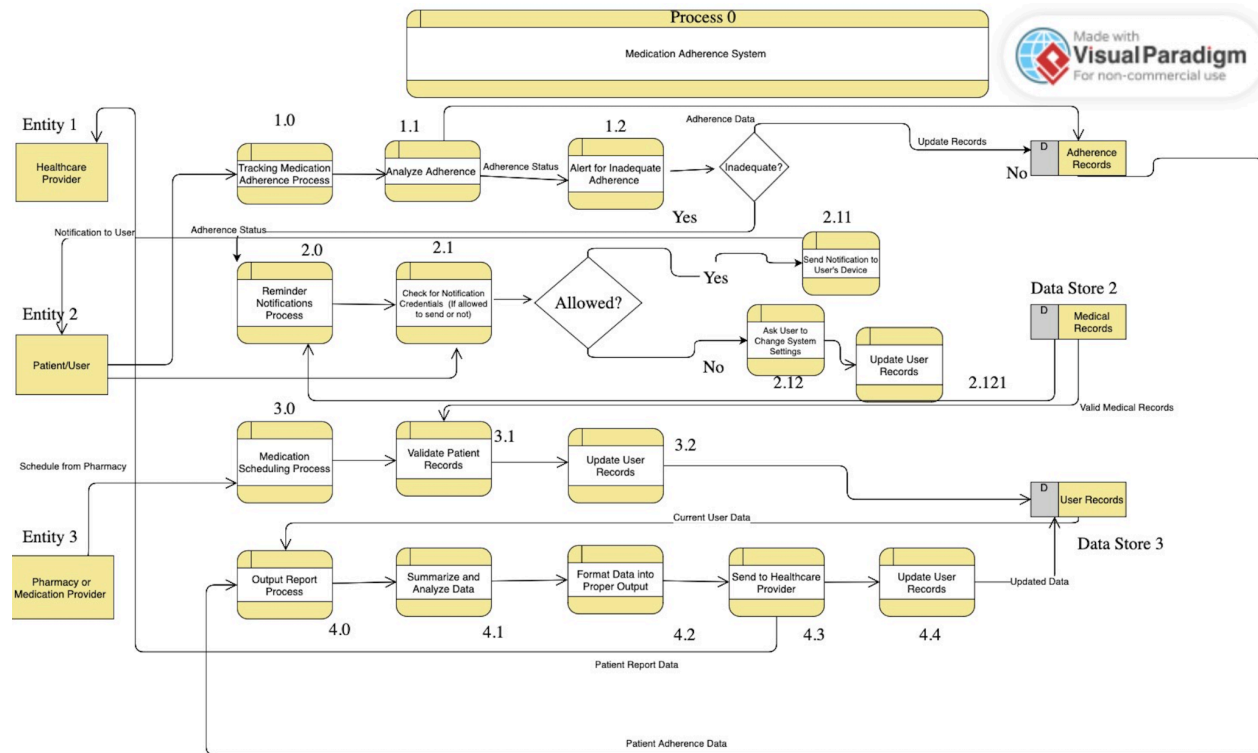CMSC 355: Pre-Dev, Data Flow Diagram
Project: Medication Adherence System
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Data Dictionary:

Data Flow	Data Item	Details
Tracking System - logs of system usage and user interaction	Usage data	Evaluation of user compliance with medication schedules
	Adherence Analysis	Evaluation of trends in adherence
	Alert Based on Status	Notifications triggered by adherence status (e.g, missed dose alerts)
	Adherence Records	Historical data on medication adherence, including missed and taken doses

	User Records	User profile details like name, age, contact info, and preferences
	Medical Records	Includes prescriptions, patient history, doctor notes, and diagnosis details
Reminder System - is a system that manages user adherence notifications and settings	Settings Data	User-defined notification preferences for reminders (e.g, time, frequency, type)
	Adherence Status	Current compliance level with prescribed medications (e.g, on time, delayed, missed)
	Medical Records	Prescriptions, patient history, and diagnosis
	User Records	User profile details like name, age, contact info, and preferences
	Medication Schedule	Timings, dosage, and frequency of prescribed medications
Medication Scheduling - setting up the timings, dosage, and frequency of prescribed medications	Medical records	Includes prescription details and scheduling data (e.g, next refill, dosage updates)
	Pharmacy records	Data from pharmacies about medication fulfillment (e.g, prescription pickup status)
	User Records	User profile details like name, age, contact info
Report creation - generating user reports	Adherence status	Summary of patient compliance with prescribed medications
	Medical Records	Patient prescriptions and history
	User Records	User profile details like name,

		age, contact info
	Medication Schedule	Prescription timing, dosage, and adherence data
	Healthcare provider contact data	Doctor and pharmacy details like name, address, contact
	Summarized analysis	Aggregated insights on adherence, trends, and system usage
	Adherence analysis	Evaluations based on adherence trends and records for healthcare providers.

