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Digital Transformation

Unit 3 - Cloud Strategy for Digital Transformation

NCI | Lárionad Néal-Inniúlachta Cloud Competency Centre

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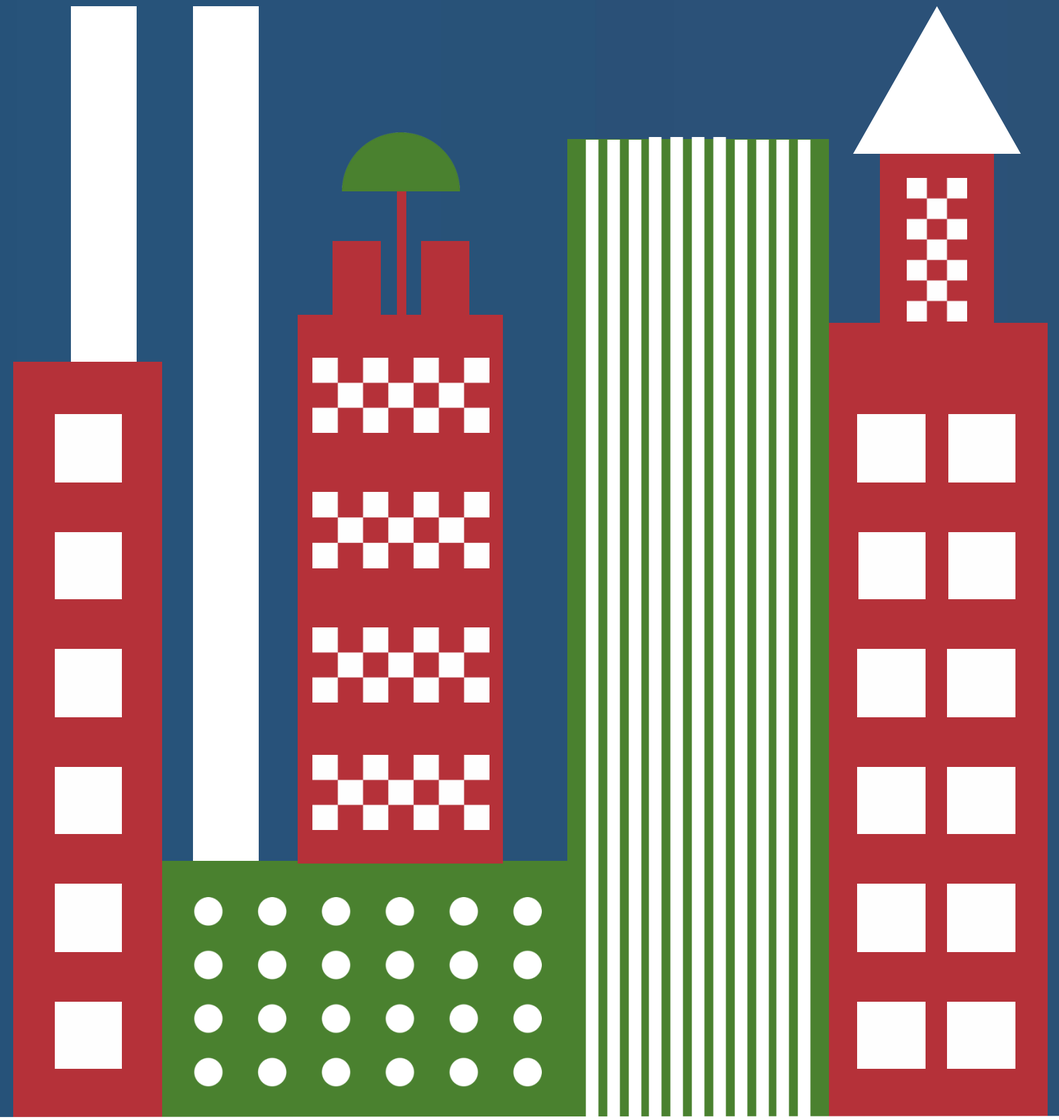

Unit 3 - Cloud Strategy for Digital Transformation

- Cloud Strategy
- Service Level Agreements and Key Performance indicators- uptime, response, cost efficiency
- Innovation
- Enterprise Architecture on the Cloud
- Cloud Computing Characteristics

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What is a Cloud Strategy?

A cloud strategy is a comprehensive plan that outlines how an organisation will leverage cloud computing technologies to achieve its business objectives. It serves as a roadmap for integrating and managing cloud resources to optimise benefits while mitigating risks. It should be developed with consideration for other strategic plans, such as the midterm corporate strategy, data strategy, and security strategy, ensuring full alignment with the business goals from the outset.

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The Cloud Strategy Team

To build a solid cloud strategy, ideally a Cloud Strategy team should be formed. This team should include people with expertise in the following roles:

- HR
- Finance
- Line of Business
- Operations
- IT Infrastructure
- Enterprise Architecture
- Application Groups
- Project Managers

This enables the Cloud Strategy Team to gain a comprehensive view of the entire enterprise, allowing them to identify opportunities and assess risks where cloud adoption could have an impact.

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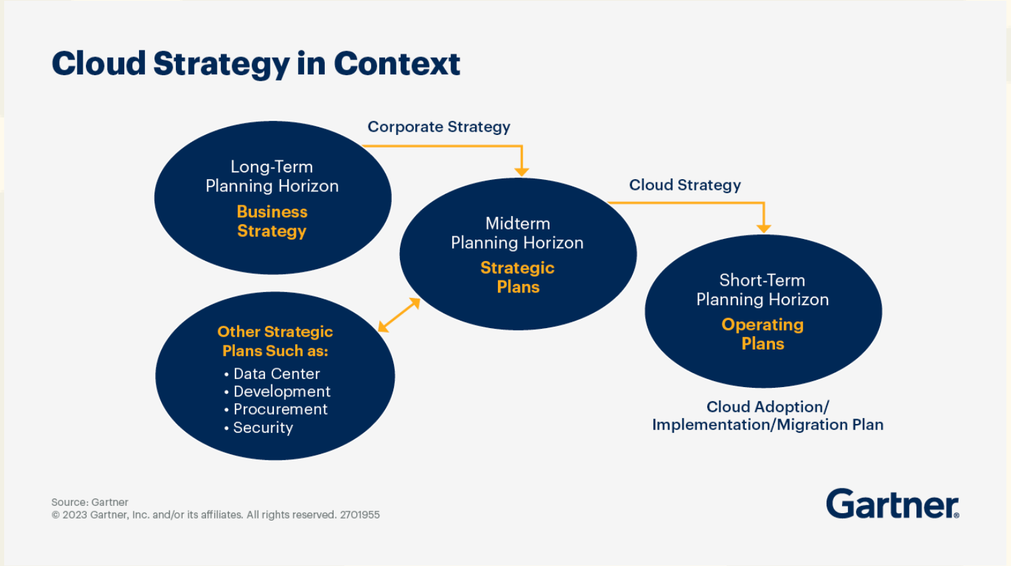
What is covered in a Cloud Strategy?

