Name: Dogiparthi Aasrith
Registration Number: 21BAI1702
Faculty: Dr. Smrithy G S
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LAB-1

Identify the Suitable Process Model

Aim: An Online Railway Ticket Reservation System (ORTR) needs to be developed for the convenience of public availing the various services provided by the Railways department. ORTR should provide information about the arrival and departure of trains along with information about stations through which it passes. Search for trains passing through the stations can be obtained either by means of train number, train name, or specifying the source and destination stations. While displaying information about a train, it must display the availability of seats in different classes along with the waiting list position.

Users can make payment through online using their credit/debit cards or internet banking.

Users can cancel the booked ticket prior to the scheduled departure date and time.

Suggest the most appropriate generic software process model that might be used as a basis for managing the development of the ORTR software system. Justify your answer with relevant arguments.

Theory:

The most appropriate software process model for developing the ORTR system would be an incremental model.

Incremental Model is a process of software development where requirements divided into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation and testing phases. Every subsequent release of the module adds function to the previous release. The process continues until the complete system achieved.

1. Requirement analysis: In the first phase of the incremental model, the product analysis expertise identifies the requirements. And the system functional requirements are understood by the requirement analysis team. To develop the software under the incremental model, this phase performs a crucial role.

2. Design & Development: In this phase of the Incremental model of SDLC, the design of the system functionality and the development method are finished with success. When software develops new practicality, the incremental model uses style and development phase.

