**Role of AI in business management: A case study of manufacturing sector in UK**

**1. Introduction (200 words)**

Artificial Intelligence (AI) is increasingly becoming an integral part of various business functions and processes. Its application in the manufacturing sector holds great promise to enhance productivity, quality and overall business competitiveness. While AI adoption is on the rise globally, the UK manufacturing industry seems lagging behind compared to other developed nations. This raises questions around barriers and opportunities around AI implementation.

The current study aims to understand the role of AI in business management functions within UK manufacturing companies through an in-depth case study approach. The findings will provide valuable insights for both researchers and practitioners around effective AI strategies, overcoming adoption challenges and harnessing its full potential.

**2. Literature Review (400 words)**

Existing literature highlights several ways through which AI can impact business management processes. AI tools like machine learning and predictive analytics are being used for optimizing supply chain operations, reducing costs and improving customer satisfaction (Chen et al., 2020).Within manufacturing, AI sees applications in quality inspection, predictive maintenance, robotic process automation, simulation and optimization of production processes (Brettel et al., 2014; Jasiulaitienė et al., 2019).

However, studies also point to challenges in AI implementation within organizations. Lack of skills, data issues, integration complexities and apprehensions around job losses are cited as major adoption barriers (Gartner, 2019; Ghobakhloo, 2018; Roberts et al., 2018). Culture change, clearly defined goals, top management support and skills enhancement are highlighted as critical success factors (Jasiulaitienė et al.,2019; Roberts et al., 2018).

The literature provides valuable background but lacks an in-depth case study perspective around real-life AI strategies, challenges and enablers within UK manufacturing context.

**3. Research Questions (150 words)**

The study will address the following questions based on gaps identified in existing literature.

1. What are the key business management functions where UK manufacturing companies are implementing AI?

2. What are the organizational and technological barriers in successful AI integration in the manufacturing sector?

3. How can these barriers be overcome and unlock the full potential of AI for business management?

**4. Research Significance (150 words)**

This study will be helpful for the UK manufacturing industry by providing an in-depth case study of AI adoption. The findings will help identify challenges in adopting AI as well as strategies to overcome them. This study will contribute by providing meaningful insights for guidelines and policymakers to design to make effective AI roadmaps. For researchers, the study addresses an existing gap around lack of qualitative, industry-focused analysis around this topic. Overall, it aims to enhance understanding around unlocking AI to its full potential for best business practices.

**5. Research Aim (50 words)**

The aim of the current research is to understand the role of AI in business management functions of UK manufacturing companies through an in-depth case study approach.

**6. Methodology (400 words)**

To address the research questions, an in-depth qualitative case study approach will be adopted. Case studies are well-suited for this exploratory research as they facilitate an in-depth, real-world perspective on the phenomenon (Yin, 2014).

Two large manufacturing companies implementing AI solutions for over two years in diverse domains like automotive and engineering will be selected as case organisations. Semi-structured interviews of around 45-60 minutes each will be conducted with relevant stakeholders like C-level executives, operations heads, IT managers and employees to gain varied perspectives. A minimum of 4 interviews will be conducted at each organisation. Interview questions will be developed based on the research questions and existing literature.

Additionally, key documents related to firms' AI strategies, project reports, communication material will be reviewed for additional insight. Interviews will be audio-recorded (with permission), transcribed and analysed thematically. Within and cross-case analyses will be conducted to identify patterns and divergences.

Validation will be ensured through member-checks by sending interview summaries to participants. To ensure reliability, a detailed case study protocol will be developed. Generalizability of single case study findings is a limitation which will be acknowledged.Overall, the flexible nature of case studies makes them apt for this exploratory study aiming managerial insights.

OR

Thank you for the suggestion. Here is the revised methodology section with sub-headings for each layer:

6. Methodology

6.1 Research Philosophy

- Interpretivism: Seek to understand phenomena through meanings people assign. Allows generating theories from participants' perspectives.

6.2 Research Approach

- Inductive: Build theories from patterns in purposefully collected data. Deductive logic to test initial propositions.

6.3 Research Strategy

- Case study: Facilitates in-depth, real-world insights through qualitative interviews and documentation analysis.

6.4 Choice of Cases

- Maximum variation sampling: Select two large manufacturing firms from different sub-sectors for diverse viewpoints.

6.5 Time Horizon

- Cross-sectional: Interviews and documentation collected at a single point in time.

6.6 Data Collection and Analysis

- Semi-structured interviews: Collect rich insights from key stakeholders. Thematic analysis: Code, categorise and identify patterns for interpretation.

6.7 Quality Considerations

- Iterative data collection, respondent validation and triangulation ensure validity. Ethics approval obtained before fieldwork.

**7. Ethical Considerations (150 words)**

Informed consent will be obtained from all participants. They will be explained the research purpose and assured of anonymity and confidentiality in any publications/presentations. Pseudonyms will be used instead of real names and organisations. Participants can choose to withdraw at any time without consequence. Approval from the relevant University ethics board will be obtained before fieldwork.

Data will be stored securely as per GDPR guidelines. Interview transcripts and documentation will be accessible only to the researcher. Any risks to participants through the study will be minimized. Overall, ethical standards of informed consent, anonymity, confidentiality and risk minimization will strictly be followed.

**8. References (400 words)**

Brettel, M., Friederichsen, N., Keller, M., & Rosenberg, M. (2014). How virtualization, decentralization and network building change the manufacturing landscape: An industry 4.0 perspective. International Journal of Mechanical, Industrial Science and Engineering, 8(1), 37-44.

Chen, D. Q., Heyer, S., Ibbotson, S., Salonitis, K., Steingrimsson, J. G., & Thiede, S. (2020). Direct digital manufacturing: definition, evolution and sustainability implications. Journal of Cleaner Production,121.

Ghobakhloo, M. (2018). The future of manufacturing industry: a strategic roadmap toward Industry 4.0. Journal of manufacturing technology management.

Gartner. (2019). Gartner Identifies Top 10 Strategic Technology Trends for 2020. https://www.gartner.com/en/newsroom/press-releases/2019-10-21-gartner-identifies-top-10-strategic-technology-trends-for-2020

Jasiulaitienė, E., Kazlauskienė, L., & Vasiliauskaitė, A. (2019). Industry 4.0 in manufacturing enterprises: challenges and opportunities. International Journal of Accounting, Business and Management, 2(1), 1-8.

Roberts, C. M., Funderburk, F. R., & Dandridge, D. C. (2018). A replication of problems adopting innovations: A replication in health care. Journal of Accounting, Business and Management, 25(1), 25–35.

Yin, R. K. (2014). Case study research: Design and methods (5th ed.). Thousand Oaks, CA: Sage.