BASED ON MINIO CLOUD DRIVE APPLICATION DESIGN AND DEVELIOPMENT

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# ABSTRACT

OpenEMR is among the most popular open-source electronic health record and medical practice management solutions. It features fully integrated electronic health records, practice management, scheduling, electronic billing, internationalization, free support, and a vibrant community. It can run on Windows, Linux, Mac OS X, and many other platforms. Mobile application development is a fast-growing industry. As the number of mobiles and smartphones increases day by day, businesses are developing innovative mobile apps to attract their target customers. Using a mobile app to reach customers is ideally suited as it can easily keep the audience engaged and interested when using mobile apps. This report explains the design and development of a cross-platform mobile application for an E-Health patient using the OpenEMR 6.0.0 patient portal.

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# INTRODUCTION

## 1.1 Background and Significance of the Study

In the contemporary era of rapid development of information technology, data, and information have become the blood of social operation. How to store and access these data efficiently and securely has become an important driving force for technological progress. Cloud storage service, as one of the solutions, is rapidly gaining popularity among individual and enterprise users with its unique advantages. In particular, open-source cloud storage solutions, such as Minio, provide users with customized service options to adapt to changing storage needs and challenges. Focusing on the application of open-source cloud storage services, this study explores the design and implementation of a cloud disk application based on Minio, aiming to provide users with a data storage option with high performance, high reliability, and easy management.

## 1.2 The Need for Research

Although there are many cloud disk services on the market today, they are often one-size-fits-all solutions that lack sufficient flexibility to meet the individual needs of specific user groups. For example, enterprise users may need to deploy cloud services in their internal network environment to ensure data privacy and security; research institutions may need customized data analysis tools combined with storage solutions; and individual users may seek more efficient data synchronization and backup functions. Existing cloud drive offerings often fail to provide adequate customization support in these areas.

In addition, many cloud disk services have limitations in terms of data sovereignty, with users' control over their own data restricted by the service provider's policies and technical architecture. Due to the ever-changing laws and regulations and the increasing demand for data sovereignty from enterprises and individuals, autonomous and controllable cloud disk services have become an inevitable trend. Based on these real-world needs, the development of a Minio-based autonomous cloud disk application not only provides customized services but also improves the flexibility and efficiency of data processing while ensuring data sovereignty and security.

## 1.3 Research Content and Objectives

The main goal of this thesis is to develop a web disk application that integrates the functions of disconnected transfer, file encryption, user management, and so on. The research covers the whole process from requirement analysis, system design, and interface implementation to functional testing. The back-end development of the system will be in Java and use the Spring Boot framework to improve development efficiency and simplify the deployment process. The front-end interface will be realized by the Vue.js framework to ensure the responsiveness and interactivity of the user interface. This research will also delve into the implementation of the breakpoint transfer technology and how to effectively manage files and user data in an online disk application to provide a secure data transfer and storage solution.

## 1.4 Research Methodology and Technical Route

Object Storage Service (OSS) is a massive, secure, low-cost, and highly reliable cloud storage service suitable for storing any type of files. Capacity and processing capacity are elastically expandable, and multiple storage types are available for selection, fully optimizing storage costs.AliCloud Object Storage OSS (Object Storage Service) is a massive, secure, low-cost, highly persistent cloud storage service provided by AliCloud. Its data is designed to be no less than 99.999999999999% (12 9s) persistent, and service availability (or business continuity) is no less than 99.995%.

MinIO is an object storage service based on the Apache License v2.0 open-source agreement. It is compatible with Amazon S3 cloud storage service interface, ideal for storing large-capacity unstructured data, such as images, videos, log files, backup data and containers/virtual machine images, etc., and an object file can be any size, from a few kilobytes to a maximum of 5T ranging.MinIO is a very lightweight service that can be easily integrated with other applications, such as NodeJS, Redis, or MySQL. For small and medium-sized enterprises, Minio is a good choice if you don't want to go to the cloud for storage. Minio can be used directly as object storage, but also as a gateway layer for object storage services on the cloud, seamlessly connecting to Amazon S3, and MicroSoft Azure.

In order to realize the research objectives, this paper adopts the method of combining theoretical research and empirical analysis. Firstly, a literature review is conducted to analyze the current state of development of cloud storage technology and netbook applications and determine the entry point of the research. Subsequently, the system functions are determined through requirement analysis, and the system architecture is designed based on the characteristics of Minio. In the implementation phase, this research will follow the agile development principle to iteratively complete the development and integration of each functional module. System testing will cover unit testing, integration testing, and performance testing to ensure the stability and reliability of the application.

## 1.5 Organization of the paper

This paper is organized as follows: chapter 1 introduces the background of the research, the need for the research, the content and objectives, and the research methodology. Chapter 2 overviews the related technologies and theoretical foundations, including cloud storage technologies, features of Minio, and the technology stack used for development. Chapter 3 analyzes the requirement points in detail. Chapter 4 discusses system design in detail, including architecture design, functional planning, interface definition, and data model. Chapter 5 shows the system implementation process, including development environment setup, code writing, functional implementation, and interface design. Chapter 6 conducts system testing, analyzes the test results, and evaluates the system performance. The last chapter summarizes the whole paper and presents an outlook on the future research direction.

# RELATED WORK

# REQUIREMENTS

# DESIGN

# IMPLEMENTATION

# EVALUATION

# CONCLUSION

# REFERENCES