

A Study on Resource Management Techniques in Cloud Computing

Urmila Shrawankar^{1*}, Froilyn S. Jamawadi²

¹ RTM Nagpur University, Nagpur, Maharashtra, India.

² Sulu State College, Philippines.

*Corresponding Author Email: ¹ urmillaa@gmail.com

Abstract

This study is based on the “resource management techniques” in cloud computing and this study has been filled with valid and authentic insights which have been collected to evaluate the subject matter. At the beginning of this study, the concept of cloud computing has been clarified and then its importance has been shown within a proper manner. By showcasing the concept of cloud computing, a generic awareness has been developed that to retain all types of crucial files, it is important to develop cloud storage within any sort of system. Also, there are several types of “resource management techniques” that have been depicted with the help of collecting crucial insights which are related with the help of gathering valid and authentic insights. Also, there are some important materials and methods and in this study, secondary data has been collected by following an inductive approach and also, qualitative research design has been chosen and implemented to bring betterment in the study. The resources have been collected from peer reviewed journals which consist of the information based on cloud computing, “resource management techniques” and cloud resource management. Also, several challenges of using resources management techniques within cloud computing with the help of crucial and effective insights have been depicted.

Keywords

Cloud computing, resource management, techniques.

INTRODUCTION

A factor which is immensely helpful in conducting any sorts of program or regulating any types of management is known as “resource management techniques”. Resources management techniques or strategies are the types of practices of making strategies, scheduling and hiring the people, revenue and technology within a project or program [1]. As an instance, it is the procedure of allocating the resources and revenues to gain the greatest organizational values and ethics in an effective way. Certainly, good and effective resources management gives an outcome within a right resource which has been available at the right time and right workplace.

Resources are crucial to achieve the goal of a company whether that be finishing a task or a project or helping an individual business owner to examine the important task to evaluate within a project. Thus “resource management techniques” are all about the visibility of a project, so that a project manager can be able to see, observe and retain the required things which can help a project to be executed in a proper manner [2]. There are several types of importance of business resource management which are actually immensely reluctant to depict the successful execution of a project.

Efficient and effective resources management techniques in cloud computing have been used in several types of forms which are immensely helpful to create a new program in a successful manner. Resources management techniques are the procedures which have been implemented to allocate resources within a process of an organization. The term resource management intends to describe the actions which have been implemented to regulate the capacities which have

been provided by cloud resources and services which have been constructed within the initial phases of a particular project [3]. In cloud computing, “resource management techniques” are the major functions which have been needed for any cloud systems and fragile resources management has a direct adverse impact on performance and cost as well within an organization. Also, the “resource management techniques” can indirectly make an impact on the system functionally which becomes immensely costly or fragmented due to ineffective performance.

MATERIALS AND METHODS

This study is filled with such data which are directly related with “resource management techniques” and its importance in cloud computing. In this study, the subject matter and the collected data has been evaluated in such a manner with the help of some criteria. There are some crucial types of criteria that have been selected and maintained to showcase the intensity of the subject matter. Within this study, materials and methods have been authentically chosen and used to evaluate the data in a proper manner. The data which has been collected for this study is secondary data by nature. For this reason, the type of this study is secondary and these data have been collected by following an important approach.

By following an inductive approach, the data has been collected and interpreted within a proper manner by making different types of themes. Also, qualitative research design has been selected and implemented to execute the gathered data for this study. The reason behind selecting this research design is to evaluate and examine several aspects at the same time. For instance, in this study, both the use of “resource

management techniques” in general and its use in cloud computing have been showcased within an extended manner.

Later on in this research work, another criterion has been selected and implemented in a successive manner and the criteria are inclusion and exclusion criteria. Within this study, primary data has been excluded and secondary data has been included to represent different types of aspects of the subject matter. As in this study, the secondary data has been collected, so that several types of themes have been developed in a proper manner. Also the secondary data are reliable and valid from all aspects. Also, the data which have been collected to evaluate the subject matter are collected from authentic peer reviewed journals, articles and newspapers which have been published after the year of 2019. Therefore, this study has been conducted by maintaining all kinds of insights and making an authentic aspect over the importance of resources management techniques on cloud computing.

