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Computing through Cloud Computing Technology using the PROMETHEE Method

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Abstract. cloud computing technology Users of Internet connected devices By storage, files, software and access to servers Offers: Computers, Smartphones, Tablets and wearables. Cloud computing providers, Separate from end users They store and process data locally. Cloud computing is computing is to provide resources as a service, That means the cloud rather than the end user Resources are owned by the provider and managed. In those sources Browser based software Apps like TikTok or Netflix Third party for photos Data storage and other digital media Like iCloud or Dropbox or computing infrastructure Third-party servers used to support are included. a business, research or personal project. Promethee is a priority for assessment enrichment Ranking system and its interactive help Descriptive complementary geometric analysis known as Promethee methods. In this The PROMETHEE method is the best solution from the analysis The shorter the distance and the longer the negative-ideal solution Determines the solution with the distance, but of these distances The comparison was not considered significant. Alternative: Amazon Cloud, Google Cloud, IBM Cloud, Azure Cloud. Evaluation Preference: Accountability, Agility, Management, Cost, Performance, Security. The result it is seen that Google Cloud is got the first rank where as is the IBM Cloud is having the lowest rank.

Keywords: MCDM, Accountability, Agility, Management Cost and Performance

1. Introduction

Many aspects of cloud computing Universities in the 1950s Enterprises also on mainframe computers Computational time is rented out Can be detected in time. At the time, Computing technology is huge and owned by individuals or Too expensive to manage Because of the high computing resources Rent is the only means of access is one. Cloud Computing In the 1960s Joseph By Carl RobnetLicklider Believed to have been discovered, in Arbanet Enterprises also on mainframe computers By what he served, at any time People and data from anywhere Can connect. Industry and of cloud computing on end users The impact is hard to overstate Available: Runs on cloud networks Everywhere in software Many aspects of daily life have been changed. Cloud computing By upgrading, startups and Businesses hardware and software Without buying and managing by themselves Improve costs and their benefits Can increase. Available worldwide Applications and online services Empower independent developers to get started has For highly funded projects If only assigned, researchers Data can be shared across metrics and can be analyzed. Further Internet users own their privacy Beyond the computing capacity of the devices Digital media at scale Create, share and save Faster software and storage can be accessed. Cloud computing is growing Despite coming, its details for many remains unclear. What is Cloud, How one uses it, Businesses, developers, researchers, Government, Health Practitioners And what are its benefits for students In this conceptual article, the cloud Computing, its history, delivery models, About the benefits and risks Let's give a general overview.

2. Cloud Computing Technology

Cloud computing technology described. traditional computer A lot more than cloud computing There are advantages. Google, Microsoft And major cloud like Amazon Providers are also available in the US and elsewhere The world's largest database of locations Centers are being developed and developed. Each data center has hundreds of thousands Computer servers, cooling instruments and substation transformers Includes. For example, Quincy, Data from Microsoft in Washington Note the center. It is 43,600 has a square meter of space and 4.8 km of chiller piping, 965 km Electric wire, 92,900 square meters of drywall and 1.5 metric tons of backup batteries and uses [1]. Cloud Computing Technology (CCT) is worldwide Software for businesses and To provide infrastructure solutions A way to harness the power of the Internet A revolutionary new way. 2017 A big one for this technology Predicted to be a breakout year, Many small and large companies do this Switch to site. This technology Use is inter-company Improves communication and mini Significant funding for businesses and generate operational benefits Has the ability. of this article The main objective is to implement CCT in small businesses A for successful implementation is to propose a conceptual model [2]. Cloud computing is a powerful and flexible software environment, It represents the administration of matter And users pay as they go. The migration of enterprise applications to the cloud is increasing. Most of these applications are web based Standardized for business logic by Available with access. However, the current Cloud offers forever Does not meet the needs of users. For example, some providers have insufficient resource flexibility and guarantee high availability Not giving. Open source to other users Based on their technologies Trying

