

Efficient Laptop Rental System : Mobile Application

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Abstract: - In today's competitive world and covid19 pandemic situation, learning skills through a laptop or system has become a basic need for almost every student and employee. But that requirement comes with a cost. A well configured laptop costs a fortune for a middle class family. Net Centers can provide a solution to an extent. Here, the problem comes with inflexible time, location, number and configuration of systems provided. Renting a laptop could be another alternative, but there is no secured platform to allow any user to rent and lend one. To overcome these problems, propose a mobile application called Efficient Laptop Renting System. The basic idea is to create an android application platform to rent and let people lend the laptops on demand online which is available 24/7 removing the constraint of time and location. The added advantage is that renters can get a laptop with customized features and pre-installed software such as java, python, etc. and lenders even after putting device for rent have the right to reject a rent request. A lender can lend more than one device. In order to achieve the key factor security, shared responsibility model is implemented between net centers and users taking advantage of net centers security trait. Biometric authentication is done at the net centers to all the renters and lenders avoiding any discrepancies that may arise

Keywords: Pandemic situation, Android Application, Customized features, 24/7 Availability, Pre installed software, shared responsibility model

Introduction

Basic computer skills and practice of theoretical skills on Personal computer has become a new need for almost every student and employees regardless of their relevance with IT industry. Although desktops and laptops may show equal performances, a report showed that people prefer laptops over desktops and tablets owing to high demand of laptops which in turn took a change on its prices. gigabytekingdom.com states that the average cost a new laptop would be 600\$ to 700\$ which is nearly 40000 to 50000 INR. From the reports released from the government of India, the average salary of a person ranges from 8080 INR to 143000 INR implying that buying a good laptop is still dream to many people in countries like India. Such people approach net centers for system use, but people living in rural areas face the crisis since not many net centers could be present in those areas. Mostly people lend laptops from their acquaintances and use them but not every person have such acquaintances.

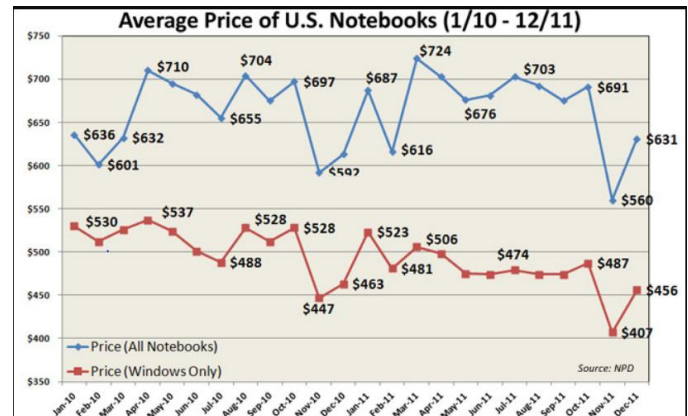


Fig 1: Laptop price

In such cases laptop renting can solve the problem. Not every person need a same configured laptop and not every person need the same software in a laptop so net centers cannot gear up to the customer needs. The present system of rental provides a person a laptop chosen with basic software, but now the expectations have crossed that bar. People find it useful to rent a laptop on demand and with pre installed required software without having to waste their time. The problem is that there is no such platform to cater the needs of the demand. Considering all problems together and putting the solutions to them in one platform gives our android app "Laptop Rental System App". Through his application user can select the laptop of his desired configuration and choose one with his required pre installed software to be delivered at his place and date of his convenience. The users after sign up can put their laptop for rent or rent one. To enable security in the first phase release of the app, the laptops are only delivered to the particular net centers which are near to the customer and net centers take partial responsibility in providing the lender of the laptop with security.

