**CLOUD STORAGE**

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**FACULTY OF SCIENCE AND TECHNOLOGY**

**MODULE: HCSE225 – MINI PROJECT**

**REG: R199147H**

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* 1. Introduction

The need for storage space is exponentially increasing every year. Mobile Applications that used to consume less than 20mb now consume over gigabytes of data, and this increase is being observed both on the client side and the server side. Files are becoming too big for a small company to setup and serve their own storage, and with the global trend of PWA (Progressive Web Applications) which predicts PWA’s will replace mobile applications, the need to implement our own Cloud Storage Service is high more than ever, to provide storage for both the developer and the client.

* 1. Brief background information about the project

As of 2021, the standard for mobile storage is (32gb, 64gb and 128gb). The standard for a mobile phone camera for photo is (48mp back camera, 16gb front camera), with some devices reaching 104mp. The standard for a mobile camera video shoot is (4k 60 fps, UHD 128fps, and HD 250fps).

If we do our math’s correctly you would note that a 4k video at 60fs will consume 2gb of data per minute, meaning our average mobile device can only shoot for 27 minutes RAW, and 135 minutes HEVC.

A RAW 48mp mobile photo consumes on average 58mb and 28mb when compressed. That means you can keep 1928 photos on your average mobile device. And of course, this is based on the event that some of the mobile’s 64gb storage is dedicated to system storage.

Considering the common installed apps on Play Store and Apple Store consume on average 1.7gb application storage and cache, and over 15gb on user files, you can already note that 64gb on a mobile is not enough.

On the other hand, broadband is becoming cheaper in Zimbabwe. In 2011, Econet used to charge US$1 for 10mb of data, but overtime the same amount could buy you 250mb (Econet) and 1gb (Telone ADSL) in 2018. Right now, US$58 can get you 200gb of data (Telone ADSL), and I believe in 2026 this same amount will get you uncapped data.

One thing for sure is that there are very few software companies in Sothern Africa that implement their own storage service, a few big names to mention DSTV and Red-Panda. The rest are using services that include Amazon S3 Buckets, Firebase and Alibaba Cloud. It is just cheaper to use cloud because they take care of everything. Zimbabwean developers also use these services for their applications and it noticeable that the number of developers is going to increase, and right there shows you that cloud storage is going to be a need.

The president recently commissioned the National Data Center in Harare, which is being run by Telone. Currently the two services they are offering are VPN, and Hosted IPX, which does not fully utilize this resource, but the data center is capable of providing more like cloud storage.

1.3 Problem Statement

The problem is very simple, the fast advancement in software as compared to hardware has resulted in the hardware not being able to keep up with the storage needs, hence the need for cloud storage.

1.4 Aim

My aim is to build a public storage service to serve both normal users and developers.

1.5 Objectives

* Setup stacks capable of storing and serving large files to multiple users as efficient as possible with latency in mind.
* Build libraries for .NET, Java, and Python which developers can use to build their applications with our service.
* To build 1 or more client-side applications that use the service.
* To build a web-application for the service.

1.5 Expected results/Contribution and future scope of the project.

* The results should be a paid service that developers and normal users can use to store their files on cloud. Normal users can use the mobile application to sync their files to the cloud, of which these files can also be accessed on the other client software.

As for developers, they can pay for storage. Theirs allows them to setup access control for their applications. Both will have authentication.

* The full-scale application should be able to handle large loads, through distributed systems. Disk mirroring now being implemented as a measure of recovery and to distribute load and should now be able to provide services to the world.

1.6 Delimitations and Limitations of the research

The major limitation I had was that building services like cloud storage or cloud computing is not documented that much on the internet, but ever since I cleared that by figuring out a way before I ought to propose this project and tested it…the limitation has become a delimitation.

However, my method being unique means that is has not been tested if it usable for production. There is no documentation on the possible challenges that could be faced and their fixes. Hence it can only be determined to be robust when implemented in production.

1.7 Significance/Justification of the research

I strongly believe setting up our own cloud storage in Zimbabwe will utilize the Data Center that was commissioned this year. It not only helps people but will also aid startups in as they newly setup….and will motivates the nation into investing in technology, as the idea and implementation are purely Zimbabwean.

1.8 Budget and Timelines

There are no know development costs now as the development is local, except testing and demonstration which I will use the Google cloud, where the cost will be very minimum < 10$.

The project will take 4 months, with each month devoted to each part of the system, except the backend which will take weeks because there is an existing model.

* 1. Backend
  2. Web Application
  3. Mobile Application
  4. Desktop Application

1.9 Conclusion

The backend is already done, and the frontend is no issue.