ARTIFICIAL INTELLIGENCE

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Text and Reference Books

- Artificial Intelligence -- Rich and Knight. -- Tata McGraw Hill.
- Artificial Intelligence – A New Synthesis – Nilsson. -- Morgan Kaufmann Publishers.
- Artificial Intelligence and Expert Systems -- Paterson. -- PHI
- Artificial Neural Networks – B. Yegnanarayanana. PHI

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CHAPTER-1
Introduction

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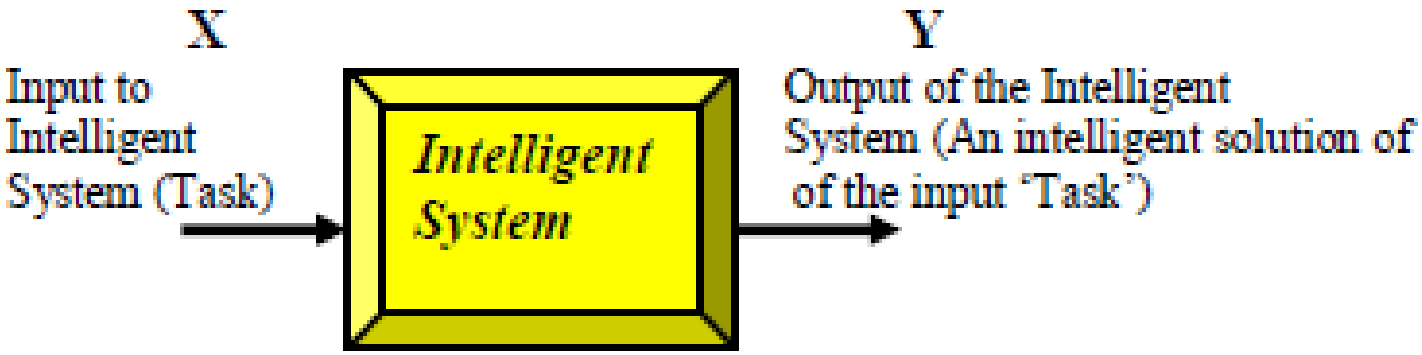
INTELLIGENT SYSTEMS



Drawbacks of Human or Natural Intelligence

1. **Time Varying output**
2. **Limited Applications**
3. **Promptitude of Response**
4. **Failure Proof.**

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Natural Intelligence tasks vs. AI tasks

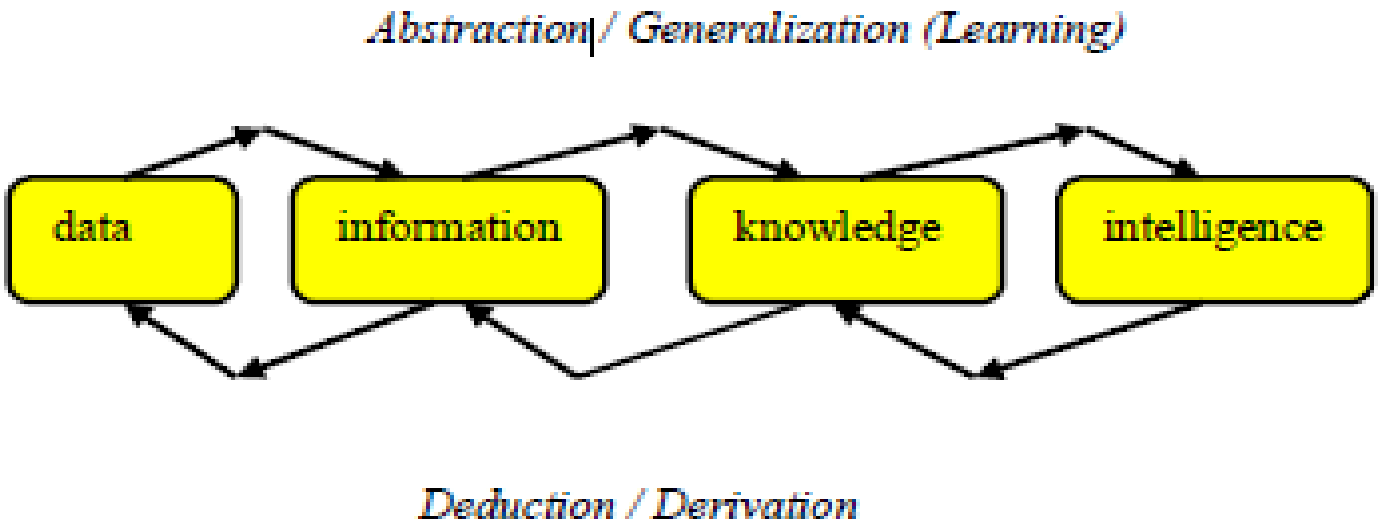
- **Tasks where Natural Intelligence outperforms Artificial Intelligence**

