

CSE 5324 - Software Engineering I Analysis, Design, Testing

28th November 2022

Iteration 3 Review Presentation

Mavs Tech Rental

TEAM 6 - Maverick Developers

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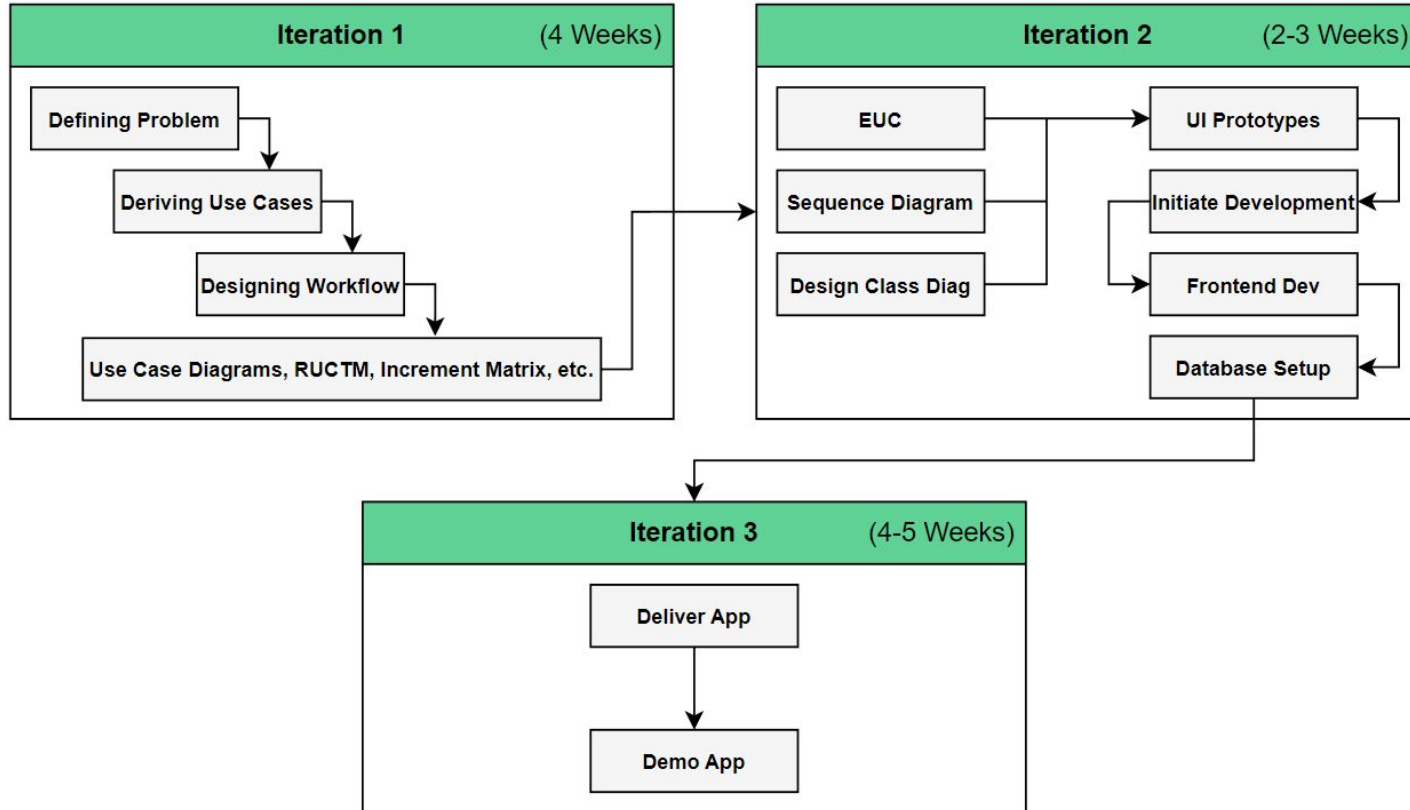
Agenda

- Project Description
- Overall Design Approach
- Requirements
- Use Cases
- RUCTM
- Increment Matrix
- Domain Diagram
- Expanded Use Cases and User Interface Prototype
- Design Sequence Diagrams
- Design Class Diagrams
- App demonstration
- Summary, Q&A

Project Description

- Problem Statement
 - Some users might need a particular piece of technology only temporarily, therefore renting it out is a good option as buying it is impractical.
 - It is not feasible to visit the library and inquire about the availability of a device every time.
- Solution
 - Users of Mavs Tech Rental can rent out devices (such as laptops and tablets) by logging into the app and reserving the item they want.
 - By searching for the desired electronics and then further filtering them out as necessary, users can view the available electronics.

