IBM Internship Final Project

STARTUP BLUEPRINT GENERATOR AGENT

Presented By:
Yash Dubey – DJ Sanghvi College of Engineering – EXTC Dept
GitHub repo

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OUTLINE

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- System Development Approach
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PROBLEM STATEMENT

Many aspiring entrepreneurs struggle to convert raw ideas into actionable business plans due to limited access to market insights, funding information, and structured planning tools.

There is a need for an intelligent system that can guide users from vague ideas to well-defined startup blueprints.

The lack of such support delays innovation and increases the risk of failure in early-stage startups.

PROPOSED SOLUTION

1. Input Mechanism:

- The user provides a simple natural language description of their startup idea.
- Example: *“An app that lets students rent textbooks peer-to-peer.”*

2. Retrieval Mechanism (RAG):

- A Retrieval-Augmented Generation (RAG) pipeline fetches relevant context.
- Sources include mock startup datasets, policies, and market information.
- This ensures the AI has grounded, relevant knowledge while generating responses.

3. IBM Foundation Model (Granite):

- Uses IBM’s Granite model deployed via Watsonx.ai for generative capabilities.
- Prompted with both idea and retrieved context to produce structured sections of a startup plan.

4. Structured Output Generation:

- AI generates a complete business blueprint broken down into:
  - Market Opportunity
  - Business Model
  - Estimated Budget
  - Go-to-Market Strategy
  - Competitor Analysis
  - Revenue Streams
  - Risks & Challenges
  - KPIs

5. Output Handling:

- All outputs are saved to a text file via Python backend.

SYSTEM APPROACH

. Programming Language:

- **Python 3.11** — used as the core scripting language for building the backend logic.

2. Environment Setup & Management:

- **.env file** — securely stores API keys and configuration variables.
- **python-dotenv** — loads environment variables into the application.

3. IBM Cloud Services:

- **IBM Cloud Lite** — used to host and run services.
- **IBM watsonx.ai** — leveraged to interact with IBM Foundation Models like Granite for text generation.
- **Granite 3-3-8b Instruct Model** — used to generate structured outputs for startup blueprints.

4. Foundation Model Inference:

- **ibm-watsonx-ai (v2.0.2)** — official Python SDK used to authenticate and interact with IBM Foundation Models.
- **ModelInference class** — provides interface to call the model and get outputs.

5. Retrieval-Augmented Generation (RAG) (Simulated):

- Context for blueprint generation is mock-simulated (due to Lite tier limitations).
- Local or predefined knowledge is injected into prompts as background context.

6. Output Handling:

- Outputs are saved in a clean format to output.txt.
- Ensures data persistence and can be reused in presentations or reports.

7. Tools Used for Presentation & Formatting:

- **Keynote (Mac)** — used to create the final project presentation.
- **GitHub** — code is version-controlled and hosted in a public/private repo for submission and reference

ALGORITHM & DEPLOYMENT

Algorithm Workflow

1. **User Input Collection**
   - The user enters a simple startup idea in natural language via the terminal.
2. **Prompt Construction**
   - A predefined prompt template is dynamically updated with the user's idea and each business plan section (e.g., Market Opportunity, Business Model, etc.).
3. **Text Generation using Foundation Model**
   - The customized prompt is passed to IBM's granite-3-3-8b-instruct model via watsonx.ai to generate relevant text output.
4. **Section-wise Processing**
   - Each business section is generated separately in a loop to avoid output truncation and maintain structure.
5. **Output Aggregation**
   - All responses are written and saved sequentially in a local output.txt file.

