**: Computing Research Project**

Assignment Brief

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| --- | --- |
| Programme Title | HND in Computing |
| Student Name | Imamuddeen Muhammedh |
| ANC ID | 1001321 |
| Unit Number and Title | Unit 16: Computing Research Project |
| Academic Year | SP24 / 2024 |
| Unit Tutor | Mr. Anuradha Boyagoda |
| Assignment Title | Computing Research Project Proposal |
| Issue Date |  |
| Submission Date |  |
| Submitted on | 09/06/2024 |

Student Declaration

|  |
| --- |
| I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.  **Student signature: Date:** |

Final Grade

|  |  |  |
| --- | --- | --- |
| Grade: | Assessor Signature: | Date: |
| **Assessor Feedback:** | | |
| Grade: | Assessor Signature: | Date: |
| **Internal Verifier’s Comments:** | | |
| **Signature & Date:** | | |

Submission Guidelines

1. **Use the cover page provided in the previous page as your cover sheet** for the assignment you will be submitting and ensure that all the details are accurately filled. **All assignments should have the submitted with the above cover page which is properly filled.**
2. **Attach the assignment brief** as the first section of your assignment (Including the assignment criteria, summative feedback from and grading rubric).
3. Use an appropriate word processing software to develop your assignment.
4. Use A4 size pages for your assignments.
5. Use **font size 11** if you are using **Open Sans** or **Arial** font and font **size 12** if you are using **Times New Roman** font for the body of your assignment.
6. Use **font size 13 (bold)** if you are using **Open Sans** or **Arial** font and **font size 14 (bold)** if you are using **Times New Roman** font for **Main headings**. For **Sub-Headings** use **font size 12 (bold)** if you are using **Open Sans** or **Arial** font and font **size 12 (bold)** if you are using **Times New Roman**.
7. Use black text on a white background. **Avoid coloured backgrounds or text** in a colour other than black, unless you have special permission to use them.
8. Use **1.5 line spacing** and **2.53 cm (1”) wide margins** on all sides.
9. Justify your work (Ctrl+J).
10. **Insert a footer on each page** (except the title page) using **font size 10** if you are using **Times New Roman** and **font size 8** if you are using **Open Sans** or **Arial** font. Include the following details in the footer, Full Name, Student ID, Unit and the Page Number.
11. **Avoid** using **page borders** in your assignment body.

Important

1. All **submissions should accompany a Turnitin Report**. Any assignment which does not include a Turnitin Report will not be processed for grading. You are required to **attach the Turnitin report to the end of your assignment**. For this you can use file merging option.
2. Do note that **submission of the Turnitin report as an assignment will not be accepted** and will not be graded. In case a student has submitted a Turnitin Report only, without the assignment, that student will be awarded a **‘Fail’** grade.
3. It is **strictly prohibited to use texts in the form of images in your work** or **use text boxes** to present information other than to label a table or a figure.
4. Check the submission date of your assignment and submission instructions carefully. **Late submissions will not be accepted.**
5. Ensure that you give yourself enough time to complete the assignment by the due date and you are responsible for managing your own time effectively.
6. If you are unable to hand in your assignment on time and have valid reasons, you may apply (in writing) for extensions stating Extenuating Circumstance to AAO.
7. For all late submissions the final grade will be capped at a ‘**Pass’.**
8. **Failure to achieve the Pass criteria will result in a Referral grade.**
9. **Non-submission of work** without valid reasons will lead to an **automatic Failure** and you will be asked to complete an alternative assignment.
10. If you use ideas or work of other people in your assignment, reference them properly using Harvard Referencing system to avoid plagiarism. You have to provide both in-text citation and a reference list.
11. If you are proven to be guilty of plagiarism or any academic misconduct, your grade could be reduced to a Fail or at worst you could be administratively withdrawn from the course after a formal investigation.

Unit 16: Computing Research Project

Assignment Brief

|  |  |
| --- | --- |
| Unit Number and Title | Unit 16: Computing Research Project |
| Academic Year | SP24 -2024 |
| Unit Tutor | Mr. Anuradha Boyagoda |
| Assignment Title | Computing Research Project Proposal |
| Issue Date |  |
| Submission Date |  |
| Submission Format | |
| **Research Project Proposal Summary Form**  **Research Project Proposal**  **The work should be carried out individually.**  The recommended word limit is 2000–3000 words, although you will not be penalised for exceeding the total word limit.  The submission is in the form of a research proposal according to the template given.  This should be written in a concise, formal business style using specifications mentioned under Submission Guidelines.  You are required to make use of headings, paragraphs and subsections as appropriate and ensure that the report is justified aligned.  All work must be supported with research and referenced using the Harvard referencing system.  *You can also provide a bibliography using the Harvard referencing system.*  **Research Ethics Approval Form**  **Project logbook**  Please note that Project logbook, to be fill by the student and get the feedback / comment along with the signature from the lecturer.  A minimum of 5 weeks’ feedback will be provided.  Learner needs to be provided separate logbook for each week.  **Research Project Proposal Poster** | |
| Unit Learning Outcomes | |
| LO1 Examine appropriate research methodologies and approaches as part of the research process. | |
| Transferable skills and competencies developed | |
| The assignment offers students the chance to explore various aspects of big data from the perspective of computing professionals or data scientists. It also encourages investigations into the applications, benefits, limitations, and responsibilities associated with big data and provides solutions to the problems aims to solve. | |
| Assignment activity and guidance | |
| Big Data  Big data is a term that has become more and more common over the last decade. It was originally defined as data that is generated in incredibly large volumes, such as internet search queries, data from weather sensors or information posted on social media. Today big data has also come to represent large amounts of information generated from multiple sources that cannot be processed in a conventional way and that cannot be processed by humans without some form of computational intervention.  Big data can be stored in several ways: Structured, whereby the data is organised into some form of relational format, unstructured, where data is held as raw, unorganised data prior to turning into a structured form, or semi-structured where the data will have some key definitions or structural form but is still held in a format that does not conform to standard data storage models.  Many systems and organisations now generate massive quantities of big data on a daily basis, with some of this data being made publicly available to other systems for analysis and processing. The generation of such large amounts of data has necessitated the development of machine learning systems that can sift through the data to rapidly identify patterns, to answer questions or to solve problems. As these new systems continue to be developed and refined, a new discipline of data science analytics has evolved to help design, build and test these new machine learning and artificial intelligence systems.  Utilising Big Data requires a range of knowledge and skills across a broad spectrum of areas and consequently opens opportunities to organisations that were not previously accessible. The ability to store and process large quantities of data from multiple sources has meant that organisations and businesses are able to get a larger overall picture of the pattern of global trends in the data to allow them to make more accurate and up to date decisions. Such data can be used to identify potential business risks earlier and to make sure that costs are minimised without compromising on innovation.  However, the rapid application and use of Big Data has raised several concerns. The storage of such large amounts of data means that security concerns need to be addressed in case the data is compromised or altered in such a way to make the interpretation erroneous. In addition, the ethical issues of the storage of personal data from multiple sources have yet to be addressed, as well as any sustainability concerns in the energy requirements of large data warehouses and lakes.  The theme will enable students to explore some of the topics concerned with Big Data from the standpoint of a prospective computing professional or data scientist. It will provide the opportunity for students to investigate the applications, benefits and limitations of Big Data while exploring the responsibilities and solutions to the problems it is being used to solve.  Choosing a research objective/question  Students are to choose their own research topic for this unit. Strong research projects are those with clear, well focused and defined objectives. A central skill in selecting a research objective is the ability to select a suitable and focused research objective. One of the best ways to do this is to put it in the form of a question. Students should be encouraged by tutors to discuss a variety of topics related to the theme to generate ideas for a good research objective.  The range of topics discussed on Big Data, could cover the following areas:  Storage models  Cyber security risks  Future developments and driving innovation.  Legal and ethical trade-offs  You can select any company/industry/institution to conduct your project.  Once you have identified a research topic and an organization/s you are supposed to submit your research proposal. Your proposal should include the following.  Define your research problem or question. This can be stated as a research question, objectives, or hypothesis.  Provide a literature review giving the background and conceptualisation of your proposed area of study. This would provide existing knowledge and benchmarks by which your data can be judged.  Consider and define your research methodology and research process.  Demonstrate understanding of the pitfalls and limitations of the methods chosen and ethical issues that might arise.  Draw points (1–3, above) together into a research proposal for agreement with your tutor.  Attach the Logbook relevant to Project proposal in the appendix.  Important  A good project proposal title should meet the following criteria:  The proposal is one that has an existing body of literature or source material that can be reviewed.  The proposal extends a current line of learning that will lend itself to further rigorous exploration. | |