Overall Design Approach



Requirements

Req ID	Req Statement	Line reference
R1	The system shall provide authenticated login to the Technology Rental app.	7, 8
R2	The system shall provide for new users to create an account to use the app.	8, 9
R3	The system shall provide for users to log out of the app.	9, 10
R4	The system shall provide authenticated users with a view of the technology rental options available for renting.	13 to 15
R5	The system shall provide essential information like name, image, and type of device on the screen with all rental items.	15 to 17
R6	The system shall provide authenticated users a search option to search for item by title.	20, 21
R7	The system shall provide authenticated users an option to filter items by the type of device.	19, 20
R8	The system shall provide authenticated users with all necessary information about a technology item when the user selects the item to rent it.	23, 24
R9	The system shall allow authenticated users to select the dates for renting the technology item.	24 to 26
R10	The system shall provide authenticated users with a notification reminder to return the item before their due date.	29, 30
★ R11	The system shall provide the authenticated user a way to view the status of their items from the profile section in the app.	36
R12	The system shall allow authenticated users to extend the deadline of the technology item if they want to use it longer.	36, 37
★ R13	The system shall provide authenticated users with the history of items they have rented out in the past.	39, 40
★ R14	The system shall provide the admin an interface to update the status of a returned item	31-34

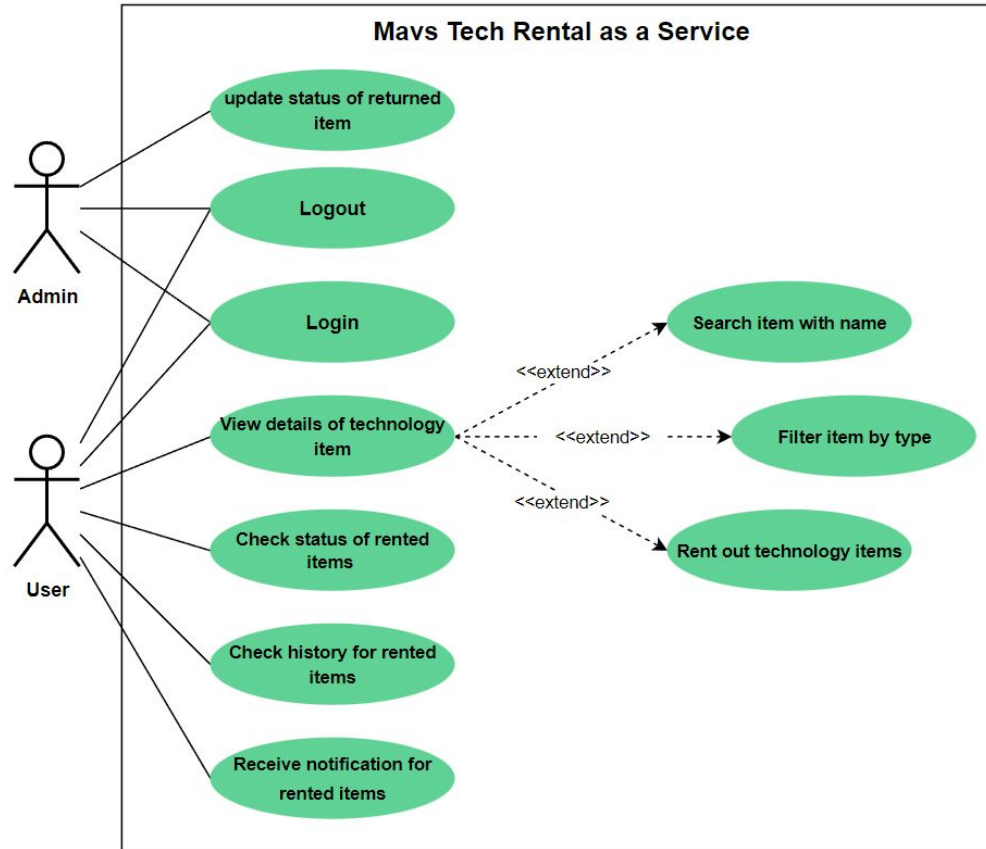
Use Cases

- **UC 1: Login**
 - TUCBW the user when they enter their login credentials and clicks on “Login” button.
 - TUCEW the user signed into the app and technology items home screen is displayed.
- **UC 2: View details of technology item**
 - TUCBW the user clicking on a technology item from the list of technology items on the home screen
 - TUCEW the user viewing the full description and images of the technology item for them to decide if they want to rent that technology item.
