

Assignment Brief and Front Sheet PGT

This front sheet for assignments is designed to contain the brief, the submission instructions, and the actual student submission for any WMG assignment. As a result the sheet is completed by several people over time, and is therefore split up into sections explaining who completes what information and when. Yellow highlighted text indicates examples or further explanation of what is requested, and the highlight and instructions should be removed as you populate 'your' section.

This sheet is only to be used for components of assessment worth more than 3 CATS (e.g. for a 15 credit module, weighted more than 20%; or for a 10 credit module, weighted more than 30%).

To be completed by the student(s) prior to final submission:

Your actual submission should be written at the end of this cover sheet file, or attached with the cover sheet at the front if drafted in a separate file, program or application.

Student ID or IDs for group work	5569029
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To be completed (highlighted parts only) by the programme administration after approval and prior to issuing of the assessment; to be consulted by the student(s) so that you know how and when to submit:

Date set	17 th February 2025
Submission date (excluding extensions)	22 nd April 2025 by 12pm (UK time)
Submission guidance	Work to be submitted via Tabula
Marks return date (excluding extensions)	21 st May 2025
Late submission policy	<p>If work is submitted late, penalties will be applied at the rate of 5 marks per University working day after the due date, up to a maximum of 10 working days late. After this period the mark for the work will be reduced to 0 (which is the maximum penalty). "Late" means after the submission deadline time as well as the date – work submitted after the given time even on the same day is counted as 1 day late.</p> <p>For Postgraduate students only, who started their current course before 1 August 2019, the daily penalty is 3 marks rather than 5.</p>
Resit policy	<p>If you fail this module and/or component, the University allows students to remedy failure (within certain limits). Decisions to authorise resits are made by Exam Boards. These will be issued at specific times of the year, depending on your programme of study. More information can be found from your programme office if you are concerned.</p> <p>If this is already a resit attempt, this means you will not be eligible for an additional attempt. The University allows as standard a maximum of two attempts on any assessment (i.e. only one resit). Students can only have a third attempt under exceptional circumstances via a Mitigating Circumstances Panel decision.</p>

To be completed by the module leader/tutor prior to approval and issuing of the assessment; to be consulted by the student(s) so that you understand the assignment brief, its context within the module, and any specific criteria and advice from the tutor:

Module title & code	WM999-15
Module leader	Dr Maryam Masood
Module tutor	Dr Maryam Masood Dr Asima Iqbal Ninna Makrinov Dr Lauren Schrock Dr Poonam Aulak
Assessment type	Essay
Weighting of mark	50%

Assignment brief

YOU ARE NOT TO COLLECT ANY DATA FOR THIS ASSIGNMENT.

For this assignment, you will prepare a comprehensive research feasibility report to investigate a complex problem within your discipline (this should align with the project requirements for your course). You may select the problem that you have identified for your MSc dissertation to complete this assignment.

To complete this assignment, follow these steps:

1. Identify and describe a complex problem within your discipline, providing a rationale for why this problem is significant and warrants research
2. Develop a clear and concise research question that addresses your complex problem.
3. Create research objective(s) based on your research question, including contribution to knowledge and/or practice that could arise from this research
4. Outline the design of your research study. including: selection and justification of type of data (e.g. primary/secondary, and secondary data may be publicly available or not), and selection and justification of potential data collection method/s (e.g. case study, systematic literature review, survey, interview, experiments, simulation) that could be utilised to collect this data for your study. *Please note you may use one or multiple methods for data collection, depending upon your research question and potential contribution*
5. Evaluate the feasibility of your selected data collection method. You are expected to evaluate your selected data collection method/s based on several criteria, including:

- Relevance of the method to addressing the research question and objectives
- Availability of resources, such as software, tools, or equipment
- Access to data sources and/or participants (consider your population and data sample)
- Time required to conduct the research, including steps for the collection of data (consider if your timeline plan is achievable)
- Ethical risks associated with data collection method/s and data to be collected

6. Summarise the key points of your evaluation and a justification of the use of your selected method, reflecting on the feasibility of your proposed research study.

In review of the numbered items above, your report must contain the following sections:

1. Introduction (step 1)
2. Research question and objective/(s) (steps 2 and 3)
3. Design of research (step 4)
4. Evaluation of selected data Collection Method/s (step 5)
5. Conclusion (step 6)
6. References

Students are encouraged to consult their supervisors for guidance in completing this report and also engage with the asynchronous content on SPA Moodle.

