A.O.K. Laptop System Overhaul

Course Project: IS 436 Structured Systems Analysis and Design

Deliverable 3 – “Process Modeling” (D3)
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Fig 1.0 : Context Diagram

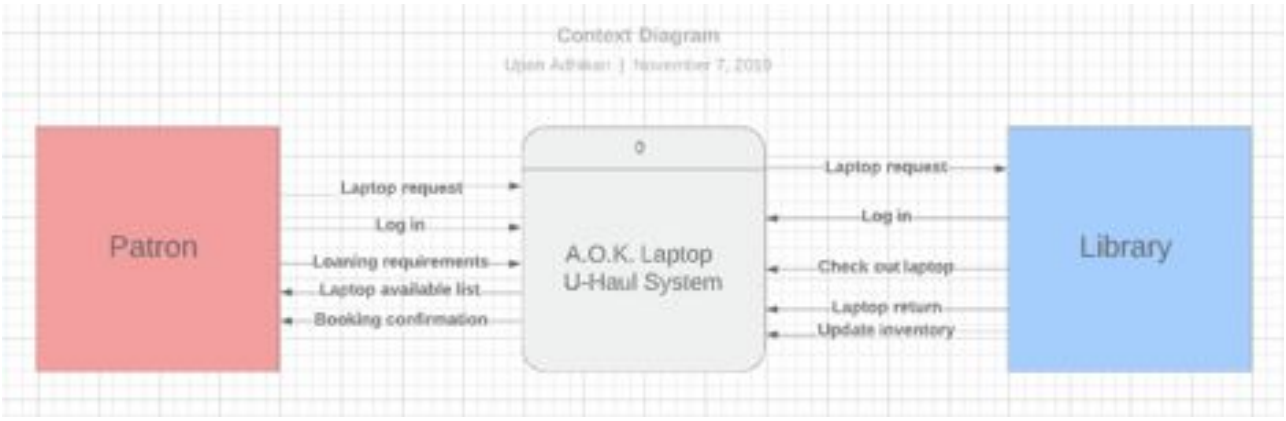
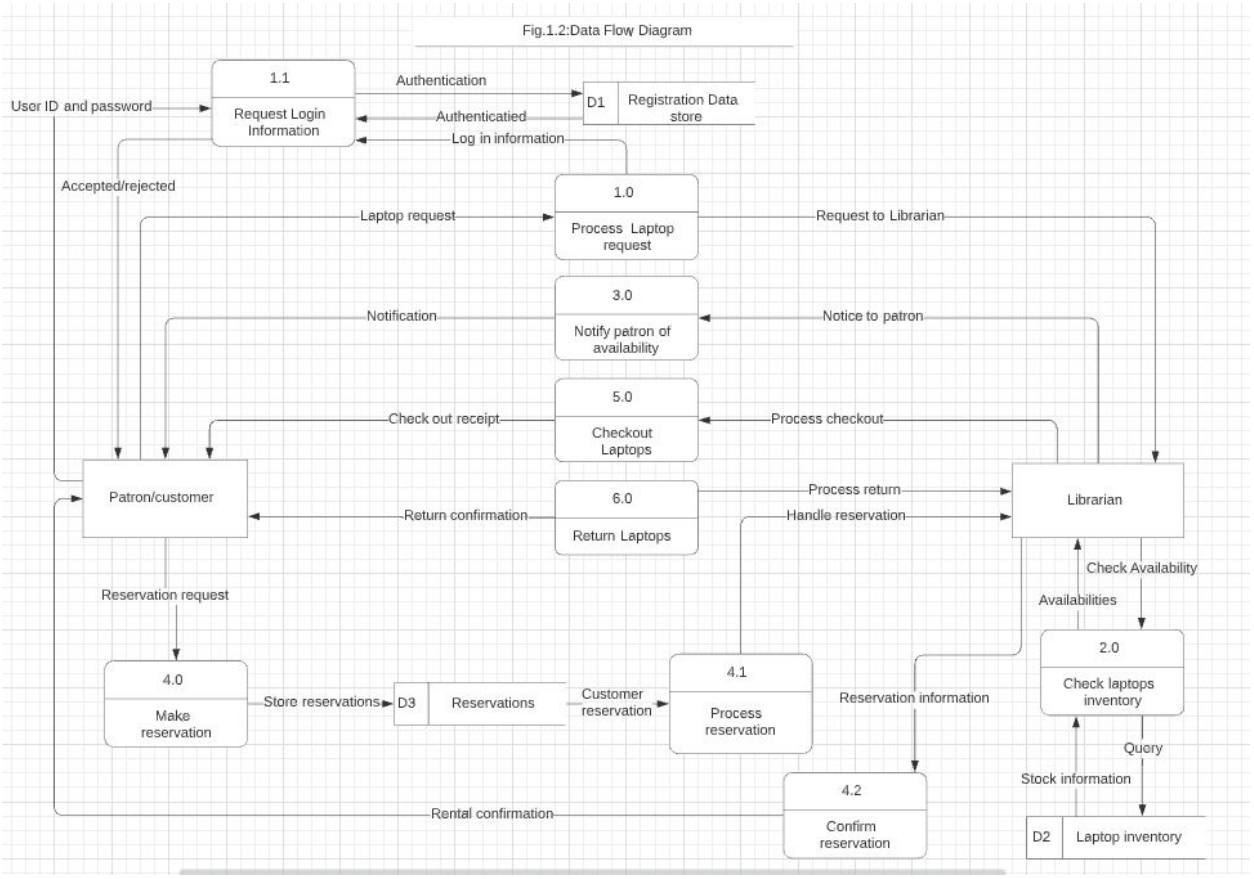


