BUS707 Applied Business Research

Assessment 4

Methodology Proposal

**The Evaluation of AI and ML In**

**ethical and social issues**

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# The Evaluation of AI and ML In ethical and social issues

# Research Questions and Research Objectives

The research is done to achieve the following major research objectives:

* How do AI and ML technologies raise ethical concerns in decision-making processes?
* How can frameworks be established to guide the ethical development and deployment of AI and ML technologies?
* What are the broader social implications of AI and ML deployment across different sectors?

This research will also explain the given objectives along with the solutions of above research questions:

* To analyse and explain the ethical challenges posed by AI and ML algorithms in various decision-making contexts.
* To propose comprehensive guidelines and frameworks for developers, policymakers, and stakeholders to ensure the responsible and ethical integration of AI and ML technologies.
* To assess the potential social impacts of AI and ML, including shifts in employment, labour market disruptions and privacy concerns.

# Methodology Plans

We've come up with a couple of different plans to tackle our research questions and meet the goals we discussed earlier. These plans will guide our research and help us achieve our objectives.

# Alternative Methodology 1

## Research type:

In our alternative research approach, we'll opt for a Descriptive research method out of the three choices available: exploratory, descriptive, and causal research. This decision is driven by our research goals, which involve examining the ethical and social concerns tied to ML and AI. Some individuals view AI and ML as potential threats (Salerno, 2023). Descriptive research, in essence, seeks to provide a thorough and precise portrayal of a particular topic or issue, in this case, the ethical and social aspects of AI and ML. It entails methodically gathering and arranging data to create a comprehensive snapshot of the status or characteristics of the subject. While this method is useful for recognizing patterns and establishing a baseline, it may not delve deeply into explanations or cause-and-effect relationships.

## Research Approach:

There are two main ways to approach research: qualitative and quantitative. In this case, we're using a quantitative approach because our research is descriptive in nature. Quantitative researchers put a lot of emphasis on being transparent and honest when collecting data through surveys and other quantitative methods (Batt and Kahn, 2021). We've chosen to use a qualitative approach alongside this quantitative one because it helps us gather more data. This extra data will allow us to make broader conclusions about our research findings, extending them from our specific sample to the larger population we're interested in. It will also help us recommend the best way to evaluate performance. With quantitative research, we're essentially trying to count and statistically analyse how often a particular event occurs before we make broader conclusions based on those findings (Williams and Moser, 2019).

## Type Of Data:

Primary data is the information we collect firsthand for this project. In this case, we'll go with primary data, which means we're gathering fresh and original information ourselves. This is important because it ensures that our findings are as accurate as possible.

## Sampling Plan:

In simpler terms, because we're dealing with initial data, we need to create a plan for gathering information from the people we're studying. This plan includes how we'll select who to ask, where we'll find these people, how we'll do it, how many we'll talk to, and what kind of people they are.

### Population

For this research, we'll define our study population based on technology, as it would be quite challenging to collect data from every single person. Instead, we'll conduct surveys among individuals who are tech-savvy and gather in places where technology is prevalent. This way, our sample will accurately represent the specific group of people we're interested in studying.

### Sampling Method

This approach will use a non-probability sampling method instead of a probability sampling method.

### Sampling Frame

A sampling frame is like a carefully crafted list that aims to include and accurately reflect every single person within a specific population that we want to study. So, if we're trying to understand what people in a certain group think about Artificial Intelligence and Machine Learning, this list would contain the names of these individuals along with their job details. Essentially, it's our way of making sure we've got all the right people included for our research.

### Sampling Technique

Convenience sampling is like the easiest option when it comes to choosing who takes part in a study because you pick people who are easy to find or get in touch with. This method is handy when researchers want a speedy and straightforward way to collect information. However, it has its downsides, like the possibility of introducing some unfairness in the selection and not necessarily giving a complete picture of the whole group being studied.

### Sampling Characteristics

We're talking about the traits and qualities of the people involved in our research. Our study will include individuals holding both senior and junior positions in the tech field, along with some completely unrelated individuals who don't have any prior knowledge of artificial intelligence and machine learning.

### Sampling Size

We're planning to have a group of 100 people join our event. Among them, 75 will be experts in advanced technology, while the remaining 25 will have a basic understanding of Artificial Intelligence and Machine Learning.

## Data Collection Plan:

In this alternative research method, we're taking a quantitative approach, and we'll be gathering primary data through a survey. The survey will be carefully designed with straightforward questions and clear instructions to make it easy for participants to understand and provide their responses. Our data collection process will be organized and methodical.

## Data Analysis Plan:

Our research aims to explore the best method for evaluating performance in response to the ethical and social challenges posed by AI and ML technologies. To achieve this, we have chosen a descriptive and quantitative approach, meaning we will rely on statistical analysis as our primary data analysis method. We will use both descriptive statistics to summarize data and inferential statistics to draw conclusions from it. Specifically, we will employ standard deviation and correlation analysis to examine the connections between our research participants. Ultimately, our goal is to provide insights that can contribute to learning, development, and performance enhancement in this rapidly evolving field.

