NPTEL ONLINE CERTIFICATION COURSES

Management Information Systems

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Week 7: Module 1

Information Systems (IS) Strategy

CONCEPTS COVERED

- **Information Systems (IS) Strategy**

Information Systems (IS) Strategy

- A strategy is a coordinated set of actions to fulfill objectives, purposes, and goals
- The essence of a business strategy is setting limits on what the business will seek to accomplish
- A business strategy is a plan articulating where a business seeks to go and how it expects to go there
- It is the means by which a business communicates its goals

Information Systems (IS) Strategy

- Strategy starts with a mission.
- A mission is a clear and compelling statement that states the purpose of existence of an organization
- It basically describes what the firm is all about.
- A mission statement sums up what is unique about the firm.

Information Systems (IS) Strategy

❖Mission statements about computer companies:

Company	Mission Statement
Amazon	We seek to be Earth's most customer-centric company for three primary customer sets: consumer customers, seller customers and developer customers
L L Bean	Sell good merchandise at a reasonable profit, treat your customers like human beings and they will always come back for more

Information Systems (IS) Strategy

- Management constructs this strategic plan in response to market forces, customer demands, and organizational capabilities.
- Some markets, such as those faced by manufacturers of laptop computers, and issuers of credit cards, are characterized by many competitors and a high level of competition such that product differentiation becomes increasingly difficult.

Information Systems (IS) Strategy

- Other markets, such as those for airlines and automobiles, are similarly characterized by high competition but product differentiation is better established
- Customer demands comprise the wants and needs of the individuals and companies who purchase the products and services available in the marketplace.
- Organizational capabilities include the skills and experience that give the corporation a currency that adds value in the marketplace

Information Systems (IS) Strategy

❖ **Generic Strategies Framework**

- **Michael Porter describes how businesses can build a sustainable competitive advantage**
- **"fundamental basis of above-average performance in the long run is sustainable competitive advantage."**
- **He identified three primary strategies for achieving competitive advantage:**
  - **Cost leadership – lowest-cost producer**
  - **Differentiation – product is unique**
  - **Focus – limited scope**

Information Systems (IS) Strategy

❖ **New Market Entrants:**

- **New entrants have a distinct advantage.**
- **They can consult the historical records on the existing players, analyze their weaknesses, and plug the mistakes committed by existing players.**
- **They are able to enter the market with innovative & improved products or services**

Information Systems (IS) Strategy

❖ **Porter's Competitive Forces Model:**

➢ **Traditional Players:**

- **There are certain companies that have been in the market for a long duration.**
- **These conventional market players pose stiff competition to other organizations.**
- **In the soft drink market, Coca-Cola and Pepsi can be considered the traditional competitors.**

Information Systems (IS) Strategy

❖ **New Market Entrants:**

➢ **Kinetic figured out that there was a need for a gearless scooter that could be started easily and effortlessly, and this is how it captured the market**

Information Systems (IS) Strategy

❖ **Substitute Products and Services:**

- **Constant innovation and upgradation can lead to the manufacturing of substitute products and new improved ways of rendering services.**
- **These substitute products and services are the greatest threat to an established organization**
- **For example, Airtel (provider of cell phone services) capturing a major portion of the market share of BSNL (landline provider)**

Information Systems (IS) Strategy

❖ **Customers:**

- **Organizations cannot take the loyalty of the customer for granted.**
- **The customer is always looking for better options.**
- **Organizations need to pay attention to retaining their customers by being sensitive to their changing demands**

Information Systems (IS) Strategy

❖**Suppliers:**

- **Organizations depend on their suppliers to provide them with right quantity & quality of products at the right price, and at the right time.**
- **Any delay in this chain can affect the delivery schedule of products or services**
- **In the Indian market, any sudden increase in the cost of material adversely impacts the organization.**

Information Systems (IS) Strategy

❖ **Suppliers:**

- **For example, to manufacture a car, a firm is dependent on suppliers for window glasses, tyres, electrical wires, lights and locks, and so on.**
- **A failure to procure any of the pieces, however minute, due to price or time constraints can throw off the entire production process.**

Information Systems (IS) Strategy

❖ **Strategies Formulated by Information Systems:**

➢ **Low-cost Leadership:**

- **Organizations need to reduce their operational costs so as to deliver the product or service at the most optimum price.**
- **Information systems play an important role in managing the operational cost of an organization.**