Motivation

Laptop is very basic need for any literate irrespective of their domain. In unfortunate situations like pandemic corona, where no net centers can help in obtaining system services. In such situations a personal laptop can be of a great help, but unfortunately not everyone can afford to buy one. The purpose of developing an Online Laptop Rental System comes from the idea to make everyone to

access a good configured laptop services. This app eases the task of renting a laptop online. Many think of giving laptops for rent to outsiders but due to problems like security since no center of authority is established online. So many people back off lingering in these thoughts. Issues like this can be solved once a structured online interface is established. The project intends on reaching the services to the most remote areas and helping everyone in getting the services.

Objective

This study main objective is to focus on solving societal problems. The objective of this initiative is

- To understand the problems and struggles faced by the rural people and poor literates in obtaining computer services.
- To establish a system of laptop rental services available to each and every person
- To find a simple way in providing an efficient method of renting laptop

Scope

- This is an Android application available to anyone who downloads the app to get the services.
- Any user of this app can rent a laptop as well as put their devices for rent in simple steps guided by the application.

Literature Review

University of Cape Town Laptop Project Report [1]:

The report summarizes the results from a pilot program of handing all the students at University of Cape Town a laptop and its outcome. It shows the advantages for students by the flexibility of laptop, increasing the students productivity and saving time. The results talk about the increased since the students protect their own laptops unlike lab equipment. Since the students do not have to reach out labs for their system requirements, the time wasted on the travelling has been effectively went on to the work. The report also emphasized that the learning capabilities of the students increased. The aftermath survey states that 84% of the students agreed that using a laptop, they can easily find relevant resources online. One more survey about "using a laptop during lectures allows me to better capture all of the information presented", more than 50% students agreed on this note. The poll on "Using a laptop during lectures improves my problem solving skills" 35% percent students agreed and 36% students were uncertain. To the question "Using a laptop during lectures gives me access to more information" more than 85% students agreed. From the report it clearly states the importance of laptops for the students in their daily learning clearly specifying the need of a laptop to all students.

Online Laptop Rental System: the Case of Tsuann Kuen [2]:

This research paper focuses on an online laptop rental system and suppose that this system is designed for TSANN KUEN. They briefly discussed the benefit of rental and find some literature about e-commerce, thus to confirm the business opportunity of laptop rental. This research utilizes INCOME to display the process of laptop rental service and organization chart. Moreover, SQL and ASP.NET are utilized to build a website. By using this service, businessmen can rent laptop when they are a business trip and travelers can also rent laptop to search local information. Without this heavy burden, people can maximize their luggage space. Moreover, the laptop retailers such as TSANN KUEN can increase the revenue from laptop business. The laptop manufacturers make customers be affordable for new laptop type.

Computer Rental Agreement [3]:

This refers to the agreement between a loaner and the owner regarding the safety of the loaned equipment. To attain security this paper follows the approach of putting the loan under the name of the loaner such that even if the laptop is theft, the loan has to be paid by the loaner securing the property of the owner.

A hardware based model for an asset monitoring and tracking system: case of laptops [5]:

Corporate mobility initiatives and the anytime, anywhere information workers is on the rise. This is mostly fuelled by availability of affordable and more powerful mobile computing devices, especially laptops and tablets. One direct consequence of this is a sharp increase in laptop theft; this is partly driven by the fact that laptops are portable and easy to conceal and pocket away, they fetch a good second-hand price on the informal market and availability of easy online disposal platforms such as Gumtree, where they are sold cheaply and anonymously. Despite the fact that many solutions have been developed in an attempt to annihilate this growing calamity, their cost has left many small and medium organizations preferring to do without one. In an attempt to bridge this gap, the research reported in this paper aimed at designing a generic middleware architecture for use in a hardware-based (RFIDs, wireless sensor nodes, fingerprint scanners and mobile phones) affordable laptop monitoring and tracking system. The resulting system prototype was evaluated using diverse experimental cases within a university in South Africa.

