Name of the chapter : **Introduction to Emerging Trends**

Topics Covered

- Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience(AR,VR),Robotics,Big data and its characteristics
- Internet of Things(IoT),Sensors,Smartcities,Cloud Computing and Cloud Services(SaaS, IaaS,PaaS);Grid Computing,Block chain technology.

Key Points

Artificial Intelligence (AI)

Artificial intelligence refers to devices or programmes that resemble human intelligence in order to carry out tasks and have the ability to iteratively improve themselves based on the data they gather

Machine Learning

Machine learning is a branch of artificial intelligence that enables computers to learn from data using statistical methods without explicit human programming. It includes algorithms that use information to learn on their own and anticipate the future.

Natural Language Processing (NLP)

Natural Language Processing (NLP) It deals with how people and computers communicate using human spoken languages like Hindi, English, etc. In fact, using our voice to conduct a web search, use a device, or control another device is achievable.

Virtual Reality – Virtual Reality (VR) is a three-dimensional, computer-generated situation that simulates the real world. The user can interact with and explore that environment by getting search immersed in it while interacting with the objects and other actions of the user.

Augmented Reality – The term "augmented reality" refers to the superimposition of computer-generated perceptual information over the actual physical surroundings (AR). Consider Pokémon Go as an illustration, where players look for animated characters that appear in their real-world surroundings on their phone or tablet.

Internet of Things (IoT)

The "Internet of Things" is a collection of interconnected devices that can connect to one another and exchange data in the same network or you can say, It is a overall network of interconnected devices as well as the technology that enables communication between them.

Sensors

Sensors are frequently used as monitoring and observing components. The development of IoT is being greatly aided by the evolution of smart electronic sensors. It will result in the development of fresh, intelligent systems with sensors.

smart city use the information and communication technologies (ICT), for creating, implementing, and promoting sustainable development methods to handle the issues of

expanding urbanization

Cloud Computing
Cloud computing is a new trend where computer-based services are supplied via the Internet or the cloud and are accessible to the user from any location using any device. C

Grid Computing
Grid computing refers to a network of computers from various administrative domains cooperating to complete a task. Grid computing enables simple completion of complicated tasks that may be intractable for a single computer machine.

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15 Objective Question (1 Mark)	
Q1.	**Which of the following is a characteristic of Cloud Computing?** A. Requires physical installation of software B. On-demand self-service C. Limited scalability D. No remote access
Ans	B. On-demand self-service
Q2.	**What is grid computing primarily designed to do?** A. Process data sequentially B. Connect individual computers into a single supercomputer C. Manage local area networks D. Improve internet speed
Ans	**B. Connect individual computers into a single supercomputer**
Q3.	**What is a block in a blockchain?** A. A unit of digital currency B. A collection of transactions C. A type of encryption key D. A computer algorithm
Ans	**B. A collection of transactions**
Q4.	**What is Natural Language Processing (NLP)?** A. A programming language used for web development B. A branch of artificial intelligence focused on the interaction between computers and human language C. A specialized type of computer hardware for linguistic tasks D. A type of human language translation service
Ans	**B. A branch of artificial intelligence focused on the interaction between computers and human language.**
Q5.	**Which cloud computing term refers to the practice of using a network of remote servers hosted on the internet to store, manage, and process data, rather than a local server or a personal computer?** A. Cloud Storage B. Cloud Computing C. Cloud Hosting

