

Smart Resume Builder: An AI-Based Intelligent Resume Generation System

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Abstract-The rapid advancement of technology and digital transformation in the recruitment industry has significantly changed the way organizations hire employees and evaluate candidates. In today's competitive job market, a professional resume plays a critical role in securing employment opportunities because it acts as the first impression of a candidate before recruiters and hiring managers. Companies increasingly rely on digital hiring platforms, Applicant Tracking Systems (ATS), and online recruitment portals to shortlist candidates efficiently. As a result, the demand for well-structured, ATS-friendly, and visually appealing resumes has increased considerably among students, fresh graduates, and job seekers.

However, many individuals face major challenges while preparing professional resumes. Most students and beginners lack sufficient knowledge about resume formatting standards, content organization, professional writing styles, and design principles. Traditional resume creation methods using word processing applications such as Microsoft Word or Google Docs require significant manual effort, formatting adjustments, and design expertise. Users often spend a large amount of time aligning sections, selecting templates, adjusting fonts, maintaining consistency, and organizing professional information. In many cases, poorly formatted resumes reduce the chances of getting shortlisted for interviews, even if the candidate possesses strong technical skills and academic qualifications.

To address these challenges, the proposed system "Smart Resume Builder" was developed as an AI-based intelligent resume generation platform that automates and simplifies the process of creating professional resumes. The system is designed to provide a modern, efficient, and user-friendly solution that enables users to generate high-quality resumes with minimal manual effort. Instead of relying on traditional manual formatting methods, the application allows users to enter their information through structured forms, after which the system automatically generates professional resume layouts using predefined templates and intelligent content assistance.

The proposed Smart Resume Builder integrates modern MERN Stack technologies, including React.js, Tailwind

CSS, Redux Toolkit, Node.js, Express.js, and MongoDB, to ensure scalability, responsiveness, and efficient performance. React.js is used to develop dynamic and reusable user interface components, while Tailwind CSS provides responsive and visually appealing styling for modern resume templates. Redux Toolkit is integrated for efficient state management and smooth handling of application data. The backend system is implemented using Node.js and Express.js APIs to manage authentication, resume processing, data validation, and communication between frontend and backend modules. MongoDB is used as the primary database system for securely storing user information, resume details, and template configurations.

I. INTRODUCTION

Resumes play a critical role in modern recruitment systems because they provide a structured representation of an individual's qualifications, technical skills, education, certifications, and professional achievements. Students and fresh graduates often face difficulties while preparing professional resumes due to lack of design knowledge, formatting experience, and professional writing skills. Traditional resume creation methods using Microsoft Word or similar editors require manual formatting and significant effort.

To overcome these limitations, Smart Resume Builder was developed as an intelligent web-based application that automates resume generation. The proposed system allows users to enter personal information through structured forms and automatically generates professional resumes with AI-powered assistance. The application uses MERN Stack technologies to ensure scalability, responsiveness, and maintainability.

- React for UI
- Vite for fast development environment
- Redux Toolkit for state management
- Clerk for authentication
- Tailwind CSS for styling
- Framer Motion for animations
- Axios for API communication

Each module of the system was implemented separately and then integrated to form the complete application.

II. EXISTING APPROACHES

Several online resume builder systems currently exist for generating resumes through predefined templates. These systems provide form-based resume creation and automatic formatting. However, many existing systems contain limitations such as paid subscription models, lack of intelligent suggestions, poor customization, and complex editing interfaces.

Most existing applications do not provide AI-assisted writing support for career objectives, project descriptions, and professional summaries. Users often struggle while writing professional content. The Smart Resume Builder addresses these limitations by integrating AI-powered suggestions, customizable templates, secure authentication, and responsive UI design.

Overview of Resume Building Systems

Resume building systems are software applications or web-based tools that assist users in creating professional resumes. These systems usually provide predefined templates, automated formatting, and editing tools that help users generate resumes quickly.

In traditional methods, resumes were created manually using word processors such as Microsoft Word or Google Docs. Users had to design the resume layout, adjust formatting, and organize content manually. This process required significant time and effort, especially for users who lacked design skills.

Modern resume builder systems simplify this process by providing structured forms where users can input their information, such as personal details, education, skills, and work experience. The system then automatically formats the information and generates a professional resume.