Please note, at Master's level academic integrity is a requirement for all of your work, including this assignment. Therefore, you need to consistently apply the Harvard referencing style-throughout your assignment, including citations and reference list. Remember you can review the Academic Integrity guidance in Study Skills on the SPA Moodle site if you have any concerns about how to correctly use the Harvard style.

Academic writing and presentation are also important qualities of a successful assignment. Review the Academic Writing guidance in Study Skills and Communication in Professional Skills to ensure you are presenting your work in a high quality, clear, and structured way that can be appreciated in the first reading.

To maintain the academic integrity of your work, for the purpose of this assignment, you must not use any GAIT (Generative Artificial Intelligence Tools) in the preparation, composition, or checking of this assignment.

Word count

This essay is limited to 2000 words. You are allowed to go above or below the word count by 10%. If you go above 10% of the overall word count, there may be sanctions applied. You can find more details here:
<https://warwick.ac.uk/fac/sci/wmg/ftmsc/postmodulework/assessmentlength/>

Please note that quotations, tables, figures, footnotes, endnotes, in-text citations, titles, abstracts and summaries **are all included in the word count**.

	While tables of contents, tables of figures, tables of tables, the reference list, bibliography and material submitted in an annex or appendix are all not included in the word count.
Module learning outcomes (numbered)	<ol style="list-style-type: none"> 1. Critically evaluate a research problem and draw conclusions from it using literature 2. Communicate critical analysis and evaluation of research effectively in verbal and written format 3. Select appropriate research design and methodologies for complex problems providing clear rationale for selected approaches 4. Analyse ethical issues involved in a research design 5. Design a feasible research project to be completed in limited time and resources
Learning outcomes assessed in this assessment (numbered)	<ol style="list-style-type: none"> 3. Select appropriate research design and methodologies for complex problems providing clear rationale for selected approaches 4. Analyse ethical issues involved in a research design 5. Design a feasible research project to be completed in limited time and resources
Marking guidelines	Please see the marking guideline below
Academic guidance resources	<p>The SPA Moodle site contains information on Study and Professional Skills that will help you to complete this assignment. See the SPA reading list for recommended sources.</p> <p>To help you achieve your potential, remember you can review additional guidance on this assignment in the 'Assessment' block of the SPA Moodle site.</p>

Where to get help:

1. Talk to your module tutor if you don't understand the question or are unsure as to exactly what is required.
2. Study, Professional and Analytical Skills (SPA) Moodle site – we have a lot of resources on this website with workbooks, links and other helpful tools. <https://moodle.warwick.ac.uk/>
3. There are also numerous online courses provided by the University library to help in academic referencing, writing, avoiding plagiarism and a number of other useful resources. <https://warwick.ac.uk/services/library/students/your-library-online/>
4. If you have a problem with your wellbeing, it is important that you contact your personal tutor or wellbeing support services <https://warwick.ac.uk/services/wss>

Criteria	80 and above	70-79	60-69	50-59	40-49	39 and below
Identification and justification of a complex problem (10%)	A complex problem is correctly identified and exceptionally well-justified , demonstrating a deep understanding of its significance.	A complex problem is correctly identified and strongly justified , demonstrating a strong understanding of its significance.	A complex problem is appropriately identified and clearly justified , demonstrating a good understanding of its significance.	A complex problem is identified and justified to an extent , demonstrating a fair understanding of its significance.	A complex problem is identified but may not be clear and the justification may be missing or limited .	A complex problem is not identified or is incorrect and justification is missing .
Development of research question and objectives (10%)	A research question and research objectives are created . The research objectives holistically support answering the research question and are well-developed for the project.	A research question and research objectives are created . The research objectives strongly support answering the research question and are well developed for the project.	A research question and research objectives are created . The research objectives are appropriately aligned with the research project and reflect the project as a whole.	A research question and research objectives are created . The research objectives may be minorly incomplete and not reflect the research project as a whole.	A research question and/or research objectives are created though are not appropriately aligned with the research project.	No research question and no research objectives are created.
Design of research study (25%)	An exceptional design of research is presented. There is excellent justification for selection of type of data and data collection method relevant to the research project	A strong design of research is presented. There is a strong justification for selection of type of data and data collection method relevant to the research project	A good design of research is presented. There is good justification for selection of type of data and data collection method relevant to the research project maybe supported	A fair design of research is presented. There is some justification for selection of type of data and data collection method relevant to the research project.	An unclear design of research is presented. There is limited or no justification for selection of type of data and data collection method relevant to the research project.	A design of research is missing or not relevant . There is no justification for selection of type of data and data collection method relevant to the research project.