to build their own cloud [3]. Cloud computing is a new The computing model is grid computing, distributed computing, Parallel computing and virtualization Technologies is a new technology Defines the shape. This is next Generation Network Computing The core technology of the site is, Especially in the education sector, the cloud Computing is the future of e-learning Basic environment and platform. This is Safe data storage, convenient Internet services and robust Provides computer power. This article Mainly of cloud computing in e-learning environment Focuses on applied research [4]. cloud computing technology of Distributed as a new application Software testing for systems We propose context. Cloud Computing technology and false injection Virtual machines with convenience. Nevertheless, In a software system The importance of high reliability Recently increased, more software Cost of complete testing of systems becomes high and time consuming, And sufficient in many cases Software testing is not possible [5]. This IDC is flexible, demand-driven and responsive data center Cloud in hopes of establishing More for computing technology Gives importance. Many are cross-European To establish cloud centers With cloud computing technology Decided to work together. First, of cloud computing technology Basically, ITC is flexible and Scalable, and of the long tail The effect is relatively low cost can feel. Cloud computing The platform is limited New products with administrative costs Can create and launch [6]. Cloud computing technology, cloud Computing is critical to working Its technical components Also provides a processing model. The third category is cloud computing Security Threats, Public Cloud Plenty of protection in the environment Identify risks, Security Threat Classification Framework Also reviews the literature. In the fourth category, Cloud Security Solution Virtualization and Web Services Important guidelines for protection and discusses structures. This segment is a multi-level integrated cloud Security considerations and service level To draft a document of contracts Provides a new concept of critical guidelines [7]. Cloud computing is a new is technology, which is software, infrastructure and computing platform Anywhere at any time Offered as a service over the Internet. This technology, storage capacity Increasing and existing Adding new capacity to the health system Many problems of health system like It is said to resolve. Cloud Computing provides cost-effective, Increases interoperability and accessibility, Improves resources and health Integrates information systems. A solution to current problems The solution is this Functionality of health information systems and lead to improved features. Therefore, the objective of this study is to Cloud computing technology for health information Research is the solution to organizational problems [8]. Cloud computing consumers their Physical and virtual according to demands Many to allocate and reallocate resources Uses the tenant model. Cloud computing is on-demand Resources can be scaled up and down. The cloud is limitless for consumers It seems, they themselves A computer of the required size or less Power can be bought. Cloud One of the essential characteristics of computing is measured service, by which services and continued use of resources monitored, controlled, Pay reasonable fees Model implementation is reported [9]. Deployment of e-Government For a long time more technical and Focus on operational matters Paid and focused since 2010 Broadly defined enterprise And turned to political issues. Cloud computing technology is on the Internet A for providing public services Adopted as a new delivery channel [10]. This study is Cloud Computing Technology is the core of eSCMS Incorporation and adoption Appropriate theory to explore uses. The theory has three components Contains: First, information processing requirements Second, information processing skills Finally, to needs and abilities Match between. Cloud Computing Acceptance of technology We now discuss these elements in context [11]. Cloud computing platforms are ERP Cost-effectiveness of systems conflicts, Customized and highly available Have the ability to deal with computer resources. Cloud-based ERP Contains: First, information processing requirements of ERP before and after migration By detailed comparison. This The object of the comparison is an individual ERP On cloud platform compared to on-premise of ERP while running ERP Show how the idea is significant [12]. Learning, research and other administrative processes Cloud in education to improve Computing technology is fast is being implemented. In a literature review It is clear from this Most of the processing takes place in the US, occur in western countries such as England, At the same time developing like India The level of CC implementation in countries is rare. of ERP while running ERP [13]. Cloud computing technology is A smart city is an innovation The place of residence, in which information and communication technologies move In all walks of life are used to effect intellectualization. Such an approach is convenient Provide services, at any convenient time, anywhere and from any devices and allows access to them. however, Smart City Intellectual Services Citizens as consumers are modern Large stored in urban environment The practice of information flow Faced with usage issues [14]. Cloud Computing Technology (CCT) Min A specific using sources To consolidate the disparate segments of the industry was used. It has given excellent results and banking, manufacturing, information technology etc A wide range of different industries Contains applications. It's software Its service delivery models such as Displays information for all categories [15]. MPEG-4 video with various video codec formats A cloud that adapts to design A computing environment is proposed. Smart Telephones, Personal Computers, Television and diverse such as bands Different types of video for devices Their organization of content provides Hadoop Distributed The file system runs on the operating system Using the MapReduce framework Authors design the computer Executing. To increase adaptability, Video transcoding features The BiF structure can be extended by adding [16]. A typical network such as the Internet infrastructures or cloud computing Advanced distribution such as environments systems. Finally, cloud computing, Service organization and students Based on needs and abilities Provisioning a virtual machine In new contexts such as this Solving some of the issues Very important [17]. These environments are cloud computing environments The reasons for its popularity are first High quality and low price on the grid Provision of services and second Phase modern or virtualized It is also about using the facilities. in education With cloud computing, users are the power Advanced software and massive computing Where and when resources are needed Microsoft believes that [18]. Currently using cloud computing or usable Reflect a range of interests Limitation of these legal issues in terms has These problems are still there Undetermined answers are also cloud Continuous development of computing And how security matters in development It's about role playing Provides significant insight [19]. In its own twist, the cloud Further technological advancements in computing Inspiring and modern information How is the technology infrastructure changes that. Strong Technical background and cloud computing In-depth about the technologies For knowledgeable professionals Builds