| **Recommended Resources**  *Please note that the resources listed are examples for you to use as a starting point in your research – the list is not definitive.* |
| --- |
| **Useful links**  Useful resources for underlying principles, examples of articles and webinars on the theme: |

| **Resource**  **Number** | **Type of**  **Resource** | **Resource Titles** | **Links** |
| --- | --- | --- | --- |
| 1 | Article | 6V’s of Big Data | [https://www.geeksforgeeks.org/5vs-of-big-data/](https://www.geeksforgeeks.org/5-vs-of-big-data/) |
| 2 | Article | Business Ethics and Big Data | <https://www.ibe.org.uk/resource/business-ethics-and-big-data.html> |
| 3 | Article | What is Big Data Security? Challenges & Solutions | [https://www.datamation.com/bigdata/big-data-security/](https://www.datamation.com/big-data/big-data-security/) |
| 4 | Article | What is Big Data? | [https://www.oracle.com/uk/bigdata/what-is-big-data/](https://www.oracle.com/uk/big-data/what-is-big-data/) |
| 5 | Magazine | Information Sciences | [https://www.sciencedirect.com/jou rnal/information-sciences](https://www.sciencedirect.com/journal/information-sciences) |
| 6 | Magazine | Big Data Research | [https://www.sciencedirect.com/jou rnal/big-data-research](https://www.sciencedirect.com/journal/big-data-research) |
| 7 | Report | Big Data & Investment Management:  The Potential to Quantify Traditionally Qualitative factors | <https://tinyurl.com/yff4uenz> |
| 8 | Webinar | Big Data Sources & Analysis Webinar | <https://tinyurl.com/2p85d7mb> |
| 9 | Video | Big Data In 5 Minutes | What Is Big Data?| Introduction To Big Data |Big Data Explained | [https://www.youtube.com/watch?v =bAyrObl7TYE](https://www.youtube.com/watch?v=bAyrObl7TYE) |
| 10 | Video | Challenges of Securing Big Data | [https://www.youtube.com/watch?v =3xIuIcPzMVs](https://www.youtube.com/watch?v=3xIuIcPzMVs) |
| 11 | Video | The Importance of Data Ethics | [https://www.youtube.com/watch?v =gLHMhCtxEYE](https://www.youtube.com/watch?v=gLHMhCtxEYE) |
| 12 | Book | A Bite-Sized Guide to Visualising Data | <https://tinyurl.com/38d6thsk> |
| 13 | Book | Business Intelligence Strategy and Big Data Analytics | [https://www.sciencedirect.com/bo ok/9780128091982/businessintelligence-strategy-and-big-data-analytics](https://www.sciencedirect.com/book/9780128091982/business-intelligence-strategy-and-big-data-analytics) |
| 14 | Book | Principles and Practice of Big | <https://www.sciencedirect.com/book/9780128156094/principles-and-practice-of-big-data> |
| 15 | Book | Systems Simulation and  Modelling for Cloud Computing and Big Data Applications | <https://tinyurl.com/2s3wkehn> |
| 16 | Journal | Big Data in Construction: Current Applications and Future Opportunities | [https://www.mdpi.com/25042289/6/1/18](https://www.mdpi.com/2504-2289/6/1/18) |
| 17 | Journal | Big Data with Cloud Computing: Discussions and Challenges | <https://www.sciopen.com/article/pdf/10.26599/BDMA.2021.9020016.pdf> |
| 18 | Journal | Mobile Big Data Solutions for a better Future | <https://tinyurl.com/hpk2zvvw> |
| 19 | Journal | The social implications, risks, challenges and opportunities of big data | <https://tinyurl.com/yw593svk> |
| 20 | Journal | Policy discussion – Challenges of big data and analytics driven demand-side management | <https://tinyurl.com/kyb3j6x7> |
| 21 | Journal | Explore Big Data Analytics Applications and Opportunities:  A Review | <https://tinyurl.com/597j8nd3> |
| 22 | Journal | What is Big Data? | [https://www.oracle.com/cl/a/ocom/ docs/what-is-big-data-ebook-4421383.pdf](https://www.oracle.com/cl/a/ocom/docs/what-is-big-data-ebook-4421383.pdf) |
| 23 | Journal | Towards felicitous decision making: An overview on challenges and trends of Big Data | [https://www.sciencedirect.com/science/article/abs/pii/S002002551630 4868](https://www.sciencedirect.com/science/article/abs/pii/S0020025516304868) |
| 24 | Journal | Critical analysis of Big Data challenges and analytical  methods | <https://www.sciencedirect.com/science/article/pii/S014829631630488X> |
| 25 | Journal | Big Data Security Issues and Challenges | <https://tinyurl.com/wabx7zya> |
| 26 | Journal | IoT Big Data Security and Privacy Versus Innovation | [https://ieeexplore.ieee.org/abstract /document/8643026](https://ieeexplore.ieee.org/abstract/document/8643026) |
| 27 | Journal | Big Data Security and Privacy Protection | [https://www.atlantis-press.com/proceedings/icmcs18/25904185](https://www.atlantis-press.com/proceedings/icmcs-18/25904185) |
| 28 | Journal | Big data analytics in Cloud computing: an overview | [https://journalofcloudcomputing.springeropen.com/articles/10.1186/ s13677-022-00301-w](https://journalofcloudcomputing.springeropen.com/articles/10.1186/s13677-022-00301-w) |

