly of two parts, and they are ***primary data collection and secondary data collection process.*** The respective researcher's paper focuses on ***both primary quantitative processes and secondary qualitative to collect data or information*** to depict appropriate findings associated with the effectiveness of kit management practices to improve sales and productivity within the automobile sector. The study is derived from the integration of primary data with the help of a ***survey*** and a secondary qualitative analysis process through ***interviews conducted.***

The aim behind using quantitative research is to accurately measure and test the variables. Additionally these is significant in effectively establishing relationships and furthermore help in

generalizing the overall findings that is to the large population. On the other hand, the qualitative research for the data collection is helpful in providing a clear understanding about the human experiences. In addition to that it is also significant in providing a clear understanding about human behavior and their different perspectives. Along with these advantages this data collection method is also very helpful in exploring the several patterns that are associated with the study (Mandala, 2022). However, the quantitative research methods are both measuring and counting while qualitative research methods are significant in both interviewing and observing. Quantitative data has been accurately analyzed with the assistance of statistical analysis. At the same time the qualitative data has been analyzed through grouping the data into different categories and themes.

Figure 3.7: Data collection process

(Source: Self-developed)

The study was conducted with the usage of two instruments for collecting primary data, and they are ***structured survey questionnaires and a semi-structured interview guide***. The respective instruments have been designed carefully for capturing both qualitative and quantitative

information from different professionals actively engaged in the automobile supply chain process for aftermarket products.

Justification for the primary data collection process:

The decision of choosing the primary data collection process in this research paper is rooted in the recruitment to obtain context-specific, current and also actionable insights on direct basis from different stakeholders, including the process of kit management within the automobile industry for the aftermarket supply chain. It provides a process-driven nature and dynamic of an effective supply chain, specifically within the segment of the aftermarket. Primary data enables researchers to gather original and first-hand information that aligns with the objectives of the study (Karunarathna *et al.* 2024). It also allows for customizing research instruments to address different variables for investigation in productivity, practices of kit management and overall sale performance. The most critical advantages of using primary data is in the given context is that it shows current practices and conditions about the industry.

Therefore, directly engagement with the professional of the supply chain with the help of surveys allows to the identification challenges, current trends and innovations which has a direct impact on business outcomes and kit management efficiency. In addition, the flexibility for primary data collection process helps researcher to probe within emerging themes through the overall process of data collection (Hossain *et al.* 2024). It is useful for research based on supply chain due to the fact that the unexpected issue such as miscommunication, vendor delay or any failure in system occurs and influence productivity. However, the real-time insight have only captured with the development of direct engagement with the professionals. Another critical reason for choosing primary data collection is for its role of validating theoretical assumption based on empirical evidence. For instance, an efficient hypothesis of kit management leads towards improving customer satisfaction and also increasing in sales effectively tested to identify its accuracy with the help of real-world practitioners.

Lastly, the respective data collection provide support for credibility and relevance about research outcomes. Through the process of data collection especially from the professionals include within supply chain process in the automobile industry, findings are practical and directly

applicable. This remarkably increases the likelihood that the recommendation developed based on the study will become more credible, implementable and also aligned within industry needs.

Justification for the secondary qualitative data collection process:

The usage of secondary qualitative information within research paper is considered an essential part to establish a strong theoretical and contextual foundation which provides industry benchmark and provides support for primary findings and validation. The usage of interviews as a primary qualitative data collection process in this study is highly accurate or justified to explore an in-depth analysis and context-rich insights about the opportunities and challenges of kit management within automobile sector (Lim, 2024). The respective method enables the collection for qualitative data which is responsible for adding nuance, depth and a particular human dimension the research paper. The aftermarket supply chain of automobile industry includes multiple process for complex operational aspects, stakeholders and dynamics of the decision-making environment.

However, kit management is not a process with logical concern but also consider as a strategic move to implement the warehouse supervisor role and also sales manager in inventory planner. The interview allows to a direct dialogue among each individual, capturing their respective insights, experiences and approaches towards problem mitigation aspects relating with inventory accuracy, customer services and kit handling. Interview also serves a valuable and qualitative insight which can further used as a contextualized aspects and enriches quantitative findings derived from the survey (Ranaweera, 2024). Furthermore, there is another strength of using interviews that it enables researchers to explore complex and sensitive topics with more nuanced and confidential manner. Participants become more willing towards discussing organizational weaknesses, disruption in supply chain or internal insufficiencies positively. The respective level of authentication and details are crucial while studying an operational process which effects sales and productivity on direct basis.

More specifically, the responses of the interview serve mean of challenging existence and validation drives through a theoretical model or primary qualitative data. In summary, interviews are subjected to be essential within this particular research paper due to the fat that it provide explanatory, rich and context-driven information. It also helps for covering “how” and “why”

behind the performance issues and also best practices for kit management and insights that are crucial to make realistic recommendations for enhancing sales and productivity within automobile industry for supply chain process.

3.7. Procedures

Primary qualitative thematic and interview data are very crucial for a study on “enhancing productivity and sales through effective kit management within the automobile aftermarket supply chain. Primary qualitative data has been used in this study as it has been the key source that has accurately provided a wider knowledge and overview of several aspects. These are mainly including market trends, several competitor strategies, and in addition to that it is also including existing industry research. All these aspects ultimately offer context for the study (Saputro *et al.* 2022). Along with this area, Thematic analysis of this data is the essential source that reveals multiple key issues and opportunities that are related to kit management. It is also significant in providing the areas for improvement. On the other hand, the data that is gathered from the interview ultimately offers deeper insights into the specific experiences and perspectives of stakeholders within the supply chain, providing a richer understanding of the challenges and opportunities related to kit management.

A secondary qualitative thematic analysis is used in the study as it accurately provides valuable context and depth that are significant to the research. It is through exploring multiple existing literature, data, and several resources that are ultimately associated with the main focus of the study. Within the context of this study, a secondary qualitative thematic analysis is very significant as it is helpful in providing a clear understanding of several current practices. Along with providing many current practices these are also essential in providing insights on the knowledge gaps, and many potential solutions through systematically examining existing research (De Ridder, 2024). It is also by accurately examining industry data that are strongly related to kit management, optimization of the supply chain and aftermarket dynamics. In this essence, a secondary qualitative thematic analysis has been the key area that is effectively serving as a crucial foundation for accurately understanding the different complexities that are related with the kit management within the automotive aftermarket.

Along with these advantages the interview that is analyzed through thematic analysis accurately provides a robust framework. This framework is also helpful in systematically developing many practical solutions. These solutions are helpful in effectively enhancing productivity, improving sales, and also ultimately driving the overall success of the business. The study is accurately adopting a mixed method research as it is highly significant in effectively studying kit management and supply that are mainly within the aftermarket automobile industry. This approach is very helpful and further it is allowing even for a more comprehensive understanding along with almost nuanced understanding regarding multiple complex issues (İkizler *et al.* 2024). At the same time, it has been identified that through appropriately combining quantitative data that may include sales figures and several inventory levels with qualitative data such as customer feedback and different interviews with many industry professionals, researchers are able to gain better understanding.

This combined approach is further assisting the research in effectively gaining a clear and even a deeper appreciation for multiple factors. In addition to that, this approach is very significant in that it further helps to accurately address multiple limitations that are related to the single-method studies. It is also providing a more significant and even a robust basis. These are significant in effectively making informed decisions and several essential recommendations. A systematic review methodology has been adopted in order to identify and to sift through many relevant studies. It is also significant in effectively appraising and accurately analyzing the overall findings that is for the different studies that are the key area in providing information about the many kit management practices (Semenov and Jacyna, 2022.). Apart from that, this chapter has also mentioned that the quantitative data are necessary and in addition to that the qualitative data are also necessary in order to meet the requirements of the study.

The qualitative data are mainly collected with the assistance of interviews and surveys and will be analysed thematically. The thematic analysis has been analyzed in order to accurately extract the key knowledge and insights for the study. The knowledge and insights that have been gathered with the assistance of the data collection methods and techniques are significant in providing a clear and a comprehensive understanding about the multiple kit management practices within the market (Ada *et al.* 2021). The primary qualitativedata has been gathered through interview and has used thematic analysis. On the other hand, in this study, primary data

was also used with the help of SPSS. SPSS has been used for quantitative analysis in the study that helps to gain fresh data and perspective of the many professionals regarding the effectiveness of the kit management practices.

However, using SPSS for primary quantitative analysis has been crucial within the study as it has been the key source in effectively providing a robust as well as versatile platform for data analysis. This is further enabling researchers to systematically explore many complex relationships. It also assists the researcher in identifying many trends, and is helpful in effectively drawing statistical conclusions. Apart from that the reason behind using SPSS in the study is that SPSS is facilitating in-depth analysis of many numerical data. However, this is very essential for accurately understanding the overall impact of many kit management strategies on both productivity along with sales metrics. Apart from these advantages, SPSS is also a significant way that further helps in empowering researchers to accurately explore the complexities that mainly exist between the kit management and supply chain performance relationship. However these insights are further accurately providing them with the required tools that are very necessary for identifying any opportunities for improvement.

These are also significant in effectively optimizing many strategies, and all these further ultimately enhance both productivity and sales that are particularly within the automobile aftermarket. SPSS “Statistical Package for the Social Sciences” within the data analysis across many fields are significant. SPSS has been widely used as a significant software tool for statistical analysis and providing the research with almost a robust platform for effectively handling many complex sets of data in an effective manner. SPSS is the key tool that has enabled researchers to accurately conduct a rigorous statistical analysis (Alam, 2022). This strategy is ultimately providing a particular basis for systematically drawing conclusions regarding the overall effectiveness of many kit management approaches. This is significant also as it further helps to avoid any subjective interpretations and it also further ensures that the overall findings are mainly based on different credible evidence and sources that are necessary to make the study more informative.

3.8 Data analysis Limitations

There are few limitations that exist with data analysis and these limitations are further highlighted for further studies. Few limitations that exist in the study are including the availability of the required data and information on the automotive aftermarket business. The other issues that have been identified within the study are mainly issues with data availability, quality of the data, and also relevance. All these limitations that have been mentioned can directly affect both accuracy along with reliability of the research findings. However this is ultimately impacting the practical implementation of many recommendations. The limited accessibility of the data is another limitation as there were few restrictions on the accessibility of the required data that is across the supply chain. It has further omitted the analysis scope and also became the reason in preventing a hoist approach or view of the situation. While the other limitation has been the lack or the insufficiency of the real time data.

Lack of integration has been another limitation which has caused another issue in the study. The integration of the multiple data sources as well as the systems may also be limited. These are further hindering the overall ability to effectively conduct a well and a comprehensive analysis. There are also a few human limitations. These are mainly including the lack of the data literacy within the company and it can further hinder the capability to use many data analysis insights along with tools. While another human limitation may include the organizational culture as a lack of required willingness that is to adopt a data driven strategy or approach may also limit the overall impact of the study's data analysis process. All these issues are causing issues in the data analysis process and it may also hinder the data analysis process that is portable in providing the accurate information that is necessary for the study.

3.9. Ethics related to human subject participation

In this study that is mainly focused on "enhancing productivity and sales in the automotive aftermarket supply chain", the ethical considerations that are related to the participation of the human subject are crucial. This is specifically when involving any individuals within the research or data collection. There are few key aspects that include obtaining informed consent, accurately ensuring voluntary participation. In addition to that the other aspects are mainly including protecting both confidentiality and anonymity, and along with that safeguarding the

well-being of all participants who are involved within the research is another crucial aspect. The participants involved with the research are fully informed regarding the purpose of the study and also they have clear ideas about the processes that are involved within the study. Furthermore the participants also have knowledge about any potential risk or benefit as well. They are also given the rights to withdraw even at any time and also without any penalty.

The data that are gathered from the participants are accurately handled with strict confidentiality in order to effectively protect the privacy of all participants. The data that are collected through participants are stored securely that help in preventing any unauthorized access. At the same time the study is also concerned about the environment. The study has considered the overall social as well as environmental impact of the supply chain of the automotive aftermarket. The study also strives to accurately promote multiple practices that are strongly associated with the sustainability and responsible aspects. These are few ethical guidelines that are accurately managed by the study as this is allowing the research to ensure that the whole study has been conducted responsible. Along with that it is also allowing the researchers to ensure that the overall well beings as well as the rights of each human participant within the study are protected.

3.10. Inclusion and exclusion criteria

Inclusion and exclusion criteria are very significant, that are the set of particular rules. These rules further determine which individuals or data are required to be included within a study, and also highlight which data or information are not required within the study. These sets of rules are very essential in order to ensure that the study focuses on a relevant as well as manageable group. These criteria are also significant in that it further enhances the validity of overall findings, and also these are significant in accurately minimizing any risks to participants who are taking active part in the study.

Inclusion Criteria:The study mainly focuses on automotive aftermarket as it is essential to particularly examine the aftermarket. Authentic data are included from online retailers and are also gathered from the company. The study is mainly including the information and data of the companies that have almost good market share within the automotive aftermarket. In addition to that., the study also includes the specific types of kits that are useful within the automotive aftermarket including brake kits and it also includes suspension kits (Nikoloupoulo, 2022).

These are a few particular inclusion criteria of the study that help to make the study more informative.

Exclusion Criteria: The data and sources from the companies who are associated with the manufacturing company rather than any aftermarket business are excluded. At the same time this is also excluding any data from the companies who are not actively engaged within the major supply chain. As these companies data vans any other information is not suitable for the study as this study is mainly focusing on the aftermarket supply chain within the organization. The study is also excluding the kit that is not related with the aftermarket sales in the companies. These aspects that have been mentioned are not included within the study.

3.11. Summary

The above chapter methodology is a very essential part of the study that is the key source in highlighting the specific ways and methods that have been employed to make the study informative. This chapter has highlighted which research design has been used in this study. Apart from mentioning the research design, the chapter has also provided information regarding the population and samples along with data collection and instrumentation. The procedures that have been used in the study are also analysed in this chapter. The limitations that existed in the process of data analysis regarding this study have also elaborated in this chapter. At the same time both inclusion along with exclusion criteria of the study has been discussed in this chapter. The ethics that are related to the human participants in the study have been discussed in chapter as well.

The study and the research areas within the automobile kits field have been carried through using the DMAIC method and also by the usage of few QC tools. In this chapter, it has been discussed that the research has adopted a mix method approach where the study has combined both qualitative and quantitative methods in order to make the study a significant source of information about the research topic. The approach has been chosen in the study as it is the significant source in accurately providing a comprehensive knowledge and understanding about the kit management and its impact on sales and productivity also.

Data for the study has been gathered from the multiple aftersales function of the Mahindra. These are mainly focussing on kit procurement, sales data, and assembly. At the same time this chapter has also mentioned that interviews as well as surveys have been conducted with many professionals who are associated with the supply chain management within the organization. The surveys and interviews are also conducted with any other relevant stakeholders in order to collect qualitative insights. The quantitative data that are required for the study has been analyzed by using many statistical methods in order to effectively establish correlation that is mainly between many kit management practices, sales and productivity.