and evolves Demand is increasing. however, Widely available cloud computing No training and professional education, as well as professional status Cloud Computing Course There is no general approach to creation [20].

3. PROMETHEE

The PROMETHEE method of each criterion Takes. In this way, every criterion Can be evaluated on different grounds Operate. For example, most better conclusions can be drawn. PROMETHEE identifies incomparable and neglected alternatives by creating an Area Ranking, PROMETHEE Complete for alternatives Provides ranking [21]. The MCDA process, using the PRO METHEE technique, generally follows the following sequence selecting DMs weighing the criteria, evaluating the effectiveness of alternatives against the criteria, selecting common values and related negligence and optional values for each criterion ion, using PROMETHEE where necessary, sensitivity analysis Making and final decision making. The primary difference between the PROMETHEE method and other MCDA techniques is the use of common criterion functions [22]. The PROMETHEE method is well known This is the outreach-based approach Decision making for decision makers Provides support for resolution. issues through a valuable outreach relationship. This relationship is based on the pairing sequences Between alternatives and PROMETHEE mode Defines custom framework. PROMETHEE The system is very much in the process of making complex decisions Is useful, especially Human in real world MADM problems Subjective judgment of consciousness and experts [23]. PROMETHEE alternatives are comparable. Positive and between negative outgoing flows Sort of alternatives by balance in Hand flow is used A "correct" instead of pointing out the result, for decision makers there is the target and more relevant to understanding the problem, the promethee method helps to find alternatives. This is a decision maker problem, with its paradoxes and creating integrations, of actions identifying and measuring clusters, and key alternatives and built-in reasons a detailed and logical to highlight provides structure. Natural stream networks have been changed. This process is the flood of urbanization occurs during rainy season, especially on high gradients, proper transmission systems and drainage system absence leads to scarcity. Urban stream, shower hotel management, process evaluation to be done. Ambiguous change is the quality of time for criteria, judgment when it was introduced standardized, this time value and comparison criteria for determining importance based on the analytic hierarchy process (AHP) is used in conjunction with next part, prometheus provides advanced decision making in a production environment [24].Taking into account the PROMETHEE Criterion Performance Uncertainty in values; However, it is very difficult for users to select common criteria functions for each criterion and the associated limits, resulting in additional uncertainty. Therefore, to overcome this, they are based on reliability Proposed the approach, which is PROMETHEE The firmness of the solution obtained from Help the decision maker to explore the character [25].The PROMETHEE family was first created by 1982 in Quebec, Canada France at the conference, including PROMETHEE I for alternative rankings and PROMETHEE while the PROMETHEE VE, PROMETHEE for the problems of the segment, is the PROMETHEE VEO for alternatives. Of the many criteria currently in place, PROMETHEE methods are the most important. The number of practitioners who use these methods for problems that determine multiple criteria in practice, and the number of returnees who are developing each year. See notes) and conference presentations using one or more PROMETHEE methods [26]. Selection of each criterion Activity Exam in PROMETHEE A function of each criterion is often Nature of criteria and the decision maker is determined predefined There are six categories' exams processes, most of which include the following criteria: standard scale, semi-scale, linear priority criterion, Level scale, linear The area of [27]. The Prometheus method is portfolio complexity Most widely used for applications One of the outlined methods. Relatively few publications Portfolio selection methods directly based Although found to contain this type of in which it is analysed and its irreversibility. The promethee approach is thought and may manage numerical facts with affordable size and accuracy. This isn't the case with the maximum energy-efficient projects, especially inside the early levels of improvement. Most information can most effective be approximate. Promethee extended fuzzy data handling [28]. At PROMETHEE, we encounter more than seven Sometimes too large to cover criteria Evaluation tables. At that point, the decision will be made PROMETHEE a to help solve problems Becomes a black box. in this situation, if a wood-structure is adopted, it can be seen as an extension of PROMETHEE [29].

