Clinical Descision Support System

A Guideline-Traceable Decision Support System for Hypertension Treatment in Vietnam

Team RawNoodles

Le Duc Huy
Pham Le Quang Minh
Le Hoang Dang Khoa
Nguyen Phuong Uyen
Tran Phan Hoang Phuc

Industrial Supervisor

Dr. Phung Tran Huy Nhat

Academic Supervisor

Dr. James Kang
Dr. Chau Thi Tuyet Trang

Visit Showcase

BACKGROUND & MOTIVATION

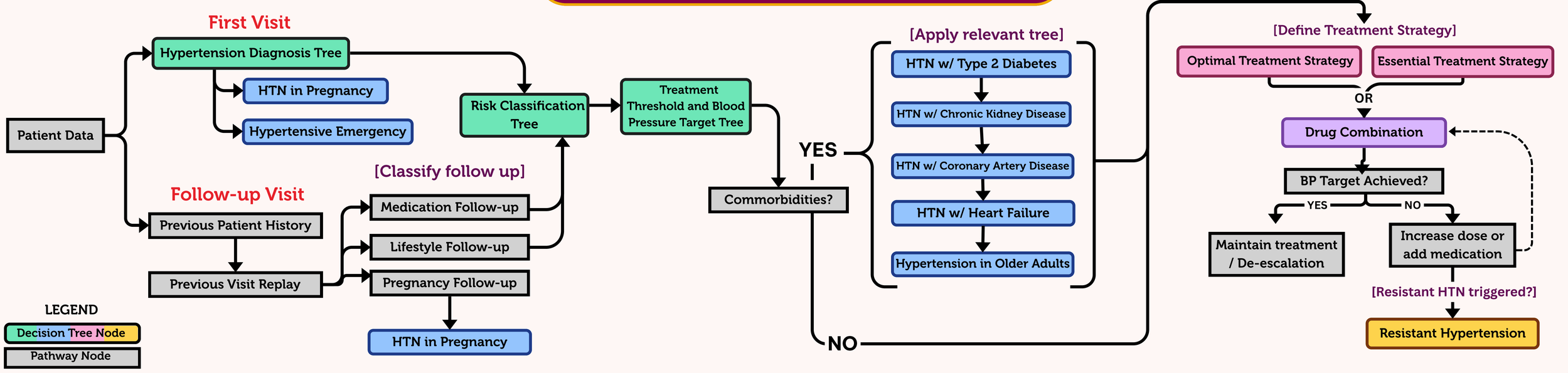
- Hypertension is a **leading cause of cardiovascular death** in Vietnam, yet a large share of treated patients still do not reach target blood pressure.
- **VSH/VNHA 2022 guidelines** are detailed and evidence based, but hard to apply consistently under clinic time pressure.
- **LLM-based tools:**
  - **Cannot guarantee** the same answer twice for the same patient
  - **Limited** guideline **traceability**

Vietnam clinicians needs a system they can trust, question, and defend.

