



SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

Accredited by NAAC-UGC with 'A' Grade

**Approved by AICTE, Recognized by UGC & Affiliated to
Anna University, Chennai**

**Department of Artificial Intelligence and Data Science
Course Name – Introduction to Artificial Intelligence**

II Year / III Semester

Unit 5 Expert System and Application





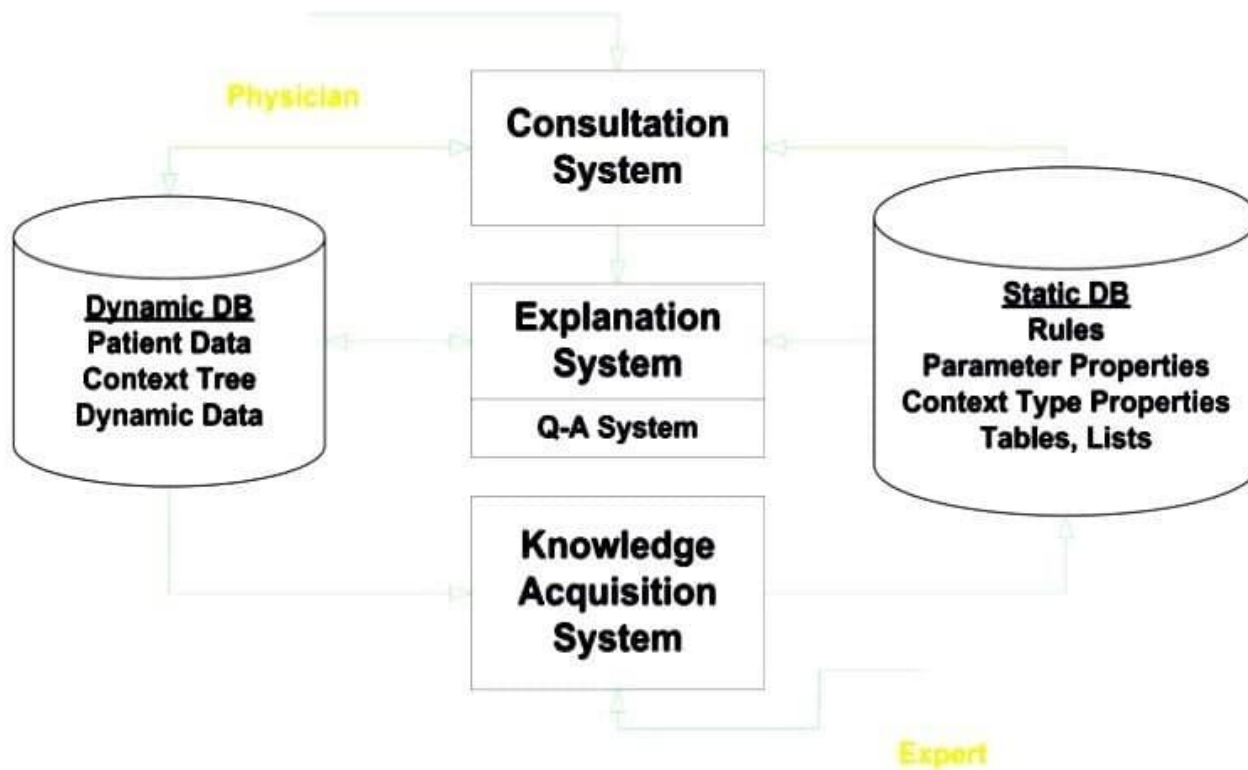
MYCIN

- MYCIN is used for **Disease DIAGNOSIS** and **Therapy SELECTION**
- MYCIN would attempt to diagnose patients based on reported symptoms and medical test results.
- The program could request further information concerning the patient, as well as suggest **additional laboratory tests**, to arrive at a probable diagnosis, after which it would recommend a course of treatment.
- If requested, MYCIN would explain the reasoning that led to its diagnosis and recommendation.
- Using about 500 production rules, MYCIN operated at roughly the **same level of competence as human specialists** in **blood infections** and rather better than general practitioners.
- MYCIN was written in LISP

