

IBM Internship Final Project

STARTUP BLUEPRINT GENERATOR AGENT

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[GitHub_repo](#)

OUTLINE

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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

1. 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

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

zsh

- yash@DUBEY-JIs-MacBook-Air startup-agent % python3 app.py
Enter your startup idea: An app that lets students rent textbooks peer-to-peer
 - ✓ Market Opportunity written.
 - ✓ Business Model written.
 - ✓ Estimated Budget written.
 - ✓ Go-to-Market Strategy written.
 - ✓ Potential Competitors written.
 - ✓ Revenue Streams written.
 - ✓ Risks and Challenges written.
 - ✓ Key Performance Indicators (KPIs) written.
 - ✓ All sections saved to output.txt

RESULT

Sample Output File Screenshot

```
Welcome  app.py  .env  prompt_template.txt  output.txt X  requirements.txt  rag_context.json  README.md
F output.txt
1  📖 Startup Blueprint for: Peer-to-Peer Textbook Rental App
2
3  Market Opportunity:
4
5  📖 The student population is constantly growing, with an increasing number of students enrolled in higher education institutions worldwide.
6  📌 Traditional textbook rental methods are expensive and inefficient, presenting an opportunity for a more affordable and convenient solution.
7  📈 The rise of the sharing economy and peer-to-peer platforms indicates a market willing to adopt such services.
8  Business Model:
9
10 📱 Develop a user-friendly mobile app and web platform for students to list, search, and rent textbooks from peers.
11 🛡️ Implement a secure payment system and offer optional insurance for rented textbooks.
12 💰 Charge a commission on each transaction as the primary revenue source.
13 📅 Offer a premium subscription model for additional features, such as priority listing, extended rental periods, and discounted insurance.
14 Estimated Budget:
15
16 💰 Development: $100,000 - $200,000 (app development, platform maintenance, and security)
17 📢 Marketing & Advertising: $50,000 - $100,000 (targeted campaigns, partnerships with educational institutions, and social media promotion)
18 👥 Team Salaries (initial): $150,000 - $250,000 (app developers, marketers, customer support, and administrative staff)
19 🛠️ Miscellaneous (legal, office space, and contingency): $50,000 - $100,000
20 Total Estimated Budget: $350,000 - $650,000
21 Go-to-Market Strategy:
22
23 🤝 Partner with universities and colleges to promote the app among students.
24 📱 Leverage social media platforms and online student communities for targeted advertising.
25 🎁 Offer incentives for early adopters, such as discounted rentals or free trials.
26 🔄 Continuously gather user feedback and iterate on the app to improve functionality and user experience.
27 Potential Competitors:
28
29 📖 Chegg (chegg.com) - Offers textbook rentals, eTextbooks, and study resources.
30 📖 Amazon Textbook Rental (amazon.com) - Provides new and used textbook rentals.
31 📖 Barnes & Noble Textbook Rental (bn.com) - Offers textbook rentals alongside other educational materials.
32 📖 AbeBooks (abebooks.com) - Marketplace for new, used, and rare books, including textbooks.
33 Revenue Streams:
34
35 💰 Commission on each textbook rental transaction (e.g., 20-30% of the rental price).
36 💰 Premium subscription fees for additional features and benefits.
37 🤝 Potential partnerships with educational institutions or publishers for sponsored listings or bulk rental agreements.
38 Risks and Challenges:
39
40 🏢 Competition from established textbook rental platforms and marketplaces.
41 🛡️ Ensuring data security and protecting user information.
42 📱 Managing textbook availability and condition across a decentralized network of renters.
43 📈 Attracting and retaining both students and listers to maintain a balanced marketplace.
44 Key Performance Indicators (KPIs):
45
46 📊 Number of registered users (students and listers).
47 💰 Revenue generated from rentals and premium subscriptions.
48 ⭐ App store rating and user reviews.
49 📖 Textbook rental volume and average rental duration.
50 🔄 Conversion rate of app downloads to active users.
51 💰 Customer acquisition cost (CAC) and lifetime value (LTV).
```

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



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/a92034d6-2b82-4463-8e37-2dbec1c31088>



IBM CERTIFICATIONS

■ Credly certificate (Journey to Cloud)

In recognition of the commitment to achieve professional excellence



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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



THANK YOU