RESULTS

Theme 1: Types of “resource management techniques” in cloud computing

The “resource management techniques” which have been used in cloud computing is known as “cloud resource management”. The cloud resources management needs difficult and decision making strategies and decision making policies for several objectives of an organization. Impactful resources management is immensely changeling and hectic due to the range of the infrastructure of cloud and to the uncertain connection of the systems with a huge scale of users within its server. Also, the range makes it more difficult to have appropriate global state insights and the huge range of population makes it nearly impossible to assume [4]. An overview of strategies and mechanism for “cloud resource management” or the “resource management techniques” for cloud computing has been maintained by the implementations of cloud resources and efficient energy and the effect of application ranging on resources management. Also, a regulation to resources allocations and a portrayal of machine learning algorithm for coordination of specialized automation performance managers has been resulted in an effective manner.

A norm typically describes the ethics guiding to the firm decision making, whereas mechanism highlights the means to use strategies in an extended manner. Isolation of strategies from mechanisms is a leading ethic within the computational workforce and computer science. Thus, cloud resources management techniques and policies can be gathered loosely within five phases and the phases are as follows- “admission regulation, capability allocation, balancing of load, optimization of energy and quality of service guarantees” [5]. Also, the explicit objective of an admission regulation strategy is to protect the systems from considering workloads in violation of high level system strategies. By restricting workload needs to some knowledge of the global states of the systems and within a non-static

system like knowledge, while available is the best obsolete.

Furthermore, the laid energy and balancing optimizing can be evaluated regionally but global load balancing and energy activation strategies intend to make an encounter over the same kind of hectic situations within the system. “Load balancing and energy” activation or optimization are related to each other and make an impact on the cost of providing services in an immensely effective manner. It has been assumed that a little percentage of the budget for IT enterprise infrastructure has been rose which would be spent on energy resources in an effective manner [6]. The basic meaning of the term balancing is that evenly providing the load to determine a bunch of servers within a system. In cloud computing, a critical objective is reducing the cost of giving the service and in a more particular way reducing the consumption of energy from the system.

It has been often observed that resource management policies impactfully and collaboratively target the performance and power consumption within a system. Also, initially motivated by the requirement to save power for mobile devices, the resources management techniques in cloud computing have been migrated to virtually all kinds of processors involving the ones which have been implemented for high performance servers. As a result of lower voltages and frequencies, the performance of the processor decreases, but at a sustainability slower rate than any types of energy consumption [7]. Furthermore, virtually all kinds of closely “optimal mechanisms” or optimal have been developed to address these five phases of strategies which do not range up and typically target a single factor of resources management within a system. Also, several needed difficult computational features that cannot be done effectively within the time which is available to respond. Therefore, it can be stated that these are the types of ““resource management techniques”” in cloud computing a system which is actually a crucial aspect for a computing system.

Allocation techniques and strategies within cloud computing must be dependent on an organized and reliable approach rather than advertisements and hoax methods. There are four general mechanisms for using the resource management strategies within cloud computing and the four mechanisms are as follows- regulation theory, machine learning, utility based approaches and market related or financial mechanisms [8]. Control or regulative theory intends to implement the feedback of the users to guarantee system stability and assume transient behaviours of the users. However it can be also implemented only to assume regional behaviour rather than predicting global behaviour.

On the other hand, there is a huge benefit of machine learning strategies and the benefit is that the strategies do not need a particular model to act within the system. This strategy of machine learning could be implemented to connect plenty of autonomic systems managers [9]. Also, the utility based methods need a performance model and mechanisms which can be able to connect with the user's level performance within a cost effective manner. Later on, the market related

mechanisms or financial mechanisms do not need a model of the system that is combinatorial auctions for the bunch of resources within cloud computing. Therefore, these four types of mechanisms can help to strengthen the process of cloud computing by using resource management strategies.