Smart Resume Builder follows a similar approach but improves the system by integrating artificial intelligence and modern web technologies. It provides an intuitive interface where users can easily create and manage their resumes without needing technical or design expertise.

III. PROPOSED SYSTEM ARCHITECTURE

The Smart Resume Builder follows a modular client-server architecture using MERN Stack technologies. The frontend layer is developed using React.js and Tailwind CSS for responsive interface design. Redux Toolkit manages state and React Router DOM handles navigation.

The backend layer is implemented using Node.js and Express.js APIs for request processing and resume management. MongoDB stores user information and resume data securely. Google Generative AI provides intelligent suggestions for professional summaries, project descriptions, and skills. The modular architecture improves maintainability and scalability while supporting future enhancements.

The system follows a modular client-server architecture.

Frontend:

- React.js and Vite for component-based UI.
- Tailwind CSS and Radix UI for responsive design.
- Redux Toolkit for state management.
- React Router DOM for navigation.
- Framer Motion for animations.

Backend:

- Node.js and Express.js for REST APIs.
- MongoDB and Mongoose for data storage.

External Services:

- Clerk for authentication.
- Google Generative AI for content suggestions.

IV. METHODOLOGY

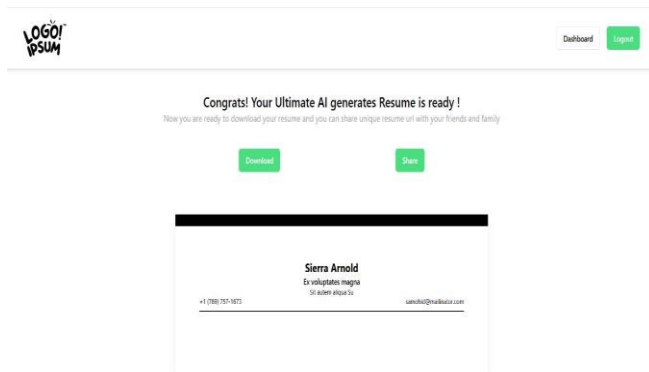
The development methodology of Smart Resume Builder follows a workflow-oriented architecture. The process begins with user authentication where users register and login securely. Users then enter personal details, education, skills, work experience, projects, and certifications through structured forms.

The backend validates and processes user data before storing it in MongoDB. Resume templates are dynamically generated using React components. Google Generative AI analyzes user input and provides intelligent suggestions for professional content generation. The workflow includes authentication, data processing, AI assistance, template rendering, preview generation, and PDF download functionality. The Smart Resume Builder was developed using a structured workflow in which each process is executed sequentially. This approach ensures that the application handles user input systematically and generates

resumes with minimal manual effort. The major phases of the methodology are:

1. User Authentication
2. Data Collection
3. Data Validation and Processing
4. Data Storage
5. AI-Based Content Generation
6. Template Rendering
7. Resume Preview
8. PDF Generation and Download

Each of these phases is implemented as an independent module, making the application modular and maintainable. If future improvements are required, additional features can be integrated without modifying the entire system.



V. SYSTEM IMPLEMENTATION

The Smart Resume Builder was successfully implemented using React.js, Tailwind CSS, Redux Toolkit, Node.js, Express.js, and MongoDB. Framer Motion was integrated to provide smooth animations and interactive transitions.

The implementation includes Login Module, Registration Module, Resume Builder Module, Template Selection Module, Resume Preview Module, and PDF Download Feature. Clerk authentication ensures secure user login and session management. Experimental testing confirmed responsive design, efficient rendering, and compatibility across multiple browsers and devices.

The application was implemented using reusable React components and REST APIs. Major modules include:

- Registration and Login Module
- Resume Creation Module
- Template Selection Module

- Resume Preview Module
- PDF Download Module
- AI Suggestion Module

Testing confirmed compatibility across modern browsers and devices, including desktops, tablets, and smartphones.

VI. RESULTS AND DISCUSSION

The implementation and testing results demonstrated that the Smart Resume Builder significantly improves resume creation efficiency and professionalism. AI-generated suggestions enhanced the quality of career summaries and project descriptions while reducing manual writing effort.

The responsive interface ensured smooth operation across desktops, laptops, tablets, and smartphones. Real-time preview functionality improved resume accuracy and allowed users to verify formatting before downloading resumes. The system successfully handled authentication, resume generation, template rendering, AI assistance, and PDF download operations without major issues.

