

Development in intelligent autonomous agents for the high-level cognitive functions like reasoning, planning, learning and abstraction

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Abstract

Intelligent Autonomous Agents (IAAs) is basic to the endurance and improvement of the firm, making new items as a wellspring of supportable upper hand. Based on Information-based hypothesis, this paper centers around the four measurements that are obtaining, processing, change double-dealing and investigated the connection between absorptive limit and item advancement execution from the possible absorptive limit and acknowledged absorptive limit. This paper is useful to clarify the irregularity between absorptive limit and item advancement execution in surviving exploration, and further uncover the system between absorptive limit and new item development execution, enhance, extend the absorptive limit hypothesis and item advancement hypothesis by joining the two speculations. This paper can assist firms with explaining the connection between potential absorptive limit acknowledged absorptive limit and development execution, and give reference to firm dynamic, and can likewise give direction viably to firms to dispense assets.

Subject Classification: 97R20, 97R40.

Keywords: *New product innovation performance, E-learning, Cognitive analysis, Learning style.*

1. Introduction

Development, which is the way toward utilizing recently made information and communicating it in different structures. The achievement of firm development relies upon the association's capacity to assimilate [1] and the degree that coordination with existing information [2]. Surviving exploration shows that organizations have an assortment of creative assets and channels, with rich and imaginative assets, to do more inventive R and D exercises, you can extraordinarily work on the capacity of development,

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and at last addition better advancement execution [3]. The compelling combination of information is the wellspring of association's upper hand [4]. Likewise, Knowledge itself isn't excessively significant, how to retain information through information securing, processing, retention and change into development is the wellspring of advancement execution [5]. In [6] contend that absorptive limit is the precondition that an association can get the information in a relatively low cost. The information absorptive limit incorporates possible absorptive limit (PACAP) and acknowledged absorptive limit (RACAP). Firms with high potential absorptive limit are bound to keep up with upper hand, acquire outside information, and firms with higher acknowledged absorptive limit are bound to change outer information for advancement and yield [7].

2. Literature review

Possible absorptive limit (PACAP) alludes to the capacity of the firm to recognize, get measure and decipher the data acquired from the outer source, that is, the capacity to acclimatize information. Potential absorptive limit speeds up and recurrence of corporate system, refreshes and works on the company's capacity to react to outside ecological changes. With the outside evolving expanded, potential absorptive limit is turning out to be increasingly more significant for responsiveness of IAA [8]. The higher the possible absorptive limit of the organizations, the more helpful for the firm to comprehend and process outside information. In surviving investigation, the interaction from likely absorptive ability to acknowledged absorptive limit is just legitimately talked about, yet less observational confirmation. Furthermore, the association's capacity to retain outside information is a significant factor in deciding the presentation of development [9]. The firm has wide scope of market information, which can possibly incorporate diverse information to give openings, distinguish and make the job of acknowledged absorptive limit is to exploit the data that the association has and coordinate, apply to shape the extraordinary assets. The firm has more grounded absorptive limit, which can all the more likely handle the organizations' data and change as per outside climate, and more fit for distinguishing valuable information and applying it imaginatively, the higher the exhibition of authoritative innovation [10].

3. Proposed Methodology

Intellectual learning styles are the information dealing with inclinations for an individual. In contrast to singular contrasts in limits, awareness portrays a man's ordinary strategy for thinking, seeing, reviewing, or basic reasoning.

3.1 Felder Silverman Learning Style Model

This model discriminates the learning style and separates between first decisions on four measurements. The four dimensions of FSLSM is given in Figure 1. The Felder Silverman developed the Index of Learning Style comprises of 44 questions where the student needs to incline toward the decisions to distinguish their learning style. The Silverman demonstrate has four measurements and each measurement concentrated on two different characters. The material view is done in the primary measurement Active/Reflective. The learning occurs in the second measurement detecting/natural. To procedure of data is done in visual/verbal measurement. The comprehension of student's character is done in the fourth measurement.

