Software Requirements Specification
for
Automated Evaluator of Handwritten Malayalam Answer Scripts
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Contents

1 Introduction

1.1 Purpose

The purpose of this document is to give a detailed description of Automated Evaluator of Hand-written Malayalam Answer scripts. This document will explain purpose and features of the system and identifies its users. It is intended for both the evaluators and management concerned with the evaluation of hand-written answer scripts in malayalam language as well as end-users of the system.

1.2 Scope

The "Automated evaluator of Handwritten Malayalam Answer scripts" will be a platform used for automatic evaluation of hand-written answer scripts and generation of marks. The user should scan and upload the answer scripts into the system for getting the answer scripts evaluated. The system will save the marks allocated to individual questions. The total marks are also calculated and saved in the system. The system will be designed to :

- save the time of evaluators by automating the evaluation of malayalam hand-written answer scripts.

- compare the written answers to the answer key and allocate marks to individual questions.

- calculate the total marks and save the total marks.

- provide platform independency and maintainability.

The product saves the time of the user by automatically evaluating malayalam hand-written answer scripts and granting marks to the correct answers thereby eliminating manual evaluation.

1.3 Document Conventions and Acronyms

Term	Defenition
NLP	Natural Language Processing is a sub domain of Machine Learning consisting of training machines to make sense of text and speech, and perform automated tasks like translation, summarization, classification, and extraction
Score Card	A report of the marks obtained for each uploaded answer file.
User	A person who wants to evaluate an answer sheet (written in malayalam language)

1.4 References

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1.5 Overview

Section 2 of this document gives an overall description about the product.It describes the general functionalities,expected user groups and constraints of the product. Section 3 gives more specific information about the functionalities specified in section 2 . Section 2 is a general view of the system and should be used as a guidance to section 3. Section 3 is intended for developers and testers and may be skipped by end users.

2 Overall Description

2.1 Product Perspective

This product is a website for the auto evaluation of malayalam hand-written answer scripts. This is an alternative for the existing manual system of evaluating malayalam handwritten scripts. It will help the intended users-teachers to evaluate the answer scripts in a more simplified way.

2.1.1 User Interfaces

The website will have a user-friendly interface.Buttons and dialog-boxes for insertion of scanned versions of malayalam handwritten scripts will be available.The user can select "Upload answer

script" button from the menu to upload an answer script. To view the score generated,user can select "View score" button from the menu.Buttons will be available to download the score-card generated in pdf format.

2.1.2 Software Interfaces

The software interface should follow the Model-View-Controller (MVC) model for rendering and modeling data objects.The interface must be able to connect to a database to store XML schema defined using XSD and data streams. Source and destination formats for data must include XML and may also include: Extensible Stylesheet Lanaguage Transformation (XSLT), JavaScript Object Notation (JSON), Portable Document Format(PDF), Comma Separated Value (CSV), and American Standard Code for Information Interchange (ASCII). The website requires the following software interfaces to run.

2.2 Product Functions

This section outlines the use cases of the user. Specific functionalities will be discussed in section 3.

2.2.1 Upload scanned versions of Answer Scripts

The user can upload separate scanned version of each hand-written malayalam answer in jpeg format.User can select a file of max size 5MB from the device.The user can upload atmost one scanned copy for each answer at a time. After selecting the required file,the user can select the "Upload answer script" button to save the uploaded file in jpeg format.

2.2.2 View and Download Score card generated

User can open,view and download the score card generated for each evaluated answers in pdf format.

2.2.3 Evaluate an Answer script

Once an answer script has been uploaded,the user can select the "Evaluate answer" option available to evaluate the uploaded answer.

2.3 User Characteristics

The users of this system are the evaluators and management concerned with the evaluation of hand-written answer scripts in malayalam language. The user must be familiar with any scanning software like Adobe Scanner, Cam Scanner etc. The user category includes

1. Evaluators of evaluation of hand-written answer scripts in malayalam language
   User under this category must be able to scan and upload a malayalam hand-written answer script using any scanning software. They must also be able to upload an answer key to the website. The knowledge is advised for better use of the product. They are not expected to be knowing about the technology used for auto-evaluation of answer scripts. Knowledge about the model used, working of the model etc are also not required.