Level 3: Structured English

Process 0: Medication Adherence System

Process 1.0 Track Medication Adherence Process
FOR each patient in User Records (consists of data, such as user's name, age, contact information)

      Retrieve Usage Data from the Tracking System

      Gather User Input on Adherence:

            Prompt user to to confirm if they took their medication (can be entered manually or automatically via tracking device)

            IF user confirms medication was taken:

                  Update Adherence Record as "Taken"

                  Log the timestamp of when the medication was taken

            ELSE

                  Update Adherence Record as "Missed"

                  Log the timestamp of when the medication was missed

      Store updated Adherence Record in Adherence Records.

END FOR

Process 1.1 Analyze Adherence
FOR each medication record in Adherence Records

      Analyze patient's Adherence Records

            Calculate the adherence percentage based on the total number of doses and number of doses taken

      Determine the patience Adherence Status

            IF adherence is under the threshold THEN

                  Set Adherence Status to "Inadequate"

            ELSE

                  Set Adherence Status to "Adequate"

      Store the status results in Adherence Analysis

END FOR

Process 1.2 Alert for Inadequate Adherence
IF Adherence Status is "Inadequate" THEN

      Send Alert Notification via Reminder System

      Log the occurrence of non-compliance in Tracking System

END IF

Process 2.0 Reminder Notifications Process
FOR each patient in User Records
        Retrieve Settings Data from Reminder System
        Retrieve Adherence Status
        IF notifications are turned ON, THEN
                Send reminder notification
        ELSE
                Ask user to turn on notification
END FOR

Process 2.1 Check for Notification Credentials
IF Settings Data allows reminders THEN
        Send reminder notifications
ELSE
        Prompt user to allow notifications
END IF

Process 2.11 Send Notifications to User's Device
Send reminder notification as per Medication Schedule

Process 2.12 Ask User to Change System Settings
IF Adherence Status is Inadequate and reminders are not allowed, THEN
        Ask the user to update their Reminder System settings
        Provide user with options to allow notifications
        Allow the user to set reminder preferences to their liking, including: time of day
        reminders are sent (morning, afternoon, night), notification type (SMS, app notification,
        email, etc)

Process 2.121 Update User Records
Store the updated notification settings in User Records
Confirm the new changes to Reminder System and Settings Data

Process 3.0 Medication Scheduling Process
FOR each patient in User Records
        Retrieve Medical Records
        Retrieve Pharmacy Records
        Gather Prescription Details, including: Medication Name, Dosage, Administration Time
        Update Medication Schedule and store it in Settings Data
END FOR

Process 3.1 Validate Patient Records
FOR each User Record
        Verify them alongside with Medical Records
        Cross-check with Pharmacy Records
END FOR

Process 3.2 Update User Records
FOR each new user OR when updating an existing User Record
        IF User Record doesn't exist, THEN
                Collect user details, such as name, age, and contact information
                Store user information in User Records
        ELSE IF user already exists, THEN
                Update user details if needed
                Check to ensure Medication Schedule is stored in User Records

Process 4.0: Output Report Process
FOR each User Record
        Retrieve Adherence Status
        Summarize Adherence Analysis (call up results from Process 4.1)
        Generate Report Data
END FOR

Process 4.1 Summarize and Analyze Data
FOR each patient in Adherence Records
        Perform summarizing statistical analysis of adherence data (adherence percentage, missed doses, trends)
        Store summarized adherence data (collect adherence percentages, trends, and insights)
        Arrange all Adherence Trends
        Analyze Medication Schedules
END FOR

Process 4.2 Format Data into Proper Output
IF Healthcare Provider needs a report THEN
        Obtain report data for Medical Records
        Structure report in a format suitable for healthcare provider (tables, charts, or detailed analysis)
ELSE
        Obtain report for user's display (simplified summary that is formatted in user-friendly format

Structure the report in a format suitable for the user (inc. summary of adherence with graphs or simple text)

Generate a readable output file (PDF, HTML, etc)

END FOR

Process 4.3 Send to Healthcare Provider

Send Report Data to Healthcare Provider Contact Data

Process 4.4 Update User Records

Store the Adherence Analysis in User Records