Department of Management Studies (MBA)

Question Bank & Solution

Subject Name : EMERGING EXPONENTIAL TECHNOLOGIES

Subject Code: 20MBA301

Semester: III

MODULE 1

1. What do you mean by Emerging Technology?

Emerging technology is a term generally used to describe a new technology, but it may also refer to the continuing development of an existing technology; it can have slightly different meaning when used in different areas, such as media, business, science, or education. The term commonly refers to technologies that are currently developing, or that are expected to be available within the next five to ten years, and is usually reserved for technologies that are creating, or are expected to create, significant social or economic effects.
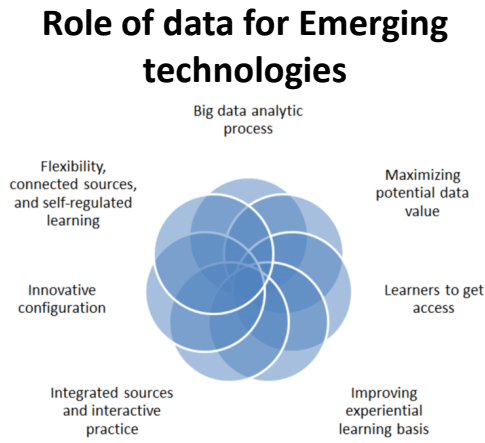
2. Outline the historical importance of Industrial Revolution (Technology).
3. Explain the future trends in Emerging Technology.
4. 5G Technology- A Boon For Businesses in 2021
5. Autonomous Driving- An Easy, Safe Driverless Drive
6. Edge computing- Bridging the Gap Between Data Storage and Computation
7. Democratization- A Democracy in Technology
8. Human Augmentation- Enhancing Cognitive Abilities
9. Automation- For Advancements in Analytics

3. What is HMI? List out its applications.

• HMI is all about how people and automated systems interact and communicate with each other. That has long ceased to be confined to just traditional machines in industry and now also relates to computers, digital systems or devices for the Internet of Things (IoT). More and more devices are connected and automatically carry out tasks. Operating all of these machines, systems and devices needs to be intuitive and must not place excessive demands on users.

MODULE 2

1.Elaborate the role of data for emerging technology.

Role of data for Emerging technologies

Big data analytic process

Flexibility, connected sources, and self-regulated learning

Maximizing potential data value

Innovative configuration

Learners to get access

Integrated sources and interactive practice

Improving experiential learning basis

2.What is Data Science?

- Data science is the practice of mining large data sets of raw data, both structured and unstructured, to identify patterns and extract actionable insight from them.

3.List the differences between Data & Information.

Data	Information
Data is unorganised and unrefined facts	Information comprises processed, organised data presented in a meaningful context
Data is an individual unit that contains raw materials which do not carry any specific meaning.	Information is a group of data that collectively carries a logical meaning.
Data doesn't depend on information.	Information depends on data.
It is measured in bits and bytes.	Information is measured in meaningful units like time, quantity, etc.
Raw data alone is insufficient for decision making	Information is sufficient for decision making
An example of data is a student's test score	The average score of a class is the information derived from the given data.

4.Classify the different types of data.

