

Applying Machine Learning To e-Services in Management Information System

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ABSTRACT

In this paper, the use of various machine learning terminologies in the fields like; online education, online shopping & loyalty in **e-Service** environments has been discussed. The basic model of machine learning is discussed. Then **Rote learning** and **Analogy learning**, the two types of machine learning approaches is discussed. This paper contains the description of **MIS** and the various research fields of it. How offline and online shopping is different from each other and the flows in online shopping. Finally it describes how machine learning can be used in the fields of e-Services.

General Terms

Machine Learning, e-Services, Rote learning, Analogy learning

Keywords

Machine learning, Management information system, e-Services, Machine Learning model

1. INTRODUCTION

Machine learning is the field which incorporates study self-improvement methods of computers that to obtain new knowledge and new skills, identify existing knowledge, and continuously improve the performance and achievement. Compared with human learning, machine learning learns faster, the accumulation of knowledge is more facilitate the results of learning spread easier.

As we all know that e-Services like; e-governance or e-shopping lacks e-loyalty. Moreover they lack the realistic interaction of user with the machine. E -Service environments are the field where we can relate machine learning with. e-Services are spreading very quickly but there are various issues also coming into existence. For example: the easiness in online shopping with customer loyalty, loyalty in e-Governance and modification and updation on online education websites. This all can be done by machine learning.

As we know that Data Mining is also a field of research which is based on Machine Learning. It has been observed that over a period of time gradually there has been a noticeable increase

in the volume of information available on-line, and the consequent need for better techniques to access this information is the need of the hour. There has been a strong resurgence of interest in Web Mining research [1]. The information Retrieval by machine learning is likely to make substantial gains in web mining research and practice by developing standards and improving effectiveness. It is important to describe, how can such techniques helps in development of e-Governance to have a better public response towards government efforts. So it gives the idea of use of Machine Learning in e-Services [2].

In second section the basic model of machine learning is discussed. In the subsequent section an introduction about Rote Algorithm and Analogy Algorithm is given. In the third section an overview that relates MIS research topics to machine learning is presented. Then the differences in online and offline shopping & issues in online shopping is shown. Then comes the discussion part in which discussion of our research is done. In conclusion our research work and the future scope is mentioned.

2. MACHINE LEARNING

2.1 The Basic Model of Machine Learning

By talking about the definition of learning by H. Simon et.al [3] as the start, and establish the basic model shown in Fig.1. In the process of machine learning, the factor which is primary is the qualitative information that is externally provided to the system. Learning is a process that does the processing of the outside information to knowledge, firstly it gets the information of outside surroundings and then does the processing of the information into knowledge, and then puts these knowledge to the repository; Which stores many of the general principles which guide a part of the implementation task, due to the environment provides all kind of information for the learning system, quality of information affects directly on learning realization whether disorderly or easily.

The other factor that affects the design of system of learning is Repository. We need to make sure of four terms when to select: strong expression, easily infer, easily modify repository, the information is easy to elaborate. The process implementation that uses the repository to finish a certain task, also to feed back the information which obtained in the further work of completing the learning, and to evaluate further research topics.

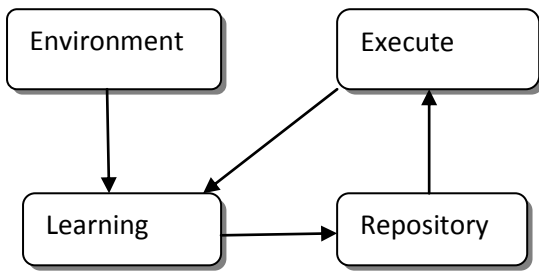


Fig 1. Basic model of machine learning

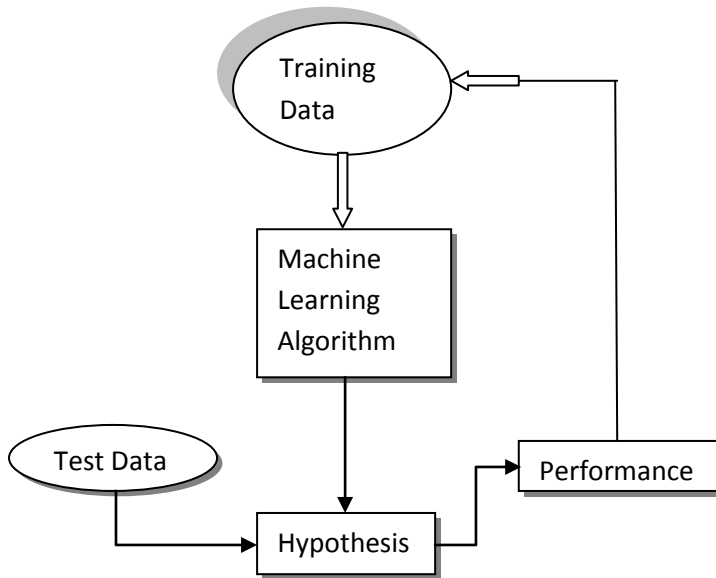


Fig 2. Machine Learning Technique

2.2 Rote Learning

It is a memory that is to store the new knowledge and call for it when necessary. Calculation and reasoning system needn't to remember anything which is in its knowledge. In the rote learning system, knowledge accessing is in a more stable and straight way. The system does not need to process too much [4].