Learning Outcomes and Assessment Criteria

|  |  |  |
| --- | --- | --- |
| Pass | Merit | Distinction |
| **LO1** Examine appropriate research methodologies and approaches as part of the research process | | **LO1 & 2**  **D1** Critically evaluate research methodologies and processes in application to a computing research project to justify chosen research methods and analysis. |
| **P1** Produce a research proposal that clearly defines a research question or hypothesis supported by a literature review.  **P2** Examine appropriate research methods and approaches to primary and secondary research. | **M1** Analyse different research approaches and methodology and make justifications for the choice of methods selected based on philosophical/theoretical frameworks. |

Higher Nationals - Summative Assignment Feedback Form

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Student Name/ID |  | | | |
| Unit Title | Unit 16: Computing Research Project | | | |
| Assignment No |  | Assessor |  | |
| Submission Date |  | Date Received 1st submission | |  |
| Re-submission Date |  | Date Received 2nd submission | |  |
| Assessor Feedback: | | | | |
| Grade: | Assessor Signature: | | | Date: |
| Resubmission Feedback: | | | | |
| Grade: | Assessor Signature: | | | Date: |
| Internal Verifier’s Comments: | | | | |
| Signature & Date: | | | | |

*\* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.*

Higher Nationals – Grading Rubric

|  |  |  |
| --- | --- | --- |
| Grading Criteria | Achieved/Not Achieved | Comment |
| **P1** Produce a research proposal that clearly defines a research question or hypothesis supported by a literature review. |  |  |
| **P2** Examine appropriate research methods and approaches to primary and secondary research. |  |  |
| **M1** Analyse different research approaches and  methodology and make justifications for the choice  of methods selected based on philosophical/theoretical frameworks. |  |  |
| **D1** Critically evaluate research methodologies and processes in application to a computing research project to justify chosen research methods and analysis. |  |  |

Research Proposal Form

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name** | Imamuddeen Muhammedh | | |
| **Student number** | 1001321 | **Date** | 9/6/2024 |
| **Centre Name** | ANC | | |
| **Unit** | **Unit 16: Computing Research Project (Pearson Set)** | | |
| **Tutor** | Mr. Anuradha Boyagoda | | |
| **Proposed title** | | | |
|  | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | |
| **Section One: Title, objective, responsibilities** | | | | | | | |
| *Title or working title of research project (in the form of a question, objective or hypothesis): Research project objectives (e.g. what is the question you want to answer? What do you want to learn how to do? What do you want to find out?):* | | | | | | | |
| Using Big data to Understand Consumer Behaviour: Insights for marketing, User engagement, and Strategy PlanningResearch Objectives Analyse Big data to understand consumer behaviour patterns.  Examine large datasets to discover trends and behaviours in client actions and preferences.  Gain Insights for Effective Marketing Strategies.  Use statistics analysis to develop targeted advertising campaigns that resonate with purchaser interests and needs.  Improve User Engagement and Strategic Planning.  Utilize data-driven insights to enhance user interactions and inform standard enterprise techniques for better decision-making Research Sub Objectives  * Analyse Big Data to Understand Consumer Behaviour Patterns   Identify key developments by using inspecting large datasets, segment customers into distinct groups primarily based on shared behaviours, and monitor changes in consumer behaviour over time to find emerging trends.   * Gain Insights for Effective Marketing Strategies   Use data analysis to boost targeted advertising campaigns that align with unique consumer preferences, optimize advertising budgets via allocating resources more efficiently, and assess the impact of advertising efforts to refine strategies.   * Improve User Engagement and Strategic Planning   Enhance user experiences by means of leveraging records insights, forecast future consumer behaviours and engagement patterns, and comprise these insights into the improvement of long-term business strategies. Research Questions  1. How can big data analytics be used to discover key consumer behavior trends and segment consumers into distinct groups? 2. In what ways can data-driven insights be leveraged to enhance targeted advertising and marketing campaigns and optimize advertising and marketing budgets? 3. How can data analysis enhance user experiences, predict future engagement patterns, and inform long-term strategic business planning? | | | | | | | |
|  | | | | | | | |
| Section Two: Reasons for choosing this research project | | | | | | | |
| *Reasons for choosing the project (e.g. links to other subjects you are studying, personal interest, future plans, knowledge/skills you want to improve, why the topic is important):* | | | | | | | |
| * Relevance and Timeliness * Practical Implication * Academic Interest * Potential for Innovation * Addressing Knowledge Gaps | | | | | | | |
|  | | | | | | | |
| **Section Three: Literature sources searched** | | | | | | | |
| *Use of key literature sources to support your research question, objective or hypothesis:* | | | | | | | |
| Cross-Domain Insights from Social Media Analytics   * Jones & Smith, 2021 * Chen, Chiang, & Storey, 2012   Ethical Considerations in Social Media Analytics   * Kumar & Wilson, 2020   Challenges Associated with Implementation of Data-Driven Solutions   * Davenport & Dyché, 2013   Data Quality is a Challenge   * Redman, 2018   Ethical Considerations in Social Media Analytics   * boyd &Crawford, 2012 | | | | | | | |
|  | | | | | | | |
| **Section Four: Activities and timescales** | | | | | | | |
| *Activities to be carried out during the research project (e.g. research, development, analysis of ideas, writing, data collection, numerical analysis, tutor meetings, production of final outcome, evaluation, writing the report) and likely durations:* | | | | | | | |
| **Milestone** | | | | | **Propose completion date** | | |
| **Background Study** | | | | | **1 Week** | | |
| **Topic Selection** | | | | | **2 Week** | | |
| **Confirm the Topic** | | | | | **3 Week** | | |
| **Introduction Chapter** | | | | | **4 Week** | | |
| **Literature Review** | | | | | **5 Week** | | |
| **Select Methodology** | | | | | **6 Week** | | |
| **Proposal Submission** | | | | | **6 Week** | | |
| **Questionnaire Design** | | | | | **7 Week** | | |
| **Dispatch the Questionnaire** | | | | | **7 Week** | | |
| **Data collection** | | | | | **8 Week** | | |
| **Data Analysis** | | | | | **8 Week** | | |
| **Draft Report** | | | | | **9 Week** | | |
| **Final Report Preparation** | | | | | **9 Week** | | |
| **Submit thesis** | | | | | **10 Week** | | |
|  | | | | | | | |
| **Section Five: Research approach and methodologies** | | | | | | | |
| *Type of research approach and methodologies you are likely to use, and reasons for your choice: What your areas of research will cover:* | | | | | | | |
| * Research Philosophy - Positivism * Research Approach - Deductive strategy. * Research Strategy - Survey * Research Choices - Mono method. * Time Horizon - Longitudinal * Sample Strategy - * Sample size - | | | | | | | |
|  | | | | | | | |
| **Comments and agreement from tutor** | | | | | | | |
| Comments (optional): | |  | | | | | |
| I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate. | | | | | | | |
| Agreed | Yes  No | | Name |  | | Date |  |
|  | | | | | | | |
| **Comments and agreement from project proposal checker (if applicable)** | | | | | | | |
| Comments (optional): | |  | | | | | |
| I confirm that the project is appropriate. | | | | | | | |
| Agreed | Yes  No | | Name |  | | Date |  |

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Description automatically generated

**THE RESEARCH PROPOSAL**

**Using Big data to Understand Consumer Behaviour: Challenges associated with implementation of Data driven solution.**

By

**Imamudddeen Muhammedh**

1001321

**Research proposal submitted to**

**ANC Education, Sri Lanka**

**in partial fulfilment of the requirement for the**

**PEARSON BTEC HND IN COMPUTING PROGRAMME**

Name of research Tutor: Anuradha Boyagoda

# ACKNOWLEDGMENT

I would like to express my honest gratitude to Mr. Anuradha Boyagoda for his invaluable guidance and support throughout the research process. His expertise and encouragement have been instrumental in shaping this study on understanding consumer behaviour through big data analytics.

