

Journal of Interdisciplinary Mathematics

ISSN: 0972-0502 (Print), ISSN: 2169-012X (Online)

Vol. 26 (2023), No. 3, pp. 407–416

DOI : 10.47974/JIM-1671

A mathematical taxonomy towards fuzzy based optimized cloud sales services

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Abstract

In the highly working system based on demand service model for end users. The on-demand service model consists of memory storage, hardware management, information processing and various IoT applications using mathematical programming logics with optimized fuzzy model. By using the fuzzy model, the end users get the best optimal cloud services. For providing cloud services in an optimized way the fuzzy logic is playing an important role. The developed algorithm is efficient in terms of cost and time for the cloud service providers. The simulation of our algorithm is done in cloud simulator.

Subject Classification: Primary 93A30, Secondary 49K15.

Keywords: Cloud parameters, Resource issues, Fuzzy logic, Mathematical parameters, Approximation process, Cloud simulation.

1. Introduction

Cloud computing associations get entry to purposes via the web with major aim is on-demand cloud services to the end users. Most of the cloud services are provided in an efficient manner to the end users [1-3].

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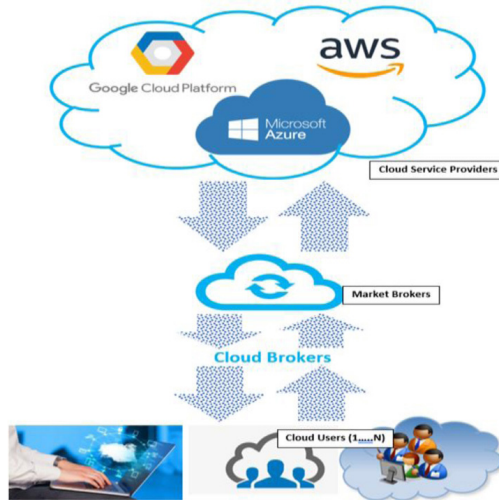


Figure 1

Basic attacks in cloud services.

Associations are opened up from being predicted to continue to be conscious of or overhaul programming and gear [5]. Figure 1, shows, possible attacks in these services. Just signal on and get to work, from any spot and, taking the whole lot into account, device. The primary point of the proposed system is offered by the cloud service providers indicated by sales-based framework by which the complete expense of giving and taking the administrations ought to be less and proficient. The gamble might increment assuming the end clients become late [6-7].

2. Related Work

In the current research it is found that IaaS service is growing the market by 45% in 2022 and it will make much profit to the cloud service provider up to 70\$ billion in the coming years. Innovation utilization from any aspect, cloud, server farm, application, community protection, or end-client point of view has developed dramatically [1][2]. Customary must alter to the continually altering monetary situations, patron necessities, and innovation progressions to successfully promote cloud administrations and arrangements. By executing these hints of the trade, channel accomplices can additionally enhance their ability to promote

cloud advantages successfully and constantly increment income. The major effective cost models are defined in different cloud strategies [12].

1. *Model of administrative-based costs*

It emphasizes expensive shipping with actual item-based value. In industries including banking, aviation, travel, criminal analysis, security, and clinics, among others, administration-based cost designs are used. The use of the unit of a level, level, per gadget, client, and requirement has been used to determine the cost of the help-based model [7-8] as shown in figure 2. This life-sized model’s cost can be sensed and estimated.

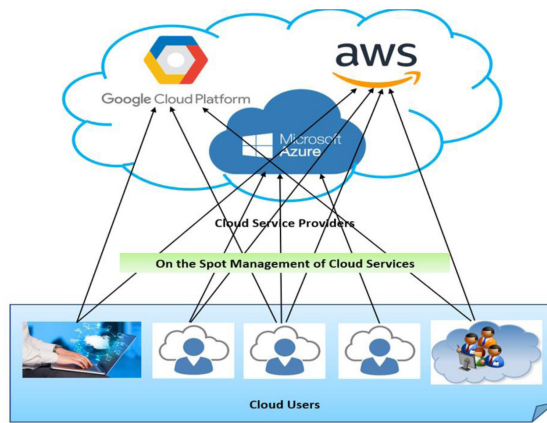


Figure 2
On the Spot Cost Management system.