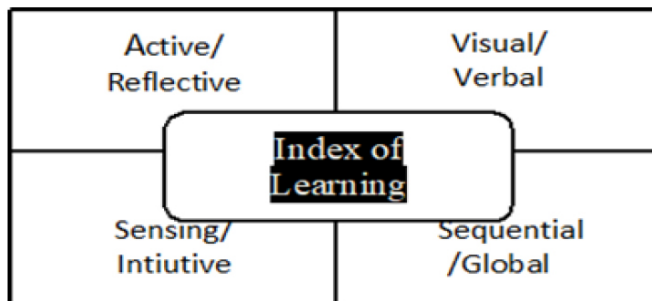


Figure 1
Felder-Silverman Learning Style Model

3.2 Felder Silverman in E-learning

In the improvement of Information and Communication Technology (ICT) and the expansion of the electronic media, the learning style will assist in the teaching learning process. This model portrays the learning style of an understudy in more detail, perceiving tendencies on four estimations. For a model the dynamic/keen, distinguishing/intuitive, visual/verbal and progressive/around the world, in like manner each

understudy has a tendency for every one of these four estimations when stood out from various models [8]. This is the most fitting model to be utilized as a part of a computer based instructive framework. The 44-thing surveys are communicated with values between +11 to - 11 for each dimension. In Felder-Silverman learning style model, learning is defined in different dimensions such as, verbal meant to required printed or oral information; visual meant to memorize what they have seen i.e., practical approach. In sequential approach, learning is done linearly and in global, complete learning can be done very quickly. In active approach, learning can do by trial-and-error method and reflective helps to learn based on ideas and concepts.

3.3 Index of Questionnaires (ILS)

In each of the 44 questions student needs to choose either respond “a” or “b”. Student needs to choose anyone answer in the query. At the point when the student has both the appropriate answer at that point chooses any one decision that applies every now and again. To execute the Felder-Silverman Learning Styles Model we utilize an accumulation of standards where each control proposes an arrangement of showing directions for one learning style. The learning styles stay over the entire session, the learning style of a man is surveyed once toward the start of the course. The Prior to considering the centre focal point of this paper.

4. Research Design, Research Methods and Experimental Procedure

This paper centres around the connection between likely absorptive limit, acknowledged absorptive limit and new item advancement execution. We have continued research on new product development, focusing research on the high-tech industry and e-commerce because the return of new products in high-tech industry is more obvious. In this paper, innovative organizations and Internet organizations as the object of study, from February 2017 to April 2017, gave an aggregate of 200 polls, reusing survey 130, after a fundamental assessment, dispense with invalid polls including not complete, conflicting, a similar answer, and at last decide the little example of 120 substantial polls. The recuperations of polls and successful surveys were 65% and 60%. The fundamental attributes of the example are displayed in Table 1.

Table 1
Sample Characteristics

Scale	Below 100 persons	29%	Stage	Founding period	11%
	100-500	10%		Growth period	62%
	500-1000	56%		Mature period	23%
	Above 1000	5%		Recession	4%
Time	Below 1 year	4%	Business	High-Tech Companies	65%
	1-5 year	19%		Electric business firms	25%
	5-10 year	43%		manufacturing	3%
	Above 10 years	34%		Wholesale and retail	7%

