

Sustainable Supply Chain of Automobile Sector: A Literature Review

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Abstract— Currently, the British automotive industry still has its own benefits within economic situations. The global automotive industry is on the verge of entering a period of comprehensive and revolutionary transformation, while sales continue to swing in favour of the innovative vehicles and environmental regulations intensify. According to data from the “European Automobile Association and the British Automobile Manufacturers and Traders Association”, the production of British cars in 2012 was 1.58 million, an increase of 7.7% compared to 2011, while automobile production has maintained steady growth. In 2012, 2.5 million units were supplied. During the same period, German car production declined by 8.1 percent and Spain by 16.6 percent. France lost another 12.3 percent. By 2013, the annual offer for British cars reached 1.6 million units, which has returned to levels well before the financial crisis. The overall development from the Supply Chain to the Extended Supply Chain has been carried out by various enterprises for some time.

As one of the largest and dominant organisations in the world, the automotive industry can greatly influence the development of a better society. Although another combination has emerged in the field of original supply chain management, no reviewing department can fully cover the front-line research of the automotive industry. To fill this gap, this research considers the sustainable management of supply chain in the automotive industry, which was adopted around 2017. Therefore, the research has performed a persuasive bias analysis and studied the material and their contents. According to the “Icam DEfinition for Function Modeling (IDEF0)”, content analysis is categorised according to several key business structures, which is a common way of separating business structures. The study provides useful principles for building the automotive supply chain of the surveyor and combines robustly distributed research theft clauses and recommendations for future investigations.

Keywords— Sustainable SCM, Supply Chain, Automotive Industry, Green SCM, Electric Vehicles

1. Introduction

Today, environmental concerns are becoming increasingly prominent. After the Industrial Revolution, every consumption day has made the world a mess. Not only will people contaminate today's assets, they will also

affect and destroy opportunities for access to important assets across the ages. Although previously demanding and focusing on land security was not a standard development, it has now become an important movement. Public reservations are drawing attention to public housing issues, and creation and assembly forms are the most effective natural processes. While considering the factors such as age of waste, environmental degradation and general resource consumption [1]. The traditional supply chain management cannot adequately respond to the needs of existing partners because it can have a negative impact on the situation, and, in addition, open-air degrees for environmental issues have been provided to all difficult areas. This makes the choice to control open tenders a sustainable and green response to tackle the use of assets in the supply chain. “Sustainable Supply Chain Management (SSCM)” is a feature that manages the flow of content and data, just like the involvement of an organisation in the supply chain, when each of these three elements at the same time which can be improved [2]. " Metrics are financial, social and environmental responsibilities. Many investigations have been completed inside the SSCM to show enthusiasm in the field. Generally, “Supply Chain Management (SCM)” is seen as a process in which raw material is transformed into a decisive commodity and then passed on to the final buyer, which includes the assets involved and are abolished and abused [2]. Regardless, currently people living within the 21st century, and environmental sustainability has always been an important factor, so it's important for organisations to incorporate green technology into their supply chain practices. This green part concerns the relationship between peaceful supply chain management and power. Therefore, green has become a mysterious and huge word that must be linked to every technology in order to keep up with advancement within the environmental framework. Over the past ten years, SCM all over the world has achieved significant growth, covering all stages of the project's lifecycle, from stages of composition, creation and rotation to end-user-to-project use and the end of the project lifecycle.

2. Literature Review

2.1. Current trends - Automotive Industry

The UK sees the supply chain as a key element in the development of its manufacturing industry. The United Kingdom vigorously promotes the advanced manufacturing strategy, and the supply chain policy is an important part of the strategy. In 2015, the United Kingdom issued the "Strengthening Government and Industry Action Plan" for the Manufacturing Supply Chain of the United Kingdom, marking that the United Kingdom will enhance the competitiveness of the manufacturing supply chain as a national strategy [3].