1. **Ambiguity Solution**
2. **Detecting Similarities in Dissimilarities and vice versa**
3. **Sense of relative importance**
4. **Intuition, Reflex, Sixth Sense**

- **Tasks where Artificial Intelligence outperforms Natural Intelligence**

1. **Data Storage and Retrieval**
2. **Computations, Calculation,**
3. **Large no. of Copying of the same document**

Relationship among Data, Information, Knowledge and Intelligence



Turing Test

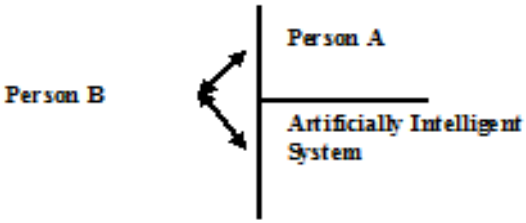


Fig. 3 Turing Test: Feasibility of the design of an AI System

Failure of Turing Test

The AI system of Turing Test since unable to learn will continuously make the same mistake and would easily be detected as a system and not a machine.

AI community and researchers have so far developed machine intelligent systems which imitate or mimic some smallest part of intelligence worthy of our particular small area of application domain.

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Features of Intelligence

- **Processing Incomplete Data.** Example: Suppose the data item presented is:-

  "Gray large_____eats plankton".
- **Processing „Conflicting", „Contradictory", „Ambiguous", „Vague" Data Items.** The example is: Suppose the data item presented is slightly modified to "Gray large fish eats plankton".
- **Processing Uncertain Data.** The example is: Suppose the data item is "He is tall" or "She is good".

- **Application of Heuristics for solution:** A "heuristic" is a search technique or method, which improves the efficiency of a search process sometimes at the cost of performing the completion of the search process to get the most optimal goal.
- **Ability to Learn:** This „learning" implies adaptive changes in the system that allows the system to perform the same task more effectively and efficiently afterwards.

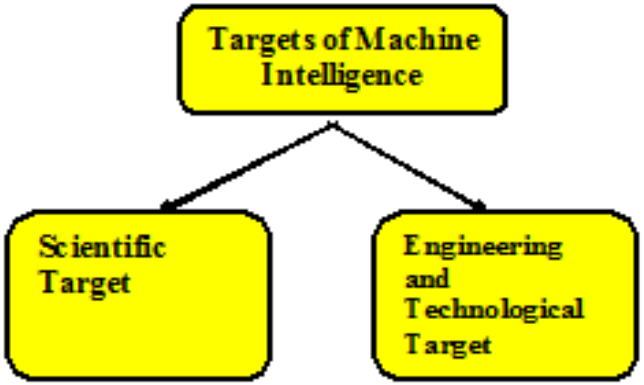
Few Observations on Intelligence

1. Exhibition of intelligence of an intelligent system requires knowledge.

2. If knowledge is restricted within a particular domain, intelligence (exhibited by the intelligent system) is also confined within that domain.

3. Intelligence leads to smartness i.e. efficiency, effectiveness and promptitude for the completion of various tasks.

THE TARGETS OF MACHINE INTELLIGENCE



TARGETS OF MI CONTD

- **The Scientific Target** To analyze and correlate natural and artificial intelligence intelligently to improve and enrich each other.

- **The Engineering and Technological Target**: The objective is to solve the real world problems using AI Techniques.

Different AI Techniques for AI Systems

- **Search:** A problem is solved by searching the methods of solution.
- **Knowledge Employment:** Robust and complicated problems are solved by analyzing the nature of those problems and thereby finding the appropriate solution technique.
- **Classification / Generalization / Inductive Learning:** Separation of important features of an object class for reuse or learning from experience or data to make the system more effective and efficient afterwards.

END OF CHAPTER - 1