2. *Model of Execution-Based Cost*

According to M. McNair’s description, it is a situation where the seller is able to receive payment based mostly on the accuracy of the general execution of a cloud life-sized model or transporter. It has to do with the client’s business project outcome, which depends on precise, all-encompassing execution measurements [4-5].

3. Proposed Methodical Structure

The proposed offers framework ASCM (Adaptive Sales Cost Model) is working for the number of services interested to work in the cloud

ontology environment. The multi cloud system helps end users to select the most efficient cloud service for end users. Cost exhibiting is a motion the place you make proper social events of cloud assets that are supposed for the affiliation’s shape and a whilst later test fees for these get-togethers. The intention of fee displaying is to consider the universal value of the relationship in the cloud. As the dispensed computing esteem life-sized mannequin advances, so will the estimating designs used. The take searches for the task will be to make these extra distinguished jumbled molds productively comprehended and assessable.

The way it is working to fulfill the necessities of cloud customers is as follows:

1. MakeSpan Time (MsT): The time in which all the cloud services successfully provide to end users. The expectation of reserving is formulating the end user’s request.
2. Efficient execution Time (EeT): In the efficient execution of cloud services the cloud service providers have to meet the virtual machines.
3. Total waiting Time (TwT): The total waiting time of cloud services for end users is very less in compression to other algorithms in our proposed work.

$$\text{Total waiting time (TwT)} = \text{EeT} - \text{MsT} \quad \dots(1)$$

The researched methodology of the proposed work is the ASCM (ADAPTIVE SALES COST MODEL) algorithm working to provide an efficient cloud service to the end users in best suitable cost and time.

Proposed Algorithm The discovered algorithm provides the best suited CSP to end users.

Input: The required cloud service (Rcs) requirement in the suitable time interval t, Cloud providers indicates (Sp), Fi is the cost function value of cloud services. ST (Fi) cloud service stating time, PT (Fi) represents the processing time of task, execution time (ET), request time (RT), n (ρ) signifies the required numbers of VMs, M bodily host (PH (M)).

Output: The overall outcome of the proposed algorithm provides the efficient cost and time to end users.

```

1: Methodology
2:   For each (Cloud service)
3:      $O \leftarrow \{\phi\}$  The time when all the cloud services not engaged.
4:   For each (end users request)
5:     The end users send the request to the CSPs.
6:   For (The cloud broker find the fress
           cloud services for end users request) do
7:      $PTi(IaaS) \geq Rcs(CPU, memory, \frac{1}{p}, \frac{o}{p})$ 
8:   IF (The cloud services are managed in
         an efficient way so that the end users
         will get in best suited cost and time) then
9:      $\forall \rho(j) \in \theta$ 
10:    offers ASCM (ADAPTIVE SALES COST MODEL) algorithm.
11:    Calculate the EeT and TwT for the proposed algorithm.
12:  end if
13: end for
14: end for
15: end Methodology

```

3.1 Experiments and results:

The trial find-out used to be carried out by the restrict of undertaking of the utilization of the Eclipse system of cloud sim for the results. The functioning system used to be 32 portions with Windows 7. Table 1 below, shows the cloud service features for the model. The aftereffect of the goal component depends upon the planning calculation. Reenactment consequences are an awesome approach for estimating and clearly taking a seem to be at the regularly occurring presentation of the created ASCM (ADAPTIVE SALES COST MODEL) Algorithm-first in category spot cost and time at a scope of effective boundaries due to the fact of the actual cloud contraption wishes to control several hindrances, for example, attain out due to the fact of the clog, load adjusting, over-provisioning and under-provisioning, versatility, etc.

Table 1
Shows the cloud service features.

Table 1 Resource Features	Resource ID	Resource Range	Resource Length	Features
	1-N	1,000-10,000	5,00,000- 10,00,000 MI	unconventional and non- preemptive

Table 2
The overall, processing time of the proposed algorithm

No. of VMs	500	500	500	500	500
Total Resources	1500	2000	2500	3000	3500
ASCM	105.233	142.43	175.43	212.45	234.43
PSO-BOOST	110.434	146.54	184.43	221.64	245.43
APSO	115.4334	151.34	186.44	225.53	246.54
PSO	116.455	152.089	189.43	227.43	248.85
BAT	118.334	155.75	191.33	229.26	249.92
ABC	119.434	156.64	194.43	231.87	252.442
IMMLB	121.232	158.21	197.44	235.63	255.26

Processing time: As shown in Table 2 and figure 3 Processing season of the created ASCM (ADAPTIVE SALES COST MODEL) Algorithm-ideal spot value and time calculation is assessed below a reenactment local weather and appeared at the presentation of the created calculation with different reducing side meta-heuristic strategies like counterfeit honey bee province, BAT calculation, PSO, versatile PSO (APSO), and IMMLB as displayed in Tables 3. We have thinking about the regular advantage of managing time in minutes to check the penalties of the created calculation.