Deployment Details

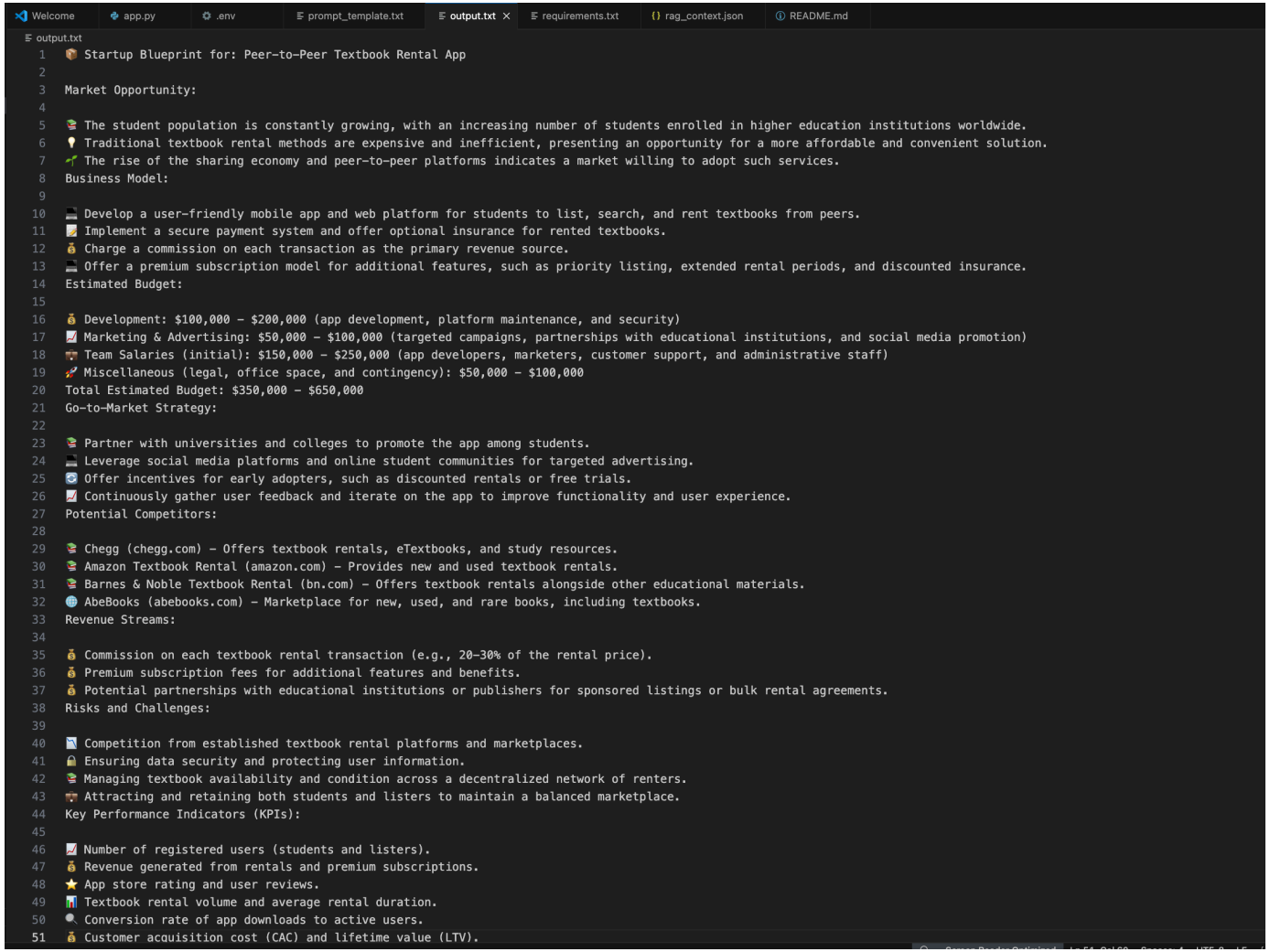
1. **Local Development Environment**
   - Developed using Python 3.11 and VS Code on macOS.
   - .env file securely stores API keys and credentials.
2. **IBM Cloud Integration**
   - Deployed using IBM Cloud Lite with access to the watsonx.ai foundation model service.
   - API authentication handled through ibm-watsonx-ai Python SDK.
3. **Execution**
   - The script is executed via terminal using python3 app.py.
   - Terminal logs show success status for each generated section.

RESULT

Terminal Screenshot

RESULT

Sample Output File Screenshot



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CONCLUSION

- The **Startup Blueprint Generator Agent** simplifies the startup journey by turning raw ideas into actionable business blueprints.
- It leverages **IBM Watsonx.ai** and **Granite Foundation Models** to generate structured outputs like market analysis, business models, and go-to-market strategies.
- The system offers aspiring entrepreneurs a powerful and user-friendly tool to validate and plan their ideas efficiently.
- By integrating **Retrieval-Augmented Generation (RAG)**, it ensures contextual accuracy and relevance in generated content.
- The project successfully demonstrates the practical use of **AI and cloud technologies** in solving real-world startup planning problems.

FUTURE SCOPE

- **Multilingual Support**: Extend the system to support multiple languages, enabling non-English-speaking entrepreneurs to benefit globally.
- **Integrated Investor Suggestions**: Recommend potential investors or incubators based on startup domain and geography.
- **Real-time Data Retrieval**: Enhance the RAG system to pull live data from startup portals, government schemes, and market reports.
- **Idea Validation Metrics**: Add AI-driven scoring systems to assess idea feasibility, competition risk, and funding potential.
- **Mobile Application**: Develop a cross-platform mobile app for easy access and idea input on-the-go.
- **Collaboration Features**: Enable team-based planning with shared blueprints, comments, and real-time editing.
- **Regulatory Compliance Suggestions**: Include startup-specific legal and compliance guidance for different regions.

REFERENCES

1. **IBM watsonx.ai Documentation**

https://www.ibm.com/docs/en/watsonx

2. **IBM Cloud Docs**

https://cloud.ibm.com/docs

3. **Prompt Engineering Guide – IBM Prompt Lab**

https://promptlab.watsonx.ai/

4. **Startup India Portal**

https://www.startupindia.gov.in

5. **Chegg, Coursera, and other EdTech competitors** (for market analysis references)

6. **Python dotenv & os libraries** – for managing environment variables

https://pypi.org/project/python-dotenv/

7. **Github Repository**

https://github.com/dubey-git/startup-blueprint-generator---agent

IBM CERTIFICATIONS

- **Credly certificate (getting started with AI)**

In recognition of the commitment to achieve professional excellence

Getting Started with Artificial Intelligence
IBM SkillsBuild

YASH DUBEY

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence

Issued on: Jul 24, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/a92034d6-2b82-4463-8e37-2dbee1c31088

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IBM CERTIFICATIONS

- **LLM certificate (RAG Lab)**

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

YASH DUBEY

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins

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THANK YOU

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