**Software Requirements Specification**

**On**

**Optimal Scheduling of Automated Diagnostic Self-Tests in an MRI Scanner System**

**SUBMITTED BY**

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***Under the guidance of***

1. **Project Overview**

MR Imaging System contains certain Automated Diagnostic Self-Tests which diagnose the functioning of the system, and provides the information about any malfunctions within the system components (hardware and software) which can potentially hinder the proper operation of the system. These diagnostic self-tests are currently scheduled at a preconfigured fixed time every day and also there will be additional tests running at the beginning of every month (at a preconfigured time). These Self-tests acquire many of the MR system resources, some of which are required for scanning of patients (the primary objective of the MRI scanner). As a result, when these pre-configured tests are executing, the system cannot be operated for clinical use leading to patient inconvenience (especially emergency scans), and dissatisfaction of the customers (hospitals) due to the unavailability of the system for its primary intended purpose. My project provides a unique solution to optimally schedule these predefined automated diagnostic self-tests.

1. **External Interface Requirements**
   1. *Hardware Interfaces:*

The application will run on MR Environment configured test systems.

* 1. *Software Interfaces:*

Inputs

The application takes the tasks which control the MR Self-tets as arguments.

Outputs

The application postpones the tasks according to the user convenience and System’s usage.

* 1. *Communication Interfaces:*

The application requires intranet connection to execute several functions such as “searching for the scheduled tasks” and “their running time” and “postponing the tasks”.

1. **Functional Requirements**

*3.1* Identify how Windows tasks are scheduled, controlled, and how they can be manipulated and programmatically controlling the scheduled tasks.

* 1. Methodology to optimally schedule the predefined automated diagnostic self-tests.
  2. Identify the System’s usage through task scheduler and postpone the self-tests whenever there is no task running.
  3. Creating a task which reschedules the trigger of the self-tests task to its default trigger which is helpful in postponing the task only for a particular day.

1. **Software System Attributes**

*4.1* *Reliability:*

The application will meet all of the functional requirements without any unexpected behavior.

*4.2* *Availability:*

The application will be available on demand provided the user has the necessary interfaces for the proper functioning of the application.

*4.3* *Security:*

The application only patches the necessary processes and will not affect the proper functioning of other applications in the user’s system.

*4.4* *Portability:*

The application is designed to run on Microsoft Windows operating system.

*4.5* *Maintainability:*

The application will be written clearly and concisely. The code will be well documented. Particular care will be taken to design the project modularly to ensure that maintenance is easy.

1. **Performance Requirements**
   1. *Real-Time:*

The application requires latest build metadata for current development stream.

* 1. *System Resource Consumption:*

Resource consumption of this application will not reach an amount that affects the normal processing of user’s system.

1. **Design Constraints**

The design constraints that will affect the design of this application are the schedule and the performance.

The project must be completed on schedule and the performance of the application must be very high.

1. **Other Requirements(if any)**

Knowledge of C# programming language, domain knowledge of MR are the additional requirements required.