	supported by credible academic literature.	supported by credible academic literature.	by credible sources.			
Evaluation of data collection method/s on the listed factors (45%)	There is an exceptional evaluation of the suitability of selected data collection method/s on the listed factors. There is deep evaluation of evidence why this method is more suitable compared to other data collection methods. This is supported by credible sources.	There is a strong evaluation of the suitability of selected data collection method/s on the listed factors. There is a strong evaluation of evidence why this method is more suitable compared to other data collection methods. This is supported by credible sources.	There is a good evaluation of the suitability of selected data collection method/s on the listed factors. There is a good evaluation of evidence why this method is more suitable compared to other data collection methods. This maybe supported by using by credible sources.	There is an attempt at evaluation of the suitability of selected data collection method/s on the listed factors. This maybe supported by credible academic sources.	There is limited evaluation of the suitability of selected data collection method/s on the listed factors.	There is no evaluation of the suitability of selected data collection method/s on the listed factors.

Academic Integrity (5%)	A variety of credible sources are used throughout the submission. There are no errors in the referencing of sources in the Harvard style. This is an exceptional example of academic integrity.	Credible sources are used throughout the submission. There are no errors in the referencing of sources in the Harvard style. This is a strong example of academic integrity.	Credible sources are used throughout the submission. There are minor errors in the referencing of sources in the Harvard style. This is a good example of academic integrity.	Sources appear on the submission, and majority are credible . There may be some errors in the referencing of sources in the Harvard style. This is a fair example of academic integrity.	Few credible sources are used in the submission, and other sources may be of questionable quality . There may be major errors in the referencing of sources in the Harvard style and/or a few sources are missing .	Limited or no credible sources are used in the submission, or all sources are of questionable quality . Sources are consistently not referenced correctly in the Harvard style and/or missing
Academic Writing (5%)	Exceptional communication skills evident throughout the document. The document is well-structured and all points can be appreciated in the first reading.	Strong communication skills evident throughout the document. The document is well-structured and most points can be appreciated in the first reading.	Good communication skills evident throughout the document though there may be minor issues . The document is well-structured and main points can be appreciated in the first reading.	Fair communication skills evident throughout the document though there may be issues that cause some confusion . The document is structured though some points may be difficult to follow at times. The document may require some re-reading.	Poor communication skills evident throughout the document that cause serious confusion . The document lacks structure and is difficult to follow majority of the time. The document may require serious re-reading	Poor communication skills evident throughout the document that prevent understanding . The document is unstructured and is overall difficult to follow

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1.0 Introduction

Artificial Intelligence is now becoming a major part to run the businesses in more productive, profitable and sustainable way and Auto Industry is no exception to that. Supply Chains are now becoming more complex and wider and car manufacturers are under pressure and continuously trying improve their operations, reduce cost and meet the customer demands. To stay competitive, auto manufacturers are tilting towards new technologies and Artificial Intelligence is one of them (Helo and Hao 2022). AI tools like Machine Learning, automation and data analytics are helping manufacturers to make better decisions, forecast demands, reduce operational cost and reduce the waste (Dumitrascu, Dumitrascu et al. 2020). For instance, AI can be used to predict the machine failure before they actually occur, also to improve the inventory planning and to lower the emissions and waste occurred that too by using available resources efficiently.

Despite of these benefits, implementing AI in automotive supply chain is still difficult. It comes with some challenges as well and challenges include, high set up cost, difficulties in integrating the current system with AI, and lack of skills and poor-quality data (Banerjee, Pawar et al. 2024). This report will guide the way from identification and justification of complex problem. Further will create a valid research question along with the research objectives. Afterwards, it will talk about some current literatures about the research topic followed by design of research, type of data required, and its collection methods, and at last will discuss about evaluation of data collection methods.

