UOW MALAYSIA KDU PENANG UNIVERSITY COLLEGE

PART OF THE UNIVERSITY OF WOLLONGONG AUSTRALIA GLOBAL NETWORK

ASSIGNMENT COVER PAGE

Programme	**Course Code and Title**
Diploma in Computer Studies	DCL1274: Cloud Computing
Student's name / student's id	**Lecturer's name**
• 0204516 KOONG YONG XIN • 0203970 KHONG ZEN YI • 0204677 LIM ZHE YUAN • 0205096 THOR WEN ZHENG • 0205430 TAN PENG HENG	Ms. Ng Fong Chiu

Date issued	**Submission Deadline**	**Indicative Weighting**
Week 2 (24/09/2021)	Week 6 - 22-October-2021	15%
Assignment [1] title	**Assignment 1**: Report writing (Group work with individual writing component)	

This assessment assesses the following course learning outcomes

# as in Course Guide	**UOWM KDU Penang University College Learning Outcome**
CLO1	Explain what cloud computing is.

Student's declaration

I certify that the work submitted for this assignment is my own and research sources are fully acknowledged.

Student's signature: Submission Date : 20/10/2021

Zhe Yuan

Yong Xin

Wen Zheng

DCL1274_Assign1_Sept2021_(Koong Yong Xin and Team)

ORIGINALITY REPORT

9%	5%	0%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to –arrisburg University of Science and Technology Student Paper	1%
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MAIN REPORT

1. INTRODUCTION TO CLOUD COMPUTING

The cloud computing concept was just introduced in the late 1990s to mid-2000s (Regalado, 2011). Not long later in the 2020s, cloud computing services are used everywhere, be it working in a company as an employee, studying at school as a student, cloud computing is used in one way or another. Cloud computing brings a lot of benefits for humans, it effectively decreases costs of a company, brings a lot of efficiency and convenience to the users, and more. However, not many people know what cloud computing exactly is.

Vennam (2020) defines cloud computing as on-demand access to computing services and resources hosted at an undisclosed data center by a third-party cloud provider, via the internet. Cloud computing utilizes virtualization, the process of dividing infrastructure such as physical servers into multiple virtual servers using special software, so that hardware can be used with maximum effectiveness (Vennam, 2020). Cloud computing can be classified into a few types, which are SaaS (Software as a Service), PaaS (Platform as a Service), and IaaS (Infrastructure as a Service) (Vennam, 2020).

Firstly, Software as a Service (SaaS) is a type of cloud computing model. Some examples of SaaS are Google Workspace, Dropbox, Salesforce, etc. Also known as cloud application services, SaaS is a cloud service that uses the Internet to deliver software applications to users. This means that SaaS software are mostly run directly on web browsers while hosted by third-party vendors, which eliminates the need for clients to manually install the software on their own computers (Watts and Raza, 2019). SaaS helps to speed up short-term projects of clients because it can support many clients to work together on the same project via the Internet. SaaS software also helps save time and money as they do not need to be manually updated, newer versions are automatically hosted by the service provider (Watts and Raza, 2019). However, some limitations like data vulnerability when dealing with large volumes of data, lack of control over software features, and others need to be given consideration (Watts and Raza, 2019).

Next, Platform as a Service (PaaS) is another type of a cloud computing model that provides a development platform for developers to build their own software projects via the Internet. Examples of PaaS include Windows Azure, Heroku, and Force.com (Watts and Raza, 2019). PaaS provides convenience for the developers while working on their projects because servers, storage, and networking infrastructure are all provided and maintained by cloud providers. This service decreases the cost of application development and reduce the amount of time needed in developing the software. Nonetheless, PaaS also has some limitations including runtime issues because the server may not support specific applications and service, data security risks, and not all programming languages and frameworks are supported (Watts and Raza, 2019).

Aside from these cloud computing models, there is also the IaaS model. Infrastructure as a Service (IaaS) is a cloud computing model that provides infrastructure and automated computing power to clients via the Internet (Ranger, 2018; Watts and Raza, 2019). Examples of IaaS include DigitalOcean, Linode, Amazon Web Services, and more (Watts and Raza, 2019). In summary, IaaS helps clients to avoid the need for purchasing and managing their own hardware, thus reducing costs and burden so clients can focus their time and money on more important business objectives.

