Introduction

Each group have to submit an Information System project proposal that describes the organization they have selected. Conduct a systems analysis of the proposed project by performing 3 phases of SDLC (planning, analysis, and design) for a small (real or imaginary) organization. The actual project implementation is not required (i.e., No coding required.) You need to apply what you have learned in the class and to participate in the team project work.

Deliverables

This project should follow the main steps of the first three phases of the SDLC (phase 1, 2 and 3). Details description and diagrams should be included in each phase.

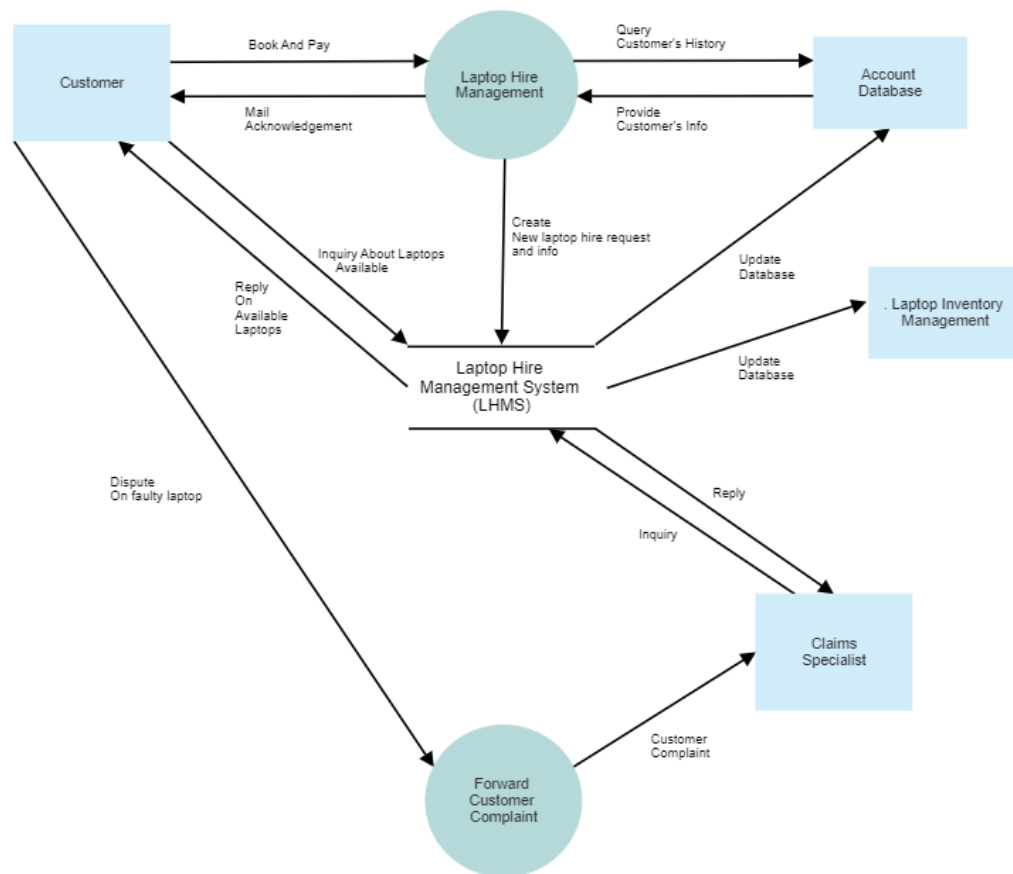| Learning Outcome(s): LO1, LO2 and LO5	**Part 1: Planning Phase** **Under this section, include the following** • **Give the problem description and project scope statement of your selected project topic. (1 mark)** • **Adopt an SDLC development methodology (1 mark)** • **Develop a work plan (Gantt chart) (1 mark)** **Answer:** **Laptop Hire Management System (LHMS)** Laptop Hire Management System (LHMS) is a software solution that we are going to design to support the rental of laptops to customers(students) which will basically be updating the manual Laptop Hire Management system into an internet-based application. The system will provide an efficient and streamlined approach to managing the rental process, from the initial reservation to the final return of the laptop

This system will allow laptop rental firms to manage their laptop inventory, track customer information, process payments, and generate reports. The software can also be integrated with mobile applications and asset tracking technology, providing a convenient and flexible experience for customers.