1. Align with Business Goals. Look at the core Business Goals and look at how Cloud Computing can help achieve them. E.g:

    - Business Goal: Accelerating Time-To-Market for New Products.
    - Possible Cloud Solution: Amazon EC2 allows for Rapid Provisioning, Flexible Scaling and Variety of Instances.

2. Define the organisations Cloud Principles for e.g. Cloud First, Hybrid Cloud, Multicloud, Security by Design etc.
3. Inventory and Rationalise the Digital Estate.
4. Choosing the right Cloud Model.
5. Identifying Relevant Cloud Services.
6. Establishing Security and Compliance Controls.
7. Planning and Implementing Migration Strategies.
8. Continuous Management and Enhancement



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Service Level Agreements

- A Service Level Agreement (SLA) is a contract between a service provider and a customer which specifies the level of service that the provider is expected to meet. It details the agreed upon service metrics, including parameters like uptime, delivery timelines, responsiveness, and the timeframe for issue resolution. However, it also outlines remedial actions or compensations, such as enhanced support services or financial rebates, should the provider fail to fulfil these commitments.

- While SLAs are commonly established between external vendors and clients, they can also be executed between different departments within the same organisation to ensure internal service quality also.

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Types of SLA's

Customer-based SLA's

Service-based SLA's

Multi Level SLA's

Internal SLA's

Vendor SLA's

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SLA Examples

- Azure Service Level Agreement Example: https://www.microsoft.com/licensing/docs/view/Service-Level-Agreements-SLA-for-Online-Services?lang=1
- AWS Service Level Agreement Example: https://aws.amazon.com/s3/sla/?did=sla_card&trk=sla_card
- Google Service Level Agreement Example: https://cloud.google.com/bigquery/sla

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Key Performance Indicators (KPI)'s

What is a KPI?

- KPI's are measurable values that demonstrate how effectively an organisation is achieving key business objectives. They are used by organisations across various industries to evaluate their success at reaching targets.
- KPI's can be used to measure goals, performance and to benchmark progress.

Types of KPI's include:

- Quantitative: These KPI's are measured in numbers and statistics such as sales revenue and profit margins.
- Qualitative: These are measured more by characteristics and attributes rather than numbers. An example of these would be Customer Satisfaction or Employee Morale.
- Leading: Leads predict future performance, e.g. customer inquiries, product trials.
- Lagging: These are reflective KPI's, they look at previous instances in order to gain insight. E.g. sales achieved, total costs incurred.

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KPI's in the Cloud

KPIs are essential for measuring metrics in the cloud. They are used to evaluate and measure the effectiveness and efficiency of cloud services against the organisation's objectives. These KPIs help businesses monitor cloud deployments, optimise resource usage, ensure cost efficiency, and maintain service levels. Examples of important KPIs specific to cloud computing include:

- Availability and Uptime
- Response Time
- Scalability
- Resource Utilisation
- Cost Efficiency
- Security Incidents
- Date Transfer Rates
- Compliance

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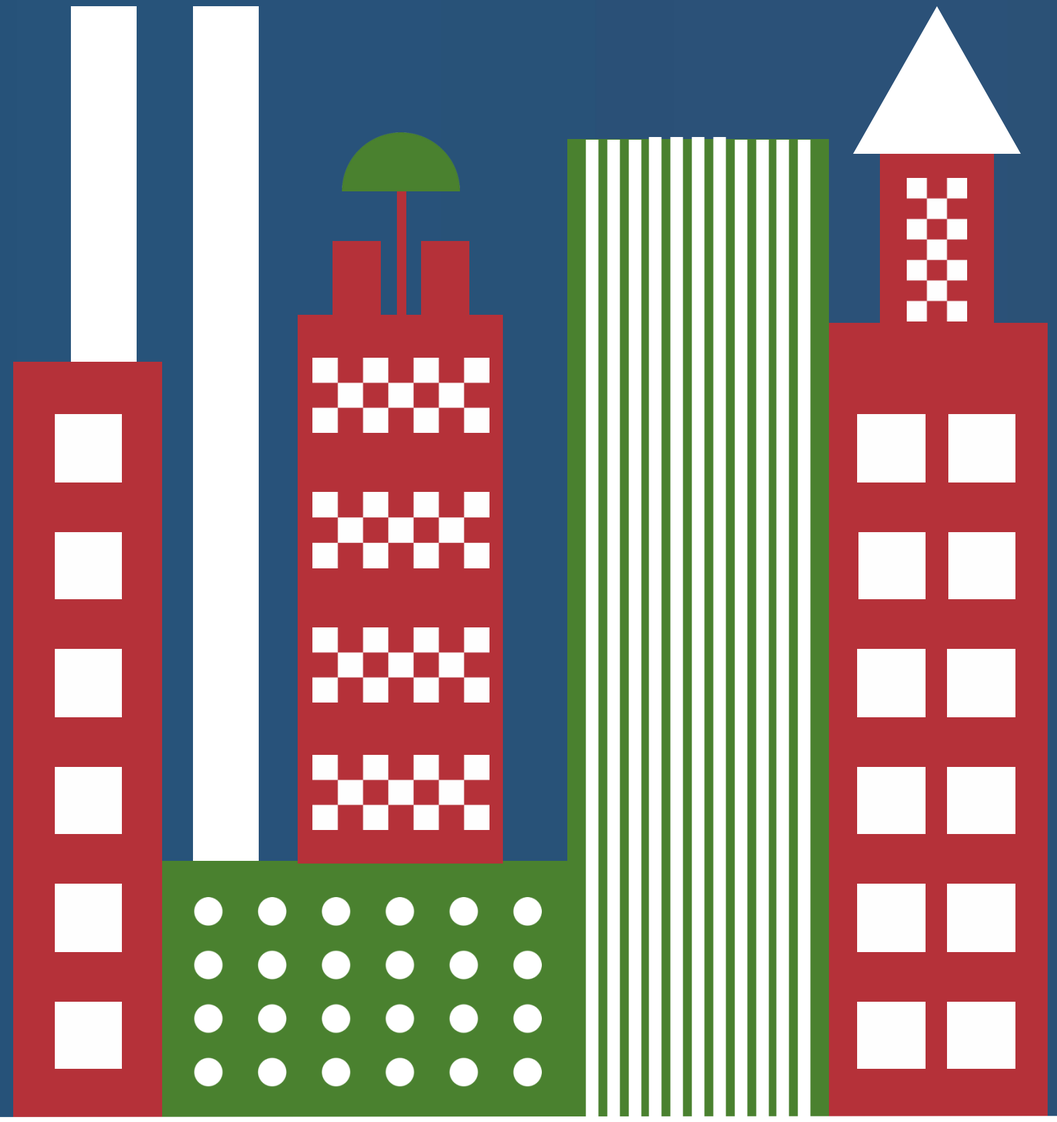

