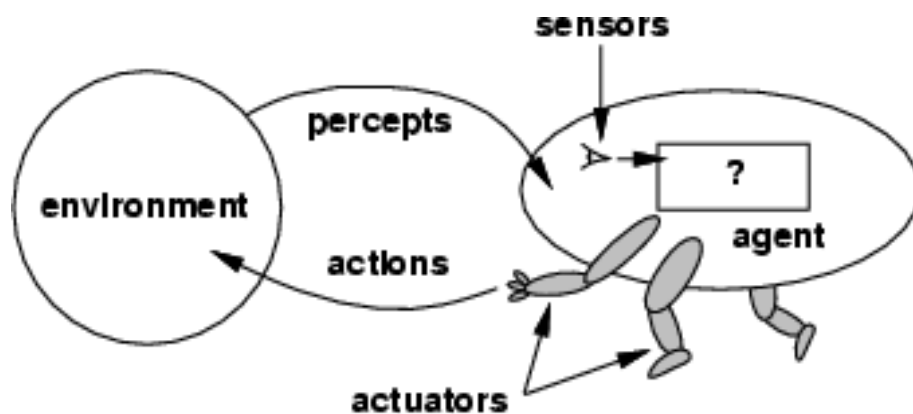


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## 1. Artificial intelligent (AI) to intelligent Agent (IA)

An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators

- Human agent: eyes, ears, and other organs for sensors; hands, legs, mouth, and other body parts for actuators
- Robotic agent: cameras and infrared range finders for sensors; various motors for actuators



## 2. PEAS: Performance measure, Environment, Actuators, Sensors

Must first specify the setting for intelligent agent design:-

Consider, e.g., the task of designing an automated taxi driver:

- **Performance measure:** Safe, fast, legal, comfortable trip, maximize profits
- **Environment:** Roads, other traffic, pedestrians, customers
- **Actuators:** Steering wheel, accelerator, brake, signal, horn
- **Sensors :** Cameras, sonar, speedometer, GPS, odometer, engine sensors, keyboard.

**Agent: Medical diagnosis system**

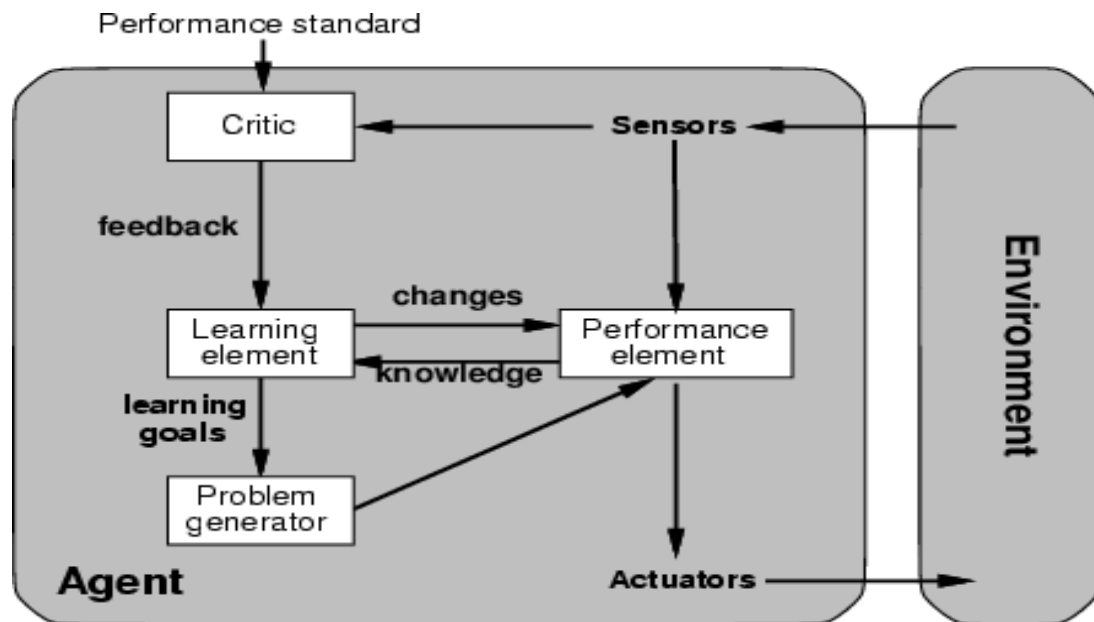
- Performance measure: Healthy patient, minimize costs, lawsuits
- Environment: Patient, hospital, staff
- Actuators: Screen display (questions, tests, diagnoses, treatments, referrals)
- Sensors: Keyboard (entry of symptoms, findings, patient's answers)

**Agent: Part-picking robot**

- Performance measure: Percentage of parts in correct bins
- Environment: Conveyor belt with parts, bins
- Actuators: Jointed arm and hand
- Sensors: Camera, joint angle sensors

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Learning agent can be viewed as :-



Needing for learning when the agent is long-lived and will perform similar tasks many times during its lifetime, then learning can be used to improve its performance.

**a. Perception**

- To make a good software agent it can be perceive for all thinks around it.
- Our IA must have a source of information about the world in which it lives and to be able to gather information about its environment.
- It can be done either by sending or receiving a stream of event messages from the system, the user, or other agents.
- The software agent must be able to distinguish the normal events from the significant events

**b. Action**

- After gather information the next step that the agent must take some action to do.
- The agent like people, it takes actions through effectors.
- The action is the process that the software agent will do them to perform a specific task.

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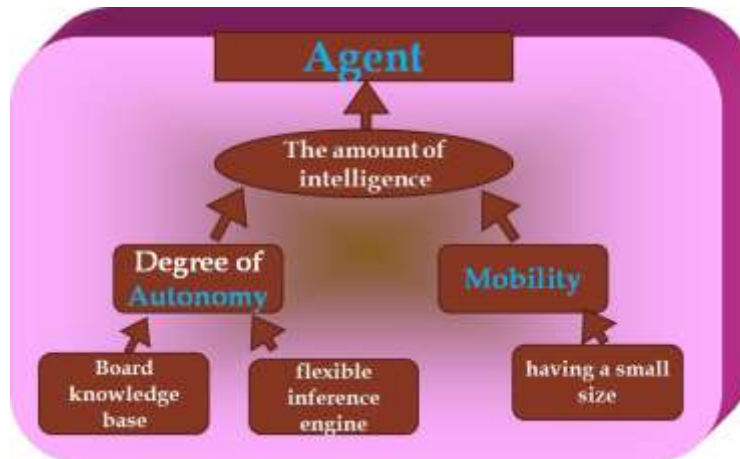
### 3. From AI to IA

intelligent agents can be used to enhance the capabilities of applications.

**For our intelligent agents, knowledge representation is a crucial issue.**

**Must determine:**

1. **The expected operation(Job) that agent will do.**
2. **The domain of that work.**
3. **The type of knowledge representation.**



### 4. Types of agents

- **Cooperating Agents**

In each distributed computing model we need system manager to:

- Performance monitors which provided clear views.
- Communicate with the remote monitor's agent to get information

*Cooperation* among agents allows a community of specialized agents to pool their capabilities to solve large problems, but with the additional cost of communication overhead. Distributed systems management, electronic commerce, and multiagent design systems are three application areas where cooperating agents have been applied.

- **Competition Agents**

*Competition* between agents will occur as soon as intelligent agents are deployed by individuals or companies with different agendas, and those agents interact in the e-commerce environment. Intelligent agents will be used to provide competitive advantages for individuals and businesses.