Expert Systems

Sample interview/dialog between the user and the expert system:

> User: I am experiencing a problem with my printer.
> System: What kind of a problem?
>
> User: The lights keep blinking.
> System: What kind of printer do you have?
>
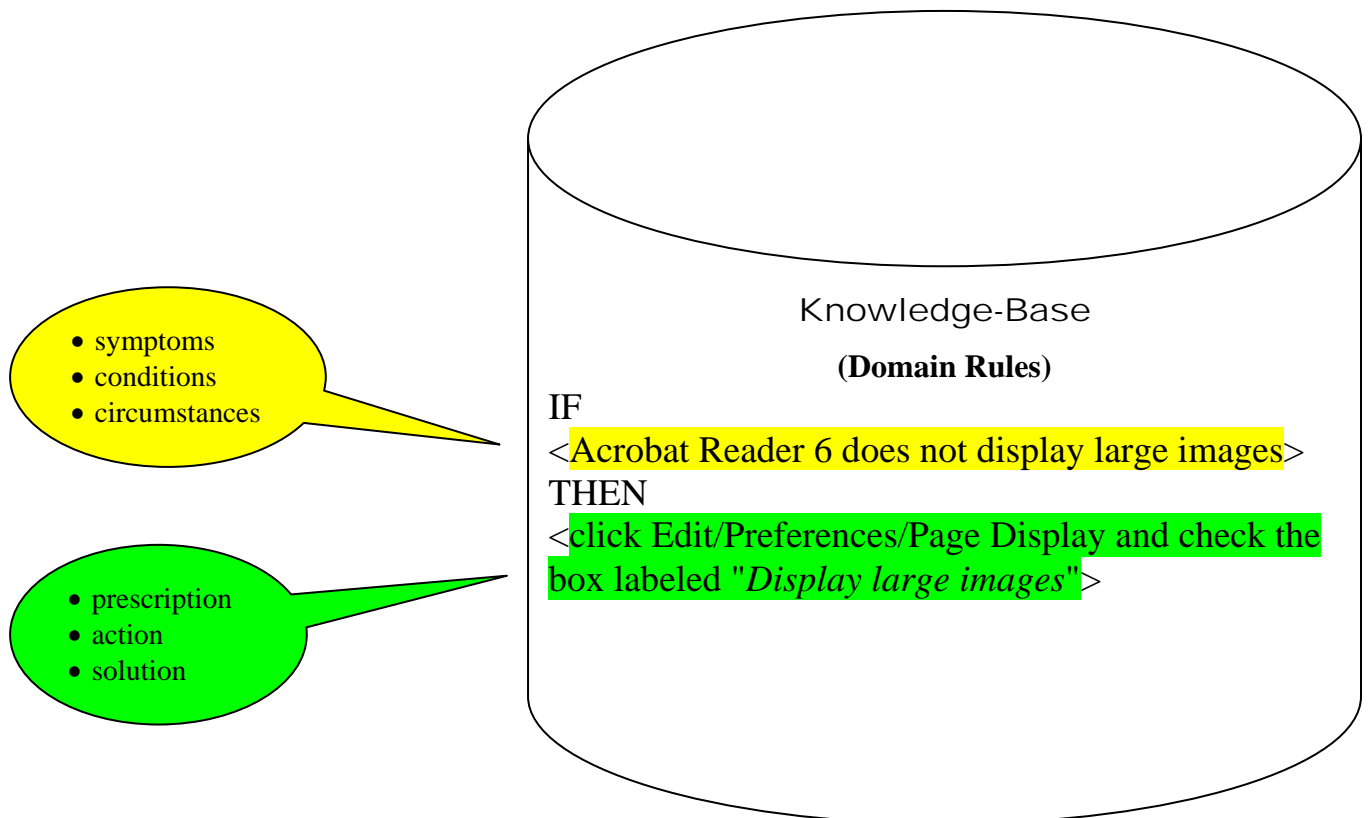> User: HP DeskJet 920C.
> System: Do all lights keep blinking?
>