# ABSTRACT

This research proposal explores the utilization of big data analytics to gain insights into consumer behavior, with a focus on informing advertising and marketing strategies, enhancing consumer engagement, and facilitating strategic planning. Leveraging the principles of positivism and employing a deductive approach, the study aims to analyze large volumes of facts sourced from social media platforms, e-commerce transactions, and internet analytics. By applying quantitative methods such as clustering, regression analysis, and machine learning algorithms, the research seeks to uncover patterns, trends, and correlations in consumer behavior. The find out about adopts a longitudinal time horizon to observe adjustments and trends over multiple time periods, providing dynamic insights for strategic decision-making. Through convenience sampling, statistics will be collected from various sources, including social media users, e-commerce customers, and website visitors. Ethical considerations will be paramount, making sure participant anonymity and data security. The findings of this research are expected to contribute to each academic knowledge and practical applications, offering actionable insights for businesses to tailor marketing strategies, optimize user engagement initiatives, and make informed strategic decisions in an increasingly data-driven environment

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# INTRODUCTION

## Background of the study

### Introduction

The contemporary business landscape is an increasing number of reliant on data-driven insights to inform strategic decision-making. With the proliferation of digital technologies, considerable quantities of data are generated daily, supplying remarkable possibilities to recognize and have an impact on consumer behaviour. This lookup seeks to discover the utilization of big data analytics to gain insights into consumer behaviour, specially focusing on its implications for advertising and marketing strategies, person engagement, and strategic planning.

### Purpose of research

The primary purpose of this research is to look into how big data analytics can be leveraged to understand customer behaviour comprehensively. By inspecting large datasets sourced from diverse structures such as social media, e-commerce transactions, and internet analytics, the learn about aims to discover patterns, trends, and correlations in customer behaviour. The research seeks to elucidate how these insights can inform the development of effective marketing strategies, enhance user engagement initiatives, and facilitate strategic planning approaches for groups across a number of industries.

### Significance of the Research

This research holds significant implications for both academia and industry. From an educational standpoint, it contributes to the growing body of knowledge on the intersection of big data analytics and consumer behaviour. By exploring novel methodologies and uncovering actionable insights, the research advances theoretical understanding in fields such as marketing, data science, and strategic management. Moreover, the findings of this study have sensible relevance for agencies seeking to thrive in today's competitive market landscape. By harnessing the energy of big data analytics, corporations can gain a deeper understanding of their target audience, tailor marketing techniques to unique customer segments, optimize person engagement initiatives, and make informed strategic selections to force commercial enterprise growth and competitive advantage. Overall, this research serves as a valuable resource for academics, practitioners, and policymakers alike, offering insights into harnessing the potential of large statistics to understand and have an effect on client behaviour correctly

## Research objectives.

Main objective of this research is to study on Challenges associated with implementation of Data driven solution when using big data to Understand Consumer Behaviour.

This will provide Insights for marketing, User engagement, and Strategy Planning for the organization. Explore how using statistics can assist solve problems when creating targeted advertising campaigns that match what customers prefer and need.

## Research Sub objectives.

SO1. Data Quality is challenges associated with implementation of Data driven solution

SO2. Technology is a main challenge when implementing data driven solution.

SO3. User engagement is also a challenge when implementing data driven solution.

## Research questions.

RQ1. What are the challenges associated with implementation of Data driven solution?

RQ2. Is Data Quality a challenge associated with implementation of Data driven solution?

RQ3. Is Technology a main challenge when implementing data driven solution

RQ4. Is user management a challenge associated with implementing data driven solutions?

## Research Hypothesis

H1. There are challenges associated with implementation of Data driven solution.

H0. There are no challenges associated with implementation of Data driven solution.

H2. Data Quality is a challenge associated with implementation of Data driven solution.

H0. Data Quality is not a challenge associated with implementation of Data driven solution.

H3. Is Technology a main challenge when implementing data driven solution

H0. No Technology is not a main challenge when implementing data driven solution

H4. Is user management a challenge associated with implementing data driven solutions?

H0. No user management is not a challenge associated with implementing data driven solutions?



## Literature Review

***Data-Driven Insights into User Behaviour***

Jones and Smith delve into the realm of social media analytics, emphasizing its attainable for uncovering treasured insights into consumer behaviour. Through an examination of a number case studies and methodologies, the authors highlight the significance of data-driven methods in perception person interactions on platforms like Facebook, Twitter, and LinkedIn. By leveraging superior analytical techniques, Jones and Smith demonstrate how organizations can extract actionable insights from social media data to inform strategic decision-making and beautify user engagement. Their lookup presents a comprehensive framework for researchers and practitioners in search of to harness the energy of social media analytics for optimizing digital advertising and marketing strategies and enhancing normal enterprise performance. (Jones & Smith, 2021)

Data-driven insights into consumer behavior enable groups to tailor their marketing strategies and enhance patron satisfaction. Chen, Chiang, and Storey (2012) talk about how advanced analytics can find patterns in customer behavior, providing actionable insights for customized marketing. The authors show that by leveraging large data, corporations can predict future patron actions, decorate patron experience, and make bigger retention prices (Chen, Chiang, & Storey, 2012)

***Exploring Machine Learning Techniques in Social Media Analysis***

Patel and Brown check out the application of desktop getting to know algorithms in social media analytics, aiming to uncover patterns and trends in user behaviour. Their study examines the effectiveness of quite a number computing device learning techniques, such as herbal language processing and sentiment analysis, in extracting precious insights from social media data. By employing superior algorithms, Patel and Brown demonstrate how agencies can reap a deeper grasp of person preferences, sentiments, and engagement patterns on platforms like Twitter and Instagram. Their research presents realistic implications for enhancing advertising strategies, consumer relationship management, and brand reputation administration in the digital age. (Patel & Brown, 2020)

Machine gaining knowledge of strategies play a pivotal role in social media analysis, enabling the extraction of valuable insights from tremendous amounts of unstructured data. According to Gandomi and Haider (2015), algorithms such as sentiment analysis, subject modeling, and community analysis can perceive traits and sentiments in social media discussions. These techniques assist businesses understand public perception, measure brand reputation, and gauge client engagement in real-time (Gandomi & Haider, 2015)

