SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

Department of Electronics and Communication

PRESENTATION

DrugCheck: Medication Interaction Analyzer

An AI-Powered Solution for Safe Medication Decisions

Group Members:
Muskhin Shahabaz vali (RA2311004010006)
A.Avinash Sastry (RA2311004010007)
V.Venkata Havish (RA2311004010041)

Introduction

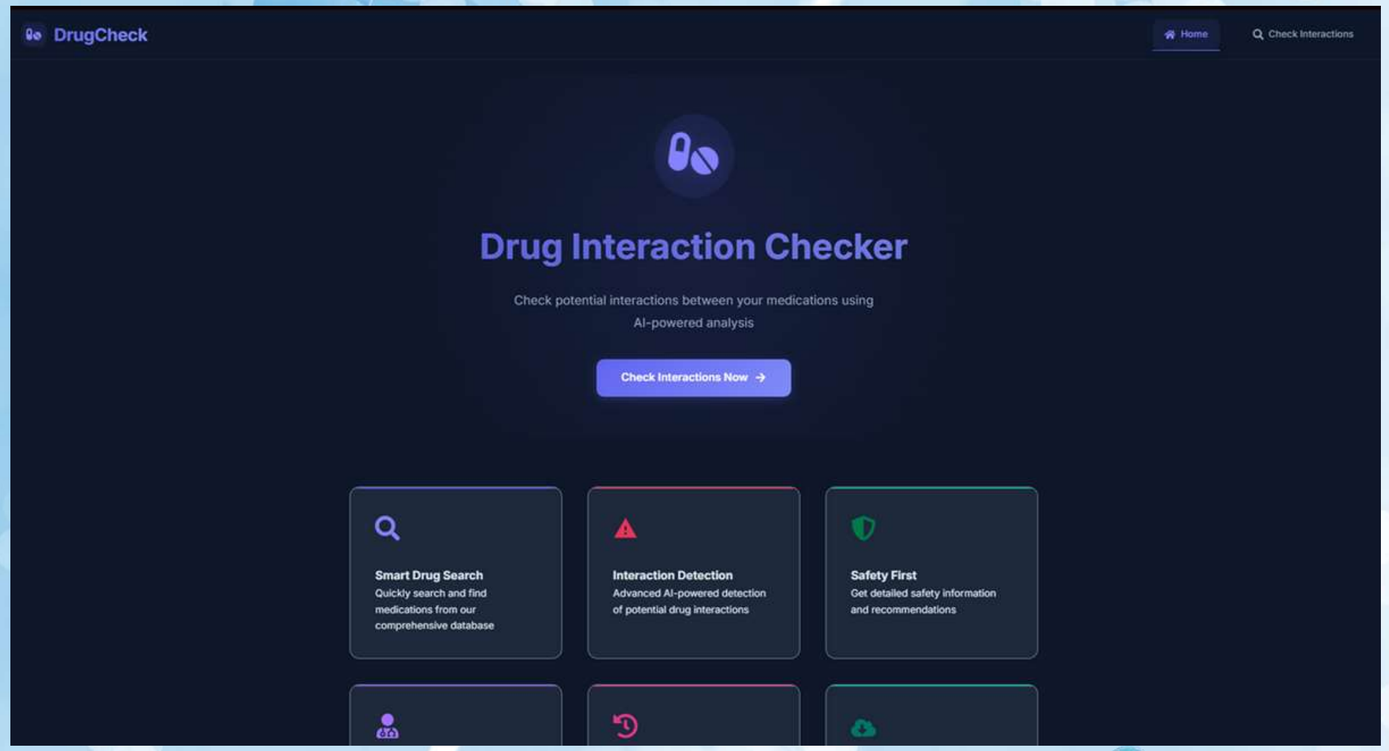
SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

What is DrugCheck?

DrugCheck is a smart web application designed to analyze potential drug interactions using an advanced language model called Mistral AI.