Cloud Computing Innovation

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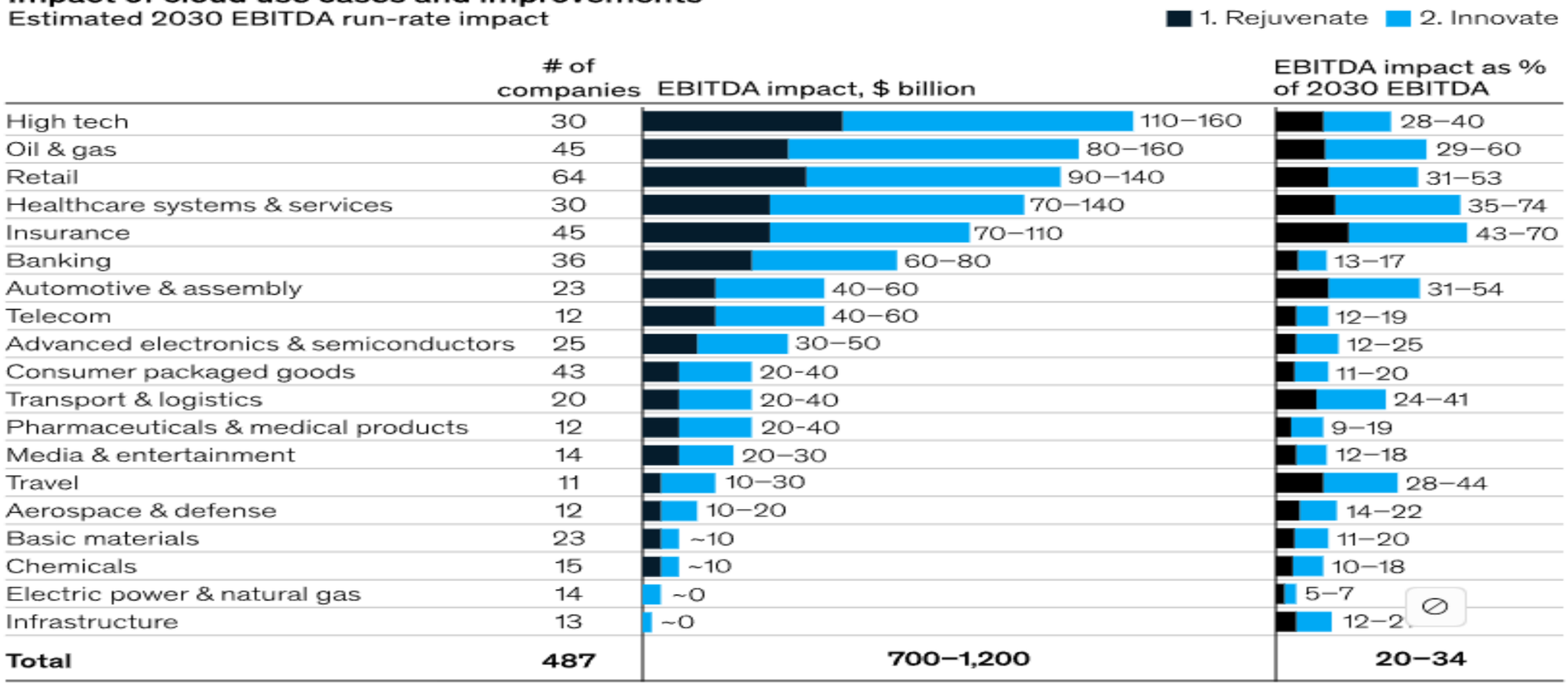
Capture of the economic value is expected to differ by industry.

Impact of cloud use cases and improvements
Estimated 2030 EBITDA run-rate impact



	# of companies	EBITDA impact, $ billion	EBITDA impact as % of 2030 EBITDA
High tech	30	110–160	28–40
Oil & gas	45	80–160	29–60
Retail	64	90–140	31–53
Healthcare systems & services	30	70–140	35–74
Insurance	45	70–110	43–70
Banking	36	60–80	13–17
Automotive & assembly	23	40–60	31–54
Telecom	12	40–60	12–19
Advanced electronics & semiconductors	25	30–50	12–25
Consumer packaged goods	43	20-40	11–20
Transport & logistics	20	20-40	24–41
Pharmaceuticals & medical products	12	20-40	9–19
Media & entertainment	14	20–30	12–18
Travel	11	10–30	28–44
Aerospace & defense	12	10–20	14–22
Basic materials	23	~10	11–20
Chemicals	15	~10	10–18
Electric power & natural gas	14	~0	5–7
Infrastructure	13	~0	12–2
Total	**487**	**700–1,200**	**20–34**