Theme 2: Importance of “resource management technique” in cloud computing

Cloud computing has been recently constructed and developed as the standardized, huge ranged and rapidly developing virtualized data centre which is also globally used in different types of systems and provides cost effective computational services. For this reason, to regulate and organize such a huge volume of resources, cloud computing has been vigorously implemented along with automation and non-static resources management techniques. Additionally, with the help of different types of public, private and mixed systems which are generally cloud based, has been already used and firms surely require to accept the “resource management techniques” within the cloud computing techniques as well [10]. However, the resource management strategies for such a difficult system as cloud computing needs another way of measuring and placing those resources in an effective manner within the cloud computing system.

“Resource management techniques” is a main function which is needed for any cloud system and insufficient resources management strategies has an adverse and direct

impact on the financial performance of a certain type of system. The resource magnet techniques for cloud computing or cloud resource management have been related with three types of cloud delivery models which are globally and those three models are as follows- IaaS, PaaS and SaaS [11]. In few cases, when the cloud service providers can easily assume a spike within the systems, the providers also observe the resources in advance as well within a system. In case of an unorganized spike, the circumstances can get more difficult and a user can implement automation in scaling for organizing those unplanned loads of spikes. Also, in order to organize the spikes, a user needs a pool of rescues by using which, a user can release or allocate the required systems on demand and an observing system that allows the users to decide within real time to re-allocate the resources.

It is an important thing to remember that “auto scaling” has been supported by PaaS services but it is more complicated for IaaS due to lack of standards and technical glitches. A cloud is a part of a cluster resource which is actually compatible with developing and shrinking to adapt the load of inclusion within a certain type of system. The cluster level of regulating power has been portrayed by cluster resources manager and a software difficulty that regulates resources and tasks within a cluster in order to manage the effectiveness [12]. Additionally, a CRM is highly responsible for making and deleting clouds within a system.

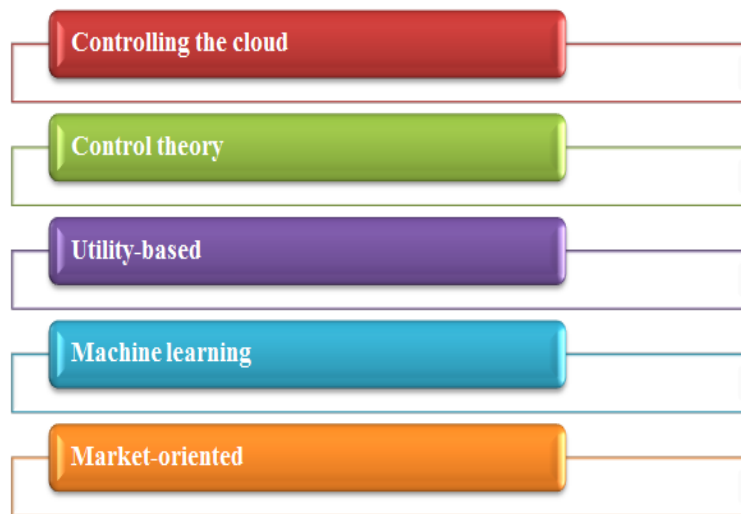


Figure 1: Types of cloud computing by using “resource management techniques”

Another level is node level which is also a crucial part of this cloud computing system and has been regulated by the resources management system. The node level power management has been evaluated by a quick action system. For this response, an “operating system” or OS regulates the high level state of equipment and for instance, to preserve energy, operating systems can create and place a processor within sleeping mode or in spin down disks [13]. There is another level which is known as hardware level within the cloud computing system. Modern central processing units have several types of modules which might not be included

within the operations permanently. Thus, the unfastened nodules can be turned off and this has been evaluated by a special circuit which is responsible for internal power supply of the CPU and so, all types of management have been executed on the hardware levels without including any types of OS.

Also, allocating the strategies in cloud computing must be dependent on an organized approach rather than advertisements and hoax methods and in order to mitigate the rate of hoax methods and making organized, there are four types of systems which can be regulated by using cloud

resources management techniques within a cloud computing and within the computational systems of an organization. Generally, a “cloud computing infrastructure” is a complex system with a wide ranged count of vulnerable resources [14]. They are subject to those unorganized resources and can

be impacted by external elements apart from any sort of regulations of the users. Thus, the cloud resource management needs difficult and confusing strategies and decisions for multi-objective activations within reluctant transition to work within the cloud computing system.

