
Title: Model Selection & Architecture in Healthcare Assistant using IBM Granite

1. Introduction

A **Healthcare Assistant** using AI aims to improve patient care, diagnostics, and workflow automation. IBM's **Granite Foundation Models** (part of watsonx) provide strong capabilities for building natural language-driven assistants in healthcare.

2. Why IBM Granite?

- **Pretrained on Diverse Medical and Clinical Datasets**
 - **Optimized for Language Understanding & Reasoning**
 - **Supports Multimodal Inputs**
 - **Fine-tuning Capabilities on Custom Health Data**
 - **Compliant with Privacy & Security Norms**
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3. Architecture Overview

Diagram:

User -> Chat Interface (Web/Mobile)

-> API Gateway

-> IBM Granite Model via Watsonx.ai

-> Healthcare Data (EMR/EHR)

-> Response to User

4. Model Selection Process

Step	Criteria	IBM Granite Capabilities
1	Domain Adaptation	Medical fine-tuning
2	Responsiveness	Real-time NLP processing
3	Language Support	Multilingual model support
4	Context Awareness	Memory & embedding support
5	Data Privacy	HIPAA, GDPR readiness

5. Code Sample (Python + Watsonx.ai + Granite)

```
from ibm_watsonx_ai.foundation_models import Model
from ibm_watsonx_ai import Credentials
```

```
# Authenticate to IBM watsonx
```

```
credentials = Credentials(
    api_key='YOUR_API_KEY',
    url='https://us-south.ml.cloud.ibm.com'
)
```

```
# Initialize Granite model
```

```
granite = Model(
    model_id='granite-13b-chat-v2',
    credentials=credentials
)
```

```
# Query the model
```

```
response = granite.generate(
```

```
prompt="What are common symptoms of type 2 diabetes?",
temperature=0.5,
max_tokens=100
)

print("AI Response:", response['generated_text'])
```

6. Use Case in Healthcare

- **Symptom Checker:** Granite responds to symptoms entered by patients.
 - **Medication Assistant:** Granite can suggest typical usage, side effects.
 - **Discharge Summary Generator:** From doctor's notes.
 - **Appointment Scheduling:** With conversational logic.
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7. Components Stack

Layer	Technology
Frontend	React / Flutter
Backend	Python (FastAPI/Flask)
Model	IBM Granite via Watsonx
Data	EMR/EHR (FHIR APIs)
Storage	IBM Cloud Object Storage
Logging & Monitoring IBM Instana / Prometheus	

8. Security & Compliance

- IBM Granite is **HIPAA-ready**
- Supports **role-based access**

- Fine-tuned with de-identified data
- API usage tracked via IAM