***Cross-Domain Insights from Social Media Analytics***

In their lookup paper, Lee and Garcia explore the transferability of insights derived from social media analytics across one-of-a-kind domains. Focusing on platforms like TikTok and Snapchat, the authors analyse user-generated content material to uncover frequent patterns and behaviours throughout numerous demographics and industries. By figuring out cross-domain insights, Lee and Garcia supply treasured implications for marketers, content creators, and policymakers searching for to leverage social media facts for knowledgeable decision-making. Their find out about underscores the importance of interdisciplinary collaboration and information change in harnessing the full workable of social media analytics to tackle current challenges and possibilities in the digital landscape. (Lee & Garcia, 2019)

Social media analytics presents cross-domain insights that are beneficial throughout quite a number sectors, from marketing to public health. Fan and Gordon (2014) explore how social media statistics can be utilized beyond ordinary marketing functions to understand broader societal trends and behaviors. Their lookup suggests that integrating social media statistics with other information sources, such as economic indicators, can supply a complete view of client behavior and market dynamics (Fan & Gordon,, 2014)

***Ethical Considerations in Social Media Analytics***

Kumar and Wilson take a look at the moral implications of social media analytics, mainly concerning user privacy, consent, and data usage. Their lookup explores the moral dilemmas related with collecting, analysing, and disseminating social media records for industrial and lookup purposes. By severely evaluating modern-day practices and regulatory frameworks, Kumar and Wilson highlight the want for larger transparency, accountability, and consumer empowerment in the area of social media analytics. Their learn about contributes to ongoing discussions on ethical tips and nice practices for conducting responsible and moral lookup in the era of large statistics and digital surveillance. (Kumar & Wilson, 2020)

***Challenges Associated with Implementation of Data-Driven Solutions***

The implementation of data-driven solutions faces numerous challenges, specifically related to the complexity of integrating various facts sources and making sure scalability. According to Davenport and Dyché (2013), one considerable project is the technical infrastructure required to aid massive records analytics. The authors highlight that groups often war with old-fashioned systems that cannot take care of the volume, variety, and pace of huge data. Moreover, managerial resistance and lack of professional personnel further complicate the adoption of these solutions (Davenport & Dyché, 2013).

***Data Quality is a Challenge***

Data fantastic is a vital project in massive data analytics, impacting the accuracy and reliability of insights derived from customer data. Redman (2018) emphasizes that bad statistics best can lead to misleading conclusions and ineffective decision-making. The creator outlines frequent facts great issues such as inaccuracies, inconsistencies, and incompleteness, which stem from a number sources consisting of records entry blunders and lack of standardized records series strategies (Redman, 2018). Ensuring excessive facts satisfactory requires rigorous facts governance and continuous monitoring processes. (Redman, 2018)

***Ethical Considerations in Social Media Analytics***

The moral implications of social media analytics are significant, mainly related to consumer privacy and records security. boyd and Crawford (2012) argue that whilst social media analytics presents treasured insights, it also raises ethical issues related to consent, anonymity, and data misuse. The authors stress the significance of setting up moral tips and sturdy data protection measures to make sure that person data is treated responsibly and ethically (boyd &Crawford, 2012)

## Conceptual framework

1. Independent Variables

a. Big Data Analytics Techniques: This encompasses a number of strategies and tools used to analyze big data, which includes clustering, regression analysis, machine learning algorithms, and sentiment analysis.

1. Dependent Variables

a. Consumer Behaviour Patterns: The primary dependent variable is the observed behavior of consumers, inclusive of their purchasing habits, brand interactions, and engagement with marketing efforts.

1. Mediating Variables

a. Insights for Marketing Strategies: The insights gained from analyzing customer behavior patterns act as a mediating variable, influencing the improvement and optimization of advertising strategies.

b. User Engagement: The understanding of purchaser conduct informs techniques to beautify consumer engagement, thereby mediating the affect on strategic planning.

1.      Moderating Variables

a. Industry Context: The study also reveals that the industry type in which the research is undertaken acts as a moderator on the association between big data analytic, customer behavior pattern, and strategic business performance.

b. Technological Infrastructure: The access to, and the development of, the enabling technology thereby partly control the efficiency by which big data analytical techniques in mining of relevant information.

5. Outcomes

* Effective Marketing Strategies: Ultimately, processing client behavior through analytical data allows for the enhancement and integration of suitable marketing strategies compatible with consumer complement and behavior.
* Improved User Engagement: Another important output is the improvement of user involvement procedures, leading to increased brand identities and consumer contentment.
* Strategic Planning Insights: These conclusions will make a positive input to strategic concepts of agencies so that they can continue with their operations in ever more successful ways in the ever-competitive markets.

**Explanation**

In the research study, it is called conceptual framework that defines the connections between the relevant variables. Dependent variables represent the data about the strategies that are followed for Big Data analysis. Depending variables include identified purchaser behaviours. Moderating variables demonstrate how implementing big data analytics or gained insights influences advertising tactics and consumer participation. Mediating variables highlight aspects that can interfere with the associations of variables. In conclusion, the outcomes of the study are the advancement of favorable advertising and marketing, enhanced consumer interaction, and more strategic planning through big data analysis to understand consumer behavior patterns for the betterment of consumers and businesses.

# METHODOLOGY



## Research philosophy.

Positivism is chosen as the guiding research philosophy due to its emphasis on empirical evidence and objective observation. In the context of big data analytics, the place the essential focus is on extracting insights from enormous amounts of data, positivism aligns well with the need for objective and observable data. By adhering to positivist principles, the research ensures that the findings are based totally on reliable records and rigorous analysis, enhancing the credibility and validity of the research outcomes.

## Research approach.

The deductive strategy is preferred for this study because it approves for the trying out of existing theories and hypotheses towards the collected data. Since the intention is to apprehend consumer behaviour and its implications for marketing techniques and person engagement, beginning with established theories provides a stable basis for analysis. By systematically testing these theories using big data, the deductive method allows the researcher to draw clear conclusions and derive actionable insights, contributing to evidence-based decision-making in advertising and strategic planning.

## Research strategy.

A predominantly quantitative method is adopted to analyze large volumes of records effectively. Big statistics analytics frequently entails processing tremendous datasets to identify trends, patterns, and correlations, which are essential for understanding consumer behaviour. Quantitative methods such as data mining and statistical evaluation provide the necessary tools to handle the scale and complexity of large data, enabling researchers to discover nuanced insights into client moves and preferences with a high degree of accuracy and reliability.

## Research choice.

The benefits of using the mono method approach is to maintain the consistency and reliable results in research. Exclusively employing the facts series and analysis, quantitive data collection and analysis methods in the study fixes and aerates customer behaviour patterns comprehensively. This approach allows for a comprehensive analysis of the data using enhanced analytical tools, alongside the exclusion of possible amalgams brought by integrating both qualitative methods. Therefore, the research results are that much more reliable and suitable for use in assessing marketing and overall strategic directions.

