International Journal of Computer Science
and Engineering (IJCSE)
ISSN (P): 2278–9960; ISSN (E): 2278–9979
Vol. 13, Issue 2, Jul–Dec 2024; 353–398
© IASET

IASET
International Academy of Science,
Engineering and Technology
Connecting Researchers; Nurturing Innovations

BEST PRACTICES IN MICROSERVICES ARCHITECTURE FOR CROSS-INDUSTRY INTEROPERABILITY

***Srinivasan Jayaraman*[1] *& Anand Singh*[2]**

[1]Maharishi International University, 1000 N 4th Street, Fairfield, IA 52556, USA

[2]Assistant Professor, IILM University, USA

ABSTRACT

Micro services architecture has emerged as a dominant design pattern for developing scalable, flexible, and maintainable systems across various industries. Its ability to enable the seamless integration of diverse systems and technologies makes it a vital approach for enhancing cross-industry interoperability. This paper explores best practices for implementing micro services architecture to foster interoperability between heterogeneous systems across different sectors. Key practices include designing service boundaries based on business capabilities, ensuring loose coupling, and utilizing standardized communication protocols such as REST ful APIs or message queues to promote seamless interactions. Additionally, the use of containerization technologies like Docker and orchestration platforms like Kuber netes is essential for ensuring scalability, fault tolerance, and ease of deployment across varied environments. Emphasizing the importance of security, this paper discusses strategies for securing microservices using techniques such as OAuth, JWT authentication, and role-based access control to mitigate potential vulnerabilities. Furthermore, adopting a decentralized data management approach, where each microservice owns its data store, improves consistency and reduces inter-service dependency. Effective monitoring and logging, along with automated testing frameworks, are critical for maintaining the health and performance of microservices across industries. The paper concludes by highlighting how these best practices enable smoother integration, faster innovation, and greater agility, ultimately enhancing the overall value and operational efficiency of businesses across diverse domains.

KEYWORDS: *Micro Services Architecture, Cross-Industry Interoperability, Service Boundaries, Loose Coupling, Restful Apis, Message Queues, Containerization, Kubernetes, Security, Oauth, JWT Authentication, Role-Based Access Control, Decentralized Data Management, Monitoring, Logging, Automated Testing, Business Agility*

Article History

Received: 17 Nov 2024 | Revised: 19 Nov 2024 | Accepted: 20 Nov 2024