CS2310 "Multimedia Software Engineering" – Dr. Chang / Ge

Exercise 4

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Problem 1

This is the multimedia database scheme:

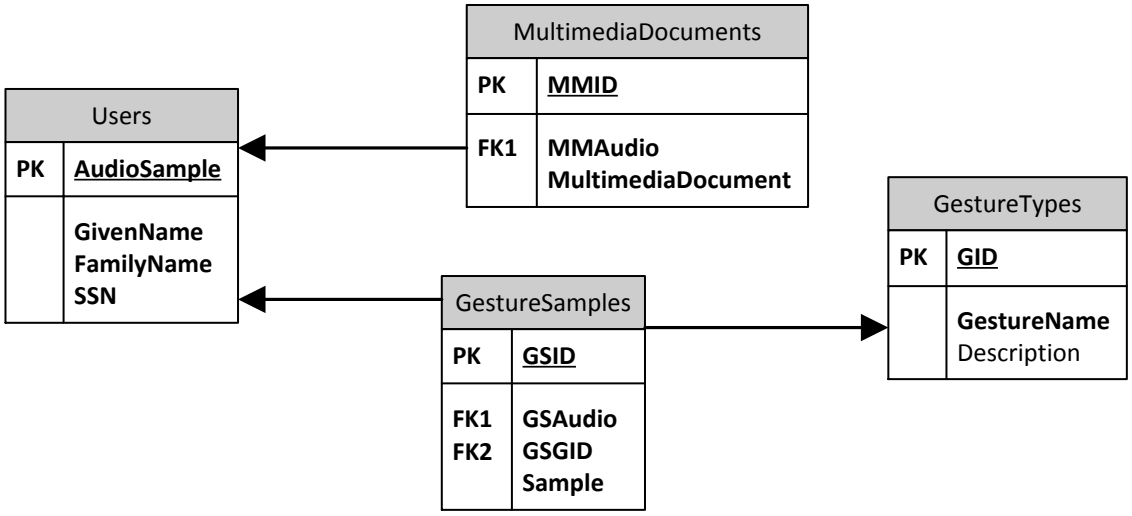

Figure 1 Database Scheme

The first table is Users. It contains basic information about every user (sinior citizen). The primary key for the table is an audio sample of the voice of the user. The voice of every man is unique due to the actual shape and size of an individual's vocal cords and also due to the size and the shape of the rest of that person's body, especially the vocal tract, thus the voice of the user is a suitable primary key.

The GestureTypes table has a unique key, which is a number, a name of the every type of gesture and a shord description about it.

The table GestureSamples covers the relationship between the users and the way they exercise the gestures – i.e. there is certain deviation from the predefined standart of the way every person

makes very type of gesture. That's why the samples are kept in this table – it links the actual gestures, their authors and the gesture type, which is actually exercised. GSAudio is foreign key to the users table and GSGID is foreign key to the GestureTypes table.

The last table is MultimediaDocuments. It has MMID column, which is the primary key. MMAudio is the foreign key to the Users table. MultimediaDocument is a large binary document (BLOB), which is the content, the user actually wants to access – it might be a graph of the EKG of the person, a video from his MRI, etc.

The database is in third normal form, which required the every table to have its own primary key and every field to have its own unique name. The relationships between the tables are many-to-one.

The way the system works is as follows – the user will make some gestures. The system will intercept them, then it will recognize them and based on the relationship of the GestureSamples table with the other tables, the system will find the identity of the user as well as it will get the semantics of the exercised gestures. Based on these results, the system will know who the user is and what information he wants to receive back from the system. Based on the primary key in the Users table and the semantics of the gestures, the system will extract the desired BLOB(s) from the MultimediaDocuments and will present them to the user.

The IC Cards are listed as follows:

IC Card IC Name: MakeGesture

Description: The user is supposed to make the gestures
Interaction Pattern:

By Myself with Interaction

My Task: Make gestures
Time Critical Condition: N/A
Name of Other IC: HealthCareSystem
Message to Other IC: gesture
Other IC's Task: Intercept the gesture
Card 1of 6 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: RecognizeGesture

Description: The Health care system should recognize the gestures
Interaction Pattern:

By Myself no Interacton
My Task: Toe recognize the gestures
Time Critical Condition: N/A
Name of Other IC: none
Message to Other IC: none
Other IC's Task: none
Card 2of 6 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: RetrieveUserID

Description: The HEalth care system should retrieve the user ID (the audio smaple)
Interaction Pattern:

By Myself no Interacton
My Task: Recognize the user (find his/her ID)
Time Critical Condition: N/A
Name of Other IC: none
Message to Other IC: none
Other IC's Task: none
Card 3of 6 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: ClassifyGestures

Description: The health care system should classify the gestures, based on their semantics
Interaction Pattern:

By Myself no Interacton
My Task: Understand what the user wants
Time Critical Condition: N/A
Name of Other IC: none
Message to Other IC: none
Other IC's Task: none
Card 4of 6 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: RetireveInformation

Description: The health care system should retrieve the multimedia documents the user is trying to get
Interaction Pattern:

By Myself no Interacton

My Task: retrieve the desired BLOBs
Time Critical Condition: N/A
Name of Other IC: none
Message to Other IC: none
Other IC's Task: none
Card 5of 6 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: PresentMMDocuments

Description: The healthcare system should present/send back the multimedia documents to the user
Interaction Pattern:

By Myself with Interaction

My Task: Present the BLOBs to the user
Time Critical Condition: N/A
Name of Other IC: user
Message to Other IC: Get these multimedia documents
Other IC's Task: to use the multimedia documents
Card 6of 6 (If necessary please use several IC cards to describe an IC)