- **UC 2.1: Search item with name**
 - TUCBW the user clicks on the search bar and typing a name of the product to search.
 - TUCEW the user sees the list of the items with that name displayed on the screen.
- **UC 2.2: Filter item by type**
 - TUCBW the user clicking on the filter technology item button and selecting a filter type.
 - TUCEW the user sees the technology item list being filled with only the selected filtered type items.
- **UC 2.3: Rent out technology items**
 - TUCBW the user selecting dates they want to rent it for and then clicking on the “Rent Device” button.
 - TUCEW the user taken back to the home screen where the rented item is removed from the home screen and added to the profile section.

Use Cases

- ★ **UC 3: Check status of rented item**
 - TUCBW the user clicking on the item they have rented out from their profile section.
 - TUCEW the user seeing the status of the item they clicked on and when it is due for them.
- ★ **UC 4: Check history for rented items**
 - TUCBW the user when they click on the statistics button on their profile section.
 - TUCEW the user sees the statistics of their rented items on the screen.
- **UC 5: Receive notification for rented items**
 - TUCBW the return date is approaching
 - TUCEW the user receives a notification to return the item
- **UC 6: Log out**
 - TUCBW the user when they click on the log out button in their profile section.
 - TUCEW the user being logged out of their account and exited to the sign in screen.
- ★ **UC 7: Update status of returned item**
 - TUCBW the admin when they click on the update status section.
 - TUCEW the database being updated with the changes made by the admin.

Use Case Diagram



Requirements to Use Case Traceability Matrix

	Priority Weight	UC 1	UC 2	UC 2.1	UC 2.2	UC 2.3	UC 3	UC 4	UC 5	UC 6	UC 7
R1	1	X									
R2	1	X									
R3	1									X	
R4	1		X								
R5	1		X								
R6	3			X							
R7	3				X						
R8	2					X					
R9	2					X					
R10	4								X		
★ R11	5						X				
R12	10						X				
★ R13	5							X			
★ R14	2										X
	Score	2	2	3	3	4	15	5	4	1	2