Source: Independent third-party research data (Omnicom Group and Known), industry and McKinsey expert interviews, McKinsey D2020 IT cost benchmarking, McKinsey Global Institute research, team analysis

McKinsey & Company

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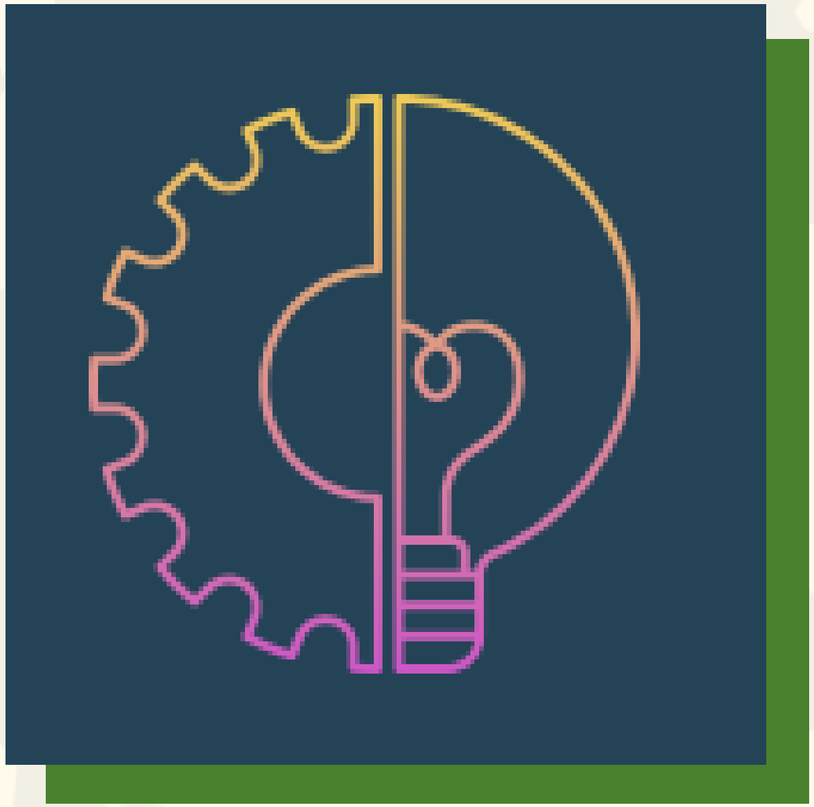
Cloud Computing Innovation Case Studies

In this section, we're going to look at some companies that have truly been innovative using the Cloud. Innovation is all about being disruptive and these companies have taken the norm, turned it on its head and came at it with a completely different perspective. This has allowed them to create incredible, trailblazing products.



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Revolut Case Study

Revolut, is a Global Banking app and a trailblazer in the financial technology sector. They have harnessed the power of Google Cloud to sculpt a robust platform that epitomises innovation in cloud computing.

Launched in 2015, Revolut quickly transitioned from a startup offering efficient transfers and foreign exchange to a global financial super app with over 20 million users across more than 35 countries. At the heart of Revolut's success is its strategic use of Google Compute Engine, which facilitates rapid, automated deployments and robust scalability while ensuring the stability and security essential for financial services. This cloud infrastructure enables Revolut to automate much of its deployment processes, significantly reducing both the time and cost associated with manual backups and updates. With features like incremental snapshotting and Google Cloud APIs, Revolut efficiently manages multi-terabyte databases and dynamically scales resources on-demand, virtually eliminating downtime and accelerating innovation. This ability to scale effortlessly and maintain high performance has been crucial as Revolut continues to expand its services globally, providing a seamless financial platform to millions of users worldwide.

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Moderna Case Study

Moderna, renowned for its revolutionary approach in the pharmaceutical industry, exemplifies innovation in cloud computing through its strategic use of a multicloud data stack. Since its inception in 2010, Moderna has focused on using mRNA technology to create new medicines, a process that demands immense data analysis capabilities. To support its operations, particularly during the critical development phase of its COVID-19 vaccine, Moderna adopted a multicloud approach to leverage the best available cloud services for various tasks.

The company integrates internal and external datasets to enhance clinical trial visibility and efficiency, accelerating scientific discovery. Leveraging Google Cloud, Moderna optimises data handling to increase trial diversity and reduce manual processes, significantly improving logistical operations to meet budget goals. Google's tools ensure Moderna's infrastructure remains flexible, scalable, and secure, facilitating compliance in a highly regulated industry. This approach not only supports Moderna’s rapid innovation but also maintains their leadership in pharmaceutical advancements, demonstrating the power of cloud computing in critical healthcare solutions.

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Canva Case Study

Canva was first launched in 2013 and it swiftly rose to prominence by leveraging cloud computing to revolutionise design accessibility and functionality. Utilising Amazon Web Services (AWS), Canva has been able to scale its operations globally, manage vast data sets, and deploy advanced features rapidly. AWS's robust infrastructure, including tools like Amazon RDS and EC2 G3 instances, enables Canva to handle complex, graphics-intensive tasks efficiently. This cloud-based approach allows for seamless scalability and reliability, facilitating Canva's expansion into new markets without the heavy lifting typically associated with large-scale IT infrastructure.

Cloud computing has been pivotal in Canva's ability to innovate continuously. For example, Canva was very fast to introduce AI-generated images to its platform, a feature that significantly expands creative possibilities for users. This addition exemplifies how cloud capabilities enable Canva to quickly integrate cutting-edge technologies and respond to user needs with agility. By leveraging the cloud, Canva remains at the forefront of the digital design space, continuously enhancing its offerings and user experience with minimal operational overhead.

