

Medi-Check Pro: Smart Prescription and Drug Safety System

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ABSTRACT: Medi-Check is an AI-powered medical prescription analysis system designed to simplify healthcare accessibility and reduce medication costs. The system leverages multimodal artificial intelligence using Google Gemini Flash to interpret handwritten and printed prescriptions. It extracts structured medical data including patient details, prescribed medicines, dosage, and diagnosis, and further suggests cost-effective alternative medicines available in the Indian pharmaceutical market.

Unlike traditional OCR-based systems, Medi-Check combines vision-based understanding with contextual language processing to ensure accurate interpretation of prescriptions. The application is implemented as a web-based platform using Python and Streamlit, enabling easy accessibility without requiring installation. Experimental results demonstrate improved readability, reduced manual effort, and significant cost savings through alternative medicine recommendations.

KEYWORDS: Prescription Analysis, AI in Healthcare, Gemini Flash, Medicine Alternatives, OCR, Multimodal AI, Streamlit

I. INTRODUCTION

Healthcare accessibility remains a major challenge, particularly in understanding prescriptions and managing medicine costs. A large number of prescriptions are handwritten and difficult to interpret, leading to confusion and potential misuse of medicines. Existing solutions such as OCR tools can extract text but lack contextual understanding. Similarly, pharmacy consultations are time-consuming and not always accessible. Medi-Check addresses these limitations by introducing an AI-powered system capable of:

- Reading handwritten prescriptions
- Extracting structured medical data
- Suggesting affordable alternatives

The system provides a user-friendly interface that simplifies prescription understanding and promotes cost-effective healthcare.

II. LITERATURE SURVEY

Traditional OCR-based systems focus only on text extraction and fail to interpret medical context. Systems like Google Vision API provide basic recognition but lack domain-specific intelligence. Recent advancements in multimodal AI models such as Gemini enable both image understanding and contextual reasoning. These models can extract structured data and generate meaningful insights. However, most existing systems:

- Do not provide medicine alternatives
- Require manual searching
- Are not optimized for real-time usage

Medi-Check bridges this gap by integrating AI-based prescription understanding with alternative medicine recommendations.

III. METHODOLOGY

System Workflow

- User uploads prescription image
- Image is validated and processed
- Gemini Flash analyzes the image
- Structured data is extracted
- Alternative medicines are suggested
- Results are displayed and exported

AI Processing

- Input: Prescription image
- Model: Google Gemini Flash
- Output: Structured JSON data

Alternative Medicine Generation

- AI suggests alternatives based on:
- Composition similarity
- Market availability
- Price comparison

IV. EXPERIMENTAL RESULTS

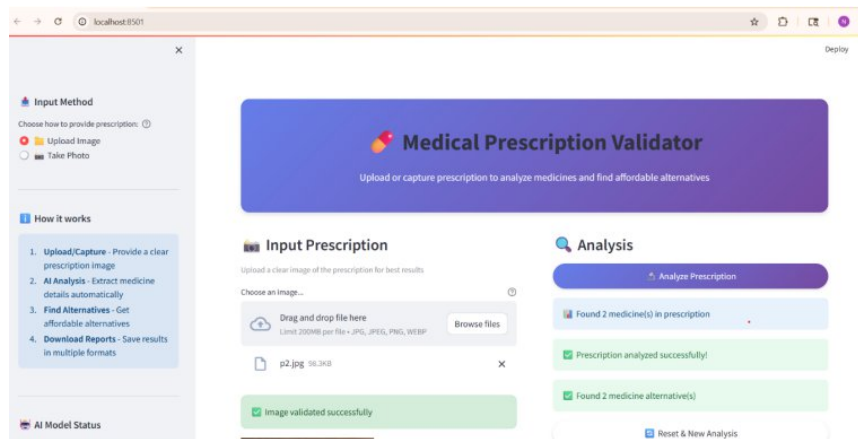


Fig. (a) User interface of the Medical Prescription Validator showing options to upload or capture a prescription image and initiate analysis