2. FUNCTIONS OF CLOUD COMPUTING

Since the advent of cloud computing, it has had unimaginably significant impact on people's lives, drastically changing how people do things, ranging from daily routines to work, businesses, transport and more. According to an article by Sumina (2021), at least 94% of global enterprises in 2021 use cloud services, while statistics published by Statista Research Department (2018) show that there are at least 3.6 billion users of cloud services in 2018. Although the cloud is so widely used, Figone (2021) suggests that many people do not know much about what cloud is capable of or what it is used for, even if they use it daily.

One of the most popular functions of cloud computing is **cloud storage**. According to IBM Cloud Education (2019) and IBM Cloud Team (2020), cloud storage is a type of cloud service that allows users to store, access, retrieve, or manage their files online on a cloud-based web application. Users' data are stored and managed by a third-party cloud provider using their servers and storage infrastructure at an off-site, undisclosed location. Using cloud storage, users will benefit from scalability as they can easily scale their cloud storage capacity according to their needs. They will also be able to save costs as they do not need to purchase, manage, and maintain storage infrastructure themselves. Muchmore and Duffy (2021) recommend some examples of cloud storage services like Google Drive, One Drive, IDrive, etc.

Another popular function of cloud computing is **cloud backup**. Roy (2019) states that cloud backup is a kind of cloud service that continuously and automatically makes backups of users' files on the cloud and provides an easy way to restore those files if those files are deleted or corrupted in the users' local storage. Its advantages are similar to cloud storage, but they are quite different services. The key difference is that cloud backup automatically makes copies of users' files in the cloud; as for cloud storage, users manually upload self-selected files to the cloud. According to Brame and Sevilla (2021), examples of cloud backup services are A Arcserve UDP Cloud Direct, Acronis Backup, and Carbonite Safe.

Cloud computing is also capable of providing **cloud collaboration** services. RingCentral (2021) defines cloud collaboration as a team collaboration method where users can access, view, edit and work together on documents on the cloud in real-time. Furthermore, most cloud collaboration platforms offer a diverse range of communication tools like text messaging, voice chat, and video conferencing to essentially serve as a virtual workplace for organizations. RingCentral (2021) also states that cloud collaboration helps improve workplace communication, increase work productivity, and reduce risks of data loss or data breach by keeping them secure and backed up on the cloud. Duffy (2021) recommends cloud collaboration software such as Zoho Projects, Slack, and Trello.

Lastly, cloud computing also plays an important role in **big data analytics**. IBM (2021) describes big data analytics as the collection and analysis of very large, diverse volumes of data sets using advanced analytic techniques. Joshi (2021) mentions that before cloud computing, organizations that performed big data analytics had to do it using in-house, self-maintained infrastructure and software, which can be very expensive and troublesome. With cloud computing, organizations can now utilize infrastructure and big data analytics tools offered by cloud providers instead. This way, organizations can benefit from greatly reduced costs, instant access to infrastructure, and high scalability. According to IBM Cloud Team (2020), organizations also utilize the cloud to extract and analyze user information like behavioral patterns and consumers' buying patterns from other cloud platforms like social networking platforms.

3. PRIVATE CLOUD vs PUBLIC CLOUD

A **private cloud**, also known as an internal cloud or corporate cloud, is a cloud computing environment in which all hardware and software resources are dedicated solely to a single organization and are only accessible by that organization. By that, it also implies that the organization has direct control over the infrastructure and that only authorized users have network access (IBM Cloud Education, 2020). Many businesses prefer private cloud to public cloud because it is easier or is the only way to meet regulatory compliance requirements. However, private cloud computing is a sort of cloud computing that offers many of the same benefits as public clouds, such as scalability and self-service (Lutkevich, 2021). On the other hand, a **public cloud** is an IT platform in which a third-party supplier manages on-demand computing services and infrastructure shared across different enterprises via the public Internet (Careerera, 2021). Anyone willing to pay for access to those resources can use them. Public cloud service providers may charge consumers a monthly or per-use fee for cloud-based services such as infrastructure as a service (IaaS). But in some cases, public cloud resources are available for free such as Gmail. In Gmail, there will be no charges for the user to use it.

