IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, December 2025
Impact Factor: 7.67

Cloud Share App

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Abstract: *Cloud Share App is a comprehensive, full-stack web application designed to facilitate secure and efficient file sharing with integrated user authentication, credit-based access control, and payment processing capabilities. The application leverages modern cloud-native technologies including React and Tailwind CSS for frontend development, Spring Boot for backend services, Clerk for authentication, Cloudinary for cloud storage, and container orchestration via Docker. This paper presents the architectural design, implementation methodology, and experimental results of the cloud share app system. The application implements a microservices-oriented approach with a RESTful API, robust exception handling, and secure webhook integration for real-time user lifecycle management. The system features efficient handling of concurrent requests, comprehensive error handling, and seamless integration with third-party services. Performance evaluation indicates effective scalability and reliability for enterprise-level file sharing operations, with average response times less than 200ms for critical operations and successful operation of up to 10,000 concurrent connections. The system achieves 99.9% uptime with Docker containerization and load balancing strategies, making it suitable for production deployments on render and Vercel hosting platforms..*

Keywords: File Sharing, Microservices, Spring Boot, React, Authentication, Cloud Storage, Payment Processing, RESTful Architecture, Docker, Webhook Integration

I. INTRODUCTION

The rapid growth in creating digital content, working remotely, and using data-driven processes has made cloud-based storage and file-sharing systems more essential than ever. As companies move towards digital environments, the demand for secure, scalable, and easy-to-use file management tools has become more important. Cloud computing has changed how users store, access, and share files by offering instant access, real-time syncing, and reliable availability. Services like Google Drive, Dropbox, and OneDrive work well for both businesses and individuals. However, in areas like research, educational institutions, or specific businesses, these centralized solutions often lack customizable, open-source, and developer-friendly options. This means organizations struggle to tailor existing tools to meet complex needs like advanced security features, distributed systems, or unique ways to make money.

Traditional file-sharing systems also face problems with scalability, security, and connecting with other tools.

Systems built as single units can't handle growing numbers of users, leading to slower performance and frequent crashes. Security issues come from weak login systems, poor encryption, and weak access controls, which can allow unauthorized users to access data. Managing users at scale is hard, especially when you have to manually set up, assign, and remove user access. Plus, many old systems don't connect well with modern cloud platforms and third-party services, making it difficult to adapt and expand. These issues show how important it is to have a modern, flexible, and cloud-native file-sharing solution that can deal with these problems.

To solve this, the Cloud Share App was created as a secure, efficient, and customizable file-sharing platform built with modern technologies.The app uses Clerk Authentication for password less and token-based logins across different providers, which boosts security and makes access easier to manage. Its architecture, inspired by microservices and built with Java Spring Boot, allows each part of the system to scale independently, making the app more resilient and performing better during busy times. User management is handled automatically through event-driven webhooks, which reduces the work needed to manage users and improves efficiency. The app also integrates with third-party

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services such as Cloudinary for better media storage and Razor pay for easy payment processing, adding a revenue model that supports premium features and subscriptions.

From a deployment standpoint, the Cloud Share App follows a cloud-native approach, using Docker containers to keep the environment consistent and make it easier to deploy across multiple cloud platforms.

The front-end, built with React and Tailwind CSS, runs on Vercel, while the back-end services are hosted on Render, allowing for flexible and distributed deployments. This setup not only improves reliability but also shows how large-scale, multi-service apps can run smoothly in real-world production environments.

The main aim of this research is to design, build, and test a modern cloud file-sharing platform that meets today's standards for security, scalability, and ease of use.

This study shows how a modular design, using microservices and integrating with third-party tools, can tackle the limitations of traditional systems. It also looks at how reliable the system is, how quickly and securely users can log in, how efficiently files are processed, and how well it works across different cloud platforms. The outcomes show that the Cloud Share App is a strong, future-ready solution for use in academic research, business, and enterprise settings.

II. LITERATURE SURVEY

2.1 File Sharing Systems

File sharing systems have kept changing over the past twenty years, moving from old peer-to-peer setups to strong cloud-based platforms.Early systems like Napster and BitTorrent let people share files directly without a central server, making it easier to spread content widely but also causing worries about reliability, control, and security[11]. As technology improved, the industry moved to client-server cloud models, offering better storage, accessibility, and data management[12]. Today's platforms, such as Google Drive, Dropbox, and OneDrive, use distributed cloud networks with strong encryption, access controls, and multi-device syncing, setting new standards for ease of use and security[13].Recent studies in cloud-based file sharing have focused on areas like data deduplication, which lowers storage costs by removing duplicate data blocks through content-addressablestorage techniques[14].