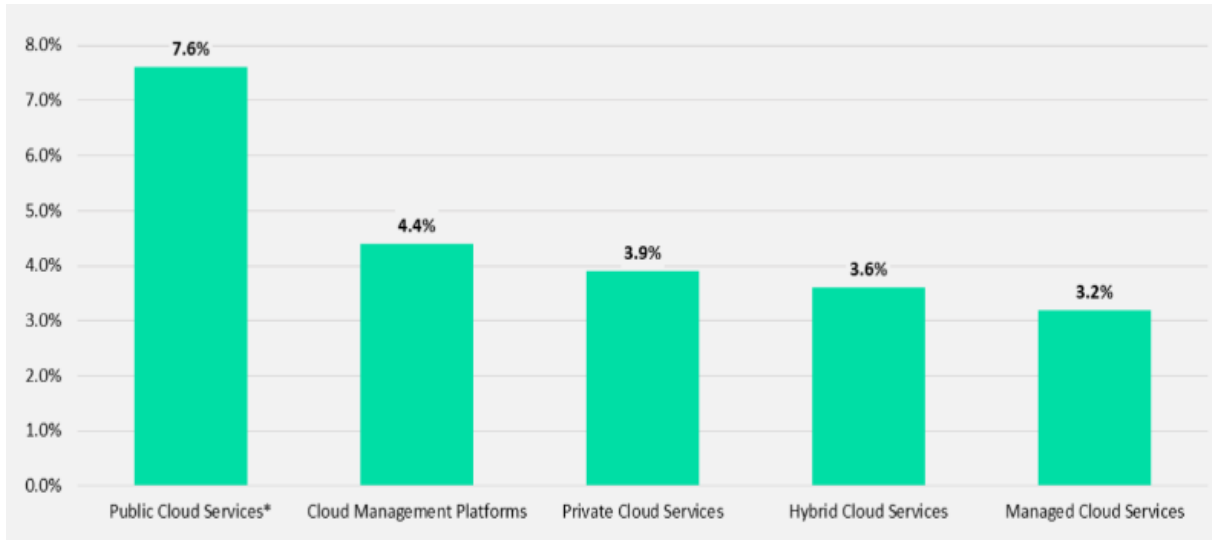


Figure 2: Growth rate of using cloud computing

The government has spent a sufficient amount of revenues on developing new internet governance projects which have been based on cloud technology and keeps all the data secured by “resource management techniques”. Among the public cloud service systems, infrastructure is the rapidly developed projects which have been increased by the rate of 8.7% by the year of 2019-2024 [15]. This development is immensely helpful which has been driven by the enhancing preferences of enterprises to use cloud computing within public and private cloud systems in an adequate format.

Theme 3: Challenges of incorporating “resource management techniques” in cloud computing

Incorporating “resource management techniques” within cloud environments or cloud computing systems is way too problematic due to the range of modern data centres. The heterogeneity or variability of the types of resources and dependencies with each other, variability and uncertainty of load can create several types of issues within the cloud computing system in an effective manner [16]. Additionally, other issues within the cloud level resource management require to be resolved by involving variability within a system, reluctance traits among virtual machines and underlying hardware can also create several types of issues within the computing system. There are some notable problems which have been faced in incorporation of “resource management techniques” in cloud computing such as fragile data migration.

Also, security protocols within cloud computing, troubleshooting, implication of downtime, migrations agents and cutover difficulties can occur while using “resource management techniques” within cloud computing for a long term [17]. Furthermore, allocation of resource management

faces different types of major issues which involve cost efficiency, response of time, issues within reallocation, computational performance and scheduling of tasks. Customers who use cloud computing services targets to fulfil the task with lower costs. Also, in cloud computing, “resource management techniques” are getting out of users both in terms of skill-set and engagement. The reason for this reason the users generally fill the roles which are based on the talent of cloud computing which can be regulated by the use of resource manage techniques in a certain manner.

The top most awareness of investing within procedures of resources management in cloud computing can be represented with the issues of security norms. Issue of security protocols has occurred for the reason where the data has been retained and maintained by their party vendors and a user may not be able to see the intrusion within the system [18]. A user gets informed about fragmented intrusion; compromised with those fragile credentials, account hacks and data breaches as well. Also, the cloud providers put more effort by straightening the resource management to develop security capabilities to retain the number of users to implement cloud computing systems.

