The purpose of this section is to describe Heart Disease Diagnosis HDD system and design approach focusing on the following three aspects:

**(a) the architecture of the system**:

Graphical user interface layer (web based)

EHR system

Heart Disease Diagnosis system

TPA external systems (e.g.1177.se)

TPA database

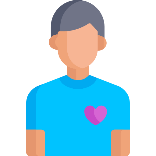
EHR database

Training database

Testing database

Security and authentication layer

Communication bus



**(b) how would you embed the classifier to the system**:

The trained algorithm of the classifier will be accessed by users using a web-based GUI through security and authentication layer to ensure that only users with the right access use it. A communication bus will be used to facilitate the interaction between several systems as the classifier will fetch part of the input data from the existing EHR data and/or third party administrated systems (like 1177 for example) then store back the predicted classification result in the EHR system.

The saved data in the EHR system could be used for training and testing purposes for future enhancement of the algorithm but in a manual process not with an automatic integration in order to preserve the system integrity.

**(c) use case**: describing user requirements specifications for a “Physician” with a patient who would like to get a prediction from the algorithm to classify the heart disease diagnosis of the patient and store this classification for future reference.

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| **UC\_001** | **Classify patient use case** |
| **Description** | The user enters the needed patient’s information in order to get the patient diagnosed and classified for heart disease and store this classification. |
| **Precondition** | * The user is authenticated with a secure login for “Physician” role. * Patient’s data is retrieved from EHR system and/or TPA systems. |
| **Ordinary Sequence** | 1- the system fetch patient data from EHR system and display to the user.  2- the user enters the missing data needed for the classification.  3- the user could modify the prepopulated data.  4- the user clicks the button “Classify”  5- the system displays the classification result  6- the user clicks “save” to save the results  7- the user exits the system |
| **Postcondition** | The patient is classified, and result is stored. |
| **Exceptions** | Steps 2 and 3: the user enters wrong value in one or more of the input fields or leave it empty then the system should highlight the error field and display error message “the highlighted fields should be filled with an acceptable value”  Step 7 the user attempts to exit the system before saving the result then the system should give warning message “You did not save the classification result, do wish to close without saving” with two options to exit without saving or cancel |
| **Comments** | After step 5 the user could repeat steps 3, 4, and five to check how different input parameters affect the result of the classification. |