

**Experiment No. 1**

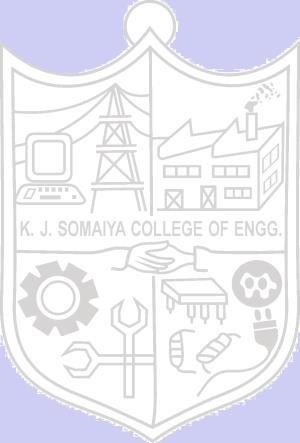
**Title:** Case Study for AI application-PEAS and Task Environments

# Batch: A1 Roll No.: 1814019 Experiment No.: 1

**Aim: To comprehend Case Study for AI application for PEAS and Task Environments Resources needed: Internet**

**Theory**

Artificial intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence.

Artificial intelligence is the search for a way to map intelligence into mechanical hardware and enable a structure into that system to formalize thought. No formal definition, as yet, is available for as to what artificial intelligence actually is.

There are numerous definitions of what artificial intelligence is. We end up with four possible goals:

1. Systems that think like humans (focus on reasoning and human framework)
2. Systems that think rationally (focus on reasoning and a general concept of intelligence)
3. Systems that act like humans (focus on behaviour and human framework)
4. Systems that act rationally (focus on behaviour and a general concept of intelligence) Artificial intelligence has successfully been used in a wide range of fields including medical diagnosis, stock trading, robot control, law, scientific discovery, video games, toys, and Web search engines.

Here are some applications of artificial intelligence:

1. Game playing
2. Speech synthesis, recognition and understanding very useful for limited vocabulary applications unconstrained speech understanding is still too hard
3. Understanding natural language
4. Computer vision works for constrained problems (hand-written zip-codes) understanding real-world, natural scenes are still too hard.
5. Expert systems Learning adaptive systems are used in many applications: have their limits
6. Planning and Reasoning only works for constrained problems: e.g., chess real-world is too complex for general systems.

# Role of AI in day to day life:

Post Office



Banks



n application classification Customer Service

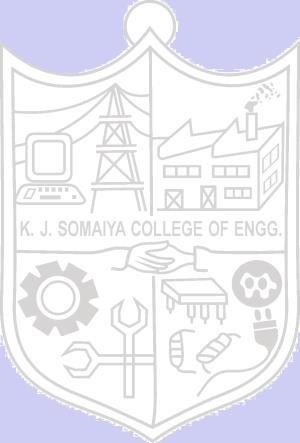


The Web



Digital Cameras

Every problem starts with PEAS description which must first specify the setting for intelligent agent design



# Performance Measure

Specified by outside observer or evaluator

Applied (consistently) to (one or more) IAs in given environment

# Environment

Reachable states

“Things that can happen” “Where the agent can go” To be distinguished (TBD) from: observable states

# Actuators

What can be performed?

Limited by physical factors and self-knowledge

# Sensors

What can be observed?

Subject to error: measurement, sampling, post processing

# Table 1: Examples of Agents Type and PEAS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Agent Type** | **P** | **E** | **A** | **S** |
| Medical Diagnosis | Healthy patient, minimize costs, lawsuits | Patient, hospital, staff | Display questions, tests, diagnoses, treatments, referrals | Keyboard entry of symptoms, test results,  patient’s answers |
| Satellite image system | Correct image categorization | Downlink from satellite | Display categorization of scene | Color pixel array |
| Interactive English tutor | Maximize student’s score on test | Set of students, testing agency | Display exercises, suggestions, corrections | Keyboard entry |

**Table 2: Example of Agents and Task Environments**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Environment** | **Observable** | **Deterministic** | **Episodic** | **Static** | **Discrete** | **Agents** |
| Crossword puzzle | Fully | Deterministic | Sequential | Static | Discrete | Single |
| Chess w/clock | Fully | Strategic | Sequential | Semi | Discrete | Multi |
| Taxi driving | Partially | Stochastic | Sequential | Dynamic | Continuous | Multi |
| Medical Diag. | Partially | Stochastic | Sequential | Dynamic | Continuous | Single |
| Image analysis | Fully | Deterministic | Episodic | Semi | Continuous | Single |

**Procedure:**

1. For this experiment students have to individually a topic on any AI Agents. Analyze case study from artificial intelligence point of view and give description and features for the same.
2. Compare the features of selected AI with other existing AI agents in terms of few performance metrics
3. Give its PEAS representation in table format
4. Write its Task Environments in the table format

# Results: (Softcopy submission of Summary Document)

1. **CASE STUDY:**

**CONTEXTUAL INTELLIGENCE**

Contextual intelligence is the ability to apply knowledge to real world scenarios and situations. It is the proficiency at adapting knowledge and skills to different situations and environments. Contextual Decision intelligence bridges the data-decision gap and helps models perform better.

