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Investigating the Effect of Artificial Intelligence Capabilities on Operational Performance with the Mediating Role of Production System Resilience and the Moderating Role of Human–Organization–Technology Fit in the Abadan Oil Industry

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1. Round 1

1.1. Reviewer 1

Reviewer:

In the Research Method paragraph of the abstract, the phrase “applied and quantitative” is not sufficient to describe the methodological logic of the study. Since the article uses survey data and PLS-SEM, the authors should clarify that the study is explanatory-correlational and cross-sectional, because this affects the interpretation of causal language throughout the manuscript.

In the same abstract paragraph, the sentence “Based on Cochran’s formula, the sample size was calculated as 201” needs further clarification. The manuscript should report the population size, confidence level, margin of error, and assumed proportion used in Cochran’s formula; otherwise, the reader cannot evaluate whether the sample-size calculation was statistically justified.

In the methodology section, the sentence “The questionnaires were randomly distributed among the individuals, and 200 questionnaires were completed” requires more detail about the sampling procedure. The authors should explain how the list of managers and experts was obtained, how randomization was performed, whether all job groups had equal probability of selection, and whether any non-response bias analysis was conducted.

In the paragraph describing the statistical population, the phrase “managers and experts in the Abadan oil industry, including individuals holding positions such as manager, deputy manager, supervisor, officer-in-charge, expert, and senior expert” is useful but incomplete. The manuscript should provide demographic and occupational characteristics of the respondents, including age, gender if relevant, education level, work experience, department, managerial level, and technical specialization, because these characteristics may influence perceptions of AI capability and operational resilience.

In Table 4, the Fornell–Larcker criterion does not appear to support discriminant validity as claimed. For instance, the correlation between artificial intelligence capabilities and human–organization–technology fit is 0.892, which is higher than the diagonal value for human–organization–technology fit, 0.888; similarly, correlations involving operational performance are higher than its diagonal value of 0.872. The statement “the Fornell–Larcker criterion provides evidence for the discriminant validity of the constructs” should therefore be reconsidered, and HTMT values should be reported.

In the paragraph interpreting Figures 2 and 3, the statement “Items with factor loadings lower than 0.30 do not have sufficient adequacy to remain in the model” uses a very low threshold. In PLS-SEM, outer loadings of 0.70 are generally preferred, while values between 0.40 and 0.70 may be considered for removal depending on AVE and composite reliability. The authors should justify the 0.30 threshold or revise the measurement-model evaluation according to accepted PLS-SEM standards.

Authors revised the manuscript and uploaded the new document.

1.2. Reviewer 2

Reviewer:

In the data collection tools paragraph, there is an inconsistency between “the 46-item scale developed by Mikalef and Gupta (2021)” and Table 2, where artificial intelligence capabilities are reported as having “45 items.” This discrepancy must be resolved, and the authors should state whether one item was removed, whether the original scale was adapted, or whether the table contains a typographical error.

In the paragraph describing the measurement of organizational performance, the manuscript states that “operational performance was measured using four items, and financial performance using three items,” while the model and title focus on “operational performance.” This creates conceptual ambiguity because financial performance appears as a dimension of the dependent construct. The authors should clarify whether the dependent variable is operational performance, organizational performance, or oil-industry performance, and whether financial performance is theoretically justified as a subdimension of operational performance.

In the measurement paragraph, the sentence “production system resilience was measured in three dimensions: cognitive resilience with two items, behavioral resilience with four items, and contextual resilience with four items” needs stronger theoretical justification. The authors should define each dimension and explain why cognitive, behavioral, and contextual resilience are appropriate for oil-industry production systems, especially because resilience in process industries often includes safety, redundancy, recovery, maintenance, and hazard-response dimensions.

In the validity paragraph, the statement “To determine the validity of the questionnaires, the content validity ratio (CVR) and content validity index (CVI) were used” is incomplete. The manuscript should report the number of experts involved, their expertise, the minimum acceptable CVR value based on the number of experts, the CVI calculation method, and the final CVR/CVI values for the constructs or items.

In Table 2, the reported AVE values and the Fornell–Larcker diagonal values in Table 4 appear inconsistent. For example, if the AVE for artificial intelligence capabilities is 0.660, its square root should be approximately 0.812, not 0.908. The authors

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should recheck all AVE, square-root AVE, and discriminant-validity values, because this inconsistency raises concern about the accuracy of the measurement model.

In Table 2, the reliability values for production system resilience, human–organization–technology fit, and operational performance are acceptable but relatively close to the lower threshold. The manuscript should not only report Cronbach's alpha and composite reliability but also explain whether item loadings were examined, whether any items were removed, and whether rho_A was assessed, which is commonly recommended in PLS-SEM reporting.

In the paragraph following Table 2, the sentence "the coefficients are higher than the minimum value of 0.60, indicating appropriate reliability of the indicators" should be revised. Reliability coefficients do not directly indicate the reliability of "indicators" but rather internal consistency reliability of constructs; indicator reliability should be evaluated through outer loadings and their squared values.

In Table 3, the Kolmogorov–Smirnov test is used to justify the use of SmartPLS 3 because the data are non-normal. This justification is too limited. PLS-SEM is not selected only because of non-normality; it is also appropriate for prediction-oriented models, complex models, formative/hierarchical constructs, and relatively small samples. The authors should provide a stronger methodological rationale for using PLS-SEM.

In the paragraph after Table 3, the sentence "The significance level was lower than 0.05; therefore, the distribution of the data was non-normal. Accordingly, SmartPLS 3 software was used" should be scientifically refined. With a sample size of 200, normality tests are highly sensitive, and minor deviations may become significant; therefore, the authors should also report skewness, kurtosis, or graphical diagnostics and avoid relying exclusively on the Kolmogorov–Smirnov test.

Authors revised the manuscript and uploaded the new document.

2. Revised

Editor's decision after revisions: Accepted.
Editor in Chief's decision: Accepted.

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