Information Systems (IS) Strategy

❖ **Strategies Formulated by Information Systems:**

➢ **Product Differentiation:**

- **Companies constantly strive to provide their customers with products or services that are different from those available in the market.**
- **This creates a positive attitude towards the brand in the eyes of the customer**

Information Systems (IS) Strategy

❖ **Strategies Formulated by Information Systems:**

➢ **Focus on Niche Markets:**

- **Information systems help organizations record the buying behavior and demands of the customers.**
- **This information enables companies to serve customers in an efficient manner.**

Information Systems (IS) Strategy

❖ **Strategies Formulated by Information Systems:**

➢ **Focus on Niche Markets:**

- **For example, organizations often offer loyalty cards to customers, so that when the customer make purchases, that information gets recorded in the central database of the organization and also on the magnetic chip on the loyalty card. Organizations give points for each purchase that can be accumulated and redeemed at a later date.**

Information Systems (IS) Strategy

❖ **Strategies Formulated by Information Systems:**

➢ **Strengthen Customer and Supplier Intimacy:**

- **Companies have found it to their advantage to encourage relations between customers and suppliers.**
- **e-Commerce companies like Flipkart allow customers to rate the suppliers.**
- **Since the companies keep track of all purchases made by the customer, and also of all the items viewed by the customers on their web-site, they can make suggestions to customers based on that data.**

Information Systems (IS) Strategy

❖ **Generic Strategies Framework**

- **Michael Porter describes how businesses can build a sustainable competitive advantage**
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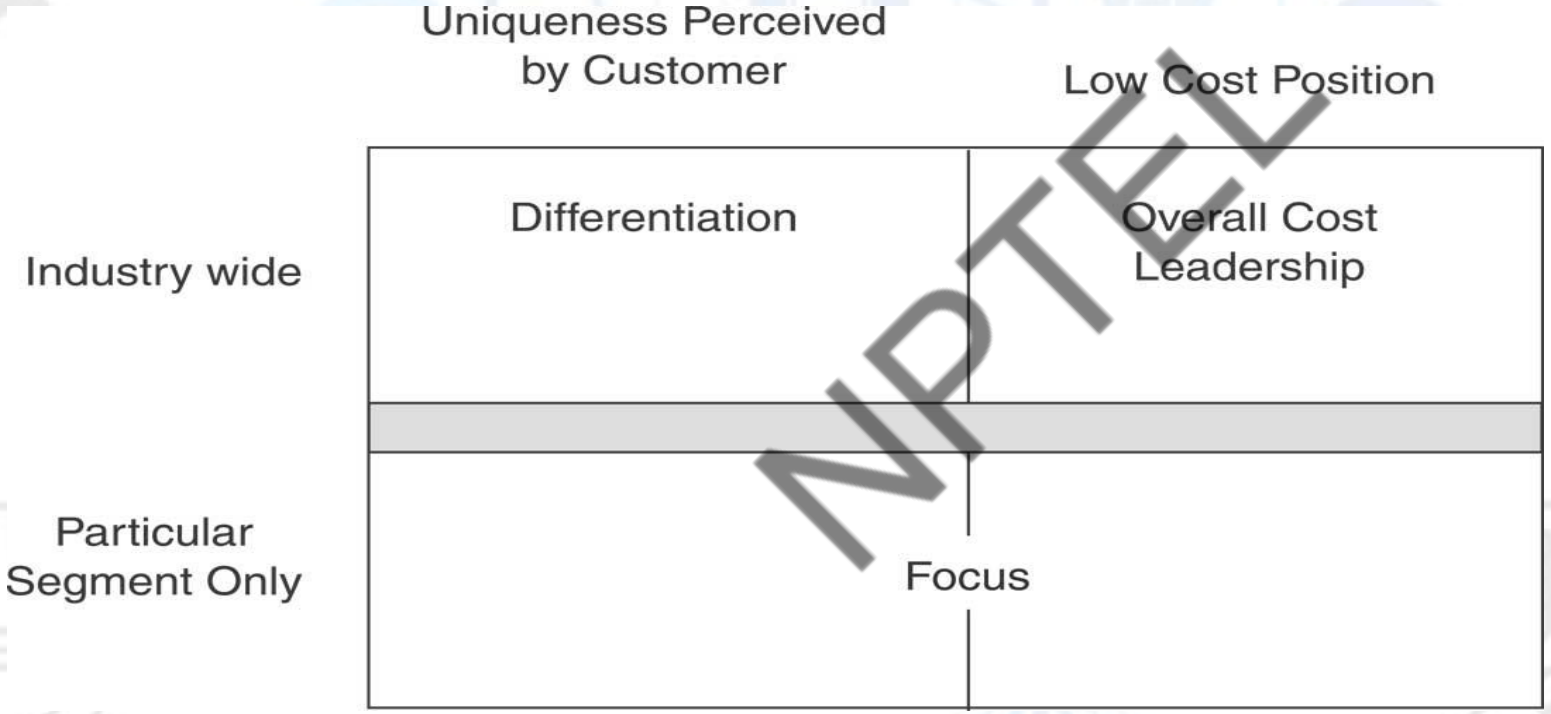
  - **Cost leadership – lowest-cost producer**
  - **Differentiation – product is unique**
  - **Focus – limited scope**

