SRS – Neurology Diagnosis System

Version 1.0

Revision History

Date	Revision	Description	Name	Approved By
11/22/2008	1.0	Initial version	NDS Team	Bikram Lal Shretha(mentor)

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1 Introduction

1.1 Purpose

The purpose of this specification is to describe all technical requirements of the product.

1.2 Scope

This document covers the all detail specifications of the product.

2 High Level Requirements

The main requirement of the project is to perform in place of a neurology expert but for ones who are from the same domain. This is because the project is highly domain specific.

As a neurology expert, once the system receives the details from the patient, it processes the case to display possible diseases, provide suggestion for further diagnosis and also provide a list of similar cases of past patients.

The system also provides functionalities to search patients' cases, add and modify rules for the neurology domain.

3 Functional Requirements

3.1 Maintain Cases

3.1.1 Purpose

Maintain cases of the patients by providing functionalities to search existing cases and insert, modify and remove cases.

3.1.2 Specifications

The input is the details of the patient

1. General information of patient
2. General assessment results
3. Upper limb neurology system results
4. Lower limb neurology system results
5. Carnal nerves results
6. Hematology test results
7. Biochemistry test results
8. Arterial blood gases results
9. Prescriptions

The system will process these data to check the appropriate format and store the information for any time retrieval and modification

3.2 Maintain Rules

3.2.1 Purpose

Maintain rules by providing functionalities to insert, modify and remove rules.

3.2.2 Specifications

The system receives rules in a predefined format which is simply, ‘IF symptom THEN disease OR further diagnosis’ and processes the rules inserted or modified to check whether it is in the appropriate format. Then, it will store the rules for future inferences.

3.3 Provide Expert Solution

3.3.1 Purpose

Once a patient’s case has been inserted, provide following expert solutions

1. Possible diseases that the patient is suffering from
2. Suggestions for further diagnosis
3. List of similar cases (the cases that match the case of the patient)

3.3.2 Specifications

1. The rule-based engine will process the current case and the rules to arrive at a solution that gives the list of diseases and the suggestions for further diagnosis.
2. The case-based engine will process the current case and the past cases to retrieve the most similar cases from the case base.

3.4 User Interface

3.4.1 Purpose

Provide a user interface to fulfill all above functional requirements.

3.4.2 Specifications

The feature will provide facilities to interact with the user to collect data and forward them to the back end and receive data from the back-end to display them for the user.

4 Nonfunctional Requirements

4..1 Usability

- Usually, to achieve flexibility and efficiency, a Graphical User Interface is hierarchically organized for novice users, medium users and regular users. Since our system is for experts, who will use software in regular basis, we focus on efficiency more than flexibility. Although this increases the training time, it saves a lot of time during regular usage.
- Assuming that the expert has sufficient domain knowledge, the user needs the training of approx. 8 hrs to use the system.

4..2 Reliability

- The system will be available all the time as long as it is hosted in a reliable server.

4..3 Performance

- We estimate that there will be maximum of 200 rules and maximum of 1000 cases of patients. The biggest concern for performance is the time taken by the Expert System Inference Engine (AI Engine) to produce results. This time, around 2 seconds, plus the time taken by the web server, DBMS and the server respond time sums up to around 4 seconds.

4..4 Security

- The users (domain experts) will be provided secure login through username and password.
- The administrative features like adding and modifying rules will only be allowed to a few domain experts who will have admin rights and they will be authorized through username and password.