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Effectiveness of Analyzing Data in the Cloud: Agenda for Future Research

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Abstract Data analyzing is facing great challenge in the modern era, Cloud computing as a modern technology has brought various benefits to the analyzing data. The purpose of the paper is to introduce the advantages of implementing cloud based analyzing data. Technical, organizational, economic, high performance, efficient, and security advantages were among the sub-themes, which included the following categories: specific capabilities, technical support, high-level and capabilities in the organizational area, organizational cost reduction and relative benefits in economic field, and security opportunity in the area of security. Considering the newness of cloud computing in data analyzing, recognizing its benefits and opportunities plays a significant role in using this technology successfully.

Keywords—Cloud computing, Implementation, Advantages, Analyzing, Processing, Data.

1. Introduction

Cloud Computing is speedily becoming one of the greatest well-known, enhanced and promising technologies. This paper discusses about the advantages of using cloud computing technology to analyze data [1]. these days business operational environment is considered by a fast pace of transformation, hence the important for organizations to be scalable in order to adjust to change, increasing costs followed by a vital for better resource utilization, better competition followed by a necessity for organizations to be pioneering, and a fast pace of high-tech developments. In this multipart and dynamic environment, the potential benefits that cloud computing capabilities is becoming gradually attractive to ensure organizations attain justifiable reasonable value, in order to accomplish development and safeguard survival of the organization. Apart from business advantages there are technological advantages as processing, I/O utilization and scaling.

Characteristics of Cloud Computing

On-demand self-service, wide network access, resource pooling, quick elasticity, and measured service are all aspects of cloud computing. Customers (often businesses) can request and control their own computer resources through on-demand self-service. Services can be delivered via the Internet or private networks with broad network access. Customers have access to a pool of resources. Services can be provided over the Internet or private networks with broad network access. Customers use a pool of computing resources, which are often located in remote data centers. Services can be scaled up or down, and clients are invoiced according to how much they utilize them.

A. Research Questions

This study examines the realized advantages of the analyzing data in the cloud finding answers to the

subsequent research questions:

1. What are the benefits that the organization has realized in terms of business related in data analyzing process using Cloud Computing?
2. What are the technical related benefits that the organization has realized in data analyzing process using Cloud Computing?

B. Objectives of the research

The objective of this paper is to identify the advantages of analyzing data in terms of business and technical perspective in cloud.

1. To find out the benefits that the organization has realized in terms of business related in data analyzing process using Cloud Computing.
2. To Explore the technical related benefits that the organization has realized in data analyzing process using Cloud Computing

2. Literature Review

As per the US National Institute of Standards and Technology (NIST) [2] Cloud Computing, "A model for enabling convenient ,ubiquitous, on-demand network access to a shared pool of configurable computing and rapidly provisioned resources and services like servers, storage, applications, and released with minimal management effort or service provider interaction". Von Solms [3] definition of Cloud computing by denoting it as a computing model which permits users to access an IT facility over a network, as and when required, without concern about the technical details of how the facility is provided. They liken the use of cloud computing to using a shared form of transportation, instead of owning a car, with the shared transportation services available on demand. Hence, one need not worry about insuring, servicing and maintaining the car, and is only concerned about its availability.

A widespread series of literature on cloud computing provisions the fact that smaller organizations, including SMEs (small & Medium enterprise organizations), stand to Benefit knowingly from Cloud computing adoption because of their lack of resources and proficiency in IT. Rader [4] concurs that cloud computing will even out the competitive landscape giving smaller organizations a chance to enter in the global marketplace. He noted for a company to grow, but with less resources than its competitors, Cloud Computing offers the possible to do more with less, thus advancing an agile, strategic adopter of such technology. Cloud turn out to be the new enclosed all over the developing technology. Cloud Computing gather all the computing resources and control them automatically. In these days World rely on Cloud computing to keep their public as well as personal information. Cloud computing, becomes the need for all client and give significant hardware, software and service in manner to the requirement that users put forward.

Main components in cloud computing can be further classified as the cloud platform, cloud infrastructure and cloud application. Cloud infrastructure contains different cloud services such as virtual machines (VM), data storage and communication networks such as Amazon's Elastic Compute Cloud. Considering cloud application, provides well-defined APIs for interaction with the applications such as Google's App Engine and Salesforce.com. Cloud infrastructure plays as the bottom layer which holds cloud applications and web services on top of it.These are the commonly used public interface applications such as the Google's Google Docs. According to a recent survey [5] According to a survey of over 800 company decision makers and consumers done globally, the number of firms getting a competitive edge from high cloud adoption has nearly doubled in the last few years, and the public cloud services industry is expected to surpass $244 billion by 2017.