CHAPTER 4: RESULTS AND DISCUSSION

4.1. Introduction

The study accurately laid down the strong foundation to accurately exploding the different theoretical as well as several factors which are impacting the kit management systems within the automobiles aftermarket supply chain. In addition to that, this chapter will accurately delve into the main findings which are mainly derived from both primary as well as secondary data analysis. The main objective is to accurately fill the gap that is between different theoretical concepts as well as the real-world applications. The chapter will also discuss how different effective management of kits are enhancing the productivity and also how these are driving sales performance.

This chapter is mainly focusing on analysing different themes that are mainly emerging from the study which is providing deep insights into different aspects which are associated with kit management. However, these are mainly including the correlation that exists between kits productivity as well as business revenue. The role of production systems in optimizing supply chain operations and providing knowledge about the challenges which are associated with inventory accuracy and consumer satisfaction are discussed here. There are few other dimensions which will be mentioned in the following chapter which will be helpful in representing a comprehensive knowledge and understanding of how a strategic kit management practice is impacting organizational outcome.

4.2. Findings of data analysis

4.2.1. Primary data analysis

Reliability analysis

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.861	.860	18

Table 4.2.1.1: Reliability Statistics

Table 4.2.1.1 illustrates that the reliability statistics of the study's primary data, focusing on the internal consistency of the 18 survey question items used to analyse kit management aspects in the automobile aftermarket supply chain. The Cronbach's Alpha value is 0.861, and the standardised item alpha-based value is 0.860. These values exceed the accepted edge of 0.70, which shows a high level of internal consistency and reliability among items in the scale. This result indicates that the survey instrument measures intended constructs, like supplier coordination, productivity and inventory management, without any excessive form of measurement error. The closeness among the alpha values (standard and standardised) further states responses consistency, validating robustness of the dataset for any subsequent statistical analyses like regression, descriptive statistics and correlations. Hence, the score of reliability analysis strengthens the credibility of findings of the research and supports the appropriateness used to collect primary data. In order to guarantee the consistency and dependability of measurement instruments, reliability analysis is crucial in research. For researchers and analysts, it is essential to comprehend the various methodologies and their underlying presumptions.

Frequency analysis

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	70	69.3	69.3	69.3
	Female	31	30.7	30.7	100.0
	Total	101	100.0	100.0	

Table 4.2.1.2: Gender demographic

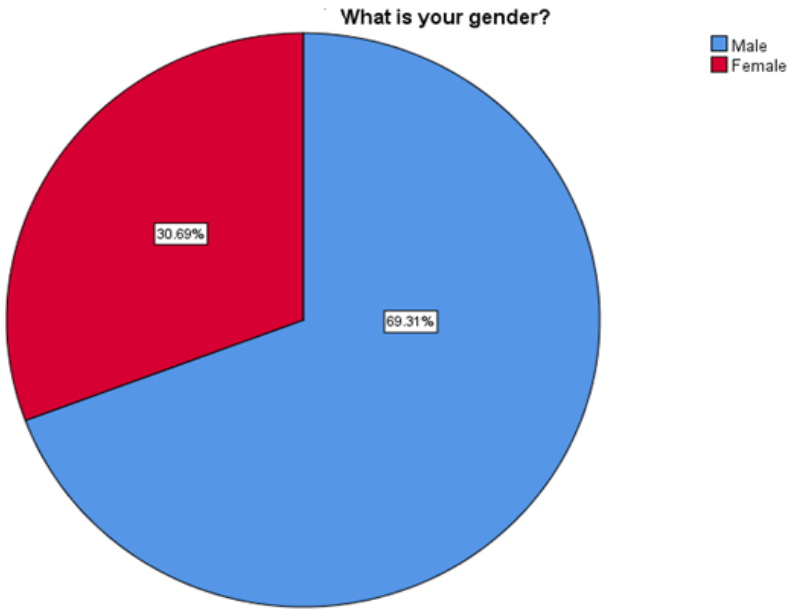

Figure 4.2.1.1: Gender demographic

(Source: IBM SPSS)

Figure 4.2.1.1 emphasises the gender demographics of the study participants, providing insight into the representation within the sample. Out of a total of 101 respondents, 70 identified as male, accounting for 69.3% of the sample, while 31 participants, or 30.7% are identified as female. This illustrates a notable gender imbalance, with male respondents who are significantly outnumbering their female counterparts. Such a type of distribution reflects the gender composition typically observed in the automobile aftermarket industry, where male professionals are more prevalent in technical, operational and managerial roles. While this distribution also offers a realistic representation of this sector, it may also introduce a gender degree bias in the study findings, mainly in perspectives related to the performance of the supply chain, productivity and kit management. Despite this imbalance, the inclusion of both the genders helps offer a broader view of perceptions of stakeholder, which also helps in enhancing data generalisability. The part emphasises the importance of recognising the gender dynamics within the industry research.

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25 years old	18	17.8	17.8	17.8
	26-35 years old	47	46.5	46.5	64.4
	36-50 years old	31	30.7	30.7	95.0
	50 years and above	5	5.0	5.0	100.0
	Total	101	100.0	100.0	

Table 4.2.1.3: Age demographic

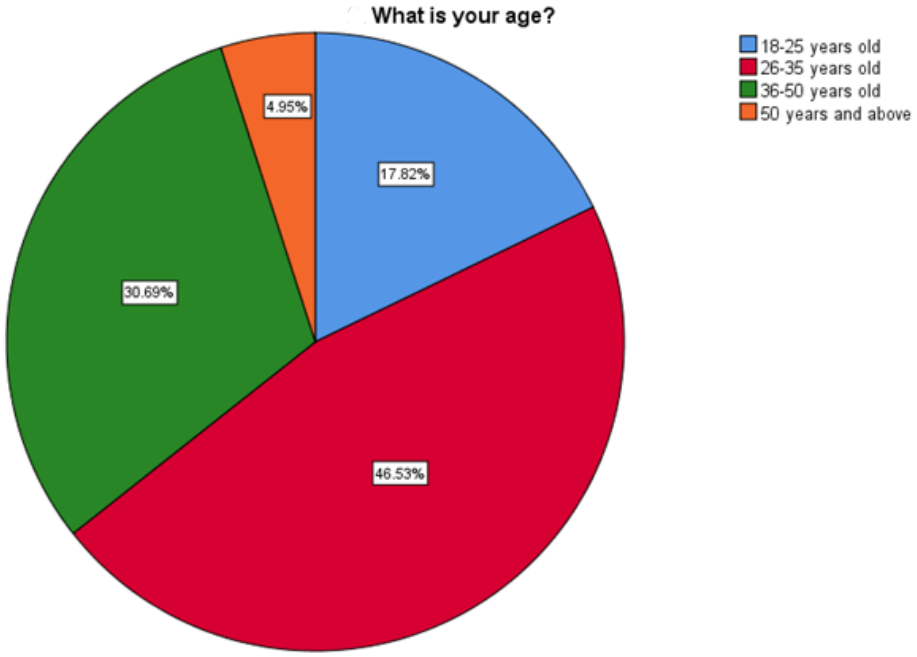

Figure 4.2.1.2: Age demographic

(Source: IBM SPSS)

The above tabular representation indicates the age demographic of respondents, offering insights into the diversity of age groups of the sample. Among 101 participants, the largest group falls within the age group of 26–35 years, comprising of total of 47 individuals or 46.5% of the total sample. This is followed by the 36–50 years group with 31 respondents (30.7%), indicating a

strong representation of experienced professionals. The 18–25 years group accounted for 17.8% (18 respondents), while only 5 participants (5.0%) were aged 50 years and above. This distribution indicates that the majority of the respondents are mid-career professionals, who are likely to be actively engaged in operational activities and the decision-making process in the automobile aftermarket supply chain. However, a relatively smaller representation of youngest and oldest age groups may reflect hiring patterns of the industry or their functional roles, which are typically held by individuals of those age groups. Overall, age diversity fosters a balanced analysis of several perspectives of different professional maturity levels.

What is your occupation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employee/Staff	28	27.7	27.7	27.7
	Manager/HR	44	43.6	43.6	71.3
	Executive	23	22.8	22.8	94.1
	Customer	6	5.9	5.9	100.0
	Total	101	100.0	100.0	

Table 4.2.1.4: Occupation demographic

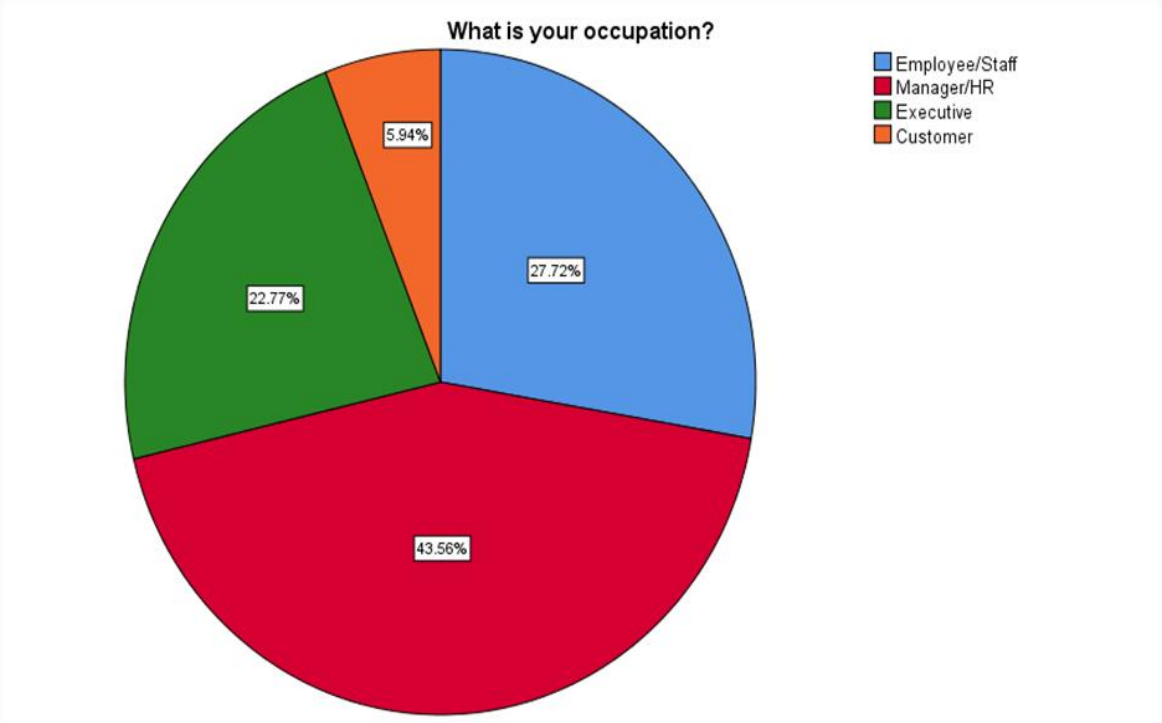

Figure 4.2.1.3: Occupation demographic

(Source: IBM SPSS)

The above figure indicates respondents' occupational distribution, which helps in offering a glimpse of the individual's professional backgrounds included in the supply chain of the automobile aftermarket. Among 101 participants, the majority identified as Manager/HR professionals, accounting for 44 respondents or 43.6% of the sample. This is followed by Employees/Staff at 27.7% (28 respondents), and Executives at 22.8% (23 respondents). A small portion, 5.9% (6 respondents), were customers. These findings illustrate that the dominance of HR and managerial professionals suggests that the survey captured insights from individuals who are involved in a strategic process for the process of decision-making, performance assessment and kit management. The presence of staff and executives also shows that tactical and operational perspectives are included, adding depth analysis. Whereas customers form a minor segment, their inclusion provides an external viewpoint on service and delivery outcomes. Overall, this occupational mix enhances the credibility and relevance of the findings by reflecting the views of key stakeholders across the supply chain.

What is your experience?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	28	27.7	27.7	27.7
	6-10 years	45	44.6	44.6	72.3
	11-15 years	11	10.9	10.9	83.2
	15-20 years	6	5.9	5.9	89.1
	20 years and above	11	10.9	10.9	100.0
	Total	101	100.0	100.0	

Table 4.2.1.5: Experience demographic

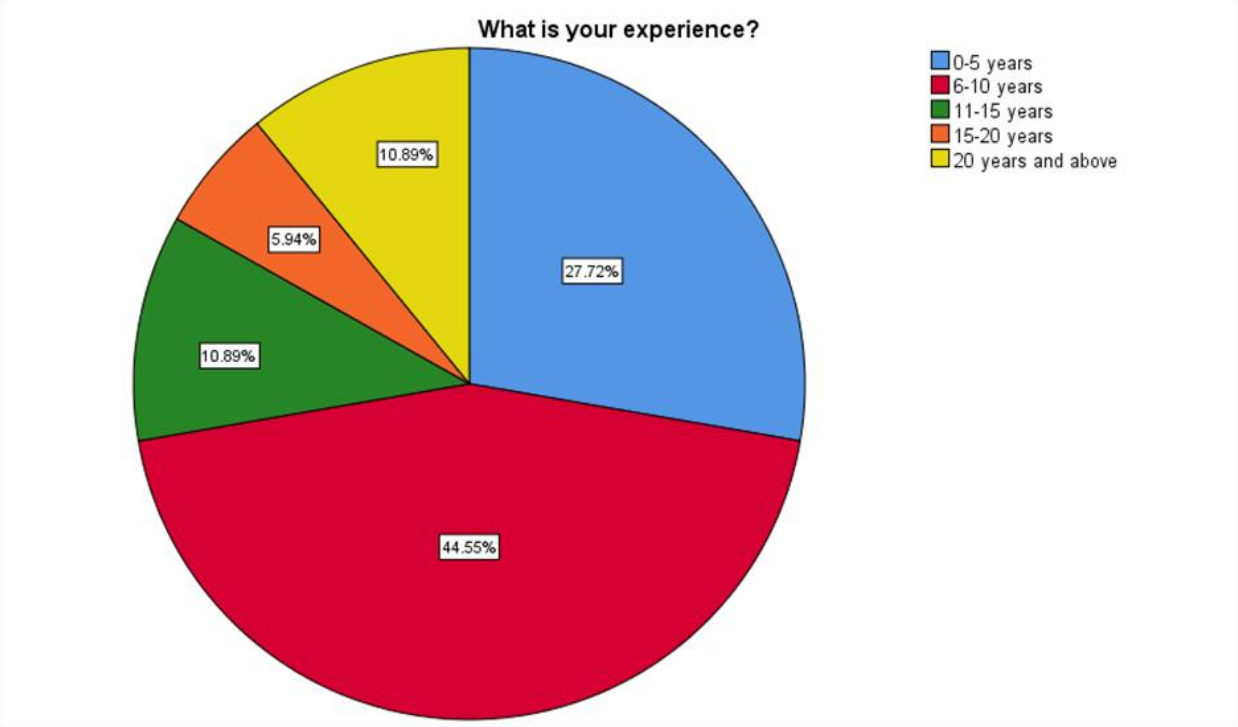

Figure 4.2.1.4: Experience Demographic

(Source: IBM SPSS)

The above data illustrate the demographic experience of the respondents, providing insights into the varying levels of industry exposure among participants. The largest segment comprises

individuals with 6–10 years of experience, accounting for 44.6% (45 respondents), indicating a strong mid-level professional presence in the dataset. This is followed by 27.7% (28 respondents) who have 0–5 years of experience, representing early-career professionals who may bring fresh perspectives to kit management and supply chain operations. Participants with 11–15 years and 20 years and above each make up 10.9% (11 respondents), while those with 15–20 years of experience form a smaller group at 5.9% (6 respondents). A balanced mix of entry-level, mid-career, and highly experienced professionals could be seen in this static data distribution, offering an exhaustive understanding of how experience affects perceptions of management of supply chains, productivity, and efficiency. Through integrating ideas from different career stages in the automobile aftermarket industry, a range of backgrounds enhances the research's reliability.

