LIVEDOCS: A PEER-TO-PEER REAL-TIME COLLABORATIVE DOCUMENT EDITOR USING WEBRTC AND CRDTS

A PROJECT REPORT

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in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

PSNA COLLEGE OF ENGINEERING AND TECHNOLOGY,

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MAY 2025

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BONAFIDE CERTIFICATE

Certified that this project report **"LIVEDOCS: A PEER-TO-PEER REAL-TIME COLLABORATIVE DOCUMENT EDITOR USING WEBRTC AND CRDTS"** is the bonafide work of "**ARUNPRASAD S (Reg.No.921321205015), CHARANKUMAR E G D (Reg.No.921321205029), DHARANI DHARAN R (Reg.No.921321205032)**" who carried out the project work under my supervision.

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ACKNOWLEDGEMENT

At this pleasing moment of having successfully completed our project report, we wish to convey our sincere thanks and gratitude to our beloved Pro-Chairman **Thiru R.S.K. Raguraam** and Chairperson **Tmt. K. Dhanalakshmi** who provided all the facilities to us.

We would like to express our sincere thanks to our beloved Principal **Dr. D. Vasudeven** for supporting the successful completion of the project.

We are also grateful to our Head of the Department **Dr. A. Vincent Antony Kumar** for his constructive suggestions and encouragement during our project work.

We also express our sincere thanks to **Mrs. S. T. Bharathi**, Project Coordinator, for her support and encouragement throughout the project.

We whole heartedly acknowledge the words of inspiration given by our Internal Guide **Mrs. A. Sangeetha**, Asst. Prof. for successfully completing this project work.

Finally, we would like to thank the almighty with whose blessings it has been possible for us to complete our project.

ABSTRACT

LiveDocs is a decentralized, real-time collaborative document editor designed to enable seamless and efficient collaboration without reliance on centralized servers. Unlike traditional cloud-based solutions such as Google Docs, LiveDocs utilizes WebRTC for direct P2P communication and Yjs (CRDTs) for distributed data synchronization. This architecture ensures low-latency collaboration, enhanced fault tolerance, and seamless scalability, supporting millions of concurrent users. Key features include real-time editing, and role-based access control, all powered by a resilient P2P network. Secure authentication is ensured through JWT-based access control, enabling efficient document indexing and user management while delivering a modern and sleek user experience. By eliminating centralized infrastructure, LiveDocs reduces server costs, enhances scalability, and improves fault tolerance, making it an ideal solution for teams, enterprises, and large-scale applications requiring secure and real-time document collaboration.

Keywords:

Peer-to-Peer Collaboration, Real-Time Document Editing, WebRTC, CRDTs (Yjs), Decentralized Collaboration, JWT Authentication.

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LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
AI	Artificial Intelligence
API	Application Programming Interface
CRDT	Conflict-Free Replicated Data Type
CSS	Cascading Style Sheets
JSON	JavaScript Object Notation
JWT	JSON Web Token
NAT	Network Address Translation
ORM	Object-Relation Mapping
OT	Operational Transformation
P2P	Peer-to-Peer
SQL	Structured Query Language
STUN	Session Traversal Utilities for NAT
TURN	Traversal Using Relays around NAT
UI	User Interface
WebRTC	Web Real-Time Communication