3. Testing: In the incremental model, the testing phase checks the performance of each existing function as well as additional functionality. In the testing phase, the various methods are used to test the behaviour of each task.
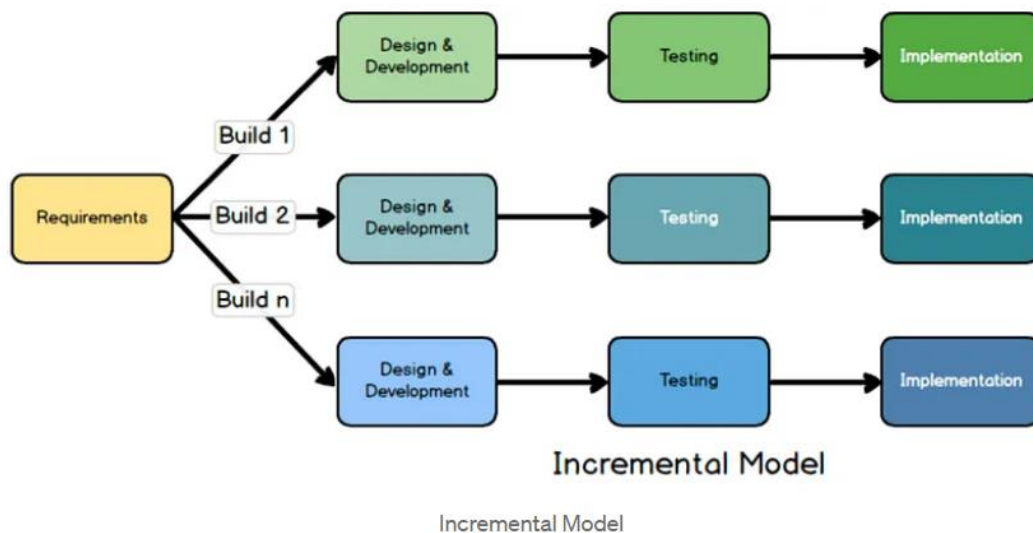
4. Implementation: Implementation phase enables the coding phase of the development system. It involves the final coding that design in the designing and development phase and tests the functionality in the testing phase. After completion of this phase, the number of the product working is enhanced and upgraded up to the final system product.
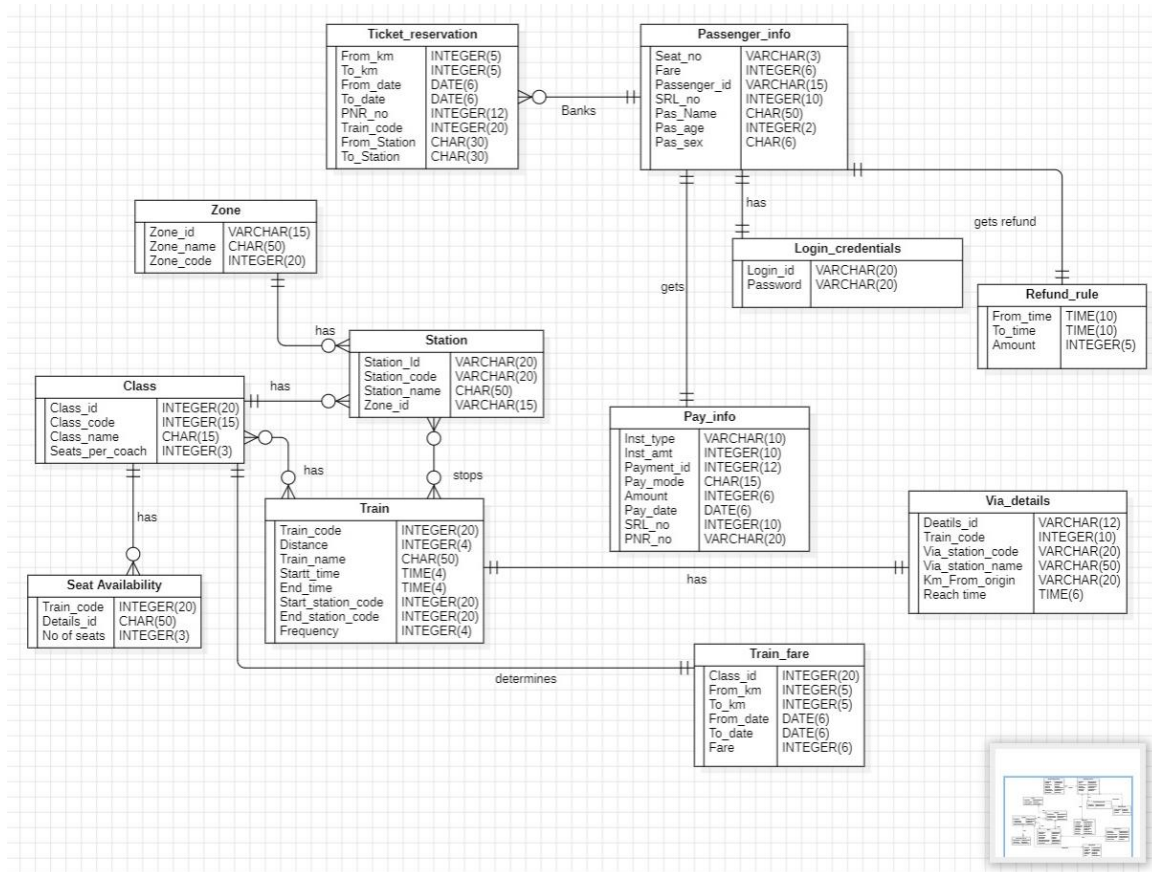
Implementation:

- **User Involvement and Feedback:** The iterative and incremental model emphasizes continuous user involvement throughout the development process. This is crucial for a system like ORTR, where user requirements may evolve or new features may be identified during the development process. Regular feedback from users can help in refining and enhancing the system.
- **Evolutionary Development:** The requirements for a railway ticket reservation system might not be fully understood at the beginning, and they may evolve over time. The iterative and incremental model allows for progressive refinement of the system through successive iterations. This ensures that the system can adapt to changing requirements and emerging challenges in the railway domain.