It helps users—patients, doctors, and pharmacists—by:

- Providing automated interaction checks
- Explaining interaction severity
- Suggesting usage recommendations
- Offering downloadable reports for medical use



SDG'S being followed

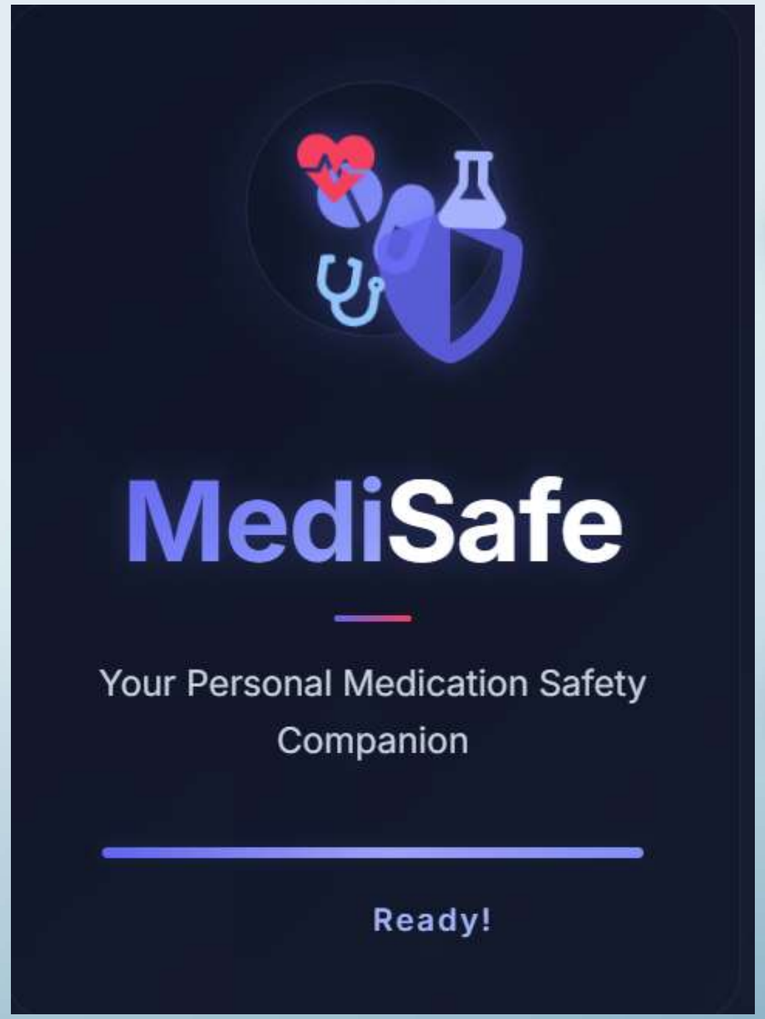
SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

•**SDG 3 – Good Health and Well-Being**
•**Target 3.8**: Achieve universal health coverage, including access to safe, effective, quality, and affordable essential medicines.
•**Target 3.B**: Support the development of health technology, including medicines and diagnostic tools.
•A drug interaction checker helps **reduce medication errors**, **improves patient safety**, and **supports rational drug use**.

•**SDG 9 – Industry, Innovation and Infrastructure**
•Encourages the development and implementation of **innovative health technologies** and digital infrastructure, particularly for clinical decision support systems.

•**SDG 10 – Reduced Inequalities**
•If made accessible and inclusive, such tools can help **bridge the healthcare gap** by supporting patients and healthcare providers in low-resource settings who may lack access to clinical pharmacology expertise.

•**SDG 17 – Partnerships for the Goals**
•Promotes collaboration between **governments, tech companies, healthcare providers, and academia** to improve drug safety and accessibility through digital health initiatives.



Overview

Why It Matters:

Taking multiple medications is common, but interactions between them can be harmful or even life-threatening.