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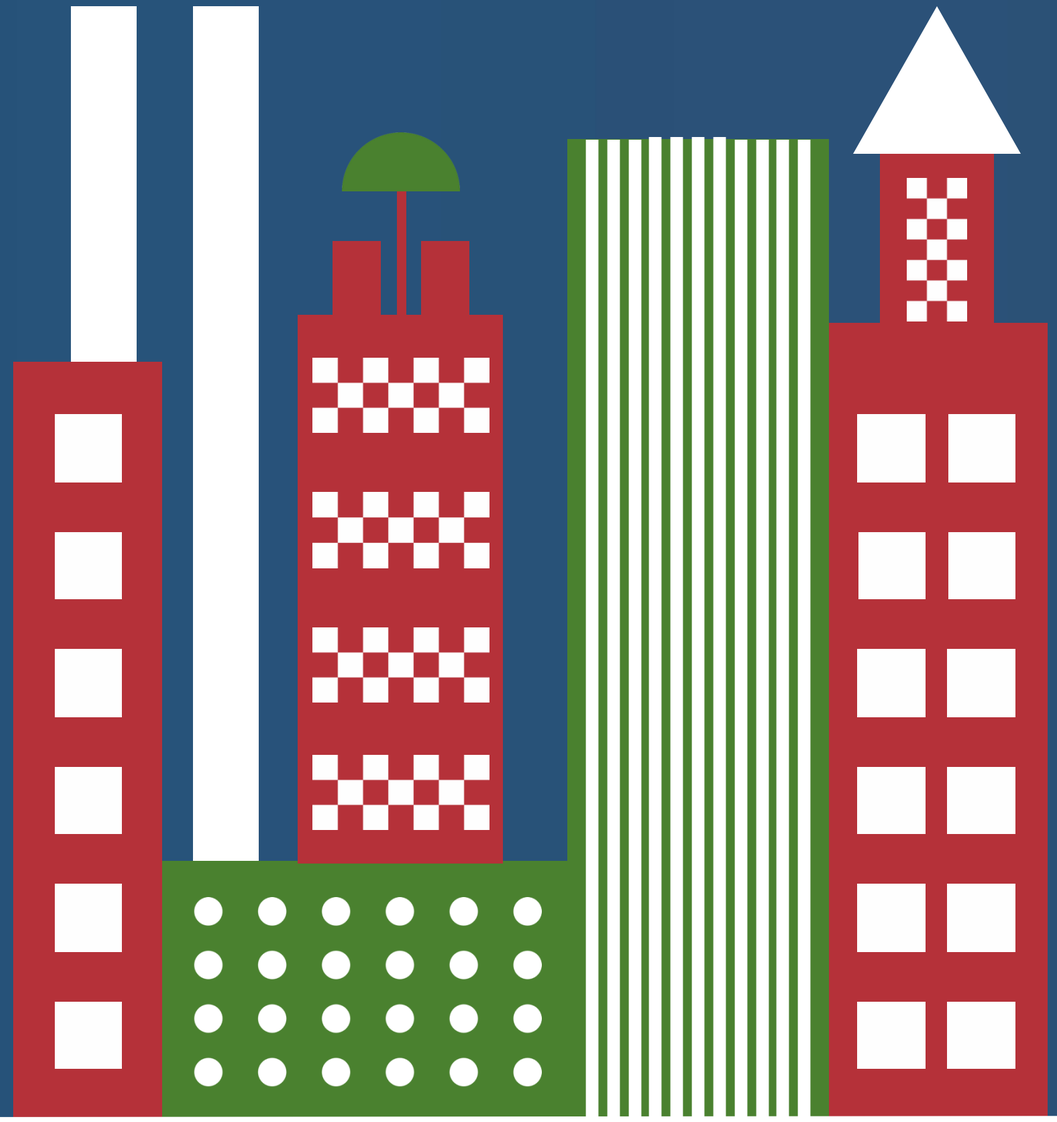

Enterprise Architecture In The Cloud

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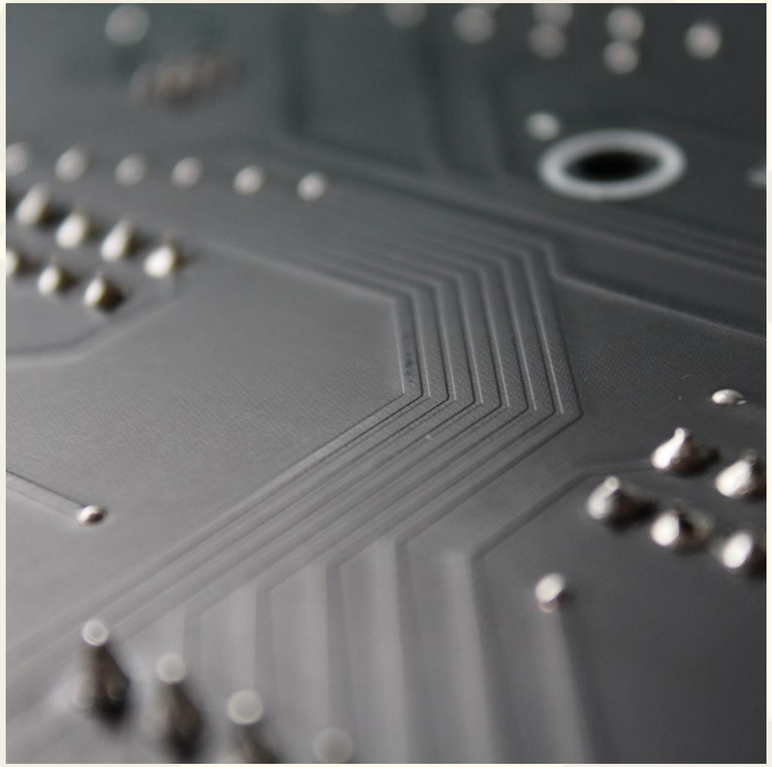
Enterprise Architecture

Enterprise Architecture is a strategic planning framework which maps the structure, operations and IT assets of an organisation. It is essentially a blueprint which helps an organisation to determine the best course of action to achieve their current and future business goals aligning the Information Systems and IT assets with the business processes.

Since its inception in the 1980's with the rise in use of technologies, other frameworks have developed under EA, some of the most popular include The Zachman Framework and The Open Group Architecture Framework among others.



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The Zachman Framework for Enterprise Architecture

The Zachman Framework was developed by John Zachman between 1984-1987 and has since been revised and extended multiple times, with the latest update occurring in 2011. It examines the intersections of different stakeholder perspectives and areas of architectural focus. The framework features columns that address the What, How, When, Who, Where, and Why, and rows that classify each perspective. This structure allows the architecture to be analysed comprehensively from multiple viewpoints, ensuring a thorough understanding of its various components.