4. Analysis and Discussion

TABLE 1. Cloud Computing Technology

	Accountability	Agility	Management	Cost	Performance	Security
Amazon Cloud	93	67	81	50	96	10
Google Cloud	97	77	89	65	99	25
IBM Cloud	78	65	76	44	90	15
Azure Cloud	89	72	74	42	91	23
Max	97	77	89	65	99	25
Min	78	65	74	42	90	10
max-Min	19	12	15	23	9	15

Table 1 shows the Cloud Computing Technology Amazon Cloud, Google Cloud, IBM Cloud, Azure Cloud.Accountability, Agility, Management, Cost, Performance, Security. shows the maximum and minimum output of each value.

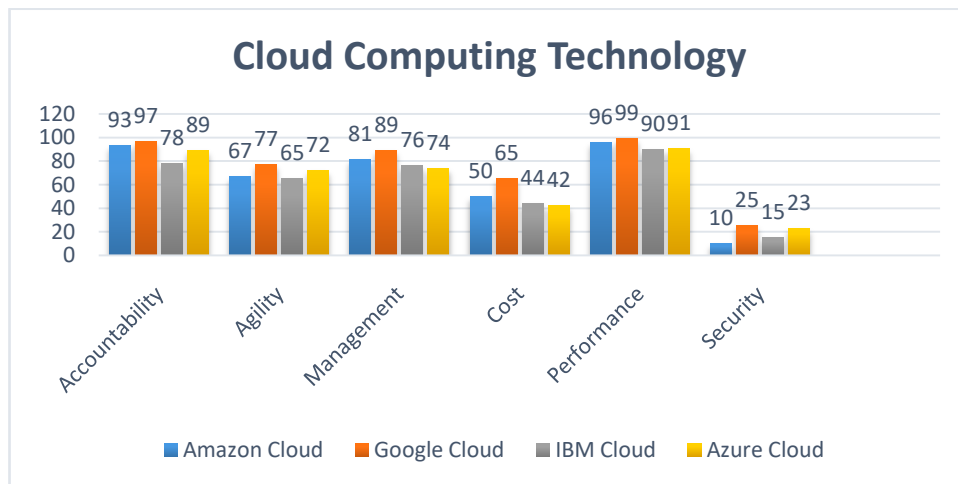


FIGURE 1. Cloud Computing Technology

Figure 1. shows the Cloud Computing Technology is a Accountability it is seen that Google Cloud is showing the highest value for IBM Cloud is showing the lowest value. Agility it is seen that Google Cloud is showing the highest value for IBM Cloud is showing the lowest value. Management it is seen that Google Cloud is showing the highest value for Azure Cloud is showing the lowest value. Cost it is seen that Google Cloud is showing the highest value for Azure Cloud is showing the lowest value. Performance it is seen that Google Cloud is showing the highest value for IBM Cloud is showing the lowest value. Security it is seen that Google Cloud is showing the highest value for Amazon Cloud is showing the lowest value.

TABLE 2. Normalized matrix

	Normalized Matrix					
	Accountability	Agility	Management	Cost	Performance	Security
Amazon Cloud	-0.05128	-0.15385	-0.10811	-0.35714	-0.03333	-1.5
Google Cloud	0	0	0	0	0	0
IBM Cloud	-0.24359	-0.18462	-0.17568	-0.5	-0.1	-1
Azure Cloud	-0.10256	-0.07692	-0.2027	-0.54762	-0.08889	-0.2

Table 2 shows the Normalized matrix of Sensitivity analysis promethe the Cloud Computing Technology Amazon Cloud, Google Cloud, IBM Cloud, Azure Cloud.Accountability, Agility, Management, Cost, Performance, Security normalization are shown in the above tabulation. Table 2 shows the default matrix of Prometheus for the sensitivity analysis shown in the table above.