DATA TYPES continued......
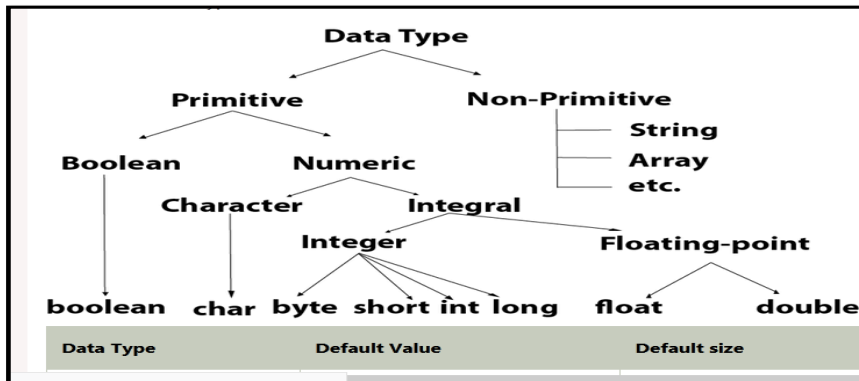
5.Explain Data Value Chain.
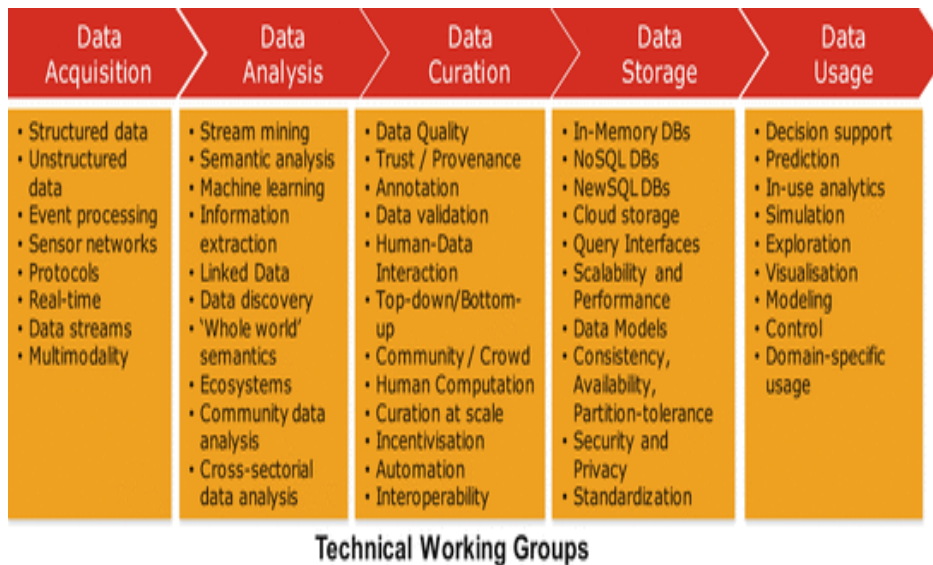
MODULE 3

1.What is Artificial Intelligence? List examples of AI applications in business.

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition.
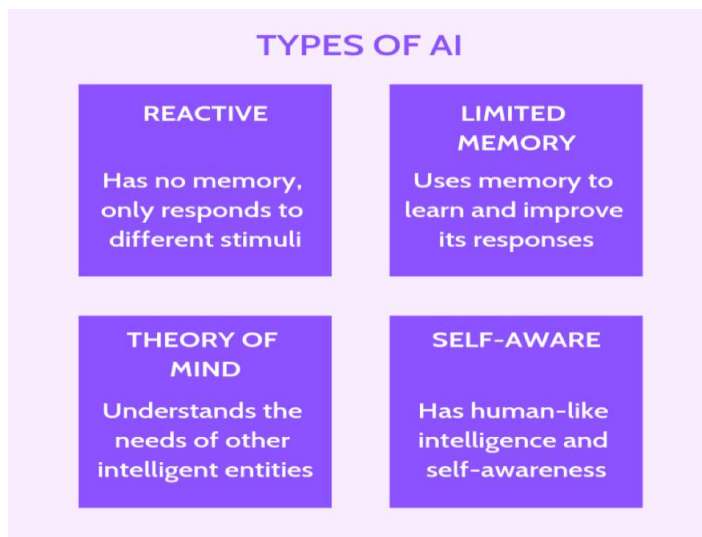
- Industry Robots

- Mail classifications
- Sensors
- ATM machines
- Google Maps

2.Illustrate the different levels of AI.

- AI is divided broadly into three stages: **artificial narrow intelligence (ANI), artificial general intelligence (AGI) and artificial super intelligence (ASI)**.
- Narrow AI has experienced numerous breakthroughs in the last decade, powered by achievements in machine learning and deep learning. For example, AI systems today are used in medicine to diagnose cancer and other diseases with extreme accuracy through replication of human-esque cognition and reasoning.
- Artificial general intelligence (AGI), also referred to as strong AI or deep AI, is the concept of a machine with general intelligence that mimics human intelligence and/or behaviours, with the ability to learn and apply its intelligence to solve any problem. AGI can think, understand, and act in a way that is indistinguishable from that of a human in any given situation.
- Artificial super intelligence (ASI), is the hypothetical AI that doesn't just mimic or understand human intelligence and behaviour; ASI is where machines become self-aware and surpass the capacity of human intelligence and ability.