> User: No; the power light blinks but the cartridge & resume lights are off.
> System: Does this happen when the printer is processing a print job?
>
> User: No
> System: What you need to do is: …………………………
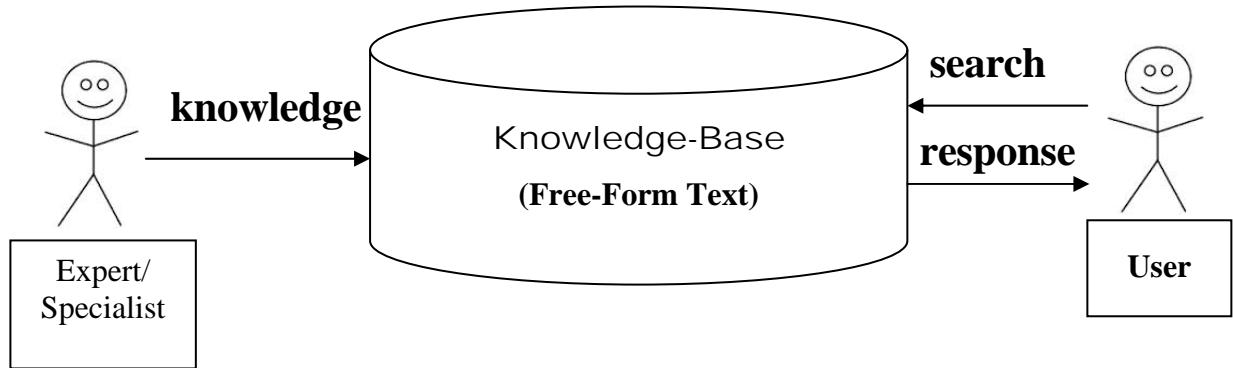
All knowledge that CAN be articulated (explicit knowledge) MAY be stated in rules of the form: **IF X, THEN Y**

