CASE STUDY- AGENT ARCHITECTURE

Problem Definition

- Design a crime investigation agent that goes through incident narration(s) or a question-answer system to give list of suspects and if possible, culprit to the crime.

PEAS

- Performance measure-(On the scale of 1 to 10)
  - Clue identification - +8
  - Wrong suspect - -9
  - Resolved case – bonus +10
  - Open case – penalty -10
  - Figured out modus operandi of similar crimes - +10
  - Motive identification - +6 per motive
- Environment- closed room, a data entry person
- Actuators- screen, printer
- Sensors – keyboard, mouse, touchscreen, image reader, video processor

Properties of task environment

- Partially observable
- Stochastic
- Sequential
- Dynamic
- Continuous
- Single agent

Architecture- Goal based
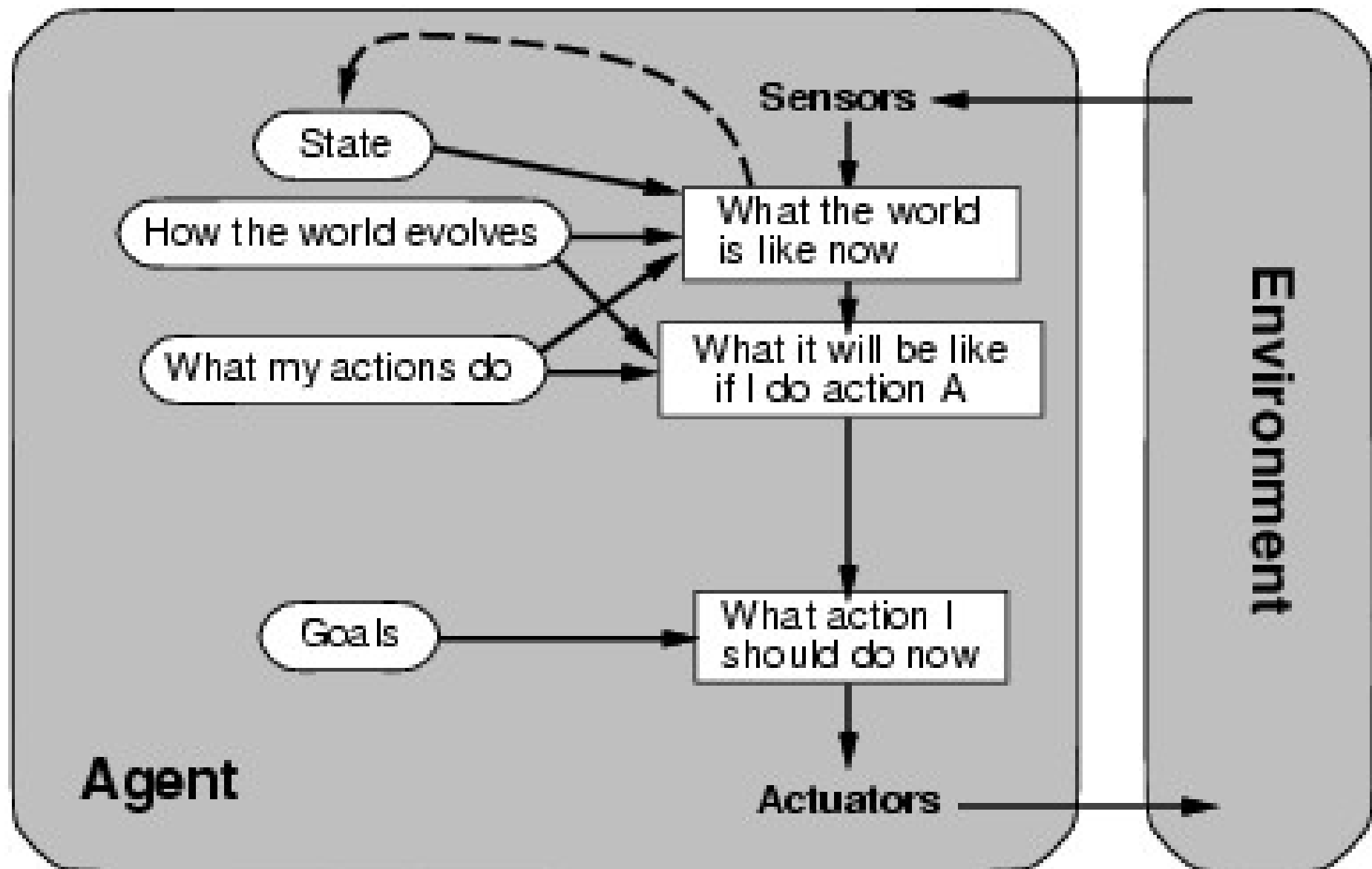
How the world evolves

- **Basic definitions** –crime, suspect, evidence & proof, legal evidence,
- **Types of crimes**
- **Evidence**- fingerprint, DNA, belongings, weapons, leaving some trail behind
- Different consequences of different crimes (shoplifting in minor while murder and conspiracies are serious)
- Science of crime investigation
- Human virtues responsible for crime – hate, jealousy, professional crime, psychological issues, money, revenge, challenge, blackmail
- People- economical status, presence or absence of respect or credibility in society with money and/or education, work culture of different professions, availability of tools due to professions, knowledge about Non-tool entities which can act as tool in crime, interpersonal relations-

What my actions do

- Action1: Find_Suspect()
- Action2: Find_Culprit()

- Both actions may have hundreds of rules for finding suspects and culprit based on information provided in "How the world works"
- Not all the rules defined would be applicable to every story, it will vary from story to story
- Information given in "How the world works" and "What my actions do" is generic(Domain knowledge)
- "what the world is like right now" would be case specific

