



Midocean University
College of Management
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RESEARCH ETHICS REPORT

**The Role of Artificial Intelligence in Improving Production in Industries an Applied
Study on Industrial Firms in Saudi Arabia**

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I. Introduction

In the recent years, advanced technologies are becoming more and more important for modern industrial organizations to improve their production systems, minimize their operational inefficiencies, increase the quality of their products, and gain competitiveness. One of the most significant technologies in manufacturing and industrial production is Artificial Intelligence (AI). By leveraging AI, businesses can process vast amounts of production data, automate repetitive tasks, forecast equipment failures, enhance quality control, and optimize resource usage. Thus, it is crucial to explore the impact of AI on industrial output to comprehend how companies can boost efficiency and productivity in industrial manufacturing.

The industry in Saudi Arabia is an essential part of the economic diversification and technological development. In the course of promoting innovation, automation, and digital transformation in various industries, industrial companies will be increasingly required to invest in intelligent technologies that can help them increase production efficiency and stay competitive in a sustainable way. In the current study, the emphasis is on the role of AI in boosting production in industrial firms in Saudi Arabia. It explores the role of AI in production efficiency, operational performance, product quality and cost reduction.

This report discusses the importance of research ethics and applies ethical principles to the current study on AI and industrial production in Saudi Arabia. It outlines the key ethical principles, outlines potential ethical issues, covers ethical governance frameworks, and outlines a practical strategy for safeguarding participants, data management, risk minimization and responsible reporting.

II. Importance of Research Ethics.

□ Protecting Participants

First of all, the importance of research ethics is to protect the individuals involved in the research. No professional, psychological, social or organizational harm should come to the participants from their participation. For this experiment, managers, engineers, supervisors and technicians in industrial companies are possible participants. Some of them might voice comments regarding the adoption of AI, efficiency in production, management support, or technological obstacles. Hence, it is essential that their identities and answers are kept secure.

☐ **Ensuring Reliable Research Findings**

Ethical research enhances the accuracy and reliability of the findings. Honest data collection and analysis makes the results more credible and useful. Manipulation, fabrication, and/or selective reporting of data disqualifies the study from scientific value. In the present study, ethical behaviors make sure that the findings represent the true real-life perceptions of employees concerning AI use in industrial production.

☐ **Supporting Academic Integrity**

Academic integrity is also safeguarded by research ethics. To create a believable academic work, proper citation, avoiding plagiarism, honest analysis, and transparent reporting are necessary. All ideas, theories and previous findings related to AI, production efficiency and the performance of the industry must be referenced properly within this study.

☐ **Protecting Organizational Confidentiality**

The current research may involve information related to production processes, AI systems, operational costs, and quality control practices. These data can be confidential to industrial companies. Ethical research will not provide names of companies, internal information about any company or specifics about a company's operations without express permission.

☐ **Support Responsible AI Research**

The study is based on Artificial Intelligence, making ethical responsibility more relevant. In research involving AI technologies, it is important to take into account fairness, transparency, accountability, privacy and the effects of AI on workers and organizations. UNESCO highlights the importance of protecting human dignity, human rights, transparency, fairness, and human oversight in the use of AI ethically.

III. Ethical Principles Relevant to the Current Study.

honesty, responsibility, objectivity, confidentiality, informed consent, fairness and accountability.

☐ **Honesty in Research**

Honesty involves the presentation of all information in an honest manner. It involves truthful information gathering, information analysis, and truthful reporting. The researcher should not make up answers, filter out undesirable results, or overhype the benefits of AI.

Application to the Study.

In the case that the data indicates a moderate impact of AI on production efficiency, the researcher is required to truthfully report this finding. Unless the statistical analysis indicates otherwise, the researcher should not state that the effect of AI is very strong.

☐ **Research Responsibility**

Research responsibility involves the researcher must be careful and professional in conducting the research. This involves adherence to academic regulations, safeguarding of participants, and only using data for the defined research project.

Application to the Study.

The researcher will gather data from the questionnaire only for AI adoption, production efficiency, operational performance, product quality, and cost reduction. The information will not be used to assess employees or specific companies.

☐ **Objectivity**

Objectivity is that the researcher must refrain from letting the personal opinion be a part of the study. While the researcher may hope for greater production with the help of AI, it is important that conclusions are based on data, not on personal opinion.