Information Systems (IS) Strategy

❖**Three Strategies for Competitive Advantage:**



Information Systems (IS) Strategy

❖ **Porter's Competitive Advantage:**

- **A company's overall business strategy drives all other strategies**
- **Porter defined these competitive advantages to represent various business strategies found in the marketplace**
- **Cost leadership results when the organization aims to be the lowest-cost producer in the marketplace**
- **Through differentiation, the organization qualifies its product or service in a way that allows it to appear unique in the marketplace**

Information Systems (IS) Strategy

❖ **Porter's Competitive Advantage:**

➢ **Focus allows an organization to limit its scope to a narrower segment of the market and tailor its offerings to that group of customers**

- ✓ **This strategy has two variants:**
  - **Cost focus**
  - **Differentiation focus**

Information Systems (IS) Strategy

❖Summary of strategic approaches and IT applications:

Strategic Approach	Key Idea	Application to Information Systems
Porter's generic strategies	Firms achieve competitive advantage through cost leadership, differentiation, or focus	Understanding which strategy is chosen by a firm is critical to choosing IS to complement the strategy

Information Systems (IS) Strategy

❖Summary of strategic approaches and IT applications:

Strategic Approach	Key Idea	Application to Information Systems
Dynamic environment strategies	Speed, agility, and aggressive moves and countermoves by a firm create competitive advantage	IS are critical to achieving the speed needed for moves and countermoves. IS are in a constant state of flux or development

Information Systems Strategy

- Information Systems (IS) strategy is the plan an organization uses to provide information services.
- IS allows a company to implement its business strategy.
- In IS strategy, the deployment plan for the required technology to support the business needs is documented.

Information Systems Strategy

- Business strategy is a function of:
  - Competition (What does the customer want and what does the competition do?)
  - Positioning (In what way does the firm want to compete?) and
  - Capabilities (What can the firm do?)
- IS strategy process help determine a company's capabilities

Information Systems Strategy

- Understanding business strategy means answering the following questions:
  - What is the business goal or objective?
  - What is the plan for achieving it?
  - What is the role of IS in this plan?
  - Who are the crucial competitors, and partners, and what is required of a successful player in this marketplace?
  - What are the industry forces in this marketplace?

Information Systems Strategy

- ❖Organizational strategy includes the organization's design as well as the choices it makes to define, set up, coordinate and control its work processes
- ❖Organizational strategy is a plan that answers the questions:
  - How will the company organize to achieve its goals and implement its business strategy?
- ❖Models for organizational design:
  - Business diamond
  - Managerial levers

Information Systems Strategy

❖Organizational strategy framework:

Framework	Key Idea	Usefulness in IS Discussions
Business Diamond	Four key components to an organization's design: people, structure, tasks & information control	Using IS in an organization will affect each of these components. This framework can be used to identify where these impacts are likely to occur

Information Systems Strategy

❖Organizational strategy framework:

Framework	Key Idea	Usefulness in IS Discussions
Managerial Levers	Organizational variables , control variables, and cultural variables are the levers managers can use to affect change in their organization	This model gives specific areas where IS can be used to manage and change the organization

Information Systems Strategy

- Understanding organizational strategy means answering the following questions:
  - What are the important structures & reporting relationships within the organization?
  - Who holds the decision rights to critical decisions?
  - What are the important people-based networks (social and informational) and how the managers can use them to get work done better

Information Systems Strategy

- Understanding organizational strategy means answering the following questions:
  - What are the characteristics, experiences, and skill levels of the people within the organization?
  - What are the key business processes?
  - What control systems (management and measurement systems) are in place?
  - What are the culture, values , and beliefs of the organization?