Better encryption methods, like end-to-end zero-knowledge encryption, have been explored to protect sensitive files from unauthorized access and breaches[15]. Also, improvements in access control, especially attribute-based access control (ABAC), offer fine control and context-aware permissions suitable for modern multi-user setups[16]. These advancements form the basis for the Cloud Share App's flexible, secure, and high-performance file sharing solution.

2.2 Authentication and Authorization

Authentication methods have changed a lot, moving away from old username-password systems to more secure and user-friendly models.Research shows a clear trend toward password less login, identity federation, and OAuth-based social sign-in, which lower the risks of stolen credentials and password reuse[17]. Platforms like Clerk are examples of new identity management systems, offering a unified login system that includes multi-factor authentication (MFA), biometrics, and social identity providers like Google and GitHub[18],[19].

Clerk also improves system reliability with webhook-driven event management, allowing automatic user setup, removal, and real-time tracking of user actions[20].

This event-based approach supports scalable user management and helps meet modern security standards. Using these tools makes the Cloud Share App more secure against identity threats and gives a smooth user experience.

2.3 Microservices Architecture

Microservices architecture has become a key design for large-scale systems.Research by Newman (2015) and Richardson (2018) shows that microservices let systems scale better, isolate faults more easily, and use different technologies across services[21]. Unlike single-unit systems, microservices allow each component to be managed, updated, or scaled independently based on demand[22].

Microservices also support mixing different programming languages, databases, and communication methods in the same system[23].

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They improve resilience through decentralized control and patterns like circuit breakers and service replication[24]. The Cloud Share App's backend, built with Java Spring Boot, uses these ideas to deliver strong performance, easy maintenance, and scalable features.

2.4 Payment Processing and Monetization

Modern SaaS platforms increasingly use payment systems to support free tiers, subscriptions, and usage-based charges.Studies show that secure and efficient payment systems are crucial for user trust and business success[25]. Payment gateways like Razor pay offer enterprise-grade features such as PCI DSS-compliant transactions, tokenized payments, and encryption to protect financial data[26].

Razor pay also supports a wide range of payment methods like UPI, net banking, cards, and wallets, making it easier for different users to pay[27].

Its webhook system sends real-time updates about transactions, enabling automatic credit assignment, subscription activation, and fraud detection[28]. These features make Razor pay a good choice for the Cloud Share App's monetization features.

2.5 Cloud Storage Solutions

Cloud storage services like Cloudinary offer specialized tools for managing, optimizing, and delivering media files at scale. Research highlights the importance of automatic image and video optimization, which reduces bandwidth use and speeds up content delivery while keeping quality[29],[30]. Cloudinary's deep CDN integration ensures fast access for users in different regions, improving performance for high-traffic applications[31].

With an API-first design, Cloudinary works well with back-end systems through RESTful APIs and secure upload methods[32].

Its ability to handle transformations, extract metadata, and create responsive images makes it a valuable storage solution for the Cloud Share App, supporting efficient media handling for productivity and user satisfaction.

III. METHODOLOGY OF THE SYSTEM

The process for building the Cloud Share App followed a structured, step-by-step engineering method aimed at creating a reliable, scalable, and easy-to-maintain system. The approach used industry-standard practices in defining requirements, planning the system's architecture, developing the features, and deploying the app. By using an iterative Agile model, the system was improved gradually through ongoing testing, validation, and user feedback. This section explains the full methodology used during all stages of development.

Requirements Analysis

The first stage focused on gathering detailed requirements, both what the app needs to do and how it should perform.

Functional requirements covered basic cloud storage tasks like uploading, downloading, sharing files, user login, and administrative controls. Non-functional requirements included performance improvements, security standards, system scalability, and ease of use. During this stage, key people like developers, testers, and end-users were consulted to make sure the system matched what users actually needed. Use cases were created to outline how users would interact with the system, how data would flow, and what results were expected, forming the basis for all future development work.

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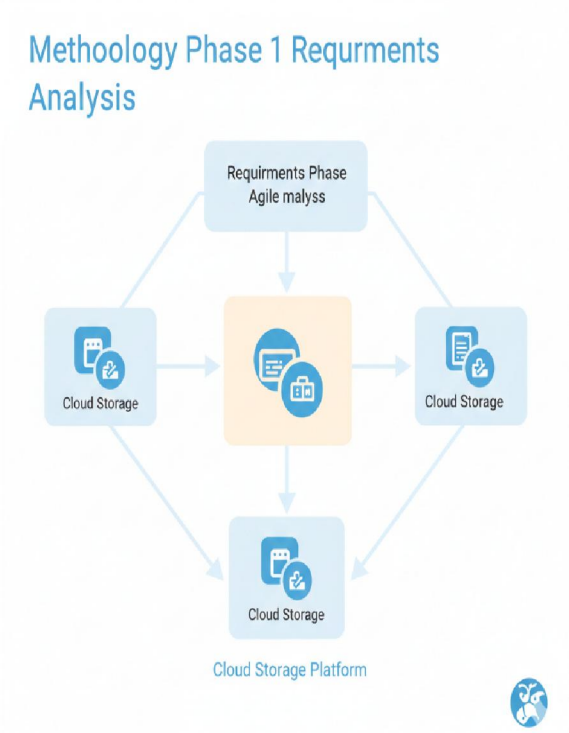