Currently existing Rental Site [4]:

This website provides an online platform for renting laptop according to the user's choice with a minimum delay of 1 day. Here the laptops are provided the website owner, no middle man is involved to make the laptop lending process secured. In case of any damage, the website puts user liable for the damage and makes the user

pay the amount of the cost of the laptop. It provides smart phones laptops for rent. The terms and conditions explicitly state that they primarily put the user in loan for the rented equipment to ensure safety

Proposed System

Block Diagram Design: The block diagram represents the pictorial working of our prototype model. This block diagram shows how our app works step by step.

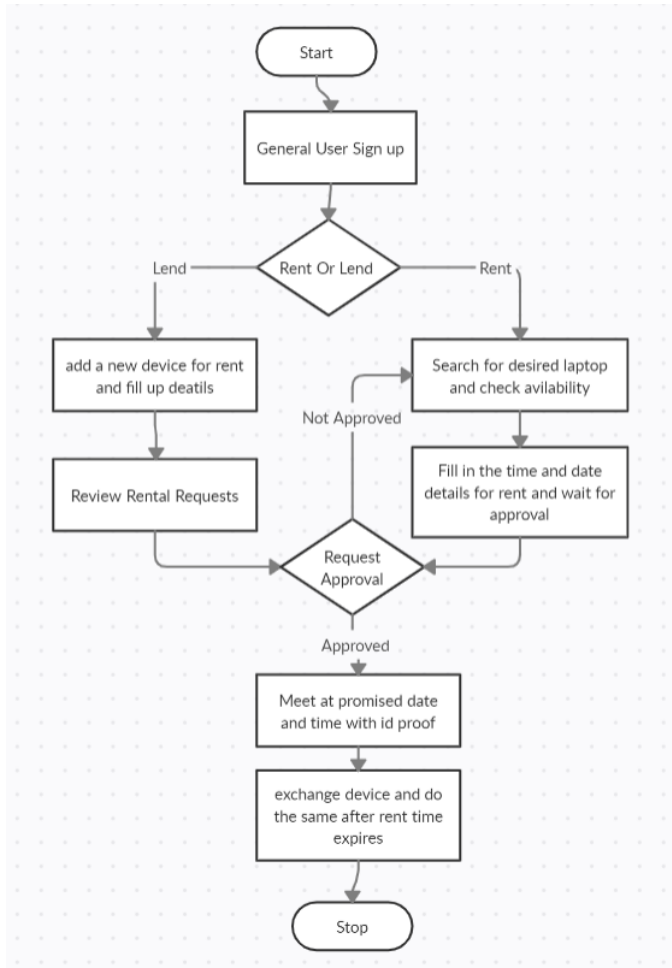


Fig 2: Block Diagram

Working Mechanism

1. When the user opens the app welcome message is displayed and the application prompts the user to login or register
2. First user have to register giving his mail id and setting a password.
3. If the user wants to rent a laptop he can go to the catalog and search for his desired laptop and look up its features and availability
4. If it is available, the user next books the laptop for a date and specifies the hours and place and wait for approval.

5. If the user wants to put his laptop for rent, he goes to my devices and add a device for rent

6. The user then receives rent requests and can reject or accept requests after reviewing the requests

7. After successful approval, both users meet at the net center with their id proof and gives their details and exchange the laptop

8. After the rent time expires the users again repeats step 7

Implementation

The application implementation screenshots are attached here



Fig 3: Welcome Screen

It is the primary screen visible to the user if he is not signed in or registered. The application prompts the user to register or login, if already logged in, the screen does not appear. In order to keep track of the user's actions, the user sign up or login is made mandatory for this application

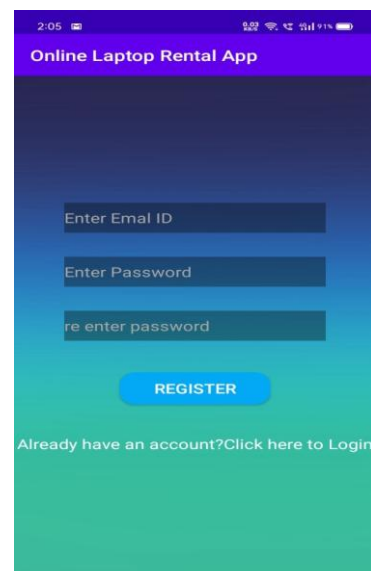


Fig 4: User Sign Up

Here the user gets registered with application with a simple mail id and password. A verification mail is sent to user's mail in order to login. No further details are asked unless the user rents or lends any device in the application avoiding annoying experience to the users.