Having a private cloud has several advantages. The primary benefit of a private cloud is that users do not have to share resources with other users. Hence, a private cloud computing architecture is best for businesses that have variable or unpredictable computing needs and need complete control over their environment (Lutkevich, 2021) The second benefit of a private cloud is that users have full control over their hardware and software configuration. The organization's private cloud is constructed throughout the requirements specified by the stakeholder to execute the proprietary application. Private clouds also give users more control over security and access. This is because the server that is uploaded to the private cloud storage will run all the tasks from the software behind the user's firewall.

The public cloud could also benefit the user by reducing the expenses by having a private server onsite. By utilizing a public cloud-based infrastructure solution, businesses can save both capital and ongoing costs. The cloud provider is responsible for maintaining servers, upgrading software programs, and assuring the cloud environment's security. For access, companies pay a monthly charge. Additionally, the scalability and flexibility of public cloud storage allow users to store large amounts of data and access it quickly. Many businesses use the cloud for disaster recovery, backing up data and applications in the event of a disaster or outage (Neenan, S. et al., 2020) by distributing computer resources in public cloud systems across several locations. Even if a power outage causes access to be lost in one area, computer resources can be dispersed across the remainder of the network to keep the services online.

Private cloud and public cloud also have their drawbacks. The most significant disadvantage of private clouds is the cost. Compared to public cloud alternatives, the private cloud is an expensive solution with a relatively high TCO, especially for short-term use cases (Raza, 2020) While, the biggest drawback of the public cloud is security. Because public clouds are inherently insecure, they are not ideal for sensitive mission-critical IT workloads.

In conclusion, the private cloud is appropriate for businesses that need complete control and security over their IT workloads and infrastructure. The essential factor is that companies can afford to invest in high-performance and high-availability technology. On the other hand, the public cloud is best for software development and testing environments (Raza, 2020)

4. CHALLENGES OF CLOUD COMPUTING

Despite cloud computing being one of the major breakthroughs of modern technology, it does not come without its risks.

Security issues has always been one of the major challenges that cloud computing end-users face. According to a RightScale (2018) survey, security became the top cloud computing challenge among many other challenges. Nowadays, many people use the Internet and all the data they use is encrypted to keep information from being exposed, but there are still hackers who can and are able to crack through that encryption without getting caught. For cloud computing, the user will not be able to see where the data has been stored. it could lead to security risks during the implementation or management of the cloud, such as data breaches and losses, broken authentication, and compromised user credentials.

The lack of resources or expertise is also one of cloud computing's end-user challenges. The cloud continues to advance rapidly as newer technologies are being unveiled. Due to this phenomenon, companies are increasingly placing more workload to the cloud and are having a hard time keeping up with the latest technologies. So, the need for cloud expertise became obviously essential for companies that work with cloud applications (Durcevic, 2019). With the rising demand of cloud expertise for companies, it became another problem of having expertise shortages. Therefore, companies usually need to invest more time and money to train their long-time employees to gain new knowledge about the cloud, ensuring that the knowledge can be passed down for the long term, instead of saving up money for hiring external expertise.

Another end-user challenge for cloud computing would be **cost management**. According to information provided by Solanki (2021), it is revealed that handling cloud spending has passed security as the biggest cloud computing challenge for a few companies. A common problem that companies face is cloud sprawl, which refers to the unexpected, uncontrollable growth of cloud instances, services and providers (Cruz, 2021). This problem would lead to inaccurate cloud cost forecasting and the lack of visibility into cloud spend (Cruz, 2021), as fluctuations of cloud usages could not be predicted. Cloud billing also adds complexity to cost management, as most cloud service providers "can and will change their billing practices over time" (Cruz, 2021).