Descriptive Analysis

Table 4.2.1.6: Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation
"The team's overall productivity improved due to efficient kit management in the supply chain."	3.08	.891
"Effective kit availability and delivery have increased sales performance over the past year."	3.20	1.010
"The inventory records for kits are consistently up to date and accurate."	3.34	1.061
"Discrepancies in the kit inventory system are directly resolved and identified."	3.45	1.005
"Inventory tracking systems for kits are efficient, especially for kitting, which includes tracking and assembling every item in the pre-defined kits."	3.39	1.020
"Inventory accuracy of kits helps in reducing time wasted at the time of order fulfilment."	3.35	1.090

“Kits are delivered within expected lead time, the time between the dynamics of the placement of the order and the delivery process.”	3.30	1.118
“Delays in the kit delivery affect the operational efficiency negatively by leading to different issues like loss of customer trust, increased costs and disruptions in the production schedules.”	3.14	1.304
“Real-time updates on the status of their kit deliveries ensure updates on the status of kit deliveries.”	3.33	1.193
“Reducing lead time in kit delivery fosters overall supply chain performance.”	3.38	1.066
“The suppliers, well-integrated into the kit supply chain systems, help in seamless data exchange and communication between the overall supply chain and the suppliers.”	3.30	1.196
“Effective communication with the suppliers on kit requirements helps in prioritising clarity, regular updatesand conciseness.”	3.29	1.169
“Coordination with the suppliers helps in enhancing the performance of the supply chain and reducing kit-related issues.”	3.22	1.246
“Joint planning with the suppliers fosters timely availability of kits through reducing potential disruption in the supply chain, improving forecasting accuracy, and streamlining logistics.”	3.40	1.078
“A standardised process for ensuring kit assembly quality helps in improving overall quality of the product, its efficiency and customer satisfaction.”	3.12	1.243
“Kits have few defects due to the manufacturer's implementation a strict quality control measures in assembly process.”	3.24	1.258
“Employees are well-trained to maintain the quality of kit assembly as it helps in ensures that the final product meets customer expectations and specified standards.”	3.38	1.165

“Inspections in regular inspections are conducted to manage quality standards of kits and other products.”	3.33	1.123
Valid N (listwise)	101	

The above table shows descriptive statistics for several statements related to the practices of kit management and its impact on productivity, quality control, sales, delivery efficiency, inventory accuracy and supplier coordination in the automobile aftermarket supply chain. Each statement was rated on a Likert scale, and the resulting mean and standard deviation values help in understanding the tendencies and variability of the opinions of respondents.

The mean score for the statement “The team’s overall productivity improved due to efficient kit management in the supply chain” is 3.08 with a standard deviation of 0.891. This dynamic shows that a moderate level of agreement, suggesting that while kit management influences productivity, perception of its influence are varies slightly among the respondents. Similarly, the statement “Effective kit availability and delivery have increased sales performance over the past year” received a higher mean of 3.20 and a standard deviation of 1.010, which indicates a modest, however positive, perception of kits role in driving the performance of sales.

Statements focusing on the real-time tracking and inventory accuracy showed relatively higher mean values. For instance, “The inventory records for kits are consistently up to date and accurate” had a mean of 3.34, showing favourable perceptions of inventory practices. Additionally, the statement on the updates of real-time delivery scored a mean of 3.33, indicating that respondents are acknowledge the importance of timely information as it helps in ensuring the efficiency of operation. Similarly, “Inventory tracking systems for kits are efficient” (mean = 3.39) and “Reducing lead time in kit delivery fosters overall supply chain performance” (mean = 3.38) indicate that respondents are generally agree that prompt delivery and systematic tracking enhance outcomes of performance.

Regarding problem resolution, statement “Discrepancies in the kit inventory system are directly resolved and identified” has a mean of 3.45 with a standard deviation of 1.005, the highest among all, showing relatively strong confidence in error rectification practices. However, the influences of delivery delays on operations, mean score 3.14 and the highest standard deviation

of 1.304—indicate greater variability in opinions. This also reflects different forms of experiences among the firms or the departments regarding how delays affected the performance of the firms.

Statements related to supplier coordination and communication, such as “Suppliers are well-integrated into the kit supply chain systems” (mean = 3.30), “Effective communication with suppliers on kit requirements” (mean = 3.29), and “Coordination with suppliers helps enhance supply chain performance” (mean = 3.22), all fall within the mid-range of agreement. These responses are imply that supplier relationships are recognised as important, there may be room for improvement in communication and integration practices for maximise the efficiency of the supply chain.

Regarding the quality control, the respondents showed moderate agreement. “Joint planning with suppliers fosters timely availability of kits” scored a mean of 3.40, suggesting that collaborative efforts significantly reduce the disruptions. “Standardized processes for kit assembly” (mean = 3.12) and “Kits have few defects due to strict quality control” (mean = 3.24) indicates the general belief in the effectiveness of quality management, apart from variance. “Employees are well-trained to maintain kit quality” and “Regular inspections are conducted” scored higher, with means of 3.38 and 3.33, respectively, reflecting consistent quality assurance efforts.

Overall, descriptive statistics exhibit a positive perception of kit management among multiple operational dimensions. However, there are rarer values which exceed 3.45, and many standard deviations are above or around 1.0, indicating the range of attitudes and experiences among the respondents. These findings of the study also highlight the importance of standardising practices among the supply chain for improve outcomes and consistency. The above data also suggests that the targeted improvements in the lead time reduction, supplier coordination and communication can also further help in enhancing the performance of sales and productivity within the automobile aftermarket industry.

Correlation analysis

Correlations between DV1 and IV1-IV2

		"Team's overall productivity improved due to efficient kit management in the supply chain."
"Team's overall productivity improved due to efficient kit management in the supply chain."	Pearson Correlation	1
"The inventory records for kits are consistently up to date and accurate."	Pearson Correlation	.257**
"Discrepancies in the kit inventory system are directly resolved and identified."	Pearson Correlation	.027
"Inventory tracking systems for kits are efficient, especially for kitting, which includes tracking and assembling every item in the pre-defined kits."	Pearson Correlation	.054
"Inventory accuracy of kits helps in reducing time wasted at the time of order fulfilment."	Pearson Correlation	.342**
"Kits are delivered within expected lead time, the time between the dynamics of the placement of the order and the delivery process."	Pearson Correlation	.197*
"Delays in the kit delivery affect the operational efficiency negatively by leading to different issues like loss of customer trust, increased costs and disruptions in the production schedules."	Pearson Correlation	.128
"Real-time updates on the status of their kit deliveries ensure updates on the status of kit deliveries."	Pearson Correlation	.437**
"Reducing lead time in kit delivery fosters overall supply chain performance."	Pearson Correlation	.274**

Table 4.2.1.7: Correlations between DV1 and IV1-IV2

The above tabular representation of correlation analysis among the dependent variable DV1—"The team's overall productivity improved due to efficient kit management in the supply chain"—and several independent variables (IV1-IV2) relating to real-time tracking, inventory accuracy, lead time and discrepancy resolution. This analysis provides an overview of strengths and provides direction to the relationship between the productivity of the automobile industry and different components for the kit management dynamics in the aftermath of the supply chain of the automobile. The most significant and positive correlation is observed among team productivity and the statement "Real-time updates on the status of their kit deliveries ensure updates on the status of kit deliveries," with the value of Persona correlation coefficient of 0.437, and its significance value stands at the 0.01 level (**). It implies that transparent and timely updates help in enhancing the productivity of the team as it also helps in operational execution, coordination and planning.

Another strong relationship is visible between the dynamic of productivity and the variable "Inventory accuracy of kits helps in reducing time wasted at the time of order fulfilment," that reinforces a positive correlation of 0.342 at the 0.01 level. This result summarises and emphasises that proper dimensioning of inventory helps the automobile organisation to streamline their order fulfilment and also enables teams to function efficiently, minimise confusion and delay in the process. The variable "Reducing lead time in kit delivery fosters overall supply chain performance" exhibits a significant correlation with the dynamics of productivity ($r = 0.274$, $p < 0.01$). This reinforces that as the time between delivery and order placement reduces, productivity improves as a better and systematic synchronisation takes place among international operations of the company and its supply chain activities. Whereas "Kits are delivered within expected lead time" correlates moderately with productivity ($r = 0.197$, $p < 0.05$), it additionally emphasises the importance of timely delivery for driving efficiency in the firm.

Hence, the correlation between "The inventory records for kits are consistently up to date and accurate" and productivity is shown to be a significant though weaker ($r = 0.257$, $p < 0.01$). These findings indicate that while accuracy in inventory positively influences producing of the organisation, somehow it may influence mediate or be indirect through the other variables like discrepancy resolution and real-time tracking. At the same time, the variables like

“Discrepancies in the kit inventory system are directly resolved and identified” have a very weak and non-significant correlation (r = 0.027), reinforcing that, as there are different forms of resolution mechanisms in place still they are still not consistent influences the driving dynmiac of overall produtcivity of the team. Likewise, “Inventory tracking systems for kits are efficient” has shown a weak correlation of 0.054, indicating the presence of tracking systems is not guaranteed any form of gain in productivity unless it is complemented by other components such as accountability of the users, real-time responsiveness and integration.

The other variables like “Delays in kit delivery affect operational efficiency negatively,” imply a low correlation with productivity (r = 0.128), maybe because of different varying degree which influences different terms of the orgnaistaion. Some teams may also have contingency plans or flexibility which allows them to mitigate the influences of this form of delay, therefore weakening the paradigm of correlation. Collaboratively, correlation analysis emphasises that since there are different aspects of inventory and the practices related to kit management which influences positively to the productivity of the team, where the most influential factors are those who are help in ensure real-time accuracy and visibility in the dynamic of the supply chain. On-time updates and an effective fulfilment process emerge to empower the team to work effectively, minimise downtime and coordinate better. Vice versa, merely having protocols or systems in place of a real-time integration and execution does not enhance productivity. This dynamic implies that there are different businesses in the aftermarket supply chain of the automobile industry that have to prioritise inventory precision, timely delivery and a proper tracking system as they are the key levers for improving overall team performance. Hence, strengthening this element can foster productivity through developing well-synchronised and more responsive environment for operations.

Correlations between DV2 and IV3-IV4

		“Effective kit availability and delivery have increased sales performance over the past year.”
“Effective kit availability and delivery have increased sales performance over the past year.”	Pearson Correlation	1

“The suppliers, well-integrated into the kit supply chain systems, help in seamless data exchange and communication between the overall supply chain and the suppliers.”	Pearson Correlation	.149
“Effective communication with the suppliers on kit requirements helps in prioritising clarity, regular updatesand conciseness.”	Pearson Correlation	.231*
“Coordination with the suppliers helps in enhancing the performance of the supply chain and reducing kit-related issues.”	Pearson Correlation	.069
“Joint planning with the suppliers fosters timely availability of kits through reducing potential disruption in the supply chain, improving forecasting accuracy, and streamlining logistics.”	Pearson Correlation	.313**
“A standardised process for ensuring kit assembly quality helps in improving overall quality of the product, its efficiency and customer satisfaction.”	Pearson Correlation	.379**
“Kits have few defects due to the manufacturer's implementation a strict quality control measures in assembly process.”	Pearson Correlation	.183
“Employees are well-trained to maintain the quality of kit assembly as it helps in ensures that the final product meets customer expectations and specified standards.”	Pearson Correlation	.259**
“Inspections in regular inspections are conducted to manage quality standards of kits and other products.”	Pearson Correlation	.198*

Table 4.2.1.8: Correlations between DV2 and IV3-IV4

The above table explores correlations between the dependent variable DV2—"Effective kit availability and delivery have increased sales performance over the past year"—and the independent variables (IV3-IV4) related to supplier coordination, communicational dynamics, integration and quality control. The coefficient of correlation offers a valuable insight into the aspects of quality management and suppliers management system, as they are most closely linked to the performance of sales in the aftermath of the supply chain of the automobile industry. Among the independent variables, a strong and positive correlation is found among the performance of sales and "A standardized process for ensuring kit assembly quality helps in improving overall quality of the product, its efficiency and customer satisfaction," with a Pearson correlation coefficient of 0.379, significant at the 0.01 level (**). It's this dynamic that indicates that quality-controlled kits for assembly directly influence the dynamic, like satisfaction of the consumer and reliability of the products, which also in turn help in boosting the dynamic related to sales. Customers are also likely to respond positively to the high standards of product, brand loyalty and repeat purchases that ultimately reflect to improved the figures of sales.

Second-highest significance correlation is observed in the DV2 and "Joint planning with the suppliers fosters timely availability of kits," which indicates a coefficient of 0.313 at the 0.01 level (**). It implies that ideas that collaborative logistics, planning and forecasting with the suppliers are helpful in reducing disruption and delays, as it helps in ensuring smoother operational processes and kit availability. These effects of the supply chain help in making it easier for the business to meet the on-time demand, which contributes to a strong performance of sales. Another notable correlation is with the variable "Employees are well-trained to maintain the quality of kit assembly," which indicates a significant positive correlation of 0.259 at the 0.01 level (**). The finding summarises that competence in the workforce and training for maintaining assembly standards play an important role in delivering a reliable product. However, a well-trained staff enhances the consistency of the product and reduces assembly errors, to ensure the trust of customers, and contributes to growth in sales.

"Effective communication with the suppliers on kit requirements" also has a significant correlation with DV2 ($r = 0.231$, $p < 0.05$). This data emphasises the need for concise, timely and clear communication to achieve accuracy and operational coordination for fulfilling the

requirements of the customer. Hence, miscommunication further leads to shortages, delays or errors, where an effective communicational dynamic helps in ensuring that contributions are align with the demand of the market, thus it positively influences sales as well. “Regular inspections are conducted to manage quality standards of kits and other products” shows a moderately significant correlation with sales performance ($r = 0.198$, $p < 0.05$). This reinforces the role of quality assurance measures in managing a high standard in the supply chain. Regular inspection in the organisation helps in early detection of inconsistencies or defects, as it further also helps ensure that only high-quality kits can reach customers and focuses on enhancing the credibility of the brand and driving the dynamic of repeated sales.