Each row of the artifact looks at:

Row 1. Scope Identification
Row 2. Business Definition
Row 3. System Representation
Row 4. Technology Specification
Row 5. Tool Configuration
Row 6. Implementation

Each column looks at:

Col 1. Inventory Sets (What)
Col 2. Process Flows (How)
Col 3. Distribution Networks (Where)
Col 4. Responsibility Assignments (Who)
Col. 5 Timing Cycles (When)
Col 6. Motivation Intentions (Why)

The Stakeholders Perspectives it looks at include:

- Context Planners
- Concept Owners
- Logic Designers
- Physics Builders
- Component Implementers
- Users

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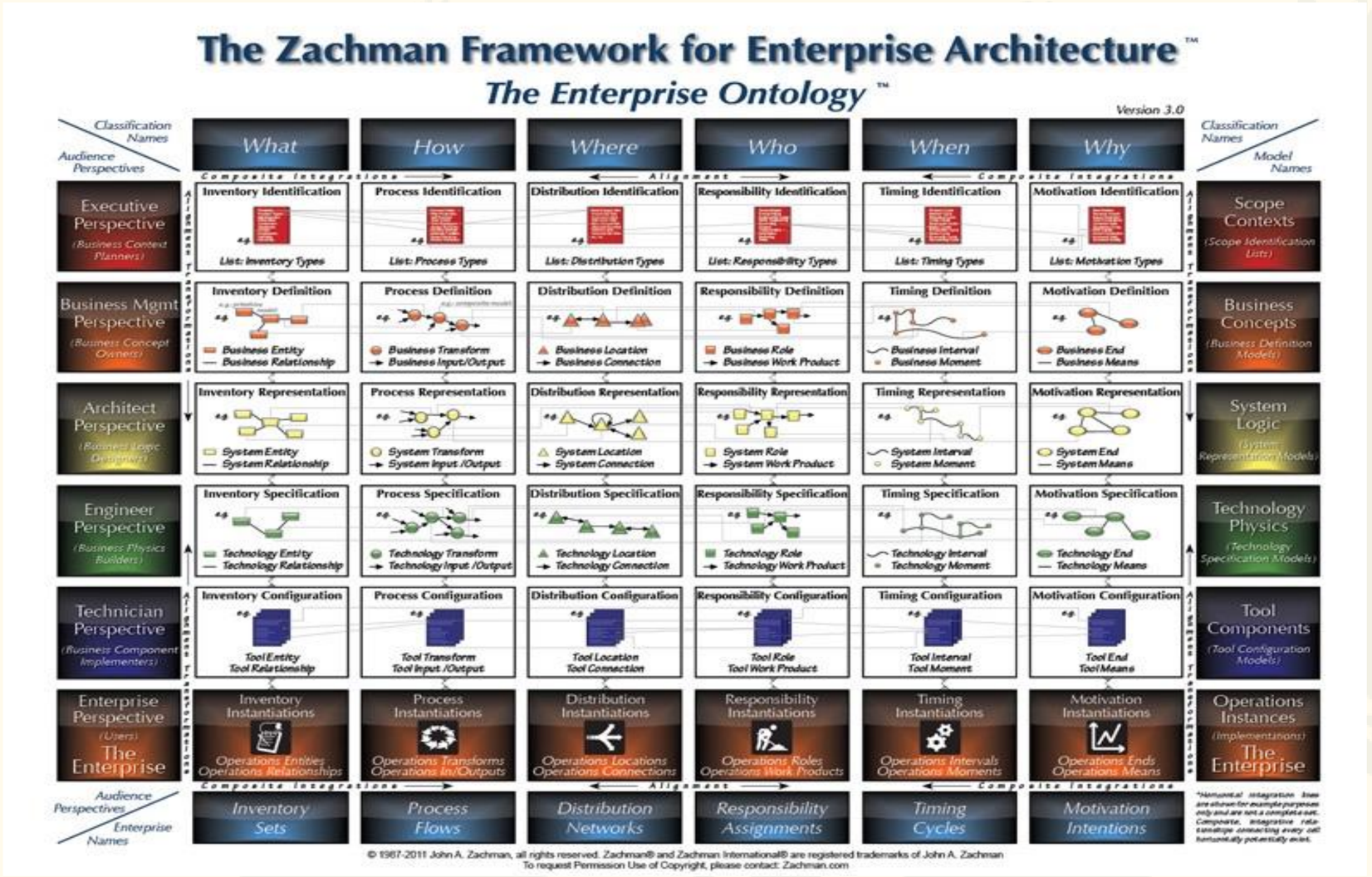

The Zachman Framework™ © 2000-2022 John P. Zachman, Zachman International, Inc.

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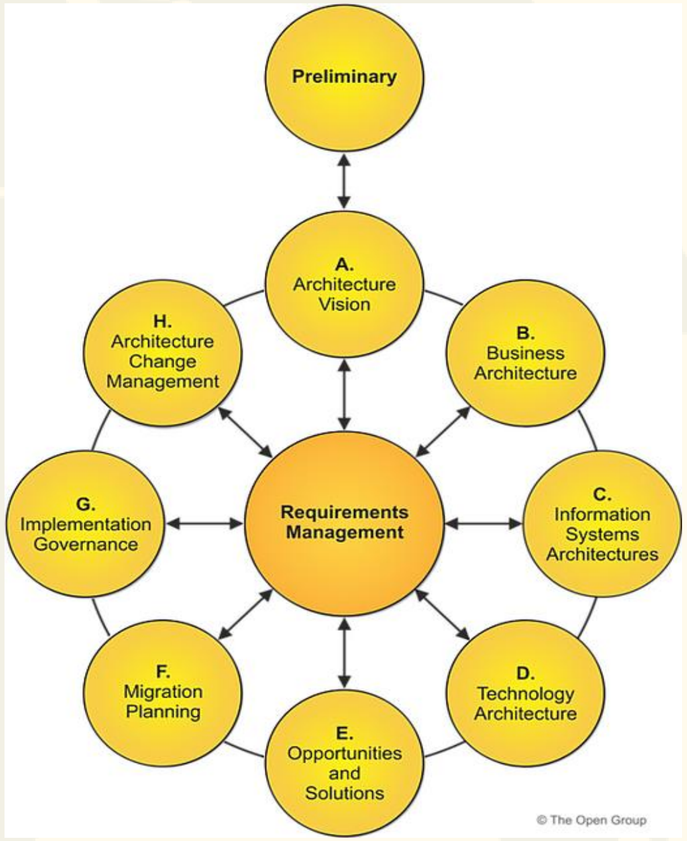
TOGAF®: The Open Group Architecture Framework

This Framework was developed in 1995 and is maintained by an industry consortium named “The Open Group”. It is one of, if not the most top rated EA Frameworks at the time of writing this.