The UK's supply chain policy system is becoming more mature and complete, and targeted policies and measures have been formed in the areas of supply chain collaboration, innovation, financing, flexibility and security. The first is to promote innovation in the supply chain. In terms of process innovation, it helps the manufacturing industry to develop and apply new supply chain production lines, promotes collaborative R & D between upstream and downstream companies in the supply chain, supports manufacturing consulting service companies and manufacturing companies to cooperate closely; in terms of technological innovation, it continues to promote digital and intelligent technologies[2]. The application of different links in the supply chain realizes information sharing between upstream and downstream enterprises through modern information technologies such as the Internet of Things and the Internet. The second is to strengthen the cooperation between the upstream and downstream of the supply chain in talent recruitment and training [4]. Encourage core supply chain manufacturing companies to use their brand power to help small and medium suppliers recruit talents, and assist small and medium suppliers to conduct regular employee training, share supply chain training programs and projects, and improve the overall level of supply chain collaboration. The third is to provide financing channels for SMEs in the supply chain and improve the supply chain capital flow. There is a need for commercial banks to actively lend to eligible SMEs and provide financing guidance for enterprises [5]. At the same time, a loan fund was established to provide supply chain financial services to SMEs. Fourth, focus on improving the competitiveness of SMEs in the supply chain. By promoting cooperation between government departments, original equipment manufacturers, and core companies in the supply chain, it provides development opportunities for small and medium-sized enterprises in the supply chain and formulates supply chain performance improvement programs. At the same time, we strongly support industry associations in important industrial fields such as energy, aviation, automotive, and railways to establish industry standards, and popularize and implement the best corporate supply chain practices for SMEs. Fifth, promote supply chain collaboration [6]. There is a need to encourage industry associations in various industries to build a platform for cooperation and negotiation and information exchange between upstream and downstream enterprises in the supply chain, and vigorously promote

the exchange and sharing of cross-industry supply chain management experience and the best business cases.

2.2. Supply Chain management in Automotive Industry

Recently, with the widespread use of the latest data such as human resources, huge information and distributed computing, Germany is also able to effectively manage the knowledge and information of industrial supply chains. Already started [4]. Building insight into the supply chain has become an important part of German Industry 4.0 strategy. In the current hyper competitive world, companies are relying more on the competitive advantages accrued of the supply chains rather than the product innovation itself [7].

EU supply management is an important way to advance provincial financial reforms. In agribusiness, accumulation and coordination, natural assurance, energy and various fields, the EU has established an excellent supply and management part of the supply chain, including mandatory management directives and control reports and directives [5]. The EU's supply chain has two key issues. First, the security of the global supply chain exchanges in some countries, especially the supply of raw materials and the transportation of goods or materials. The European Union and the United States have directed internal and external involvement in supply chain security issues. In addition, it does note that progress has been made in some states' perspectives. For the tradition of the states, people have been working to increase security needs and exchange imports and rents [8]. Second, integrate green supply chains and promote appropriate provincial financing. The European Union has ordered strict authorisation for green supply chains and praised the provision of natural nature insurance for the acquisition, creation, transportation, distribution and reuse of raw materials.

Early German supply chain arrangements focused on establishing a green supply chain under environmental insurance and asset protection to support the supply chain. The four basic steps are: First, strengthen natural name verification, the world's first environmental name verification framework "Blue Angel", the original trash damage framework "Green Dot" logo, and materials, cars, machinery and environmentally driven environments second One name is to establish a data divorce framework and send out the "German Sustainability Guidelines", usually hoping that organisations will have access to energy and assets [9]

. The expected public exposure to the use of ozone, harmful substances and other harmful substances gas in the supply chain. The third is to establish government subsidies to follow the path of potential improvement and transform natural and pleasant commodities into markets, including automobile collection, development and materials companies [10]. The fourth is to improve the life cycle monitoring of the supply chain. German law clearly specifies the characteristics of the risk framework for all manufacturers' sites, and it is expected that these frameworks will be solely responsible for the generation,

use, reuse and final uninterrupted transfer of equipment can guarantee the elimination of pollution throughout the delivery period.

2.3. Policies within UK Automotive Industry for Supply Chain management

In general, the supply chain strategy and supply chain of the producing country mainly involve two angles. The first is to develop an effective, convenient and feasible supply chain to advance business progress and improve financial quality in key areas [1]. The supply chain strategy in the UK and Germany runs through the factory model. Secondly, from the perspective of supply chain security, it effectively responds to the impact of various risk factors on key commodities and commodity supply, and provides financial security, business security and national security for the country or region. Guarantee. The perspective of the US supply chain falls into this category.

Focus on the supply chain arrangements and procedures in producing countries and regions, and consider the current problems facing UK's supply chain. UK should effectively improve the effectiveness and coordination of supply chain operation, the development of appropriate components, and speed up the establishment of the system. Upgrade the supply chain and promote the development of the supply chain [11]. Conditions; from a distance, research on supply chain security issues should be further strengthened, and the relationship between advancing global supply chain design and ensuring supply chain security should be appropriately addressed. It has been seen that from an individual view, it usually promotes the different aspects of supply chain as well as their main presence in the country. The automotive industry is said to be essential part in increasing the economy of UK for over £82 billion turnover as well as £18.6 billion that has been added in the value of country's economy. In the year 2018, the country has produced up to 1.6 million of vehicles and more than 2.72 million of engines and this shows the fall within the production since there was a peak economic condition in the year 2017, these are still considered as high level of production in the history [8].

