



# Enhancing User Experience in Prize Bond Lotteries through Intelligent Notification Systems

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## Abstract

This thesis proposes the design and implementation of a modern, user-friendly system for checking prize bond results. It aims to revolutionize the process of checking prize bond results by implementing OCR(Optical Character Recognition) by using pytesseract and PyMuPdf library. The primary objective is to simplify the process of verifying whether a user's prize bond number has won or not .

## Background Information

Prize bonds are a very popular investment option in many countries, allowing the chance to win prizes while earning a great return on investment. However, the old-fashioned method of checking winnings can be lengthy, time-consuming and error-prone.The goal of this research is to streamline the prize bond checking process by utilizing data processing and computer vision techniques. It will be shown as system Functionality or Automation.The system will consist of three main components:

- Data Extraction
- Winner List Integration
- Winner Notification

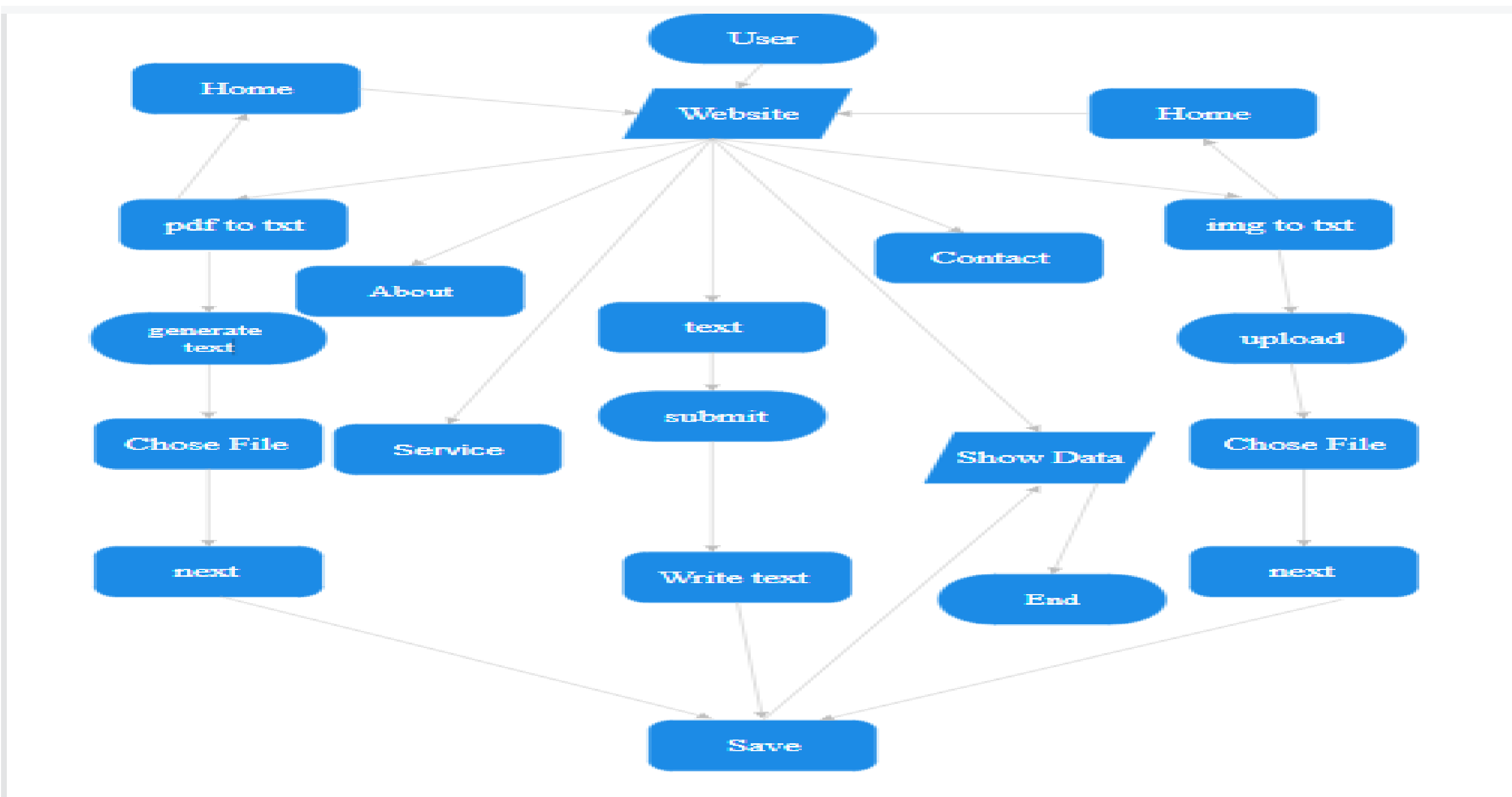
This automation offers several benefits:

- Efficiency
- OCR Accuracy
- Data Security
- Scalability

In order to improve user experience and expedite the prize claim process, this research offers a novel approach to prize bond winner detection by combining computer vision and data processing techniques.

## Preliminary Analysis

Here is a Preliminary Analysis of our research:



## Methodology

The implementation of the Optical Character Recognition(OCR) which was used for data Extraction was geared towards enhancing the user experience in the prize bond lotteries. The system utilized MySQL as the database for storing and managing the extracted data. The methodology encompassed the following stages:

- **PDF to Text Extraction:** The PDF to Text Extraction process is implemented by using the PyMuPDF library to extract text from uploaded PDF files.
- **Image to text extraction:** For image files we used pytesseract library.
- **AJAX Integration:** AJAX (Asynchronous JavaScript and XML) integration played a vital role by handling image and pdf file uploads.
- **Data Storage and Presentation:** The extracted text, specifically the prize bond numbers, was stored in MySQL database.

Below the figure 1.1 shows visual representation of The core process.

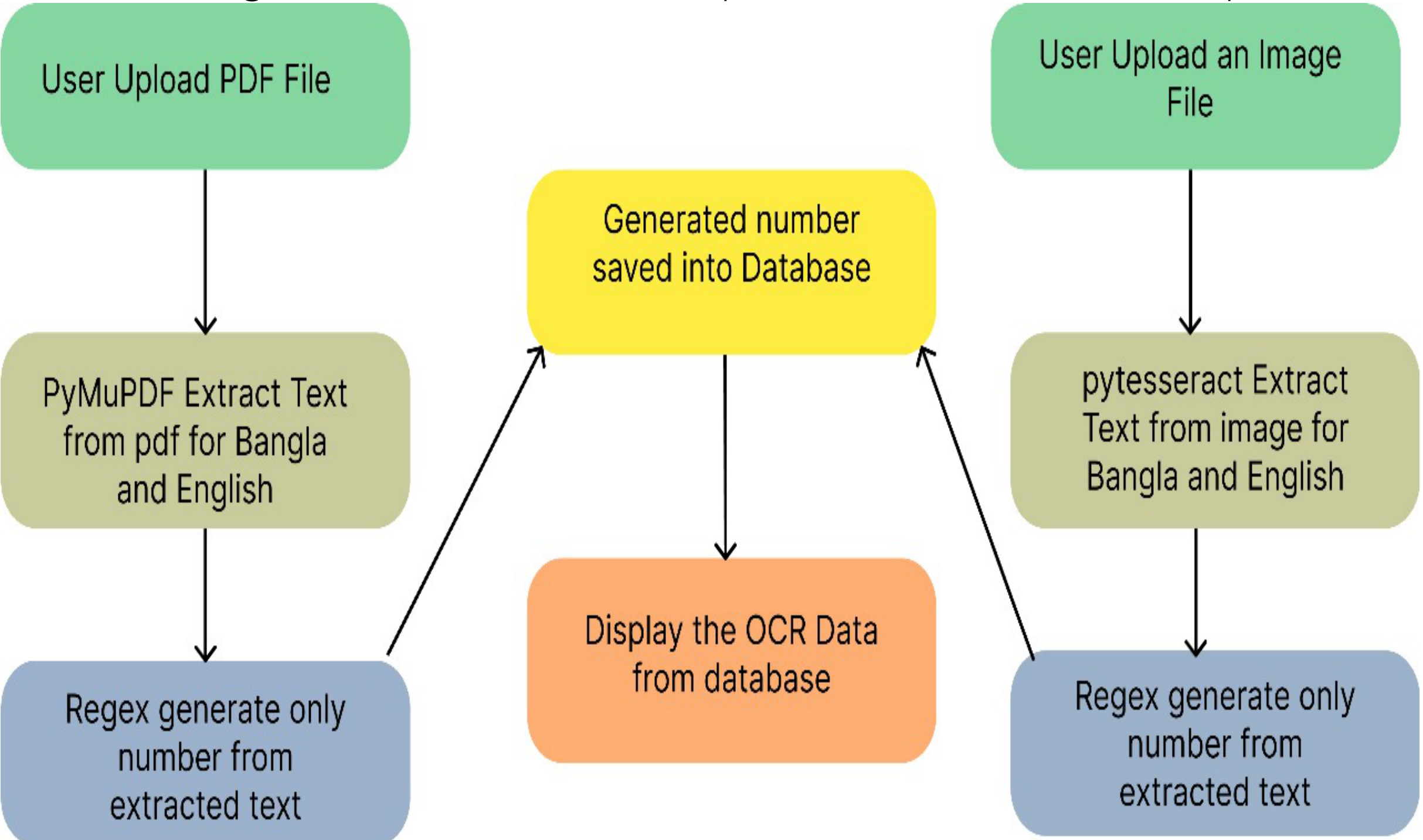


figure 1.1

## Visualization

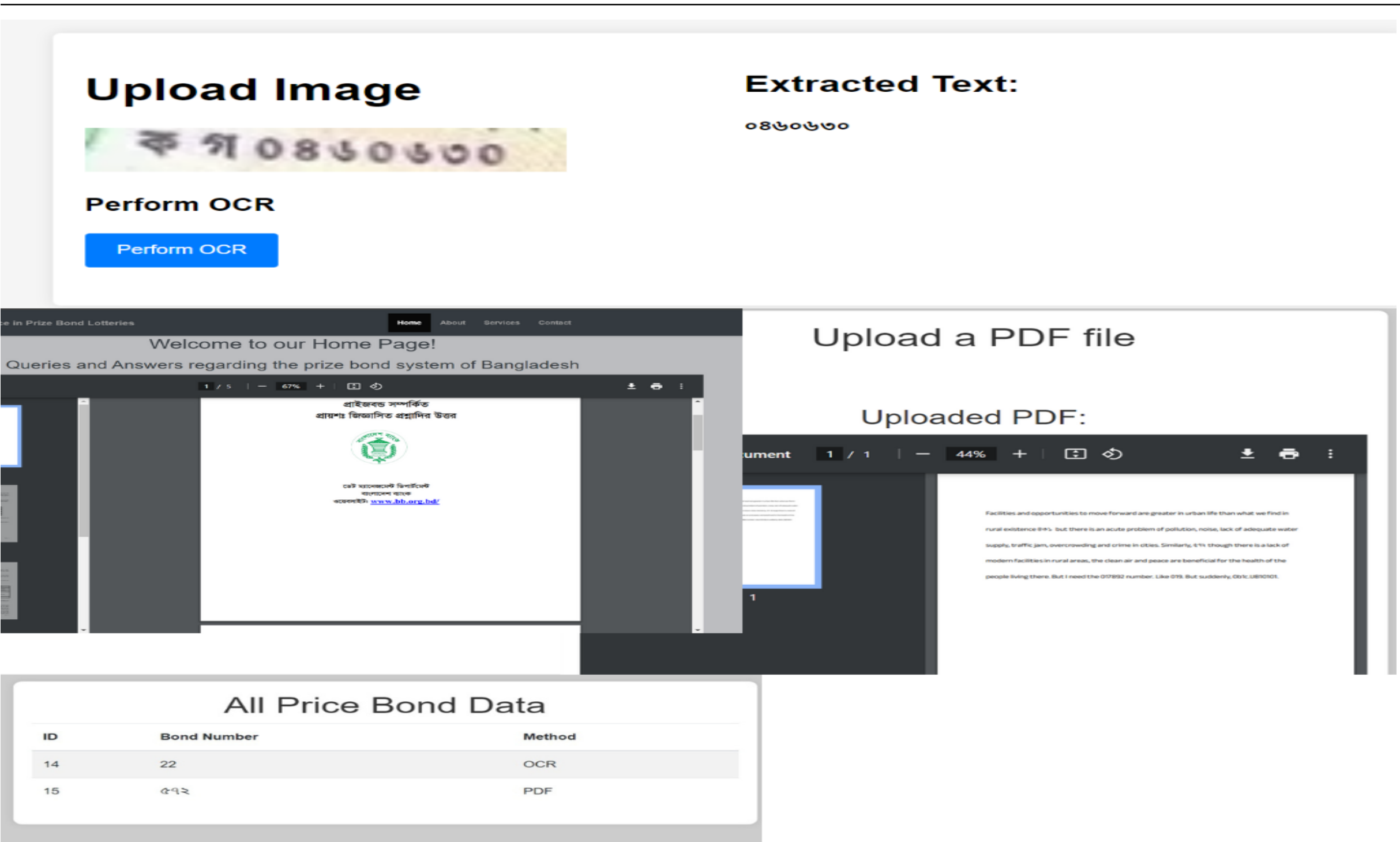


figure 1.2

The above figure 1.2 is the Visualised version of our website

## Before the Final Defence

Feature Enhancements objectives:

- **Notification System:** Notify users in a timely manner on the status of their bonds.
- **User Account Management:** Allow users to have safe, customized experiences.
- **Multiple Options for Scanning:** Giving user to scan single bond number and bulk bond number

Analytics Objectives

- **Visual Information using graphs and Charts:** Give users more detailed information about their winnings and bond numbers.
- **Integration with Official Databases :** Assure bond number validation's accuracy and dependability in real time.
- **Database Optimization:** Enhance the performance of database operations.

Scalability Objectives

- **System Architecture Optimization:** Make sure the system can manage a growing volume of data and users.

Performance Optimization Objectives

- **Algorithm Enhancement:** Increasing efficiency of the bond number scanning and validation procedures' effectiveness and speed.
- **Database Optimization:** Enhance the performance of database operations..

## References

Chen, T., Chen, X., Ma, X., Wang, Y., and Wang, Z. (2022, June 9). Coarsening the granularity: Towards structurally sparse lottery tickets. arXiv.org. <https://arxiv.org/abs/2202.04736>

Katz, R. (2000, September 27). US20070129144A1 - Methods and apparatus for enhanced play in lottery and gaming environments - Google Patents. <https://patents.google.com/patent/US20070129144A1/en>

How- Lottery ticket scanners work | VA Lottery blog. (2020). <https://www.valottery.com/aboutus/blog/how-lottery-ticket-scanners-work>

Inbasekaran, A., Gnanasekaran, R. K., and Marciano, R. (2021). Using Transfer Learning to contextually Optimize Optical Character Recognition (OCR) output and perform new Feature Extraction on a digitized cultural and historical dataset. 2021 IEEE International Conference on Big Data (Big Data). <https://doi.org/10.1109/bigdata52589.2021.9671586>