As an extended number of users are able to access the cloud account, it becomes more vulnerable for threats and attacks. In case the “resource management techniques” have been used in cloud computing, anybody who knows the password can be able to intrude within the cloud and can be able to access any sorts of personal information which is supposed to be confidential from all aspects. An organization which uses cloud computing by incorporating “resource management techniques”, should implement several level authentications and enable that the passwords remain secured within the system. These are the challenges while it becomes

more necessary to incorporate resources management techniques within cloud computing to increase the effectiveness of computational work within a company.

DISCUSSION

The following study is based on the importance of resources management techniques with the help of collecting secondary data which are closely related with the subject matter and representing such results which shows depth of the following subject matter within a proper manner. By collecting secondary data with the following inductive approach within the study, three major themes have been developed and each and every theme consists of such data which have been gathered from such sources which are the part of peer reviewed journals, newspapers and articles. Also, three themes have been depicted as the core factors without developing which, the study cannot be executed in a proper manner.

The first theme is based on the types of “resource management techniques” which have been used in cloud computing over the globe. With the help of this following theme, there are plenty of “resource management techniques” that have been depicted which help to regulate the norms of cloud computing within public and private systems in a certain manner. Also, with the help of using these techniques, the storage can be increased within systems which are supposed to be used in an extended manner. Also, by following five different phases, cloud computing has been regulated in an organized manner and the phases are as follows- admission regulation, capability allocation, balancing of load, energy optimization and quality of service guarantees.

The subject matter of the second theme is the importance of “resource management techniques” in cloud computing and with the help of developing these themes, there are uncountable importance has been shown which by reporting which, the depth of using “resource management techniques” within the cloud computing has been maintained within an extensive order. However, the “resource management techniques” have some adverse impact which can disrupt the pace of running cloud computing within a system whether it is a public system or a private system. Also, with the help of incorporating “resource management techniques”, the data can be stored in a safe and secure manner within a system.

Later on, with the developing last theme, the challenges of incorporating “resource management techniques” within cloud computing has been showcased by collecting several valid and authentic data which are related with the subject matter directly. Several crucial issues such as, security protocols, password encryption and unauthorized intrusion can occur for the use of “resource management techniques” within cloud computing. Therefore, it can be rather stated that by developing themes, the subject matter has been evaluated in a proper manner and all the required types of insights have been insight to execute the subject matter in a proper way.

CONCLUSION

The core subject matter of the study is based on the impact of “resource management techniques” in cloud computing and in this study, there are some criteria which have been followed and maintained within an extensive manner. This study has been parted with such segments which are closely related with each other and depicts the intensity of the subject matter which is actually an important factor to showcase the importance of the subject matter in an appropriate way. At the beginning of this study, an introduction has been served which is based on the topic and in this section; the concept of “resource management techniques” has been clarified properly with the help of insights and resources.

Later on in this study, a stereotypical form of methodology has been followed and maintained to give this study an adequate execution. At first of this section, there are several types of criteria have been maintained and followed within this study. It is an evident factor that in this study, the data which has been collected are secondary by nature and for this reason; the type of this research is secondary. While collecting the data which can be able to evaluate the subject matter, the inductive approach has been selected and followed and also a qualitative approach has been chosen and used to depict the potentiality of the subject matter in an appropriate manner. Also, the main source of the data which has been collected to maintain the aspect of the topic are gathered from the peer reviewed journals, articles and newspapers which have been published after 2019.

After the execution of materials and methods, there are three major themes which have been developed depending on the subject matter. The first theme depicts a concept of resources management techniques and an overview of using “resource management techniques” within cloud computing in an effective manner. Later on, the next theme consists of such information which contains the importance of “resource management techniques” in cloud computing and with this theme, there are several types of significance of using resource management technology within cloud computing that has been showcased within a proper manner. The last theme is based on the challenges while incorporating “resource management techniques” within cloud computing and this study has been executed within an appropriate discussion over the themes.

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