In comparison to the variables like “The suppliers, well-integrated into the kit supply chain systems” ($r = 0.149$) and “Kits have few defects due to the manufacturer’s implementation of strict quality control measures” ($r = 0.183$) are show a weak however a positive correlational dynamic. These correlations of the variables are not statistically significant but still suggest the direction of a positive association, which implies that the defect control and suppliers' integration contribute to the sales, furthermore, it can moderately or indirectly influence the other factors in the automobile supply chain operational dynamics. However, “Coordination with the suppliers helps in enhancing the performance of the supply chain and reducing kit-related issues” indicates the weakest correlation with values of DV2, $r = 0.069$. It indicates that the general coordination without any strategic joint planning or communicational dynamics is not sufficient to foster meaningful improvement in the dynamics of sales. It also might reinforce that there is a need for a deeper and proactive supplier collaboration than routine coordination.

However, it is summarised that correlation analysis shows that effective sales performance in the automobile aftermarket supply chain is driven by clear communication, quality control, employee training, and joint planning with suppliers. As these factors can contribute to the reliable kit availability, high product quality and timely delivery—the key elements which influence customer satisfaction and ultimately translate the increased sales. From the product's original concept to its delivery to a consumer, a value chain is a sequence of consecutive steps that go into making a final product. Every point of the production process where value is added is identified by the chain, including the sourcing, manufacturing, and marketing phases. The

organisations are aim to boost sales through implementing better kit management practices, which should further focus on reinforcing these core relational and operational practices.

Regression analysis

Model Summary between DV1 and IV1-IV2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.584[a]	.341	.284	.754

a. Predictors: (Constant), Inventory accuracy of kits, Lead time in kit delivery

Table 4.2.1.9: Model Summary between DV1 and IV1-IV2

The above table provides the model summary for the regression analysis between DV1—"The team's overall productivity improved due to efficient kit management in the supply chain"—and the independent variables IV1 and IV2, specifically accuracy in inventory of kits and lead time in kit delivery. The model yields a correlation coefficient (R) of 0.584, illustrating a moderate to strong positive relationship between the dependent and independent variables. The R Square value of 0.341 reinforces that approximately 34.1% of the variance in team productivity can be explained through the combined effect of lead time and inventory accuracy in kit delivery. This is a meaningful proportion, showcasing the significant role these two variables play in shaping productivity outcomes. The Adjusted R Square of 0.284 reveals for model complexity and still supports predictive strength of independent variables. The standard error of the estimate (0.754) implies the average deviation of observed productivity scores from predicted values. Overall, this model suggests that reducing lead times and improving inventory accuracy are important for strategic actions to enhance the productivity of the team in the automobile aftermarket supply chain. These findings offer an empirical support for focusing on the operational and logistical efficiency to achieve performance improvements.

ANOVA[a] between DV1 and IV1-IV2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.085	8	3.386	5.958	.000[b]
	Residual	52.282	92	.568		

Total	79.366	100			

a. Dependent Variable: Productivity performance

b. Predictors: (Constant), Inventory accuracy of kits, Lead time in kit delivery

Table 4.2.1.10: ANOVA between DV1 and IV1-IV2

The above tabular representataions provide the ANOVA (Analysis of Variance) results for the regression model assessing the relationship between DV1—"The team's overall productivity improved due to efficient kit management in the supply chain"—and the independent variables IV1 and IV2, which involve lead tme and inventory accuracy in kit delivery. The F-value is 5.958 with a significance level (p-value) of 0.000, indicating that the regression model is statistically significant. This means that this model offers a good fit, and the independent variables jointly significantly influence the dependent variable. The regression sum of squares is 27.085, representing the variation explained by the model, while residual sum of squares is 52.282, reflecting an unexplained variation. The total sum of squares is 79.366, showing substantial portion of the variability in productivity are explained by this model. The F-test significance confirms that improvements in the inventory accuracy and reductions in lead time are not because to random chance however, it has a statistically and measurably supported influence on the productivity of the team. These results imply that the necessities of efficient supply chain management practices for enhancing the operational dynamics.

Model Summary between DV2 and IV3-IV4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464[a]	.215	.147	.933

a. Predictors: (Constant), Supplier coordination and integration, Quality control in kit assembly

Table 4.2.1.11: Model Summary between DV2 and IV3-IV4

Above tabular representation on model summary for the regression analysis among DV2—"Effective kit availability and delivery have increased sales performance over the past year"—and the independent variables IV3 and IV4, that involve supplier coordination and integration, and quality control of kit assembly. The model reports an R value of 0.464, reinforce a moderate

positive correlation between the dependent and independent variables. The R Square value of 0.215 indicates that approximately 21.5% of variance in sales performance are explained by model, which suggests that while quality control and supplier coordination do impact the outcomes of sales, other external factors can also play an important role. The Adjusted R Square of 0.147 accounts for a number of predictor which indicates a form of generalizability in the model's for a broader population. The standard error of the estimate is 0.933, showcasing the predicted sales values and the average distance between observed. Although the predictive power of this model is moderate, as it still underlines the need which help in strengthening supplier relationships and implementing a strict quality control measure for support growth in sales. These results suggest that focusing on quality assurance and operational alignment and operational alignment in kit delivery contributes meaningfully for improved the performance of sales in the aftermarket supply chain of the automobile industry.

ANOVA[a] between DV2 and IV3-IV4

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.946	8	2.743	3.151	.003[b]
	Residual	80.093	92	.871		
	Total	102.040	100			

a. Dependent Variable: Sales performance

b. Predictors: (Constant), Supplier coordination and integration, Quality control in kit assembly

Table 4.2.1.12: ANOVA between DV2 and IV3-IV4

The above table of ANOVA results for the regression analysis between DV2—"Effective kit availability and delivery have increased sales performance over the past year"—and the independent variables IV3 and IV4, namely supplier integration and coordination, and quality control in kit assembly. The F-value of 3.151 and the significance level (p-value) of 0.003 that the overall regression model is statistically significant. This means that the independent variables jointly have a meaningful impact on the dependent variable, and the likelihood that this result occurred by chance is very low. The regression sum of squares is 21.946, representing the

variation in sales performance explained by the model, while the residual sum of squares is 80.093, indicating the unexplained variance. The total sum of squares is 102.040, suggesting that while the model does not explain all the variance; it does capture a notable portion of it. These findings of the study summarise the conclusion that both quality control processes and supplier-related practices significantly influence the outcomes of sales in the aftermarket supply chain of automobiles. However maintaining consistent quality of kit and enhancing the dynamics related to supplier collaboration can therefore be strategic priorities for the firms aiming to boost the performance of sales in a competitive market.

4.2.2 Secondary data analysis

Interpretation

Transcript 1

The improvement of kit productivity enhances business revenue and the management process with current process tracking management of kit in aftermarket supply chain.	
Participants	***Response***
Participants 1	Kit management has effectively managed through assessment of demand forecasting. (Q1)
Participants 2	Kit management maintain with optimal inventory for meeting demand without facing the overstocking aspect. (Q1)
Participants 3	Inventory accuracy creates issues in managing the errors in data entry and this reaches towards inefficient tracking approaches. (Q2)

Theme 1: The improvement of kit productivity enhances business revenue and the management process with the current process tracking management of kit in aftermarket supply chain.

The aftermarket supply chain in the automobile industry is being processed with the implementation of kitting management to boost business performance (Zehra *et al.* 2025).

Kitting in automobile states that combining different essential equipment that are related to the aftermarket services to form one bundle and selling it with effective offers creates a positive perception among consumers to purchase it, output spending much time. However, the respective research paper has a process with both primary quantitative and qualitative data collection processes. The primary qualitative data analysis was conducted through an interview design among a total ***10 participants to answer 10 interview questions.*** This reflects a real-time and appropriate data finding because different people have their respective experiences and expertise about the supply chain process within the automobile industry. According to participant 1, "kit productivity improvement foster to increase business revenue and the entire management process of kitting practices". Kit significant importance of kit productivity improvement is that, it benefits business through cost reduction, streamlining process and also increases entire efficiency.

Kitting is the specific component that is assembled previously and offers several advantages to in the areas of packing and picking, saves labor cost and utilizes warehouse space optimization. The significant phenomenon reduces time to handle material, reduces the number of errors and also increases quality control. Kitting is the core idea that benefits business through its implementation creates profitability and effective strategies (Ayyappan and Sankeetha, 2024). Kitting develops product value and also encourages positive customer loyalty. Thus, it helps to decrease the overall cost of labor, storage have streamlined improved business productivity. Appropriate visibility and tracking improves kit management supply chain process and improve operational productivity. This theme is significantly targeting objective four with a significant purpose of understanding about different systems, practices and also potential insufficiencies. The significant process of tracking and managing kit within aftermarket supply chain process includes different stages and they are sourcing, planning and manufacturing, returns and also delivery.

The stage of demand forecasting and planning includes the prediction for future demand for the kits according to the aspects of its market trend, historical data and also other factors that are relevant. Accurate forecasting enhances the performance of the business in determining appropriate quantities about several components and this helps business to finish kits for further production and restocking (Çağlayan and Aksoy, 2025). However, this is important for the business to process with demand forecasting aspects as it leverage with an adequate idea to make

a sufficient kit production and release in the marketplace according to customer demand,. This phenomenon leads to decrease the aspects product to become out of dated and also requires huge storage to manage the stock. Customer often seeks to purchase products that are current and are up to date to use hence, with the help of demand forecasting business active positive customer perception and make the customer satisfied with accurate products.

On the other hand, according to Participants 2, Kit management maintain with optimal inventory for meeting demand without facing the overstocking aspect. According to interview question participant 1, have answered that demand forecasting and planning is one of the important processes that helps businesses to predict future demand. However, this is important for the automobile industry to forecast order demand in order to mitigate challenges related to managing the process of kit tracking in the aftermarket supply chain approaches. Participant 2 have also depict that, Procurement and sourcing leverage with managing kit management tracking system through a reliable relationship with the suppliers. The sourcing and procurement strategy significantly combine with robust kitting management system and this helps the business to process with a powerful synergy to manage assets effectively. Through the uses of these respective strategies automobile industry have leverage with supply chain optimization, cost reduction and the improvement in overall business efficiency effectively.

Sourcing and procurement involves the identification of business aspects, evaluating also negotiate with different suppliers (Olawale *et al.* 2024). Sourcing also process with the incorporation of right suppliers for negotiating a favorable contract and participant 3 have responses that, Kitts has shipped to the customer end through effective distribution system with maintaining appropriate transportation methods. Thus, this is important for the automobile aftermarket supply chain process to effectively deliver the product that have ordered by the customers as it helps them to get a positive reputation about the business performance in the marketplace. Visibility enhancement helps business to track their supply chain process more accurately. Appropriate tracking of supply chain through inventory management aftermarket the automobile business develops accuracy to boost business performances. Customers are remarkably influenced through the performance regarding kit management. Demand forecasting accurately optimizes inventory to ensure the right amount of kit is present in the marketplace to serve the customer.

Maintaining an accurate record with the level of inventory optimizes storage space for minimizing the overall cost and increases efficiency. The robust transportation and logistics are required to be reliable to track kit aftermarket supply chain and Kitts have been shipped to the customer end through an effective distribution system. The pre-assembled kits minimize the requirement of packing and kicking, helping them to save both time and labour cost. However, it does not require much labour to complete the task to complete in time.Kitting combines multiple items to form a single kit, hence significantly reducing the action in pick-up and also pack-up for each order.

Transcript 2

A user-friendly and simple production system helps businesses to increase supply chain productivity, and addresses different issues that affect inventory accuracy on customer satisfaction.	
Participants	***Response***
Participants 4	Missing components and faulty products within kit create a negative impact on customer satisfaction. (Q2)
Participants 5	Inventory accuracy reduces productivity as the time of staff is wasted searching for the item that is misplaced. (Q2)
Participants 6	Inventory accuracy has an impact on customer satisfaction through the incorrect shipment of products. (Q2)

Theme 2: A user-friendly and simple production system helps businesses to increase supply chain productivity, and addresses different issues that affect inventory accuracy on customer satisfaction.

Kit productivity improvement within the automobile industry in its supply chain process significantly focuses on effective streamlining the process of kitting to optimize supply chain specification (Fatima *et al*. 2024). It remarkably includes effective logistics optimization,

inventory management and leverage with technological aspect. Inaccurate inventory practices lead towards shortage or stock out, which causes production line for halt or else operating through reduced capacity. The issues regarding quality control have seen through the implementation of inventory management and this significantly hampers customer satisfaction. According to participant 4, “Missing components and faulty products within kit create a negative impact on customer satisfaction”. On the other hand, participant 5 responses that, Inventory accuracy reduces productivity as the time of staff are wasted searching for the item that is misplaced. Customer satisfaction is one of the main concerns of supply chain business in order to boost business effectiveness. Customer becomes satisfied only if they get their ordered item in the given time limit and with accurate items.

Hence, if there is found any type of misplace of product customer tend to become dissatisfied and this negative impact on business development of the aftermarket supply chain process. Inventory accuracy leverage with different issues in the areas of inaccurate management and these impacts in production delay, supply management cost enhancement and unhappy customer. The inventory management has also process with the issues in the areas of human error in data entry, item that is misplaced. Inventory accuracy has an impact on customer satisfaction through incorrect shipments of products (Vaka, 2024). Order delays have also seen with inventory aspects within the aftermarket supply chain process of automobile industry. The reputation of the aftermarket supply chain has damage due to inaccurate product shipment and delay in delivery time. The inventory accuracy leverage with customer dissatisfaction and this lead to impact negatively on future business development within automobile industry.

Issues regarding quality control have seen through the implementation of inventory management. Furthermore, the impact of inventory accuracy within supply chain management process of kitting emphasizes for production areas (Şenaras *et al.* 2025). Production impact emphasized with incorrect or incomplete inventories of kit that leads towards bottlenecks production and leverage with delay due to the phenomenon of facing difficulties in finding proper item. However, this impact on negative customer perception as there is an unavailability of aftermarket product within marketplace. Thus, inventory accuracy need to process with identifying appropriate production or the required items. Production cost has increase with the implementation of inventory accuracy as, the unplanned stock out have significantly triggers order rush, reaches high cost for order shipment and also potentially in overtime payments.

Material have also wasted due to inaccurate stock leveling and leads towards overstocking approaches, it impact negative on customer satisfaction. Because overstocked product become out of date after it validation time and it result for increasing cost for the production line and also increasing wastage of material.

Unpredictability in the availability of the product depicts with customer frustration and disappointment at the time they have encounter with incomplete products order that are significant stock out. This phenomenon makes customer to lose their loyalty towards the specific organization and trend to buy it from another brand. Inaccurate records with inventory aspects results for providing an inaccurate notification about stock mislead premixes and also delayed for order confirmation (Engle-Stone *et al.* 2024). Thereafter, if it clears that communication breakdown have negative impact on customer satisfaction and this significant reduces customer satisfaction. It create a negative impact for the automobile supply chin process to face difficulties in enhancing business productivity in the compititative marketplace as customer are the one who is responsible for purchasing the product. These remarkably approaches create a negative reputation for the organization and leads towards achieving negative review, criticism in different social media platform and also decline referrals.