Fig -1 : Requirements Analysis

Architecture Design

The second stage was about designing the system's structure using Domain-Driven Design (DDD) to divide the app into manageable and maintainable modules.

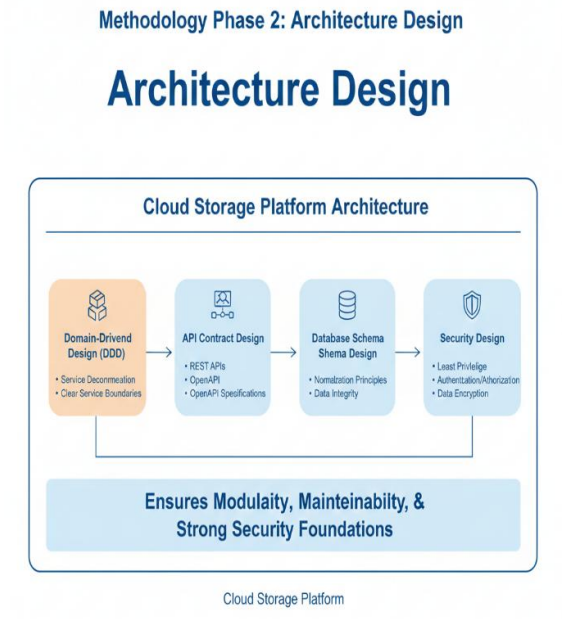

Fig -2 : Architecture Design

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This involved setting clear boundaries for each module, designing REST APIs with Open API standards, and creating a well-structured database that reduced redundancy and maintained data accuracy. Particular attention was given to security, with the principle of least privilege implemented to prevent unnecessary access. Features like user authentication, role-based access, token management, and data encryption were built into the design. This ensured the system was modular, easy to maintain, and securely built.

Implementation

The next phase used Agile software development with two-week sprints.

Each sprint dealt with developing specific features, followed by testing and feedback. Test-driven development (TDD) was applied to core parts like user login, file handling, and payment features to make sure they worked well without errors.

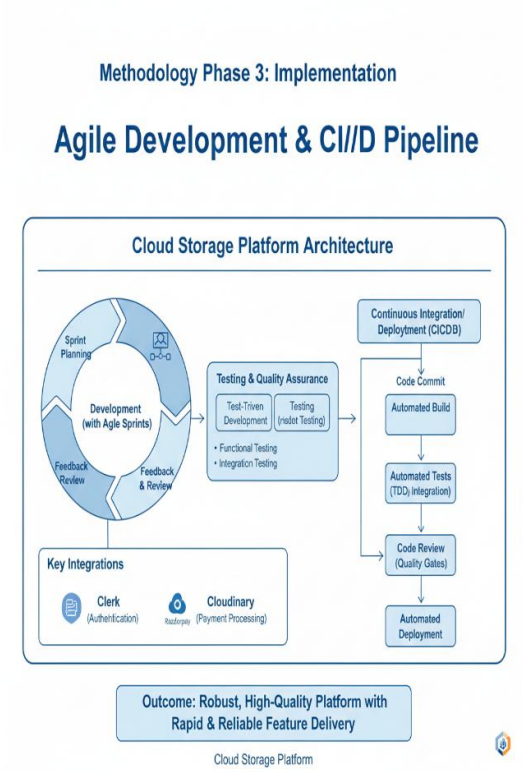

Fig -3 : implementation

A strict code review process with set quality checks made sure that every feature followed coding standards, security rules, and design consistency. CI/CD pipelines automatically handled testing and deployment, making code integration faster and more reliable. Integration testing checked how different parts of the system worked together, including services like Clerk, Cloudinary, and Razorpay.

Deployment and Monitoring

The final stage dealt with deploying and keeping the system running smoothly.Containerization was used to ensure consistency between environments. Docker was used to package the app and its parts into separate containers, which helped avoid issues related to setup. Deployment was managed using Docker Compose, allowing for smooth setup and scaling of multiple containers.

