

Software Requirements Specification

Project: CloudPi

CLOUD BASED STORAGE PLATFORM USING RASPBERRY PI

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PROBLEM STATEMENT

- Problem or challenge

Users may be concerned about the security and privacy of their files when using third-party storage solutions. Moreover remote access and sharing is needed for them.

- The context

Users finds it very difficult to trust their confidential data with a third party cloud

- The impact

A huge risk of data breaches and cyber security issues

PROBLEM STATEMENT

- The proposed solution:

The proposed solution is to create a web-based platform, Cloud Pi, that allows users to store, access, and manage their files securely and efficiently on a Raspberry Pi device remotely connected.

- The expected outcome:

A functional web application that allows users to upload files and have them automatically transferred to a remote Raspberry Pi storage device using a Python script.

OBJECTIVES

- File storage and sharing
- Remote access and control
- Security (encryption)
- Web application development
- Raspberry Pi integration
- User authentication and authorization

LITERATURE REVIEW

Research Paper	Inference
Preventing Pollution Attacks in Cloud Storages, Aswin Viswas V, Philip Samuel, 2018	<ul style="list-style-type: none">• Utilizing remote storage to store information has numerous advantages including accessibility and operational costs.• Although the security of such information is still one of the major concerns for the clients.
Secure distributed adaptive bin packing algorithm for cloud storage Irfan Mohiuddin, Ahmad Almogren, Mohammed Al Qurishi, Mohammad Mehedi Hassan, Giancarlo Fortino, Ihab Al Rassan 2018	<ul style="list-style-type: none">• Provides highly scalable and flexible computing and storage resources through a pay-as-you-go strategy.• They are becoming more and more popular, and many companies are now moving their data from internal data centers to cloud storage providers.• The ever-growing user base and storage space for remote data management will bring problems such as low resource efficiency and internal threats to static data in cloud storage.
An integrity verification scheme of cloud storage for internet-of-things mobile terminal devices , Xiuqing Lu, Zhenkuan Pan, Hequn Xian,2019.	<ul style="list-style-type: none">• Since mobile cloud computing has many advantages, such as mass storage, low cost, and scalability, most data owners store their data on cloud servers to share• It exposes you to many security issues, such as data integrity.• More and more test programs have been proposed to verify the integrity of the data

STAKEHOLDERS

If our cloud based storage using Raspberry Pi were to be launched out in the software market, the potential stakeholders would be :

- Customers
 - Software Professionals
 - Professors
 - Accounting Staff
 - Medical, etc
- Employees

Individuals working for a company who help the market and support the company

- Competitors

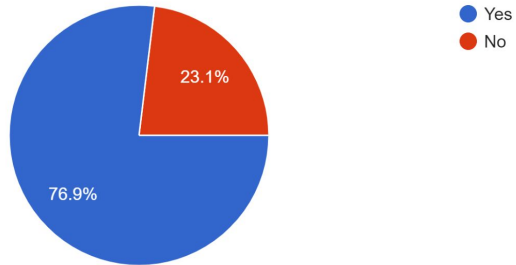
Other companies offering similar cloud storage solutions - NextCloud, Sync.com etc.

SURVEY STAKEHOLDER ANALYSIS

This is a survey conducted by our group to get to know what users prefer in terms of file storage.

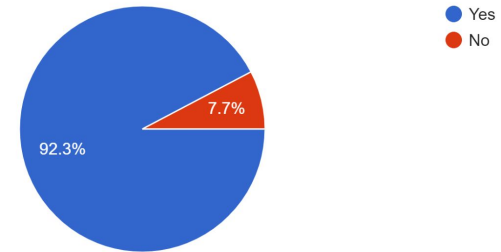
Do you frown upon the fact that you have to spend money for more cloud storage?

13 responses



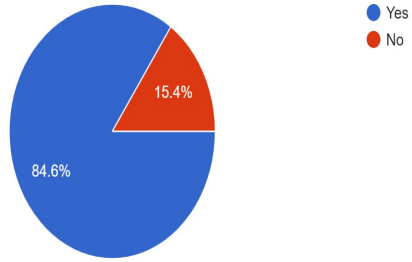
Do you have trouble storing large sized files on your device?