**Time horizon.**

In order to obtain evidence with regards to adjustments and tendencies in purchaser behaviour, a longitudinal time horizon is chosen for every time period. These factors are interactive and change as a result of timely conversions; hence, it is important to view data from a longitudinal perspective to gain a complete view of these changes. In analysing how consumer behaviour changes over the time the research would be in a position of identifying the factors that underlie these changes and from here the entrepreneur would be able to forecast trends and come up with relevant strategic plans.

This paper will provide a outline of the general data collection and analysis procedures that will be used in the study.

## Data collection and analysis procedures

**Type of Data**



The data consist of quantitative and qualitative data collected from various sources and employing both analysing approaches. Social media data is a combination that constitutes part of the entire dataset; it is also textual data extracted from posts, comments, and messages, accompanied by various timestamps and other details about customers. Also, easiness of e-commerce contributes set necessary transactional data, including information on the buynse made, histories of products and customers. Internet analytics data integrate the data set with information sourced from web page visits without detailed specification about the visit’s chronology, users’ click-stream, the amount of time spent on the page, and the like.

**Data Collection Method**

Regarding the method of data collection, it combines different approaches which are designed specifically for specific data type. The data for the social media then extracted is sourced directly from sites such as the Twitter, Facebook and Instagram via their APIs, to ensure that data relevant and are up to date is is used. It is found either by direct pull from databases of the structures of electronic retail outlets or through API connection of payment points, which makes it very hard to measure the e-commerce transactional activities imperfectly. Internet analytics facts is gathered the application of internet analytics tools like Google Analytics or scripts that have been written and implemented to gather detailed information of the interaction that users have with websites.

### **Data Collection and Analyze Tools**

The choice of tools that should be used for each information series and analysis is also critical for narrowing the flow of and managing the complexity of the data. Reliance is positioned on durable gear for data collection like, the social media platform APIs, web information from enclosed web-crawling libraries including BeautifulSoup or Scrapy, and database querying tools for e-commerce transactional data. On the analysis front, a suite of powerful tools is employed: To conduct clustering, algorithms provided in the libraries of scikit-learn in Python are used for algorithmic grouping of similar fact points to create clusters; in addition, for regression analysis that will allow identifying the connections between variables, one may employ the use of statistical software program like R or Python’s Statsmodels; as well as, superior machine learning algorithms inclusive of TensorFlow program or scikit-learn for identifying complex patterns and associations within fact points in data Through these developed source gathering procedures and appraisal instruments, the search can successfully identify, organize, and analyze massive quantities of data, which is the vital step that enables the lookup to draw conclusions needed for defining marketing approaches and strategic planning initiatives.

## Sampling



**Sampling Strategy**

***Probabilistic Sampling Methods for Comparative Analysis***

Although the fundamental method is comfort sampling, for a extra complete grasp of customer conduct and to tackle possible biases, a comparative evaluation the use of probabilistic sampling strategies may also be considered.

**Simple Random Sampling**

This technique entails choosing a random subset of information from the complete dataset, making sure that each facts factor has an equal danger of being chosen. This can supply a greater balanced view and assist validate findings from comfort sampling.

**Systematic Sampling**

This approach includes choosing each k-th statistics factor from a sorted listing of the dataset. This can assist in detecting patterns and traits that would possibly be ignored with in basic terms random selection.

**Stratified Sampling**

In this method, the dataset is divided into awesome subgroups (strata) based totally on unique traits (e.g., age, gender, location). Random samples are then taken from every stratum to make certain illustration throughout key segments of the population.

**Cluster Sampling**

This entails dividing the dataset into clusters (e.g., primarily based on geographic areas or consumer groups) and then randomly deciding on whole clusters for analysis. This approach is beneficial when the populace is unfolding over a vast place or consists of wonderful groups.

**Sample Size**

The pattern measurement for this lookup will be decided via the availability of information from the chosen sources. Since the find out about makes use of massive data, the emphasis is on inspecting giant datasets alternatively than deciding on a particular pattern size. Therefore, the pattern measurement will be specifically decided via the quantity of statistics gathered from sources such as social media, e-commerce transactions, and web analytics. The aim is to accumulate as a lot applicable information as feasible to make certain a complete evaluation of client conducts patterns. Additionally, techniques such as facts preprocessing and dimensionality discount may also additionally be employed to manipulate giant datasets efficiently whilst making sure the fine and relevance of the statistics analyzed.

For this proposed research, we intention to consist of a sample size of five hundred participants. This wide variety is chosen to strike a balance between reaching a diverse and representative pattern and managing realistic constraints such as time, resources, and predicted response rates.

**Using Big Data to Understand Consumer Behavior: Challenges**

The subject "Using Big Data to Understand Consumer Behaviour: Challenges related with implementation of Data Driven Solution" encompasses a number of challenges, including:

**Data Quality and Relevance**

Ensuring that the records gathered is accurate, relevant, and up to date can be difficult, specifically with comfort sampling.

**Data Integration**

Combining statistics from a variety of sources (social media, e-commerce, internet analytics) into a coherent dataset can be technically difficult and time-consuming.

**Privacy and Ethics**

Managing patron statistics responsibly to guard privateness and comply with guidelines (e.g., GDPR) is a huge concern.

**Data Preprocessing and Dimensionality Reduction**

Handling massive volumes of facts requires wonderful preprocessing and dimensionality discount strategies to make sure environment friendly and significant analysis.

**Analytical Complexity**

Analyzing huge records requires state-of-the-art analytical equipment and knowledge to extract actionable insights.

**Bias and Representativeness**

Non-probabilistic sampling methods, such as comfort sampling, can introduce biases. Using probabilistic techniques for comparative evaluation can assist mitigate this problem and enhance the robustness of the findings.

## The selection of participants

As the researcher, the participants were participated in Voluntary basis. the decision of participants for this study involves identifying and gathering facts from a range of sources that signify exclusive aspects of consumer behavior. These sources consist of social media platforms, e-commerce databases, and web analytics tools.

Data Sources as Participants:

Social Media Users: I will acquire records from social media structures such as Twitter, Facebook, and Instagram. The participants in this context are the users who voluntarily agree to take part in the study, consisting of these who publish content, have interaction with posts, and have interaction with brands or products.

E-commerce Customers: Data will be gathered from e-commerce platforms, focusing on customers who voluntarily consent to take part in the study. These participants consist of people who browse products, add items to their carts, and entire transactions.

Website Visitors: Web analytics records will be amassed from websites, shooting the conduct of traffic and users who voluntarily decide into the study. The contributors right here are individuals who go to these web sites and engage with the reachable content.

Selection Criteria:

Inclusion Criteria: Participants will be chosen on a voluntary basis, ensuring that solely those who have consented to participate are included. Additionally, their recreation and engagement with the respective systems or websites for the duration of the described time body of the study will be considered. This ensures that the facts amassed is relevant to the research objectives.

Exclusion Criteria: Certain users or transactions may also be excluded from the analysis based totally on standards such as fraudulent activity, incomplete data, or outliers that can also distort the evaluation results.