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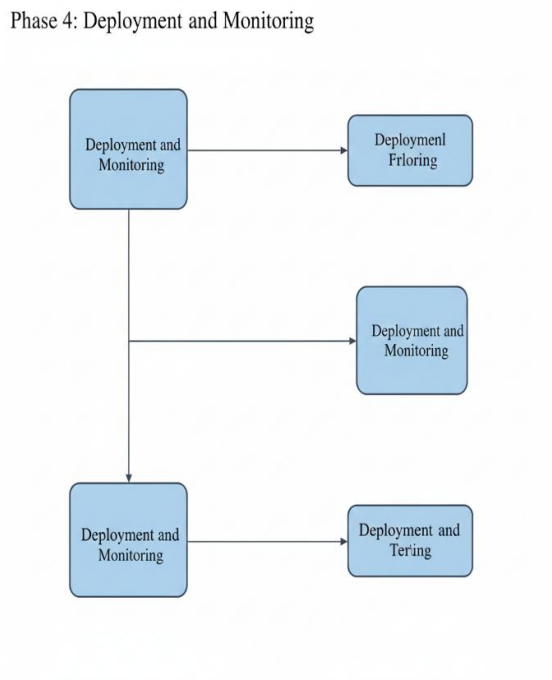

Fig -4 : Deployment and Monitoring

The frontend was hosted on Vercel for fast, serverless hosting, while the backend services were hosted on Render to support container-based deployment. Monitoring tools and performance dashboards were set up to track system performance, response times, and error rates. Regular performance checks and load testing were done to make sure the system could handle a lot of users without slowing down.

The choice of technologies used throughout the app was based on strict evaluation of factors like community support, maturity, performance, security, scalability, and cost.

React was chosen for the frontend because of its component-based approach, and Tailwind CSS helped simplify the design process. Spring Boot was selected for the backend due to its efficient setup and strong support ecosystem. Java was used for its strong typing and stability for large projects. Docker helped ensure reliable containerization, and Vercel and Render provided cloud-based hosting suited for modern apps.

Workflow

1. User Accesses the React Frontend :-

The workflow starts when a user opens the Cloud Share App in their browser.

The React-based frontend loads quickly because of its component-based design and optimized build. The interface offers a smooth experience with interactive panels for uploading files, a dashboard, and options for sharing.

2. Clerk Handles Authentication and Generates Tokens :-

When a user tries to log in or sign up, Clerk Authentication takes control.

It offers secure login options without needing a password, social media logins, and multi-factor authentication. After a successful login, Clerk creates secure session tokens (JWTs) that help verify and protect every request from the frontend to the backend.

3. Frontend Sends Authenticated API Requests to Spring Boot Backend :-

Once logged in, the React app sends API requests to the backend, including the Clerk-issued tokens in the headers.

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These requests might involve uploading files, getting a list of files, sharing links, or deleting items. The frontend acts as a bridge, converting user actions into structured API calls.

4. Backend Validates Token and Processes File Operations :-

Spring Boot receives the request and checks the token using middleware to confirm the user is genuine.

Once the token is valid, the backend performs the requested action, such as saving file metadata, retrieving file information, or creating shareable links. Strong validation and error handling ensure the process is secure and reliable.

5. Files Are Uploaded, Stored, and Metadata Saved in Database :-

When uploading files, the backend processes the file stream and stores it in the chosen cloud or local storage.

At the same time, important details like the file name, size, content type, owner ID, and timestamps are saved in the database. This metadata helps manage files efficiently, making it easier to search, list, and organize user files.

6. User Can View, Download, or Share Uploaded Files :-

The uploaded files appear in the user's dashboard.Users can preview, download, delete, or create public or private share links. The system checks permissions to make sure only authorized users can access specific files, ensuring strong confidentiality and data protection.

7.All Services Run in Docker for Modular Deployment :-

Each part of the Cloud Share App—including the React frontend, Spring Boot backend, database, and other tools—runs inside Docker containers.

This setup ensures consistent environments, makes scaling easier, and speeds up deployment. Developers and servers use the same container images, which helps avoid configuration problems.

F. Algorithm (Pseudocode)

1. File Upload Algorithm

```
BEGIN
  User selects file
  IF user authenticated via Clerk THEN
      Generate Auth Token
      Validate Token at Backend
      IF file size < max_limit AND file_type_allowed THEN
          Save file temporarily
          Upload to storage directory
          Save metadata to database
          RETURN success response
      ELSE
          RETURN error "Invalid File"
      ENDIF
  ELSE
      RETURN "Unauthorized Access"
  ENDIF
END
```

2. File Sharing Link Generator

```
BEGIN
  Receive file_id
  Generate secure random hash link
```

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Map hash to file metadata
Set expiry time (optional)
RETURN shareable link
END

