

REVIEWER'S REPORT

Manuscript No.: **IJAR-59194**

Title: Designing the AI Web Architectural Principles for Interoperable Artificial Intelligence Systems

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision ...✓.....

Do not accept (*Reasons below*)

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

Reviewer's ID: JPR- **098**

Detailed Reviewer's Report

Decision: Accept after Major Revision

1. Clarify the primary research contribution.

The manuscript proposes a nine-layer AI Web architecture, but the novelty compared with existing distributed AI, multi-agent, SOA, microservices, Semantic Web, and agentic-AI architectures is not sufficiently demonstrated. The authors should clearly identify what is newly proposed and how it differs from existing frameworks.

2. Strengthen the methodological rigor of the systematic literature review.

Although the manuscript describes an SLR approach, it does not provide sufficient details about the number of records retrieved, duplicates removed, studies screened, full texts assessed, and final studies included. A PRISMA flow diagram and quantitative screening statistics should be added.

3. Provide a reproducible search methodology.

The databases and Boolean search strings are reported, but important details such as search dates, field restrictions, exact query execution, screening procedure, and independent reviewer involvement are missing. These details are necessary for reproducibility.

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4. Validate the proposed nine-layer architecture more rigorously.

The architecture is primarily conceptually derived from the reviewed literature. The paper should provide stronger validation, such as expert evaluation, implementation, benchmark experiments, or comparison with established interoperability architectures. At present, the evidence for the proposed architecture is largely conceptual.

5. Clarify the relationship between MCP and A2A.

The manuscript presents MCP and A2A as important components of the proposed architecture, but their respective responsibilities, interfaces, limitations, and interaction within the nine-layer model need to be explained more precisely. A detailed protocol-flow diagram would substantially improve the technical contribution.

6. Improve the evidence supporting the case studies.

Seven case studies are presented, but several are descriptive scenarios rather than experimentally evaluated implementations. The authors should clearly distinguish real-world deployments from conceptual examples and provide supporting references or measurable outcomes where claims such as reduced errors, improved accuracy, or reduced delays are made.

7. Address quantitative evaluation of interoperability.

The manuscript discusses scalability, flexibility, communication overhead, semantic fidelity, and interoperability, but does not provide quantitative evaluation metrics. The authors should consider metrics such as communication latency, message overhead, context preservation, task-completion rate, interoperability success rate, and computational cost.

8. Strengthen the security and governance analysis.

Security, privacy, prompt injection, data poisoning, authentication, and governance are identified as challenges, but the proposed architecture does not sufficiently specify how these threats are addressed at each layer. A layer-by-layer security and governance mapping would improve the technical depth.

9. Revise several broad or insufficiently supported claims.

Statements such as “no widely recognised, platform-neutral standard yet exists,” “REST APIs are too restrictive,” and claims regarding future AI-native internet development should be carefully qualified and supported with recent authoritative references. The distinction between established evidence and the authors' conceptual interpretation should be clearer.

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10. **Improve figures, tables, and overall presentation.**

The manuscript would benefit from a more detailed architectural diagram showing interactions among all nine layers, protocols, agents, data, and governance components. Figure 2 should also explain how its qualitative dimensions were derived from the literature. Tables should consistently define their evaluation criteria and terminology.

Minor Comments

1. The distinction between **AI Web, Internet of AI Agents, AI-native Internet, and multi-agent systems** should be made more explicit.
2. Some sections repeat similar arguments regarding interoperability, modularity, and standardisation; these could be consolidated.
3. The terminology for **AI agents, autonomous agents, and multi-agent systems** should be used consistently.
4. Several claims would benefit from more recent primary sources rather than relying mainly on conceptual or secondary references.
5. The manuscript should carefully distinguish **proposed architecture** from **existing standards and technologies**.
6. The phrase “genuine turning point” in the conclusion is somewhat assertive and could be replaced with more objective academic wording.
7. The limitations section should explicitly acknowledge that the architecture has not been implemented and empirically benchmarked.
8. The references and in-text citations should be checked for consistency and completeness.
9. The manuscript should undergo professional language editing to correct awkward phrasing and improve readability.
10. The conclusion should explicitly summarize the research objectives and explain which objectives were addressed through the proposed conceptual framework.