	D. Cloud Data
Ans	**B. Cloud Computing**
Q6.	**What is the main goal of machine learning?** A. To enable computers to make decisions without human intervention B. To replace human intelligence with artificial intelligence C. To eliminate the need for data in computer systems D. To make computers faster and more powerful
Ans	**A. To enable computers to make decisions without human intervention**
Q7.	**What does "decentralized" mean in the context of blockchain?** A. The technology is managed by a central authority B. The ledger is distributed across multiple computers or nodes C. It is only accessible by a single user D. It is controlled by a single company
Ans	**B. The ledger is distributed across multiple computers or nodes**
Q8.	**What is the primary difference between Augmented Reality and Virtual Reality?** A. Augmented Reality adds digital elements to the real world, while Virtual Reality creates a fully simulated environment. B. Augmented Reality is only used in the gaming industry, while Virtual Reality has broader applications. C. Augmented Reality requires specialized headsets, while Virtual Reality can be experienced on any device. D. Augmented Reality is completely independent of the real world, while Virtual Reality interacts with physical surroundings.
Ans	**A. Augmented Reality adds digital elements to the real world, while Virtual Reality creates a fully simulated environment.**
Q9.	**What is Artificial Intelligence (AI)?** A. A type of computer program B. The ability of machines to perform tasks that typically require human intelligence C. A branch of computer hardware engineering D. A form of virtual reality technology
Ans	**B. The ability of machines to perform tasks that typically require human intelligence**
Q10.	**Which of the following best defines the Internet of Things (IoT)?** A. A network of physical devices connected to the internet, capable of collecting and exchanging data. B. A virtual reality system for gaming and simulations. C. A system of interconnected computer servers used for data storage. D. A type of advanced computer programming language.
Ans	**A. A network of physical devices connected to the internet, capable of collecting and exchanging data.**
Q11	**What is one potential benefit of widespread IoT implementation?** • A. Reduced need for cybersecurity measures • B. Increased energy efficiency and resource conservation • C. Decreased reliance on cloud computing

	• D. Limited accessibility to data and information
Ans	**B. Increased energy efficiency and resource conservation**
Q12	**Which of the following is a characteristic of AI?** A. It only works in controlled laboratory environments B. It can learn and adapt from experience C. It is limited to a specific set of pre-programmed tasks D. It is exclusively used for playing video games
Ans	**B. It can learn and adapt from experience**
Q13	**Which cloud service model provides applications over the internet on a subscription basis?** A. Infrastructure as a Service (IaaS) B. Platform as a Service (PaaS) C. Software as a Service (SaaS) D. Function as a Service (FaaS)
Ans	**C. Software as a Service (SaaS)**
Q14	**What is the primary goal of robotics?** A. To create artificial intelligence capable of human-level cognition B. To build machines that can perform tasks or functions autonomously C. To develop virtual reality environments for simulation purposes D. To study the history of mechanical engineering
Ans	**B. To build machines that can perform tasks or functions autonomously**
Q15	**What does "algorithm" refer to in the context of AI?** A. A specific type of computer hardware used in AI B. A sequence of steps or rules followed by a computer to perform a task C. A type of virtual reality headset used in AI simulations D. A visual representation of data in AI systems
Ans	**B. A sequence of steps or rules followed by a computer to perform a task**
05 Assertion and reason Based question (1 Mark)	
(a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True	
Q1.	**Assertion:** Cloud computing reduces the need for physical infrastructure and on-premises hardware. **Reasoning:** In cloud computing, resources are hosted and managed by cloud service providers, eliminating the need for organizations to maintain their own physical servers and hardware.
Ans	(a) Both A and R are true and R is the correct explanation for A
Q2.	**Assertion:** IoT devices are interconnected physical objects capable of collecting and exchanging data over a network. **Reasoning:** IoT enables devices to communicate and share information, leading to increased automation and efficiency in various domains.