2. Management concerned with evaluation systems
   Users in this category are those, who needs to re-evaluate the scripts to ensure accuracy of manual correction.Users in this category must be able to to scan the answer scripts and

upload to generate the score-card.No knowledge of the working of the models and algorithms used are needed.

2.4 Constraints

Every component of the system should be written in Java. The source code must follow Java 7 API and should not use any depecrated APIs.

2.5 Assumptions and Dependencies

None

2.6 Apportioning of requirements

The following requirements shuld be provided as increments on future versions and need not be included in the first release. This is to ensure the delivery requirements of the product. No more specific details for these requirements will be provided in section 3.

1. Evaluation of One-Word Answers
   The user can scan and upload the answer scripts using the options available in the website.The written malayalam one-word answers are compared with the correct answer provided by the answer key and based on the correctness marks are either awarded or deducted.This feature depends on the (NLP technique/algorithm) used.

2. Evaluation of Short Descriptive Answers
   The user can scan and upload malayalam hand-written answer scripts containing short descriptive answers. The model evaluates and award marks accordingly by comparing the answers written in the scripts to that in the answer key. The total marks will be available to the user at the end of evaluation. This feature depends on the (NLP technique/algorithm) used.

3 Specific Requirements

3.1 Functional Requirement Specification

3.1.1 Uploading Scanned version of Answer Scripts

Use case name	:	Upload scanned version of answer scripts
Objective	:	The user selects "Upload Answer Script" option and uploads the scanned version of answer scripts in jpeg format.The software saves the uploaded file in format in the database.
Priority	:	High
Precondition	:	File size must be atmost 5MB.
PostConditions	:	File selected is uploaded and saved in the database in jpeg format.
Flow of Events	:	

3.1.2 Evaluating the answer scripts

Use case name	:	Evaluate the answer scripts
Objective	:	The user clicks the "Evaluate answer" option available and the software evaluates the answer scripts and generates the corresponding score-card.
Priority	:	High
Precondition	:	Answer scripts must be uploaded.
PostConditions	:	The answer script is evaluated and the corresponding score card is generated.
Flow of Events	:	1. Basic Flow

    1.1. User selects "Evaluate answer" option from toolbar.

    1.2. Software evaluates the answer scripts.

    1.3. Software generates the score card.

3.1.3 View and Download results

Use case name	:	View and Download the evaluated script
Objective	:	The user saves the evaluated document with a pdf extension
Priority	:	Low
Precondition	:	functionalities 3.1.1 and 3.1.2
PostConditions	:	The document is saved into disk
Flow of Events	:	1. Basic Flow

    1.1. User selects view score card.

    1.2. The score card is displayed in pdf format.

    1.3. User clicks download option.

    1.4. The score card is downloaded.

2. Alternate Flow 1

    2.1. After step 1.4 the user entered file already exists

    2.2. A confirmation box for overwriting the file is selected

    2.3. User clicks Yes

    2.4. Software overwrites contents in the file in the disk with new contents

3. Alternate Flow 2

    3.1. After step 1.1 file is already created or the file is an existing one opened by the software

    3.2. Software rewrites existing file with new contents

3.2 Non-functional Requirements

3.2.1 Performance Requirements

The system can take longer time to process the answer script if the file size is larger but the grades should be consistent with the scores provided by human evaluation.

3.2.2   Portablitiy

The software for recognizing handwritten malayalam characters can be run on any platform irrespective of the OS.Software developed for the evaluation of answers is also portable.If required,it can be installed and run on any PC or laptops.

3.2.3   Reliability

The system would provide reliable output during normal run.But human intervention would be required as the complexity of the input increases.

3.2.4   Usability

User interaction has to be made as comfortable as possible.For each answer on a question,corresponding score would be generated.

3.2.5   Security Requirements

3.2.6   Software Quality Attributes

4   Additional models and reqirements based on them