Learning agents
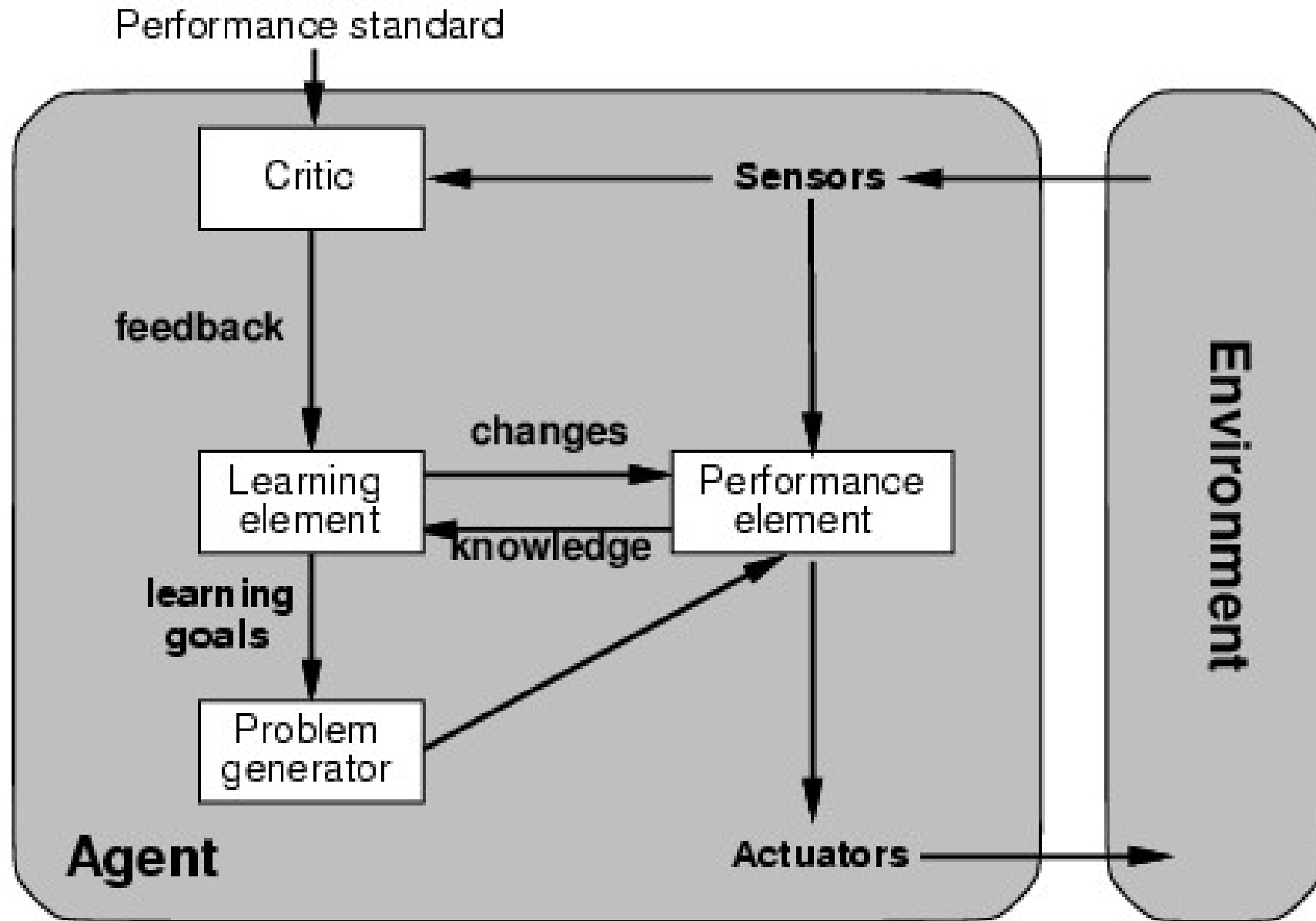
Goal based- Learning agent

- Performance element –
  - Goal based agent

- Learning element
  - Receives new knowledge from PE (E.g. role of mobile location in narrowing suspects in faster and better manner)
  - Creates a rule and adds to "How the world evolves" part so that it can be used for solving any such case; rather than solving only this case
  - Based on this new info, PE may choose different rule to execute in similar situation while solving another crime
  - or may choose to change the sequence of rules to execute while checking on suspects and culprits

Goal based- Learning agent

- Problem generator
  - May make rules for unseen situations (e.g. solving a case wherein mobile location isnt available)
  - Use it when such a situation arises and based on the effect, may change it or accept it in "How the world evolves" part
  - Will learn better ways to achieve goals or sub-goal(s)
- Critic
  - Sensors give account of situation and rewards/penalties given in performance element tells if its good, better, bad or worst
  - E.g. lots of suspects but no solution/ wrong clues being used etc
  - Learning element updates rules accordingly and changes them in "How the world works" part of performance element

Video recommendation system??

- Design a video recommendation system on the basis of what the user's watching history and refines the recommendations on the basis of recommendations the user has already chosen to view.

- Design a video recommendation system which takes into consideration the preferences like language, genres and viewing history to display a list of recommended series/movies.

- Design a video recommendation system based on; user views, history, previous view durations and general trends observed.

Properties of task environment

- Oservable?
- Deterministic?
- Episodic?
- Static?
- Discrete?
- Single user?

PEAS

- P
- E
- A
- S

Agent architecture(s)?