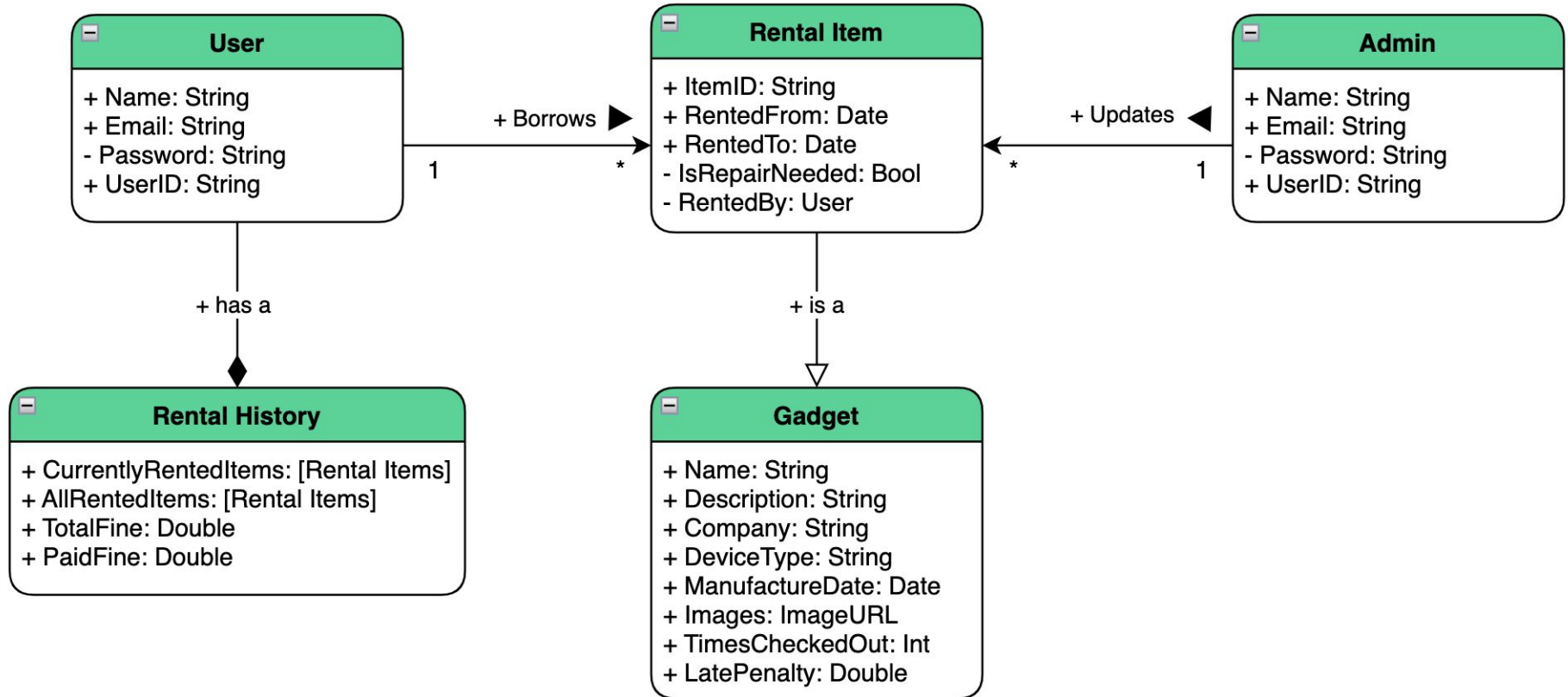
Note: Priority 1 is the highest

Increment Matrix

1 Person-Week = 5 hrs.

Use Case	Priority	Effort (person-weeks)	Depends on	Assigned to	Iteration 1 (10/7/22)	Iteration 2 (11/04/22)	Iteration 3 (12/05/22)
UC 1	2	3	None	MP, AP	3		
UC 2.1	3	2	UC 1	SA, AV	2		
UC 2.2	3	2	UC 1	SA, AV		2	
UC 2.3	4	4	UC 1	AP, SA		4	
★ UC 3	15	3	UC 1, UC 2.3	MP, AV			3
★ UC 4	5	3	UC 1, UC 2.3	AR, MP			3
UC 5	4	1	UC 1, UC 2.3	SA, AV		1	
UC 6	1	1	UC 1	AP, AR	1		
★ UC 7	2	3	UC 2.3	MP, AR			3
Total Effort		22			6	7	9

Domain Diagram



EUC and UIP- Check History for Rented Items

UC 4: Check History for Rented Items

Precondition: The signed in user is on the profile screen and wants to check his rental history for rented items

Actor: User

System: Mav Tech Rental app

(0) System displays the profile of the user.
(See figure 4)

(1) TUCBW the user when they click on the check history on their profile section.

(2) System displays the list of the previously rented items. (See figure 4.1)
(*)

(3) TUCEW the user sees the list of their old, rented items on the screen.

