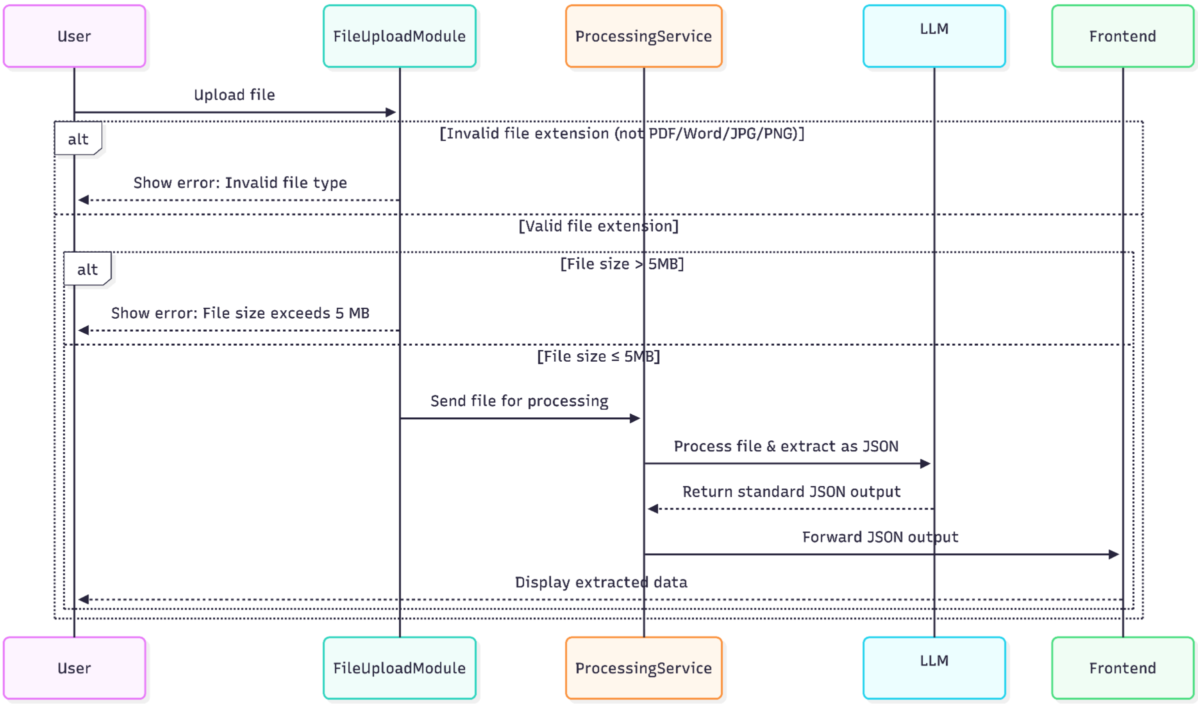
Deliverables

End to End Workflow
File upload → Processing → Extraction → Frontend Display.

Sequence Diagram – Suggested Tool - MermaidChart.com



Recommended tools, frameworks, and programming languages for: - File ingestion and preprocessing.
- OCR or document parsing (especially for tables or images).
- LLM integration.
- Backend orchestration.
- Frontend rendering.

OCR or Document Parsing (Tables and Images)
DeepSeek OCR / GPT-4V or GPT-4o

LLM Integration

Backend Orchestration
Node JS / Python Fast API

Front end Rendering
NextJS / React / Svelte

Database Schema
PostgreSQL with JSONB for flexible timetable data

Additional information on your LLM Integration strategy:

I use Multi-stage Approach
Stage 1 : Document Understanding
Use LLM to validate extracted data for logical consistency

- Check time overlaps, duration reasonableness
- Confidence scoring for each extraction

Stage 2 : Validation and Correction

Stage 3 : Fallback Strategy

If confidence < 70%, using vision model , Manual review queue for ambiguous cases

- What part of the pipeline uses it?
Processing Service uses the LLM Integration

- What is the prompt strategy?

```
# Prompt strategy for initial extraction
system_prompt = """You are a timetable extraction expert. Extract structured timetable data from the provided text.

Output Format (JSON):
{
  "days": ["Monday", "Tuesday", ...],
  "timeblocks": [
    {
      "day": "Monday",
      "subject": "Mathematics",
      "start_time": "09:00",
      "end_time": "10:00",
      "teacher": "optional",
      "notes": "optional"
    }
  ]
}

Rules:
1. Preserve original subject names exactly
2. Infer missing times from context
3. Handle varied formats (12h/24h)
4. Extract all additional notes
"""
```

- How do you ensure accuracy and reproducibility?

- Error handling & fallbacks: - How do you handle bad uploads, ambiguous data, or missing fields?
  - **Bad uploads:** File validation (type, size, corruption check)
  - **Ambiguous data:** Confidence scoring + manual review queue
  - **Missing fields:** LLM inference with explicit uncertainty markers
  - **OCR failures:** Fallback to vision models

- How will you ensure the system is flexible, for possible future updates and needs?

I will implement Plugin architecture for new file formats

- Webhook support for processing completion
- Template library for common timetable formats
- AI training feedback loop (human corrections → fine-tuning)