Cloud migration is also another challenge for cloud computing end-users. Malvi (2021) describes cloud migration as the process of moving applications, data or even the whole enterprise IT infrastructure to the remote server facilities and a virtual environment. However, this can only be made possible if the architecture of applications is compliant and compatible with the cloud. Additional time and money need to be spent on hiring IT experts to make them fit in the cloud with the adequate amount of processing speed (Malvi, 2021). According to the report referred by Solanki (2021), 62% of organizations said that their cloud migration projects were tougher than they anticipated, 64% said their migration projects took more time than predicted and 55% said it went beyond their budgets.

Lastly, **vendor lock-ins** can also be a challenge for cloud computing end-users. It refers to a situation where the cost of switching to a different vendor is so high that the customer is essentially tied to the original vendor (Cloudflare, 2021), in this case the vendors are the cloud service providers. The risks of vendor lock-ins are prominent, as being stuck with the original vendor meant that the customer is very reliant on the vendor. In any case where the vendor's quality of service declines or their product offerings drastically changes until they do not meet the customer's needs, the customer is still forced to be stuck with it and bear the consequences as they could not switch to another vendor due to being locked in (Cloudflare, 2021).

5. DOES CLOUD COMPUTING BRING POSITIVE EFFECTS TO THE SOCIETY?

TAN PENG HENG:

According to a Microsoft Azure article (2021), technology had become a part of our human life, it brings a lot of positive effects to society and Cloud Computing was also the same. Cloud computing delivers services, storage, databases, networking, software, and more. Cloud computing has now commonly been used by clients in different fields in society and we can separate them into parts, which are organizations usage, personal usage, and more. So, I think cloud computing will bring positive effects to society, and below are some reasons why I think cloud computing will bring positive effects to society.

First, cloud computing will increase more efficiency for the clients. Cloud computing was mostly using the cloud server that provides by other companies. The cloud server allows the clients to access the server by using network devices anytime and anywhere with only the Internet needed. For example, Google company allows clients to access the cloud server in any network device by using the Internet to transfer, receive data, and also support more than one user to work in the same workspace since the cloud server provides by the company have those features it will make the clients work efficiency (Microsoft Azure, 2021).

Next, cloud computing decreases the costs of the clients. Cloud computing was a new technology that not needed upfront hardware and software purchases that will help society to reduce a lot of costs especially the organizations. Out of that, the cloud server will only be running costs and when it was been accessed. For example, when a client accessed the cloud server then it will only start to run the server and it is different from the normal server because the normal service will be running all the time ready to let the clients access it (Microsoft Azure, 2021).

Besides that, cloud computing also increases the security of the data. Most company cloud servers provided a set of protection to protect the data of the clients from threats. Example insider threats, disaster recovery, and more (McAfee, 2021).

In conclusion, I think cloud computing will bring many positive effects to society since the benefits of cloud computing are better than expected. Imagine all of the users can access cloud computing just by connecting to the Internet and open the website or application to access their cloud storage or cloud server. It will be so efficient and helping the organizations save a lot of costs. Lastly, cloud computing brings many positive effects to society, and I hope that cloud computing technology will become better in the future.

KOONG YONG XIN:

Nowadays, the population of cloud computing's users has been gradually increasing day by day. The same as cloud computing, it is getting more significant day by day due to the growth of the user and the needs of society. For a variety of reasons, including cost savings, greater productivity, responsiveness, and security, cloud computing is a popular choice among individuals and corporations. According to an article from Cloudwards (Sumina, 2021), he has stated that it will be over 100 zettabytes of data will be stored into the cloud by 2025. A zettabyte is equal to a billion terabytes or a trillion gigabytes in size.

However, there is still some good impact that cloud computing has brought into society. In economic society, cloud computing helps users reduce their IT costs by having a more advanced way to operate their server and keep their files. By this, it aids the people that are just starting up their firm. It also saves up costs for individuals who want more space to keep their data, such as photos, videos, and files. They don't have to buy any physical hardware to extend their storage. Instead, they can upload to the cloud, such as iCloud.

Apart from the economy, cloud computing has also increased the workforce for society. The employees can access their work anytime and anywhere, as long as they are connected to the network. It is because cloud computing enables the creation of a virtual workplace in which several apps and services can be hosted on a single platform (Ohri, 2021). Hence, it allows the workplace to run more efficiently, and employees assigned the appropriate jobs and functions.

