InfoSphere :

NAVIGATING THE WORLD OF INFORMATION

Preserving the Past, Valuing Present, Enriching the Future

InfoSphere:
Navigating the World of Information

Preface

It gives me great pleasure to present *InfoSphere: Navigating the World of Information*, a collective effort that brings together insightful discussions, empirical findings, and critical reflections from academics in information management, library management, records management, and information and communication technology (ICT).

In today's digital era, the vast and complex landscape of information continues to expand at an unprecedented pace. The convergence of technology and information systems has transformed how data is created, organized, stored, and utilized. This book aims to navigate that dynamic "infosphere" , a term that reflects the interconnected environment in which information flows seamlessly across platforms, disciplines, and contexts.

The chapters compiled here explore diverse perspectives and contemporary issues shaping the management of information resources and services. From emerging trends in digital librarianship and knowledge governance to innovations in ICT applications and recordkeeping practices, each contribution highlights the growing importance of integrating technology, policy, and human expertise in managing information effectively.

This publication also serves as a reflection of our faculty's commitment to advancing scholarship and practice in the information domain. It showcases the intellectual depth and interdisciplinary collaboration among academics who continue to shape the future of information work.

As the Chief Editor, I wish to express my sincere appreciation to all the contributing authors for their dedication and scholarly rigor, and to the editorial team for their meticulous effort in ensuring the quality and coherence of this volume. Special thanks are also extended to the Faculty of Information Science and Universiti Teknologi MARA Cawangan Johor for their continuous support and encouragement in realizing this publication.

I hope that *InfoSphere: Navigating the World of Information* will inspire readers among students, educators, researchers, and practitioners alike to engage critically with the evolving information landscape and to contribute meaningfully to its advancement.

Azura Abdul Jamil @ Kamarudzzaman
Chief Editor
InfoSphere: Navigating the World of Information
2025

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CLOUD COMPUTING IN INFORMATION MANAGEMENT

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1.0 Introduction

Cloud computing is a revolutionary idea that has altered how businesses handle, store, and analyze data in the ever-changing world of information technology. For university students majoring in Information Management, understanding cloud computing is now a necessary ability instead of an optional one. The purpose of this chapter is to present a complete image of cloud computing by talking about its key ideas, distinct models, and a critical look at its merits and cons, especially when it comes to managing information. Students will have a better understanding of the challenges and be able to take advantage of the benefits of cloud technologies by delving at these different areas.

2.0 Getting to Know Cloud Computing

Definition and Important Features

Instead of using local computers or actual data centres, cloud computing is a contemporary method of delivering computing services. These services include storage, servers, databases, networking, and software. As with electricity, which we use from a power grid instead of producing our own, it enables people and organisations to access powerful digital resources at any time and from any location. A vital component of today's digital revolution, this technology offers cost effectiveness, scalability, and flexibility.

Cloud computing is the on-demand delivery of IT resources such servers, storage, databases, networking, software, analytics, and intelligence over the Internet, with a pay-as-you-go price model (Gilbert, 2025). Companies have to acquire, maintain, and upgrade their own hardware and software in a traditional on-premises infrastructure. This strategy is considerably different from that. The main idea behind cloud computing is that it lets people use computational power and storage when they need it, without having to worry about the infrastructure that makes it all work. This is because it provides scalable and adaptable resources as a service (Gilbert, 2025).

Some of the most important things that make cloud computing what it is are:

- **Self-service on demand:** Users can automatically get computational resources like server time and network storage when they need them, without having to go to each service provider (Gilbert, 2025).

- **Wide network access:** You can get to capabilities via the network using standard techniques that make it easy for different types of thin or thick client platforms to use them (for example, mobile phones, tablets, laptops, and workstations) (Gilbert, 2025).

- **Resource pooling:** The supplier employs a multi-tenant approach to combine its computing resources so that many clients can use them at the same time. The supplier dynamically assigns and reassigns different physical and virtual resources based on consumer demand (Gilbert, 2025).