The automobile industry, with its aftermarket products, faces difficulties in escalating costs, as kitting includes additional costs for packaging, labour costs and storage approaches. The other issues have also arisen in the area of overproduction of kits.This needs to be managed more carefully with the help of the entire cost optimisation and analysis.

Transcript 3

Hassle-free kit management helps the automobile industry to generate positive customer satisfaction and emphasizes the factor that contributes to delays with reliability and timeliness.	
Participants	***Response***
Participants 7	Ensuring an adequate level of inventory and the operation of an efficient warehouse is important to reduce delay. (Q3)

Participants 8	Supply chain improvement effects in delay, as if there is any inefficiency management occurs within inventory management level. (Q3)
Participants 9	Weather also plays important role in effecting delay, hence it important to monitor weather forecast. **(**Q3**)**

Theme 3:

Hassle-free kit management helps the automobile industry to generate positive customer satisfaction and emphasizes the factor that contributes to delay with reliability and timeliness.

The significant factor that affects timeliness and reliability is accurate transportation and logistics. Inventory management affects the reliability if kitting through poor management of inventory aspects and leads to face delay I dispatching goods. Unpredictable conditions of weather disrupted the transportation schedule and impact of business reliability. The issues have found in supply chain, manufacturing delay problems through material sourcing impact on delivery time. The reliability is also based on choosing appropriate delivery carriers to enhance or ensure of getting the order on time. The remarkable factor that cause for delay is delay in product preparation (Khalid *et al.* 2024). Inventory management affects the reliability if kitting through poor management of inventory aspects. Ensuring an adequate level of inventory and the operation of an efficient warehouse is important to reduce delay and also helps to derive well-functioning warehouse. Appropriate inventory management has been ensuring the fact that, product are positively available as per customer or market requirements and preventing stock out aspects important to boost business performance.

The streamline of warehouse optimization helps business for reducing errors and also emphasizes with good workflow acceleration. This phenomenon is remarkably important in order to minimize delay as a well-managed inventory system and warehouse helps to avoid delay in delivering order to the customer end at the given time. Adequate inventory level have maintain to improve customer satisfaction and this has been done with the help of delivering ordered items to customer with considering minimum level of storage cost, wastage reduces and also improvement of labor productivity. The approaches regarding a hassle-free management of kit enhances the approaches of customer satisfaction within the respective automobile industry

through process simplification and error reduction. This phenomenon leads towards faster and more efficient services that further generate trust among customers and gather positive customer of customers. Different areas effects through appropriate kit management process to achieve positive customer perception.

Through the utilization of easily accessible and standardized management system, technician is responsible for accessing correct part more accurately and quickly, minimized delays and errors. Furthermore, efficient part of organization and retrieval allows achieving a quicker process of repairing and diagnosing, saves time of the customer and reduces inconveniences. A hassle-free management of kit has leverage with different advantages and they are development of positive customer communication, service streaming, enhancement of customer experience and other areas in business effectiveness. A perfectly management of kit leverage with better communication to the customers to discuss about potential delays, service needs and also repairs progress (Rehman *et al.* 2025). Positive kit management embraces the improvement of transparency, in relating with part repair process develop trust and confidence among customers in the areas of effective service provider. Personalized experience has also process with well-structure kit management with accessing of customer detail data.

On the other hand, dealership have also derives more insight into the development of personalized experience and tailor for services recommendation. Additionally, it has also identifying through the development of interview among different participants that a significant structure of kit management aspects detects the enhancement of customer experience in a positive manner. Customer become able to reduce their frustration and stress by the simplification of service process, the customer tend to face less frustrated and stress and this creates a positive experience among entire customer base. This positive experience of customer create the opportunities for the business in the automobile industry to embraces their respective supple chain process to increasing productivity and business growth (Krishnan *et al.* 2025). Increasing in customer loyalty makes the business to assure about getting a strong based on customer to purchase on repetitive basis from the same company. Furthermore, the significant phenomenon is also leverage with achieving competitive advantages through the development of super services to the customers and also on the other hand, dealership also leverage with competitive advantages within the marketplace.

Transcript 4

Effective kit management fosters order fulfillment to improve efficiency and reduce kitting errors and collaboration influence for kit to become available to boost performance in supply chain.	
Participants	***Response***
Participants 10	Collaboration with suppliers creates a positive environment to work effectively. (Q4)
Participants 5	Positive collaboration with suppliers increases work flexibility for the business. (Q4)
Participants 3	Lacking in collaboration with suppliers reaches towards inefficiencies, cost improvement and disruption with on supply chain. (Q4)

Theme 4:

Effective kit management fosters order fulfillment to improve efficiency and reduce kitting errors and collaboration influence for kit to become available to boost performance in supply chain.

The effective kit management process helps the business to foster operational efficiency in supply chain process and also to mitigate error in kitting management. This phenomenon havesignificantly done with the help of packaging and grouping different aftermarket items into a pre-define kit, this streamline the aspects of order fulfillment through the reduction of error, improve efficiency and ales accelerate the time for delivery. Through the aspects of streaming of packing, picking and the entire process of shipping, kitting have minimizes error to increases the operational efficiency in the business line. Appropriate kitting management process emphasized with different benefits in the areas of faster process of order fulfillment, reduces in error picking, simplifies inventory management and also improvescustomer satisfaction.

The aspects of inventory kitting have process with a significant method for organizing the inventory aspects towards different kits for the purpose of sales or other uses. Each of this kit has remarkably assigned unique approachesof stock keeping unit that is SKU number. Organization

have physically panicking and organ organized with the help do using inventory management technology for defining SKU for the respective item that have stored within warehouse separately. Kitting has process with different type of effective features to boost supply chain process and the keyfeatures include process standardization and customization flexibility. Process standardizationhave remarkably process the phenomenon of standardizing process of kitting in order to improve consistency and also reduces error (Fatima *et al.* 2024). Through the establishment of a clear guild line to assemble kit, different warehouses have claim to ensure each order need to be package by following a particular constant way in regardless of changes in staff.

The respective approach helps business to achieve productivity faster, leaded to minimum mistake and a comparative smoother workflow. The standardizedprocess also contributes positively into cost saving phenomenon and positive customer satisfaction. On the other hand, customization flexibility derives with effective solution of kitting that is must become flexible for meeting diverse business need in accordance to product configuration in a unique way or else the requirement of scaling up demand on customization for kitting solution. Tailored solution for kitting enables different business to cater according to specificrequirementof the customers and offers several packaging about custom bundle. Enhancing operating efficiency and cost reduction helps businesses to achieve success to promote adequate supply chain process with a comprehensive manner. On the other hand, disruptive supply chain has negative impact on kit availability within the marketplace as it reduces the availabilityof product within marketplace. Goods and material flow disruption leads towards the aspects of delay and reduces output, this phenomenon have negatively impact of customer satisfaction. Based on the interview analysis it have found that, disruption in the supply chain process have leverage with the issues of natural disaster in accordance with floods, earth quick and other approaches. This phenomenon promotes to create a gap or lack in supplying kit product in the market and this negatively impact on business performance. Furthermore, there re different type of challenges that business within automobile industry has been facing and they are resource allocation, setup cost initially, space recruitment and other approaches. Kitting has demand to a dedicated resources availability that can strain time and labor towards other operations such as inventory management approaches. Initial cost fiord setting up kitting is also another important approach that builds challenges for

the business to arrange. The investment required to install packaging station, barcode scanner and also staff training.

On the other side, kitting station seeks for a designated space having les disruption for other operations. However, the study have found that, effective management of kit foster the order fulfillment for increasing the overall efficiency of the supply chain process in the automobile aftermarket supply chain process. It also leverage with reducing the error emphasizes with kitting. This is important for the business to maintain an error free kit development. The main reason behind this is that customer seeks for their required items and if they get item that they does not required makes them feel dissatisfied to purchase from the specific organization. Hence it is crucial for the automobile business to keep in mind that business only improves its operational efficiency and revenue with making customer satisfied and also looking after about their review (Kumar, 2025). Looking after customer review helps business to get an idea about the need of customer and their respective recruitment and any other aspects of changes.

This builds a positive opportunity for the business to make the changes according to customer preference and leaded the business towards success by selling maximum product within competitive marketplace. Collaboration with suppliers is an important aspect that creates a common platform to share about business or supply chain process specification, these practices helps customer to get entire idea about the operation efficiency. Business transparency have improved thorough the development of positive collaboration with several stakeholder of the supply chain process within the respective automobile industry in the process of selling aftermarket kits efficiently.

Transcript 5

Usability and Training Needs within Kit Management Systems	
Participants	*Responses*
Participants 1	"The system is good and it is user friendly but it needs periodic table updates that is for usability" (Question 6)
Participant 5	"It is quite challenging to operate and that is why a more visual user interface would assist usability". (Question 6)

Participant 7	"Workers face issues and struggle mainly with data entry and training on many shortcuts related to the system is required." (Question 6)
Participant 8	"Mostly easy but mobile app access would be helpful in improving flexibility". (Question 6)

Theme 5:-Usability and Training Needs within Kit Management Systems

The usability as well as the training needs of multiple kit management systems are significant for effectively ensuring seamless operations and employee efficiency also. It has been noted by participant 1 that the system is useful and it is also user friendly but the problem mainly lies in the requirement of periodic updates. The periodic updates are necessary in order to effectively maintain its usability. This is further reflecting a wider requirement for almost continuous system enhancements in order to appropriately adapt to the constantly changing operational demands, these are also necessary for accurate technological advancements (Lan *et al.* 2023). At the same time, participant 8 has further emphasized that mobile app access can be significant. As it could further enhance flexibility and this is further suggesting that integrating modern, different mobile-friendly features that are into kit management systems can strategically enhance both accessibility and usability.

Usability and training are very significant and these are considered crucial for accurate and even successful implementation as well as long-term effectiveness of KMS "kit management systems". A usable KMS should contain few qualities among them one is that it needs to be easy to learn. Additionally, a KMS also needs to be efficient to use, and should also be almost satisfying for whole users, while multiple effective training further ensures users can accurately leverage the several features and functionalities of the system. Usability within the kit management systems include different aspects which include learnability, efficiency, reduction in any issues and error, memorability and so on (Ntoa, 2025). The system needs to be almost easy to learn and it also contains clear instructions and several interfaces which are user friendly. Along with that the user should also be capable of accurately completing the different tasks and activities within a short duration even without any kind of unnecessary steps or any delays.

Another usability within the kit management system is including error reduction as the system needs to reduce any errors and should provide feedback which are helpful while any errors occur. In addition to that the users also need to find the system enjoyable and ultimately need to increase the adoption and positive experience for the users. There are also the needs of training for an accurate kit management system. It is essential to provide comprehensive training for different new interfaces of the system and also need to provide training on systems functionality as well as overall workflows. Advance training for the user is also required for the users who want to perform any complex task (Meyer *et al.* 2023). Another training associated with system update training, troubleshoot training are also included which will be helpful in meeting specific requirements. Customize training will be helpful which will be significant in meeting the specific requirements of different user groups.

The km strategy needs to be both dynamic as well as adaptable. However, through accurately prioritizing usability as well as the providing comprehensive training, organizations will be able to accurately ensure that the different kit management systems are effective within their firm. At the same time the organization will also be able to ensure that the kit management systems in companies are user friendly and also leading to the higher rates of adoption. All these aspects are further significant in improving the efficiency of the work flow and ultimately helpful in providing better results which are significant for companies (Foshammer *et al.* 2022). Hence it becomes very essential for the firms to priorities usability and also need to invest in comprehensive training that will be ultimately helpful for them to get beneficial outcomes within the workplace. Furthermore, organizations can also assist the workers through training that helps them to get an understanding about the kit management practices and its advantages for the study.

Apart from that, participant 5 has further highlighted the several challenges which are ultimately faced by the staff within operating the system. It is further advocating for a clear interface in order to simplify operations. This is further aligning with the findings within usability research which ultimately indicate that it is visually interfaces and are significant in decreasing the learning curve for workers and also helpful in enhancing the overall productivity. It has been shown within the study that system designs that are with the user feedback within might are significant in improving operational efficiency and also very helpful in boosting employees at

affection and decreasing any errors. In addition to that, the integration of different advanced technology which include Artificial intelligence interfaces and also the integration of different real time data analytics is the key source which can enhance system usability and it can also enhance the training effectiveness.

Transcript 6

Multiple Consequences of Kit Quality and Errors	
Participants	*Responses*
Participants 1	"Incorrect components of the kit may further cause almost a week-long delay within production." (Question 7)
Participant 5	"The issues or any errors within kit are leading to additional cost for labor to deal with issues." (Question 7)
Participant 7	"The incorrect labelling of multiple kits is ultimately creating confusion within the warehouse operation." (Question 7)
Participant 10	"Insufficiency of quality checks within kits further led to complaints from several distributors." (Question 7)

Theme 6:-Multiple Consequences of Kit Quality and Errors

The kit quality issues and different errors have caused a number of consequences which are ultimately impacting the product timelines and have a direct impact on financial cost along with the overall operational efficiency. It has been identified that participant 5 has said that incorrect components of Kit have been the main reason which has ultimately caused weak long delay within production. It is further highlighting the direct impact of any kit errors on the performance of the supply chain. At the same time participant 7 has further emphasized the confusion which is directly caused by any incorrect labeling of any kits that is mainly within the warehouse operations. It can further disrupt the flow of the work and it may also cause any kind of delay in the fulfillment of the order.

Apart from these participants, participant 10 has accurately pointed out that insufficient checks of the quality may further lead to complaints from any distributors which is underlining the significance of accurate protocols for assurance. All these findings are consistent with the study that is further accurately linking the preparation of the design to the error rates and also the different operational disruption. However, addressing all these issues are very necessary and it also further requires a multifaceted approach (Haftor *et al.* 2021). It includes enhancing the protocols which are associated with quality control and in addition to that it is also including a better labelling system. The approach also needs to prioritize the accurate integration of different technologies which are significant in detecting any kind of errors.

Poor kit quality and any errors that are within the kitting processes can directly lead to several consequences. These are mainly including increased costs, decreased productivity, and potential damage to reputation. All these consequences mainly arise from different errors such as wrong or any missing components. These issues also directly arise from any damaged parts, and any incorrect quantities. All these are also further impacting assembly lines and customer satisfaction as well. It is seen that the Poor-quality kits are directly necessitate rework, scrapping of several defective components, and damaged parts disposal and all of which also incur costs. At the same time any Defective products or any defective materials can directly lead to customer returns and may also lead to lost sales (Pan *et al.* 2022). These aspects are also further impacting profitability. Along with this area, Inaccurate kitting can also lead to inventory discrepancies which is also making it problematic to track and manage several materials effectively.