Postcondition: the user has checked the history of the rented items

Rental History

3 Items Rented In The Past

Tablet

iPad Mini Gen 3

08/30/2022 - 09/23/2022



Laptop

Macbook Air 2020

09/23/2022 - 10/09/2022



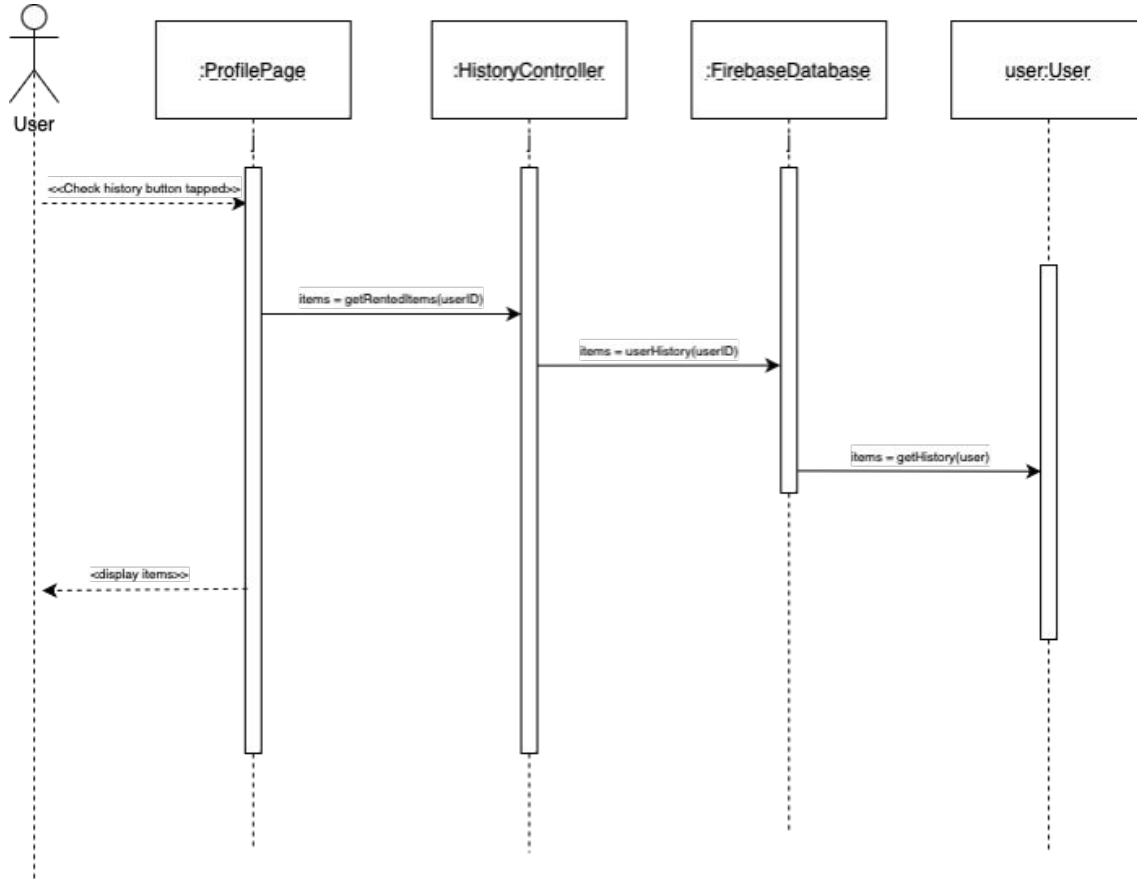
Laptop

Lenovo Ideapad 3

02/19/2022 - 02/25/2022



DSD- Check History for Rented Items



EUC and UIP- Update Status of Returned Item

UC: Update Status of Returned Item	
Precondition: The admin receives the physical device from the user to return it.	
Actor: Admin	System: Mav Tech Rental app
	(0) System shows list of all users to the admin.
(1) TUCBW the admin searching for the user with the user's student ID.	(2) System shows admin the user that was search for. (See Figure 7)(*)
(3) The admin clicks on the user that is displayed on the screen.	(4) System displays user's current rentals and profile information.
(5) The admin clicks on the rental item that the user returned.	(6) System displays details of the device.
(7) TUCEW the admin clicking on the return device button.	
Postcondition: The admin has updated the status of returned item on Firebase.	