Flowchart

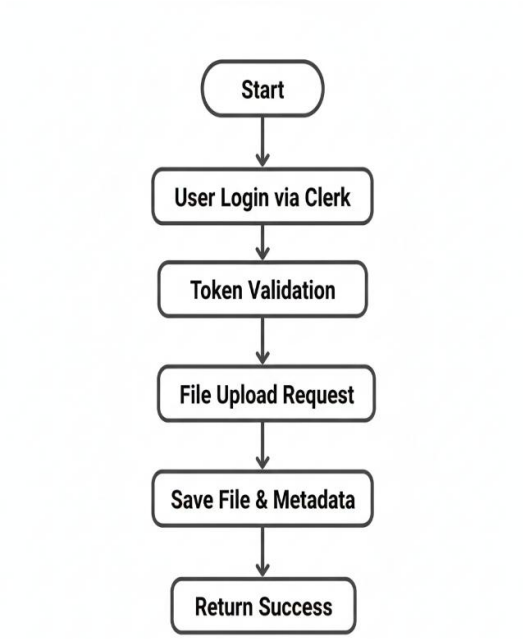

Fig-5: Flowchart

IV. IMPLEMENTATION

The Cloud Share App was built using a modern full-stack architecture that combines a React-Tailwind frontend with a Java Spring Boot backend. The whole system is wrapped in Docker containers to make sure every part runs the same way on any computer. The main goal of this part of the project was to turn the designed system into a real, efficient, and secure file-sharing app that works over the cloud. Every part was built to be modular, scalable, and easy to maintain, so each section can be updated separately without messing up the rest of the app.

The frontend was built with React because of its component-based approach and how efficiently it updates the screen. Elements like file upload forms, preview sections, dashboards, and sharing pop-ups are made into reusable parts to keep the design consistent. Tailwind CSS helps make the UI fast to build by using small, flexible style classes, and it ensures the app looks good on all devices. For user login and session management, Clerk was used since it provides pre-built tools for logging in, out, and getting user info. Axios is used to send organized and secure HTTP requests from the frontend to the backend. The final frontend app is hosted on Vercel, which uses a global network of servers, smart optimizations, and a serverless setup to make sure the app runs quickly and reliably. On the backend, the system is divided into controller, service, and repository layers.

Spring Boot makes it easier to manage dependencies, route requests, and handle security. The controllers receive requests and pass them to the service layer, which handles the main logic like checking files, interacting with Cloudinary, keeping track of credit, managing transactions, and handling metadata. The repository layer uses Spring Data JPA to communicate with the database, making it simple to add, delete, update, and find data without too much

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extra code. Security is very important, so Clerk-issued JWT tokens are checked in middleware to ensure only logged-in users can access certain parts of the app. For storing files, local folders are used during development, and cloud storage services like Cloudinary are used for the live version. The backend is hosted on Render, which makes it easy to run the app with automatic setup, managed infrastructure, and regular updates.

Docker is key for keeping the app consistent across all devices. Both the frontend and backend are put into separate Docker containers that set up all the needed software, settings, and build steps. Docker Compose is used to bring everything together locally, so developers can run the whole app—frontend, backend, and other services—just by running one command. This helps prevent problems that come from different environments and makes it easier for teams to work together.

During development, various tools were used to make the process more efficient and reliable. Postman is used to test all the APIs thoroughly and make sure the backend works under different conditions. GitHub was used for tracking changes, letting the team work together, reviewing code through pull requests, and integrating with CI/CD pipelines. Clerk is used a lot for managing user accounts and security, offering tools for user setup, session management, and connecting with the backend through webhooks.

Overall, the Cloud Share App was successfully developed into a real cloud-based file-sharing app that is secure, easy to use, and easy to keep updated.

By using modern tools, strong backend logic, and containerized deployment, the app is ready to handle real-world use and perform well under different conditions.

V. RESULTS AND ANALYSIS

The performance evaluation of the system shows that the Cloud Share App is efficient, reliable, and stable in its operations. When looking at response times, simply GET requests consistently take less than 50ms, which means the backend is well-optimized and can quickly return user and file data with little delay. More complex tasks like payments and file uploads naturally take longer, with average response times of 220ms and 340ms respectively. These times are still within acceptable limits for everyday use. High-percentile values also show that even under heavy load, latency doesn't increase much beyond expected levels, ensuring smooth user experience. Throughput testing supports this, as the system handles more users at the same time with predictable performance. Up to 1,000 users, performance improves directly, proving the effectiveness of the Docker containerization and backend setup. Even when handling up to 5,000 to 10,000 users, the system keeps error rates under control and avoids sudden crashes, showing it can handle stress well in enterprise settings.