However, for instance leveraging artificial intelligence as well as machine learning are very significant which can be helpful in recognizing and also significantly in accurately rectifying any issues within real time. Furthermore, these are also beneficial in reducing any disruptions and are also significant in minimizing the costs which are associated with this (Tzampazaki *et al.* 2024). In addition to these areas, accurately fostering a culture which is prioritizing accountability and also prioritizing continuous improvement are very necessary within the organization as it will be helpful in enhancing the quality of the kit. These are few significant strategies that are the key areas and strategies for the firm that help them to manage issues and enhance quality of the kit.

It has been identified that Kitting can directly compromise the overall quality of the assembly process, as multiple kit errors may occur even during kit preparation. Additionally, it has been

identified that the Kit errors further lead to costly disruptions that are mainly if they reach the assembly process. For instance, requiring the assembly process to stop, that is even unless the accurate components are supplied within the right time, or also that the several wrong components have been assembled onto numerous end products. However, the kit errors that can also arise with kit preparation are mainly including wrong components, any missing components, and it may also include damaged components (Fager *et al.* 2021). Furthermore, these are also including the wrong quantity of several components, and any components that are wrongly positioned within kits. Furthermore, it has been seen that location is almost critical, mainly for the response time of supplying many components to correct any kit errors.

Quality control is very essential and it accurately serves as the careful guardian, further ensuring that each kit is helpful and it also meets or even exceeds almost the highest standards. In addition to that, the Quality control is also referred to as the frontline defender of the reputation of the brand. Furthermore, it has been identified that even a single defective kit can be problematic and it may also tarnish the image of the firm or the brand and may also destroy the established trust of the consumers towards the brand (Newstreaming.com, 2024). Furthermore, errors within kitting can directly lead to several costly consequences. These consequences may be even from production delays to also lead to any potential recalls. A thorough process of the quality control is helpful in minimizing any errors in assembly, any packaging, and also labeling that are ultimately saving both time as well as resources of the businesses.

Transcript 7

Impact of Kit Management Systems on Aftermarket Sales Performance and Customer Satisfaction-	
Participants	*Responses*
Participants 1	"It helps in enhancing brand reputation through reliability." (Question 8)
Participant 2	"This is ultimately leading to quicker fulfilment of the order of the customer." (Question 8)
Participant 5	"Contributing to better market competitiveness." (Question 8)

Participant 8	"It is further ensuring overall sales revenues within the firm." (Question 8)

Theme 7:- Impact of Kit Management Systems on Aftermarket Sales Performance and Customer Satisfaction

The efficiency of the kit management is playing a significant role in accurately enhancing the performance of the aftermarket sales. At the same time the kit management systems are also beneficial for customer satisfaction. Participant 1 has been the major key person who has accurately highlighted that the enhanced as well as improved kit management is the key source which is ultimately enhancing the reputation of the brand with reliability. The participant has also highlighted that it is a significant and key factor in accurately building the trust of the customer (Naru *et al.* 2024). Apart from participant one, it has been identified that participant 2 has further discussed that it is the key source in accurately facilitating quicker fulfilment of the orders of the consumers which is ultimately contributing to higher level of customer satisfaction. Apart from these two participants there was participant 5 as well who has noted that efficient kit management systems is the key source which is ultimately improving the market competitiveness.

On the other hand, participants have mentioned that it has accurately emphasized the significant role in accurately increasing the overall revenue of their sales. However, all these observations are ultimately aligning with their studies that are also linking the quality management systems to enhance satisfaction as well as financial performance within the automotive industry. Investing within the different advanced kit management systems is very significant which will be the key source in accurately stream dining operations (Ji and Han, 2022). Apart from that the investment which will be made for the advanced kit management systems are also the key areas which will be helpful in strengthening the relationship with the customer and significant in driving the revenue growth of the organization. The organization which is prioritizing all the systems are very significant and these are also accurately positioned in order to accurately achieve long-term success even in the highly competitive market.

Hence it became crucial for the firm to priorities this area and make investment in this area in order to gain better and beneficial outcomes. Along with these areas the accurate integration of different predictive analytics as well as real time tracking capabilities. Other key areas which are very essential in accurately enhance the overall effectiveness of the kit management systems through accurately anticipating the requirements of the customer. It is also accurately ensuring timely delivery. The organization is able to get another significant advantage by meeting the needs of the consumers and also ensuring the accurate and time delivery (Mustak *et al.* 2024). Organization will be able to achieve a particular competitive age even in the highly competitive market. This approach is also very crucial in accurately boosting the satisfaction level of the customer. Another advantage from which the company can gain is that it is also boosting its long-term loyalty from the customer side.

Kitting is helpful as it is ultimately providing a large amount of value to many customers, and they can also accurately increase sales for many companies as well. Though the firms or any companies will be effectively selling their items even at a lower price, then ultimately the popularity of many bundled products will mostly lead to an increase within sales volume. In return it will be a key source in accurately generating huge profits (Shahikian, 2019). Apart from these advantages, another significant way in which kiting accurately improves satisfaction of the customer is that it is accurately making it easy for them to effectively purchase whole sets of products even instead of looking for them individually. This particular sort of convenience is ultimately taking the stress even out of shopping. This further ensures that consumers are appropriately purchasing products that accurately complement one another. Kitting also appeals to many customers who are finding any purchase gifts for others.

The Kit Management Systems are also ensuring the accurate stocks have been available even at the right time which is ultimately helpful in decreasing any delays and also improving the services delivery. In addition to this through accurately minimizing stockouts as well as overstocking, all these systems are the key source in enhancing the profitability and also have a positive impact on operational efficiency. The accurate automation of different processes which is mainly including order tracking, inventory updates as well as the fulfillment are the other key areas which are playing a significant role in decreasing any manual errors (Balci, 2021). At the same time these are also accurately accelerating operations. Several advanced analytics tools are

the key source in accurately providing kit management systems and it is further enabling the business to accurately forecast demand. It is also helpful in optimizing the levels of stock within the organization. This proactive approach is further ensuring better allocation of resources.

Along with these areas, this is also helpful in maximizing the opportunities of sales within the firm. It also has a direct impact on the customer satisfaction as effective kit management systems are also helpful in providing better services through delivering the products in an accurate time to the customer (Soniya, 2019). Furthermore, this is also significant in customization and personalization which allow the business to accurately tailor to the different needs and requirements of the consumers and need them personalized services which are provided by them. These systems are very helpful in enhancing the experience of the customer and also fostering and establishing long term relationships with many customers.

Transcript 8

Challenges and Barriers in Implementing Changes to Kit Management Systems	
Participants	*Responses*
Participants 2	"Multiple regulatory and compliance issues and challenges are one another barriers." (Question 9)
Participant 3	"One significant challenge is the space constraints within the warehouse facilities". (Question 9)
Participant 7	"Issues are present in forecasting demand appropriately." (Question 9)
Participant 10	"Resistance to changes among workers is one another problem." (Question 9)

Theme 8:-Challenges and Barriers in Implementing Changes to Kit Management Systems

Implementing any changes to kit management systems can also face a number of challenges. These challenges and barriers are mainly including resistance to change, inadequate communication, lack of required leadership support, and it is also including insufficient resources. All these issues can further hinder the successful adoption of several new systems and

multiple processes. The workers may be almost hesitant to adopt any new systems mainly because of the fear of any loss of control or may also because of the preferences for the different practices which are already existing. Apart from resistance to change the other challenge is including inadequate communication as the lack of clear communication may also directly lead to misunderstanding. A great leadership support is also required but the lack of leadership support may cause many issues and the employee may also find issues in dealing with new systems.

Organizational culture is playing a significant role in accurately determining the overall success of different new systems within the workplace. A rigid organizational culture which is mainly characterized by different aspects such as resistance to change and adherence to several traditional practices and also related to the lack of flexibility may cause a number of issues. All these aspects which are associated with the rigid organizational culture. These are hindering the accurate implementation of different innovative systems within the workplace. Rigid culture is discouraging open communication and it is also discouraging collaboration which are necessary for successful adoption of the system (Vargas-Halabi and Yagüe-Perales, 2024). A lack of adaptability within the organization may also cause issues and prevention for the firm from changing market demands. However, it is very essential for the firm to accurately cultivate a culture which prioritizes both adaptability and innovation.

Technical issues and challenges are also present in implementing any kind of changes within the accurate kit management systems. These are mainly including software compatibility; data migration and it is also including system integration (Shibl *et al.* 2021). Data migration is mainly involving transferring several data that is from one system to another which may be quite complex. This is particularly because of the differences which exist within data formats and structures. However, the risks are mainly including loss of data or also including duplication which is mainly during the process of migration (Hussein, 2021). The solution for the challenge which is associated with Data Migration is including a well-defined data migration strategy which includes validation and testing. It also includes data mapping. Integrating several systems to any function which is as a significant unit can also be problematic.

Apart from these issues and challenges which have been discussed above, the insights which have been provided by the participants have also highlighted several natures of the challenges in

accurately implementing any changes within the kit management system. However, through accurately analyzing all these responses it becomes quite evident that addressing all these issues need a combination of planning and effective communication and other aspects as well. It has been seen that the participant who has mentioned the issues which are associated with regulatory and compliance which ultimately underscores the significance of staying up to date with the constantly changing regulations (Raghuram and Arjunan, 2022). Apart from that, the observation made by participant 3 is about the space constraints further emphasizing the requirement for different innovative solutions of storage and also highlighting the significance of different management practices which are associated with efficient warehouses.

There is another participant as well who is mainly focused on demand forecasting. It is further highlighting the overall advantages of data driven decision making that is significant in further ensuring the operational efficiency. Apart from that participant 10 has been very beneficial who has discussed about the resistance to change that is among workers. It is further illustrating the advantages of accurately fostering a culture of both continuous learning as well as adaptability within the workplace. All these insights which have been discussed above are accurately serving as the strong foundation for systematically developing strategies in order to overcome the challenges and barriers which have been identified. These are also ensuring the accurate and even a successful implementation of different challenges changes which are associated with multiple kit management systems.

The insufficient space within the warehouses is further hindering the storage along with organization of multiple kits; it is making it very difficult to accurately implement different systems in an effective manner within the company. The space constraints may directly lead to any kind of inefficiencies which is ultimately increasing the overall costs of operational activities and are also leading to delays within the distribution of the kit (Tang *et al.* 2022). The strategies which are helpful in addressing this concern is accurately optimizing the warehouse layouts in order to accurately maximize the utilization of the space.

Apart from that it is also very essential for the organization to accurately implement vertical storage solutions that will be helpful in dealing with this issue. Another challenge is including demand forecasting issues however it is also very problematic in systematically predicting the demand for kits within a complex task. The poor forecasting may directly lead to overstocking

which may also have a negative impact on the customer satisfaction and also cause a negative impact on operational efficiency within the firm (BELACHEW, 2022). However, the strategies which are very significant in accurately dealing with the demand forecasting issues are including advanced analytics uses. It also includes the use of different machine learning tools that are significant for demand forecasting.

4.3: Discussion

4.3.1 Discussion of the primary data analysis

In this increasingly globalised and interconnected world, technology is crucial to supply chain management. Supply chain planning software, inventory management systems, and real-time analytics tools give businesses the visibility, agility, and reactivity they need to swiftly adapt their operations to changing customer demands and market conditions. The automotive sector and its stakeholders have effectively developed numerous strategies and adaptive measures to address issues, and they are now in a position to neutralise the situation for future growth, productivity, and stability (KHONDAKER and CHOWDHURY, 2022). In its most basic form, effective supply chain management is a complex process that requires cooperation, innovation, and continuous improvement. Through process improvement, technology use, and customer demands, firms may create robust and competitive supply chains that can propel success in a market that is continuously changing. As per the findings of the primary data analysis, organisations aim to boost sales through implementing better kit management practices, which should further focus on reinforcing these core relational and operational practices.

The automotive supply company needs to give supplier selection top priority in order to maintain its success in the fiercely competitive global market of today. One important area of the economies of industrialised countries is the automotive sector, which requires effective supply chain management. The network of businesses, assets, operations, and technological advancements involved in the design, production, distribution, and maintenance of automobiles and their component parts is referred to as the supply chain in the context of the automotive industry. Findings of the study illustrate that while supplier relationships are valued, communication and integration strategies may be strengthened to increase supply chain efficiency. On the other hand, companies can reduce any effects by putting in place strong

supply chain management and plans that are prepared for future betterment (Dang *et al.* 2021). Hence the findings of the study also indicate that the investment into staff development and training is essential to boosting productivity in the automotive sector.

Employees with proper training contribute to a healthy work atmosphere that encourages continual growth, are more productive, and make fewer mistakes. Every stage of the automotive supply chain, which is distinguished by its high degree of complexity and interconnection, involves a large number of stakeholders. As per the study findings of Saragih *et al.* (2021), In order to save costs, choose the best technology, offer alternative ideas, and aid with design review, suppliers can get involved early in the product design process. For ensure that operations will go smoothly and that vehicles and components will be delivered on time, various stakeholders must successfully coordinate and collaborate with one another. Globalisation, outsourcing, and just-in-time production methods are some of the factors that have further influenced the dynamics of the automotive supply chain in recent years. The findings of the primary data indicate that the automotive aftermarket industry's sales performance and productivity can be further improved by targeted improvements in lead time reduction, supplier coordination, and communication.

A number of quantitative and qualitative aspects which influence the decision-making process are making the supplier selection process complex and dangerous. The supplier selection method is an essential component of procurement (Easa and Blonder, 2024). For satisfy the substantial demand, the supplier must have the proper supplier selection approach. The procurement will identify numerous suppliers prior to implementing the selection process, which begins with information sharing. This procedure is crucial since it will impact a company's success. Finding and working with suppliers who best satisfy an organisation's needs in terms of quality, pricing, delivery, and dependability is the goal of the selection process. Prior to talking about supplier selection techniques suitable for the automotive industry, it would be helpful to have a general awareness of all approaches now in use. Findings indicate that the automotive aftermarket industry's sales performance and productivity may be further improved by implementing focused enhancements in lead time reduction, supplier coordination, and communication.

For companies hoping to increase customer happiness, optimise processes, and turn a profit, effective aftermarket supply chain management is essential. Businesses must implement best

practices that allow them to confront these difficulties head-on, given the growing complexity of the global marketplace and the rising demands of their clientele. In order to provide readers a thorough grasp of the topic, we will look at insights from several angles as we examine some of the most important best practices for aftermarket supply chain management. However, through guaranteeing that every part is on the market at the appropriate moment, kitting services assist organisations in increasing productivity and minimising waste. Kitting increases the overall accuracy of supplying products with the fewest possible errors in the automotive aftermarket supply chain process (Columbine and Seder, 2025). The fitting process is regarded in the automobile industry as one of the key supply chain management strategies that aids equipment manufacturers in effectively meeting or fulfilling orders.