Information Systems Strategy

- **Infrastructure Components:**
  - **Hardware: desktop units and servers**
  - **Software: programs used to do business, to manage the computer itself, and to communicate between systems**
  - **Network: physical means by which information is exchanged among hardware components, such as through a modem and dial-up network (in which case the service is provided by a vendor), or through a private digital network (in which case the service is provided by an internal unit)**
  - **Data: bits & bytes of information (what data are in the system & where the rest are stored)**

Information Systems Strategy

- A basic framework to understand the decisions related to IS that an organization must make is shown in the next three slides.
- The purpose of this framework (IS Strategy Matrix) is to give the managers a high level view of the relation between the four IS infrastructure components & the other resource considerations that are the keys to IS Strategy

Infrastructure Components	What	Who	Where
Hardware	List of physical components of the system	System users and managers	Physical location of components

Information Systems Strategy

❖IS Strategy Matrix

Infrastructure Components	What	Who	Where
Software	List of programs, applications, and utilities	System users and managers	What hardware it resides on and physical location of hardware

Information Systems Strategy

❖IS Strategy Matrix

Infrastructure Components	What	Who	Where
Networking	Diagram of how hardware and software components are connected	System users and managers, company that provides the service	Where the nodes are located, and where the wires and other transport media are located

Information Systems Strategy

❖IS Strategy Matrix

Infrastructure Components	What	Who	Where
Data	Bits of information stored in the system	Owners of data, & data administrators	Where the information resides

Information Systems Strategy

❖ **Strategic Relationships:**

- **Organizational strategy and information strategy must complement each other.**
- **They must be designed so that they support, rather than hinder, each other.**
- **If a decision is made to change one corner of the IS strategy triangle, it is necessary to evaluate the other two corners to ensure that balance is preserved.**

Information Systems Strategy

❖ **Strategic Relationships:**

- **Changing business strategy without thinking through the effects on the organizational & IS strategies will cause the business to struggle until balance is restored.**
- **Likewise, changing IS or the organization alone will cause an imbalance**

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Week 7: Module 2
Aligning IT With Business Objectives

CONCEPTS COVERED

- **Aligning IT With Business Objectives**

Aligning IT With Business Objectives

- The more successfully a firm can align information technology with its business goals, the more profitable it will be
- Only one-quarter of firms achieve alignment of IT with the business
- About half of a business firm's profits can be explained by alignment of IT with business

Aligning IT With Business Objectives

- ❖Most businesses get it wrong.
- ❖Information technology takes on a life of its own and does not serve management and shareholder interests very well.
- ❖Instead of taking active role in IT, business people ignore it
  - Claim not to understand It
  - Tolerate failure

Aligning IT With Business Objectives

- Successful firms and managers understand
- ✓ what IT can do and
- ✓ how IT works,
- ✓ take an active role in shaping its use, and
- ✓ measure its impact on revenues and profits

Aligning IT With Business Objectives

❖Strategic Systems Analysis

➢To align IT with the business and

- use information systems effectively for competitive advantage,
- managers need to perform a strategic system analysis

Aligning IT With Business Objectives

❖ **Strategic Systems Analysis**

➢ **To identify the types of systems that provide a strategic advantage to their firms,**

- **managers should ask the following questions:**

Aligning IT With Business Objectives

- ❖Strategic Systems Analysis
- ✓What is the structure of the industry in which the firm is located?
- ✓What are some of the competitive forces at work in the industry?
- ✓Are there new entrants to the industry?
- ✓What is the relative power of suppliers, customers, and substitute products and services over prices?

Aligning IT With Business Objectives

- ❖ Strategic Systems Analysis
- ✓ What is the basis of competition
- ➢ quality, price, or brand?
- ✓ What are the direction and nature of change within the industry?
- ✓ From where are the momentum and change coming?

Aligning IT With Business Objectives

- ❖ Strategic Systems Analysis
  - ✓ How is the industry currently using information technology?
  - ✓ Is the organization behind or ahead of the industry in its application of information systems?

Aligning IT With Business Objectives

❖Strategic Systems Analysis

- What are the business, firm, and industry value chains for this particular firm?

✓How is the company creating value for the customer – through lower prices and transaction costs or higher quality?