Ans	(a) Both A and R are true and R is the correct explanation for A .
Q3.	**Assertion:** Natural Language Processing (NLP) is an application of Artificial Intelligence. **Reasoning:** NLP involves enabling computers to understand, interpret, and generate human language.
Ans	(a) Both A and R are true and R is the correct explanation for A This statement is true. NLP is a field within AI that focuses on enabling computers to process and understand human language, including tasks like language translation, sentiment analysis, and chatbots.
Q4.	**Assertion:** Public blockchains allow anyone to participate in the network and validate transactions. **Reasoning:** In public blockchains, nodes compete to validate transactions through a process called mining.
Ans	(a) Both A and R are true and R is the correct explanation for A This statement is true. Public blockchains are open and permission less, allowing anyone to join the network, validate transactions, and participate in consensus mechanisms like Proof of Work (mining) to secure the network.
Q5.	**Assertion:** Software as a Service (SaaS) delivers electricity over the internet on a subscription basis. **Reasoning:** SaaS applications are hosted and maintained by a service provider, eliminating the need for users to install or manage the software locally.
Ans	(d) A is false but R is True
05 Short Knowledge/Understanding/Application Based Questions (2 Marks)	
Q1.	**What is the significance of Machine Learning in Artificial Intelligence?**
Ans	Machine Learning is a subset of Artificial Intelligence that focuses on enabling machines to learn from data and improve their performance on specific tasks without being explicitly programmed. It allows AI systems to recognize patterns, make predictions, and learn from experience. Machine Learning is crucial in building AI models that can adapt to new information and perform tasks more accurately as they are exposed to more data. These questions aim to assess your understanding of fundamental concepts in Artificial Intelligence, including its goals, types of AI, and the role of Machine Learning.
Q2.	**What is Machine Learning?**
Ans	Machine Learning is a subset of AI that involves the development of algorithms that enable computers to learn from data and improve their performance on specific tasks without being explicitly programmed.
Q3.	**Define Robotics and provide an example of a real-world application where robotics is commonly used.**
Ans	• **Definition:** Robotics refers to the interdisciplinary field of engineering and computer science that focuses on the design, construction, operation, and use of robots. • **Example Application:** Manufacturing Industry - Robots are commonly used

	in manufacturing processes for tasks like welding, assembly, painting, and packaging.
Q4.	**What are some common applications of Augmented Reality (AR)?**
Ans	• **Gaming:** AR games, like Pokémon Go, use the real world as a backdrop and superimpose virtual elements for an interactive experience. • **Navigation and Wayfinding:** AR can provide visual directions and information about the user's surroundings in real time, helping with navigation. • **Education and Training:** AR can enhance learning by providing interactive and immersive educational experiences. • **Retail and E-commerce:** AR allows customers to virtually try on clothing, visualize furniture in their homes, or see products in 3D before making a purchase. • **Industrial and Maintenance:** AR can provide real-time guidance for technicians during complex tasks, overlaying information on machinery or equipment.
Q5.	**How does Grid Computing differ from other computing paradigms like Cluster Computing or Cloud Computing?**
Ans	**Cloud Computing:** Cloud computing involves accessing computing resources (like servers, storage, databases, networking, etc.) over the internet through a service provider's infrastructure. It is highly scalable and provides on-demand access to resources, while grid computing often involves a network of resources contributed by multiple organizations or entities.
05 Short Knowledge/Understanding/Application Based Questions (3 Marks)	
Q1.	**What are the three primary service models in cloud computing? Provide examples for each.**
Ans	1. **Infrastructure as a Service (IaaS):** • **Definition:** IaaS provides virtualized computing resources over the internet. Users can rent virtual machines, storage, and networking resources on a pay-as-you-go basis. • **Example:** Amazon Web Services (AWS) Elastic Compute Cloud (EC2) provides virtual servers (instances) that users can rent to run applications or host websites. Users have control over the operating system, software, and network configuration. 2. **Platform as a Service (PaaS):** • **Definition:** PaaS offers a platform that allows developers to build, deploy, and manage applications without having to worry about the underlying infrastructure. It provides a framework and environment for application development. • **Example:** Google App Engine allows developers to build, deploy, and scale applications without managing the underlying infrastructure. It supports various programming languages like Python, Java, and Go. 3. **Software as a Service (SaaS):** • **Definition:** SaaS delivers software applications over the internet on a subscription basis. Users can access these applications through a web browser, without needing to install or maintain them on their local devices. • **Example:** Salesforce is a customer relationship management (CRM)