VII. FUTURE ENHANCEMENTS

Future versions of Smart Resume Builder can integrate ATS optimization systems, LinkedIn synchronization, GitHub profile integration, cloud-based resume storage, and multilingual resume generation. Advanced AI models can improve grammar correction, career recommendations, and intelligent interview preparation support.

Future deployment on cloud platforms such as AWS and Google Cloud can improve scalability and distributed accessibility. Additional features such as voice-assisted resume generation and advanced template customization can further improve usability.

Future versions can include:

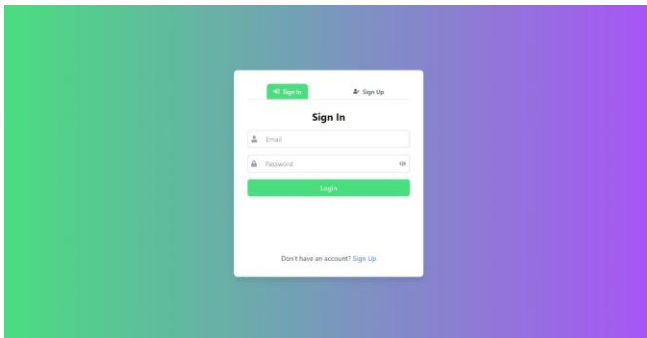
- More professional templates
- ATS score and keyword optimization
- LinkedIn and GitHub integration
- Cloud storage
- Multilingual resume generation
- Interview preparation assistance
- Career recommendations based on job roles

The scope of the Smart Resume Builder project focuses on developing a web-based application that enables users to create professional resumes quickly and efficiently. The system allows users to input their personal details, education, skills, projects, and work experience through an interactive interface.

The application processes this information and generates a structured resume that can be previewed and downloaded by the user. The system is designed to be accessible through web browsers, making it easy for users to create resumes from anywhere.

The project also includes AI-powered features that provide intelligent suggestions for resume content. This helps users improve the quality of their resumes and present their information more effectively.

In the future, the system can be enhanced by adding additional features such as multiple resume templates, cloud storage, job portal integration, and advanced AI-based resume analysis.



VIII. Problem Statement and Objectives

Traditional resume creation methods are time-consuming and require significant formatting effort. Many existing online tools are paid, provide limited customization, and do not offer intelligent writing assistance.

Objectives of the project:

- Develop a user-friendly web application for resume creation.
- Automate formatting and template generation.
- Provide AI-based content suggestions.
- Generate ATS-friendly resumes.
- Allow real-time preview and PDF download.
- Store user data securely in MongoDB.

User Interface (UI) design plays an important role in ensuring that users can interact with the Smart Resume Builder application easily and efficiently. The UI is designed to be simple, intuitive, and responsive so that users can create professional resumes without technical difficulties.

The interface is developed using modern frontend technologies such as **React**, **Tailwind CSS**, and **Radix UI**. These technologies help in creating responsive layouts, reusable components, and attractive visual designs.

The system also uses **Framer Motion** to provide smooth animations and transitions that enhance user experience.

The main user interface pages of the Smart Resume Builder include the Home Page, Login Page, Resume Builder Page, and Resume Preview Page.

IX. LITERATURE REVIEW

The literature review is an important part of the Smart Resume Builder project because it provides a detailed study of existing resume creation systems, technologies, methodologies, and tools used in the field of automated resume generation. The purpose of this section is to analyze the currently available resume builder platforms, understand their working mechanisms, evaluate their strengths and weaknesses, and identify the challenges faced by users while creating professional resumes. This analysis helps in understanding how modern technologies can improve the process of resume creation and contribute to the development of a more intelligent and user-friendly system.

In today's digital era, resumes play a very important role in the recruitment and job application process. A resume acts as the first impression of a candidate and helps employers evaluate the qualifications, skills, experiences, and achievements of applicants. Traditionally, resumes were created manually using word processing software such as Microsoft Word. This process required significant effort in formatting, alignment, design, and organization of information. Many users, especially students and fresh graduates, often faced difficulties in creating professional resumes because they lacked technical knowledge and design skills.

With the advancement of internet technologies and web applications, online resume builder platforms emerged as a solution to simplify resume creation. These systems allow users to generate resumes quickly by entering their personal and professional details into structured forms. Most online resume builders automatically organize the entered information into predefined templates, reducing the need for manual formatting. Such systems save time and help users

create professional-looking resumes without requiring advanced technical expertise.