3.Discuss the different types of AI based on capabilities and functionalities.

TYPES OF AI

REACTIVE
Has no memory, only responds to different stimuli

LIMITED MEMORY
Uses memory to learn and improve its responses

THEORY OF MIND
Understands the needs of other intelligent entities

SELF-AWARE
Has human-like intelligence and self-awareness

- This means such machines cannot use previously gained experiences to inform their present actions, i.e., these machines do not have the ability to "learn."

Limited memory machines are machines that, in addition to having the capabilities of purely reactive machines, are also capable of learning from historical data to make decisions. Nearly all existing applications that we know of come under this category of AI.

- While the previous two types of AI have been and are found in abundance, the next two types of AI exist, for now, either as a concept or a work in progress. Theory of mind AI is the next level of AI systems that researchers are currently engaged in innovating.
- Self-aware AI, which, self explanatorily, is an AI that has evolved to be so akin to the human brain that it has developed self-awareness. Creating this type of Ai, which is decades, if not centuries away from materializing, is and will always be the ultimate objective of all AI research.

4.What are the components of Smart Grid? Discuss the advantages and disadvantages of Smart Grid.

5.Technology was merely used to automate the most routine and monotonous tasks and cut down on the use of paper through digitization of health records while also aiding in the easy flow of this information among insurance companies, hospitals, and patients. Explain the applications of AI in healthcare sector.

6.What is IOT and IIoT?

MODULE 4

1.List out the role of smart phones in IOT.

- IoT for the average person is the smartphone because it is going to be everywhere and everyone carries a smartphone all day
- We use it for a large number of daily tasks to interact with other smart devices
- Interaction with IoT using a smartphone simply because this is the computing platform that we are most likely to have with us at any point in time
- Concerned that something is not quite right with our IoT-enabled device (e.g. when your own car got a "Check Engine" light), we will be able to run a professional vehicle scan diagnostic tool from our smartphone to read diagnostic trouble codes which is cheaper than bringing it to a professional car mechanic to diagnose the problem
- IoT means that consumers will have more options when it comes to smart devices (interaction with those devices through the smartphone)

- More possibilities like connecting your smartphone with a washing machine to get a graph to see the water usage and electricity over the past few weeks/months
- In all, every IoT device such as washing machines, refrigerators or cars are able to send and receive data to specially configured servers on the Internet – they are able to connect and communicate over the Internet.

2.What are the components of Smart Grid? Discuss the advantages and disadvantages of Smart Grid.

Smart Grid components are a group of intelligent appliances and heavy equipment that plays an important role in the generation, transmission, and the distribution of electrical energy. These appliances are smart enough to understand the working and how to utilize them.

Advantages of Smart Grid

A smart grid performs lots of smart work. so Advantages of the smart grid are as mentioned below.

- The smart grid provides better power management technologies through its integrated systems. This provides a better user interface.
- It has also provided with a better protective management system in case of emergency.
- It also provides a better supply and demand management.
- It has reduced Carbon emission Technology.
- Better Quality power.
- Lower cost of operation, maintenance, and management for both utility and consumers.
- It provides more efficient and improved security and protection.
- It has also provided the convenience of reading meters remotely. Meter readers will not have to appear physically to check the meter readings. It will all be done through IT resources.

Applications of Smart Grid

These are the *Applications of the smart grid*.

- Quick recovery after any disturbances in the transmission network.
- Reduction of generation coast.

- Reduction in peak demands.
- They improve the adeptness of transmission networks.
- They possess the ability to integrate other renewable energy sources through distributed generations and microgrids.

3.What are the Challenges in Internet of things? Discuss.

