**IT Infrastructure and emerging technologies**

**Introduction to IT infrastructure**

* IT infrastructure facilitates business information technology operations and services via a combination of software and hardware components.

IT infrastructure provide services such as:

* **Telecommunication services** – enabling the communication between members within the organization
* **Data management services** – provides the ability to store data as well as analyze it.
* **Enterprise Resource Planning (ERP), Customer Relationship Management (CRM),** etc.

**Connection between an organization, IT infrastructure and business capabilities**

* The service a firm is capable to provide its customers, suppliers or employees is directly affected by the IT infrastructure.
* The business and IS strategy should be supported by the IT infrastructure.

**Components of an IT infrastructure**

* **Hardware platforms –** involves the physical parts of a computer e.g. Dell, HP, Apple.
* **Operating systems** – refers to the software that acts a mediator between computer programs and the hardware, it talks to the hardware of the computer when programs want to execute instructions. It also manages hardware and software resources of the computer.
* **Enterprise software applications** – are computer programs that satisfy the needs of the enterprise in terms of business operations and service delivery, such as, digital creation, collaboration, ERP, etc. e.g. Microsoft.
* **Database management and storage** – serves the function of organizing, analyzing, maintaining and storing the organization’s data allowing it to be efficiently accessed or used e.g. MySQL, Apache, etc.

**Emerging technologies – cloud computing**

Cloud computing is a model of computing that virtualizes the computer processing, storage, software and other services’’ resources in which the physical resources comes from only one hardware source.

**Three types of services offered from the cloud**

* **Infrastructure-as-a-Service (IaaS)** – cloud service providers rent out their processing, storage, networking and other computer resource capabilities to clients who then integrate these resources into their information systems.
* **Platform-as-a-Services (PaaS)** – cloud service providers rent out programming, application hosting, development and other frameworks to allow clients to develop, deploy and manage their own consumer-facing applications, internal software, etc.
* **Software**-**as-a-service (SaaS)** – clients use software provided and hosted by the cloud service providers e.g. Google Workspace, Zoom, Dropbox, etc.

**Characteristics of cloud computing**

* **On demand self-service –** customers can obtain services easily without engaging with the provider.
* **Rapid elasticity –** computing resources obtained from the service provider can be quickly provisioned, increased or decreased to suit the needs of the client.
* **Measured services –** financial charges are done based on the quantity and duration usage of the product.
* **Ubiquitous network access –** cloud services can be widely accessed anywhere using standard network and internet devices, including mobile platforms.

**Challenges of managing IT infrastructure**

* **Spending on infrastructure –** over spending on advanced infrastructure results in resources becoming idle and business having to absorb high financial costs, while spending too little means the business cannot deliver important services making the business inefficient.
* **Scalability –** upgrading IT infrastructure to satisfy new needs in the business environment without internal failures occurring, may require diligence, new intellectual skills, as well as trial and error.

**Components of the Total Cost of Ownership (TCO) model**

TCO is analysis of all direct and indirect costs of implementing of a specific technology, helping the business determine the total cost of implementation.

Components of TCO are:

* **Hardware acquisition –** the cost of obtaining physical components of computers.
* **Software acquisition -** the price of licensing or buying the rights to use particular software programs.
* **Training –** the process of employees acquiring new skills is often costly.
* **Support –** the cost of providing ongoing technical support.
* **Maintenance –** cost to upgrade, stabilize and manage both software and hardware.
* **Infrastructure -** the cost to acquire, maintain and support related infrastructure.
* **Downtime –** the cost of losing productivity if the IT infrastructure fails.

**Competitive Forces Model of IT infrastructure investment**

* **Market demand for the firms’ services –** conduct a market analysis to find out if the current IT infrastructure is sufficient to meet current demands of customers, or is it too little or too much.
* **IT assessment –** keep up latest technological trends to ensure your business is not lacking behind or overcommitting financial resources to advanced and expensive technological.
* **Business strategy –** analyze your business strategy and see what capabilities and technological resources are required to achieve your strategic goals and objectives.
* **IT infrastructure investments of competitors –** compare your own IT investment cost against competitors to determine which party is more cost-effective, and then adopt practices or technologies of competitors if your company is less cost-effective.