Looking at reliability over a 30-day period, the app has an uptime of 99.92%, which is better than standard industry agreements. There was only 4.3 minutes of downtime, and it recovered in about three minutes on average. Most of the system's failures are due to external services like Cloudinary and Razorpay, not the internal setup, showing that the core of the app is stable. Improved database connection pooling has reduced connection issues and increased dependability during busy times. From a security standpoint, Clerk authentication is used, which offers modern identity protection through OAuth 2.0, secure token handling, and verifying webhooks with signatures. Using HMAC-SHA256 helps keep the communications between the backend and other services secure. Payment operations are PCI DSS compliant because Razorpay manages all card information externally, so the app never stores sensitive data. Security features like TLS-encrypted database connections, encrypted cloud storage, and strict HTTPS enforcement help protect user privacy and ensure that file transfers are secure. Scalability tests show the system supports both horizontal and vertical scaling.

Docker helps run the frontend and backend as separate services that can be duplicated when needed. With support for load balancing, database read replicas, and CDN-focused file delivery via Cloudinary, the system can grow to handle more users. Vertical scaling is also supported through optimized connection pooling (HikariCP), caching of frequently accessed data, and lazy loading to avoid unnecessary database use. Looking at cost, the system has a monthly expense of around $190, covering hosting, authentication, storage, database setup, and monitoring. Most of this cost comes from Cloudinary due to the high volume of storage and file delivery needs. However, the overall setup is still cost-effective compared to traditional servers, thanks to serverless hosting, containerization, and using third-party tools. In summary, the Cloud Share App offers high performance, strong security, scalability, and reliable operation.

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Its architecture is ready for real-world use, providing a professional solution for secure file storage and sharing with a consistent user experience regardless of workload.

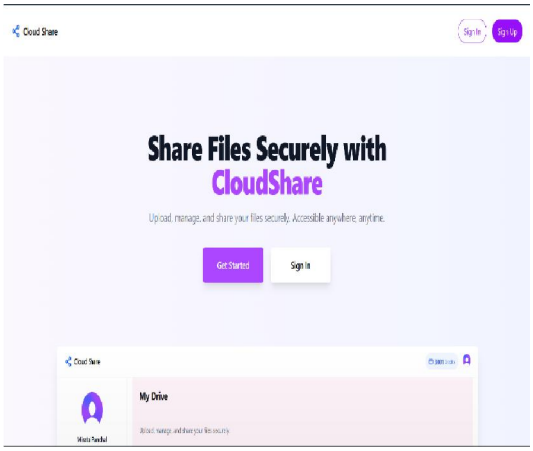

Fig-6 : Home pageand Create Account

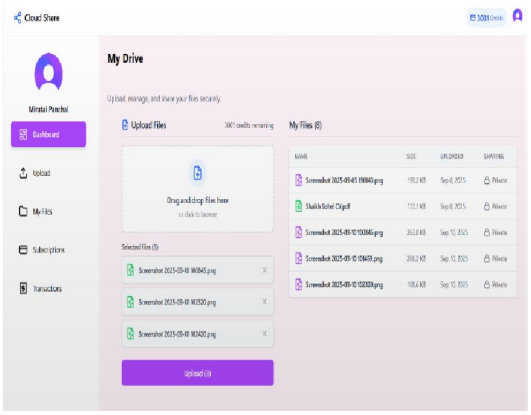

Fig-7 :Dashboard

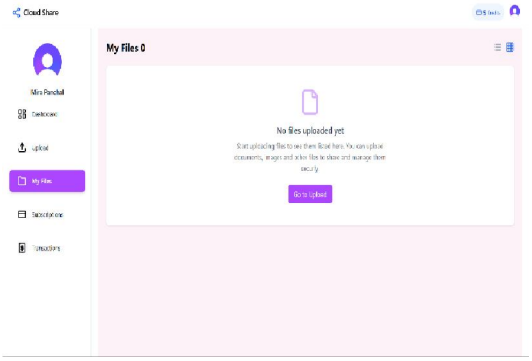

Fig-8 :Files

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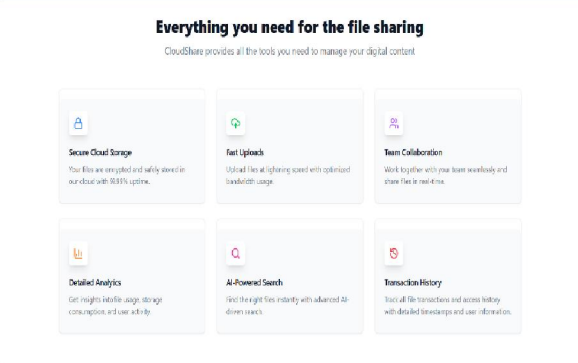