DrugCheck offers:

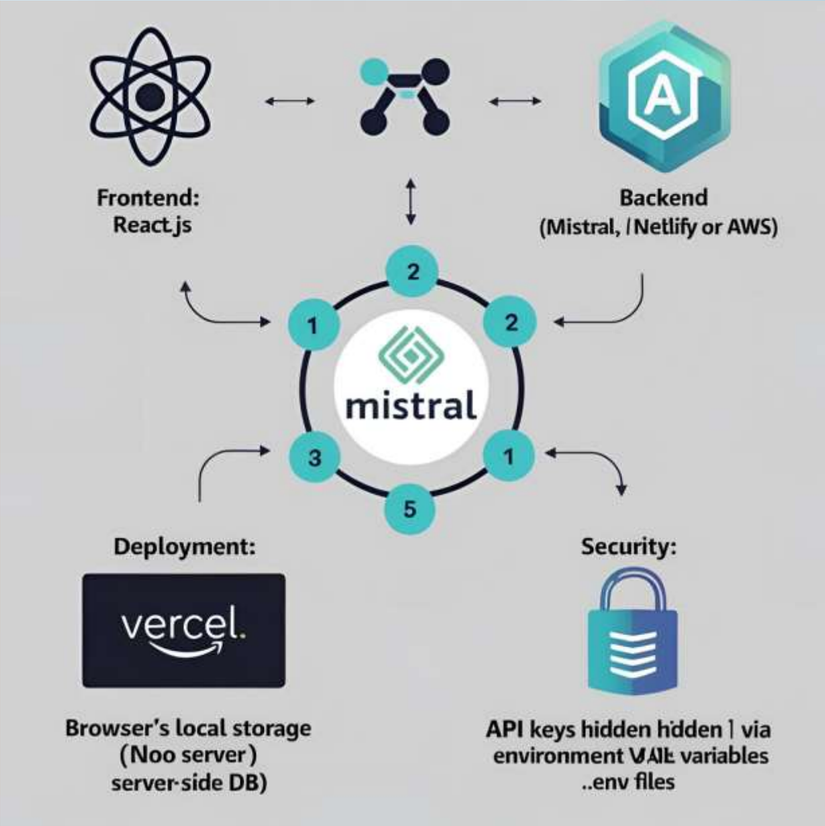
- Real-time analysis using AI
- Plain-language interpretation of medical data
- Secure, private, and fast access to safety information
- A user-friendly interface for all ages and technical levels

Problem Statement

- 💊 Polypharmacy (taking multiple drugs) is increasing, especially among older adults and chronically ill patients.
- ❗ Drug interactions can cause side effects, reduced effectiveness, or dangerous reactions.
- Manual interaction checking is time-consuming and limited to known databases.

➡️ There is a clear need for a faster, smarter, automated tool.

The Solution – DrugCheck



DrugCheck addresses this problem by:

- Using AI (Mistral model) to detect interactions
- 📊 Providing severity and risk analysis
- 💡 Offering clear recommendations for safe usage
- 📄 Generating PDF reports for personal or medical documentation

Key Features

SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

Smart Drug Search

Type the drug names, select dosage/frequency and Analyze them

Severity + Recommendation Output

Levels like “Severe”, “Moderate”, with advice

Search History

Users can access past queries and access your old history that the interactions you analyzed