2.4. Risks Associated with SCM

There is a need to effectively realise the potential of the supply chain and ensure the well-being of the industrial economy. Regarding the development process of globalisation, the competition among projects, enterprises and even countries reflects the characteristics of hostility in the supply chain [1]. With the rise of global foreign exchange insurance options, the risk of collapse of raw materials and advances in financial centers in UK's key regions has increased, and risk factors for industrial security and even national security have also increased. To this end, the supply chain should establish long-term channels to make a practical response to risks, a supply chain early warning framework, and the supply chain intervention crisis system development and supply [5].

Dynamic support for global participation in UK's security and in-depth cooperation in global work distribution has promoted the development of machinery in key areas and provided gradual defects that have become the focus of attention and to improve the stability of exchanges and activities in global exchanges [12].

3. Research Methodology

The Research Method that will be used in this study is systematic review as well as content analysis in order to search and therefore classify the main literature body. The systematic review is considered as the type of the literature that analyses in a structured way and then shows the outcomes in objective, transparent as well as reproducible way [6].

3.1. Database Selection and the First Search Phase

To take the first search test, Scopus was selected as the main database for searching related papers in the initial stages. As Scopus or WOS is a more detailed database (Scopus covers more than 22,000 peer-reviewed journals, while the WOS contains only 12,000 journals), we prefer Scopus over "Web of Science (WOS)" [1]. Scopus is also recognised as a good location for SC peer review papers. Scopus is therefore widely used to search by using the final words of the keywords described to identify the papers that show the keywords. Search for keywords using titles, summaries, and keywords from two databases. With the above arrangements, is searched papers each year [4]. During our writing search, 957 papers were identified.

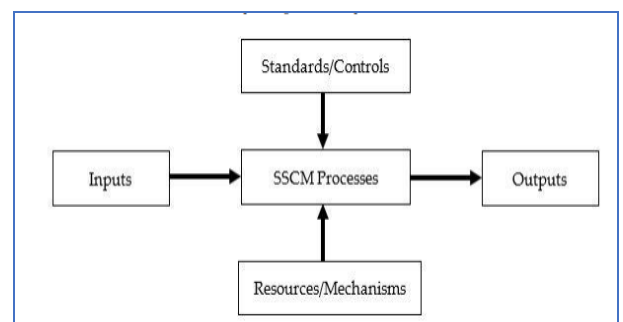


Figure 1. Framework for the Content analysis

3.2. Filtration

In the second phase of Scopus, various exclusion criteria were met. Initially, the paper type was selected as the article, to explore and publish in the media, and to select various sources (so-called grey text) such as conference papers, books and chapter books, editors, notes, short surveys, letters and features, and Invitations stop them from searching. Traditional risks impacting the complex globalized supply chains arise from issues of distorted demand information and breakdowns in

production, logistics and transportation, which can be recurrent and routine which may be due to the bullwhip effect condition that occurs within the company, due to distortion in inventory levels, which causes the repetitive delivery process [13]. During the search phase, English is the language of the dissertation [2]. At this stage of the search, 389 papers were received. To make sure there are no papers in the survey, we use Google Scholar as the second scholarship database to search. These papers were searched through Google Scholar using keywords not shown in the exhibition and compared to Scopus's. This progress was made by discovering 31 other papers [14]. Both papers from the database were coordinated and designed as a model.

Table 1. Best results

Main Category			Process Sub-Categories					
Content Category	Fre. *	Perc. **	Content Category	Fre.	Perc.	Content Category	Fre.	Perc.
Input	12	3.87%	Delivery	3	2.27%	Management Capabilities	7	17.07%
Legislation and Standards	18	5.81%	Supply	26	19.70%	Network Structure	16	39.03%
Processes	130	41.93%	Production	15	11.36%	Technology	18	43.90%
Resources/Mechanisms	36	11.62%	Use	8	6.08%			
Output	102	32.9%	Post-use	80	60.61%			
Overall Review	12	3.87%				Total	41	100%
Total	310	100%	Total	132	100%			

*Frequency of appearance in the literature, **Percentage.

3.2.1 Snowball Approach

In order to ensure that the sample includes all papers distributed in writing, whether in advance or in reverse, a snowball method is implemented by searching for references to sample papers. There is a need to go through the references to see if they contain previous keywords. In addition, the related files among the files related to the sample files were also checked. At this stage, a sample of 14 sheets is added to the sample paper [6].