The details page further to the adding device link, taking the device configuration details, image and the existant preinstalled softwares.



Fig 5: Catalog

This is the catalogue page displaying the available laptops for rent and their status to the users after successful sign in



Fig 8: Device Information

This page shows the user the details of a laptop when clicked on a catalog item. It shows whether the laptop is available or not and displays the pre installed softwares

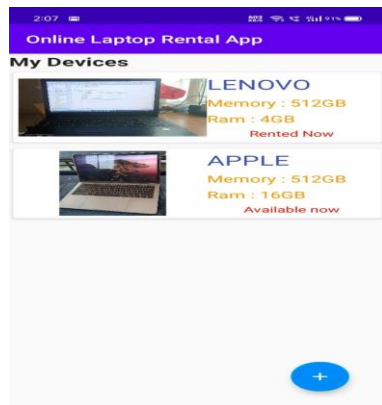


Fig 6: My devices contains

This page allows users to add devices for rent and displays the current devices of the user put under rent



Fig 9: renting process

In order to rent the device the user fills in the above form about location, hours and time which is notified to the lender through email

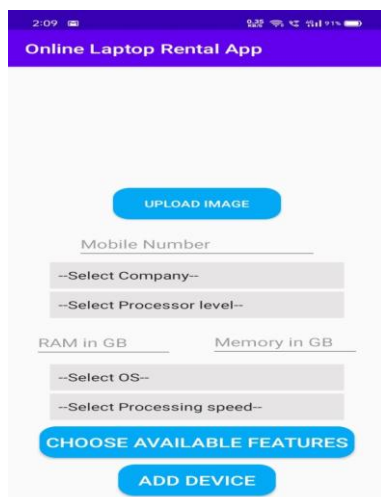


Fig 7: Adding device for rent



Fig 10: Lender device view

The lender after receiving email alert, if checked my devices page, then he could find the above page. The user can view the rent requests of different users, their location, hour and time requested

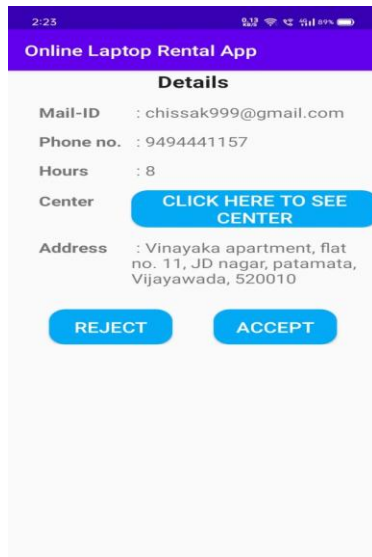


Fig 1.17: Lender approval

After checking the rent requests, the lender can choose to accept the request or reject it. The reason for rejection is obtained from the lender and sent to the renter through mail. Once accepted the availability status of the laptop changes too.

Results and Analysis

A beta testing of the application has been done. The application response time and request processing is up to the mark and an actual client satisfactory rental has been tested. The user reported that the interface is simple to use and good. The renter is satisfied with the safety provided by the application guidelines. The application works good and within the expected metrics

Conclusion

This paper proposes a way of renting laptops online called efficient laptop renting system. The app also provides users a way to lend a laptop at a reasonable price and convenient place with customized software requirements unlike the traditional system of approaching a net center at inflexible time and limited hardware and software resources

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