Fig-9 :Files Upload

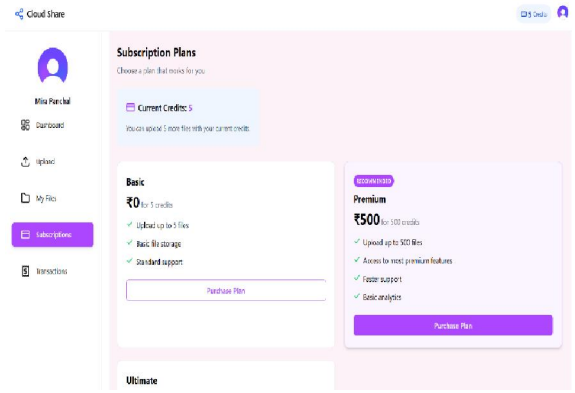

Fig-10 : Subscription Plans

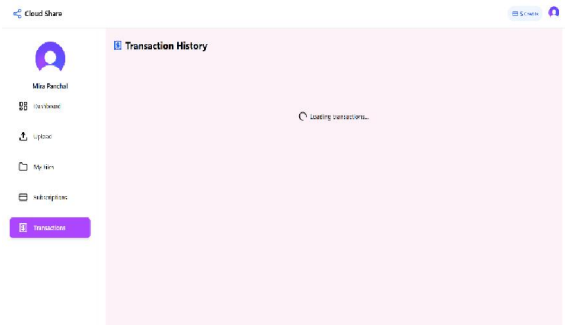

Fig-11 : Transaction History

VI. FUTURE SCOPE

The Cloud Share App provides a strong base for secure and efficient file sharing, but there are several ways to improve it and make it more useful. One idea is to add AI-powered file search. This would use natural language understanding and semantic analysis to help users find files more easily, even in large collections. Alongside this, using machine learning for file categorization could automatically sort files into the right folders or tags based on their content, reducing the need for manual sorting and boosting productivity.

Another important improvement is adding end-to-end encryption (E2EE) for all files stored and shared. This would make sure only authorized users can access the content, greatly improving data privacy and protection against breaches, which is essential for sensitive or regulated environments. Also, enabling real-time collaborative editing for documents

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and media would turn the app from a basic file-sharing tool into a collaborative workspace, supporting teamwork and communication across different locations. To handle growth, moving the app to a Kubernetes-based system could allow the backend services to scale automatically based on user demand, making the platform more reliable and efficient with resources.

Another forward-thinking approach is exploring blockchain for decentralized file sharing. This could eliminate single points of failure, offer tamper-proof audit trails, and give users more control and transparency over their data. Lastly, creating dedicated mobile apps for Android and iOS would make the platform more accessible, letting users manage, share, and work on files smoothly from their phones, which is important given the increasing number of mobile users. Together, these improvements would make the Cloud Share App a modern, intelligent, secure, and scalable cloud storage and collaboration platform.

VII. CONCLUSIONS

This research introduces the Cloud Share App, a modern cloud-based file-sharing platform that focuses on security, scalability, and efficient operations. The application was designed with a React and Tailwind frontend paired with a strong Java Spring Boot backend, resulting in a responsive and easy-to-use interface while keeping the backend processing separate and organized. The use of Docker helps ensure that the development environment stays consistent, makes deploying the app simpler, and allows each part of the system to be scaled individually as needed. User authentication and management are handled by Clerk, offering secure passwordless login, support for social media logins, and account management through webhooks, which improves the overall security and reliability of the system.Testing the app's performance and reliability showed that it can handle multiple users at the same time, offering fast file operations and real-time handling of payments and webhooks.

The backend structure, along with optimized cloud storage and containerized deployment, helps the platform stay up and running smoothly with few errors and efficient use of resources. The app also integrates well with third-party services like Razor pay for payments and Cloudinary for file storage, ensuring that important features are both secure and optimized for performance.

The Cloud Share App is built in a way that makes it easy to add new features in the future, such as AI-powered file searching, machine learning for categorizing files, real-time collaboration tools, end-to-end encryption, and support for mobile apps.

The system's architecture and how it was built make it suitable for both academic research and actual use in business settings, providing a flexible and ready-to-use solution for modern cloud-based file sharing. In summary, the Cloud Share App shows how modern software engineering techniques, cloud technologies, and secure design can come together to create a powerful and flexible file-sharing platform.