- symptoms
- conditions
- circumstances

- prescription
- action
- solution

Knowledge-Base

(Domain Rules)

IF
<Acrobat Reader 6 does not display large images>
THEN
<click Edit/Preferences/Page Display and check the box labeled "*Display large images*">

How are Knowledge-Based Systems <u>different from</u> Expert Systems?

Knowledge-Based Systems: Less Structured

knowledge

Expert/
Specialist

Knowledge-Base

(Free-Form Text)

search

response

User

Expert Systems: More Structured

knowledge

Expert/
Specialist

Knowledge
Engineer

rules

Knowledge-Base

Domain Rules

"IF …, THEN …"

User
Inter
-face

interview

advice

User

Inference Engine
Logic Rules

IF X, THEN Y
<u>IF Y, THEN Z</u>
IF X, THEN Z
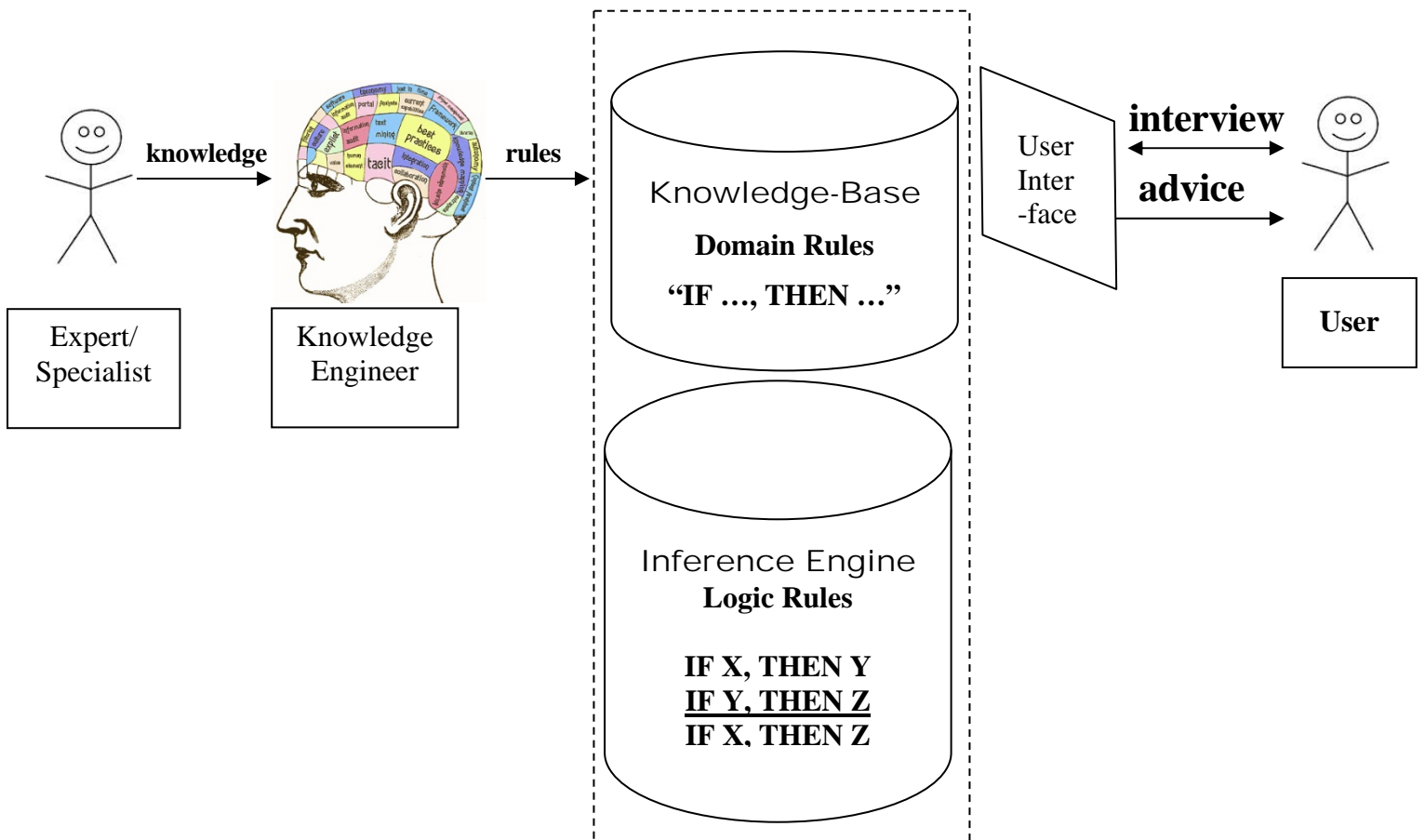
Need a new truck but not sure what the best way
to finance the investment?
Simply follow the flow chart to find the best finance
option for you.

start

Yes ← Ownership → No

Yes ← Deferment → No

Yes

Lease → No → No Option

Final_payment_guarentee

Yes

Company_asset

Yes

No

Yes

No

Triple
Choice

Hire
Purchase
with
Balloon

Hire
Purchase

Finance
Lease

Contract

Yes

No

Contract
Hire

Operating
Lease

Automotive Expert Sys

start

does the engine start? → no

yes

does the engine rotate? → no

does the engine run? → yes → No repair needed

is the battery charged? → no → Charge the battery

yes

no

is there gas in the tank? → no

is the engine sluggish? → yes → Clean the fuel line

is the conductivity test for the ignition coil positive? → no → Replace the ignition coil

no

yes

does the engine misfire? → yes → Point gap adjustment

Repair distributor lead wire

no

yes → what is the surface state of the points?

does the engine knock? → yes → Timing adjustment

normal → Take the car to a mechanic

burned → Replace the points

contaminated → Clean the points

no

is the output of the engine low? → no