ISSN: 2348 9510
International Journal Of Core Engineering & Management (IJCEM)
Volume 1, Issue 6, September 2014

Flourishing Preparation For Problem Solving By Learning And Reasoning

Dr.Raman Chadha
Professor, Computer Science Engg. Deptt.
Chandigarh Group of Colleges, Jhanjeri.
Mohali. INDIA
dr.ramanchadha@gmail.com

Ms. Shalini Verma[1] / Ms. Gurwinder Kaur[2]
M.Tech Students (CSE)
Chandigarh Group of Colleges, Jhanjeri.
Mohali. INDIA
vermas.shalini@gmail.com[1]/
gurwinderkaur28@gmail.com[2]

Abstract: **Intelligence in a world which is artificial but replacement of presence of human being in performing is to make the computers behave like humans in the better way. The goal of Artificial Intelligence is to identify and solve tractable information processing problem. It deals with the robotic world to make programming computers to *see,* hear and react to other sensory stimuli. But they are capable for limited tasks only. They have difficulties in identifying the objects based on appearance or feel, and they still move and handle objects clumsily. In this study, we have discussed the planning for problem solving process with reasoning and learning. It is focusing on-planning for purchasing the different things from different places with a reason specification i.e. it answers the "WHY" of purchasing things from different places.**

Keywords: **Planning, learning, Problem solving process, reasoning.**

I. INTRODUCTION

Artificial intelligence is the study and design of intelligent agents where intelligent agent is anything that can perceive its environment through sensors and act upon that through effectors. Intelligent agent is a computational system that performs a set of goals for which they are designed. Artificial Intelligence (AI) is usually defined as the science of making computers do things that require intelligence when done by humans[1]. AI has had some success in limited, or simplified, domains. However, the five decades since the inception of AI have brought only very slow progress, and early optimism concerning the attainment of human-level intelligence has given way to an appreciation of the profound difficulty of the problem. Mainly the goals of artificial intelligence are:

A. Planning
B. Learning
C. Reasoning
D. Problem Solving
E. Perception

ISSN: 2348 9510
International Journal Of Core Engineering & Management (IJCEM)
Volume 1, Issue 6, September 2014

A. Planning:

Planning means to set the goals and achieve them i.e. it is the map to reach at the required goal. The planning of a problem is to find a plan that is guaranteed to generate a sequence of actions that leads to one of the goal states. Mainstream thinking in psychology regards human intelligence not as a single ability or cognitive process but rather as an array of separate components. Research in AI has focused chiefly on
the following components of intelligence: learning, reasoning, problem-solving, perception, and language-understanding.

B. Learning:

Learning is distinguished into a number of different forms. The simplest is learning by trial-and-error. For example, a simple program for solving mate-in-one chess problems might try out moves at random until one is found that achieves mate [2]. The program remembers the winning move and next time the computer is given the same difficulty it is able to construct the answer immediately. The simple memorizing of individual items--solutions to problems, words of vocabulary, etc.--is known as rote learning.

Rote learning is relatively easy to implement on a computer. More challenging is the problem of implementing what is called generalization. Learning that involves generalization leaves the learner able to perform better in situations not previously encountered. A program that learns past tenses of regular English verbs by rote will not be able to produce the past tense of e.g. "jump" until presented at least once with "jumped", whereas a program that is able to generalize from examples can learn the "add-ed" rule, and so form the past tense of "jump" in the absence of any previous encounter with this verb[3]. Sophisticated modern techniques enable programs to generalize complex rules from data.

Learning means acquiring new knowledge, behaviors, skills, values, preferences or understanding, and may involve synthesizing different types of information. It also concerns with the construction and study of systems that can learn from data. Like machine learning, it deals with representation of data instances and generalization of unseen data instances. It can be of two types:-

- Supervised learning
- Unsupervised learning

Supervised learning:

In this type of learning the output is known. It includes classification to determine what category something belongs in and regression to produce a function that describes the relationship between inputs and outputs and predicts how the outputs should change as the inputs change [4]. Supervised learning is a type of machine learning algorithm that uses a known dataset (called the training dataset) to make predictions. The training dataset includes input data and response values. From it, the supervised learning algorithm seeks to build a model that can make predictions of the response values for a new dataset. A test dataset is often used to validate the model[5]. Using larger training datasets often yield models with higher predictive power that can generalize well for new datasets.
Supervised learning includes two categories of algorithms:

ISSN: 2348 9510
International Journal Of Core Engineering & Management (IJCEM)
Volume 1, Issue 6, September 2014

Classification: for categorical response values, where the data can be separated into specific "classes"

Regression: for continuous-response values

Unsupervised learning:

In this type of learning the output is not known. It is the ability to find patterns in a stream of input. Unsupervised learning means that trying to find hidden structure in unlabeled data. Unsupervised learning is a type of machine learning algorithm used to draw inferences from datasets consisting of input data without labeled responses.

The most common unsupervised learning method is cluster analysis, which is used for exploratory data analysis to find hidden patterns or grouping in data. The clusters are modeled using a measure of similarity which is defined upon metrics such as Euclidean or probabilistic distance. Common clustering algorithms include:

- **Hierarchical clustering**: builds a multilevel hierarchy of clusters by creating a cluster tree.
- **k-Means clustering**: partitions data into k distinct clusters based on distance to the centroid of a cluster.
- **Gaussian mixture models**: models clusters as a mixture of multivariate normal density components.
- **Self-organizing maps**: uses neural networks that learn the topology and distribution of the data.