TOGAF focuses on four domains of architecture:

- Business Architecture- business processes, strategy, organisation, governance
- Application Architecture- application deployment with their connection to the businesses processes
- Data Architecture- logical & physical data assets, along with the resources for managing data
- Technical Architecture- hardware infrastructure, logical software & digital architecture, everything required to facilitate the rollout of business, data and application services. This includes Cloud Services, IoT, IT infrastructure, processing, networks, middleware, communications and standards.

TOGAF® offers a wide range of artifacts to help organisations to establish, develop, transition or govern their architecture. A core aspect of which is the Architecture Development Method (ADM). This ADM can be seen on the Diagram to the right. It provides a repetitive cycle of ongoing architecture development and implementation, enabling organisations to evolve their enterprises methodically in alignment with business objectives and opportunities.



TOGAF® ADM © The Open Group

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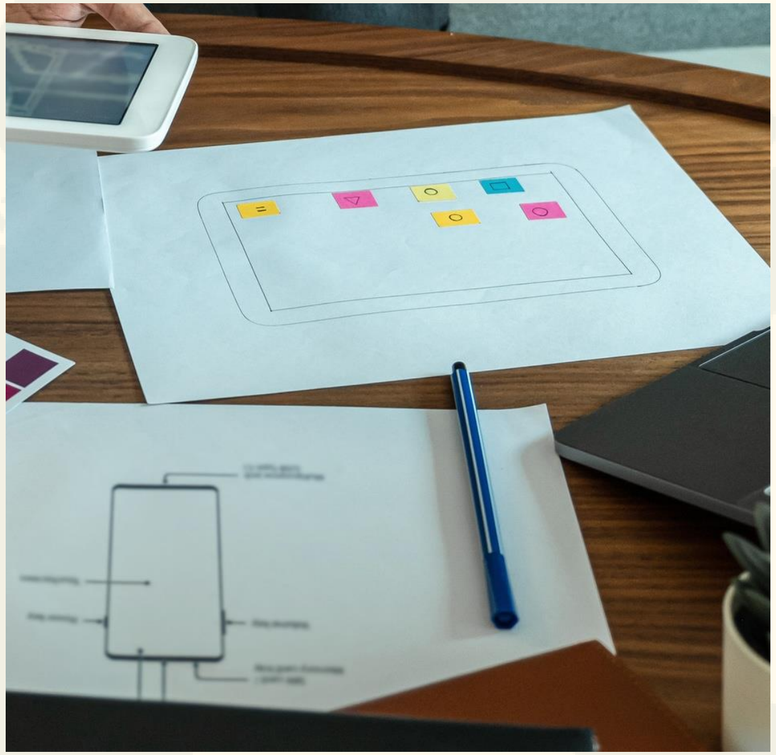
Enterprise Architecture

TOGAF and Zachman are just two of the EA frameworks out there but there are many EA frameworks out there, choosing the right one is crucial because each framework offers distinct methodologies and tools tailored to different organisational needs. These frameworks facilitate structured planning, execution, and management of cloud architectures, enabling businesses to optimise their cloud investments efficiently. By guiding the selection and integration of cloud services, a well-implemented EA framework empowers organisations to minimise risks, reduce costs, and enhance operational efficiency, making it an essential element in the successful adoption and management of cloud technologies.



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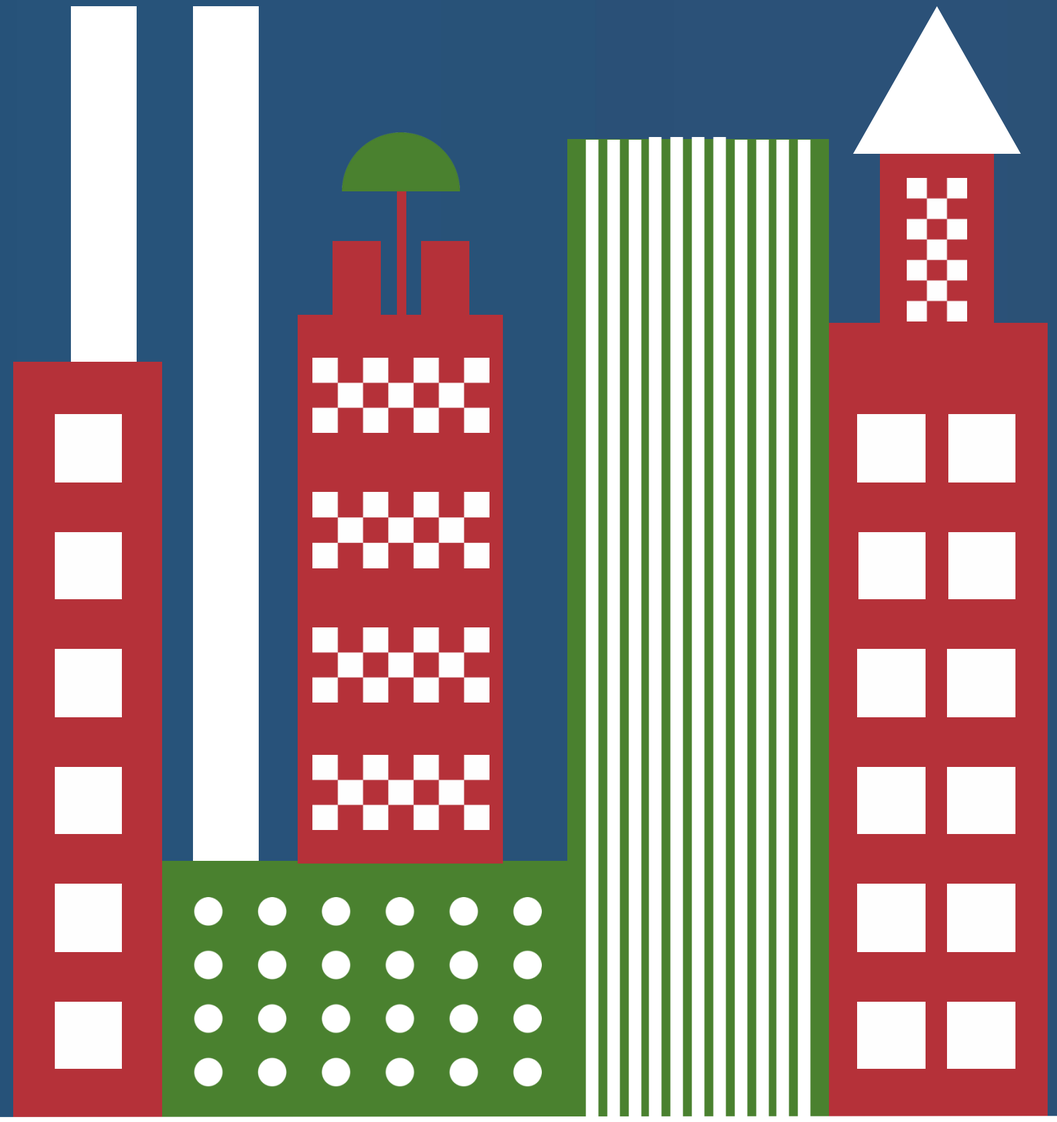