Several online resume builder applications are available today, and each system offers different features and functionalities. Popular resume builders generally provide facilities such as multiple templates, drag-and-drop editing, real-time previews, PDF downloading, and profile management. Some platforms also include resume scoring systems and career guidance features. These systems have significantly improved the resume creation process by automating formatting tasks and simplifying document generation.

However, despite these improvements, many existing resume builder systems still have several limitations. One of the most common issues identified during the literature study is the lack of free accessibility. Many platforms allow users to create resumes without cost, but they require paid subscriptions or premium memberships to download resumes or access advanced templates. This creates financial barriers for students and unemployed job seekers who may not be able to afford such services. As a result, users are often restricted to basic templates with limited functionality.

Another major limitation observed in existing systems is limited customization capability. Although many platforms provide templates, users are often unable to modify layouts, colors, fonts, spacing, or section arrangements according to their requirements. Different industries require different resume styles; for example, technical job roles may require skill-focused resumes, while creative industries may demand visually attractive and innovative designs. Existing systems frequently fail to provide enough flexibility for users to personalize resumes according to their career needs.

Complex user interfaces are also a challenge in many current resume building applications. Some systems include too many editing tools, complicated navigation structures, or technical design settings that may confuse beginners. Users who are not familiar with online editing tools often struggle while entering information, selecting templates, or adjusting

formatting settings. This negatively affects the user experience and increases the difficulty of resume creation.

Another important issue identified in the literature review is the lack of intelligent writing assistance. Most traditional resume builders only provide empty text fields where users manually enter resume content. These systems do not guide users in writing professional career objectives, summaries, work experience descriptions, or skill statements. Many students and freshers face difficulty in presenting their qualifications effectively because they are unsure about professional resume writing standards. As a result, the generated resumes may appear weak, incomplete, or unprofessional.

Recent advancements in artificial intelligence and web technologies have introduced a new generation of smart resume builder applications. Modern systems now integrate AI-based text generation and machine learning technologies to improve user experience and automate content creation. AI-powered systems can analyze user information and provide intelligent suggestions for summaries, skills, achievements, and resume formatting. Such technologies help users generate more professional and ATS-friendly resumes.

Responsive web design is another important advancement observed in modern resume builder systems. Earlier applications were mainly designed for desktop environments, making them difficult to use on smartphones and tablets. However, modern web technologies such as React and Tailwind CSS allow developers to create responsive interfaces that adapt to different screen sizes and devices. This improves accessibility and enables users to create resumes from anywhere using mobile devices.

Cloud storage integration is also becoming increasingly common in modern resume management systems. Cloud-based systems allow users to save multiple resumes online, access them from different devices, and update them whenever necessary. This eliminates the risk of losing important resume data and improves convenience for users. Additionally, some systems integrate with professional

networking platforms to import user information automatically, reducing manual data entry.

The literature review also highlights the growing importance of Applicant Tracking Systems (ATS) in recruitment processes. Many companies now use ATS software to filter resumes before they are reviewed by recruiters. Therefore, resume builders need to generate ATS-friendly documents with proper formatting, keyword optimization, and structured layouts. Several traditional resume builders fail to address this requirement, reducing the effectiveness of resumes during job applications.

After analyzing the strengths and weaknesses of existing systems, the Smart Resume Builder project was designed to overcome many of the identified limitations. The project aims to provide a simple, intelligent, and efficient platform that helps users create professional resumes quickly and easily. The system focuses on improving usability, customization, accessibility, and intelligent assistance.

The Smart Resume Builder integrates modern technologies such as React, Node.js, MongoDB, and Google Generative AI to create a responsive and scalable web application. React is used for developing dynamic and reusable user interface components, while Node.js and Express.js handle backend processing and API management. MongoDB is used for flexible and efficient data storage, allowing the system to manage user profiles and resume information effectively.

One of the key innovations of the Smart Resume Builder is the integration of Google Generative AI. This technology enables the system to provide intelligent content suggestions, professional summaries, and writing assistance to users. The AI-based functionality improves the quality of resumes and helps users who may not have professional writing experience.