Hidden Markov models: uses observed data to recover the sequence of states unsupervised learning methods are used in bioinformatics for sequence analysis and genetic clustering; in data mining for sequence and pattern mining; in medical imaging for image segmentation; and in computer vision for object recognition. A hidden Markov model is a statistical Markov model in which the system being modeled is assumed to be a Markov process with unobserved states. A HMM can be presented as the simplest dynamic Bayesian network[8].

C. Reasoning:

Reasoning is one of the pivotal processes in artificial intelligence. Reasoning is to draw inferences appropriate to the situation and here inferences is the means by which we reason from given knowledge. There has been considerable success in programming computers to draw inferences, especially deductive inferences. However, a program cannot be said to reason simply in virtue of being able to draw inferences. Reasoning involves drawing inferences that are relevant to the task or situation in hand. One of the hardest problems confronting AI is that of giving computers the ability to distinguish the relevant from the irrelevant.

D. Problem Solving:

Problem solving is characterized as a systematic search through a range of possible actions in order to reach some predefined goal or solution. In this there are problem solving agents which are goal based agents that decide what to do by finding sequences of actions that lead to desirable states. Problems have the general form: given such-and-such data, find x. A huge variety of types of problem is addressed in AI. Some examples are: finding winning moves in board games; identifying people from their photographs; and planning series of movements that enable a robot to carry out a given task[6].

ISSN: 2348 9510
International Journal Of Core Engineering & Management (IJCEM)
Volume 1, Issue 6, September 2014

Problem-solving methods divide into special-purpose and general-purpose. A special-purpose method is tailor-made for a particular problem, and often exploits very specific features of the situation in which the problem is embedded. A general-purpose method is applicable to a wide range of different problems. One general-purpose technique used in AI is means-end analysis, which involves the step-by-step reduction of the difference between the current state and the goal state. The program selects actions from a list of means--which in the case of, say, a simple robot, might consist of pickup, putdown, move forward, move back, move left, and move right--until the current state is transformed into the goal state.

E. Perception

In perception the environment is scanned by means of various sense-organs, real or artificial, and processes internal to the perceiver analyze the scene into objects and their features and relationships. Analysis is complicated by the fact that one and the same object may present many different appearances on different occasions, depending on the angle from which it is viewed, whether or not parts of it are projecting shadows, and so forth.

At present, artificial perception is sufficiently well advanced to enable a self-controlled car-like device to drive at moderate speeds on the open road, and a mobile robot to roam through a suite of busy offices searching for and clearing away empty soda cans [7].

II. BACKGROUND

Human beings solve most of their problems using fast, intuitive judgments rather than the conscious, step-by-step deduction. But in AI world programming computers cannot solve their problems easily; there should be some specific technique to solve the problems. In the artificial intelligence (AI) there are many problem solving techniques used in different ways to solve the problems, but there is no reason given for doing the particular task in a specific manner.

III. PROPOSED CONCEPT

As Artificial intelligence problems are discussed and they are solved by using many problem solving techniques. But there is no reason for “WHY” i.e. why the purchaser purchases the different things from that planned place only. As Artificial Intelligence(AI) is the artificial world , so it can be applicable on robotic world that they can think of why and from where they can purchase the things easily and beneficially with the efficiency of reasoning and avoiding uncertain knowledge ,the correct focus is on strong purchasing that can be inferred.

For Example:

The purchaser wants to purchase different things like milk, fruits and vegetables and these all are available in super market but in different sections. So the purchaser has to plan that which thing is to be purchase at first and from which section.

ISSN: 2348 9510
International Journal Of Core Engineering & Management (IJCEM)
Volume 1, Issue 6, September 2014

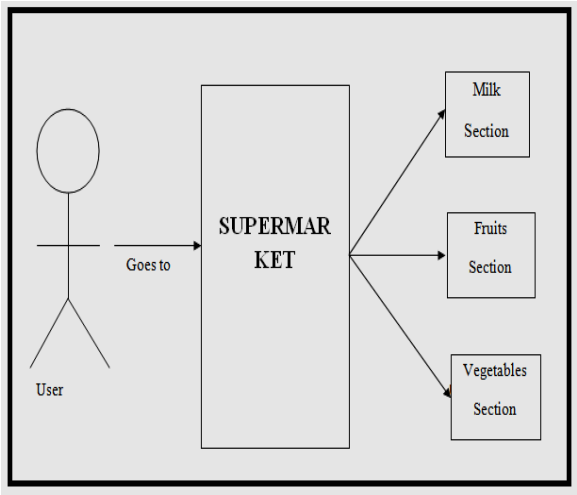

Figure1: Block Diagram of Purchasing

IV. CONCLUSION

In this paper, we studied the various aspects of successful problem solving in artificial intelligence. We reviewed the main goals of artificial intelligence i.e. planning, reasoning, learning and problem solving. In this the work is presented on the basis of successful problem solving using learning and reasoning. This paper is focusing on AI world where learning and reasoning techniques can be strongly implemented on planning process to reach at successful plan. Planed actions with specified reasons can reach at desired goal with reason of each condition. In our next study we will use detailed knowledge database gain during planning.

REFERENCES

[1] D.Marr,Artificial Intelligence, Volume 9, Issue 1, August 1977

[2] A. Blum, M. Furst ,Fast planning through planning graph analysis,Artificial Intelligence,1992.

[3] A. Newell, H. Simon, Human Problem SolvingPrentice-Hall, Englewood Cliffs..

[4] http://web.itu.edu.tr/sonmez/lisans/dogus/come444/REASONING.pdf

[5] http://www.webopedia.com/TERM/A/artificial_intelligence.html

[6] http://en.wikipedia.org/wiki/Reasoning.

[7] http://scholar.google.co.in/scholar?start=20&q=Artificial+intelligence&hl=en&as_sdt=0,5.

[8] http://en.wikipedia.org/wiki/Hidden_Markov_model