Collaboration and communication are two of the most important components of an efficient aftermarket supply chain management system. For guarantee smooth coordination and an effective flow of goods and information, suppliers, manufacturers, distributors, and service providers must work closely together. Businesses can minimise lead times, improve inventory levels, and proactively handle possible concerns by building good partnerships and encouraging open lines of communication. Implementing real-time data sharing and collaboration systems, for instance, can give all stakeholders access to current and accurate information, speeding up decision-making and improving supply chain visibility overall (Ardolino *et al.* 2025). Study primary findings indicate that the automotive aftermarket industry's sales performance and productivity can be further improved by targeted improvements in lead time reduction, supplier coordination, and communication. It suggests that substantial improvement in sales dynamics cannot be achieved through general coordination alone, without strategic cooperative planning or communicational dynamics. It may also reaffirm that more aggressive and in-depth supplier collaboration is required than just regular coordination.

Excellent aftermarket supply chain management requires precise demand forecasting and excellent inventory control. Businesses may predict demand more precisely and lower the risk of stockouts or excessive inventory levels by utilising historical data, industry trends, and consumer insights. More accurate demand forecasting and pattern recognition can be achieved with the use of machine learning algorithms and advanced analytics technologies. Additionally, optimising inventory levels, reducing carrying costs, and increasing order fulfilment rates can be achieved

by putting in place a strong inventory management system that works with demand projections. For example, businesses can cut excess inventory while maintaining product availability by implementing just-in-time (JIT) inventory management techniques. The Just-In-Time (JIT) principles increase efficiency and reduce storage costs by aligning material supply with the production schedule, hence reducing inventory levels (Sarker and Biswas, 2020). In addition to ensuring that only high-quality kits can reach customers, routine inspection within the company aids in the early detection of discrepancies or faults and concentrates on building the brand's credibility and fostering a recurring business model.

4.3.2 Discussion of the secondary data analysis

The study has mentioned that the aftermarket supply chain within the automobile industry is being accurately processed with the implementation of kitting management in order to accurately boost performance of the business. A number of participants have shared their perspectives on the improvement of kit productivity and mentioned how kit productivity is enhancing the business revenue (Ayyappan and Sankeetha, 2024). One participant has mentioned that kit productivity improvement is the key area that is significant in fostering increased business revenue and the overall management process of many kitting practices. From another participant it has been identified that Kit management is accurately maintaining a particular optimal inventory for appropriately meeting demand even without facing the overstocking aspect. Maintaining a particular record with the inventory level is optimizing significant storage space for reducing the overall cost.

In addition to that, from the findings of the study, it can be known that improvement of the kit productivity within the automobile industry within the supply chain process is particularly focusing on accurately streamlining. Furthermore, the secondary data analysis of the study is highlighting that accurate forecasting is significant for the business performance. It is the key area that enhances the business performance in determining accurate quantities regarding several components. This also helps businesses to accurately finish multiple kits for both further production and restocking (Vaka, 2024). Customers most often seek to purchase any products that are current and are also up to date to use. However with the assistance of the demand forecasting business are able to actively positive perception of the customer. It allows the business to make the customer satisfied with appropriate products.

The secondary data analysis of the study has mentioned that inventory management has a direct affect on the kitting reliability by poor management of several inventory aspects. Along with this area, ensuring a particular level of inventory and also the operation of an accurate warehouse is significant to decrease any delay and also assist to effectively derive a well-functioning warehouse. The effect of inventory within the process of the supply chain process of kitting is significant that emphasizes production areas (Şenaras *et al.* 2025). By the accurate utilization of an easily accessible along with standardized management system, technicians are very responsible for accurately assessing the specific part quickly, reducing both delays and errors. The approaches that are associated with a hassle-free management of kit ultimately enhance the customer satisfaction approaches even within the respective automobile industry. It is mainly through process simplification and also by error reduction.

Furthermore, with the secondary data analysis of the study, it has been concluded that effective kit management is the key source in accurately fostering fulfillment of order. Accurate kitting management process is helpful that emphasizes several benefits within the particular areas of faster process of order fulfillment. Additionally it also reduces error picking and along with that it is also helpful in simplifying inventory management and enhancing customer satisfaction. Customer satisfaction is very significant for the businesses as businesses are able to improve their operational efficiency and revenue mainly when their consumers are satisfied. The organization can get several advantages by accurately meeting the constantly changing needs and requirements of the customers (Mustak *et al.* 2024). However, collaboration with many suppliers is a significant aspect that is the key area in creating a common platform to accurately share about business or may also share about specification of the supply chain process.

From the secondary data analysis, it has been seen that there is a requirement of training within the kit management systems that help to gain overall advantage spoof the systems within the firm. Participant 1 has mentioned that the system is useful and also user friendly but the problem mainly lies within the particular requirement of periodic updates. The findings of the analysis suggested that the periodic updates are necessary to appropriately maintain its usability. Usability that is mainly within the kit management systems includes a number of aspects which mainly include learnability, efficiency and reduction in error as well as memorability (Balci,

2021). Along with these areas, it has been recognized within the study that advance training for the user is very necessary for the users who want to perform any complex activity or any task.

There are several consequences of the kit quality and errors within the business performance. The kit quality issues and many errors have further several consequences which are ultimately impacting the product timelines and it also has a direct impact on financial cost and overall operational efficiency. The secondary data analysis has also contained multiple responses of different participants, among them it has identified that participant 10 has accurately pointed out insufficient checks of the quality. It also further directly leads to many complaints that are directly from any distributors which is further emphasizing the importance of accurate protocols for assurance. The findings suggest that leveraging AI “artificial intelligence” and ML “machine learning” are very significant in managing multiple errors (Tzampazaki *et al.* 2024). These areas can be very helpful in recognizing and helpful in accurately rectifying any issues even in the real time.

The Kit Management Systems are beneficial that are also ensuring that the accurate stocks have been available even at the required time. It is ultimately helpful in effectively reducing any delays and also enhancing the service delivery. The accurate automation of multiple processes is mainly including order tracking, inventory updates and it also includes the fulfillment. These are the other key areas which are playing a crucial role in effectively decreasing any manual errors. In addition to that, the findings that have been obtained from the secondary data analysis of the study has also provided knowledge regarding the challenges and barriers while implementing kit management systems within the firm. Implementing any changes to kit management systems may face many issues and challenges (Tang *et al.* 2022). These challenges are mainly including resistance to change, any inadequate communication, lack of necessary leadership support, and any insufficient resources.

4.4. Summary

The chapter has provided information with the help of both primary and secondary data analysis. These two analyses have been the major source in providing deep insights on the study topic. The above chapter has presented the analyses that have discussed how the effective management of kits within the automobile aftermarket supply chain can be significant in enhancing both sales

and productivity. It has analyzed in the above chapter that the automotive sector and its stakeholders have accurately developed multiple strategies and numerous adaptive measures to address issues. It has also identified that they currently accurately position to effectively neutralize the place for future growth, productivity, along with stability. In this chapter, it has also mentioned that it is essential for the automotive supply company to give supplier selection top priority that assists them to accurately maintain its success even within the competitive market.

Furthermore, the secondary data analysis of the study in this chapter has highlighted that accurate forecasting is required for the business performance. The findings in this chapter have further suggested that the periodic updates are necessary to appropriately maintain usability of the kits management systems. Accurate kitting management process has been very helpful that is leading to many benefits within the particular areas and significant for even faster process of order fulfillment. Apart from that, in this chapter it has also recognized that the kit quality issues and many errors have numerous consequences which are ultimately impacting the product timelines. It also has a direct impact on financial cost and affects overall operational efficiency.

Chapter 5: Conclusions, and implications

5.1 Introduction

This chapter of the study summarizes the findings and the other significant points that have been elaborated within the study. In this chapter it is discussed what methods and different techniques have been employed within the study to gain information about the research topic. The topic is enhancing both productivity and sales by kits management systems within the automobile aftermarket supply chain. Furthermore, this chapter also provides a summary of all the above chapters that have been discussed above. Apart from discussing the findings that are obtained in each chapter of the study, the chapter also provides future implications of the study. It mentions how the study that has been conducted are beneficial and why it is a significant area of the research. Along with this, the chapter also discussed in what ways the study can be beneficial in practical implications and for whom the study will be a significant source of reading.

The impacts of several kit management practices within the supply chain have been discussed in this study. Furthermore, the advantages of kit management in both sales performance of the organization and its periodicity have been examined in this chapter. Additionally the study has provided a sound knowledge on how training will be the key source in accurately using kit management practices. The study has many advantages and it is the significant source of information that is providing deep insights on the advantages of the kit management practices. There are multiple issues that may occur when the quality of the kit is not good, hence the study has provided strategies recommendations for the firm to accurately deal with these kinds of consequences.

Along with this information, in this chapter there will be a discussion on how the study has gathered information from multiple resources in order to make the study more informative. Primary along with secondary data have been gathered for the study that is providing practical insights along with theoretical knowledge. Furthermore, theories have also been discussed in the study that help to know how kit management practices can be effective in business areas. At the same time, this chapter also discusses what are the major obstacles faced by the organization while implementing kit management systems within their business practices.

5.2. Conclusions

The first chapter introduction of the study has mentioned the significance of effective kit management and highlighted the overall aims and goals of the study. In this chapter it has been identified that accurate management of kitting in the automotive aftermarket can particularly boost productivity and also sales. Furthermore the study has aimed to accurately address the issues and the barriers that are connected with the inaccurate inventory management within this market. In addition to this, it has been identified that the automobile market supply chain has been very serving as a critical component in effectively ensuring the availability of the several parts which are necessary for vehicle maintenance. The significance of the study has also been discussed where it has been mentioned that the significance mainly lies in recognizing the importance of kitting in enhancing business sales.

The second chapter of the study has been a significant source in providing deep insights of the topic. The chapter is providing a sound knowledge of the need of kit management in the supply chain. Additionally, the chapter also provides information regarding the design and the performance of the kit preparation. In this area, it has recognized that any mistake by humans during the preparation of the kit may cause kit defects and it may further increase the assembly costs. Along with that in the above chapter it has analyzed that there are multiple factors that have direct impact on the kit management. Relationship management has found to be one major factor that has an impact on this particular area.

Additionally, the study has discussed the relationship that exists between the supply chain productivity and the dynamic associated with the kit management. In addition to this information, the above discussion also revealed that an accurate and efficient management of a kit is mainly involved in accurately managing and organizing the multiple components. The importance of customer satisfaction for the business has also been mentioned in this study, where it has recognized that when a customer is satisfied with the company then they will make repeat purchases. These are ultimately significant in driving the sales performance of the company that helps them to gain benefits in the highly competitive market. Use and application of DMAIC methodologies have also been discussed in this study. The aim of this methodology is to accurately adopt to enhance the production process that helps in decreasing the cost of prediction.

The significant management of kits within the automobile supply chain for aftermarket products has crucially emerged to enhance overall sales of the business and its operational productivity. Kit, which remarkably comprises a group of different interrelated components or parts, have bundled together for specific maintenance or repair. Maintenance plays a vital role for streaming operational activity effectively, reduces lead time and improves overall service efficiency for both the approaches of customers and suppliers (Pakkala *et al.* 2024). The respective research paper has critically analyzed how adopting a strategic management of kit can further positively influence entire supply chain performance. The study has developed appropriate findings from the chapter of data analysis through survey and interview process and literature review that a structured approach towards the development of kit configuration, distribution, and inventory control takes part in reducing errors in order, increasing the fulfilment rate of orders and enhancing customer satisfaction significantly. Through the organization of different essential parts of the automobile industry, a kit has been developed and is often required for service.

Through the respective approach, organizations have reduced the burden of packing different products individually and their respective shipments, which causes for reputational delay. Furthermore, the study have also concluded that, kit management approaches have significantly reduces the complexity related to downstream partners such as dealership, service center and garages. The respective stakeholder have work only with a definite time constrain, require dependable and faster access for correct parts. On the other side, the pre-assemble kit remarkably assures to get each of the product that are crucial to do the job of repairing within one particular package (Hegde *et al.* 2024). This phenomenon have not only increases the operational efficiency it also promotes positive loyalty to the suppliers by offering the kit. From the standpoint of productivity the management of kit heals for the optimization of warehouse operation. Storing and assembling the items of a kit enables for a quicker packing, picking and also shipment process.

The respective phenomenon improve or increase warehouse throughput, it also benefits by reducing cost of labor due to fact that fewer manual interventions are required for packing and locating individual parts. In return, the operational efficiency have translated to a faster time for delivery and achieved better responsiveness based on customer demand. Moreover, through the implementation of digital technologies, in the areas of RFID tracking systems, barcode systems and software of “enterprise resource planning (ERP)” is instrumental for increasing kit accuracy,

track ability and stock visibility. The advanced process of data analytics can be effectively used for fostering demand associated with different kits according to historical trends, cycles for vehicle maintenance and also seasonal variations to ensure stock level optimization and reduce excess stock out and inventory level.

5.3 Implications and applications Future research

The findings based on the research paper on kit management within automobile aftermarket supply chain process reveal a significant range for operational and strategic benefits that realized with the help of adequate and thoughtful implementation. Thus, the research paper have highlighted different areas that have warrant for further development and exploration. The aftermarket of the automobile industry continues for evolve technological advancement, changes in the preference of customers and also globalization the understanding about kit management application and its implication became more critical. The respective section delve through practical application based on findings.

Industry practice implication:

Productivity, engagement and ***operational efficiency*** have significantly improved the the implication of kit management practices within automobile aftermarket supply chain process. Through the integration of the kit management process within the operation of the supply chain, leads towards the enhancement of warehouse efficiency, shipping activities and picking practices. Through the development of different part, bundling is frequently used together; the business have significantly have significantly become able to save their respective time to fulfil the process. Companies should consider the redesigning in their workflow and warehouse layout for accumulating operation that are kit based with more accurate manner. ***Inventory optimization*** is also an important aspects that implore with the incorporation of kit management aspect through the reduction of reducing the need to stock individual items separately (Tiwari *et al.* 2024). The bundle have effectively reduced SKUs that further simplifies inventory tracking processes and reduces overstock situations or stock out hazards.

The real-time inventory through the management system has been integrated through predictive analytics, positively optimizing kit availability. Furthermore, the organization of the automobile industry should implement in the dynamics of inventory optimization, which adopts the latest compositions according to demand trends. ***Positive service quality and customer satisfaction*** is

crucial for business to enhance their number of sales and mane the business successful within the competitive marketplace. Kit design according to customer requirement improve the overall experience of service for the end-users, they are vehicle owner and mechanics (Hauslbauer *et al.* 2024). Hence, by receiving a ready-to-use comprehensive kit reduce delay due to having any issues related to missing part. The future strategies need to include kit personalization according to customer preference and their requirement and this enhance customer satisfaction and they often purchase product from the respective organization that have been maintaining the fact. The improvement in ***demand planning and forecasting*** also plays vital role in developing product that are required instead of kitting maximum items that are not required in the market.