- **Rapid elasticity:** You can swiftly add and remove capabilities, sometimes automatically, so that they can grow and shrink as needed. Customers typically think that there are no limits on how much they may take and when they can take it (Gilbert, 2025).

- **A metering feature** that is right for the type of service (such storage, processing, bandwidth, and active user accounts) lets cloud systems automatically control and optimize resource utilization. Both the service provider and the user can see how resources are being used by monitoring, regulating, and reporting on them (Gilbert, 2025).

Service Models (IaaS, PaaS, SaaS)

Cloud computing works through several service models that show how users can get to and use computing resources. Each model gives the user and the service provider a different amount of control, freedom, and responsibility. Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) are the three main service models. They build on each other, from giving you the maximum control over hardware resources to giving you ready-to-use apps. There are three basic types of cloud computing services:

- **Infrastructure as a Service (IaaS):** This concept lets you use virtualized computing resources over the internet. IaaS gives users the most power over their IT resources, like apps, operating systems, and network settings. Google Compute Engine, Amazon Web Services (AWS) EC2, and Microsoft Azure Virtual Machines are all examples.

- **Platform as a Service (PaaS):** PaaS lets customers create, run, and administer apps without having to worry about the trouble of creating and keeping up the infrastructure that is generally needed to make and launch an app. Google App Engine, AWS Elastic Beanstalk, and Heroku are a few examples.

- **Software as a Service (SaaS):** SaaS lets you get software programs over the Internet when you need them, and you normally pay for them on a subscription basis. Users don't have to install or execute the program on their own devices; they can utilize it through a web browser or a client application. Salesforce, Google Workspace, and Microsoft 365 are a few examples.
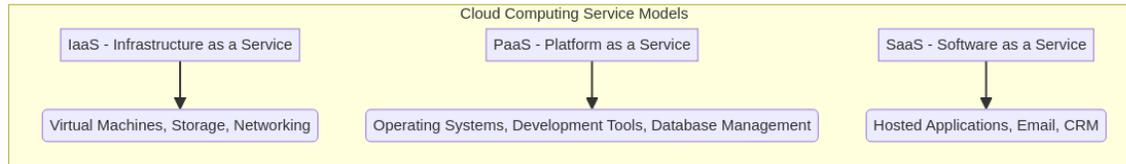
Figure 1: *The three main types of cloud computing services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), along with the parts that make them up.*

Deployment Models (Public, Private, Hybrid, Community)

Cloud deployment models explain how consumers can access cloud services:

- **Public Cloud:** Anyone can buy services over the public internet. In a public cloud, everyone uses the same hardware, storage, and network devices. The infrastructure is owned and controlled by the providers. Some examples are AWS, Google Cloud, and Microsoft Azure.

- **Private Cloud:** Only one business uses the cloud infrastructure. Someone inside the firm or someone else can take care of it, and it can be hosted on-site or off-site. You have more control and safety with private clouds.

- **Hybrid Cloud:** A combination of two or more different cloud infrastructures (private, communal, or public) that stay separate but are connected by proprietary or standardized technology that lets data and applications move between them. This architecture allows organizations use the best parts of both public and private clouds.

- **Community Cloud:** A group of organizations works together to support a specific community with similar goals, such as mission, security needs, policy, and compliance challenges.

Figure 2: *The four primary types of cloud computing deployment models: Public, Private, Hybrid, and Community Cloud. It also points out what makes each one unique.*

3.0 Benefits of Cloud Computing

Cost-Effective

One of the best things about cloud computing is that it may help you save money. When companies shift to the cloud, they can stop spending a lot of money on hardware and infrastructure (CapEx) and start spending money on things like rent and utilities (OpEx) that they can plan for (Ma, 2021, Gilbert, 2025). This means you don't have to spend a lot of money on servers, data centers, and the upkeep, cooling systems, and physical

security that go along with them (Gilbert, 2025). Cloud providers handle the infrastructure, so businesses don't require as many IT workers or the fees that come with them (Gilbert, 2025). For instance, small businesses can save between $15,000 and $30,000 a year on IT infrastructure by embracing cloud solutions (Gilbert, 2025).