TABLE 3. Pair wise Comparison

	Pair wise Comparison					
	Accountability	Agility	Management	Cost	Performance	Security
D12	-0.05128	-0.15385	-0.10811	-0.35714	-0.03333	-1.5
D13	0.192308	0.030769	0.067568	0.142857	0.066667	-0.5
D14	0.051282	-0.07692	0.094595	0.190476	0.055556	-1.3
D21	0.051282	0.153846	0.108108	0.357143	0.033333	1.5
D23	0.24359	0.184615	0.175676	0.5	0.1	1
D24	0.102564	0.076923	0.202703	0.547619	0.088889	0.2
D31	-0.19231	-0.03077	-0.06757	-0.14286	-0.06667	0.5
D32	-0.24359	-0.18462	-0.17568	-0.5	-0.1	-1
D34	-0.14103	-0.10769	0.027027	0.047619	-0.01111	-0.8
D41	-0.05128	0.076923	-0.09459	-0.19048	-0.05556	1.3
D42	-0.10256	-0.07692	-0.2027	-0.54762	-0.08889	-0.2
D43	0.141026	0.107692	-0.02703	-0.04762	0.011111	0.8

Table 3 shows the Pair Wise Comparison of table 2 the Cloud Computing Technology Amazon Cloud, Google Cloud, IBM Cloud, Azure Cloud.Accountability, Agility, Management, Cost, Performance, Security comparing each row with other row on the tabulation.

TABLE 4.Preference Value

	Preference Value						
	0.2336	0.1652	0.3355	0.1021	0.0424	0.1212	
D12	0	0	0	0	0	0	0
D13	0.044923	0.005083	0.022669	0.014586	0.002827	0	0.090087
D14	0.011979	0	0.031736	0.019448	0.002356	0	0.065519
D21	0.011979	0.025415	0.03627	0.036464	0.001413	0.1818	0.293343
D23	0.056903	0.030498	0.058939	0.05105	0.00424	0.1212	0.32283
D24	0.023959	0.012708	0.068007	0.055912	0.003769	0.02424	0.188594
D31	0	0	0	0	0	0.0606	0.0606
D32	0	0	0	0	0	0	0
D34	0	0	0.009068	0.004862	0	0	0.013929
D41	0	0.012708	0	0	0	0.15756	0.170268
D42	0	0	0	0	0	0	0
D43	0.032944	0.017791	0	0	0.000471	0.09696	0.148165

Table 4 shows the Performance value of the Wise Comparison of table 2 the Cloud Computing Technology Amazon Cloud, Google Cloud, IBM Cloud, Azure Cloud.Accountability, Agility, Management, Cost, Performance, Security When compare to all others. And the last one is the sum of the same row.

TABLE 5. Sum of Performance Value

	Amazon Cloud	Google Cloud	IBM Cloud	Azure Cloud	SUM	positive flow
Amazon Cloud	0	0	0.090087	0.065519	0.155607	0.051869
Google Cloud	0.293343	0	0.32283	0.188594	0.804767	0.268256
IBM Cloud	0.0606	0	0	0.013929	0.074529	0.024843
Azure Cloud	0.170268	0	0.148165	0	0.318433	0.106144
SUM	0.52421	0	0.561083	0.268043		
Negative Flow	0.174737	0	0.187028	0.089348		

Table 5 shows the sum of all rows and column are applied on the last row. The sum of all row of performance value are arranged above tabulation and the diagonal value are zero.

TABLE 6. Positive flow & Negative Flow & Net flow &Rank

	Positive flow	Negative Flow	Net flow	Rank
Amazon Cloud	0.051869	0.174737	-0.12287	3
Google Cloud	0.268256	0	0.268256	1
IBM Cloud	0.024843	0.187028	-0.16218	4
Azure Cloud	0.106144	0.089348	0.016797	2

Table 6 shows ranking for the positive flow, Negative Flow, Net flow values. the final result of this paper the Amazon Cloud is in 3rd rank, the Google Cloud is in 1st rank, the IBM Cloud is in 4th rank, the IBM Cloud is in 2nd rank The final result is done by using the PROMETHEE method.