2.0 Identification and justification of complex problem

Modern automotive supply chains are getting complex due to increasing global scope, logistics and involvement of multiple stakeholders. They face major challenges which include demand fluctuations, supply chain disruptions and the requirement of sustainable practices. Traditional methods often lack the potential to manage the issues effectively (Elbegzaya 2020). Artificial Intelligence offers promising solutions by improving the forecast accuracy, optimizing inventory, and enabling faster and data driven decisions. However, adopting the AI in automotive supply chain and operations is not an easy task. This bring us to our research question which has been mentioned below.

2.1 Research Question

How Artificial Intelligence can be effectively implemented in Automotive supply chain and operations to improve efficiency and sustainability?

2.2 Research Objectives

1. To explore the current need for Artificial Intelligence in the Automotive supply chain and operations - This Objective aims to explore why Artificial Intelligence is currently needed in the automotive supply chain and operations by reviewing trends, industry pressures, and operational complexities.

2. To examine existing AI applications and their impact on performance and sustainability
This objective focuses on assessing how various AI tools are currently being used in forecasting, inventory management and logistics and how they affect efficiency, cost, environmental performance in automotive industry.

3. To identify challenges and suggest improvements for better AI integration in the automotive supply chain – This objective looks into the barrier's companies face, like data privacy, costs or technical limitations, through various case studies.

3.0 Potential Contribution to Knowledge and Literature

Researchers are continuously searching how AI can contribute to automotive supply chain. However, there are still lot of questions to answer. (Baryannis, Validi et al. 2019) explains, that AI is now becoming important because supply chains are facing major problems like unpredictable demands and disruptions, and continuous pressure to cut down the pollution. Further adds, AI tools, like ML or data analysis can help predict what customers want or manage risks, which connects to our first objective of requirement of Artificial Intelligence in automotive supply chain and operations. For example, car manufacturers deal with continuously changing orders, complex logistics, this is where AI plays a major role, AI can analyse the previously available data and make these processes faster and comparatively cheaper as well. Since the time is saved, less resources will be used and it will further help to move closer to the sustainability goal. To compliment that, (Baryannis, Validi et al. 2019) adds, AI tools have practically shown improved real time decision making and reduced operational costs in auto motive supply chain. These Improvements have direct impact Just in Time (JIT) manufacturing processes where delays or inefficiencies could cause serious financial and resource loss.

Looking at the current AI tool that are being used in Automotive supply chain and operations,

a report from (Aich, Sengupta et al.) shows that with the help AI tools like predictive maintenance cutting factory downtime by up to 30%, In the car industry, major companies like Tesla, use AI to manage stock, keeping just enough stock which helps to reduce maintaining unnecessary inventory which eventually helps to reduce the use of resources and waste generated (Sathish and Weenk 2020). Furthermore, sustainability has now become a main requirement for automotive companies due to regulatory pressure and shifting customer expectations and preferences (Richter and Medunic 2020). Artificial Intelligence can support green supply chain initiatives which helps auto manufacturers to optimise the logistics routes, minimising waste, better energy consumption management through smart factory automation (Nahr, Nozari et al. 2021) These applications not only align with the environmental goals but also contribute to cost saving opportunities and create win situations as well.

4 Design of Research

This research follows an interpretive paradigm, aiming to explore how artificial intelligence can improve supply chain in automotive industry using available knowledge and information. The design focuses on secondary data, which means using the data which is already available and published (Johhson and Sylvia 2018). The sources include. Academic journals, literature reviews, industry reports from McKinsey, Deloitte, and PwC, various case studies from car manufacturers and publicly available data about supply chain efficiency, sustainability and environmental impact.

4.1 Types and amount of data

This research will be based on both qualitative and quantitative secondary data. Qualitative data which includes detailed case studies, literatures explaining how AI is being used to contribute to solve the supply chain problems (Seers 2012). While, quantitative data which include various stats about cost savings, carbon emission reductions, time savings and many more. A sample of 40-60 articles and reports will be used for the Systematics Literature Review (SLR) along with around 4-6 case studies. This amount of data will be enough to meet the study's goal.