Adaptability and Scalability

Cloud computing is incredibly adaptable and scalable, which means that businesses may easily modify the amount of computer power they need. Public cloud resources can immediately scale up when demand is strong, so e-commerce sites and other organizations can handle traffic spikes without slowing down (Gilbert, 2025). Because of this flexibility, firms only pay for the space they require. They can save money on hardware that isn't being used by increasing capacity when demand is high and lowering it when demand is low (Shahar, 2024; Gilbert, 2025). This capability is extremely helpful for firms that are growing because they can start with little and expand throughout the world without having to overhaul their systems (Gilbert, 2025).

Better Teamwork and Easier Access

Cloud computing makes it easier for individuals to work together and get to data and apps by giving them a single place to do so. Employees can get to data and apps from anywhere if they have an internet connection. This lets people work from home and makes them more productive (Gilbert, 2025). People can collaborate on documents, presentations, and spreadsheets collaboratively in real time from anywhere with Google Workspace and Microsoft 365 (Shahar, 2024; Gilbert, 2025). This is highly significant for schools since it lets teachers and students use learning materials and software from anywhere and at any time. It also helps pupils learn from home (Ma, 2021; Shahar, 2024).

Business Continuity and Disaster Recovery

Cloud computing gives businesses a lot of good choices for staying in business and recovering from disasters. Cloud storage includes built-in backup and recovery options, and data is often stored in more than one place to keep it safe (Gilbert, 2025). This decreases recovery periods from days to hours by a lot, which is a major difference from traditional disaster recovery solutions that can be hard to set up and cost a lot (Gilbert, 2025). Cloud systems are intrinsically trustworthy, and their comprehensive disaster recovery management features help keep enterprises going even when things go wrong (Gilbert, 2025).

Automatic Updates and Maintenance

Cloud service providers handle all system upgrades, security patches, and regular maintenance on their own, so the infrastructure is constantly up-to-date and safe without getting in the way of corporate operations (Gilbert, 2025). This helps in-house IT staff work on more important initiatives and come up with fresh ideas instead of executing normal maintenance (Gilbert, 2025). This means that schools' IT departments will have less work to complete, which will help them use their resources better (Tozzi, 2024).

Global Reach and Environmental Sustainability
There are data centers for cloud services all over the world, so apps load rapidly no matter where the user is (Gilbert, 2025). Businesses can swiftly service clients all across the world thanks to this global infrastructure, which means they don't have to develop their own (Gilbert, 2025). Cloud data centers are also generally more energy-efficient than traditional installations that are on-site, saving up to 80% on energy costs (Gilbert, 2025). Cloud computing is good for the environment because it lets businesses pool resources and put money into renewable energy, which lowers their carbon footprint (Gilbert, 2025).

4.0 Problems with Cloud Computing

Concerns About Privacy and Security
Even if cloud security has gotten better, people are still quite worried about their data's safety and privacy. Cloud providers invest a lot of money on security systems, but users are also accountable for some of the security effort because of the shared responsibility model. Misconfigurations are a common cause of security problems in cloud settings (Gilbert, 2025). You lose some control and transparency when you submit data to a third party. This can make it tougher to meet data protection requirements like HIPAA, PCI-DSS, or GDPR (Tozzi, 2024; Gilbert, 2025). Schools and institutions that handle private student data need to make sure their security measures are solid and that their staff knows how to utilize digital technologies properly (Arkansas State University, 2023; Shahar,2024).

Problems with Internet Dependency and Connectivity
One fundamental concern with cloud computing is that it needs an internet connection. If the internet is down, cloud services won't work, which could mean that work stops and productivity drops (Ma, 2021; Gilbert, 2025). When you're doing a lot of data-heavy chores or using real-time apps, slow internet speeds might also make things less reliable (Gilbert, 2025). This dependence can be a concern, especially in regions where the internet isn't very dependable or for remote learning scenarios where students might not have enough bandwidth (Ma, 2021; Tozzi, 2024).