With a Laptop Hire Management System, laptop rental firms can improve operational efficiency, increase customer satisfaction, and gain valuable insights into their rental operations.

For the success of this project, we will use the Waterfall Model Systems Development Life Cycle (SDLC) which is a process used in software development to plan, design, develop, test, and deploy software systems. For the Laptop Hire Management System (LHMS) project, adopting the Waterfall Model SDLC methodology to ensure that the project is executed systematically, efficiently, and effectively.

The following phases of the Waterfall Model will be used:

- Requirements Gathering: This stage involves identifying the needs and requirements of the stakeholders, including customers, business owners, and end-users. This information is used to determine the scope and goals of the Laptop Hire Management System (LHMS) project.

- Analysis: In this stage, the requirements gathered in the previous stage are analyzed and documented to create a detailed project plan. This stage also involves creating a prototype of the system to visualize the end product.

- Design: In this stage, the system architecture, database design, and user interface are designed based on the requirements gathered in the previous stages. This stage also involves creating detailed design documents, such as system flow diagrams and data flow diagrams.

	• Development: In this stage, the system is developed based on the design created in the previous stage. This stage involves coding, testing, and debugging the system to ensure that it meets the requirements. • Testing: In this stage, the system is thoroughly tested to identify and fix any bugs or issues. This stage involves conducting both unit testing and integration testing to ensure the system is functioning as intended. • Deployment: In this stage, the system is deployed to the production environment. This stage also involves training end-users on how to use the system. • Maintenance: This stage involves providing ongoing support and maintenance for the Laptop Hire Management System (LHMS). This includes fixing any issues that arise, updating the system to meet changing requirements, and providing technical support to end-users. Below is our Gantt chart which provides a visual representation of the project timeline and which will be used to track progress, identify potential risks, and make necessary adjustments to the project plan.

ACTIVITY	STATUS	START DATE	END DATE	
Requirements Gathering	Completed	25/01/2023	29/01/2023	
Analysis	Pending	30/01/2023	5/02/2023	
Prototype Development	Pending	5/02/2023	19/02/2023	
System Architecture	Pending	20/02/2023	4/04/2023	
Database Design	Pending	4/04/2023	10/03/2023	
User Interface Design	Pending	11/04/2023	20/04/2023	
Development	Pending	20/04/2023	14/05/2023	
Testing	Pending	14/05/2023	16/05/2023	
Deployment	Pending	17/05/2023	18/05/2023	
Maintenance	Pending	18/05/2023	N/A	

Learning Outcome(s): **LO2, LO3 and LO5**	**In this section, you are required to determine the main business requirements; consequently, the following must be included:** • **Model Processes (Data Flow Diagramming) (2 mark)** • **Draw the usecase diagram and the give the written usecase description for any two activities. (2 mark)** • **Model data (ER modeling) (2 mark)** **Answer:** Some of the main business requirements for the Laptop Hire Management System (LHMS) project include: • User Management: The LHMS should allow for the creation, modification, and deletion of user accounts for employees, customers, and administrators. • Laptop Inventory Management: The LHMS should allow for the tracking of laptops and accessories available for hire, including the number of available units, specifications, and rental prices.