13 responses



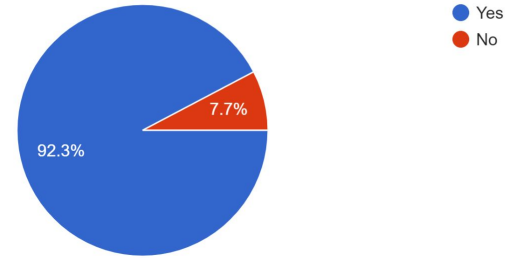
Would you prefer a more personalised cloud storage software over the one you are currently using?

13 responses



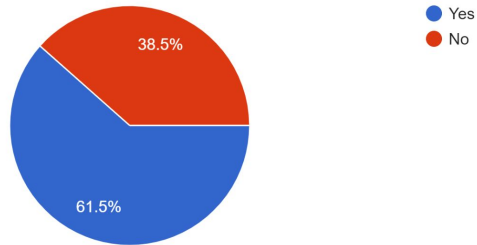
Have you ever wished you could remotely access and download files physically stored on your devices?

13 responses



Have you ever worried about how secure your files would be when you use a third party for cloud storage?

13 responses



MOTIVATION

- Increasing demand for file sharing and collaboration in remote work environments.
- Providing a secure and reliable platform for file sharing and storage.
- The need for a cost-effective and scalable solution for storing and managing files.
- The opportunity to develop skills in web development, cloud computing, and network security.

ASSUMPTIONS

1. Users have access to a web browser and an internet connection to use the application.
2. Users have basic knowledge of how to upload and delete files.
3. The remote storage system is available and accessible to the application.
4. The Raspberry Pi is properly set up and configured to receive and process the uploaded files.
5. The uploaded files will not exceed the available storage capacity of the remote storage system or the Raspberry Pi.

DEPENDENCIES

1. The application relies on the Django web framework and its built-in functionality for handling file uploads and forms.
2. The Raspberry Pi must have the necessary software and libraries installed to process the uploaded files.
3. The application may depend on third-party packages or modules for specific features or functionality.

TECHNICAL REQUIREMENTS

- Django framework
- Raspberry Pi with Raspbian OS
- Internet connection with sufficient bandwidth to handle file transfers
- Web server (e.g., Apache, Nginx) to serve Django web application
- Access control mechanisms to secure file uploads and downloads

FUNCTIONAL REQUIREMENTS

User registration and login	he system should allow users to create an account, log in, and log out of the system.
File upload	Users should be able to upload files to the system, including specifying a name and description for each file.
File retrieval	Users should be able to view and download files that they have previously uploaded.
File deletion	Users should be able to delete files that they have previously uploaded.
Search	The system should allow users to search for files based on their name or description.

NON FUNCTIONAL REQUIREMENTS

Performance Requirements

- File transfers should be fast and reliable, with minimal data loss or corruption.
- The system, also Raspberry Pi, should be able to handle large files and file volumes without performance degradation.

Security

- All user authentication should be done securely to prevent unauthorized access to the system.
- Files and data should be encrypted for maximum security.