3.2.2 Final Filtration

To solve the sample problem, the title, abstract, and content of the paper were examined. As long as the papers are analysed, as long as they highlight the areas of business management and automated SSCM operations, and may be considered ineffective (ie, pay attention to different areas, such as topics and build plans), remove from the sample. In addition, several papers in the sample were eliminated due to doubling [11]. This status was reduced to 229 papers.

3.2.3 Descriptive Analysis of the Sample

The articles other than the automotive industry needs to exclude this search result. Finally, considering the total number of 229 articles allocated in 1995 and 2017, the ultimate goal is to analyse the situation directly. In this way, the content classification scheme developed a material analysis framework for collecting test documents [11]. The framework recognises that MSSA is a core part of the core business structure and realises the innovation of IDEF0 (Functional Function), which is an independent strategy for core business analysis. IDEF0 is a comprehensive and versatile technology that can be appropriately applied to systems that reflect goals, resources and multi-faceted-ness [10]. One approach is to change the promise of results by using resources and applying components under various standards and controls. Since SSCM can see many processes, actions and rules, IDEF0 can be discussed as a system. After IDEF0, the test implemented a research analysis framework in which SEML was designed to isolate five topic classes, as shown in Figure 1. depends on IDEF0 published in. What the box provides for this survey is very important and explains why the supply chain should be green. In the left half of the diagram, one or more diagrams are identified, representing the task that came to a conclusion, with the window to the right of the basket. Regarding the survey, as partners moved to the SSCM structure, information sources integrated the information flow, and as a result, the results of the supply chain lock-in were considered in the presentation planning framework [15]. Control bumps to the most prominent position of the function box are code and rules. The SSCM structure is tailored to meet its needs. As the research go through from the IDEF00 syntax, if data is populated with data and controls, it will be treated as everything. The compression vibration used to make the SSCM structure real is a composite vibration that enters the bottom of the function box.

4. Analysis and Discussion

4.1. Political Scenario

In the 1980s, under the guidance of the Thatcher government 's liberal industrial policy, the auto industry, as one of the diseased state-owned industries, was opened by the UK to foreign automakers led by Japan [1]. Prosperous. However, Brexit may now rewrite the fate of the British auto industry. The deadline for Brexit is approaching, Nissan announced its withdrawal of investment plans, Honda announced the closure of its plant in Swindon; BMW Mini suspended production for 30 days; Jaguar Land Rover lay off staff significantly. In the late 1970s, the British auto industry was seriously troubled by deteriorating labour relations, lack of capital

investment and backward management methods. The solution given by the current Thatcher government was not to help the poor but to help the weak, but to put a headache on Japanese companies who came to explore business opportunities [4]. Rene explained to the First Business Reporter: "Mrs. Thatcher did not believe in the government's means of 'picking winners' and preferred to rely on market forces to ensure the survival of the fittest. Therefore, Mrs. Thatcher sold the automobile industry. Changing the focus of the economy from manufacturing to finance has indeed been a huge success in terms of economic returns."