- Rental Management: The LHMS should allow customers to reserve laptops for rental, and employees to manage the rental process, including verifying customer information, issuing and returning laptops, and generating invoices.
- Payment Processing: The LHMS should support online payment processing for rental fees, and should also provide options for customers to pay using other methods, such as cash or credit card.
- Reporting: The LHMS should provide a range of reports and data visualizations, including rental history, sales, and customer demographics, to help the business make informed decisions.
- Security: The LHMS should ensure the confidentiality and privacy of customer information, and should be protected against unauthorized access and data breaches.
- Accessibility: The LHMS should be accessible from any device with internet access, and should be designed with user-friendly interfaces for employees, customers, and administrators.
- Scalability: The LHMS should be scalable and able to accommodate growth in the number of laptops, customers, and transactions, as the business expands.
- Integration: The LHMS should integrate with existing systems, such as accounting software, customer relationship management (CRM) software, and inventory management software, to streamline business processes and reduce manual work.

Data Flow Diagramming

Here are two use case descriptions for the Laptop Hire Management System (LHMS) project:
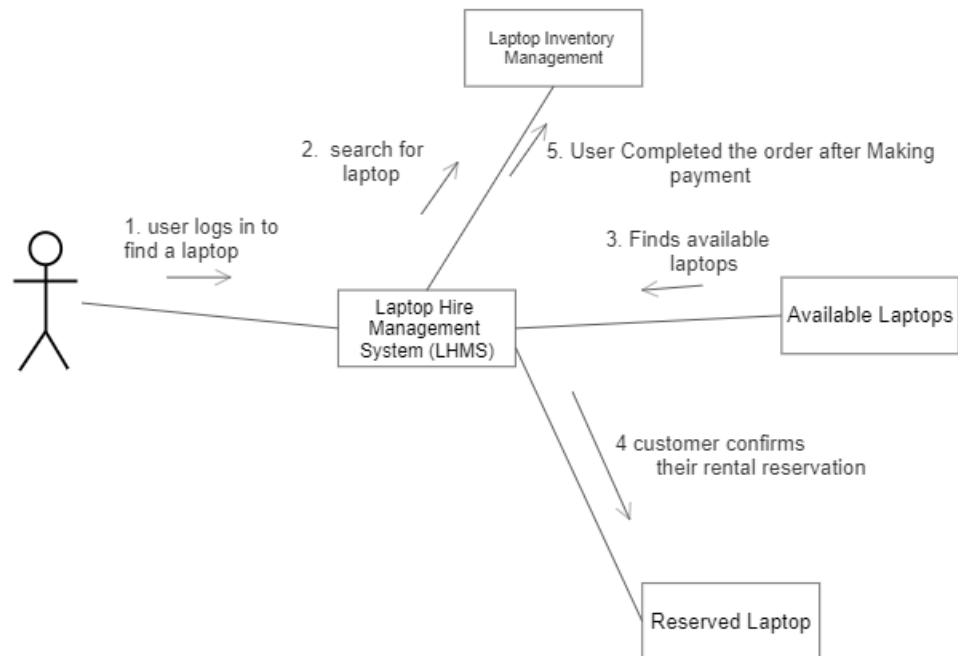
Renting a laptop:

Primary Actor: Customer

Precondition: Customer has created an account on LHMS and has provided necessary information such as name, address, and payment method.

Description:

- The customer logs into the LHMS using their account credentials.

	- The customer browses available laptops and accessories and selects the desired items for rental. - The customer confirms their rental reservation, including the rental period and pickup location. - The LHMS verifies the customer's information and payment method. - The LHMS reserves the selected items for rental and generates an invoice for the customer. - The customer picks up the rented items from the designated pickup location. - The customer returns the rented items at the end of the rental period. Postcondition: The customer has successfully rented a laptop and accessories, and has made payment for the rental