- **Phased Development:** The ORTR system is complex, involving multiple functionalities such as train information, station details, seat availability, online payment, and cancellation. The Incremental Model allows for phased development, where each phase can focus on a specific set of functionalities. This facilitates easier management and reduces the risk of overwhelming the development team.
- **Early Delivery of Core Functionality:** The iterative approach allows for the early delivery of essential features. In the context of ORTR, this could involve implementing the basic functionality of searching for trains, checking availability, and making reservations. This allows users to start benefiting from the system sooner and provides an opportunity to gather feedback early in the development process.
- **Risk Management:** The railway ticket reservation system involves several complex components such as payment processing, seat availability management, and cancellation functionalities. An incremental approach allows the team to address high-risk components early in the development process, reducing overall project risk.
- **Flexibility in System Design:** The iterative model allows for flexibility in system design. As the team gains a better understanding of user needs and system requirements, they can make adjustments to the design and architecture of the system in subsequent iterations. This is beneficial for accommodating changes in regulations, technology, or user preferences.

- **Parallel Development:** Different modules or features can be developed in parallel during different iterations. For instance, the team can work on the reservation module, payment processing module, and cancellation module simultaneously. This parallel development can speed up the overall development process.
- **Verification and Validation:** Each iteration involves a cycle of planning, implementation, testing, and evaluation. This ensures that the system is continually validated against user requirements, and issues can be identified and addressed early in the development lifecycle.

- **Maintenance and support:** Provides continuous support and maintenance for the deployed ORTR system.

Diagram of Incremental Model

Incremental Model

Ticket_reservation

From_km	INTEGER(5)
To_km	INTEGER(5)
From_date	DATE(6)
To_date	DATE(6)
PNR_no	INTEGER(12)
Train_code	INTEGER(20)
From_Station	CHAR(30)
To_Station	CHAR(30)

Banks

Passenger_info

Seat_no	VARCHAR(3)
Fare	INTEGER(6)
Passenger_id	VARCHAR(15)
SRL_no	INTEGER(10)
Pas_Name	CHAR(50)
Pas_age	INTEGER(2)
Pas_sex	CHAR(6)

has

gets refund

Zone

Zone_id	VARCHAR(15)
Zone_name	CHAR(50)
Zone_code	INTEGER(20)

Login_credentials

Login_id	VARCHAR(20)
Password	VARCHAR(20)

gets

Refund_rule

From_time	TIME(10)
To_time	TIME(10)
Amount	INTEGER(5)

has

Station

Station_Id	VARCHAR(20)
Station_code	VARCHAR(20)
Station_name	CHAR(50)
Zone_id	VARCHAR(15)

Class

Class_id	INTEGER(20)
Class_code	INTEGER(15)
Class_name	CHAR(15)
Seats_per_coach	INTEGER(3)

has

Pay_info

Inst_type	VARCHAR(10)
Inst_amt	INTEGER(10)
Payment_id	INTEGER(12)
Pay_mode	CHAR(15)
Amount	INTEGER(6)
Pay_date	DATE(6)
SRL_no	INTEGER(10)
PNR_no	VARCHAR(20)

stops

has

Via_details

Deatils_id	VARCHAR(12)
Train_code	INTEGER(10)
Via_station_code	VARCHAR(20)
Via_station_name	VARCHAR(50)
Km_From_origin	VARCHAR(20)
Reach time	TIME(6)

has

Train

Train_code	INTEGER(20)
Distance	INTEGER(4)
Train_name	CHAR(50)
Startt_time	TIME(4)
End_time	TIME(4)
Start_station_code	INTEGER(20)
End_station_code	INTEGER(20)
Frequency	INTEGER(4)

has

Seat Availability

Train_code	INTEGER(20)
Details_id	CHAR(50)
No of seats	INTEGER(3)

determines

Train_fare

Class_id	INTEGER(20)
From_km	INTEGER(5)
To_km	INTEGER(5)
From_date	DATE(6)
To_date	DATE(6)
Fare	INTEGER(6)

Conclusion:

The Incremental Model is well-suited for the development of the ORTR system, considering its complexity, user interactions, and the need for phased implementation of various functionalities. This model aligns with the iterative nature of software development and provides flexibility in adapting to changing requirements.