Supply chain applications:

The original manufacturer of equipment's use kits for offering consistency package for service across service network and dealership (Titu *et al.* 2025). It ensures service delivery standardization and significantly promote brand loyalty. The kit also facilitates servicing warranty and scheduled program associated with maintenance. Future study could examine impact in branding and also consumer trust through OEM-branded kitting. ***Wholesalers and distributors*** are the stakeholders that can enhance value position through offering the curated kits which cater towards a market segment specifically. Online relater benefited from the aspects of bundle kit as a part of the solution as DIY for customers. E-commerce platforms and retailer's offers tutorial through online video, guides for installation and also customer review alongside product listing to reach a high conversion rate. The independent workshops and dealers can remarkably streamline operations to reduce the time of service with the uses of kit. The solution relating with pre-packing eliminates the guesswork and also ensures compatibility of parts.

Limitations and challenges in implementation:

The implementation of the kit management process in the automobile industry have process with several challenges and issues to address. Cataloguing and data inconsistencies are subject to being one of the main issues in terms of maintaining consistency and accurate information across several suppliers and also platforms (Gameti and Singh, 2024). Standardizing description parts, compositions in the kit and information related to the kit is important. Hence, future research needs to propose a universal process of data framework and block chain that is based on decentralizing the part tracking process accurately. Maximum standardization also creates an issue for the customer to understand and it also increases the complexity of operational

customizations. The modular kit, which allows the optional components to be processed with a balancing solution. Research through the principle of modular kit design and also the customer preferences process of modeling is expected to be beneficial for the business to achieve success.

The barrier through the integration of technological aspects is another challenge to adopt kit management aspects (Kronlid *et al.* 2024). Hence, through the incorporation of new technologies through legacy systems become complex and costly. The organization need to proceed with an effective plan for transition to minimize disruption. Further, the study through the scalable adoption of the technology module and the phased implementation roadmap requires. The implementation of kit management process within the supply chain globally creates issues in the aspects of change management and workforce training. The employees need to adapt and understand about the adoption of kit-based workflow within the automobile industry. Resistance towards changes can create further barriers to achieving success. Incentive structure, educational program and design participatory process could ease the respective transition. A change management behavioral study within the context of the supply chain would add remarkable value.

Consideration of environmental aspects and sustainability is another challenges occur due to kit management practices within the automobile supply chain process. Additional packaging is critically included in kit management, and this may contribute towards environmental wastage. However, through the implementation of smart packaging, design and recycling can minimize the respective issues. Sustainable packaging research solution and the impact on lifecycle kit assessment are necessary.

Directions for future research:

Machine learning and artificial intelligence

The implementation of a machine learning (MI) and artificial intelligence (AI) within kit management process for the aftermarket supply chain in automobile industry considers remarkable opportunities to improve operational efficiency, customization and responsiveness (Banerjee *et al.* 2024). The respective technologies are responsible for driving the transition from reactive towards proactive strategies in the supply chain process, specifically in demand forecasting areas, kit configuration dynamics and inventory optimizations. ML and AI further used for processing a vast amount of real-time data and historical aspects, including records for vehicle maintenance, purchasing behavior of consumers, seasonal trends and also feedback of the

service center. It enables demand more accurately fostered and helps the organizations anticipate which kit is essential for them. The algorithm in machine learning in the areas of gradient model for boosting and neutral network facilitates dynamics in kit compositions. The respective module have all-time leader from new information input and also adjust the contents relating with kit accordingly. This one-on-one ensure that remaining relevant for emerging different customer needs. The particular initiative is valuable within a market wherein customer preference and car models are evolving constantly.

Block chain for transparency in the supply chain

The technology of block chain has offered a revolutionary approach for enhancing the transparency, trust and track ability in the supply chain process of the automobile industry (Oriekhoe *et al.* 2024). The immutable nature and decentralization of block chain derives it ideally suited for addressing key challenges in the areas of inaccurate documentation, counterfeit parts and a lack in visibility across tiers of the multiple supply chain. Through recording each movement and transition of kit component with the help of a block chain ledger entire stakeholder, including the distributor, manufacturer, end customer and service center, have leverage in accessing a single source of the truth.

Kit adoption and consumer behavior

Understanding about the customer segments differently perceive and also use kit can significantly inform marketing strategies and designs (Huang *et al.* 2024). Kits are effectively designed for offering cost cost-saving approach, convenience and compatibility for both customers and organizations. But, the perceived value varies depending on the amount of several customer segmentations. The factors of mechanical budge, ownership duration, perceived quality, brand loyalty and after-sale service entirely influence customer perception for using or purchasing kits.

5.4. Summary

From the above study it can be summarized that, the effectively kitting management process helps business to improve their operational productivity in the areas of supply chain process. The application and implication of kit management process within automobile aftermarket are considered extensive and touching on each aspect of supply chain. As the competitive is intensified the expectation of customers have also raises hence, the organization need to

incorporate the phenomenon of kit management process witching supply chain practices. Embracing the strategy related to kit management deliver a substantial gain but at the same time it require investment, commitment and also collaboration among stakeholders. Furthermore, future research need to address evolving opportunities and challenges that are presented through technological advancement, changes in the market dynamics and also concern related to sustainability. Through focusing on the data-driven and decision-making approaches. Design with customer-centric and also agile framework implementation, both the researcher and industry practitioners can significantly unlock full kit potential for enhancing sales and productivity within automobile aftermarket supply chain process. However, by effectively focusing on kitting, the study likely seeks to enhance a number of aspects that are going to be mentioned. Effective management of kit within the supply chain process of the automobile aftermarket enhances sales and productivity through operational streamlining and error reduction.

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Appendix

Interview Responses

Q1: *"Can you describe your current process for managing and tracking kits in the aftermarket supply chain?"*	
Participants	Responses
Participants 1	Demand forecasting and planning is one of the important processes that help businesses to predict future demand.
Participants 2	Procurement and sourcing leverage with managing kit management tracking system through a reliable relationship with the suppliers.
Participants 3	Kitts have shipped to the customer end through effective distribution system with maintaining appropriate transportation methods.
Participants 4	Visibility enhancement helps business to track their supply chain process more accurately.
Participants 5	Appropriate tracking of supply chain about aftermarket products within the automobile business leverage with maintaining accuracy.
Participants 6	Customers are remarkably influenced through the performance regarding kit management.
Participants 7	Demand forecasting accurately optimizes inventory to ensure the right amount of kit is present in the marketplace to serve the customer.
Participants 8	Maintaining an accurate record with the level of inventory optimizes storage space for minimizing the overall cost and increases efficiency.
Participants 9	The robust transportation and logistics are required to be reliable to track kit aftermarket supply chain.
Participants 10	Kittens have been shipped to the customer end through an effective distribution system.

Q2: *"What are the most common issues you face regarding inventory accuracy of kits, and how do they affect production or customer satisfaction?"*

Participants	Responses
Participants 1	Inaccurate inventory practices lead towards shortage or stock out, which causes production line for halt or else operating through reduced capacity.
Participants 2	The main issues of incorporating inventory management within kiting approaches increases cost for in increasing storage capacity.
Participants 3	The issues regarding quality control have seen through the implementation of inventory management and this significantly hampers customer satisfaction.
Participants 4	Missing components and faulty products within kit creates a negative impact on customer satisfaction.
Participants 5	Inventory accuracy reduces productivity as the time of staff is wasted searching for the item that is misplaced.
Participants 6	Inventory accuracy has an impact on customer satisfaction through incorrect shipments of products.
Participants 7	Order delays have also seen with inventory aspects within the aftermarket supply chain process of automobile industry.
Participants 8	The reputation of aftermarket supply chain has damage due to inaccurate product shipment and delay in delivery time.
Participants 9	The inventory accuracy leverage with customer dissatisfaction and this lead to impact negatively on future business development within automobile industry.
Participants 10	Issues regarding quality control have seen through the implementation of inventory management.

Q3: *"How would you rate the reliability and timeliness of your kit deliveries, and what factors contribute to delays, if any?"*

Participants	Responses
Participants 1	The significant factor that affects timeliness and reliability is accurate transportation and logistics.
Participants 2	Inventory management affects the reliability if kitting through poor management of inventory aspects and leads to face delay I dispatching goods.
Participants 3	Unpredictable conditions of weather disrupted the transportation schedule and impact of business reliability.
Participants 4	The issues have found in supply chain, manufacturing delay problems through material sourcing impact on delivery time.
Participants 5	The reliability is also based on choosing appropriate delivery carriers to enhance or ensure of getting the order on time.
Participants 6	The remarkable factor that cause for delay is delay in product preparation.
Participants 7	Ensuring an adequate level of inventory and the operation of an efficient warehouse is important to reduce delay.
Participants 8	Supply chain improvement effects in delay, as if there is any inefficiency, management occurs within inventory management level.
Participants 9	Weather is also played important role in effecting delay, hence it important to monitor weather forecast.
Participants 10	Inventory management affects the reliability if kitting through poor management of inventory aspects.

Q4: *"In what ways does supplier collaboration or lack thereof influence your kit availability and supply chain performance?"*

Participants	Responses
Participants 1	Supplier collaboration impact on kit availability and also the performance of supply chain process.
Participants 2	Enhancing operating efficiency and cost reduction helps businesses to achieve success to promote adequate supply chain process.

Participants 3	Lacking in collaboration with suppliers reaches towards inefficiencies, cost improvement and disruption with on supply chain.
Participants 4	Disruptive supply chain has negative impact on kit availability within the marketplace.
Participants 5	Positive collaboration with suppliers increases work flexibility for the business.
Participants 6	Collaboration boosts greater transparency within business operations to enhance growth.
Participants 7	Supply chain collaboration process begins with sharing mutual information.
Participants 8	The proper alignment of objectives and goals is significantly important to a critical collaboration of supply chain.
Participants 9	Collaboration with suppliers create a positive environment to work effectively and boost supply chain productivity of kit.
Participants 10	Collaboration with suppliers creates a positive environment to work effectively.

Q5: *"Have you implemented any technologies (like IoT or block chain) to improve kit management? If so, how have they impacted your processes?"*	
Participants	Responses
Participants 1	The incorporation of block chain technology aims to improve overall transparency and traceability of supply chain.
Participants 2	Block chain helps to keep all the information about transactions and records from start to end.
Participants 3	Transparency builds trust across entre stakeholders to access the entire real-time information.
Participants 4	In the process of kitting tractability performs well to improve management efficiency and productivity positively.
Participants 5	Block chain automates different process in the areas of payment and inventory management.
Participants 6	Sharing real-time data and also collaboration among resource allocation and partners of supply chain minimize delay.

Participants 7	Collaboration helps businesses to mitigate errors in delivery and leads to faster delivery.
Participants 8	Blockchain facilitates transportation data for sharing among different partners, including in the supply chain.
Participants 9	Block chain decentralized the risk associated with record settlements and helps to mitigate risks.
Participants 10	Sharing real-time data and also collaboration among resource allocation.

Q6: "How easy or difficult is it for staff to use your current kit management system? What training or usability improvements would help?"	
Participants	Responses
Participant 1	The system is good and it is user friendly but it needs periodic table updates that is for usability
Participant 2	The system complex has been found by the staff, training workshops would be beneficial.
Participant 3	This is almost easy to use but it needs accurate integration with particular technology
Participant 4	Issues for new staff, hence on boarding training is essential.
Participant 5	It is quite challenging to operate and that is why a more visual user interface would assist usability
Participant 6	Useful and efficient for staff who are experienced, but it is not intuitive for any new worker.
Participant 7	Workers face issues and struggle mainly with data entry and training on many shortcuts related to the system is required.

Participant 8	Mostly easy but mobile app access would be helpful in improving flexibility
Participant 9	The system usage is almost manageable but the interface further need simplification
Participant 10	Quite easy to use but there are few issues in integration with any new technology

Q7: "Can you share an instance where poor kit quality or errors in assembly caused production delays or customer dissatisfaction?"	
Participants	Responses
Participant 1	Incorrect components of the kit may further because almost a week-long delay within production.
Participant 2	The consumers are complaining mainly because of any faulty assembly that is further led to the loss of brand reputation.
Participant 3	Poor quality kits may further increased warranty claims
Participant 4	The kits that are defective may further delay the deadline of delivery that is for any major client project
Participant 5	The issues or any errors within kit are leading to additional cost for labour to deal with issues.
Participant 6	A supplier error that is mainly within the quality of kit may directly cause almost a halt within several manufacturing operations.
Participant 7	The incorrect labelling of multiple kits is ultimately creating confusion within the warehouse operation
Participant 8	Kit assembly issues may also lead to any returns of the product and lead to

	dissatisfied consumers.
Participant 9	Production lines stopped that is mainly due to missing components within kits
Participant 10	Insufficiency of quality checks within kits further led to complaints from several distributors.

Q8: "In your experience, what effect does improved kit management have on aftermarket sales performance or customer satisfaction?"

Participants	Responses
Participant 1	It helps in enhancing brand reputation through reliability
Participant 2	This is ultimately leading to quicker fulfilment of the order of the customer
Participant 3	This has a direct impact on the purchase rate which ultimately helpful in boosting repeat purchase
Participant 4	It is improving both services as well as maintenance operations
Participant 5	Contributing to the better market competitiveness
Participant 6	It has direct impact on it is decreasing Returns rate mainly due to any incorrect parts
Participant 7	Ensure multiple spare parts are always within stock
Participant 8	It is further ensuring overall sales revenues within the firm
Participant 9	This has been significant in improving dealer satisfaction that is with stock availability

Participant 10	This has positive impact on sales and other business performances

Q9: "What challenges have you encountered when trying to implement changes in kit management systems or processes?"

Participants	Responses
Participant 1	One major barrier is the lack of accessibility of real time data
Participant 2	Multiple regulatory and compliance issues and challenges is one another barrier
Participant 3	One significant challenge is the space constraints within the warehouse facilities
Participant 4	The issues is the limited budget that are required for advanced technologies
Participant 5	Lack of training in any new processes is one major barrier
Participant 6	There are different integration problems with many existing systems
Participant 7	Issues are present in forecasting demand appropriately
Participant 8	One another barrier is the high initial investment that are required within automation
Participant 9	Inconsistent supply reliability is one major issues
Participant 10	Resistance to changes that is among workers is one another problem

Q10: "If you could change one aspect of your kit management process to improve supply chain performance, what would it be and why?"

Participants	Responses
Participant 1	Introducing automation that is for real time tracking of kit in order to decreases any errors.
Participant 2	Simplifying the system interact that help in improving the staff efficiency
Participant 3	Develop the predictive analysis that will allow for better forecasting and also for better demand planning
Participant 4	Increasing collaboration with multiple suppliers in order to ensure several quality kits
Participant 5	Expanding warehouse space that is significant in accommodating new storage systems for kits
Participant 6	Implementing mobile access that is for effective kit management to accurately streamline processes.
Participant 7	Introducing stricter quality checks that help in avoiding a y assembly issues or errors
Participant 8	Integrating kits that are in the main ERP system in order to enhance coordination
Participant 9	Enhancing real time accessibility of data that will helpful in improving decision making
Participant 10	Allocate budget that is for continuous staff training within handling of kit