

# IBM Internship Final Project

## STARTUP BLUEPRINT GENERATOR AGENT

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[GitHub\\_repo](#)

# OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
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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).
```



# RESULT

## Sample Output From Jupyter notebook

```
startup_blueprint_final_notebook.ipynb ☆ ☁
File Edit View Insert Runtime Tools Help
Q Commands + Code + Text ▶ Run all Connect ^

[ ]
# 3. Save
print(f"\n\n=== {section} ===\n{full_text}\n")
with open("output.txt", "a") as f:
    f.write(f"\n\n{section}:\n{full_text}\n")
print(f"✅ {section} written.")

except Exception as e:
    print(f"❌ Error in {section}: {e}")

=== Market Opportunity ===
**Market Opportunity**

The global textbook market is valued in the billions annually, with students often facing high costs for purchasing new books. A peer-to-peer textbook rental platform can significantly reduce expenses for student
✅ Market Opportunity written.

=== Business Model ===
**Business Model**

1. **Value Proposition** – Affordable and eco-friendly access to textbooks for students through peer-to-peer rentals.
2. **Customer Segments** – Primary: College and university students. Secondary: Independent learners and academic institutions.
3. **Channels** – Mobile app, campus ambassador programs, and partnerships with student organizations.
4. **Revenue Model** – Rental transaction fees, premium subscriptions for unlimited rentals, and optional late fee charges.
5. **Key Partnerships** – Campus bookstores, student unions, delivery/logistics providers.
6. **Cost Structure** – Platform development & maintenance, customer support, marketing, and logistics partnerships.
✅ Business Model written.

=== Estimated Budget ===
**Estimated Budget**

1. **Platform Development** – $15,000 – Initial app and backend system development.
2. **Marketing & Outreach** – $5,000 – Campus ambassador programs, online ads, and social media campaigns.
3. **Operations & Support** – $3,000 – Customer support tools and moderation.
4. **Hosting & Maintenance** – $2,000 – Cloud hosting and security.
**Total Estimated Initial Budget:** $25,000
✅ Estimated Budget written.

=== Go-to-Market Strategy ===
**Go-to-Market Strategy**

1. **Target Market Identification** – Focus on students in metropolitan areas with large university populations.
2. **Launch Plan** – Begin with pilot programs in 3 universities to gather feedback and build trust.
3. **Marketing Tactics** – Leverage campus ambassadors, social media influencers, and targeted ads.
4. **Growth Strategy** – Introduce referral bonuses, seasonal promotions, and expand to multiple cities within 12 months.
5. **Retention Plan** – Regular app updates, loyalty points for frequent users, and exclusive discounts.
✅ Go-to-Market Strategy written.

=== Potential Competitors ===
**Potential Competitors**

1. **Chegg** – Large online rental platform, but more expensive and less localized.
2. **Amazon Textbook Rentals** – Wide selection but lacks community focus.
3. **Campus Bookstores** – Often limited to specific institutions and higher prices.
4. **Facebook Marketplace** – Informal option, but lacks security and structured rental management.
```

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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



**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 )

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Has successfully satisfied the requirements for:

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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**