AI-Based Interaction Detection

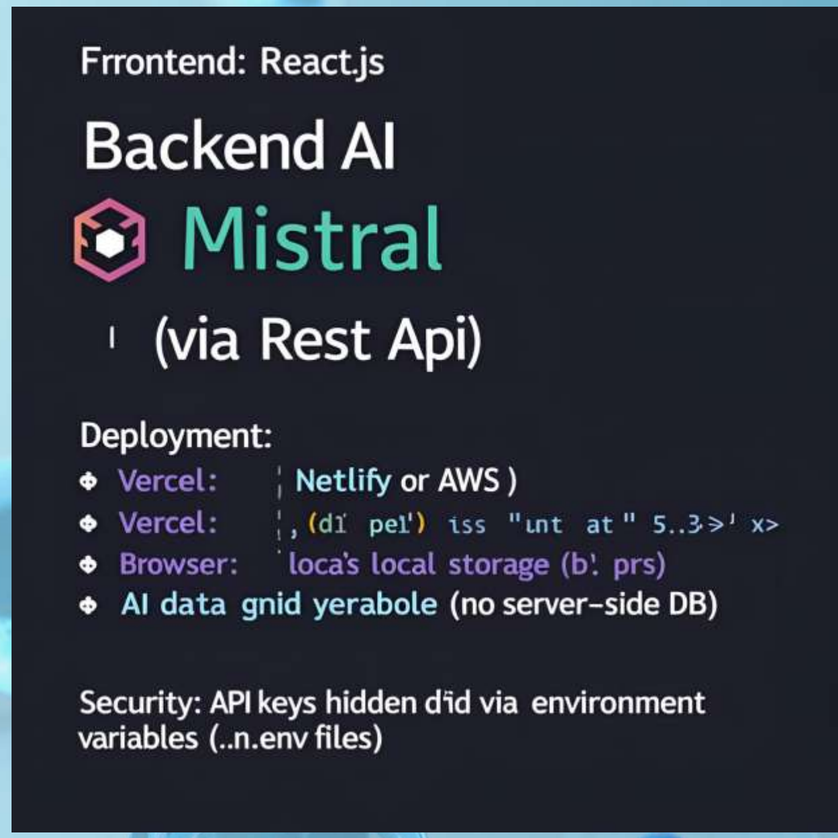
Queries Mistral AI to find known interactions and others

PDF Report Generation

Easy download and print for consultation

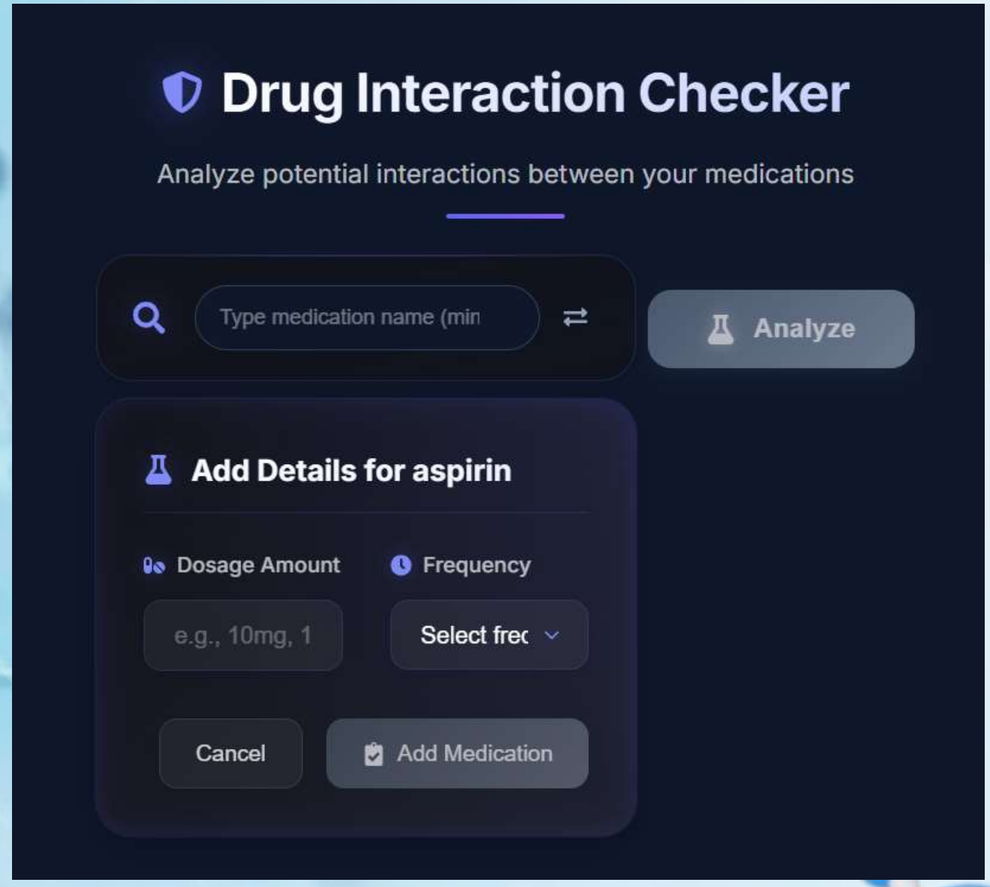
Technology Stack

- Frontend: React.js
- Backend AI: Mistral (via REST API)
- Deployment: Vercel, Netlify, or AWS
- Data Storage: Browser's local storage (no server-side DB)
- Security: API keys hidden via environment variables (.env files)