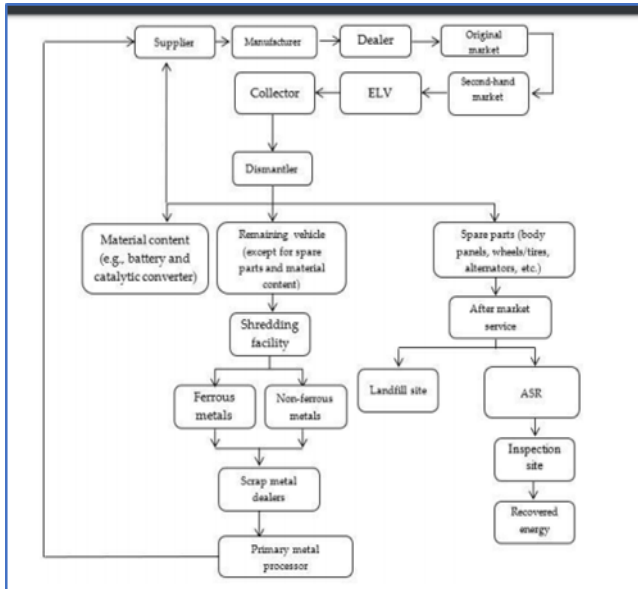


Figure 2. Structure for Auto-SSCM

4.2. Entry of Foreign Auto Companies

According to a study by Newcastle University professor Colin Wren, after implementing this industrial policy, government subsidies to the manufacturing industry fell from 5 billion pounds in 1979 to 3 million pounds in 1990[1]. After entering the UK, Japanese auto companies invested in and rectified factories, technology, supply chains and training. Subsequently, German companies and Indian companies also found the right time to step into the British auto industry. BMW of Germany set up Rolls-Royce and Mini production bases in the United Kingdom. India's Tata took over Jaguar Land Rover sold by Ford in the United States in 2008 and invested billions of pounds to revitalize its production base in the United Kingdom. Geoffery Owen, director of the Industrial Policy Division at the British Think Tank Policy Exchange, said the presence of foreign automakers has helped the British auto industry to prosper for more than 30 years and helped the UK weather the downturn risks of not joining the Eurozone and the financial crisis[10].

4.3. Dynamic Supply Lines

Paddy criticized this, and Brexit has long been a prism of British auto industry policy: "The Thatcher government did not prioritize the restoration of British car companies, but instead sought to invest in Japan and deregulate the market. As an alternative to extend the life of the British automotive industry". In other words, when a patient refuses to treat the disease and only accepts the support of a ventilator, the life of the British patient is difficult to continue once the ventilator is withdrawn [14].

The use of 3-D printing in a manufacturing chain, because of flexibility in shape design and storage of digital designs in the system, results in enhanced customization scope. Moreover, the use of 3-D printing aids in distributing deployment of digital manufacturing capacity in small batches which results in saving a considerable amount of inventory by postponing the creation of a variety of products to the last link in the chain thereby avoiding compromised delivery times [16]. Thirty years ago, Honda's interest in Britain was considered a characteristic of Margaret Thatcher's industrial strategy. Around that time, Britain had time to stagnate from shipyards to steel mills. Japanese car-organisational departments, such as Honda, Nissan and Toyota, have used new basic requirements for the British economy, which requires a troop. Sunderland Nissan's plant is also the most advantageous car in Europe and better than all North American competitors [1]. Moreover, this time Honda closed the plant, which may mean the end of time. Christian Stadler, the principal management teacher at Warwick Business School in the UK, accepted Honda's announcement to close its UK plant, which could be a "spark" after the UK's automotive industry has intensified [11]. For International Motors, it started to look less thoughtful. "Greg Clark, Minister of Commerce, Energy and Industry, also said that although Honda became a business option due to market changes, the UK would have a negative impact. Factory representatives, their families and all supply chain workers."

5. Conclusion

As the information from British car manufacturers and dealers (SMMT) shows, due to the Brexit loophole, British car interests fell by about half a year in 2018. The total speculation for the year was 588.6 million pounds. The output of automobiles decreased by more than 9% year-on-year, and about 1.51 million vehicles were continuously delivered. This article examines the impact of sustainability on EV manufacturers or EV buyers supply chains. In this article, the highlights of our findings are that although the British government developed an EV stimulus model for the scope of the organization (including EV manufacturers and customers), but in this model, we were able to identify the lack of EV retailers. It was further found that when applying for the maximum salary increase, the proportion of early and late subsidy allocations, and subsidy technology are prepared in the chain itself. The first thing one should consider is EV customers and the way the sponsored spending plans

affect the office's financial affairs. In the erstwhile days, the higher the cost of the subsidy program, the greater the amount that should be allocated to electric car manufacturers. In future development courses, it is recommended that all proceeds be distributed to electric vehicle customers. Moreover, the overall plan to subsidize consumption and illegal spending affect the decision to deduct and buy a car? The results show that fuel prices, lower electricity prices, and the opportunity to reduce electric vehicle charges should enable electric vehicle users to have more memberships, and at a later stage as the company grows and develops. However, since 2019, the actual situation is obvious. The study also recommends the proposal to carry out research in the South East Asia region for the sustainability in the supply chain of Electric batteries and their recycling. This research would help in exploring solutions to the explosive growth in the battery (Lithium- ion) waste generated by the end-of-life of Electric batteries. In January 2019, British car production fell steadily by 18.2% year-on-year to 120,600 vehicles, indicating that British car production declined in the eighth month. In addition, declining demand in the UK and overseas markets, especially in overseas markets, has driven British car sales down 21.4% year-on-year to about 93,800. Honda's conclusion at the factory represents one-tenth of the results of all British cars that year, which is undoubtedly hit by the British auto industry. This is the first time a large car group has reported that its plant has been closed since Britain chose Brexit. However, due to the increasing uncertainty of Brexit without a deal, a large number of foreign auto companies have decided to withdraw, relocate, suspend production or lay off employees in order to avoid risks, and have re-ignited external questions about the rationality of British industrial policies.

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