# Product Requirement Document (PRD)

## 1. Overview

Product Name: 拍照轉注音 App

Platform: Web Application (Chrome)

Goal: Allow users to take or upload a photo of Traditional Chinese text and convert the recognized characters into Zhuyin (注音) annotations, aiding learners of Mandarin who prefer phonetic assistance.

## 2. Problem Statement

Reading native Traditional Chinese text can be difficult for learners unfamiliar with certain characters. Existing tools often lack support for quick photo-to-Zhuyin conversion in a simple, offline, or desktop-friendly format.

## 3. Objectives

* - Enable users to take or select an image from their device.
* - Use OCR to extract Traditional Chinese characters from the image.
* - Convert extracted characters into corresponding Zhuyin (Bopomofo).
* - Display both original text and Zhuyin overlay or side-by-side.

## 4. Target Users

* - Mandarin learners (especially children or beginner-level readers)
* - Teachers or tutors preparing phonetic materials
* - Taiwanese users familiar with the Zhuyin system

## 5. Features

### MVP Features

|  |  |
| --- | --- |
| Feature | Description |
| Image Picker | Let users select or take a photo using the system file picker |
| OCR Text Extraction | Use Tesseract or similar OCR to extract Traditional Chinese characters |
| Zhuyin Mapping | Convert each character into its Zhuyin equivalent using a lookup dictionary |
| Text Display | Show original text with Zhuyin annotation above or below |

### Nice-to-Have Features (Post-MVP)

* - Handwriting image input
* - Export to PDF or image with Zhuyin overlay
* - Add Pinyin/English definitions
* - Dark mode or font size customization

## 6. UX/UI Requirements

* - Simple 2-screen UI:  
   - Screen 1: Upload or capture image  
   - Screen 2: Display extracted text with Zhuyin
* - Responsive layout for desktop
* - Error message if OCR fails or image is unreadable

## 7. Technical Requirements

* - Flutter (Windows)
* - `image\_picker` or `file\_picker` for image input
* - OCR: Tesseract via `tesseract\_ocr` or platform channels
* - Mapping: JSON/Map from character → Zhuyin

## 8. Edge Cases & Constraints

* - Poor image quality may affect OCR accuracy
* - OCR may misread similar-looking characters
* - Characters not found in Zhuyin dictionary should be marked or skipped
* - Only supports printed Traditional Chinese text (no Simplified or handwriting for now)

## 9. Timeline (Suggested)

|  |  |
| --- | --- |
| Date | Milestone |
| Week 1 | Image picker + OCR integration (basic) |
| Week 2 | Zhuyin mapping + UI layout |
| Week 3 | Error handling + minor polish |
| Week 4 | Internal testing + packaging for Windows |

## 10. Open Questions

* - Will users need to crop or adjust the image manually?
* - Is offline functionality a requirement?
* - Will tone marks be shown explicitly in Zhuyin?

## 11. Implementation

| * **File** | * **Purpose** |
| --- | --- |
| * main.dart | * Entry point |
| * screens/image\_picker\_screen.dart | * First screen: choose image |
| * screens/zhuyin\_result\_screen.dart | * Second screen: show result |
| * services/ocr\_service.dart | * OCR logic |
| * services/zhuyin\_mapper.dart | * Map to 注音 |
| * data/zhuyin\_dictionary.dart | * Character → 注音 lookup |
| * widgets/zhuyin\_text\_display.dart | * UI for Zhuyin text display |

Editing while vibe code

* After uploading the image, let the user crop the image so that only text will be recognized.