2.3 Analogy Learning

This type of learning is based on Analogy. Analogy can describe the similarities between objects clearly and concisely. Analogy learning learns by comparing similar things. For example, when there is difficult topic that the professor wants to understand to students, then there is good to use figure of speech between the example: to enable students to have deep understanding by the analogy. This type of learning process has four steps: [5][6]

- 1) Input some of known evaluations and some of conditions which are not fully evaluated.
- 2) For these two conditions described, according to the description, search the respective relation between each by a common definition.
- 3) According to similar transformation method, the new knowledge is gathered from the several issues by comparing some similarities

- 4) Test the new information gained from the analogy of the new problems and input the correct information into the repository. The information unable tested is put in the repository only as referenced knowledge. The main functioning of Analogy Learning is the process by which it selects the similarities between the objects. If the main focus of learning is to gain some terms of new issues, then its definition should be based on the similar attributes between new and old issues; if the aim of learning is to solve new issues, then analogy should be said a relationship between the old problems and new problems in different states.

3. APPLYING ML TO E-SERVICES

3.1 Evolution of e-Services From Management Information Systems

Management Information Systems (MIS) team examined information technology (IT) and information systems within the context of an organization. And these faculty members of the group have established research programs that takes into account a wide range of research topics—such as technical issues and also organizational issue with strategic issues, adopting & diffusing of innovative technologies in small businesses, Institutional Theory has a role in understanding technology selection, the knowledge transfer between information technology (IT) workmen and non-IT workmen within a firm, the knowledge management, the project management, on-line education, and e-Services of electronic government. A large set of research methodologies are discussed to do research on these topics, including computer simulations, laboratory experiments, large-scale surveys, in-depth interviews, and participant observation. The common aim throughout this task of research is better interaction of people to technology and processes.

3.2 Online Shopping VS Offline Shopping

Many researchers started researching about the differences between online shopping and offline shopping and what they found; in comparison to offline shopping the internet shopping lacks the human warmth and sociability. Hence it is really a complex process to create loyalty in customer. This term is called as e-loyalty in many research papers. The traditional shopping differs from online shopping in many phrases. In online shopping the shoppers are replaced by complex socio technologies which are hard to understand by customers. The face to face interaction is approximately zero. In online shopping the transactions transcend time and space. This separation between time and space is thought to create negative impact on customer trust. This separation is known as dis-embedding. Now days what we are doing; we use virtual embedding. In virtual embedding we use pictures so that we can create a feeling of warmth n social interaction. It makes the social presence little realistic. As in online shopping we have less social cues so by using the virtual embedding we just incorporate the social cues. Customer's loyalty to a specific brand or website has a great effect on the company's bottom line. And the customer loyalty can be maintained by a proper face to face realistic interaction. [7][8]

But Machine Learning Algorithms like; **Rote Learning** and **Analogy Learning** can also be a solution of this. Analogy Learning has the technique to compare the similarities between the things and Rote Learning has technique to store new knowledge and access it when needed. Combination of these to algorithms can be helpful in resolving the e-Services issues.

4. DISCUSSION

It can be used in online education, online shopping, e-Governance and many e-Services. Online education needs to be updated every time with new topics, new research, new information regarding the field of study. And it will be easier if the machine could do it by itself. And you need not to make separate tasks regarding the updation of data. By machine learning we can create the situation for the consumer which makes him feel comfortable and interaction will be more easy and realistic with the machine.

Trust on e-services can also be maintained. For example; if our machine knows how to represent a particular page to a particular type of user. User can differ in age, gender, religion or anything. But if the machine is already aware of this and learnt how to resolve these kind of situations by comparing its last experiences and results then outcome will be so brilliant that you will be having a totally new era of e-Services.

Table 1. Assessment of application of e-Services

Problem Area	Problem	Algorithm	Comment
Online shopping	e-Loyalty	Machine can compare the different situations and act accordingly.	Analogy Learning
Online shopping	e-Loyalty	Machine will be able to store new knowledge and to access it when needed so it will be updated to new circumstance	Rote Algorithm
Online education	Investigation and updation of data	Analogy Learning can compare the results with the others and Rote algorithm can store and update new corrected information	Analogy Learning and Rote Algorithm

5. CONCLUSION

After going through the whole paper it can be observed that it discusses the basic model of machine learning and how can you relate it to the e-Services. But the research is not that much mature to carry out solid results. Here is need to work on it, though the research phase is started but yet to do a lot of discussion and work on it and there are many issue yet to discussed and solved [9]. The comparative analysis has still to be done as the learning algorithms are chosen from the classic algorithms in this paper. There may need to design new algorithms or need to modify the old ones. You have to mange a lot of data in e-Services and its not an easy task every time. Our responsibility towards that data increases with the newly uploaded data. Moreover changing human nature with time is also one of the matters of concern. What I want to say is that we should focus on to develop such algorithms which can increase trust of user on e-Services by acting accordingly after understanding the human behaviour.

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