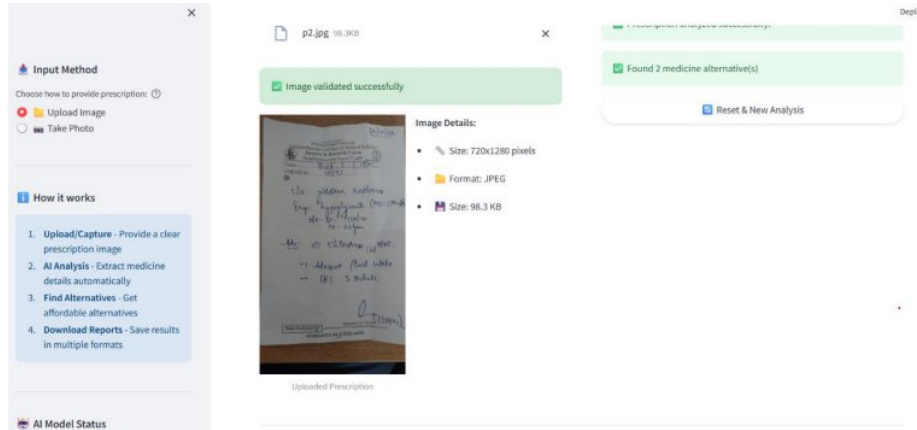


Fig. (b) Uploaded prescription preview along with image validation details such as size, format, and resolution.

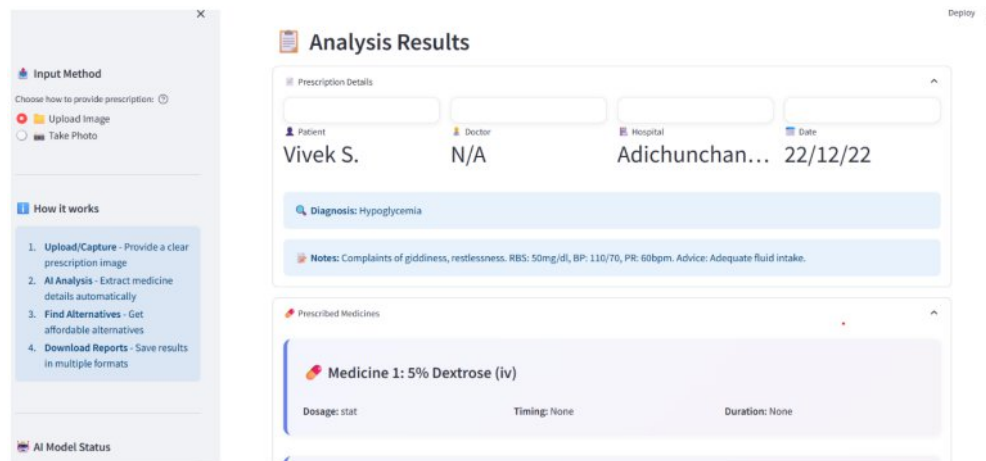


Fig. (c) Analysis results displaying extracted patient information, diagnosis, notes, and prescribed medicines..

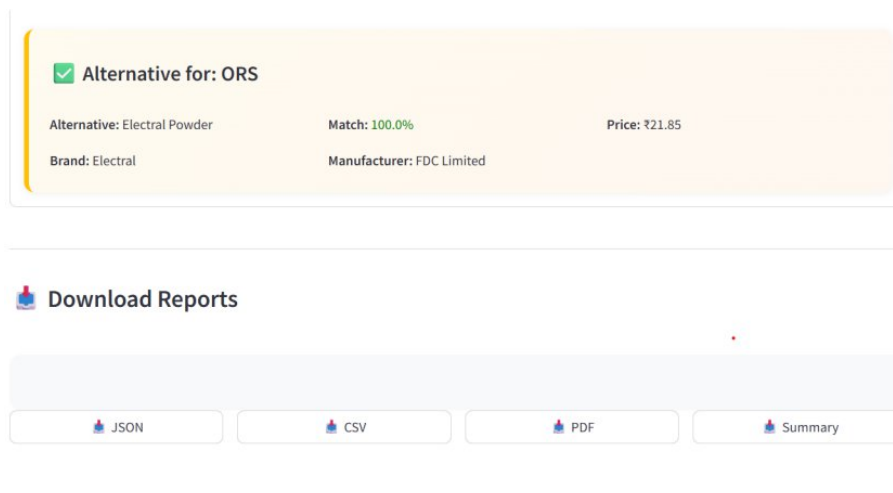


Fig. (d) Shows alternatives for tablets.

V. CONCLUSION

Medi-Check provides an innovative solution for prescription analysis and medicine cost optimization. By leveraging multimodal AI, the system overcomes limitations of traditional OCR tools and offers a comprehensive healthcare solution. The system improves accessibility, reduces costs, and enhances user experience. Future enhancements include integration with pharmacy databases and mobile application development.

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