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REVIEWER'S REPORT

Manuscript No.: IJAR-52634 Date: 5/7/25

Title: A review and comparative study on task scheduling in group mutual exclusion algorithms to solve critical section problem based on cloud computing

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision ...yes.....
Do not accept (*Reasons below*) .....

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

Reviewer Name:Dr.Shaweta Sachdeva **Date:** 5/7/25

Reviewer's Comment for Publication. Accepted with Major Revision as it is only Review paper

(*To be published with the manuscript in the journal*)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewers name.

Significance

1. **Bridges Scheduling and GME in Cloud Context**:
   The paper uniquely combines task scheduling with **Group Mutual Exclusion (GME)** — a relatively less-explored area — within cloud computing. This niche integration is valuable for optimizing resource allocation in distributed systems that involve multiple users accessing shared resources concurrently.
2. **Comprehensive Review**:
   The manuscript surveys a variety of task scheduling algorithms (FCFS, Round Robin, Priority Scheduling, and DHJS), offering both **conceptual overviews** and **comparative analysis**, which serves as a solid starting point for researchers new to the domain.

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Key Strengths

1. Focus on Real-World Metrics:
   The discussion includes practical factors such as SLA adherence, QoS, and fault tolerance, showing awareness of real-world deployment constraints in cloud environments.
2. Coverage of Dynamic Algorithms:
   The paper pays special attention to dynamic scheduling techniques like DHJS, which is more suited to adaptive cloud environments compared to static models.
3. Inclusion of Classical and Heuristic Approaches:
   It draws from both traditional algorithms (e.g., FCFS) and modern heuristic-based methods (e.g., NSGA-II + GSA hybrid), reflecting the evolution of scheduling techniques over time.
4. Well-Cited Background:
   The literature review covers a wide array of foundational work (e.g., Ricart-Agarwala, Raymond's tree algorithm, Maekawa's algorithm), grounding the study in classical distributed systems theory.

Key Insights

- No One-Size-Fits-All:
  The paper underscores that different scheduling strategies have trade-offs, and selection must consider specific workload, system requirements, and performance metrics.
- Dynamic Heuristics Are Promising:
  The Dynamic Heuristic Johnson Sequencing algorithm is identified as particularly well-suited for cloud environments due to its ability to handle variable service times and dynamic workloads efficiently.
- Need for Context-Aware Scheduling:
  The study highlights the importance of designing context-sensitive scheduling algorithms that adapt to the heterogeneous and dynamic nature of cloud resources.

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Detailed Reviewer's Report

1. The abstract lacks clarity, suffers from grammatical errors, and repeats phrases like "some others scheduling method".
2. Many sections repeat the same ideas (e.g., advantages/disadvantages of scheduling algorithms).
3. Consider organizing with clearer subsections under Related Work (e.g., "Static Priority Algorithms", "Dynamic Priority Algorithms") to help reader navigation.
4. Add **figure(s) or flowcharts** comparing the algorithms visually — these would improve readability and comprehension.
5. The comparison is mostly textual; a **quantitative or simulation-based comparison** using metrics like execution time, throughput, or latency under various workloads would greatly strengthen the study.
6. Include a **summary table** of algorithms against evaluation criteria (e.g., SLA adherence, fault tolerance, resource efficiency).The treatment of some algorithms is superficial (especially for more advanced ones like DHJS).
7. Suggested improvements:
    a. Highlight main takeaways for each algorithm.
    b. Mention **open challenges** in dynamic scheduling for cloud environments.
    c. Suggest **future enhancements** or potential hybrid models.
8. Add:

- **Detailed algorithm steps**
- **Complexity analysis**
- **Use-case applicability**