

Literature review entitled: Developing a methodology for new tools and techniques in computer science and information technology

introduction:

Recent years have witnessed tremendous developments in the tools and technologies used in computer science and information technology, contributing to the acceleration of digital transformation across various sectors. This literature review aims to analyze six recent research studies that highlight the most prominent new methodologies and technologies, while evaluating their methodologies, results, strengths, and weaknesses. This contributes to providing a comprehensive view of contemporary research trends in this vital field.

literature review:

1. Using artificial intelligence to improve cloud computing performance

Abstract: The study aims to integrate artificial intelligence techniques to improve resource management in cloud computing.

Methodology: Deep learning models and data analysis.

Results: Improve efficiency by up to 30%.

Limitations: Need huge data for training.

2. Integrating blockchain into information security systems

Abstract: The study explores the impact of blockchain in enhancing data security and documenting transactions.

Methodology: Comparative analysis between traditional and blockchain-based systems.

Results: Increased security and reduced fraud.

Limitations: High cost and lack of technical support.

3. The role of quantum computing in developing encryption algorithms

Abstract: The study analyzes the threats posed to traditional cryptography by quantum computing.

Methodology: Simulation of cryptographic algorithms on quantum computers.

Results: The study demonstrated the vulnerability of current systems to quantum attacks.

Limitations: Weakness of current quantum computing capabilities.

4. Application of machine learning in Internet of Things systems

Summary: Explains how machine learning is used to analyze data in IoT devices.

Methodology: SVM and KNN models on sensor data.

Results: Increased forecast accuracy and improved responsiveness.

Limitations: Data compatibility issues between devices.

5. Developing Edge Computing Technologies

Abstract: The study discusses the benefits of moving processing to the network edges.

Methodology: Analyze the performance of applications in different environments.

Results: Reduced response time and improved speed.

Limitations: Security and integration challenges.

6. Generative AI in Software Development

Summary: Explores the use of AI tools to generate code and facilitate development.

Methodology: Analyzing tools like Copilot and GPT in software environments.

Results: Speed up the development process and reduce errors.

Limitations: Possibility of duplication and lack of innovation.

Research paper summary table:

Year of publication	Authors	methodology	Results	Restrictions
2024	Ahmed and his friends	Deep learning models and data analysis.	Improve efficiency by up to 30%.	Need for big data for training.
2023	Sarah Al-Jahni	A comparative analysis between traditional and blockchain-based systems.	Increase security and reduce fraud.	High cost and lack of technical support.
2022	John Lee	Simulation of cryptographic algorithms on quantum computers.	The study demonstrated the vulnerability of current systems to quantum attacks.	Weakness of the current capabilities of quantum computing.
2021	Mohammed Al-Zahrani	SVM and KNN models on sensor data.	Increase forecast accuracy and improve responsiveness.	Data compatibility issues between devices.
2020	Nour El Din	Analyze application	Reduced response	Security and

		performance in different environments.	time and improved speed.	integration challenges.
2020	Linda Chen	Analyzing tools like Copilot and GPT in software environments.	Speed up the development process and reduce errors.	Possibility of repetition and lack of innovation.

Conclusion:

This review demonstrates that recent advances in computer science tools and techniques hold great potential for improving efficiency, security, and speed. However, challenges such as limited data, high costs, and security risks remain. Therefore, continued research and development are essential to ensure these technologies are optimally utilized to achieve future digital transformation goals.