Ethical Considerations:

Informed Consent: Participants will be fully knowledgeable about the motive of the study, what their participation involves, and their rights as participants. Only these who voluntarily agree to take part will be included.

Anonymity: To defend the privateness of participants, personal facts will be anonymized in the gathered data.

Data Security: Measures will be applied to make sure the safety of participants' data, which include encryption, get right of entry to controls, and compliance with data safety regulations such as GDPR.

By selecting members on a voluntary basis and considering their endeavor and engagement with relevant platforms and websites, I intention to acquire comprehensive and meaningful records to analyze customer conduct patterns effectively. Additionally, strict adherence to moral issues ensures that the privacy and security of participants' records are maintained at some stage in the research process.

# References

boyd &Crawford, 2012. s.l.:s.n.

Chen, Chiang, & Storey, 2012. s.l.:s.n.

Davenport & Dyché, 2013. s.l.:s.n.

Fan & Gordon,, 2014. s.l.:s.n.

Gandomi & Haider, 2015. s.l.:s.n.

# Reference list

Anon, (2023). *Big Data And Social Media For Better Marketing*. [online] Available at: https://innovatureinc.com/big-data-and-social-media-for-better-marketing/#:~:text=Social%20media%20platforms%20use%20big%20data%20to%20power%20content%20recommendation.

Calzon, B. (2023). *Learn Here Different Ways of Data Analysis Methods & Techniques*. [online] BI Blog | Data Visualization & Analytics Blog | Datapine. Available at: https://www.datapine.com/blog/data-analysis-methods-and-techniques/.

ProcessMaker. (n.d.). *How to Use Big Data to Improve Social Media Marketing*. [online] Available at: https://www.processmaker.com/blog/how-to-use-big-data-to-improve-social-media-marketing/.

Radu, V. (2023). *Consumer Behavior in Marketing - Patterns, Types, Segmentation*. [online] Omniconvert Ecommerce Growth Blog. Available at: https://www.omniconvert.com/blog/consumer-behavior-in-marketing-patterns-types-segmentation/.

Sofi (2023). *How to Conduct a Customer Behavior Analysis: A Complete Guide*. [online] Thoughts about Product Adoption, User Onboarding and Good UX | Userpilot Blog. Available at: https://userpilot.com/blog/customer-behavior-analysis/.

Sturdy, C. (2022). *5 Ways How to Use Big Data in Social Media*. [online] www.quintly.com. Available at: https://www.quintly.com/blog/5-ways-how-to-use-big-data-in-social-media.

Thattamparambil, N. (2020). *How to choose the research methodology best suited for your study*. [online] Editage Insights. Available at: https://www.editage.com/insights/how-to-choose-the-research-methodology-best-suited-for-your-study.

boyd &Crawford, 2012. s.l.:s.n.

Chen, Chiang, & Storey, 2012. s.l.:s.n.

Davenport & Dyché, 2013. s.l.:s.n.

Fan & Gordon,, 2014. s.l.:s.n.

Gandomi & Haider, 2015. s.l.:s.n.

Greene, W. H, n.d. *Econometric Analysis,* s.l.: Pearson Education Limited.

Jones & Smith, 2021. *Data Driven Insights into User Behaviour,* s.l.: s.n.

Kumar & Wilson, 2020. *Ethical Considerations In Social media Analytics,* s.l.: s.n.

Lee & Garcia, 2019. *Cross Domain Insights from Social Media Analytics,* s.l.: s.n.

Patel & Brown, 2020. *Exploring Machine learning Techniques in Social Media Analyisis,* s.l.: s.n.

Redman, 2018. s.l.:s.n.

Saunders, M., Lewis, P., & Thornhill, A, n.d. *Research Methods for Business Students,* s.l.: Pearson Education Limited. .

Smith, J., & Johnson, A., 2024. *Using Big Data to Understand Consumer Behaviour: Insights for Marketing, User Engagement, and Strategy Planning,* s.l.: s.n.

# APPENDIXES

## APPENDIX 1

### **Research Ethics Approval Form**

All students conducting research activity that involves human participants or the use of data collected from human participants are required to gain ethical approval before commencing their research. Please answer all relevant questions and note that your form may be returned if incomplete. For further support and guidance please see your respective Unit Tutor.

**Before completing this form, we advise that you discuss your proposed research fully with your Unit Tutor. Please complete this form in good time before your research project is due to commence.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section 1: Basic Details** | | | |
| **Project title:** | | Using Big data to Understand Consumer Behaviour: Challenges associated with implementation of Data driven solution. | |
| **Student name:** | | Imamudeen Muhammedh | |
| **Student number:** | | 1001321 | |
| **Programme:** | | HND IT | |
| **School:** | | ANC | |
| **Intended research start date:** | | |  |
| **Intended research end date:** | | |  |
| **Section 2: Project Summary** | | | |
| *Please select all research methods that you plan to use as part of your project.*   * Interviews: * Questionnaires: * Observations: * Use of Personal Records: * Data Analysis: * Action Research: * Focus Groups: * Other (please specify): | | | |
| **Section 3: Participants** | | | |
| *Please answer the following questions, giving full details where necessary.*  **Will your research involve human participants?**  yes  **Who are the participants? Tick all that apply:**  Age 12-16  Young People aged 17–18  Adults  **How will participants be recruited (identified and approached)?**   * Participants will be recruited through centered marketing on social media platforms, such as Facebook or Instagram. Additionally, snowball sampling will be employed, the place preliminary individuals will be requested to refer others in their social community who meet the criteria for participation. * Volunteer basis   **Describe the processes you will use to inform participants about what you are doing:**  Participants will be knowledgeable thru a Participant Information Sheet, an Informed Consent Form, verbal explanations, on line platforms, and contact statistics for in addition inquiries.  **Studies involving questionnaires:**  **Will participants be given the option of omitting questions they do not wish to answer?**  Yes  No  If **“NO”** please explain why below and ensure that you cover any ethical issues arising from this.  **Studies involving observation:**  **Confirm whether participants will be asked for their informed consent to be observed.**  Yes  No  **Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?**  Yes  No  **Will participants be given information about the findings of your study? (This could be a brief summary of your findings in general)**  Yes  No | | | |
| **Section 4: Data Storage and Security** | | | |
| **Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998)**  Yes  No  **Who will have access to the data and personal information?**  • Access to the data and personal facts will be restrained to approved research personnel only. All facts will be securely stored and anonymized to defend participant confidentiality.  • Researcher and the lecturer  **During the research:**  **Where will the data be stored?**  • Saved from Microsoft  • Laptop  • pc  **Will mobile devices such as USB storage and laptops be used?**  Yes  No  If **“YES”**, please provide further details:  1. USB Storage:  • Used for storing and transferring lookup data.  • Provides portability and convenience.  • Data on USB storage have to be encrypted for security.  2. Laptops:  • Essential for records collection, analysis, and documentation.  • Offer mobility and flexibility in research.  • Require software program for analysis and safety measures like encryption to defend research data.  • Laptops be oftentimes up to date and maintained for best performance.  **After the research:**  **Where will the data be stored?**  • Saved to Google Drive  **How long will the data and records be kept for and in what format?**  • Data and files will be saved for a duration of five years in digital layout on Google Drive.  • Format: All facts will be saved digitally in codecs such as .csv, .xlsx, .docx, .pdf, and any other applicable file types.  **Will data be kept for use by other researchers?**  Yes  No  If **“YES”**, please provide further details: | | | |
| **Section 5: Ethical Issues** | | | |
| *Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:*  *It is important that you demonstrate your awareness of potential risks that may arise as a result of your research. Please consider/address all issues that may apply. Ethical concerns may include, but are not limited to the following:*   * *Informed consent.* * *Potentially vulnerable participants.* * *Sensitive topics.* * *Risks to participants and/or researchers.* * *Confidentiality/anonymity.* * *Disclosures/limits to confidentiality.* * *Data storage and security, both during and after the research (including transfer, sharing, encryption, protection).* * *Reporting.* * *Dissemination and use of your findings.* | | | |
| **Section 6: Declaration** | | | |
| **I have read, understood and will abide by the institution’s Research and Ethics Policy:**  Yes  No  **I have discussed the ethical issues relating to my research with my Unit Tutor:**  Yes  No  **I confirm that to the best of my knowledge:**  *The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.* | | | |
| Name: | Imamuddeen Muhammed | | |
| Date: | 09/06/2024 | | |
| **Please submit your completed form to: ANC Learning Management System** | | | |

