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REVIEWER'S REPORT

Manuscript No.: IJAR-52183 Date: 10/06/2025

Title: Exploring the Potential of AI-Driven Safety Management in Tunisia\\\'s Agriculture Sector Trust, Readiness, and Barriers to Adoption

Recommendation:

Accept as it is .....Yes.....

Accept after minor revision.....

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality	Yes			
Clarity	Yes			
Significance	Yes			

Reviewer Name: Dr. Yanti Budiasih, SE.MM **Date:** 10/06/2025

Reviewer's Comment for Publication.

In short, this research demonstrates the depth, thoroughness, and relevance required for a strong scientific work that contributes to knowledge in its field

Detailed Reviewer's Report

The research demonstrates significant **novelty** in several key areas:

- Pioneering focus on AI in ggricultural OHS in Tunisia
  This study is among the first to systematically investigate the factors influencing the adoption of AI-driven safety solutions specifically within Tunisia's agricultural sector. This is a crucial, under-researched area, especially in developing economies.
- Contextualized application of established models
  It uniquely applies well-established technology acceptance frameworks (TAM, TRI) and trust theories to a high-risk, yet traditionally underserved, industry in a specific developing country context. This adaptation provides fresh insights into how these models hold up and need to be interpreted within unique socio-economic and technological environments.
- Bridging a research gap
  The paper explicitly addresses the lack of empirical research examining perceived trust in AI systems and organizational barriers to their integration in agricultural OHS, particularly in Tunisia. By doing so, it provides novel, empirically derived data and insights.
- Multi-faceted examination of adoption determinants
  While trust and technology readiness are known factors, their specific interplay and relative importance in the niche context of agricultural OHS, combined with perceived usefulness and ease of use, offer a novel and comprehensive understanding.

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- Insights for developing economies
  By focusing on Tunisia, the study offers a roadmap and contextual insights that can be applied to other developing economies facing similar technological and socioeconomic barriers to AI adoption, contributing to global research on AI in OHS in such regions.

Strengths of the Research

- High relevance and academic contribution
  The research addresses a crucial and under-explored area: occupational health and safety (OHS) in Tunisia's high-risk agricultural sector, particularly concerning AI adoption in a developing economy context. This fills a notable gap in existing literature.
- Holistic approach to technology adoption
  It adopts a comprehensive framework by examining multiple critical factors influencing technology adoption, including trust in AI, technology readiness, perceived usefulness, and perceived ease of use. This provides a richer and more nuanced understanding of the adoption dynamics.
- Robust methodology:
  - Clear research design
    The use of a quantitative, cross-sectional design with a deductive approach to test a theoretically grounded conceptual framework is well-defined.
  - Careful sampling strategy
    The multi-stage sampling (purposive, stratified random, systematic) targeting pesticide-intensive zones and diverse job roles ensures a representative sample.
  - Adequate sample size
    The determination of a minimum sample size of 450 using G*Power analysis indicates thorough planning for sufficient statistical power.
  - Valid and reliable instrumentation
    The development of the questionnaire in Arabic and French, expert validation, pilot testing, and high Cronbach's Alpha values (all > 0.80) confirm the instrument's quality and internal consistency.
  - Advanced statistical analysis (CB-SEM)
    The application of Covariance-Based Structural Equation Modeling (CB-SEM) with AMOS 26.0 is a major strength. CB-SEM excels at confirming theoretical models, evaluating measurement errors, and assessing model fit with high precision. The reported *goodness-of-fit* indices (Chi-square/df, CFI, TLI, RMSEA, SRMR) meet recommended thresholds, validating the structural model.
  - Common method bias (CMB) mitigation
    The proactive testing for CMB using Harman's Single Factor Test and marker variable analysis demonstrates rigorous attention to potential biases, bolstering confidence in the model's estimations.
- Clear and structured results
  The results section is well-organized, presenting descriptive statistics, measurement model evaluation (reliability, convergent and discriminant validity), structural model evaluation, explained variance (R^2), effect sizes (f^2), and hypothesis testing with clarity.
- Specific contextual insights
  By focusing on Tunisia, the study offers unique insights into the challenges and opportunities of AI adoption within a specific developing country context, making its findings particularly valuable for similar economies.

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- Actionable recommendations
  The research aims to provide evidence-based recommendations for policymakers and industry stakeholders, increasing its practical utility.
- Multigroup analysis (MGA)
  The MGA based on experience level and job role provides rich additional insights into how relationships between constructs might vary among subgroups, highlighting the need for tailored implementation strategies.