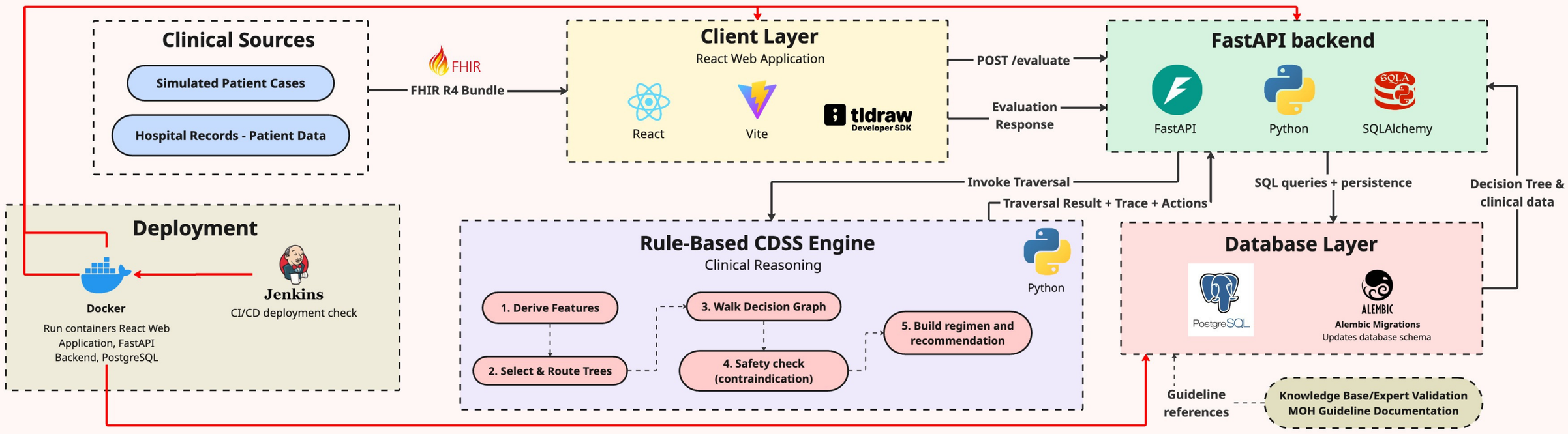
OBJECTIVES

- **Guideline Extraction** and build a **rule-based engine** for evaluating patient data against Vietnamese guidelines
- **Recommendation traceability** to the exact guideline clause behind each recommendation
- **Doctor review interface** for inspection and adjustment of the **suggested regimen**
- **Transparent decision paths** showing the clinical factors and rules used to **generate recommendation.**

SIMPLIFIED DECISION FLOW

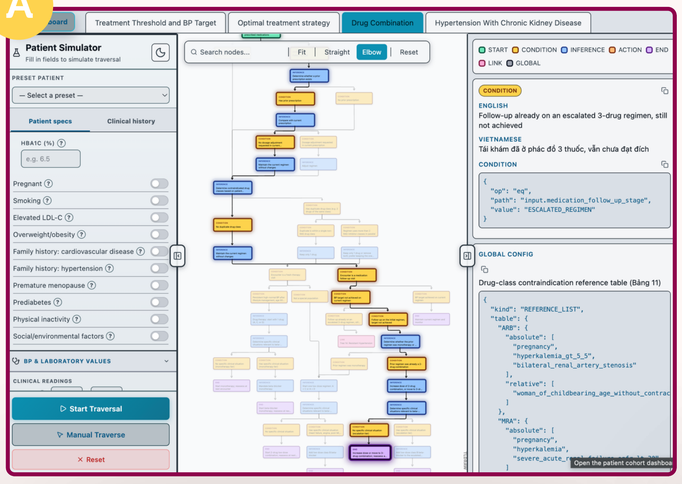


SYSTEM ARCHITECTURE



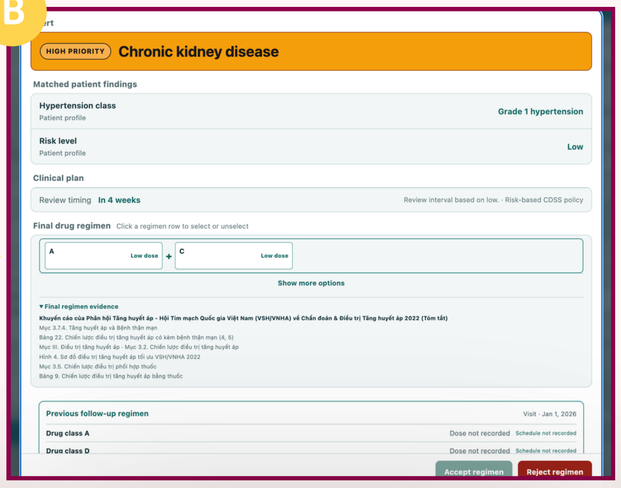
PRODUCT OUTCOMES

A INTERACTIVE DECISION SUPPORT



- **Traversal path** is followed **node by node** showing how each **patient scenario** leads to the **final recommendation**.

B CLINICAL RECOMMENDATION



- **Guideline-based regimen** with the **reference source** attached to every step, **reviewable** and **adjustable** by the doctor.

CONCLUSION & FUTURE WORK

- Delivered a **working CDSS** covering 14 hypertension pathways, all recommendation **traceable** to VSH/VNHA 2022.
- Demonstrated that **guideline knowledge** can be encoded as data, making the system **auditable** and **updatable** without engineering work.
- Reviewed by **clinical experts** for decision trees fidelity. Further **formal clinical validation** will be conducted by AstraZeneca during continued development.

- **Toward deployment:** integration with **hospital information systems** via FHIR R4, then **piloting** in **Vietnamese clinics**.
- **Beyond hypertension:** the engine is disease agnostic, so the **same platform** can **encode guidelines** for other conditions.