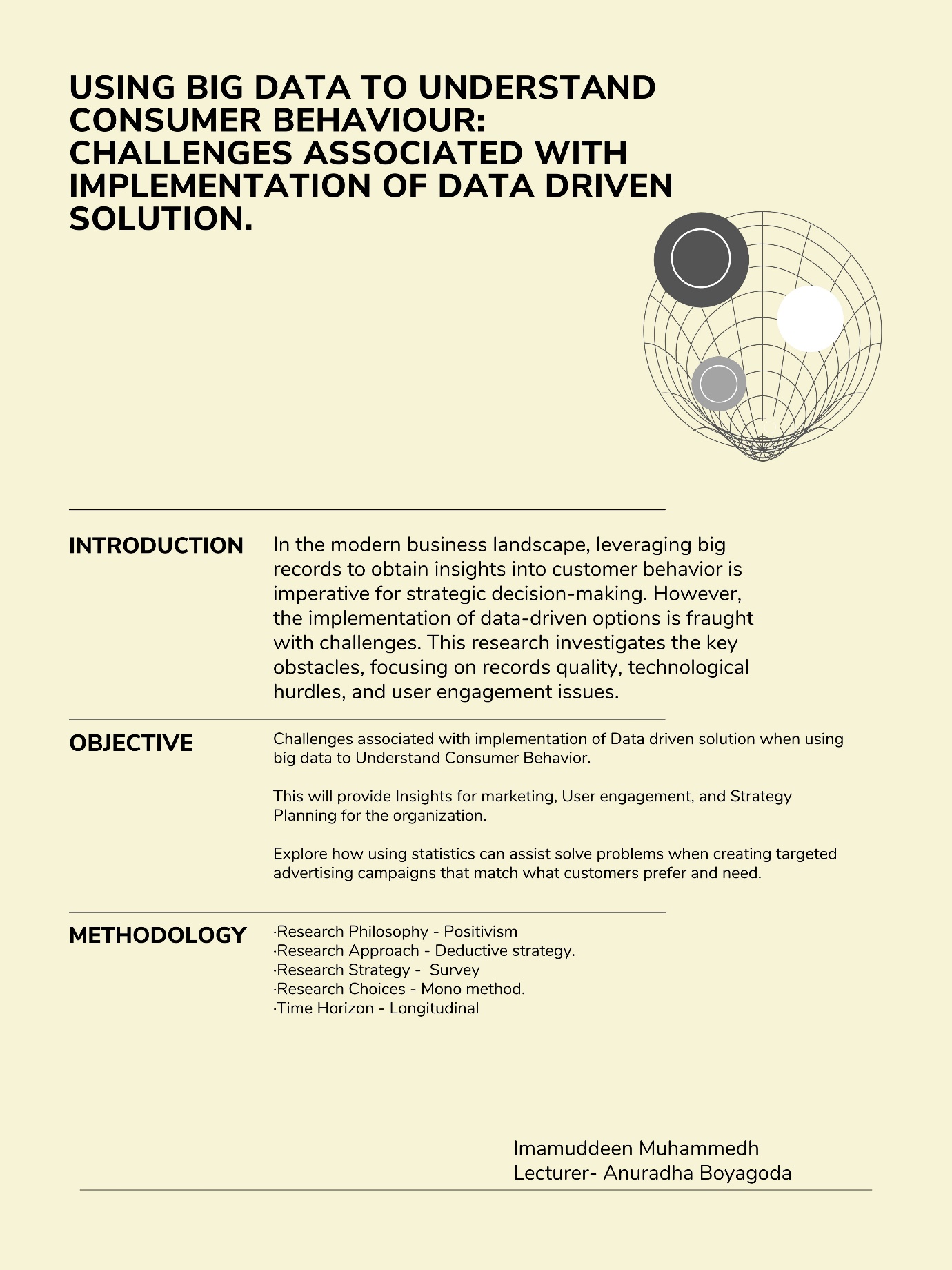
## APPENDIX 2

### **Project logbook**

|  |  |  |
| --- | --- | --- |
| **Section 1: Basic Details** | | |
| **Project title:** |  | |
| **Student name:** |  | |
| **Student number:** |  | |
| **Week** | 5  6  7  8  9  10  11  12 | |
| **Date** |  | |
|  | | |
| **Section 2: Weekly Progress** | | |
| **Issues identified and Points to consider:** | | |
| • Ensure that emerging technologies are effectively integrated into product designs and manufacturing processes.  • Strengthen the communication channels between departments to ensure alignment and collaboration. | | |
| **New ideas and change of project direction Points to consider:** | | |
| Conduct thorough feasibility studies to assess the viability and potential impact of new ideas.  Evaluate potential risks associated with changing project direction and develop mitigation strategies. | | |
| **What have you learned about yourself through your work?** | | |
| I have discovered that I can adapt quickly to changing occasions and find fantastic solutions to new challenges.  Working intently with a variety of departments has accelerated my potential to collaborate and speak efficaciously with numerous teams.  I have developed better problem-solving skills, specifically in identifying problems and imposing corrective actions. | | |
| **Next steps for your work Points to consider:** | | |
| Develop a strategic plan that outlines the next phases of development and sets clear milestones and objectives.  Invest in training and development programs to enhance the skills and knowledge of the team.  Emphasize the implementation of high technologies as tools that can facilitate the work of professionals and introduce them to new ideas and approaches.  Studying the possibility for expanding to new markets and targeting other clients. | | |
| **Supervisor feedback / comments** | | |
|  | | |
| **Supervisor Sign:** | | **Date:** |

## APPENDIX 3

### **Research Project Proposal Poster**



## Turnitin Report