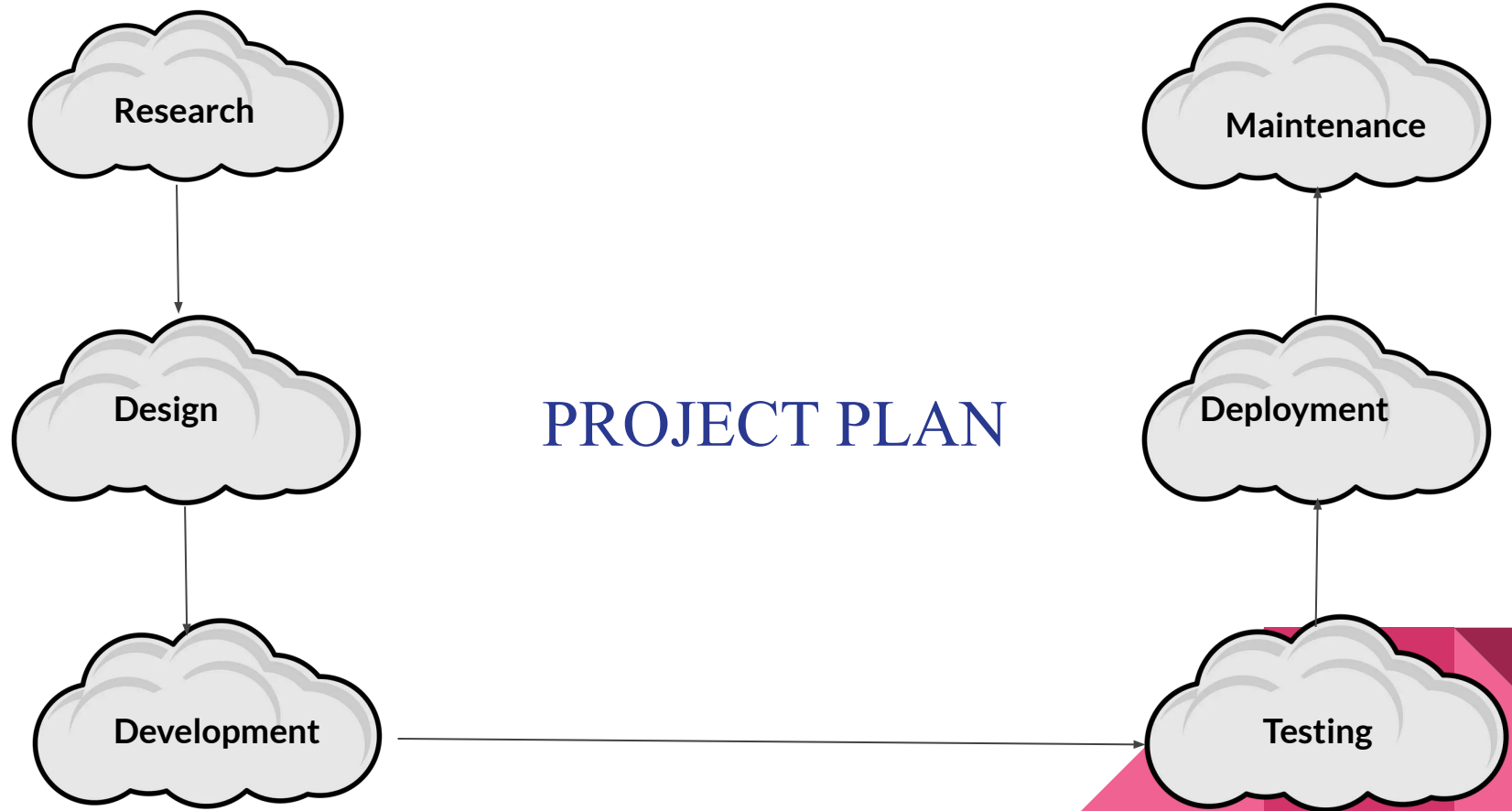
- The system should be protected against malicious attacks and data breaches.

Safety Requirements:

- Authentication : This requires implementing a user authentication system, such as a login page that prompts users to enter a username and password.
- Authorisation
- Encryption: Data stored on the Raspberry Pi should be encrypted to protect against unauthorized access or theft. This requires implementing encryption mechanisms.

SOFTWARE QUALITY ATTRIBUTES

1. Reliability
2. Security
3. Scalability
4. Usability
5. Performance
6. Compatibility
7. Maintainability
8. Portability



CHALLENGES

- Performance : being a low cost single-board computer, it may not have the same performance capabilities as more powerful servers
- Maintenance and support : we will need to provide ongoing maintenance and support to ensure that it remains functional and updated
- Marketing and competition : we will need to develop effective marketing strategies to differentiate our solution from competitors in the market