Social Cloud: An Introduction

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ABSTRACT

Social cloud which is also known as CloudSocial or peer-to-peer social cloud computing (P2P) is a robust social media management and listening platform that helps businesses to monitor, analyze, and engage with their audience in real time. It is used in analyzing social media sentiment (by gaining valuable insights into audience's sentiments, preferences, and trends, which will lead to refined strategy in building stronger connections), assesses campaign effectiveness, monitors competitors, benchmarks performance, and compares brand presence. It also measures engagement metrics, supports major platforms such as Facebook, X, Instagram, Linkedln, and YouTube, and consolidates data into a cohesive view. The paper dives into the numerous values or benefits, the challenges, and the probable future deployment/application of CloudSocial for human uses.

KEYWORDS: *Social cloud, social media sentiment, cloud computing, data privacy, social storage, social networking*

INTRODUCTION

Online social networks, such as Facebook, Google, and Linkedln, are now predominate service today, which caters for people of all ages, gender, and class, becoming a primary means of communication between friends, family, and colleagues. These digital relationships are creating new opportunities to spur the adoption of socially oriented computing.

One representative example of this trend is the concept of "social cloud," which is a means of facilitating resource sharing by the use of relationships established between members of a social network [1, 2], as shown in Figures 1 and 2. A social cloud leverages preexisting trust relationship between users to enable mutually beneficial sharing. It facilitates long term sharing with lower privacy and security requirements when compared to that of traditional cloud environments. This goes to say that the cloud, as shown in Figure 3, accrues massive amounts of private information, as shown in Figure 4, for targeted advertisements, hence the exposure to security breaches, poor judgement, or even the lack of judicial oversight leaving users vulnerable. According to Pearson, one of the "top six" recommended privacy practices for cloud systems is to maximize user control, which is one of the outstanding features of the "social cloud" [3-5].

HISTORY OF THE CLOUD

The current digital age is marked by our reliance on the cloud. All Internet users are confronted with a variety of cloud choices and options that were not available a decade ago. Now a plethora of services we rely on either for downloading apps or for storing our photos and videos are hosted by the cloud, as shown in Figure 5.

The three fundamental concepts that defined the cloud are: 1). The delivery of a service, such as computing or storage as a utility; 2). Multiple people sharing the same computer resource, which is possible through a technology, referred to as virtualization, and 3). The accessing of services via networking – the 1960s was the momentous decade in laying this foundation.

The late Professor John McCarthy – a visionary computer scientist who coined the term "artificial intelligence" – suggested in 1961 that computing

would one day be sold as a utility. IBM in 1967 virtualized operating systems allowing for multiple users to timeshare the same resource. In 1969, ARPANET (Advanced Research Projects Agency Network), a network relying on the TCP/IP protocol was launched by the US Department of Defense, became the forerunner of the Internet.

The 1970s/80s witnessed the research in virtualization, operating systems, storage, and networking advanced in the next two decades finding new applications never known before. This melting pot fused technologies for novel outcomes, such as networks that allowed wire transfers between financial institutions. In the UK, scientists worked on using unused television signals for sending data. In 1976, advances in networking were demonstrated by Queen Elizabeth ll by sending an email. The White House after a couple of years installed its first computers. In the early 80s, network operating systems were launched to allow computers to talk to each other. By 1985, storage tapes that could store up to 200 megabytes of data (an average smartphone has 10 times this memory) were available. By this time around 100,000 computers were connected to the Internet.

In the 1990s, the foundational technologies for the cloud reached a certain level of maturity, epitomized by the launch of the World Wide Web (WWW) in 1991 with more than a million machines connected to the Internet. The inception of the modern-day cloud was realized by Amazon Web Services (AWS) launching its public cloud in 2002, with virtually no competitors at this stage and while the benefits of using the cloud, such as elasticity and scalability were known, the real use cases to convince potential users were not yet available.

The next decade saw the cloud develop over two distinct generations, i.e the first generation cloud – 2005 – 2011, and the second generation cloud – 2012 – 2017, which was followed by 2017 and beyond. The first generation cloud was related to processing outside the cloud and the second generation regarding heterogeneous cloud resources [6].

THE ROLE OF CLOUD COMPUTING IN SOCIAL NETWORKING

Cloud computing has now become an integral part of modern social networking platforms, enabling users to access shared computing resources, such as servers, storage, applications, and services over the Internet. Social networking platforms have evolved from simple text-based forums to complex platforms that support multimedia content, real-time messaging, and social gaming, which require the need for scalable and reliable computing resources.