Application to the Study

The researcher will use the SPSS software to analyse the data according to the methodology proposed in the study with objective statistical methods like Descriptive Statistics, correlation, regression, and reliability analysis.

☐ **Fairness**

Discrimination and treating everyone the same is unfair. Selection of the participants should be based on their relevance to the area of research not based on personal preferences.

Application to the Study.

Managers, engineers, supervisors and technicians of industrial companies will be involved in the study as these are directly related to industrial production and AI adoption. Unless there is reason, the sample should not be restricted to a single job category.

IV. Ethical Issues in Scientific Research.

☐ **Data Fabrication**

Data fabrication is the creation of fake data or fake responses that were not gathered. It's a serious breach of ethics.

This example is to be used in the Current Study.

It would be unethical to add fake questionnaire responses in order to achieve the desired sample size of about 200 participants. The sample should be comprised of real participants only. Ethical problems may occur at different stages of the research process. These issues should be taken care in the current study to keep academic integrity and protect participants.

☐ Plagiarism

Plagiarism is when a researcher presents another person's ideas, words or findings without giving them credit. It undermines academic integrity and could result in rejection of the research.

This is shown in the Current Study.

It would be plagiarism if the researcher mentions Industry 4.0, predictive maintenance or smart manufacturing and draws upon ideas found in prior research without citing the source. All sources must be cited using APA style.

☐ Data Falsification

Data falsification involves altering or fabricating collected data to get the results they were looking for.

In the Current Study, similar examples are provided.

The researcher should not change the regression outcome to show a stronger association between the adoption of AI and cost saving.

☐ Researcher Bias

Bias is when the researcher is involved in the research process in a way that is influenced by personal expectations.

Example in the Current Study

The researcher might assume that AI will always increase production efficiency. But cost, lack of technical expertise and resistance to change are potential problems that may be raised by some participants. These responses are to be included and objectively analysed.

☐ Conflict of Interest

A conflict of interest is one of the personal or professional interests of the researcher that could affect the study.

In the Current Study, it is used as an example.

The researcher should disclose if he/she has a relationship with an AI vendor or one of the participating firms to avoid any doubts about neutrality.

V. Rules and Ethical Governance of the Research

Institutional rules, academic standards and professional frameworks guide ethical research. These rules ensure that the participants are protected and that the study is responsibly conducted.

☐ **The role of Research Ethics Committees**

Research which involves humans is reviewed by research ethics committees or Institutional Review Boards. Their job is to make sure that the study does not harm the participants, risks are minimized, and ethical procedures are followed.

Application to the Study

The researcher should get approval from the university or appropriate academic authority before sending out the questionnaire. The committee has the option to consider the questionnaire, consent statement, confidentiality procedures, and data protection plan.

☐ **APA Standards**

The purpose of APA style is to ensure that academic integrity is upheld by giving credit to the work of others through accurate citation and referencing. It promotes transparency, openness, and accountability.

Application to the Study

All academic references will be in the APA style. This ensures that there is no plagiarism and enables readers to check the sources cited.

☐ **AI Ethics Standards**

The study is about Artificial Intelligence, making AI ethics standards relevant. The UNESCO Recommendation on the Ethics of Artificial Intelligence is hailed as an international standard agreed upon by the member states of UNESCO and is geared towards human rights, dignity, transparency, fairness, and human oversight.

NIST also released the AI Risk Management Framework to help manage risks of AI to individuals, organizations, and society.

The application of the Study

When discussing implications of the use of AI in industrial companies, the researcher should take into account the risks that come with the use of AI, including the risk of lack of transparency, the risk of automation bias, the risk of impact on the workforce, the risk of data privacy, and the risk of unequal access to AI skills.

☐ **Data Protection Principles**

Responsible for collection, storage and reporting of research data. The data collected should be necessary and access should be restricted.

Application to the Study

The researcher will obtain only the answers to the questions and basic demographic information. It will not involve the collection of confidential business records, financial statements, production or trade secrets, or personal identifiable information.

VI. Application of Research Ethics in the present study

This section outlines how the ethical principles will be applied in the ongoing research on AI and production in Saudi industrial companies.

To begin, the study population and sample are described.

The population of the study are the managers, engineers, supervisors and technical staffs of the industrial manufacturing companies in Saudi Arabia. These are appropriate participants as they are engaged in production processes and potentially know AI technologies that can be applied to production.