According to Dutta [6], the attractiveness and benefits of cloud computing is related to the economic benefits, simplification and convenience of the way computing services are delivered. They describe these benefits as the key drivers that will speed up the adoption of cloud computing, with the expectation that it will result in cost reductions, increase efficiency and ultimately create a competitive advantage in any market.

Cloud service models.

1. *Software as a Service (SaaS):* This model provides Software applications through the Internet, using a web browser. The client does not control any infrastructure (network, servers, operating systems, and storage) [7].
2. Infrastructure as a Service (IaaS): It provides a web-based management access to resources such as processing capacity, disk space, and many others. IaaS allows the user deploy software in that infrastructure [7].
3. Platform as a Service (PaaS): This model provides a platform and environment to developers enabling them to create applications and services accessible through the Internet [7].

Main Advantages for Business Organizations
Cost effective: Resource utilization can be tracked and would be charged on the basis of utilization. This method is very clear which makes the supplier and the user more comfortable to accept it. When it comes to storing massive amounts of data, big data technologies like Hadoop and cloud-based analytics provide significant cost savings, as well as the ability to uncover more effective methods of doing business.
On-demand self-service: As the name indicates, enterprises can increase storage or service capacity with a single press of a button, without the need for human intervention. Organizations will be able to swiftly set up big data infrastructure.
Data and information through the internet: Information is available through the internet and may be accessed at any time by various devices such as laptops, mobile phones, and iPads.
Resource pooling: The multi-tenant model groups and uses provider resources efficiently. Storage, memory, virtual machines, and other resources are examples of resources.
Rapid elasticity: Resources (both hardware and software) can be efficiently and effectively increased or decreased in a short period of time. The resources can be purchased in any number and at any time by customers.

A. Cloud Analytics advantages over On-Premise Analytics
● Agile Computing Resources
Helps to deliver business queries and reports immediately in cloud computing because the handling speed and less hassles on delivery time related processes in the premise servers. [10]

● Better performance in Ad hoc Deployment of Resources analytics and data science in cloud can support for business context by scale-up by creating a direct linking between them, reducing the latency and reaction problems to less than a millisecond [10]. It helps to prepossessing data such as cleaning, transform and match, consolidate data in effortless manner. The concept of Real Time Cloud (RTC) gives even more benefits for data analytics and big data such as combine, match and clean.
- Data effortlessly with actual access to sources systems and data up-to date and organized, assisting your Operations and Analytics groups' functions (Data Virtualization and semi Virtualization) under the same roof. These facilities tend to provides finer marketing/business decisions and predictions in organization.

● Accessibility
Cloud services has the ability to visualize data generating analytic reports comparing organizations and sharing them mmaking raw data fingertips away and make them visible for a larger worker base. [10]

● High Profits on Time Investments
Services provided by cloud facilitates on-demand data models, uploads, innovative tools for analytics and application servers. Time can be saved in building up a new infrastructure employing Marketing teams. on premise analytics teams in the organization can prediction and fragment your movement plans, leads and the campaign reports produced are available anytime to your sales teams to follow-up, real time customer data and insights from sales and marketing teams helps strategy teams of the organization in predicting game changing decisions or make their support teams informed instantly with consumer queries. By increasing the cooperation, we can expect advanced returns, and an ideal cloud service can deliver it as expected. [10]

● **Flexible and Faster Adoption**

Cloud provides high UX experience by supporting self-learning models and have a user-friendly consumer experience unlike the on-premise applications. Cloud infrastructure helps the business growth and can enlarge or amend as your data storage and applications needs growth or lessening without any user interaction (auto-scaling).

● **Affordability**

New tools or applications require minimal IT maintenance and no improvement costs or issues. This retains the business in a continual flow without any intrusions like the need for improvement the on-premise Infrastructure, and having other time-consuming efforts. And to rebuild your combinations [10]

●**Security**

In terms of data breach, cloud-based infrastructure (robustly built) is more effective because detecting such security issue by analyzing data and fixing it take less time than on premise security analysis. Since the agility, flexibility and virtualization techniques, with the help of cloud-based data science services it is best to streamline each of business processes as cloud. [10].

B. The Best Uses of Data Analytics

● Social Media

A widely used practice for cloud data analytics is depicting and compounding social media content. It was very hard to process various social media activities across different sites before cloud drives became available, mainly because of the data was stored on different servers. Cloud drives has the ability to examine social media site data simultaneously, so the result generation and quantification can be done quickly and attention and time designate appropriately [10].