Some of the various advantages of cloud computing are [7]:

1. *Scalability and flexibility:* One of the biggest benefits of cloud computing in social networking is its ability to scale quickly and easily. Cloud computing platforms allow users to scale up or down depending on the demand for their services. This means that social networking sites can handle large amounts of traffic during peak usage periods without experiencing any downtime or slow loading times. It also allows for flexibility in terms of data storage and processing as shown in Figure 6.

2. *Cost-efficiency:* Cloud computing is cost-effective, in the sense that social networking platforms can save much money as there is no need to invest in expensive hardware or software; they only need to pay for what they use. It also eliminates the need for maintaining and managing physical servers, thereby reducing the costs of IT infrastructure and maintenance. As a result, social networking platforms can redirect their resources towards enhancing user experience and developing innovative features.

3. *Improved collaboration*: It has helped revolutionized collaboration in social networking by enabling users to work on the same project or document in real time, regardless of their location. Cloud-based tools such as Google Docs and Dropbox allow multiple users to edit and share files simultaneously, making it easier for remote teams to work together seamlessly. This has significantly improved productivity and reduced turnaround time, making it a valuable asset for businesses and individuals.

4. *Data security:* A primary concern with cloud computing is that data is stored on remote servers and may be accessed by unauthorized users. This can occur due to vulnerabilities in the software or infrastructure or due to insider threats. Robust security measures to protect against these risks, like encryption, access controls, and monitoring are provided by cloud providers. While on the other hand, users could take steps to protect their data by the use of strong passwords and two-factor authentication and regularly reviewing their security settings.

CLOUD-BASED SOCIAL NETWORKING PLATFORMS

Cloud-based social networking platforms like Facebook, Twitter, Linkedln, and Instagram are built on cloud computing technology. These platforms use cloud computing to store and manage vast amounts of

user-generated data. They use cloud storage to store users' data, such as photos, videos, messages, and posts and can access them quickly from anywhere in the world. It also ensures that users can access their data from multiple devices seamlessly.

Furthermore, cloud-based social networking platforms process and analyze users' data using cloud computing. These platforms leverage big data analytics tools to analyze users' behavior, preferences, and interests and use this information to deliver personalized content and advertisements to users – helping the platforms to enhance user engagement and generate revenue from targeted advertising.

SOCIAL NETWORKING CHALLENGES

Despite the revolutionizing of the world of social networking by cloud computing, it also presents some challenges and risks, which are [7]:

➤ *Performance*: Performance issues can occur when the server infrastructure cannot handle large amounts of traffic, which can lead to slow response times, downtime, and reduced user engagement

➤ *Integration with existing systems*: Many companies already have existing IT systems, and integrating cloud services into them can be challenging. It is therefore important for businesses to carefully plan and manage the integration process in order to ensure that everything works together smoothly.

➤ *Regulatory compliance:* Since social networking platforms often collect and store sensitive personal information, they are subjected to various regulations and laws. These regulations and laws must be complied with by the companies when using cloud computing for social networking.

SOLUTION TO THE CHALLENGES

1. *Managing cloud spend:* One of the biggest challenges for all organizations, either big or small, is the cost of cloud. Organizations can remove wasteful spending by using analysis, tracking, and optimization of expenses associated with cloud services and infrastructure. This is the use of cloud spend management strategies and tools which helps to identify cost saving opportunities, control cloud usage, improve compliance measures, and the better allocation of resources.

2. *Cloud security:* Crime targeting cloud environments is now on the rise as the industry and user increases. The major challenge facing cloud security are misconfigurations that leave

data and access exposed, limited visibility of the full cloud environment, human error if processes are not built or followed correctly, and unmanaged attack surfaces that can expose IT infrastructure. Cloud environment can be secured via:

A. Use of identity and access management (IAM) tools that control the management and access of resources,

B. Security information and event management (SIEM) tools which automate monitoring, incidence response and detection of threats, and

C. Data loss prevention (DLP) tools that provide visibility to the data stored in cloud environments.

3. *Lack of resource expertise*: There is a growing need for cloud expertise due to cloud adoption, and while research showed that over 85% of surveyed IT professionals expressed lack of skills in cloud computing. Not everyone is skilled in cloud computing, since this is a specialized field. Cloud skill gap can be resolved through recruitment, upskilling staff and training programs. Organizations can as well seek for service providers with knowledge in cloud management/services, so that they can concentrate more on their core business. Therefore, partnering with cloud experts will ensure efficient control of security, compliance, and services without the costs of hiring candidates. Some other benefits of using managed services are: 1. cost saving due to subscription-based pricing centered around requirements, 2. access to expertise and skills, and 3. remote monitoring and management to avoid downtime [8].