Aligning IT With Business Objectives

- **Strategic Systems Analysis**
  - ✓ **Are there any places in the value chain where the business could create more value for the customer & additional profit for the company?**

Aligning IT With Business Objectives

- **Strategic Systems Analysis**
  - ✓ **Does the firm understand and manage its business processes using the best practices available?**
  - ✓ **Is it taking maximum advantage of SCM, CRM, and Enterprise Systems?**

Aligning IT With Business Objectives

- ❖ Strategic Systems Analysis
  - ✓ Does the firm leverage its core competencies?
  - ✓ Is the industry supply chain and customer base changing in ways that benefit or harm the firm?
  - ✓ Can the firm benefit from strategic partnerships?

Aligning IT With Business Objectives

- **Strategic Systems Analysis**
  - ✓ **Where in the value chain will information systems provide the greatest value to the firm?**

Aligning IT With Business Objectives

❖Strategic Systems Analysis

- Have we aligned IT with our business strategy and goals?

✓Have we correctly articulated our business strategy and goals?

Aligning IT With Business Objectives

- **Strategic Systems Analysis**

- ✓ **Is IT improving the right business processes and activities to promote this strategy?**
- ✓ **Are we using the right metrics to measure progress toward these goals?**

REFERENCES

- Laudon, K. C., and Laudon, J. P. (2016), Management Information Systems: Managing the Digital Firm
- Turban, E., Volonio, L., Wood, R. Gregory.(2016), Information Technology for Management
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Week 7: Module 3
Balanced Score Card

CONCEPTS COVERED

- **Basic Concepts of Balanced Score Card (BSC)**

Introduction to Balanced Score Card (BSC))

- As companies around the world transform themselves for competition that is based on information, their ability to exploit intangible assets has become more decisive than their ability to invest in and manage physical assets.

Introduction to Balanced Score Card (BSC))

- A balanced scorecard focuses on measurable outcomes on four dimensions of a business's performance: Financial, business process, customer, and learning and growth. Each dimension uses key performance indicators (KPIs) to understand how well an organization is performing on any of the dimensions at any time.

Introduction to Balanced Score Card (BSC))

- The framework of a balanced scorecard requires managers to focus on more than just financial performance. They must focus on things they are able to influence at the present time like customer satisfaction, business process efficiency, or employee training. The KPIs are developed by senior executives and are automatically provided to users through executive support systems.

Introduction to Balanced Score Card (BSC))

- Today's managers recognize the impact that measures have on performance.
- But they rarely think of measurement as an essential part of their strategy.

Introduction to Balanced Score Card (BSC))

- For example, executives may introduce new strategies and innovative operating processes intended to achieve breakthrough performance, then continue to use the same short-term financial indicators they have used for decades (e.g., ROI, Sales growth, Operating income and so on).

Introduction to Balanced Score Card (BSC))

- Hence they fail not only to introduce new measures to monitor new goals and processes but also to question whether or not their old measures are relevant to the new initiatives.

Introduction to Balanced Score Card (BSC))

- BSC enables companies to track financial results while simultaneously monitoring progress in building the capabilities and acquire the intangible assets they need for future growth.

Introduction to Balanced Score Card (BSC))

- BSC addresses a serious deficiency in traditional management systems : their inability to link a company's long-term strategy with its short term actions.
- BSC is a comprehensive framework that translates a company's strategic objectives into a coherent set of performance measures.

Introduction to Balanced Score Card (BSC))

- Balanced Score Card is a framework for operationalizing a firm's strategic plan by focusing on measurable outcomes on four dimensions of a firm's performance:
  - Financial
  - Customer
  - Business process
  - Learning and Growth

Introduction to Balanced Score Card (BSC))

- Managers need to select a limited number of critical indicators within each of the four perspectives.
- Thereby BSC helps managers to focus on strategic vision.

Introduction to Balanced Score Card (BSC))

- While traditional financial measures report on what happened last period without indicating how managers can improve performance in the next, BSC functions as the cornerstone of a company's current and future success.

Introduction to Balanced Score Card (BSC))

- Unlike conventional metrics , BSC provides balance between external measures like operating income and internal measures like new product development.

Introduction to Balanced Score Card (BSC))

- This balanced set of measures both reveals the trade-offs that managers have already made among performance measures and there is no need to make any further trade-offs among key success factors

Introduction to Balanced Score Card (BSC))

- Many companies that attempt to implement local improvement programs (e.g., process reengineering, total quality, employee empowerment) lack a sense of integration.