Title: **Returning a laptop**

Primary Actor: Customer

Brief Description: A customer returns a laptop that was rented from the laptop hire management system.
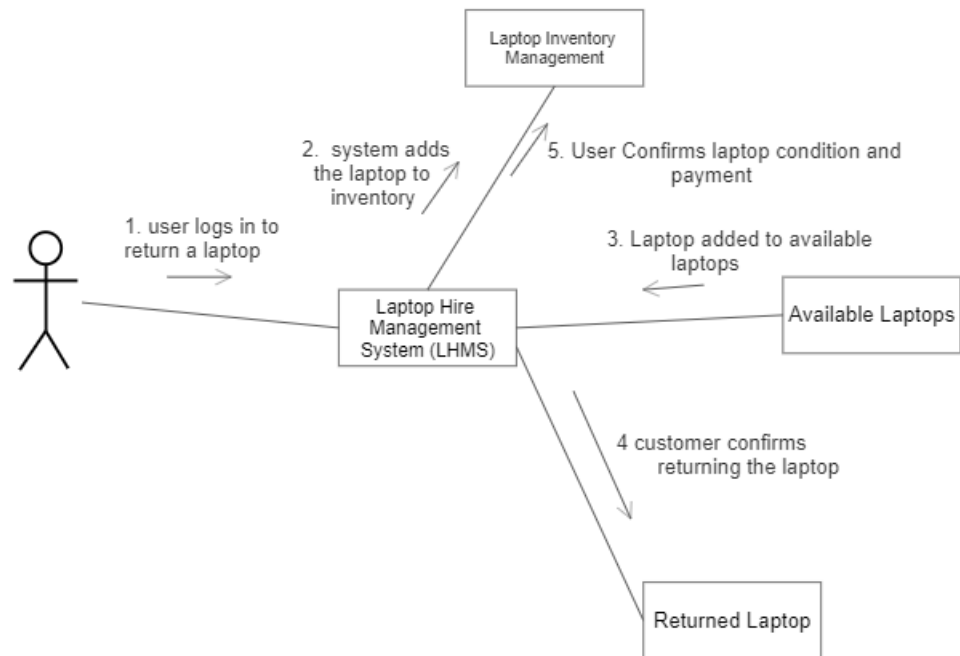
Pre-conditions:

- Customer has rented a laptop from the system.

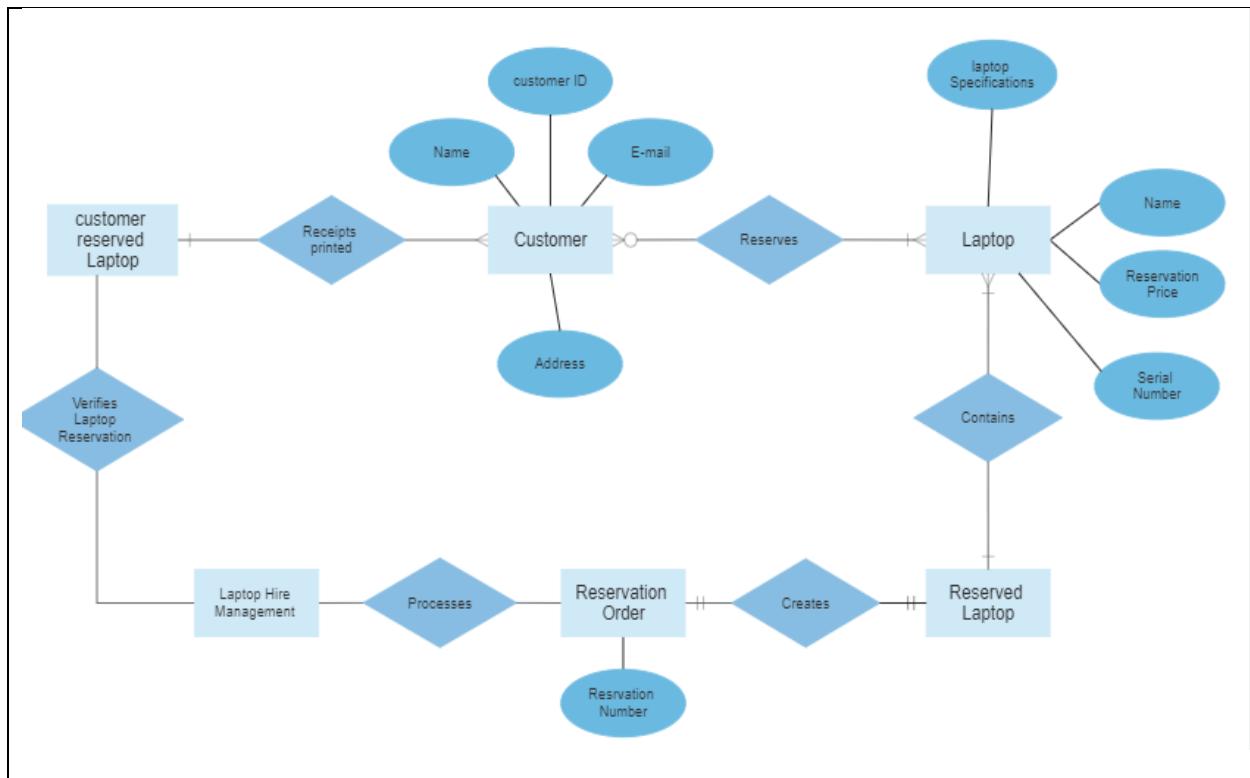- The rental period has ended.