4.2 Data Collection Methods

4.2.1 Systematic Literature Review

The Systematic Literature Review will collect and summarise the studies about how Artificial Intelligence is applied in automotive supply chains. Databases which offer vast information to search on are IEEE Xplore, Warwick Library, Google Scholar using keywords like sustainability in supply chain, machine learning in logistics, AI in automotive supply chains. Only peer-reviewed articles, industry reports, and sources from 2015 or later will be included. The main goal is to find relevant information on AI tools, their benefits and the challenges associated with them.

Systematic Literature Review is suitable because it helps achieve the requirements in a planned manner (Lame 2019). It will help to identify the requirements of AI in supply chain and gaps between traditional approaches and the sustainability aim. Also, it will be helpful to find out how AI is being currently used in supply chain and to what extent it is useful. Furthermore, with SLR, we can figure out the updates to be made with AI in order to use it at its full potential and achieve desired results with it. This approach gives a well-rounded view of the research topic.

4.2.2 Case Study Analysis

The case study analysis will explore how AI is being used in particular car companies such as Tesla, BMW, Toyota and VW. Sources will include their company reports, news articles, academic case studies and industry publications. The analysis will focus on how these companies successfully implemented AI in their supply chain and operations and will analyse the results they achieved and how they handled the changes (Beinabadi, Baradaran et al. 2024). This will help to develop practical strategies by showing what has worked for those companies who went down the Artificial Intelligence road. It adds a practical dimension to the literature findings,

making the research more applicable for the auto industry.

On more approach that can be followed is using Combination Rationale. Using both Systematic Literature Review and case study analysis will provide a more strong and solid understanding. The SLR gives a broad view of AI's potential, while case studies will offer practical and real-world example (Weltin, Zasada et al. 2018). This combined approach strengthens the findings by balancing the theory with actual business implementation of these theories.

5. Evaluation of Selected Data Methods

5.1. Relevance of the Method to Addressing the Research Question and Objectives

5.1.1 Systematic Literature Review – The SLR method is very relevant because it collects clear and detailed evidence on AI tools, their need in today's fast paced environment, efficiency benefits which directly addresses our objectives. By reviewing available study material, it answers how AI can be effectively used in automotive supply chains and operations.

5.1.2 Case Study Analysis

Supports the objectives by offering insights from companies currently using AI in their supply chain and operations explaining how these tools are applied and what outcomes they have produced.

5.2 Availability of Resources, tools and software

With the access of academic databases like, Warwick Library, google scholar we can find information. Tools like, EndNote and Mendeley Cite will be used to managed the references.

5.4 Time Required to conduct the research

For the Systematic Literature Review the process is planned to take around 5 weeks. 2 weeks for the planning and understanding, 2 weeks for data gathering, 2 weeks to summarise findings, and 1 week for reviewing quality. For the case study, it will take 4 weeks. 1 week to identify relevant case studies, 2 weeks for analysis and 2 weeks for combining findings with SLR. Overall, the combine approach will take around 12-week time frame.

5.5 Ethical Risks Associated with Data Collection Method and Data to be collected

Ethical risks are low because all data comes from public sources. Risks such as missing important studies or misinterpreting findings are addressed by using clear selection criteria and proper referencing. As it uses publicly available company information, ethical concerns are minimal, and even if they are there, the risk can be managed by using multiple information sources to find the most accurate data of the case studies (Guntzburger, Pauchant et al. 2017). No personal data or direct contact with people is involved. All sources will be properly cited.

6.0 Conclusion

This research is a practical and well-structured way to answer our research question. How Artificial Intelligence can be effectively implemented in Automotive supply chain and operations to improve efficiency and sustainability. The Systematic Literature Review and case study analysis are strong and most appropriate choices to go with. The SLR provides a clear picture of AI tools and their benefits, while case studies show how they work practically in automotive supply chain and operations. Additionally, combining both of the research methods will provide strong foundation to our research.

Resources are easy to access, with databases, public reports and basic available software's. Data is widely available and easily accessible, with issues in getting the case studies or reading materials. The 12-week timeline is accurate, allowing a careful and detailed work. Ethical risks are small and not that challenging. They can be managed with careful selection of sources, clear methods and proper referencing. This study will offer valuable ideas for researchers and car companies, showing a clear way to integrate Artificial Intelligence in a better way in their supply chain and operations.

7.0 References

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