Fig 1.1 DFD level diagram



PROCESSES

The data flow diagram shows processes that will occur in the system during the laptop reservation.

1. Process Laptop Request – This process represents how the customer will log in to the system and perform an online booking of a laptop depicting the time of reservation and return dates.

    1.1. Request Login Information - In this process, when the patron process laptop request, he will be directed to the login page requesting username and password. The username and password will be verified against the data storage of student information. The system authenticates the user and provide access to the user.

2. Check Laptops Inventory: – In this process, the librarian will process the query against the database inventory to check the availability of the laptops. After getting the current stock information, it will be relayed to the patron through the librarian.

3. Notify Patron of Availability: After querying the availability of laptops, the patron will be notified with the list of available laptops.

4. Make Reservations: The patron will make the reservations of laptop after viewing the list of available laptops. The reservation of the laptops will be stored in the database storage under reservations.

    4.1. Process Reservation: The reservations made by the patron will be processed and handled by the librarian.

4.2. Confirm Reservation: This is the sub-process under make reservation. The confirmation of reserved laptops will be sent to the patron with the confirmation number

5. Check out Laptop – This process will be used to save the book details of the customer and the expected return date. The librarian will process the checkout and after the successful completion of the process the checkout receipt will be delivered to the patron.
6. Return Laptop – This process will be carried out by the librarian and will include filling out of a form that will be used to monitor the condition of a laptop when the customer returns it by comparing it with the data collected during picking of the laptop

Data Stores

1. **Registration data store –** This data store keeps a record of the data of the customer that includes the name, address and billing information.
2. **Laptop inventory–** This data store keeps data of the available laptop inventory.
3. **Reservations –** This data store keeps details on the reservation history of every customer and created on the first reservation of the customer.

Data Flow

The user will register and log in to the system. Upon login, they will be required to enter the login details, which are confidential and will not be shared. The customer will be assigned a new customer ID, which will be used to track customer interactions throughout the system. The customer will then move to the booking and reservation module, where they will choose a laptop of choice depending on specifications and preferences. The customer may reserve a laptop online

or in person. If online, there is a 15 min allowance from the specified pick-up time allowed after which the laptop will be available for booking by other customers. On successful reservations, the customer will pick up the laptop, which must be inspected before handing over and the data sent to the data store with the laptops ID as the identifier.

The customer will then have to return the laptop on the specified date. The laptop is re-inspected as compared to the previously collected data and compared. If the laptop is in good condition and the staff satisfied the customer is cleared to have returned the device.

We have made several changes to the requirement specification and use cases as per the DFD diagram.

First Use Case: Login

ID:	UCX-1
Title:	Login s sss
Description:	The user enters login information. The system authenticates and validates the login information against the D1(Registration data store). If the user enters invalid login information, the system alerts and displays the alert notification.If it is correct then it allows the user to get into the user pages.
Actor:	Primary actor is library user, the secondary actor is patron
Preconditions:	1.The user must have valid user ID and password. 2.The familiarity of the user to use the system. 3.The system is up to date to perform the desired tasks.
Postconditions:	1.The system displays the relevant home page. 2.The system records the events. 3.The system authorizes the patron to receive the services. 4. The system notifies the user about in stock/out of stock laptops.
Main Success Scenario:	1.The user enters login information. 2.The user submits the user id and password. 3.The system validates the user id and password. 4. The system verifies the user id and password. 5.The system displays user's home page.