● **Tracking Products**

For product tracking, use the cloud to distribute items wherever they are needed, regardless of their proximity to customers. Amazon is a wonderful example; they track products over their sequence ship items using data analytics on cloud disks. [10]

and warehouses anywhere as needed. Red-Shift, big data analysis services, initiative by AWS helps Amazon users for remote analysis of cloud drivers. Alongside red Shift gives same provision of analytics tools and storage capabilities for smaller business organizations. It is cost effective for smaller business as it prevents spend money on extensive hardware and related components. [10].

● **Tracking Preference**

Netflix has gotten a lot of press for their DVD delivery service and movie selection on their website. One of the features of their website over the last decade or so has been its movie recommendations, which tracks the movies users view and suggests others they would love, offering a service to clients while encouraging them to use their productEmployer data is saved remotely on cloud disks so that preferences do not change from computer to computer. Netflix was able to make a television show that statistically appealed to a huge section of their audience based on their proven taste because they preserved all of their users' preferences and choices in movies and television. Therefore, in 2013, Netflix's House of Cards turn into the most successful internet-television series ever, all thanks to their data analysis and information stored on clouds. Cloud Computing technology tips on data analytics The Most Effective Data Analytics Applications Quick Tip: As SaaS gets more prevalent, data analytics may become easier as client information gets more centralized. 7 Cloud Computing technology tips on data analytics [10].

● **Keeping Records**

Analytics in cloud allows for concurrent recording and processing of data regardless of proximity to local servers. Companies can track and forecast sales and improve customer relationship management (CRM) based

on computational analysis [10].

C. Leading Cloud Providers Solutions

According to the leading cloud providers as AWS using Amazon Athena, Amazon Kinesis, AWS Data Pipeline, AWS Glue[11],

Figure 1: Amazon Kinesis architecture

Microsoft Azure also use Cortana Intelligence Suite [CIS] [12], and IBM Watson provide IBM Analytics [13] service.

Finally, Google also use services such as Google Data Lake approach and Analytics (GA), Data Studio, Data Lab

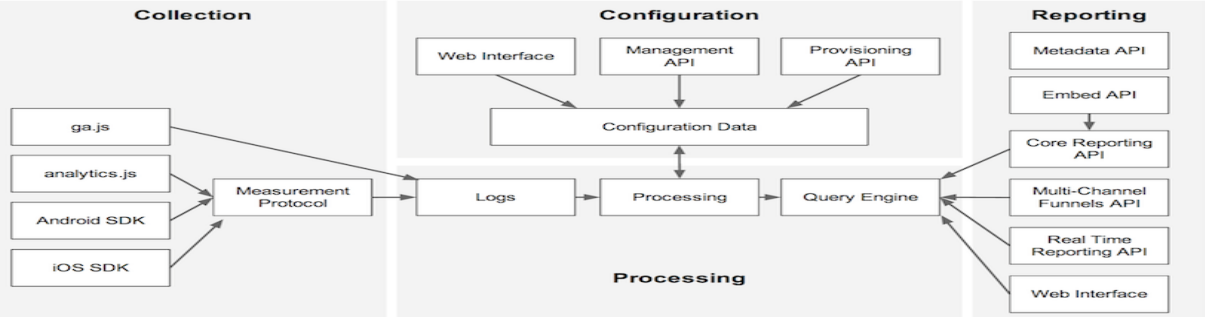

Figure 2: Google Analytics architecture

D.

Advantages of analyzing data in cloud	**Leading Cloud Providers Solutions**
cost effectiveness On-demand service Rapid elasticity Agile computing resources Consolidate Clean data effortlessly Accessibility High returns on time investments	AWS using Amazon Athena, Amazon Kinesis, AWS Data Pipeline, AWS Glue. Microsoft Azure also use Cortana Intelligence Suite [CIS]. IBM Watson provide IBM Analytics Google also use services such as Google Data Lake approach and Analytics (GA), Data Studio, Data Lab.

3. RESEARCH DESIGN AND METHODOLOGY

The study design and methodology for this research are described below. Secondary data used for this paper such as journal articles, conference papers, related websites.

CONCLUSION AND FINDINGS

Cloud Computing is becoming back bone to data analyzing process. In terms of business perspective, it provides many benefits such as, on-demand service, high returns on time investments, rapid elasticity, agile computing resources, cost effectiveness, resource sharing, consolidate and clean data effortlessly, accessibility, flexible and faster adoption, affordability, and security. In terms of technical perspective there are many

advantages as better performance Mach in ad hoc deployment of resources, performance improvement in processing data in secure way and it supports data recovery and replication. Data migration become easy. It supports effective testing methods like A/B testing.

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