Security challenges in IoT :

1. **Lack of encryption –**
   Although encryption is a great way to prevent hackers from accessing data, it is also one of the leading IoT security challenges.
   These drives like the storage and processing capabilities that would be found on a traditional computer.
   The result is an increase in attacks where hackers can easily manipulate the algorithms that were designed for protection.

2. **Insufficient testing and updating –**
   With the increase in the number of IoT(internet of things) devices, IoT manufacturers are more eager to produce and deliver their device as fast as they can without giving security too much of although. Most of these devices and IoT products do not get enough testing and updates and are prone to hackers and other security issues.

3. **Brute forcing and the risk of default passwords –**
   Weak credentials and login details leave nearly all IoT devices vulnerable to password hacking and brute force. Any company that uses factory default credentials on their devices is placing both their business and its assets and the customer and their valuable information at risk of being susceptible to a brute force attack.

4. **IoT Malware and ransomware –**
   Increases with increase in devices. Ransomware uses encryption to effectively lock out users from various devices and platforms and still use a user's valuable data and info.
   Example –
   A hacker can hijack a computer camera and take pictures.
   By using malware access points, the hackers can demand ransom to unlock the device and return the data.

5. **IoT botnet aiming at cryptocurrency –**

IoT botnet workers can manipulate data privacy, which could be massive risks for an open Crypto market. The exact value and creation of cryptocurrencies code face danger from mal-intentioned hackers.

The blockchain companies are trying to boost security. Blockchain technology itself is not particularly vulnerable, but the app development process is.

4.Illustrate with block diagram the IOT working process/Architecture.

Architecture of IOT
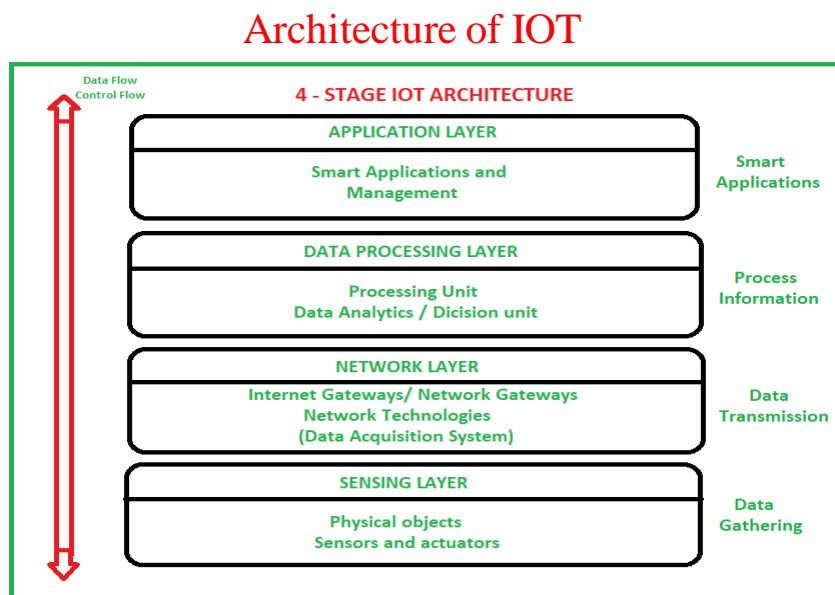
MODULE 5
   1. What is Cloud Computing?

Cloud computing is the delivery of different services through the Internet, including data storage, servers, databases, networking, and software. Cloud-based storage makes it possible to save files to a remote database and retrieve them on demand.