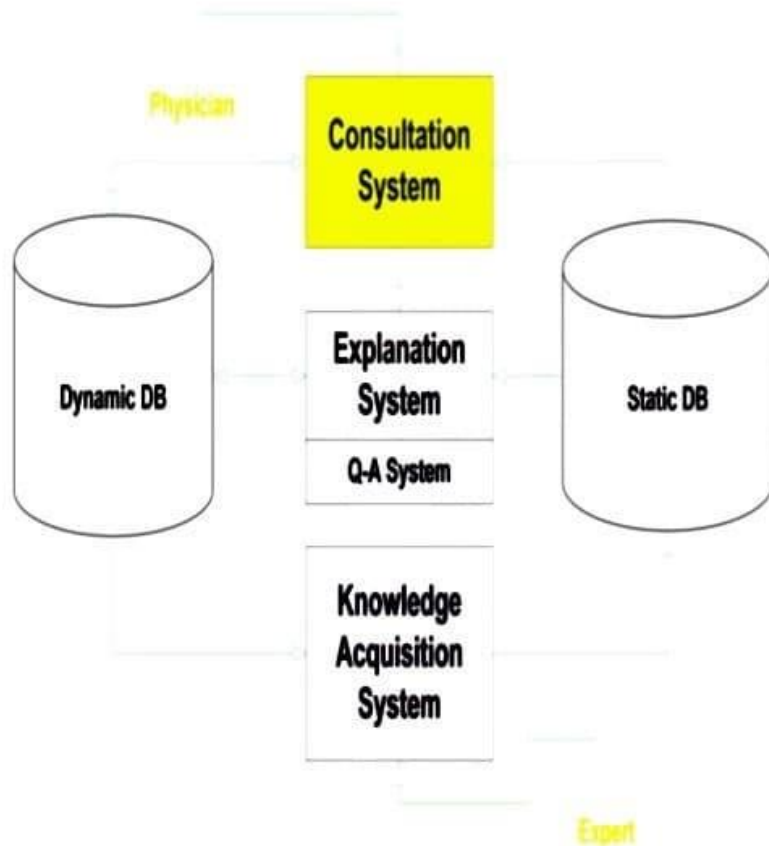
MYCIN

- Represent Domain-specific Knowledge
- Over 450 rules in MYCIN
- Premise-Action (If-Then) Form:
 <predicate function><object><attrib><value>
- Each rule is completely modular, all relevant context is contained in the rule with explicitly stated premises

MYCIN Architecture



Consultation System



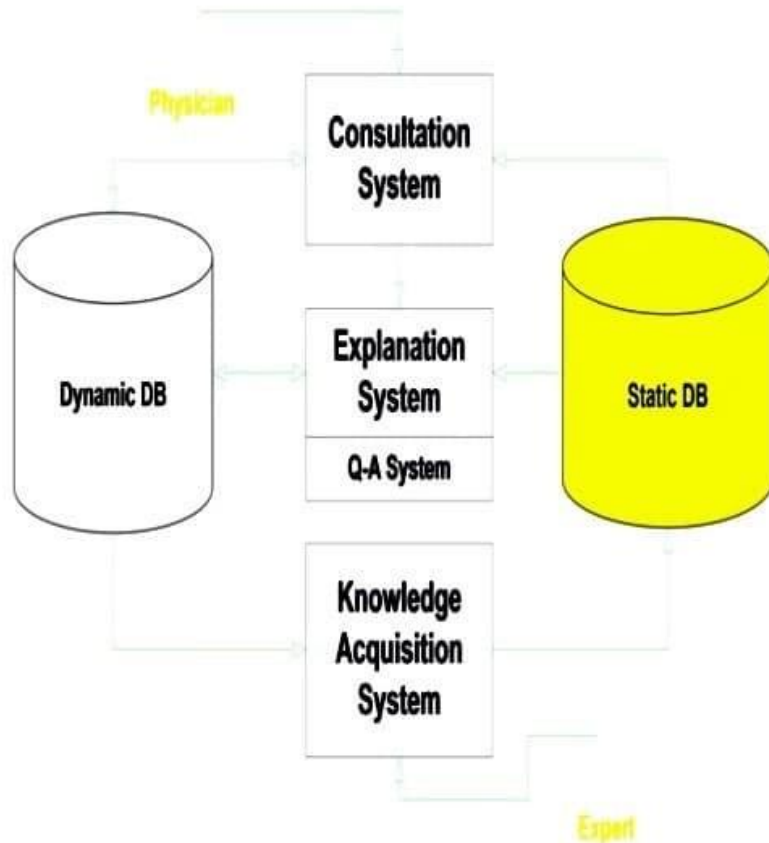
- Performs Diagnosis and Therapy Selection
- Control Structure reads Static DB (rules) and read/writes to Dynamic DB (patient, context)
- Linked to Explanations
- Terminal interface to Physician