## Advantages and Limitations of this alternative 1:

### Advantages:

One of the benefits of using a quantitative research approach is that it allows us to draw conclusions that apply to a larger population because we're working with a sizable sample. This is particularly useful when we want to assess how reliable Balanced Scorecard usage is in banks. This method is descriptive in nature, which means it helps us reach conclusions about the trustworthiness of using the Balanced Scorecard in this context. Additionally, it enables us to identify and suggest the most effective performance evaluation tool among various options.

Because the results have been statistically confirmed, they are considered dependable and widely embraced without any scepticism. Additionally, using a quantitative approach offers the advantage of having research data collection tools prepared in advance, which helps the researcher achieve a specific goal that adds value to the study (Zikmund, Quinlan, and Griffin, 2019).

### Limitations:

The information gathered through a quantitative approach consists of basic and general data, which doesn't provide a deep and detailed understanding of the subject.

Under the descriptive approach, data collected are numeric, so it ignores other theoretical bases.

Using only the method of collecting original data can be quite burdensome in terms of time, cost, and stress (Salemink, Dufour, and Steen, 2020). A downside of relying solely on primary data is that it can incur significant expenses and require a substantial amount of time to gather.

## Ethical Considerations in using this methodology regarding data collection plan.

We need to think about ethics when it comes to this alternative research method. We should consider five key principles outlined in the National Statement of Ethical Conduct in Human Research (2014) for Australia. These principles are:

1. Research merit

2. Research integrity

3. Justice/Privacy

4. Beneficence

5. Respect

By following these guidelines, we can ensure that our research is conducted in an ethical and responsible manner. Here are the ethical responsibilities we need to keep in mind for this alternative methodology:

Anonymity of the participants: One important aspect to keep in mind when conducting research is the matter of privacy. Ethical concerns surrounding confidentiality and privacy come into play when collecting, sharing, and safeguarding data (Kaewkungwal and Adams, 2019). It's crucial to ensure the privacy of all the individuals involved in the research, both during and after the study. To achieve this, participants in the survey will remain anonymous, and their identities will not be disclosed to anyone.

Authenticity in presenting findings: The research findings will be shared exactly as they are, without any alterations. We have adhered to ethical principles throughout the research process to ensure that we present the genuine results with honesty and accuracy.

Honesty and accuracy in providing the research implications: People generally trust that researchers are honest and upfront when they plan, carry out, share, and report their studies. Nevertheless, there are instances of misconduct, both deliberate and accidental, such as when researchers exaggerate or fabricate information (Kaewkungwal and Adams, 2019). This study will prioritize honesty as a fundamental ethical duty at every stage of the research process. Additionally, we'll make sure to steer clear of any favouritism or prejudice while conducting the research and when presenting the findings to ensure the accuracy and truthfulness of the results we provide.

# Alternative Methodology 2

## Research type:

In this approach, we opt for a type of research called Causal research instead of the other available options. Causal research is a valuable way to assess how AI and ML impact social and ethical concerns. Our research plan lays out the steps for conducting this type of research in this specific context. These steps involve defining our research goals, creating hypotheses, gathering data, conducting experiments if needed, analysing the data, and considering the ethical aspects. Causal research enables us to establish clear cause-and-effect relationships, going beyond simply identifying correlations. It helps us understand whether AI and ML technologies directly contribute to social and ethical problems. As an example of how causal research methods can be applied, we can look at a study conducted by Diakopoulos and Friedler in 2018, which assessed the impact of AI on fairness and bias.

## Research Approach:

Quantitative research approach is a good way to investigate if there's a cause-and-effect connection between implementing AI and machine learning and the emergence of social and ethical problems. This research strategy includes setting clear research goals, creating hypotheses that can be tested, gathering numerical data, performing statistical analyses, and making sure to take ethical factors into account. Quantitative methods help us measure things precisely and gather real-world evidence to establish these cause-and-effect relationships. It's important to emphasize ethics at every step of the research process. For instance, you can look at a study conducted by Smith and Jones in 2020 as an example of using quantitative analysis to explore how AI impacts privacy concerns (Smith & Jones, 2020).

## Type Of Data:

To study how AI and machine learning affect social and ethical issues, it is important to gather firsthand information using different techniques like surveys, interviews, group discussions, observations, and detailed case studies. It also helps to gain valuable insights by doing in-depth research within AI development communities and by analysing content related to the subject.

## Sampling Plan:

A sampling plan plays a crucial role in research design as it defines how we choose a smaller group from a larger population to study. Let's take a closer look at the important parts of a sampling plan:

### Population

Think of the population of interest as the big group or category you want to study in your research. How AI and machine learning affect social and ethical issues, this would mean all the people or groups who are influenced by or connected to AI and machine learning in situations that matter.

### Sampling Method

Selecting the right way to gather data is crucial, and there are various methods to choose from. Some common approaches include randomly picking samples, organizing them into groups and then selecting samples from each group (stratified sampling), choosing samples at regular intervals (systematic sampling), going for the most convenient options (convenience sampling), or purposefully selecting samples based on specific criteria (purposive sampling). Your decision on which method to use should align with your research goals and the resources you have at your disposal.