   2. Explain the architecture of AR System.
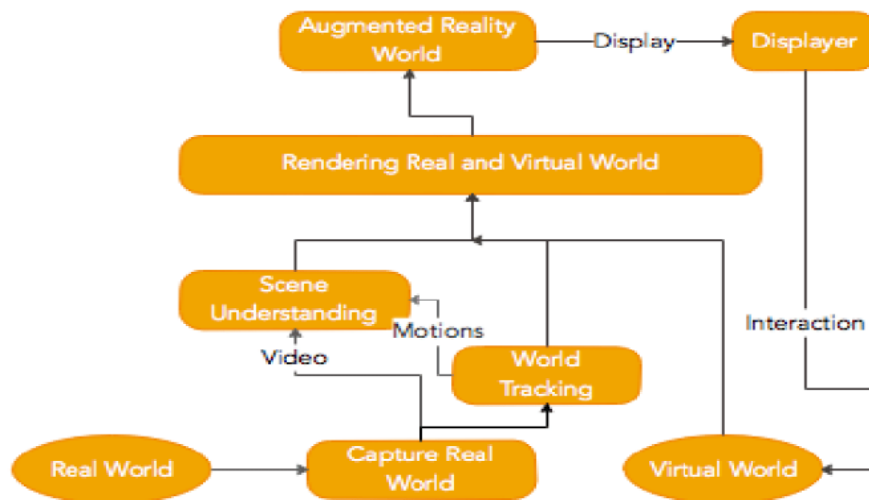
3. What is Digital Privacy?

Most Important Ethical Issues in Technology

- Misuse of Personal Information.
- Misinformation and Deep Fakes.
- Lack of Oversight and Acceptance of Responsibility.
- Use of AI.
- Autonomous Technology.
- Respect for Employees and Customers.
- Moral Use of Data and Resources.
- Responsible Adoption of Disruptive Tech.

4. Describe the applications of AR and VR

1. Classroom Gaming
2. Virtual Exploration
3. Practical Tasks
4. Overcoming Language Barriers
5. Special Learning

1. *Computer vision* is a field

MODULE 6

1. Describe the various ethical challenges in the usage of emerging technologies.

Most Important Ethical Issues in Technology

5. Misuse of Personal Information.
6. Misinformation and Deep Fakes.
7. Lack of Oversight and Acceptance of Responsibility.

8. Use of AI.
9. Autonomous Technology.
10. Respect for Employees and Customers.
11. Moral Use of Data and Resources.
12. Responsible Adoption of Disruptive Tech.

    2. What is additive manufacturing? Explain its significance with examples.

    3. Additive manufacturing (AM) or additive layer manufacturing (ALM) is the industrial production name for 3D printing, a computer controlled process that creates three dimensional objects by depositing materials, usually in layers.

    4. Significance:

    5. 1. Cost of Entry is Becoming More Affordable

    6. 2. It Is Easy to Change or Revise Versions of a Product

    7. 3. Training Programs Are Becoming Readily Available at All Levels

    8. 4. It Reduces Waste Production

    9. 5. It Saves on Energy Costs

    10. What is Computer Vision?
    11. Define Block Chain Technology and why it is important?

A blockchain is a distributed database that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems, such as Bitcoin, for maintaining a secure and decentralized record of transactions.

    12. It is an immutable public digital ledger, which means when a transaction is recorded, it cannot be modified

    13. Due to the encryption feature, Blockchain is always secure

    14. The transactions are done instantly and transparently, as the ledger is updated automatically

    15. As it is a decentralized system, no intermediary fee is required

    16. The authenticity of a transaction is verified and confirmed by participants

17. Blockchain Security
18. Increasing Government Accountability
19. Reducing Government Corruption
20. Public Procurement / Government Contracting
21. Land Title Registries
22. Electronic Voting
23. Beneficial Corporate Ownership Registries

24. Write short notes on
1. Virtual Reality and its types

non-immersive, semi-immersive, and fully-immersive simulations.

2. Quantum Computing

Quantum computing is a type of computation that harnesses the collective properties of quantum states, such as superposition, interference, and entanglement, to perform calculations. The devices that perform quantum computations are known as quantum computers.

Cyber Security

3. Cyber security is the application of technologies, processes and controls to protect systems, networks, programs, devices and data from cyber attacks. It aims to reduce the risk of cyber attacks and protect against the unauthorised exploitation of systems, networks and technologies.

25. Grant Disbursements

26. Autonomic Computing

Autonomic computing is a computer's ability to manage itself automatically through adaptive technologies that further computing capabilities and cut down on the time required by computer professionals to resolve system difficulties and other maintenance such as software updates.