Special Requirements:	1.The login action is initiated when a registered user chooses to login. 2.The system prompts for username and password. 3.The registered user enters user name and password and submits them.
Exception:	E1: Missing user ID or password: 1. The system prompts for user id and password. 2. The use case resumes step 1 in main success scenario. E2: Maximum attempts exceeded: 1. The system displays “maximum attempts exceeded, contact administrator” message. 2. The systems locks user account. 3. The use case ends. E3: Invalid user id or password: 1. The system displays “Invalid user id or password” message. 2. The system prompts for user id and password. 3. The use case resumes step 1 in main success scenario.
Frequency of Use:	The system will be used very often.
Priority:	High

Second Use Case: Request for Laptop

ID:	**UCX-2**
Title:	Request for Laptop
Description:	The patron will request a loanable laptop either through the mobile app or through the browser or simply by visiting the Circulation Desk in person.
Actor:	Primary,Patron who is requesting laptop, Secondary: Laptop Loan Mobile App
Preconditions:	The patron has no other loanable laptop in their possession and/or patron has a fine
Postconditions:	If precondition is violated, patron must return the loanable laptop and/or pay a fine.

Main Steps:	1) User requests laptop. 2) The system asks for login information. 3) User enters login information. 4) The user submits the request. 5) The system sends notification about availability. 6) User will go to “Reserve a laptop” tab 7) User Reserves a laptop of their choice 8) User will then go to the Circulation desk to pick up a laptop
Exception:	E1: User already is borrowing a laptop 1. The system will display that “User is already borrowing a laptop” 2. The system will prompt the user to return the laptop E2: Unpaid balance 1. The system will display that “There is an unpaid balance due” 2. The system will ask the user if it wants to pay the balance
Frequency of Use:	This would be used very often because requesting a laptop is the main interaction that the user has with the system.
Special Requirement:	The patron must comply with the library policy and laptop loaning programme.
Priority:	High priority

Third Use Case: Check Out

ID:	UCX-3
Title:	Check Out
Description:	The library user scans the student id. The system validates the id and prompts the user to scan the laptop and the charger. The system records all the information and prints the checkout slip.
Actor:	Library user
Preconditions:	1. The student must have a valid student id. 2. The library has to have a laptop for checkout.
Postconditions:	1. The system displays “check out successful” message. 2. The system updates the actions in database.

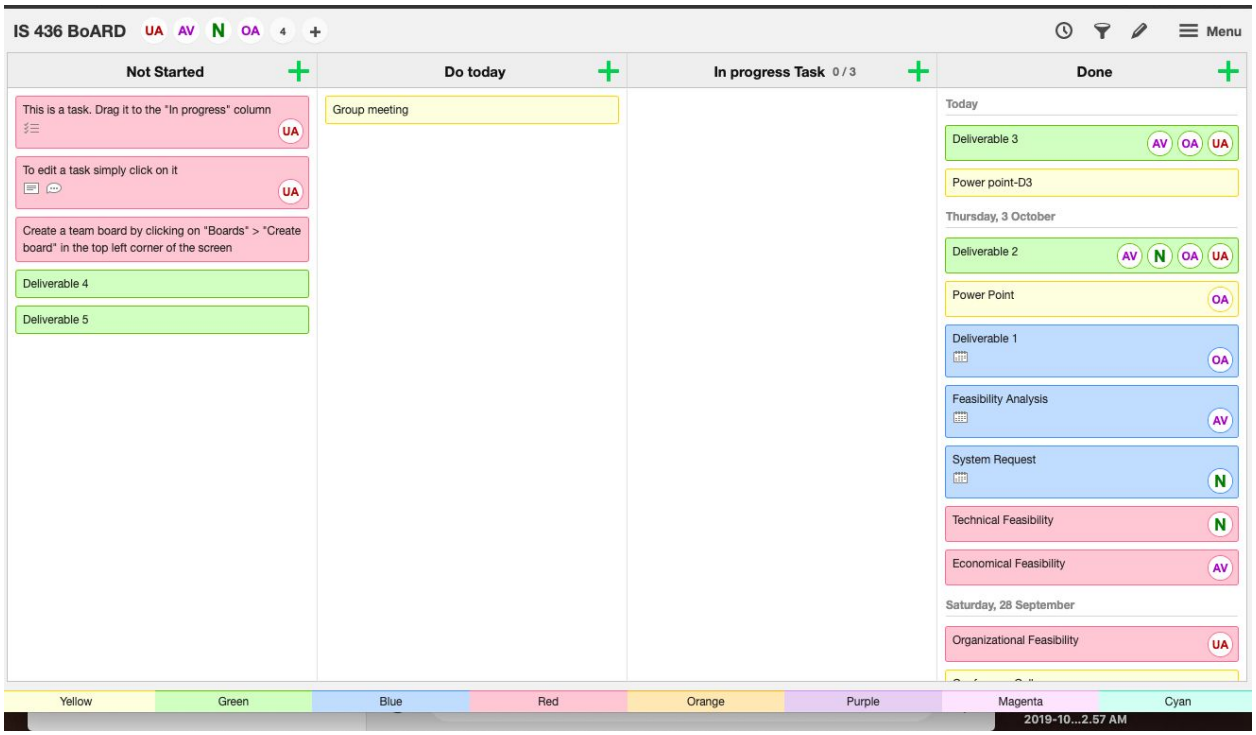
Main Success Scenario:	1. The library user scans the student id. 2. The system validates and authorize the student id. 3. The library user selects the requested laptop 4. The library user scans the laptop and the charger. 5. The system records all the information and prompts the user to print out the check out slip. 6. The system displays “check out successful” message.
Special requirements	The borrower must agree to checkout terms and conditions.
Exception:	E1: Invalid Student id 1. The system prompts the user to have a valid student id. E2: Unpaid balance/fine 1. The system displays unpaid balance or fines and prompts the user to collect unpaid balance/fines.
Frequency of Use:	It is used often as the student can checkout laptops upon availability.
Owner:	System Developer
Priority:	High

