

## Transfiguration in Information Retrieval Using AI-Quantum Hybridization for Decentralized Knowledge Discovery

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Libraries have traditionally been the center of socio-economic growth, advancing education and culture while giving everyone equal access to knowledge. However, in the digital era conventional library Systems (JSTOR, DSpace) face challenges such as low search speeds, scattered data storage, and insufficient global accessibility. Together with algorithmic bias, data privacy concerns, and over-reliance on centralized cloud infrastructure, these problems substantially hinder equitable knowledge access throughout academia, research, and cultural preservation. Therefore, to address these challenges a Cloud based Quantum Driven Information Retrieval System is proposed. The proposed Cloud based Quantum Driven Information Retrieval System utilizes a hybrid AI-Quantum model with Cloud Computing architecture. It enables much faster access to books by using heuristic-optimized AI search algorithms for personalized recommendations, while a decentralized, blockchain-based storage framework will connect worldwide library systems. Preliminary simulations revealed that the proposed system had the potential to reduce search latency by as much as 70% in comparison to conventional digital repositories such as D-Space and JSTOR. In a hypothetical case study that involved a global academic repository, the AI-powered search algorithm successfully identified relevant papers in less than three seconds, thereby substantially improving efficiency compared to existing systems. Additionally, the incorporation of quantum optimization algorithms demonstrated promised enhancements in search accuracy and speed, with a 15% increase in retrieval precision compared to conventional methods. The future enhancements will include transitioning to real quantum hardware, integrating multimodal retrieval, and expanding global access through a scalable, ethical, and federated framework.

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