In fact, cloud computing brings a revolution in the entertainment industry. Social media like Facebook and Instagram also use the cloud in one or another way. Most social media applications store the photos or videos uploaded by the apps' users in the cloud. Before the presence of cloud computing, people used to listen to the radio or watch television. But after the presence of cloud computing, we are watching our favorite shows or movie from an application such as Netflix. The cloud delivers the content we watch from our devices. Thus, we can watch it anywhere and anytime when we have our network connected.

Besides, as human beings, we love shopping, but everyone must stay at home due to the pandemic. Here is where cloud computing came in; people shop through websites such as Shopee and Lazada. It will make it easier and have more fun in the shopping experience. On the other hand, education has also been affected by this pandemic. But with the help of cloud computing, the lecture can have online classes with students from different countries. The lecturer notes or material used in the online course can be stored in the cloud and shared with all students.

In conclusion, cloud computing has brought a significant and positive impact on society. Cloud computing is an extraordinary revolution in the area of technology. However, the research in cloud computing is still going on. Hopefully, it will bring more good impact to society sooner or later.

THOR WEN ZHENG:

Yes, cloud computing brings positive effects to the society. Based on an article by Sumina (2021), cloud technology processes up to 94% of all computing workloads in the world, while the most popular cloud platforms like Google Workspace have up to 2 billion users. If cloud computing did not bring positive effects to the society, it would undoubtedly not be that popular and widely used across the whole world.

One of the major positive effects of cloud computing is it greatly contributes to **cost-savings** (OpenCirrus, 2018). Most cloud computing services offer scalable resources and calculate charges based on usage, which means clients only pay for the resources that they use. This method of payment is known as pay-as-you-go (OpenCirrus, 2018). This is especially useful for businesses that want to acquire computing resources at minimal cost, without incurring extra costs for purchasing and maintaining their own infrastructure. This not only applies to businesses, but also to individuals using the cloud for personal use. For example, when a person runs out of storage space on their personal computer, instead of buying a storage device like an external hard drive, they can opt for cloud storage to store their data, which is often cheaper or even free.

Next, cloud computing also helps **improve work-life balance** in the society (InformationAge, 2020). Using the cloud, people have the choice of working from anywhere, even at home. This is made possible by cloud collaboration services, which provide convenience for employees to communicate and work together on same documents via the Internet, in real-time. With work-from-home becoming the new norm, people no longer have to spend extra time commuting to and from work, they can do all their work in the comfort of their homes and have more opportunities to relax or spend time with family, thus improving their mental health. Furthermore, an experiment by Stanford researchers, Bloom et al. (2014), shows that work-from-home can also increase work productivity by up to 13% (ApolloTechnical, 2021).

Cloud computing also contributes to **improved education** in the society (Wilber, 2020). Cloud computing technology enables vast amounts of knowledge and information to be shared on the Internet, accessible by anyone, anywhere, at all times (Ohri, 2021). Thanks to this, students across the world can freely access educational websites, Massive Open Online Courses (MOOC), or knowledge-sharing forums to gain valuable knowledge. With knowledge becoming increasingly accessible, societies around the world will become more educated and even poor countries will become more developed and advanced in the near future.

Cloud computing also plays a major role in forming a **low carbon society,** a society where people work together to reduce carbon dioxide emissions (Bracco, 2019; Salesforce, 2021). Aside from making knowledge on environmental awareness easily accessible, cloud computing also indirectly reduces society's carbon footprint in various other ways. For example, cloud computing gives people the work-from-home option, reducing the need for driving to work, thus reducing carbon dioxide emission from vehicles. Many organizations are also shifting their operations to the cloud, thus they can reduce their energy usage on their own infrastructure. In addition, cloud data centers often rely on renewable energy and energy usage optimization techniques like virtualization and hot/cold aisle containment to reduce carbon footprint (Goulston, 2021).

