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Question 1

Process Model 1: Waterfall Model

An example of a software project implementing the waterfall model would be a payroll management system. This project has well-defined requirements like calculating salaries, handling deductions, creating pay slips, and maintaining attendance records. The process follows a clear sequence from gathering requirements (pay rate calculations, deductions), designing and implementing calculation tools, testing for accuracy and validation, to deploying the software and training HR. The requirements are unlikely to change after an initial analysis so a linear and phase-by-phase process is appropriate.

Process Model 2: V-Model

An example of a software project implementing the V-Model would be a medical device software for a healthcare company. This is because medical devices requires thorough testing to guarantee safety and adherence to legal requirements and the V-Model places strong emphasis on validation and verification at every stage. This guarantees flaws are found quickly which makes this model perfect for applications with stringent quality standards like medical devices.
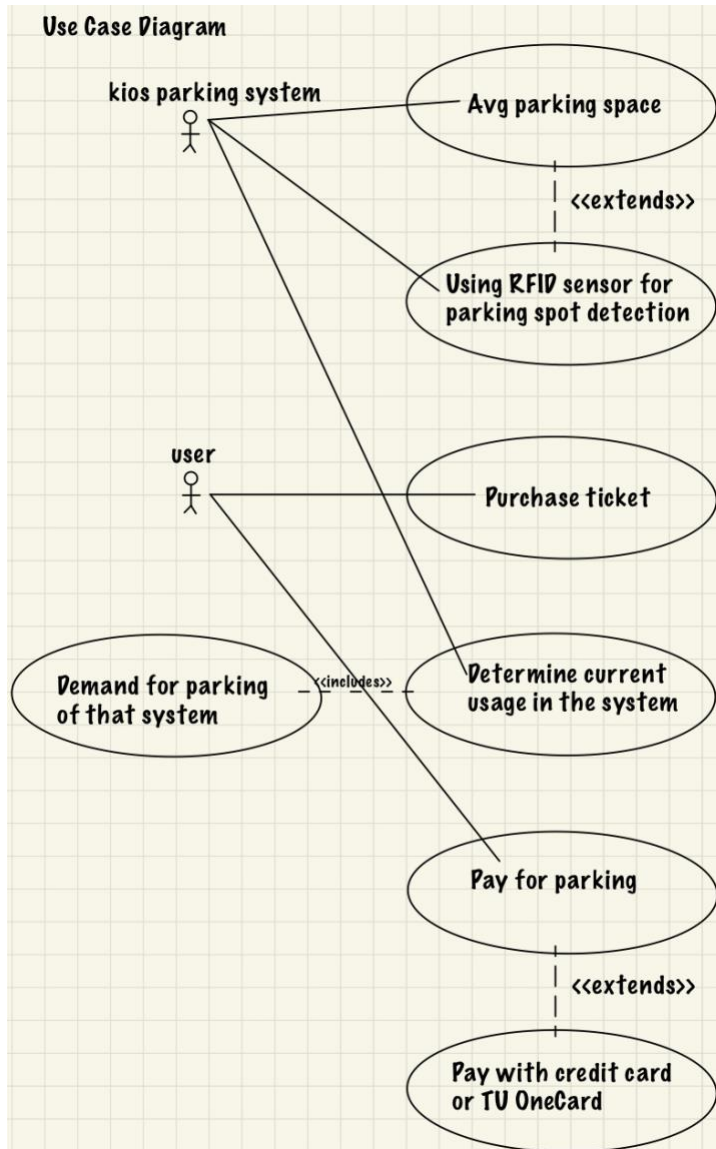
Question 2

a) Two Functional Requirements

1. The kiosk must allow users to purchase a parking ticket for a requested period and either using a credit card or a TU OneCard. This is a functional user requirement.
2. The system must calculate and display the current parking price based on real-time demand data and historical parking usage. This is a functional system requirement.

b) Two Measurable Non-Functional Requirements

1. After the user enters their payment details, the system should process the parking ticket purchases within 5 seconds of the user submitting.

2. The RFID sensors must detect the status of a parking space within 2 seconds of a car entering or leaving the space.

c) Use Case Diagram

Use Case Diagram

kios parking system

Avg parking space

<<extends>>

Using RFID sensor for parking spot detection

user

Purchase ticket

Demand for parking of that system — <<includes>> — Determine current usage in the system

Pay for parking

<<extends>>

Pay with credit card or TU OneCard

Assumptions:

- The system assumes users will pay for parking using either a credit card or a TU OneCard with no other payment methods supported
- The system assumes that spot detection is handled by RFID sensors meaning the parking system is equipped with sensor technology that can monitor space availability

- The system assumes it has the capability to track real-time parking usage for entry, exit, and occupancy statuses
- The system assumes it can automatically organize available parking spaces