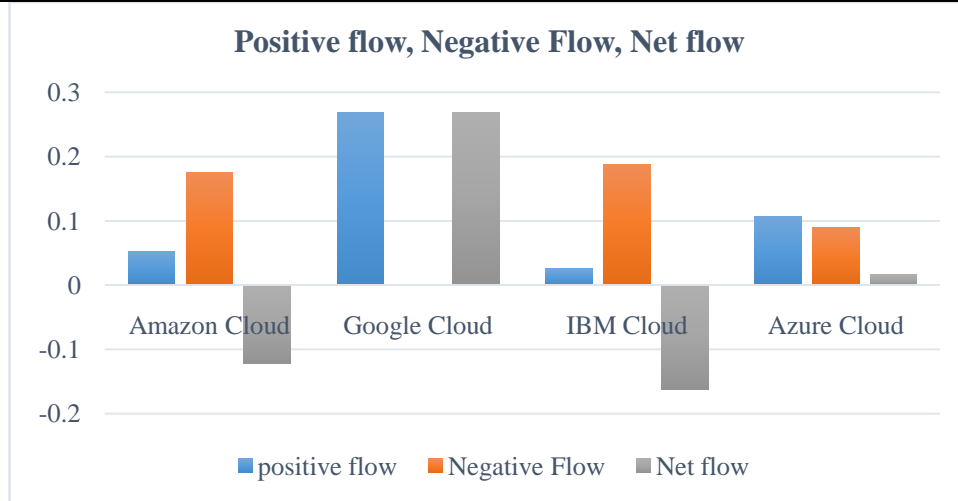


FIGURE 2. Positive flow & Negative Flow & Net flow

Figure 2 shows compare the Positive flow & Negative Flow & Net flow it is seen that Google Cloud is showing the highest value and IBM Cloud is showing the lowest value.

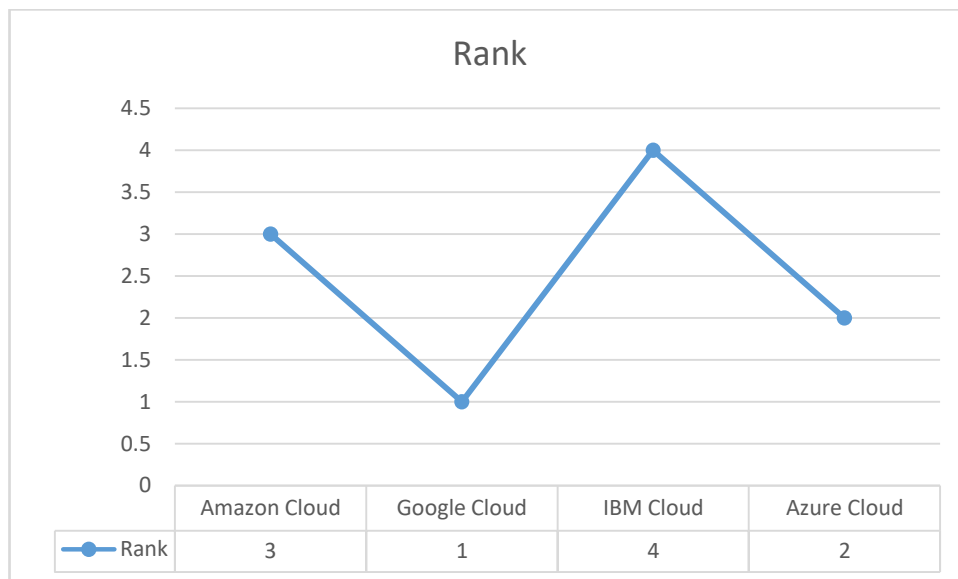


FIGURE 3. Rank

Figure 3 shows the final result of this paper the Amazon Cloud is in third rank, the Google Cloud is in first rank, the IBM Cloud is in fourth rank, the IBM Cloud is in second rank the final result is done by using the PROMETHEE method.

5. Conclusion

Business, Research, Education and Social Cloud for infrastructure How helps and your Cloud for native projects How to start using You will gain an understanding of For the vast proliferation of cloud computing Before, businesses and general computing Users usually use themselves Desired software and hardware Had to buy and maintain. Cloud based applications, storage, As services and machines are increasing, Businesses and consumers now On-demand as Internet access services Access computer resources. The PROMETHEE method of each criterion Takes. In this way, every criterion Can be evaluated on different grounds Operate. For example, most better conclusions can be drawn. PROMETHEE identifies incomparable and neglected alternatives by creating an Area Ranking, PROMETHEE Complete for alternatives Provides ranking the final result of this paper the Amazon Cloud is in third rank, the Google Cloud is in first rank, the IBM Cloud is in fourth rank, the IBM Cloud is in second rank the final result is done by using the PROMETHEE method.

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