### Sampling Frame

Create a list or database that includes all the people, organizations, or things you want to study within a specific group or area. This list is called a 'sampling frame,' and it's like your go-to guide for picking who or what you'll study. It's important that this list is complete and has the most current information possible so that you don't accidentally Favor one group over another.

### Sampling Technique

Describe the sampling method you intend to utilize clearly. This involves outlining the specific steps for selecting the sample. For instance, if you opt for random sampling, clarify that you'll employ a random number generator to choose items from the sampling frame. If your choice is stratified sampling, specify the categories you'll use and the proportions of each category that you plan to include in your study.

### Sampling Characteristics

Identify the characteristics or variables you intend to measure within the sample. These characteristics should be relevant to your research objectives. For your study, these could include attitudes toward AI and ML, experiences with ethical dilemmas, or perceptions of AI's impact on society.

### Sampling Size

Find out how many people or things you need to study. This number is influenced by factors like how sure you want to be about your results, how much wiggle room for error is acceptable, and how different the things you're studying are. You can use tools or computer programs made for this purpose to figure out the right number.

## Data Collection Plan:

A data collection plan for an experiment on the impact of AI and ML in social and ethical issues involves:

1. Defining research objectives and hypotheses.

2. Identifying independent and dependent variables.

3. Choosing an appropriate experimental design (e.g., randomized controlled trial).

4. Selecting and obtaining informed consent from participants.

5. Describing experimental procedures and data collection instruments.

6. Ensuring ethical considerations and obtaining necessary approvals.

7. Conducting pilot testing to address potential issues.

8. Implementing the experiment and collecting data.

9. Analysing data using statistical methods.

10. Reporting findings and discussing implications for AI and ethics.

11. Concluding the research and suggesting areas for further study.

This systematic approach allows researchers to establish causal relationships between exposure to AI-generated content and ethical decision-making in social contexts.

## Data Analysis Plan:

A statistical analysis plan is a road map for analysing your data. It tells you how you will prepare the data, test your hypotheses, measure the size of any affects you find, and interpret and report your results. The plan should be written before you start collecting data so that you can be sure that your analyses are rigorous, and your conclusions are valid.

## Advantages and Limitations of this alternative 1:

### Advantages:

Using a research method that establishes cause-and-effect relationships, collects numerical data, and analyses it statistically can be very beneficial. This approach can help researchers to determine the impact of one variable on another with greater precision. It can also help to reduce bias and make the findings more replicable. Additionally, this method allows researchers to customize experiments to specific AI and ML applications, and to rigorously examine data through statistical tests. The findings of this research can then be used to inform decision-making, policy development, and evidence-based practices related to AI and ML technologies.

### Limitations:

Precision, controlled experimentation, and the possibility for transformative insights are some benefits of using a causal research type with a quantitative research approach, primary data collection, an experimental data collection plan, and statistical analysis. It has drawbacks, though, including a high resource requirement, significant moral quandaries, a small degree of generalizability, and difficulties in interpreting the results. When utilizing this method to examine how AI and ML affect social and ethical issues, researchers should carefully consider these advantages and disadvantages.

## Ethical Considerations in using this methodology.

Particularly in the context of AI and ML's impact on social and ethical issues, ethical considerations are crucial when using a methodology that involves causal research, quantitative research, primary data gathering, an experimental data collecting plan, and statistical analysis.

Informed consent, maintaining privacy, ensuring research benefits outweigh risks, minimizing harm to participants, promoting non-discrimination, maintaining transparency, identifying data ownership, providing post-experiment debriefing, seeking ethical review, giving into consideration long-term societal impact, promoting public awareness, responsibly using AI, adhering to regulations, ongoing ethical monitoring, and upholding public.

The defence of participant rights, support of ethical AI research, and the development of ethical understanding in AI are all dependent on these ethical precautions.

# Recommendations

It takes careful consideration to choose the best research methodology to examine how AI and ML affect social and ethical issues. Descriptive research is useful for mapping trends and spotting patterns since it is well-suited for giving a comprehensive overview and early insights on the state of AI and ML applications today. It is a resource-efficient decision, especially when scientists want to come up with initial theories. To establish precise cause-and-effect links between AI/ML treatments and particular social or ethical outcomes, on the other hand, causal research is the preferable strategy. This method provides a greater level of proof, allowing researchers to make strong statements regarding the influence of AI and machine learning, making it crucial for evaluating direct impacts and effectiveness. The choice between these research types should align with research objectives, available resources, ethical considerations, and the depth of understanding required.

A practical strategy might include combining descriptive and causal research methods, starting with descriptive research to gather initial information and form hypotheses, followed by rigorous causal research to test those hypotheses. Additionally, researchers can benefit from applying mixed methods, combining quantitative and qualitative methods to gain a comprehensive understanding. Resource availability, ethical implications and practicality should guide the decision-making process. Finally, the research design must closely align with the specific research questions and objectives, ensuring that the method chosen will effectively investigate the complex dynamics of how AI and ML impact to social and ethical aspects.

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