Little Control and Vendor Lock-In
A lot of people worry about vendor lock-in since cloud service providers generally use their own formats and APIs, which makes it hard and expensive to migrate between them (Gilbert, 2025). Transferring enterprise apps from one cloud provider to another can take a lot of time and money (Gilbert, 2025). This makes it tougher for a corporation to manage its infrastructure and could impair its capacity to negotiate, since changes to the platform could change how the business functions (Ma, 2021; Gilbert, 2025). Organizations may also have less control over upgrades, training, and other features when solutions are handled "as a service" (Ma, 2021).

Ongoing Costs and Cost Management
At initially, cloud computing can save you money, but if you don't keep track of your subscriptions, the expenses can build up and become greater than the costs of traditional infrastructure over time (Gilbert, 2025). 82% of firms believe that keeping track

of their cloud costs is one of their top worries (Gilbert, 2025). Usage spikes, data transfer fees (egress fees), API requests, and premium support can all add up to costs that go over budget (Gilbert, 2025). It's crucial to effectively optimize and manage the lifespan of data and resources so that you don't waste money and resources.

Concerns About Following the Rules and Laws
For regulated businesses like higher education (Tozzi, 2024; Gilbert, 2025), following all the rules on data privacy and security (including HIPAA, PCI-DSS, GDPR, and the HECA compliance matrix) is a huge difficulty. International restrictions about data sovereignty can make it much harder to use public clouds. Some rules, for instance, dictate that data must stay inside particular geographic bounds (Gilbert, 2025). It is hard to check that cloud providers are following the rules, and the organization is ultimately responsible for compliance, even if they employ outsourced infrastructure. This means that careful preparation and due diligence are essential (Gilbert, 2025).

Issues with Moving and Putting Together
It might be hard and take a lot of time to move current systems and data to the cloud. Organizations, especially those with limited IT resources, may find it hard to plan and carry out a successful cloud migration (Tozzi, 2024). When trying to link outdated apps to cloud, there can be challenges with integration, and not all specialized systems function with ordinary cloud platforms (Gilbert, 2025). For major firms, moving data can be expensive and take a lot of planning to make sure the change happens well and doesn't cause too many problems for business (Gilbert, 2025).

Strategic Implications of Cloud Computing in Information Management
Cloud computing has a big effect on how information is managed from a strategic point of view. It allows businesses stop worrying about their physical infrastructure and start thinking of new ways to use data and apps. If university students who are studying Information Management want to do well in their jobs, they need to know about these effects. Big data analytics and artificial intelligence (AI) apps can store and process more data on the cloud, which makes it easier to make decisions based on data (Shahar, 2024)]. It helps develop cloud-native apps and microservices architectures, which makes it easier to be agile and get new services to market faster (Gilbert, 2025). Cloud computing also changes how we manage information, which means that in a distributed environment, we need new ways to keep data safe, obey the laws, and manage it throughout its life cycle. Using global cloud infrastructure might help you reach more people and give them better service, but it can also make things harder because of restrictions about data across borders and political problems. To handle strategic information in the cloud, you need a thorough plan that takes into account the organization's policies, risk management, and the requirement to stay up to date on new cloud services and risks.

6.0 Conclusions

Cloud computing is a huge revolution in how we store, analyze, and send data. It is a fantastic choice for many fields, including higher education, because it has numerous

benefits, such as saving money, being more scalable, making it easier to work together, having robust disaster recovery, and being easier to maintain. But these benefits come with some huge problems, like worries about security and privacy, reliance on the internet, the danger of vendor lock-in, complicated cost management, and problems with obeying the rules. If you are a college student who wants to work in Information Management, you should know all the good and bad things about cloud computing. By carefully dealing with these problems and making the most of the capabilities of cloud technology, future information professionals may use the cloud to its fullest potential to promote creativity, efficiency, and resilience in their businesses.

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