In summary, cloud computing is very beneficial to society as it can help people save money, improve work-life balance, improve education, make societies more environmentally friendly, etc. It will continue to significantly change the world for the better, improving living standards and making life easier for everyone. Therefore, it is essential to promote and bring more attention to cloud computing, so that it can continue to thrive in the future.

LIM ZHE YUAN:

Cloud computing is one of the pinnacles of modern technology. On that note, it is true that cloud computing brings positive effects to the society, as the usage of cloud computing have transformed lifestyles and reformed work practices to become more productive and efficient.

Firstly, it is worth mentioning that **the constant availability of data** is undisputedly one of the major positive effects of the cloud. Microsoft Azure (2021) explains that the dependence of users on cloud servers stems from the fact that cloud computing makes disaster recovery and business continuity easier by making data backups. It is done by mirroring data at multiple redundant sites on the cloud provider's network (Microsoft Azure, 2021) to ensure that resources stored on the cloud will always be online whenever it is needed. Therefore, data loss is not a concern and users are almost guaranteed that data on the cloud is able to remain accessible using any device with Internet.

Another positive effect of cloud computing is **data security** (Microsoft Azure, 2021)**.** According to Admin Globaldots (2018), cloud providers implement baseline protections for their platforms such as user authentication, role management, access control and data encryption. These features enable users to control visibility of sensitive data in the cloud and allow them to enforce their own security rules easily while being compliant with data protection laws and regulations. Not to mention, the cloud can virtually be anywhere and is impossible to constantly keep track of it. So, companies can rest assured that cybercrimes made towards the cloud will be significantly lesser.

In terms of businesses, the usage of cloud computing had substantially **saved business capital costs** (Peterson, 2021). Cloud computing eliminates the need for businesses to invest in physical hardware for server hosting. Operational costs such as costs for system upgrades, wages of maintenance experts and energy consumption costs (Queensland Government, 2017) can all be reduced to a minimum. According to Peterson (2021), one of the hardest parts of running a start-up is coming up with the capital to make your business model work and pay employees, and these server costs can be astronomical and a huge investment. Additionally, it also frees up space inside an organization for more acquisition of company assets.

Cloud computing also **promotes collaboration** among teams. The ability to delegate cloud roles assists in increasing the clarity of each member's tasks on the cloud and prevents them from performing conflicting operations (Admin Globaldots, 2018). One perk of cloud computing is real-time communication, and it can be seen in various solutions, such as in Microsoft Word Online. It allows users to collaborate and simultaneously work for the same document, which is updated in real-time with minimal latency. This completely obviates the point of making multiple copies of the same document in versions (Admin Globaldots, 2018) to keep track of progress. With cloud computing unaffected by physical constraints, team members are given more mobility as they can access work resources and collaborate anytime, anywhere.

Lastly, a positive effect of cloud computing concerning application developers would be it **facilitates application development**. The cloud offers IaaS and PaaS service models which gives developers a much more comprehensive environment in which they can develop, deploy and debug their applications. Aside from that, advanced technologies like AI and data analytics which help simplify development processes are also being provided by cloud service providers to let developers monitor their progress and improve their overall experience. Developers has no more excuse of being limited by hardware, as the scalability of the cloud ensures that any part of an application can be scaled quickly and easily (Dice Guest, 2019).

KHONG ZEN YI:

Cloud computing has indeed brought a lot of positive effects nowadays. It can be used for business, education, cybersecurity manufacturing nd etc. According to research by Internet Data Group, 69% of enterprises or business are using cloud computing and 18% say is plan to use cloud technology for their work. It shows that using the cloud can be having many benefits like more efficiency, cost saving, flexibility and more.

First is about the cost saving, by using cloud user will be saving more than the more cost for usual based server. Once user use cloud, user can be access in anytime anywhere, so it saves up the project start-up cost. Also, no worry with the feature cost, in cloud it will be pay as you go system, this is one of the advantages of cloud mean user won't have worry about spending money on it. This pay as go also provide data storage, you can get as many spaces if you need and not charged. It shows that it will be having low cost and higher returns.