According to Cody Slingerland, it is known that 67% of worldwide cloud infrastructure is controlled by AWS, Azure, and Google Cloud among others globally in 2024 [9].

CONCLUSION

Cloud computing no doubt has become essential to social networking with its advantages of scalability, cost-effectiveness, data security, flexibility, and collaboration. Despite this, cloud computing also has its own challenges that have to do with performance issues, integration with existing systems, and regulatory compliance. Nonetheless, regardless of the challenges, cloud computing has revolutionized the way we interact with each other online. With the future advances in technology, cloud computing will still play greater and more significant roles [10].

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Figure 1   Social networking service.

Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
y8QP0PRAhciNQ:1728377644883&q=images+on+cloud+social+by+wikipedia&fbs=AEQNm0A-
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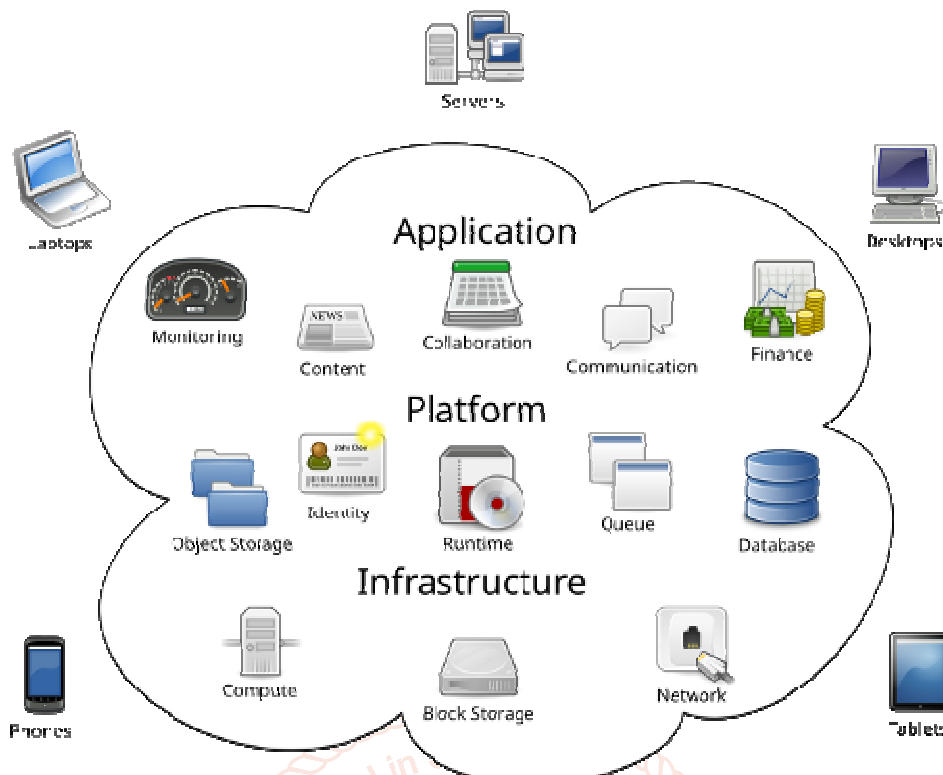m=2#vhid=jZG3K4eumpImhM&vssid=mosaic

Figure 2 Cloud computing.

Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
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Figure 3 Cloud.

Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
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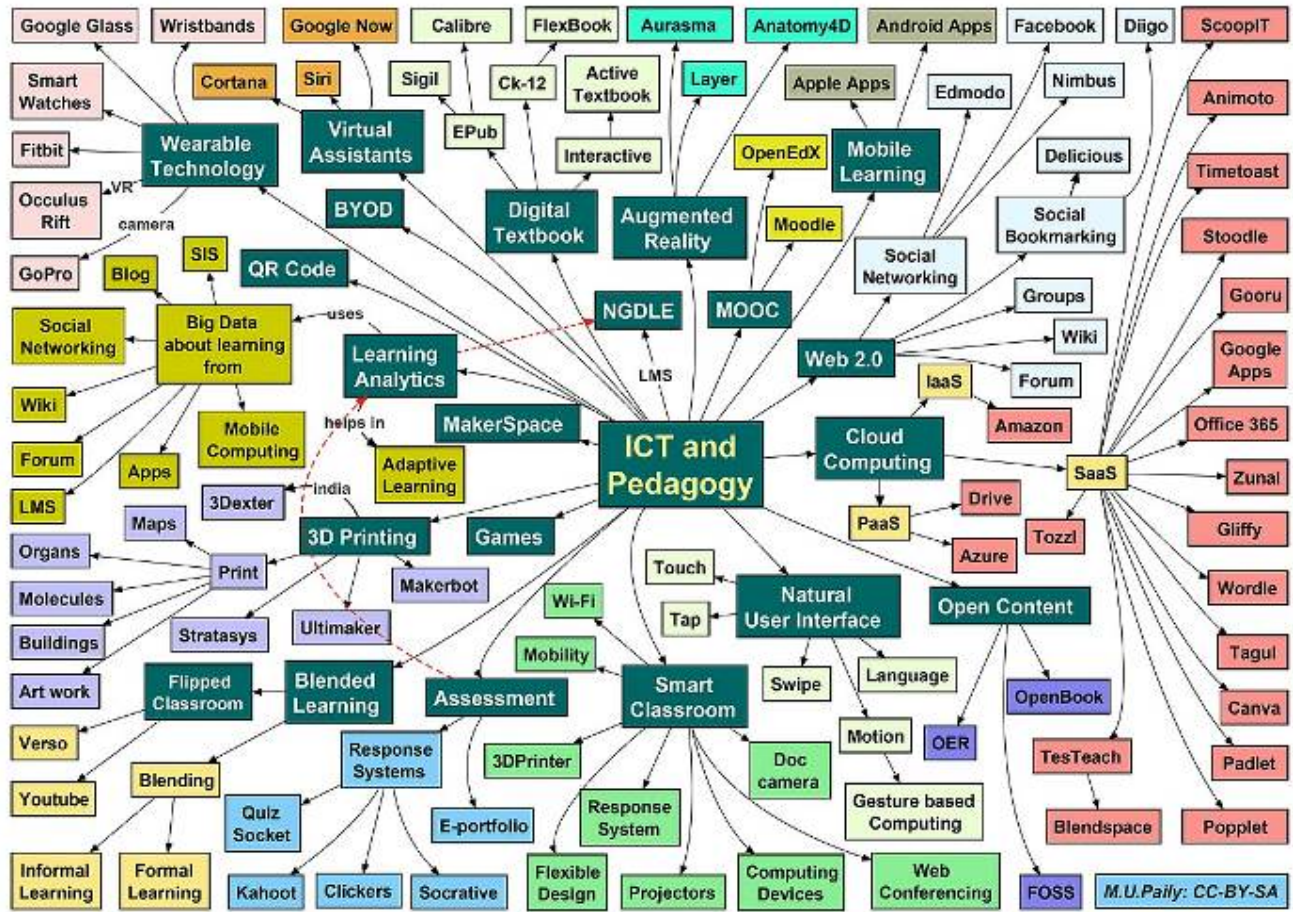m=2#vhid=2talQXgDyn_M6M&vssid=mosaic

Figure 4 Information and communications technologies.
Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
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Figure 5 Cumulus clouds panorama.jpg
Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
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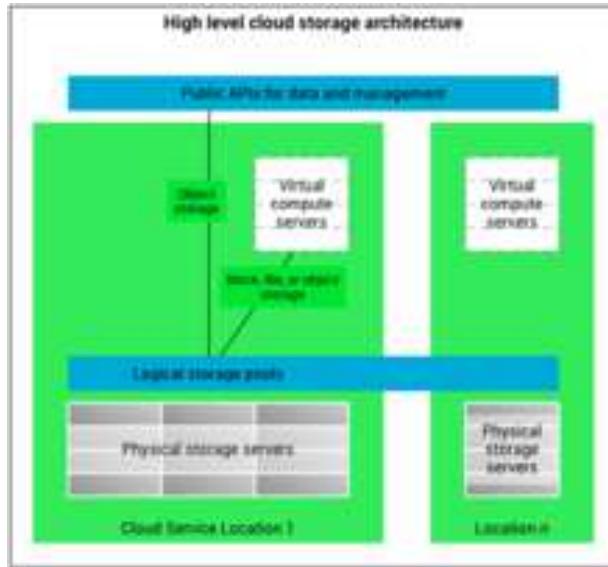m=2

Figure 6 Cloud storage.

Source:https://www.google.com/search?sca_esv=159f37a1251190f9&sxsrf=ADLYWIJPOsWAi6wMJpf8q
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