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Tablet

iPad Mini Gen 3

08/30/2022 - 09/23/2022

Laptop

Macbook Air 2020

09/23/2022 - 10/09/2022

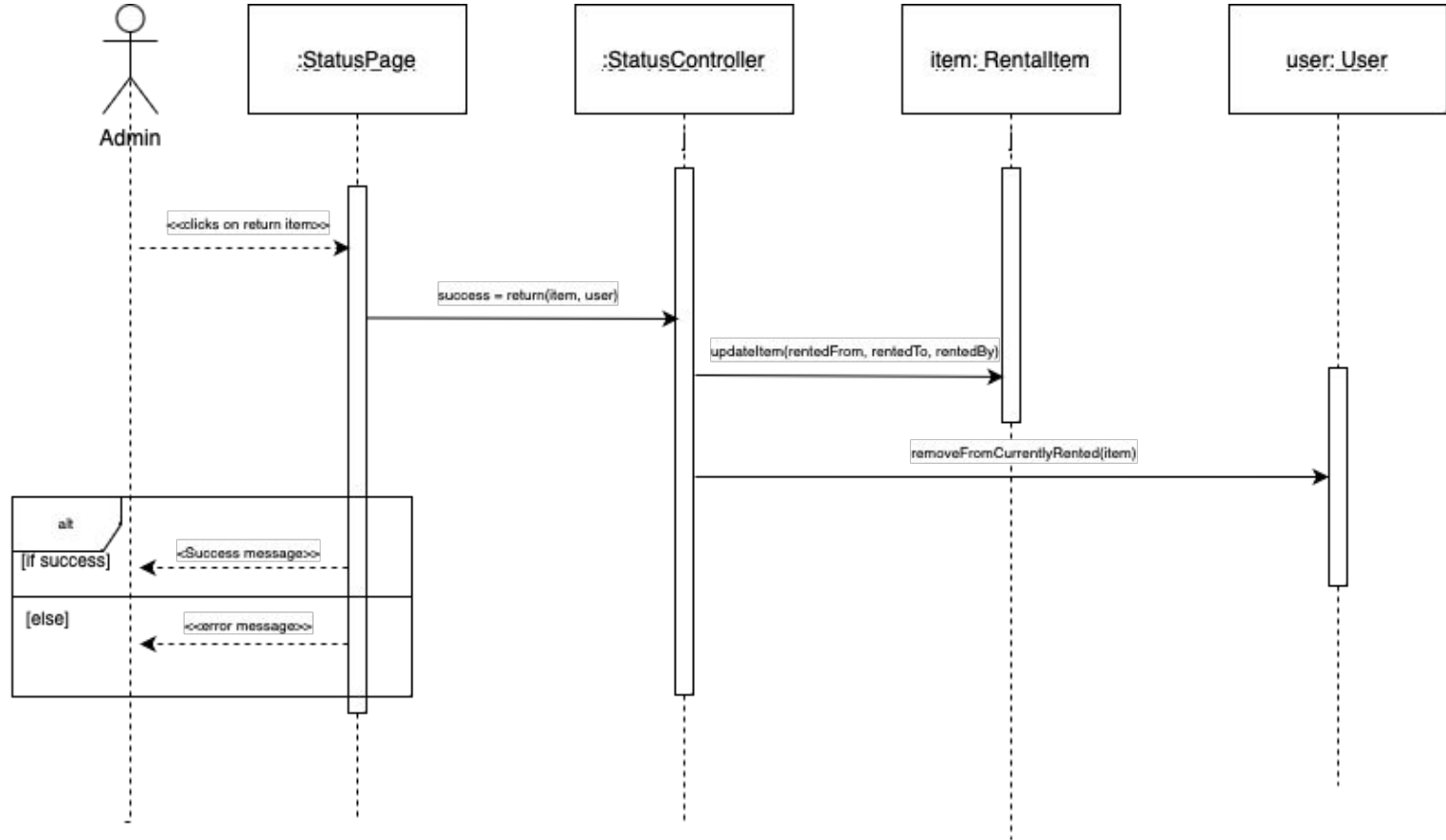
Laptop

Lenovo Ideapad 3

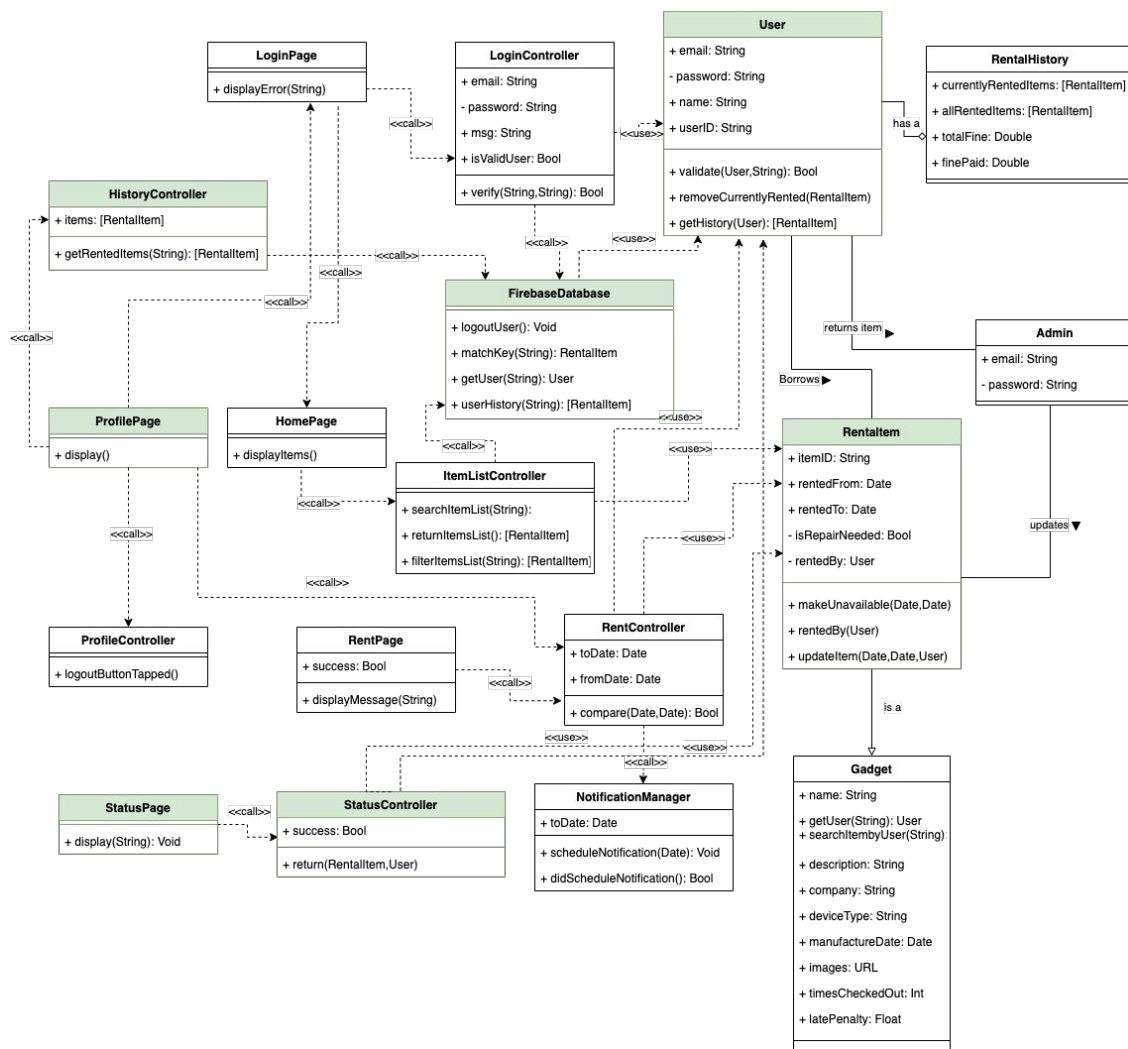
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DSD- Update Status of Returned Item



Design Class Diagram



DEMO



Summary

- Mavs Tech Rental allows users to rent out electronics.
- It helps users by saving them money, and exploring different technologies.
- We used an agile approach to fulfill the requirements.
- Planned the development in iteration 1.
- Made progress with app development in Iteration 2.
- Completed app in iteration 3.