Second is the security, security is important to any system, especially business, that is fully work on computer every data in been stored in the cloud. This is one of the major concerns for the user, when your remote access the data so can the hacker too and not just about the hacker in a lot of cases happen before by internally employee. Cloud can meet government compliance requirements, which mean it has a higher-level security that the normal standard. By using encryption, the data will be saver from the hacker and the only the authorized user can be touch with the data (OpenCirrus Admin, 2020).

Flexibility, a flexibility system can be helping to solve a lot of problem during the works. Cloud is one the best for business with multiple workloads. When user have to pay more time and effort to get more computer and storage problem, user will lose more to expand your business. Cloud can offer with hosting server, expand bandwidth with instance services then can continue to work without more concern of the IT structure (Salesforce, 2020).

Last but not least is the disaster recovery. This is one of the positive effects. Sometime no matter how the user controls the organization, there will be some mistake or issue occur that will be out the user control. Cloud service can help to provide quick data recovery to for emergency scene, case like power out or disaster like earthquake.

Finally, in conclusion, using the cloud can be profit or in a lot of positive effect to the society, it creates a new generation for people to use less and cost less to make more profit. It will continue to improve and bring a lot more different thing to the society in the future.

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[DCL1274 Cloud Computing]

MARKING RUBRIC
ASSIGNMENT [1]

Report Writing (15%)

REPORT COMPONENT (100%)							
LEARNING OUTCOME	**MARKING CRITERIA**	**SCALE**					
		Fail (0-49)	**3rd Class (50-59)**	**2nd Lower Class (60-69)**	**2nd Upper Class (70-79)**	**1st Class (80-100)**	**YOUR MARKS**
CLO1: Explain what cloud computing is.	**Question 1 (10%)**	The write-up is unclear. Topics were not addressed properly.	The write-up states the topic but lacks interest. One or more examples were not addressed.	Adequate write-up that explain the relevant topics. All examples are addressed, and most examples answered with 1 sentence about each.	Proficient write-up that is interesting and explain the topic. All examples are addressed and most questions answered with at least 2 sentences about each.	Exceptional write-up that grabs interest of reader and states topic. All examples are addressed and all questions answered with at least 2 sentences about each.	
	Question 2 (10%)	Fails to provide a level of information that answers the question. Statements are internally contradictory without explanation.	Statements are sometimes on target and sometimes off center. Segments of the writing hang together but other parts are unclear or contradictory with no good resolution.	Statements are on target and sometimes off center but with minimal explanation.	Most statements are at the best level of information that answers the question. Statements are usually mutually supporting and follow from one another.	Statements are at the best level of information that answer the question. Statements are mutually supporting and follow from one another.	
	Question 3 (20%)	Information provided has little or nothing to do with cloud computing.	Information clearly relates to cloud computing. Points are insufficiently developed	Information clearly relates to cloud computing. Points are made adequately.	Information clearly relates to cloud computing. Good points and analysis are made and related to the topic.	Information clearly relates to cloud computing. Outstanding points are clearly made with sophisticated analysis.	
	Question 4 (20%)	The explanation is irrelevant.	Average explanation with average facts and evidences	Average to good explanation with standard facts and evidences.	Good explanation with good facts and evidences.	Very good explanation with outstanding facts and evidences.	

	Question 5 Justifications (Individual) (30%)	Little or no justification is offered. Inadequate justification.	Some attempt of justification, but the work is weak. The justification is missing or ill-considered.	The justification is on balance acceptable. The justification is limited and do not show the necessary broader perspective. Not outstanding in any respect.	A sound justification that covers a good range of issues. The justification is appropriate and may show a broader perspective. No section has serious weaknesses, and there may be excellent or outstanding features. On balance the work is good but not wholly excellent.	Outstanding justification is stated clearly with sharp discussion and are relevant to the topic.	
	Citation and references (10%)	Missing or no citation and major flaws on the format. Reference section is missing.	Very minimal amount of cited works, with incorrect format. Improper reference section.	Adequate amount cited works, both text and visual, are done in the correct format. Inconsistencies evident. Reference section with minor flaws.	All, both text and visual, are done with minimal errors on the format or reference.	All cited works, both text and visual, are done in the correct format with no errors. Reference section properly formatted.	
						Total (100%)	