Flow of Events:

1. Customer logs into the system using their username and password.

2. Customer selects the option to return the laptop.

	3. System prompts the customer to confirm the return and to check the condition of the laptop.
	4. Customer confirms the return and inspects the laptop for any damages.
	5. Customer reports any damages to the system and provides relevant details.
	6. System generates a damage report and displays it to the customer for review.
	7. Customer confirms the damage report and the system calculates the repair cost (if any).
	8. System displays the final rental cost, including the repair cost, if any.
	9. Customer makes the final payment and the system confirms the return of the laptop.

Post-Conditions:

- Customer has successfully returned the laptop.

- System updates the availability of the laptop.

- System generates a final rental report for the customer.

This use case represents a basic scenario for returning a laptop through the Laptop Hire Management System. The system can be enhanced to include additional functionality, such as providing receipts, printing damage reports, and notifying customers of any overdue rentals.

Entity-Relationship (ER) modeling

Entity-Relationship (ER) modeling is a technique used to model the data in a

software development project. In the context of the Laptop Hire Management

System (LHMS), the following are some of the main entities that can be modeled
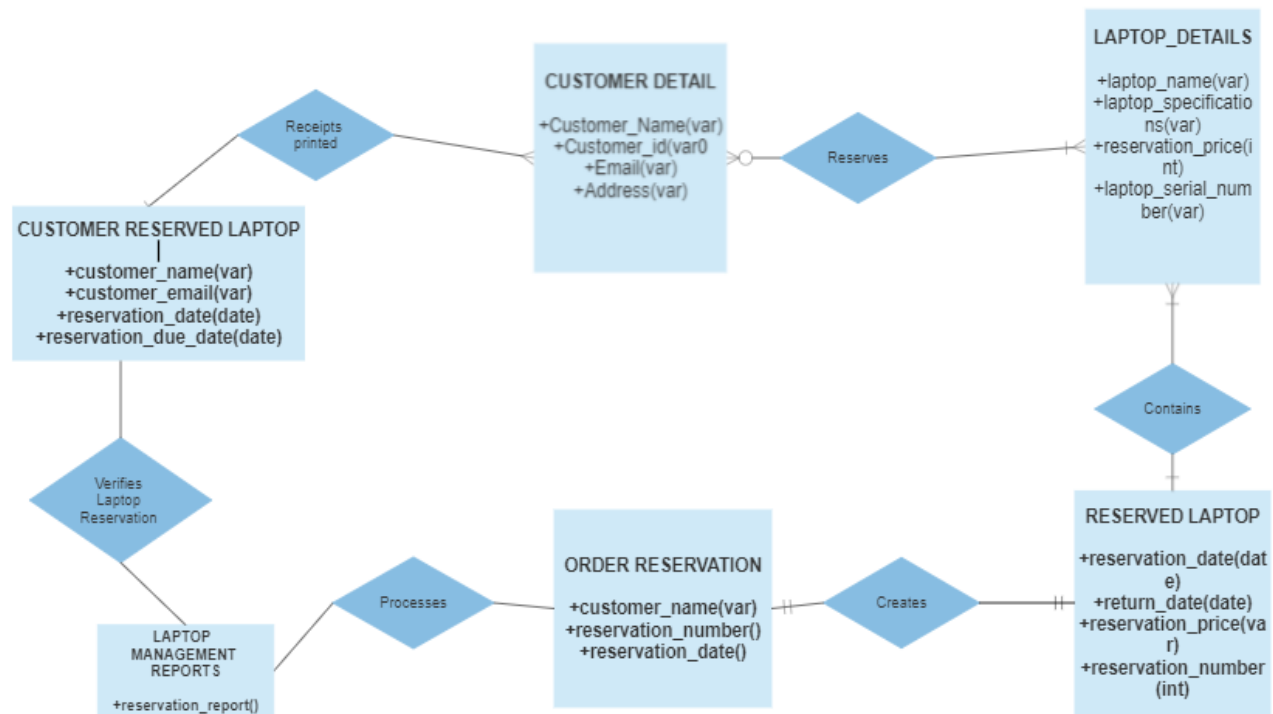
using ER modeling