Introduction to Balanced Score Card (BSC))

- BSC is used as the language, the benchmark against which all new projects and businesses are evaluated.

Introduction to Balanced Score Card (BSC))

- Performance on each dimension is measured using Key Performance Indicators (KPIs), which are the measures proposed by senior management for understanding how well the firm is performing along any given dimension.

Introduction to Balanced Score Card (BSC))

- For example, one key indicator of how well an online retail firm is meeting its customer performance objectives is the average length of time required to deliver a package to consumer.

Introduction to Balanced Score Card (BSC))

- For a bank, a key indicator of business process performance is the length of time required to perform a basic function like creating a new customer account

Introduction to Balanced Score Card (BSC))

- The balanced scorecard framework is thought to be “balanced” because it causes managers to focus on more than just financial performance

Introduction to Balanced Score Card (BSC))

- In this view, financial performance is past history – the result of past actions – and
- ✓ managers should focus on the things they are able to influence today, such as
  - business process efficiency,
  - customer satisfaction, and
  - employee training

Introduction to Balanced Score Card (BSC))

- Once a scorecard is developed, the next step is
- ✓automating a flow of information to executives and managers for
- ✓each of the key performance indicators.

Introduction to Balanced Score Card (BSC))

- Clearly communicating the Vision & Strategy of the Company.
- Selecting a balanced set of measures.
- Aligning action plans to the Objectives.
- Linking organizational objectives to individual goals

Introduction to Balanced Score Card (BSC))

- **Translating the Vision : By relying on measurement, BSC forces the managers to come to agreement on the metrics they will operationalize to realize their vision.**

Introduction to Balanced Score Card (BSC))

- **Communicating & Linking : When a scorecard is disseminated up and down the organizational chart, strategy becomes a tool available to everyone.**

Introduction to Balanced Score Card (BSC))

- **Business Planning: BSC forces companies to integrate strategic planning and budgeting , thereby ensuring that financial budgets do indeed support strategic goals.**

Introduction to Balanced Score Card (BSC))

- **Feedback and Learning: Based on a mechanism for strategic feedback and review, BSC fosters a kind of learning – the ability to reflect on inferences & adjust theories about cause and effect relationships.**

REFERENCES

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- Turban, E., Volonio, L., Wood, R. Gregory.(2016), Information Technology for Management
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Week 7: Module 4

Data Centers, Virtualization and Cloud Computing

CONCEPTS COVERED

- **Data Centers, Virtualization and Cloud Computing**

Introduction to Virtualization and Cloud Computing

❖ **Data Centers, Virtualization and Cloud Computing**

- **On-premises data centers, virtualization, and cloud computing are types of IT infrastructures or computing systems**
- **Previously, companies owned their servers, storage, and network components to support their business applications, and these computing resources used to reside in their own premises**
- **Today, there exists several choices, each with their strengths, weaknesses and cost considerations**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Data Centers:**

- A data center consists of a large number of network servers used for the storage, processing, management, distribution, and archiving of data, systems, web traffic, and enterprise applications
- It also refers to the building or facility that houses the servers and equipment

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Data Centers:**

- A data center is mainly used in organizations that run many different types of applications and have complex workloads
- However, a data center has limited capacity
- Once it is built, its capacity cannot be changed without installing additional equipment

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Data Centers:**

- **Data center failures disrupt all operations regardless of who owns the data center**
- **The outages in data centers indicate the risks of maintaining the complex and sophisticated technology needed to maintain digital services used by millions of people**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Virtualization:**

- **Physical corporate data centers are rapidly being replaced by virtual infrastructure, called virtualization.**
- **A virtual infrastructure originally referred to one where software replaced hardware in a way that a "virtual machine" was accessible to provide computing power**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Virtualization:**

- **Typically, computing capabilities, storage, and networking are provided by a third party or group of vendors, usually over the Internet or through a private network.**
- **Facilities available through virtual architectures are servers, storage, backup, network, and disaster recovery**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Virtualization:**

- In a virtualized desktop, the user's device locally accesses desktop software on a remote server.
- Virtualization is a way to design architecture because it enables resources to be shared and allocated as needed by the user, and makes maintenance of the systems and equipment easier since resources are centralized

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Virtualization:**

- **Increases the flexibility of IT assets,**
- **Allows companies to consolidate IT infrastructure,**
- **Reduces maintenance and administration costs and**
- **Prepares for strategic initiatives**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Virtualization:**