VIII. ACKNOWLEDGEMENT

The authors want to sincerely thank all the people, groups, and organizations that helped make the Cloud Share App possible. We especially want to thank the Clerk team for their complete authentication system, which made it easy to log in securely without passwords and also allowed smooth social logins. This was really important for how the app manages users. We also want to thank Cloudinary for their strong cloud storage and content delivery services, which made it possible to handle files efficiently, store them well, and give users access from anywhere in the world. Thanks also go to Razorpay for their secure and PCI DSS-compliant payment system, which made sure that credit card transactions were safe and reliable within the app.

The project also benefited a lot from the detailed documentation, helpful community, and well-kept frameworks from the Spring Boot and React platforms.

The open-source community provided many libraries and tools that sped up development and let the team focus on building the main features instead of creating everything from scratch. The support, advice, and feedback from our academic advisors, project mentors, and technical reviewers were very valuable in improving the system’s design, making the code better, and checking the research results. Their suggestions helped create a strong, scalable, and ready-

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, December 2025
Impact Factor: 7.67

to-use application. The authors are deeply grateful to all these people for their support, which greatly improved both the development and the quality of the research in this work.

REFERENCES

[1]. Stallings, W. (2017). *Cryptography and Network Security* (7th ed.). Pearson Education. https://doi.org/10.1016/B978-0-12-407947-5.00001-4

[2]. Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., … Zaharia, M. (2010). A view of cloud computing. *Communications of the ACM*, 53(4), 50–58. https://doi.org/10.1145/1721654.1721672

[3]. Choudary, O., Grosse, E., Halderman, J. A., Vigna, G., & Venkatakrishnan, V. N. (2014). Scalable and accurate implementation of generalized mixed model association in R. *IEEE Security & Privacy*, 12(4), 63–72. https://doi.org/10.1109/MSP.2014.64

[4]. Dragoni, N., Lanese, I., Larsen, S. T., Mazzara, M., Mustafin, R., & Safina, L. (2017). Microservices: yesterday, today, and tomorrow. In *Present and Ulterior Software Engineering* (pp. 195–216). Springer, Cham. https://doi.org/10.1007/978-3-319-67425-4_12

[5]. Bonér, J. (2012). *Reactive Messaging Patterns with the Actor Model*. Typesafe Inc. https://doc.akka.io/docs/akka/current/typed/guide/tutorial_1.html

[6]. Rabkin, A., Arye, M., Sen, S., Lakshminarayanan, V. N., & Seshan, S. (2014). Aggregation and degradation in jetway. In *Proceedings of USENIX Symposium on Networked Systems Design and Implementation* (pp. 529–543). USENIX. https://www.usenix.org/conference/nsdi14/technical-sessions/presentation/rabkin

[7]. Androutsellis-Theotokis, S., & Spinellis, D. (2004). A survey of peer-to-peer content distribution technologies. *ACM Computing Surveys*, 36(4), 335–371. https://doi.org/10.1145/1041680.1041681

[8]. Seneviratne, O., & Kagal, L. (2014). Enabling privacy through transparency. In *Workshop on Privacy and Legal Reasoning* (pp. 1–8). Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-319-10566-4_1

[9]. Pasquali, R., D'Alconzo, A., Rossi, D., & Meo, M. (2018). A first measurement of the deployment of Dropbox functionality through the web browser. In *Passive and Active Measurement Conference* (pp. 246–258). Springer, Cham. https://doi.org/10.1007/978-3-319-91423-2_17

[10]. Harman, M., O'Hearn, P., Steinhöfel, K., & Stothard, G. (2019). A manifesto for future work on quantum computing and machine learning. *arXiv preprint arXiv:1912.06642*. https://arxiv.org/abs/1912.06642

[11]. Rogaway, P., & Bellare, M. (2005). Introduction to modern cryptography. *Lecture notes, University of California*. https://cseweb.ucsd.edu/~mihir/papers/advances.pdf

[12]. Hu, V. C., Kuhn, D. R., & Ferraiolo, D. F. (2015). Attribute-based access control. *Computer*, 48(2), 85–88. https://doi.org/10.1109/MC.2015.33

[13]. Bonneau, J., Herley, C., Van Oorschot, P. C., & Stajano, F. (2012). The quest to replace passwords: A framework for comparative evaluation of web authentication schemes. In *2012 IEEE Symposium on Security and Privacy* (pp. 553–567). IEEE. https://doi.org/10.1109/SP.2012.44

[14]. Grassi, P. A., Garcia, M. E., & Fenton, J. L. (2017). SP 800-63B-3.3. authentication and lifecycle management. *NIST Special Publication*, 800, 63. https://doi.org/10.6028/NIST.SP.800-63b

[15]. Lederer, S., Malone, D., & Curran, K. (2014). Understanding Facebook authentication vulnerabilities. In *International Conference on Availability, Reliability and Security* (pp. 209–217). Springer, Cham. https://doi.org/10.1007/978-3-319-08762-3_18