The project also emphasizes simplicity and user-friendliness. The interface is designed to be clean, responsive, and easy to navigate, ensuring that users can create resumes without technical difficulties. Multiple

customizable templates and real-time preview functionality further improve the overall user experience.

In conclusion, the literature review demonstrates that although existing resume builder systems have simplified the resume creation process, they still contain several limitations related to cost, customization, usability, and intelligent assistance. Modern technologies such as artificial intelligence, responsive web design, and cloud integration provide opportunities to improve these systems significantly. Based on the analysis of existing platforms and technological advancements, the Smart Resume Builder project was developed as an intelligent, user-friendly, and efficient solution for professional resume creation

X. CONCLUSION

This paper presented Smart Resume Builder, an AI-based intelligent resume generation system designed to simplify

The application was developed using modern web technologies such as **React**, **Redux Toolkit**, and **Tailwind CSS**, which helped in creating a responsive and scalable system. Authentication was handled securely using **Clerk**, ensuring that user accounts and personal information remain protected.

The system includes several important modules such as user registration, login authentication, resume creation, template selection, resume preview, and resume download. Each module was designed and tested carefully to ensure smooth integration and functionality.

The Smart Resume Builder provides a convenient solution for students, job seekers, and professionals who need to create resumes quickly without spending time designing them manually. The application improves productivity and helps users generate well-structured resumes with minimal effort.

In conclusion, the project achieves its main objective of developing a user-friendly resume generation platform. With further enhancements and additional features, the Smart Resume Builder can become a more powerful and widely used tool for resume creation.

The Smart Resume Builder project was developed with the objective of simplifying the process of creating professional resumes for students, job seekers, and professionals. In today's competitive job market, having a well-structured and visually appealing resume is extremely important. However, many individuals face difficulty in designing resumes due to lack of technical knowledge or design skills. The Smart Resume Builder addresses this problem by providing an easy-to-use platform that allows users to create professional resumes quickly and efficiently.

The system was developed using modern web technologies such as **React**, **Redux Toolkit**, and **Tailwind CSS**. These technologies helped in building a responsive, scalable, and user-friendly interface. The use of **Clerk** ensures secure user authentication and safe management of user accounts. Additionally, integration with **Google Generative AI** provides intelligent assistance for generating resume content and improving the quality of resumes.

REFERENCES

1. React Documentation Team, "React Developer Documentation," Meta Open Source, 2025.
2. MongoDB Inc., "MongoDB Documentation," MongoDB Official Documentation, 2025.
3. Node.js Foundation, "Node.js Documentation," OpenJS Foundation, 2025.
4. Tailwind CSS Labs, "Tailwind CSS Documentation," 2025.
5. Google AI Team, "Google Generative AI Documentation," Google Developers, 2025.
6. Redux Toolkit Team, "Redux Toolkit Essentials," 2025.
7. Express.js Documentation Team, "Express.js Framework Guide," 2025.
8. M. Fowler, "Modern Web Application Architecture," Addison-Wesley, 2021.
9. 15. Babburi, S. Lightweight Distributed Provenance Framework for Edge and IoT Data Systems.
10. 16. Gaddam, S. Integrating Analytics into the Development Process: Bridging the Gap between Data Insights and Design Execution.
11. 17. Reddy, S. K. R. Developing a Modular AI Framework to Enhance Scalability and Personalization in Next-Generation Reward Platforms.
12. 18. Poojari, R. Frameworks for Data Management and Lineage in Large-Scale Healthcare Data Systems.
13. 19. Mahimalur, R. K., Vasmam, M., & Manoharan, D. Devops Lifecycle Management And Cloud Migration Assessments: A Security-Driven CICD Perspective.
14. 20. Purmani, S. S. R. (2025). Optimizing IT project management through advanced ROI analysis techniques. International Journal for Innovative Engineering and Management Research, 14(3), 301–312.
15. 21. Kotte, G. (2025). Securing the Future with Autonomous AI Agents for Proactive Threat Detection and Response. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.5283830>
16. 22. Purmani, S. S. R. (2024). Aligning IT investment decisions with overall business strategy from an enterprise program management perspective, focusing on the integration of IT leadership in strategic decision-making processes. International Journal of Communication Networks and Information Security, 16(5), 1213–1219
17. 23. Cyril, H. P., & Kumara, S. (2026, February). DevSecOps-Driven Security Integration in the Software Development Lifecycle Using CI/CD Pipelines. In 2026 IEEE 5th International Conference on AI in Cybersecurity (ICAIC) (pp. 1-6). IEEE.
18. 24. Kotte, G. (2025). Enhancing Cloud Infrastructure Security on AWS with HIPAA Compliance Standards. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.5283660>
19. 25. Ranjbareslamloo, S., Dzukeya, G. A., Muhit, M. M. I., & Qattawi, A. (2025). Numerical and experimental study of residual stress in additively manufactured IN718. Manufacturing Letters, 44, 915–927. <https://doi.org/10.1016/j.mfglet.2025.915927>
20. 26. Viswanathan, V. Generative AI for Smarter Workforce Planning and Enterprise Resource Decisions.
21. 27. Viswanathan, V., Shah, A. K., Kubam, C. S., Dontu, S., Gandhi, A., & Singla, P. (2025, August). Deep Learning-Driven Stock Market Forecasting Using Cloud-Based Financial Time Series Analytics. In 2025 International Conference on Emerging Trends in Networks and Computer Communications (ETNCC) (pp. 1-6). IEEE.
22. 28. Mudusu, S. K. (2026, April 15). The secure intelligence framework: Architecting AI