Workflow (How it Works)

- User enters drug names, dosage, and frequency
- App formats a structured request
- Sends it to Mistral AI's Chat API
- AI returns interaction description, severity, and recommendations
- Results are shown in UI + PDF download option



API Setup

Code Snippet:

```tsx
const MISTRAL_API_KEY =
import.meta.env.VITE_MISTRAL_API_KEY;
const MISTRAL_API_URL =
'https://api.mistral.ai/v1/chat/completions';
const MEDICAL_MODEL = 'mistral-medium';
```

- Store the Mistral API key in environment variables for security.
- Define the API endpoint and AI model.

Sending Data to Mistral

- The app sends drug names, dosage, and frequency to Mistral AI.
- AI is instructed to return severity, description, and recommendations.

Code Snippet:

```tsx
const response = await fetch(MISTRAL_API_URL, {
 method: 'POST',
 headers: { 'Authorization': `Bearer ${MISTRAL_API_KEY}` },
 body: JSON.stringify({ model: MEDICAL_MODEL, messages: [...] })
});
```

Processing Mistral's Response

- Extract severity, description, and recommendation from AI response.
- Convert JSON response into structured data.

Code Snippet:

```tsx
const data = await response.json();
const analysis = parseAIResponse(data.choices[0].message.content);
return [{
 drugPair: [drug1, drug2],
 interaction: { severity: analysis.severity, recommendation: analysis.recommendation }
}];
```

Generating a Full MedicationReport

•- Mistral AI can generate a comprehensive drug report.
•- The report includes risk level, monitoring suggestions, and timing recommendations.
•
•Code Snippet:
•```tsx
•const reportResponse = await fetch(MISTRAL_API_URL, {
• method: 'POST',
• body: JSON.stringify({ model: MEDICAL_MODEL, messages: [...] })
•});
```

- **The AI provides a full summary: when to take, what to avoid, risks, and alternatives**
```

Search History Feature

SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

- Users can track their previous searches for quick reference.
-
- Code Snippet:
- ```tsx
- const addToHistory = (query) => {
- const newHistory = [...history, { query, timestamp: new Date() }];
- localStorage.setItem('searchHistory', JSON.stringify(newHistory));
- };

  - Saves each query with a timestamp
  - Makes it easy to revisit or export previous checks

Error Handling in API Calls

•Proper error handling ensures smooth user experience.

•

•Code Snippet:

•```tsx

•useEffect(() => {

• const fetchData = async () => {

• try {

• const result = await fetchSomeData();

• setData(result);

• } catch (error) {

• setError('Failed to load data');

• }

• };

• fetchData();

•}, []);

- The UI shows fallback messages
- Errors don’t break the flow, ensuring a smoother user experience

Deployment & Future Plans

Current Deployment:

- Hosted on Vercel, Netlify, or AWS Lambda

Secured by:

- Environment variables for API safety

Future Enhancements:

- 📈 Improve Mistral's medical accuracy with feedback loops
- 🔐 Add user authentication (save drug profiles)
- 📱 Build a mobile version with push notifications
- Real-time interaction warnings (with text-to-speech alerts)

Conclusion

- ✅ DrugCheck uses AI to make drug combinations safer.
- 💡 Delivers fast, reliable, and easy-to-understand results.
- 📄 Useful for patients, doctors, caregivers, and pharmacists.

➡️ Combines modern tech with real-world healthcare impact.

- Receives drug details from the user.
- Sends data to Mistral AI for interaction analysis.
- Mistral AI returns severity, risks, and recommendations.
- The app processes and displays results.
- Users can download a PDF report.

Thank You