**IMPACTS OF AI ON LOGISTICS AND SUPPLY CHAIN:**

* Considering the complex operations and vast amounts of information that data specialists need to process in the present business scenario, enabling AI to learn and automate data analysis can simplify difficult and time-consuming tasks. It can track the location of products throughout the entire distribution process through GPS data and smart sensors. Moreover, AI technology can shorten the entire distribution process by guiding autonomous vehicles efficiently.
* AI mitigates the risks of supply chain demands so that the time and money invested do not go waste with the help of predictive abilities. It can predict the upcoming demand of products, bring transparency to the entire process and influence decision making.
* AI plays a vital role in personalizing customer experiences. Personalized customer experience improves the relationship between logistics providers and their customers. AI-powered systems enable voice-based shipment tracking that allow the customers to get in touch with the customer assistance team directly in case of any issues, thereby enhancing customer service.

ECHO GLOBAL LOGISTICS:

Transportation management company [Echo](https://www.echo.com/) uses AI to provide supply chain solutions that optimize transportation and logistics needs so customers can ship their goods quickly, securely and cost effectively. Services include rate negotiation, procurement of transportation, shipment execution and tracking, carrier management, selection, reporting, and compliance, executive dashboard presentations and detailed shipment reports, and much more.



**CORPORATE DECISION MAKING:**

* You’ve got all the data you need to make better decisions. But data is spread across internal and external systems, and is often poor quality.
* Single view solutions can’t handle data lake volumes, and quickly become siloed to specific use cases. Without good data, models under-perform and can lack transparency, so you can’t confidently automate decisions.
* Contextual analysis automatically builds critical data to support a decision. It creates a complete network graph for real-world entities and their links to internal and external data.
* Decision intelligence combines context with data science models to automate decisions.

BENEFITS:

* Drive automation and deliver greater business value from enterprise data.
* Process operational decisions faster and more accurately.
* Spot hidden risks and identify high-value growth opportunities.
* Automate decisions with confidence, using context-based models.
* Overcome poor quality data and inaccurate decision models.

QUANTEXA:

It is a corporation, founded in 2016, which uses latest data analytical tools alongside CDI (contextual decision intelligence provided by AI) to make better operational decisions. Handling vast amounts of data is a very tedious task and many key points are lost while visualizing data. Every data-intensive organization has been facing such issues. With real-time entity resolution, network generation and advanced analytics, Quantexa creates context that helps organizations make more informed and accurate decisions – faster.



**2) COMPARISON**

* In logistics and supply chain, the example taken echo global logistics, it uses GPS for tracking and microphones for voice assistance but in quantexa we don’t need such assistance or tracking.
* Although both work mostly on contextual intelligence and CDI still the tasks that are accomplished by either of them differ majorly.
* Quantexa needs to continuously monitor the changes in the capital markets and prevent any damage done to the data of the client, the markets are never static, and the number of unforeseen circumstances are immense. Whereas, in the case of logistics and supply chain the number of possibilities are complete and the movement of shipment and can be tracked at all points, although the supply-chain demands cannot be always predicted at all times since customers are whimsical and demands may be volatile.

**3) PEAS PRESENTATION:**

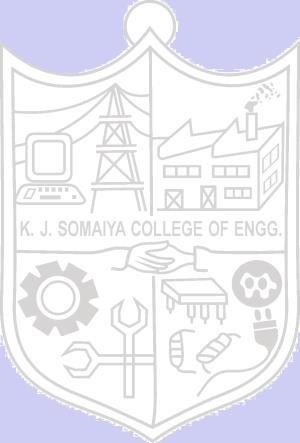
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Agent Type | P | E | A | S |
| Logistics and supply chain | Supply chain demands prediction, customer services, tracking orders. | Internet, customers, company, factory, warehouse. | Display of location of orders, customer feedback, visualized charts of supply-demand. | GPS sensors, microphone, keyboard entry of customer feedback. |
| Quantexa | Maximize market profits, monitor supply chains, provide security to client data. | Capital markets, internet, shareholders, clients/organizations. | Scorecards, visualized charts and graphs. | Database (provided by the client) |

**4) ENVIRONMENT TYPE:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Environment | Observable | Deterministic | Episodic | Static | Discrete | Agents |
| Logistics and supply chain | Fully | Stochastic | Episodic | Dynamic | Discrete | Multi-agent |
| Quantexa | Partially | Stochastic | Episodic | Dynamic | Continuous | Multi-agent |

**Outcomes:** Understand structure, types and PEAS parameters of an AI (Artificial Intelligence) agent and formalize the problem.

**Conclusion: We completed the case study and analyzed and understood the structure, types and PEAS parameters of the AI domain chosen.**

**Grade: AA / AB / BB / BC / CC / CD /DD**

**Signature of faculty in-charge with date**

**References:**

* Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Second Edition, Pearson Publication
* Elaine Rich, Kevin Knight, Artificial Intelligence, Tata McGraw Hill, 1999.