# Project Proposal Form

**Instructor**: Yusuf Altunel, PhD

**Academic Year**: 2024 - 2025 **Semester**: Fall ☒ Spring ☐ Summer ☐

**Team Name:** DDMS Team

**Student No Name & Surname E-mail Address Signature**

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| --- | --- | --- |
| 2000001920 | Alin Bitmani | 2000001920@stu.iku.edu.tr |
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**Student1:**

**Student2:**

**Project is** A survey☐ An Implementation ☒ Code in Python: Yes ☐ No ☒

**Project Name**: Decentralized Document Management System

(DDMS)

# Project Statement

Our project creates a **Decentralized Document Management System (DDMS)** using **blockchain** and **IPFS** to offer a secure, transparent, and scalable solution for document storage and access control, aimed at enhancing data privacy, user autonomy, and protection against tampering compared to traditional centralized systems.

The final project is planned to be deployed as a local web page & published as an open-source project on GitHub.

# Complete List of Submissions

1. **Submissions**:

**i.** Documentation:

* + - 1. Project proposal form to explain the project and team
      2. A Software Requirement Specification (SRS) document to explain the details of the implementation, data description, algorithms and libraries and all external references including the exact position in source code of those references.
      3. Academic Document in IEEE format
      4. A video showcasing the usage of the DDMS, demonstrating document upload, access control, and retrieval.
      5. Installation guide to show how to compile, deploy and run the application.

**ii.** Web application

**iii.** GitHub page to access and download the source code

1. **Features**:

* 1. Document upload from a web interface and assignment of access controls
  2. Documents will include unique IDs, timestamps, usernames, and metadata
  3. Blockchain will store document metadata (document ID, timestamps, hash values, etc.)
  4. Each block in the chain will include a block number, Nonce, data, and hash value
  5. Nonce will be mined to satisfy validity conditions using a hashing algorithm
  6. A consensus mechanism will be implemented to verify the integrity of the blockchain across nodes
  7. (Decentralization) system nodes will store multiple copies of the blockchain, distributed across different servers
  8. Users can search the chain for document histories and retrieve specific document details
  9. Smart contract-based access control will be integrated for permission management
  10. Validation of the blockchain will include cross-referencing with nodes to resolve any discrepancies
  11. A decentralized voting mechanism will determine the correct version of the blockchain in case of conflicting copies across nodes
  12. Cryptocurrencies will be used to incentivize document validation and transactions.

# Team Roles

**1. Developers**:

1. Developer-1 (Feras Jadallah): Blockchain implementation, IPFS implementation
2. Developer-2 (Alin Bitmani): Web interface, access control , document versioning system.
3. Developer-3 (Viyan Nafi): Frontend, Decentralized storage, Encryption.
4. Developer-4 (Ata Kürklü): Backend, Blockchain implementation.

# Resources[[1]](#footnote-1)

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1. [2] G. Zyskind, O. Nathan, and A. Pentland, "Decentralizing Privacy: Using Blockchain to Protect Personal Data," in 2015 IEEE Security and Privacy Workshops, San Jose, CA, USA, 2015, pp. 180-184. DOI: 10.1109/SPW.2015.27.

1. [3] X. Huang, J. Hong, and Y. Shen, "Blockchain-Based System for Secure and Efficient Data Sharing in Decentralized Storage," in Proceedings of the 2018 International Conference on Data Science and Information Technology, Paris, France, 2018, pp. 1-5. DOI:

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2. [5] H. Li, L. Liu, and T. Wang, "Decentralized Document Management System Using IPFS and Blockchain," in Proceedings of the 2021 IEEE International Conference on Blockchain and Cryptocurrency, Sydney, Australia, 2021, pp. 1-7. DOI:

10.1109/ICBC51069.2021.9461113.

1. [6] F. Koç, “A Decentralized BIM Document Management System with Blockchain and IPFS integration for construction project delivery” Master of Science in Civil Engineering, the Graduate School of Natural and Applied Sciences, Middle East Technical University, Ankara, Türkiye.
2. [7] E. Kokoris-Kogias, E. C. Alp, L. Gasser, P. Jovanovic, E. Syta, and B. Ford, "CALYPSO: Private Data Management for Decentralized Ledgers," Cryptology ePrint Archive, Paper 2018/209, 2018. [Online]. Available: https://eprint.iacr.org/2018/209. [Accessed: May 15, 2024].

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1. [10] S. Ahmadisheykhsarmast, S. Golmohammadi Senji, and R. Sonmez, "Decentralized tendering of construction projects using blockchain-based smart contracts and storage systems," Automation in Construction, vol. 146, no. 104900, pp. 1-10, 2023. doi:

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1. [12] OpenAI, "ChatGPT: Language Model for Generating Text," OpenAI, 2024. [Online]. Available[: https://www.openai.com/chatgpt.](https://www.openai.com/chatgpt) 

1. Any type of reference should be listed like the source codes, libraries, and resources to use in implementation and reading [↑](#footnote-ref-1)