Cloud Computing Characteristics

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Interoperability

- NIST's definition of interoperability on a very high level is "The ability of one entity to communicate with another entity." Barker (2020). As we look more specifically into Cloud Computing, interoperability refers to the ability of different systems, applications, and services to work together across various cloud environments.
- This capability is crucial because it allows data and applications to communicate across different platforms and services without interruption, enabling more flexible, efficient, and strategic use of cloud resources. Interoperability is essential for businesses seeking to avoid vendor lock-in, as it allows them to choose the best services from multiple providers and integrate them into their existing infrastructure.
- For businesses aiming to drive innovation and agility while maintaining a robust and adaptable IT ecosystem, achieving high levels of interoperability in the cloud is paramount.

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Scalability

Scalability in cloud computing is a fundamental feature that refers to the ability of a cloud system to dynamically adjust and allocate resources based on the current demand, either by scaling up (adding more resources) or scaling down (removing unnecessary resources). This capability is essential for businesses as it allows them to handle varying workloads efficiently without overprovisioning or underutilising resources, leading to cost savings and improved performance for organisations.

Scalability ensures that applications can maintain performance levels during peak loads and decrease resource usage during quieter periods and so it optimises operational costs and resource use. For organisations aiming to grow and adapt quickly to changing market demands, scalability in the cloud provides the flexibility to expand and contract IT resources as needed, making it crucial for maintaining continuous service and competitive advantage.

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Availability

- High availability in cloud computing ensures that services are consistently operational, aiming to minimise any potential downtime that could impact business operations. This level of reliability is typically achieved through the implementation of redundant systems and automated failover solutions. Redundant systems involve setting up duplicate components such as servers, networks, or databases which mirror the functions of primary systems. These duplicates stand ready to take over instantly and seamlessly in the event of a system failure.
- Failover solutions are critical mechanisms that automatically detect system failures and switch operations to the redundant systems without human intervention, ensuring uninterrupted service.
- The effectiveness of these strategies is often measured in terms of availability percentages, such as the "Four Nines" (99.99%) availability being a common target. Achieving 99.99% availability implies that a system can only afford a downtime of about 52.56 minutes in a year and this should ideally be for planned maintenance. This highlights the robustness required in cloud computing environments to support continuous business processes. This high standard ensures that services remain reliable and available to users nearly all the time.

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Analyticity

Analyticity in the cloud refers to the capability to perform data analysis and business intelligence operations directly within cloud environments. This approach leverages the vast computational resources and scalable storage solutions provided by cloud platforms to handle large volumes of data efficiently.

The significance of cloud-based analytics lies in its ability to provide real-time insights and data-driven decision-making across organisations. As businesses generate increasingly larger datasets from various sources, traditional on-premise solutions often struggle with the required scalability and agility. Cloud environments, by contrast, offer integrated tools and services that can quickly process and analyse data, allowing for seamless updates and upgrades without the overhead of maintaining physical infrastructure.

The advent of analyticity in the cloud is driven by advancements in cloud computing technologies, including automated data pipelines, machine learning models, and sophisticated analytics platforms. These technologies enable organisations to rapidly deploy analytics applications, perform complex calculations, and generate actionable insights. The importance of this capability is underscored by its impact on optimising operations, enhancing customer experiences, and driving innovation, making it an essential element for businesses looking to maintain a competitive edge in today's data-driven economy.

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Usability

Usability in the cloud refers to the design and implementation of cloud services and interfaces that are easy to use, accessible, and efficient for a wide range of users. This aspect is crucial because it directly affects the adoption rate and overall user satisfaction with cloud technologies. Usability in cloud computing comes about through user-centric design principles that prioritises intuitive navigation, clear documentation, and responsive layouts that adapt to different devices, such as smartphones, tablets, and desktops.

The importance of usability is magnified in cloud environments because these platforms often serve a diverse audience with varying levels of technical proficiency and ability. Enhanced usability helps in reducing training and support costs, accelerates the deployment of cloud solutions, and improves productivity by enabling users to focus more on their core tasks rather than on understanding how to use the technology. In essence, strong usability in the cloud ensures that the benefits of cloud computing such as scalability, flexibility, and accessibility are fully accessible and can be leveraged efficiently by all users.

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Unit Completed - What's Next?

To consolidate your learning and reflect on the key concepts covered, please take a moment to complete this quiz.

Your feedback and results will help you track your progress and support continuous improvement of the training experience.

By completing this quiz, you will also become eligible to receive a certificate of successful training completion.

Click the link to begin the quiz!

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