| Learning Outcome(s):

LO3 and LO5 | **Under this section, include the following:**

   • **Transform the ER diagram from the previous phase: Develop the logical and physical database design.** (2 marks)
   • **Screens Design (create the User Interface Structure Design), and sample system screens, forms, and reports design. No need to be in HTML, they can be just drawing of how the screen will appear.** (2 marks)
   • **Design and appropriate Architecture for your proposed system** (1 mark)

Answer: |

Transform the ER diagram from the previous phase: Develop the logical and physical database design. (2 marks)

Screens Design (create the User Interface Structure Design), and sample system screens, forms, and reports design. No need to be in HTML, they can be just drawing of how the screen will appear. (2 marks)

User Login Screen

E-Mail:

Password:

| Create Account | Login |

WELCOME BACK TO LAPTOP HIRE MANAGEMENT SYSTEM (LHMS)

You looking for a laptop to rent we got you… Search for available laptops here

You have | 0 Months, 4 Days, 23 Hours, 35 Minutes | left to return your laptop

| View profile Information | Renting History | Payment statement | About us |

Reserving A Laptop or Returning a Laptop That Is Due

Select Laptop:

[   ] [Info]

Select reservation date:

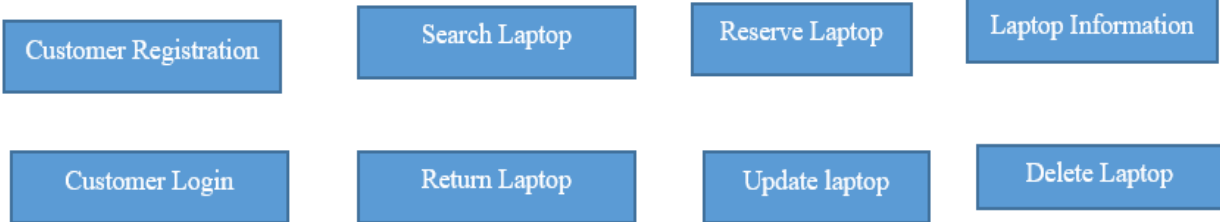[   ]

Select return date:

[   ]

Additional Remarks:

[   ]

[Confirm Laptop Reservation]

[Return Laptop]

Design and appropriate Architecture for your proposed system (1 mark)

APPLICATION LAYER

Customer Registration	Search Laptop	Reserve Laptop	Laptop Information
Customer Login	Return Laptop	Update laptop	Delete Laptop

BUSINESS LAYER

System Administrator	Customer	Laptops For Hire

DATA LAYER

Laptop Data Table	Customer Info Data	Reservation Report

Payment Report