- **Cost-cutting aspect of virtualization is for tactical reasons**
- **Flexible sourcing and cloud computing are the most important strategic reasons for virtualization**

Introduction to Data Centers, Virtualization and Cloud Computing

❖**Virtualization:**

❖**The characteristics and benefits of virtualization are as follows:**

➢***Memory-intensive*:**

- **Need a huge amount of RAM (or primary memory) because of their massive processing requirements.**

➢***Energy-efficient*:**

- **Minimizes energy consumed for running and cooling servers in the data centers (95% reduction in energy use per server)**

Introduction to Data Centers, Virtualization and Cloud Computing

❖**Virtualization:**

❖**The characteristics and benefits of virtualization are as follows:**

➢***Scalability and load balancing*:**

- **Provides load balancing to handle the demand for requests to the site.**
- **The infrastructure automatically distributes the load across a cluster of physical servers to ensure the maximum performance of all running virtual machines.**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

- **Cloud computing is another term used to describe an architecture based on services provided by a third party over the internet and private network.**
- **Companies offering cloud computing make an entire data center's worth of servers, networking devices, systems management, security, storage, and other infrastructure available to their clients.**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

- **Cloud systems are scalable.**
- **Clients can buy the exact amount of storage, computing power, security, or other IT functions that they need, when they need it, and pay for what they use.**
- **Cloud systems can be adjusted to meet changes in business needs**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

- **At an extreme, the cloud's capacity is unlimited depending on the vendor's offerings and service level agreements (SLAs).**
- **However, a drawback of the cloud system is control because it is managed by a third party.**
- **Companies do not have as much control as they do with a data center.**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

➢ **Service Level Agreements (SLAs):**

- **A negotiated agreement between a company and service provider that can be a legally binding contract or an informal contract.**
- **The goal is not building the best SLA terms, but getting the terms that are most meaningful to the business.**

Introduction to Data Centers, Virtualization and Cloud Computing

❖**Cloud Computing:**

➢**Unless a client company uses a *private cloud* within its network, it shares computing and storage resources with other cloud users in the vendor's *public cloud.***

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

- ***Public clouds*** **allow multiple clients to access the same virtualized services and utilize the same pool of servers across a public network.**
- **In contrast, *private clouds* are single-tenant environments with stronger security and control for regulated industries and critical data**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing:**

- In effect, *private clouds* retain all the IT security and control provided by traditional data center infrastructure with the advantage of cloud computing
- Companies often use an arrangement of both on-premises data centers and cloud computing.

REFERENCES

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Week 7: Module 5
Selection of Cloud Vendor

CONCEPTS COVERED

- **Selection of Cloud Vendor**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Infrastructure as a Service (IaaS):**

- **Provides infrastructure through virtualized servers, networks, storage, and systems software to augment or replace the functions of an entire data center**
- **The customer may have full control of the actual server configuration**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Infrastructure as a Service (IaaS):**

- **A way of delivering cloud computing infrastructure as an on-demand service.**
- **Rather than purchasing servers, software, data center space, or networks, companies instead buy all computing resources as a fully outsourced service**
- **Amazon Web Services is an example of IaaS provider**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Platform as a Service (PaaS):**

- **Provides services using virtualized servers on which clients can run existing applications or develop new ones**
- **The cloud provider manages the hardware and underlying operating system**
- **Tools and services make coding and deployment faster and more efficient, like Google App Engine**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Platform as a Service (PaaS):**

- **Provides a standard unified platform for app development, testing, and deployment**
- **Allows the creation of Web applications quickly and easily without the complexity of buying and maintaining the underlying infrastructure**

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Platform as a Service (PaaS):**

- **Without PaaS, the cost of developing some apps would be prohibitive**

Introduction to Data Centers, Virtualization and Cloud Computing

❖Cloud Computing: XAAS: "As A SERVICE" Delivery Models

➢Software as a Service (SaaS):

- Provides software application functionality through a web browser
- Sometimes known as an ASP, or Application Services Provider
- Apps are designed for end users
- Users can run applications via multiple devices on cloud infrastructure

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Software as a Service (SaaS):**

- **Other terms for SaaS are *on-demand computing* and *hosted services***
- **Instead of buying and installing expensive packaged enterprise applications , users can access software apps on demand over a network, with an internet browser *paying the license fee as required***