Algorithm: Learning based on classification model

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Input: Initialize total score & count
Output: To determine the learning style for the learners
Apply Questionnaire learning style
Select the question from the database
Choose any one option as answer from 4 different options
If (answer matches the learners answers) {
    Count incremented to 1 else count remains the same
}
Again, redirected to next question Repeat step 2 to 7
Repeat till all the questions are completed. To determine the learning
style for the
learners Learning Style_ Prediction () {
    if (VAC>AAC&& VAC>KAC)
        learner is visual learner else if (AAC>KAC && AAC >VAC) learner
is aural learner
    else if (KAC>VAC&& KAC& AAC) learner is kinaesthetic learner
    else not able to predict the learning style
}

```

Here the VAC= Visual Answer Count, AAC = Aural Answer Count and KAC=Kinaesthetic Answer count. When the particular answer count value is greater than the other two then the student belongs to that learning type. In summary, each style has a common and a specific content for every concept, and different paths of contents are generated to be visualized depending on the style. The same set of students varying

Table 2
Course content using blooms dimensions

Blooms dimension	Course content	Expansion
Remember	Define Data Structure (DS), List the types of DS	Recall the fact and basic concepts
Understand	Explain or discuss the concept of DS	Explain the basic concepts
Apply	Execute the concept of DS	Implement the idea in new purpose
Analyze	Differentiate the types of DS, Relate the types of DS.	Compare and contrast the idea or concept.
Evaluate	Experiment the data DS with sample inputs	Justify the decision
Create	Design or construct the data structure for the student using array	Produce the new idea from the previous concept.

from 20 to 100 was involved in this experiment. The results shows that the post assessment was effective for the proposed compared with the traditional learning such as, SVM based learning [8] and decision tree learning [9]. The proposed system was tested with the learners belongs to under graduates of same course. Mostly the learners preferred the sequential learning. Sequential learning is the way of learning in linear progress or in step-by-step progress. Here, 64 % learners belong to this sequential learning. 50 % were active learners. The subject is designed using blooms taxonomy is given in Table 2 for the reference. The course material has been designed using blooms taxonomy and the 64% of the learners have taken the course. Finally, they were measured by assessed by set of questions. Now, the learners' performances are improved in their basic skills, attitude, perceived skills, satisfaction level and knowledge transfer.

5. Analysis and Results

In this paper, linear regression analysis is used to analyse the mediating effect of realized absorption capacity, the mediation effect of market orientation, spss19 is used to test whether the hypothesis is established or not. In regression analysis, the dependent variables of model 1 and model 3 are new product innovation performance, including

Table 3
Intermediate Regression Analysis Results

Variables	M1 NPIP	M2 RACAP	M3 NPIP	M4 NPIP	M5 NPIP
time	.04	.02	.06	.09	.080
stage	-.14	.04	-.11	-.06	-.080
scale	.11	-.08	.12	.03	.060
PACAP		0.73***		0.77***	0.49***
RACAP			0.73***		0.38***
AdjR ²	0.00	51.19	54.42	37.66	58.81
ΔR ²			54.42	37.66	21.15
F	.99	32.20***	36.53***	43.48***	46.37***

Note: N=120; * p < .05; **p<.01; ***p<.001.

the firm establishment time, firm development stage, the firm scale and independent variables the potential absorption capacity. The data we can see in Table 3.

It tends to be seen from the information in Table 3 that the F upsides of model 2, model 3, model 4 and model 5 in the table are huge (p < 0.001). AdjR² and Δ R² additionally show that the model has the best in general impact. The coefficient of potential ingestion limit with regards to new item advancement execution is 0.77***, which demonstrating that the potential assimilation limit of the new item development execution fundamentally, when add the mediator factors acknowledged absorptive limit, the coefficient of potential retention limit with regards to new item development execution decreased to 0.49***, it implies that RACAP has an intervening impact on new item advancement execution, and is incomplete intervention impact. The coefficient of potential ingestion limit with regards to RACAP is 0.73***, the coefficient of acknowledged absorptive limit with respect to new item advancement execution is 0.73***, which demonstrating the relationship is huge. In Figure 2, we inferred that the proposed learning technique provides effective accuracy compared to the existing SVM and decision tree learning techniques. classification techniques are denoted as 1 to 6 where, 1 as create; 2 as evaluate; 3 as analyse; 4 as apply; 5 as understand and 6 as remember. In Figure 3, we inferred that the proposed learning technique which provides the effective accuracy result which compared to the existing learning techniques of SVM and decision tree. The Learning techniques are denoted as 1 to 5. Whereas 1 is deep learning, 2 as SVM, 3 as graphical models, 4 as decision tree and 5 as Markova model.

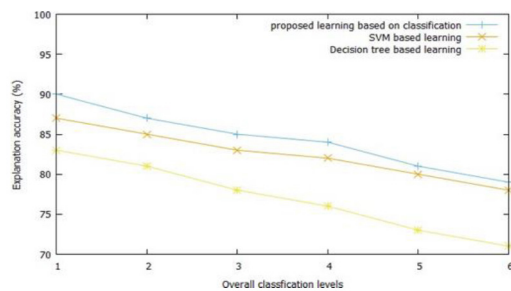


Figure 2

Comparison of explanation accuracy with overall classification levels

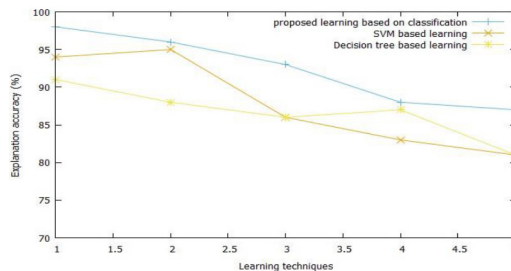


Figure 3

Comparison of explanation accuracy with overall learning.

6. Conclusion

In this proposed system the learning style of the learner is identified which helps to gain more knowledge in the particular field. The learner needs to fill out a questionnaire to identify their preferences. The post assessment calculations are carried out which proves that the proposed learning provides effective results when compared to the existing SVM and decision tree technique. Explanation accuracy is calculated based on both classification and learning techniques. The proposed technique provides gradual increase in the learner’s skill level when it compared to the existing ones. The learning style helps to learn the topic interestingly; the recalling of the data is effectively possible and exists for a long time. Learner’s performances are improved in their basic skills, attitude, perceived skills, satisfaction level and knowledge transfer and it helps in their career.

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