Fourth Case: Return

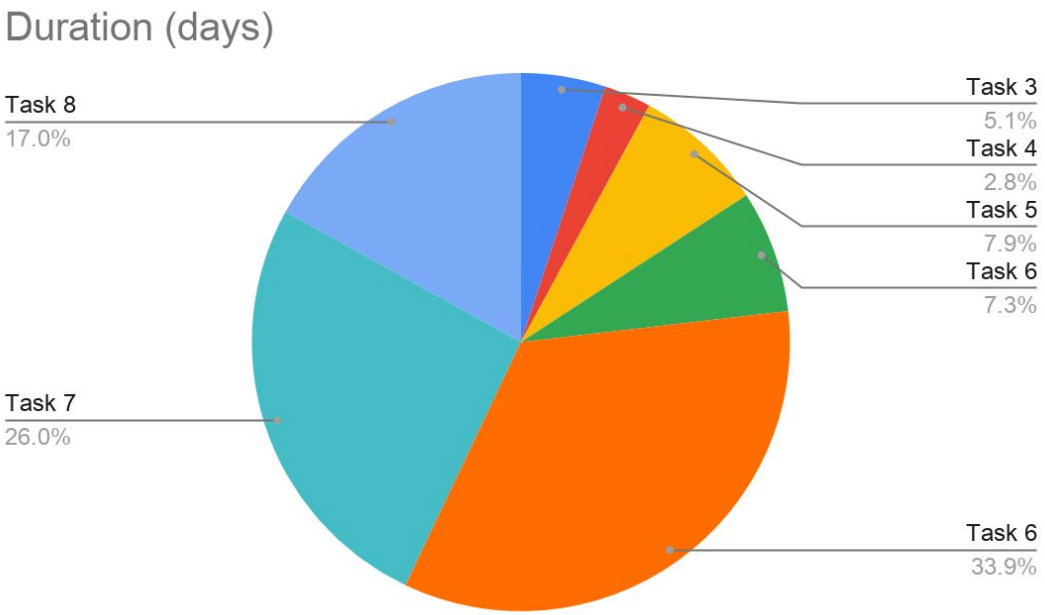
ID:	UCX-4
Title:	Return
Description:	The library user scans the student id. The system validates the id and prompts the user to scan the loaned laptop and the charger associated with it. The library staff manually perform the checks to ensure that the laptop and charger is in a good condition. If it is not in good condition, the patron will be fined according to the policy set out by the library.
Actor:	The patron who initiates the return.
Preconditions:	1. The student is authenticated. 2. The laptop should be in good condition without internal/external damage.
Postconditions:	1.The return is completed successfully. 2. The action is recorded in the database.
Main Success Scenario:	1.The library user scans the student id. 2.The system validates and authorize the student id. 3.The library user scans laptop and the charger.

	4.The library staff manually checks the condition of the laptop and the charger. 5. The systems displays “return complete” message and sends notification to the borrower.
Special Requirements:	The system initiates the return if pre-conditions are satisfied.
Exception:	The patron damages the laptop.
Frequency of Use:	Very often.
Priority:	High

Kanban Board



Project Plan:



Tasks ▲	Status	Title	Start date	End date	Duration (in days)	Duration (in %)
Task 1	Completed	Identify the problems	09/19/2019	09/21/2019	2	1.11%
Task 2	Completed	Meeting with sponsor(Board)	09/22/2019	09/22/2019	1	0.56%
Task 3	Completed	Feasibility Study	09/16/2019	09/26/2019	9	5.00%
Task 4	Completed	System Request	09/26/2019	10/01/2019	5	2.78%
Task 5	Completed	Requirement Specification	10/4/2019	10/17/2019	14	7.77%
Task 6	Completed	Process Modeling	10/24/2019	11/6/2019	13	7.22%
Task 6	Not Started	Building/Designing the system	10/20/2019	12/20/2019	60	33.33%
Task 7	Not Started	Security check	12/21/2019	02/21/2020	46	25.56%
Task 8	Not Started	Post Testing and Implementation	02/22/2020	03/19/2020	30	16.67%
Total Time			09/19/2019	03/19/2020	180	100.00%