- systems for a data-driven world. CIO (Foundry Expert Contributor Network).
23. 29. Mudusu, S. K. (2026, February 9). AI-augmented data quality engineering. InfoWorld (Foundry Expert Contributor Network).
 24. 30. Gajula, S. (2026, March). Two Pillars of Banking Intelligence: A Comparative Analysis of AI Techniques for Fraud Prevention and Churn Mitigation. In 2026 14th International Symposium on Digital Forensics and Security (ISDFS) (pp. 1-6). IEEE.
 25. 31. Maturi, S. Y. (2025). Vulnerabilities in the 802.11 Wireless Client Selection Mechanis.
 26. 32. Chowdhury, A. K., Muhit, M. M. I., & Islam, M. M. (2023). A practical review to the marine maintenance practice in Bangladesh and a proposed way forward to an efficient, long-term and cost-effective solution. In Proceedings of the 13th International Conference on Marine Technology (MARTEC 2022). <https://doi.org/10.2139/ssrn.4445071>
 27. 33. Manoharan, D. (2025). Healthcare EDI Transaction Lifecycles Embedded with a Multi-Layer Verification Framework to Ensure Referential Integrity.
 28. 34. Ravishankara, M. (2026, February). CircuChain: Disentangling Competence and Compliance in LLM Circuit Analysis. In SoutheastCon 2026 (pp. 1-7). IEEE.
 29. 35. Doragacharla, V. R. (2023). Comprehensive Benchmarking Analysis of Auto Scaling Approaches in Cloud Native Streaming Pipelines During Flash Sales and Holiday Traffic Peaks. Available at SSRN 6566479.
 30. 36. Venkata Ramana, P. (2024). AI-driven predictive analytics in ERP systems for proactive supply chain optimization. International Journal of Research in Information Technology and Computing, 8(4).
 31. 37. Srikanth Kavuri. (2025). AI-DRIVEN TEST AUTOMATION FRAMEWORKS: ENHANCING EFFICIENCY AND ACCURACY IN SOFTWARE QUALITY ASSURANCE. International Journal of Applied Mathematics, 38(10s), 699–710. <https://doi.org/10.12732/ijam.v38i10s.990>
 32. 38. Venkata Pavan Kumar Gummadi. (2026). Infrastructure Optimization Techniques for Enterprise Integration Platforms: A Comprehensive Analysis. Computer Fraud and Security, 37–44. <https://doi.org/10.52710/cfs.875>
 33. 39. Kumar Gummadi, V. P., Chilamkurthi, L. S., & Kavuri, S. (2026). Distributed Platform Architecture and API-Led Integration. 2026 International Conference on Artificial Intelligence, Systems, and Emerging Technologies (ICAISSET), 1–6. <https://doi.org/10.1109/icaisset66439.2026.11541787>
 34. 40. Gajula, S. (2025). Ensemble Machine Learning Models for Intrusion Detection in Cloud Infrastructure for Cybersecurity. 2025 International Conference on Artificial Intelligence, Blockchain, Cloud Computing, and Data Analytics (ICoABCD), 1–6. <https://doi.org/10.1109/icoabcd67551.2025.11470865>