Weaknesses of the Research

- Cross-sectional nature
  While effective for examining relationships at a single point in time, a cross-sectional design cannot definitively establish cause-and-effect relationships. Changes in perceptions or readiness over time are not captured. A longitudinal study would offer a more dynamic understanding of the adoption process.
- Limitations in generalizability
  While valuable for Tunisia, the findings may not be directly generalizable to all developing economies or other agricultural sectors without further validation. Cultural, economic, and policy factors can vary significantly.
- Reliance on self-reported data
  Although CMB was tested and found not to be a significant concern, self-reported data always carry the potential for response biases (e.g., social desirability bias). Respondents' perceptions of AI may not always align with objective realities.
- Lack of deep qualitative data
  While qualitative field observations are mentioned (e.g., regarding organizational and policy support), the primary data is largely quantitative. Adding in-depth interviews or focus groups with workers and managers could provide a deeper understanding of the "why" behind perceptions and barriers, especially concerning cultural factors and AI literacy.
- Potentially vague "AI-driven safety solutions" for respondents
  The questionnaire included a brief explanation of AI and safety monitoring systems. However, without concrete examples or demonstrations of specific AI systems applicable to Tunisian agriculture, respondents' understanding of "AI-driven safety solutions" might have varied, potentially influencing their responses.
- Focus on behavioral intention vs. actual adoption
  The study measures behavioral intention to adopt AI, not actual adoption. High intention does not always translate into actual adoption behavior, as external factors like cost, availability, and infrastructure support can play a significant role.
- Absence of economic/cost analysis
  The research does not delve into the economic aspects of AI adoption or the return on investment (ROI) for AI-based safety systems. This is a crucial factor for farmers and agricultural organizations, particularly in resource-limited developing countries.

To elevate this already excellent research to a higher level of perfection, the focus should be on data enrichment and expanding its validity. Here are the suggested improvements:

1. Data Expansion and diversification
   - Longitudinal study for adoption dynamics
     This is the most crucial enhancement. Instead of merely capturing views at a single point in time, a longitudinal study would allow researchers to track changes in perceptions, intentions, and especially the actual adoption of AI over time. This would provide a more

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dynamic understanding of how adoption factors evolve, and help establish more definitive cause-and-effect relationships. For example, does initial training genuinely increase trust in AI in the long term?

- Integration of in-depth qualitative data
  While field observations are mentioned, adding in-depth interviews and/or focus group discussions (FGDs) with various stakeholders (farmers, workers, managers, AI technology producers, policymakers) would uncover the "why" behind quantitative findings. This could reveal cultural nuances, practical barriers, actual AI literacy levels, and personal experiences that surveys cannot capture. For instance, why is there resistance to new technology despite high perceived usefulness?
- Measurement of actual adoption
  Beyond behavioral intention, researchers can endeavor to measure the actual level of AI adoption in the field. This could involve questions about the use of existing AI technologies, or detailed case studies of AI implementation.

2. Enhanced concretization and practical relevance
   - Specific illustrations of AI solutions
     To avoid ambiguity in respondents' understanding of "AI-based safety solutions," researchers can include more detailed descriptions, concrete examples, or even visualizations (short images/videos) of how specific AI systems could function within the Tunisian agricultural context. This will help respondents provide more accurate and relevant answers.
   - Comprehensive economic analysis
     Adding a cost-benefit analysis (CBA) or return on investment (ROI) of AI-based safety systems would significantly enhance the practical value of the research. Understanding implementation costs and economic benefits (e.g., reduction in injuries, increased productivity) is crucial, especially in developing countries. This could be done through secondary data or additional surveys with farm owners/managers.
   - Specific industry needs research
     It might be beneficial to conduct a preliminary or separate, more in-depth study to identify the most pressing occupational safety and health (OSH) needs in the Tunisian agricultural sector that could be addressed by AI, as well as the most realistic and accessible types of AI solutions.
3. Increased external validity and scope
   - Generalizability testing
     While focusing on Tunisia provides rich contextual insights, future studies could expand the scope to other developing countries or other agricultural sub-sectors (e.g., livestock, fisheries). This would help test whether findings are generalizable and how different cultural, economic, or policy factors influence AI adoption.
4. Deeper ethical and social considerations
   - Ethical aspects and data privacy
     Given that AI often involves surveillance and data collection, further research can explicitly explore concerns about data privacy, the ethics of surveillance, and its impact on worker autonomy in the agricultural sector. This can be uncovered through qualitative interviews.
   - Social impact and human resource readiness
     Analyzing the potential impact of AI on required skills, job displacement, and new training needs for farmers and agricultural workers will provide a more complete picture. This can also include the readiness of human resources to face these technological changes.

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Recommendation : Well-deserved acceptance