Thank You

Mavs Tech Rental

Q&A

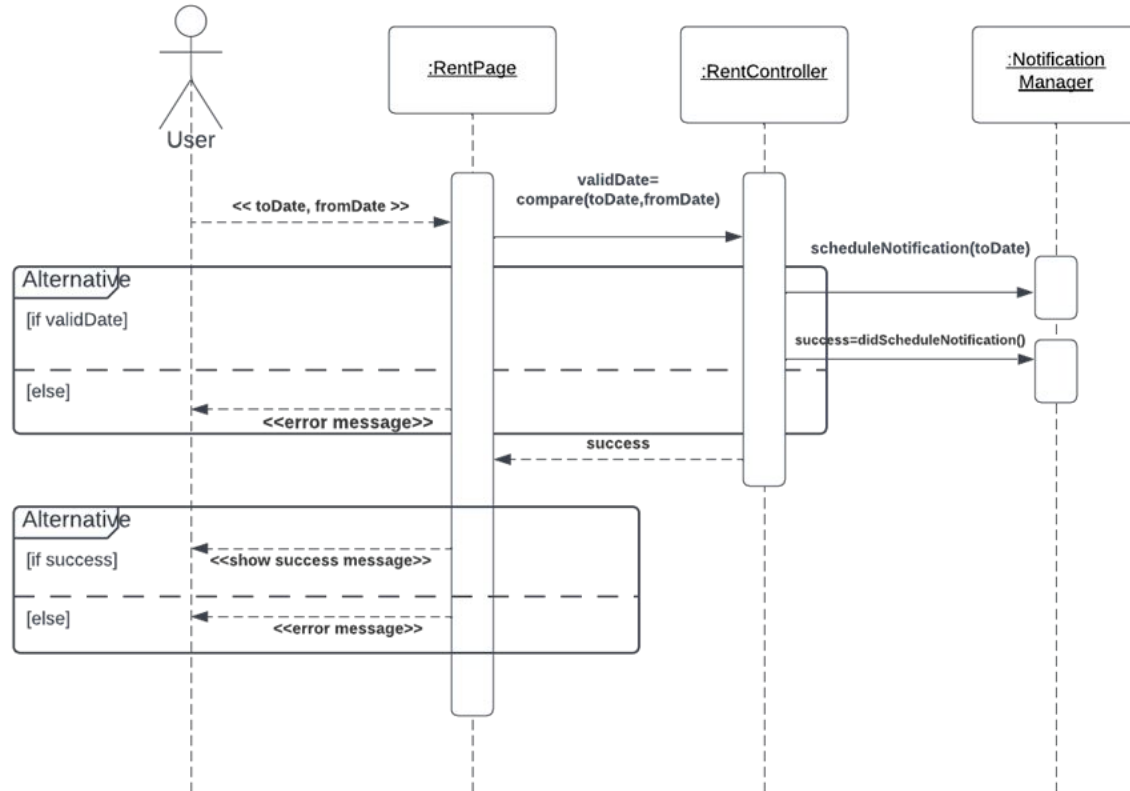


EUC and UIP- Receive Notification for Rented Item

UC5: Set Notification for Rented Item	
Precondition: The signed in user has rented item and is on the rented item screen and needs a reminder for when the item is due.	
Actor: User	System: Mav tech rental app
	(0) System displays the item that was just rented by the user.
(1) TUCBW the user seeing an alert saying that the item has been rented out and they will receive a notification when it is due.	(2) System schedules a notification on the day the rented item is due. (See Figure 5) (*)
(3) The user clicks on the dismiss button on alert after reading it.	(4) System triggers a notification to the user on the rented item due date. (See Figure 5.1)
(3) TUCEW the user receiving the notification on the day when the item is due.	
Postcondition: The user has received the notification of the due date.	



DSD- Receive Notification for Rented Item



Code Snippets

Function to Search items

```
override fun onCreateOptionsMenu(menu: Menu, inflater: MenuInflater) {

    inflater.inflate(R.menu.nav_menu, menu)
    val search = menu.findItem(R.id.nav_search)
    val searchView = search?.actionView as SearchView
    searchView.queryHint = "Search by name"

    searchView.setOnQueryTextListener(object : SearchView.OnQueryTextListener {
        override fun onQueryTextSubmit(query: String?): Boolean {
            return false
        }

        override fun onQueryTextChange(newText: String?): Boolean {
            val filteredDevices = devices.filter { device ->
                device.name.lowercase().contains(newText.toString().lowercase())
            }
            recyclerView.adapter =
                HomeRecyclerViewAdapter(filteredDevices) { selectedDevice: TechDevice ->
                    onItemClick(selectedDevice)
                }
            return true
        }
    })
}
```

Schedule Notification

```
private fun scheduleNotification() {
    val intent = Intent(applicationContext, Notification::class.java)
    val title = device?.name
    val message = "You rented $title on ${fromDate.toString()} to ${toDate.toString()}. This item is due soon. " +
        "Please return it before the due date."
    intent.putExtra(titleExtra, title)
    intent.putExtra(messageExtra, message)
    val pendingIntent = PendingIntent.getBroadcast(
        applicationContext,
        notificationID,
        intent,
        PendingIntent.FLAG_IMMUTABLE or PendingIntent.FLAG_UPDATE_CURRENT
    )
    val alarmManager = getSystemService(Context.ALARM_SERVICE) as AlarmManager

    val notificationTime = Calendar.getInstance()
    notificationTime.set(toDate.getYear(), toDate.getMonth(), toDate.date, 12, 0)

    var time = notificationTime.timeInMillis
    alarmManager.set(
        AlarmManager.RTC_WAKEUP,
        time,
        pendingIntent
    )
    if (title != null) {
        alert(title, message+"\nA notification will be sent to you on ${Date(time)}")
    }
}
```