Introduction to Data Centers, Virtualization and Cloud Computing

❖ **Cloud Computing: XAAS: "As A SERVICE" Delivery Models**

➢ **Software as a Service (SaaS):**

- **Salesforce.com is one of the most widely known SaaS providers.**
- **Another example is Google Docs.**

✓ **Instead of installing MS-Word on ones own computer, and then loading Word to create a document, one can use a browser to log into Google Docs. Only the browser uses one's computer resources.**

Introduction to Data Centers, Virtualization and Cloud Computing

❖Cloud Computing: XAAS: "As A SERVICE" Delivery Models

➢Data as a Service (DaaS):

- Data shared among clouds, systems, apps, regardless of the data source or storage location.
- DaaS makes it easier for data architects to select data from different pools, filter out sensitive data, and make the remaining data available on-demand
- Eliminates the risks and burdens of data management to a third-party cloud provider

Selection of Cloud Vendor

- Decision to select a cloud service provider requires greater diligence compared to any other IT decisions
- Assessment and selection of the right cloud services provider is an important strategic decision for business leaders since cloud computing is becoming an increasingly important part of the IT delivery model
- It is important to investigate each provider's offerings prior to subscribing

Selection of Cloud Vendor

- A vendor needs to address several service factors for being selected as the right cloud services provider
- The move to the cloud is a move to vendor-managed services wherein cloud service-level agreements is the most important element of a contract

Selection of Cloud Vendor

❖Service Level Agreements (SLAs):

- A negotiated agreement between a company and service provider that can be a legally binding contract or an informal contract.
- The goal is not building the best SLA terms, but getting the terms that are most meaningful to the business.
- Staffs experienced in managing outsourcing projects may have the required expertise for framing and managing SLAs with vendors.

Selection of Cloud Vendor

❖**Service Level Agreements (SLAs):**

- **The Practical Guide to Cloud Service Level Agreements (published by the Cloud Standards Customer Council) brings together numerous customer experiences into a single guide for IT and business leaders who would like to consider cloud adoption.**

Selection of Cloud Vendor

❖ **Service Level Agreements (SLAs):**

➢ **As per the Practical Guide to Cloud Service Level Agreements, an SLA serves:**

✓ **as a means of formally documenting the services, performance expectations, responsibilities and limits between cloud service providers and their users**

Selection of Cloud Vendor

❖ **Service Level Agreements (SLAs):**

➢ **A typical SLA describes levels of service using various attributes such as :**

- **Availability**
- **Serviceability**
- **Performance**
- **Operations**

Selection of Cloud Vendor

❖ **Service Level Agreements (SLAs):**

➢ **A typical SLA describes levels of service using various attributes such as :**

- **Billing and**
- **Penalties associated with violations of such attributes**

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Delays	What are the estimated server delays & network delays
Workloads	What is the volume of data & processing that can be handled during a specific amount of time
Costs	What are the costs associated with workloads across multiple cloud computing platforms?

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Security	How are data and networks secured against attacks? Are data encrypted & how strong is the encryption? What are network security practices?

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Disaster recovery & business continuity	How is service outage defined? What level of redundancy is in place to minimize outages, including backup services in different geographical regions? If a natural disaster or outage occurs, how will cloud services be continued?

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Technical expertise and understanding	Does the vendor have expertise in one's industry or business processes? Does the vendor understand what one needs to do Does the vendor have the technical expertise to fulfill those obligations?

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Insurance in case of failure	Does the vendor provide cloud insurance to mitigate user losses in case of service failure or damage? This is a new and important concept

Selection of Cloud Vendor

❖Service Factors to Consider When Evaluating Cloud Vendors or Service Providers

Factors	Examples of Questions to Be Addressed
Third-party audit or an unbiased assessment of the ability to rely on the service provided by the vendor	Can the vendor show objective proof with an audit that it can live up to the promises it is making?

Selection of Cloud Vendor

- Cloud services can advance the core business of delivering superior services to optimize business performance
- Cloud can cut costs and add flexibility to the performance of critical business apps.
- Cloud can improve responsiveness to end-consumers, application developers, and business organizations.

Selection of Cloud Vendor

❖In order to achieve those benefits, there must be IT, legal, and senior management oversight because a company still must meet its

➢ legal obligations and responsibilities to

- employees,
- customers,
- business partners, and
- society.

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THANK YOU !