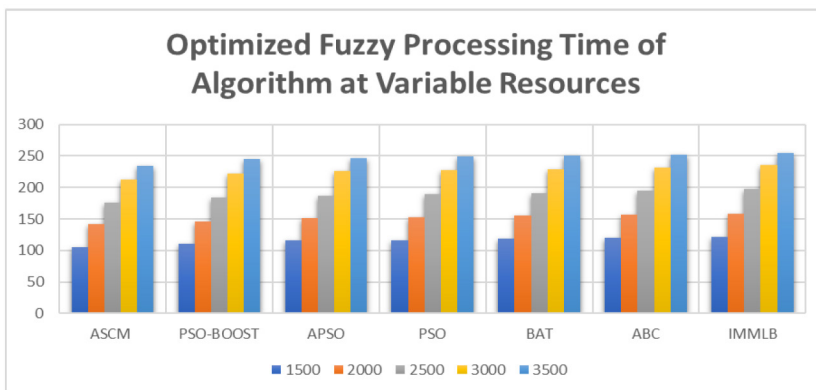


Figure 3
Results indicating the processing time of proposed algorithm

Execution cost: As shown in table 3 and figure 4, We have notion about internet-based asset designation and evaluating troubles in a cloud climate. The cloud expert employer gives one-of-a-kind types of property like CPU, memory, and non-compulsory stockpiling. Amazon EC2 has introduced any other valuing manner named “spot estimating” which expects to use the empty limits in the server farms to accomplish the biggest gain and step by step make concord amongst the natural market.

Table 3
The cost values of the VMs

No. of VMs	No. Tasks	ASCM	PSO-BOOST	APSO	PSO	BAT	ABC	IMMLB
500	1000	189.54	197.56	206.87	208.8	211.22	212.43	222.34
500	1500	206	219.26	234.65	226.36	232.32	238.42	248.45
500	2000	226.65	231.85	241.97	244.34	244.56	247.43	259.86
500	2500	237.23	239.31	246.96	249.33	254.96	256.32	266.86
500	3000	240.86	244.25	254.64	256.35	259.86	263.97	272.43
500	3500	246.12	249.57	261.26	263.97	266.32	269.78	278.14
500	4000	251.75	256.97	266.37	270.85	274.75	276.97	281.87

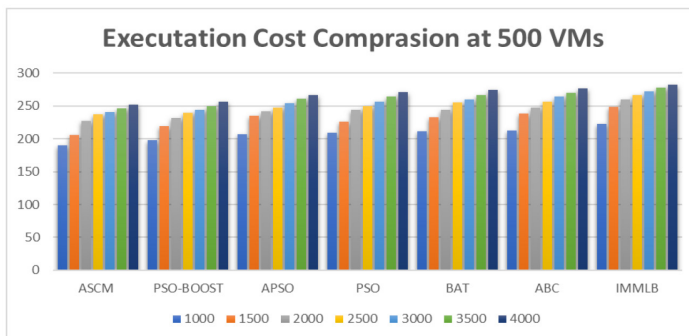


Figure 4
The total execution cost of the proposed algorithm.

4. Conclusion and Future Work

In the membership model, a cost is charged whether or not the purchaser makes use of contributions or not, however price types essentially headquartered reachable are set completely when contributions are utilized. A whole of every can be equipped with membership affords relying on the cloud transporter supplier. To beat the impediment of

current estimation, we have proposed and made a cloud supportive useful resource phase shape close by with their parts; working essentially of controller middle factor is provisioning and de-provisioning of necessary useful resource in reality mounted on solicitation of the patron with the help of organized estimations, scheduler, and assist to absolutely take a appear at core factor the use of ASCM computation.

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