Consultation System

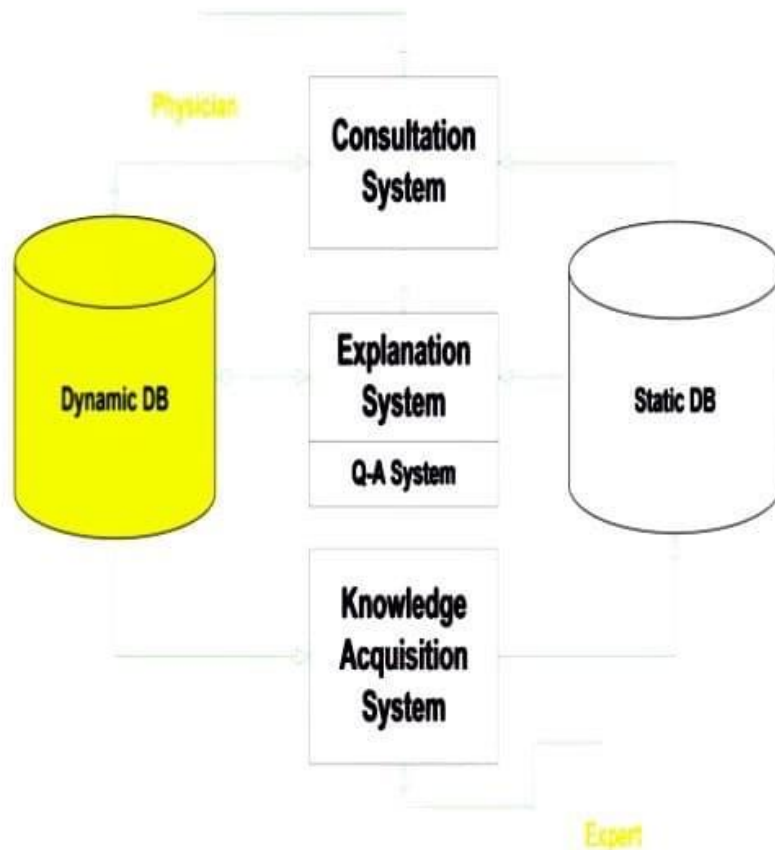
- Questions are asked when more data is needed
- Goal-directed Backward-chaining Depth-first Tree Search
- High-level Algorithm:
 1. Determine if Patient has significant infection
 2. Determine likely identity of significant organisms
 3. Decide which drugs are potentially useful
 4. Select best drug or coverage of drugs

Static Database



- Rules
- Meta-Rules
- Templates
- Rule Properties
- Context Properties
- Fed from Knowledge Acquisition System

Dynamic Database



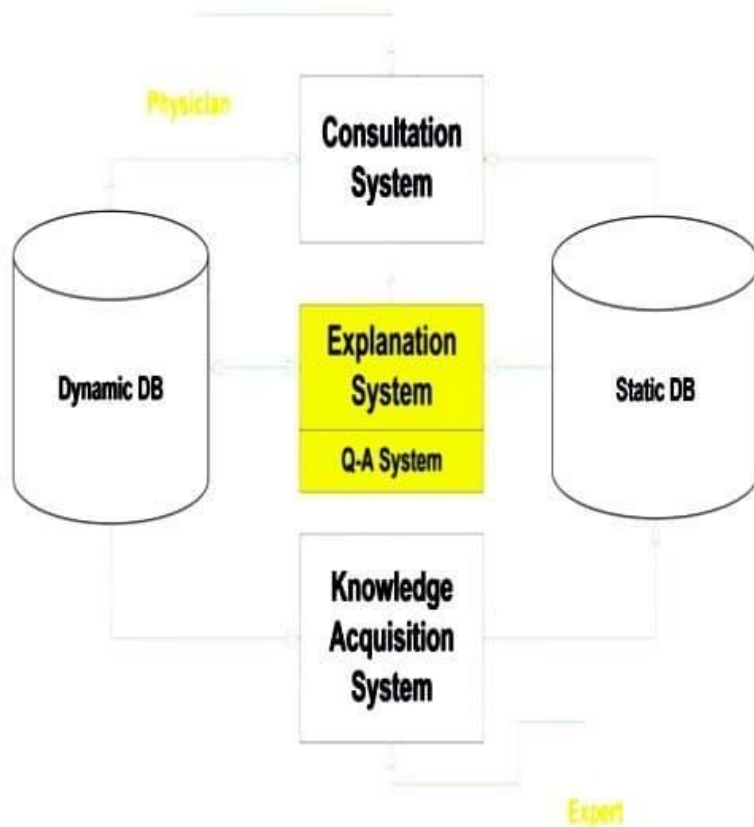
- Patient Data
- Laboratory Data
- Context Tree
- Built by Consultation System
- Used by Explanation System



Dynamic Database

- Plan-Generate-and-Test Process
- Therapy List Creation
 - Set of specific rules recommend treatments based on the probability (not CF) of organism sensitivity
 - Probabilities based on laboratory data
 - One therapy rule for every organism

Explanation System



- Provides reasoning why a conclusion has been made, or why a question is being asked
- Q-A Module
- Reasoning Status Checker