Simple random sampling will be used to select about 200 participants. This sample size is suitable for quantitative research like descriptive statistics, correlation and regression.

☐ **Participant Recruitment**

There will be a structured questionnaire for participants to complete. Recruitment will be an honest and pressure free process. No one will coerce a participant to participate in the study. The researcher will not recruit the participants directly through a manager in such a manner as to place pressure on the participants. Where companies are involved with the

dissemination of the questionnaire, it should be clearly indicated that participation is voluntary.

☐ **Confidentiality and Anonymity**

The researcher will take all necessary steps to ensure confidentiality of the participants and will not seek information that could directly identify the individuals. The questionnaire will not include questions on:

- ✓ Participant names.
- ✓ Employee ID numbers.
- ✓ Personal phone numbers.
- ✓ Personal emails.
- ✓ Exact company names.
- ✓ Exact job location.

The participants will be segmented into broad groups based on job position, number of years in job position, and industrial sector.

✓ **Access to Data**

Raw data will be only available for:

- ✓ The researcher.
- ✓ The academic supervisors.
- ✓ Examination committee (where necessary for academic review).

Individual responses will not be shared with any employers, company managers or external parties.

✓ **Data Storage**

Data will be collected electronically, in password-protected files. The researcher will make sure that the data are not posted on unsecured platforms or devices without protection. Back up files will be made and access will only be permitted to authorised individuals.

☐ **Data Retention and Disposal**

In accordance with standard practice of academic institutions, research data will be kept securely for five years after the end of the study. Following this time, any electronic files will be securely deleted.

□ Managing Indirect Identification

If names aren't captured, but the demographic information is specific enough, the person can still be indirectly identified. For instance, a participant could be recognized as 'a senior production manager at an energy company with over 15 years of experience'.

- ✓ To minimise this risk:
- ✓ Individual level results will not be reported.
- ✓ Where needed, small demographic categories will be aggregated.
- ✓ Examples will be brought to a general.
- ✓ Company names will not be mentioned.

□ Risk Assessment and Management

Risk Assessment and Mitigation Plan

Potential Risk	Risk Level	Mitigation Strategy
Concern about participant identification	Low	No names, employee IDs, or personal contact details will be collected.
Disclosure of company information	Low	Company names and sensitive operational details will not be reported.
Fear of employer access to responses	Low	Individual responses will not be shared with employers or managers.
Pressure to participate	Low	The consent statement will clearly explain that participation is voluntary.
Participant fatigue	Very Low	The questionnaire will be concise and designed to take approximately 10 minutes.
Misunderstanding questionnaire items	Very Low	Items will be written clearly and reviewed before distribution.

Data security concerns	Very Low	Data will be stored in password-protected files with restricted access.
Researcher bias	Low	Data will be analyzed objectively using SPSS statistical procedures.
Selective reporting of findings	Low	All results will be reported honestly, whether they support the hypotheses or not.

VII. Conclusion

Research ethics plays an important role in scientific integrity, responsibility and respect for research subjects. Ethical issues are especially significant in organizational and industrial research, as an individual may share information regarding practices, production systems, technological adoption, and organizational performance.

This report is about the application of research ethics in the study on “The Role of Artificial Intelligence in Improving Production in Industries: An Applied Study on Industrial Firms in Saudi Arabia”. The discussion revealed that ethical factors are required throughout the research process, from recruitment of the participants, informed consent, data collection, data storage, data analysis and reporting.

The study is conducted with managers, engineers, supervisors and technicians of Saudi industrial companies. For this reason, the ethical requirements are of confidentiality, anonymity, voluntary participation, data protection. Participants need to be assured that their answers will not put them at risk of professional damage or the public disclosure of information that is sensitive to the company.

AI ethics was another key focus of the report. The researcher needs to take into account the challenges of transparency, accountability, human oversight, privacy, and social issues with AI use, as these are important factors in the adoption of AI. While ethical research should show the positive aspects of AI, it should also address issues like implementation expenses, workforce preparedness, data security, and organizational transformation.

To sum up, the use of ethical principles enhances the credibility and academic worthiness of the study. It maintains confidentiality of the participants, builds trust in the

organization, and guarantees that the findings offer valuable and accountable insights into the impact of AI on industrial production in Saudi Arabia.

VIII. References

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