	platform delivered as a SaaS. Users can access Salesforce through a web browser to manage customer relationships, sales pipelines, and more.
Q2.	**Provide three real-world applications where AI is currently being utilized and briefly describe how it benefits those applications.**
Ans	Any three valid examples.
Q3.	**What is Augmented Reality (AR) and how does it differ from Virtual Reality (VR)?**
Ans	• **Augmented Reality (AR):** AR is a technology that overlays digital information, such as images, sounds, or text, onto the real world. This can be done through devices like smartphones, tablets, or AR headsets. AR enhances the user's perception of the real world by adding virtual elements. • **Virtual Reality (VR):** VR immerses users in a completely virtual environment. It typically involves the use of a VR headset that completely covers the user's field of vision, replacing the real world with a computer-generated environment. VR aims to create a sense of presence, making the user feel like they are physically present in a different world.
Q4.	**What is Cloud Computing and how does it differ from traditional computing?**
Ans	**Cloud Computing:** Cloud computing refers to the delivery of computing services (such as storage, processing, networking, databases, etc.) over the internet. It allows users to access and use resources hosted on remote servers, which are maintained and managed by a cloud service provider. **Difference from Traditional Computing:** In traditional computing, applications and data are stored and processed on local computers or on-premises servers. In contrast, cloud computing offloads these tasks to remote servers, providing scalability, accessibility, and cost-efficiency benefits.
Q5.	**What is the purpose of Natural Language Processing (NLP) in AI?**
Ans	Natural Language Processing (NLP) is a branch of AI that focuses on enabling computers to understand, interpret, and generate human language. It allows machines to interact with and process text or speech data, enabling tasks like language translation, sentiment analysis, and chatbot interactions.**02 Marks** Valid e.g**1 mark**
05 Short Knowledge/Understanding/Application Based Questions (4 Marks)	
Q1.	**Define Blockchain and explain its key characteristics.**
Ans	Blockchain is a decentralized and distributed digital ledger technology that records transactions across multiple computers in a way that ensures security, transparency, and immutability. **Key Characteristics:** 1. **Decentralization:** No single entity or authority has control over the entire blockchain network. 2. **Distributed Ledger:** The ledger is maintained by a network of nodes, and every participant has a copy of the entire ledger. 3. **Immutability:** Once a transaction is added to the blockchain, it cannot be altered or deleted. 4. **Transparency:** All transactions are visible to all participants in the network. 5. **Security:** Blockchain uses cryptographic techniques to secure transactions

	and prevent unauthorized alterations.
Q2.	**Discuss one potential challenge or limitation in the field of AI and propose a possible solution to address it.**
Ans	One potential challenge in the field of AI is the issue of bias and fairness. When these biases are not addressed, AI models can perpetuate and even amplify existing social, cultural, or economic inequalities. This can result in discriminatory outcomes, particularly in sensitive areas like hiring, lending, or criminal justice. **Proposed Solution:** 1. **Diverse and Representative Training Data:** 2. **Bias Detection and Mitigation:** 3. **Transparent and Explainable Models:** 4. **Diverse Development Teams:** 5. **Ongoing Monitoring and Evaluation:** 6. **User Feedback and Accountability:** 7. **Regulations and Standards:**
Q3.	**What are the key advantages of Grid Computing?**
Ans	1. **Resource Sharing:** Grid computing allows organizations to share resources across different locations, optimizing resource utilization and reducing the need for excess capacity. 2. **Cost Efficiency:** By pooling resources, organizations can save costs associated with maintaining dedicated infrastructures for specific tasks. 3. **High Performance and Scalability:** Grids can provide significant computational power by harnessing the combined capabilities of multiple machines, making it suitable for large-scale, computationally intensive tasks. 4. **Flexibility and Load Balancing:** Grid systems can dynamically allocate resources based on demand, ensuring optimal performance and balancing workloads. 5. **Fault Tolerance:** Grids often incorporate redundancy and failover mechanisms to ensure continued operation even in the event of hardware failures.
Q4.	**What are the key characteristics of cloud computing?**
Ans	1. **On-Demand Self-Service**: Users can provision and manage computing resources as needed, without requiring human intervention from the service provider. 2. **Broad Network Access**: Cloud services can be accessed over the internet via various devices like laptops, smartphones, tablets, etc. 3. **Resource Pooling**: Cloud providers use multi-tenant models, where resources are pooled together and shared among multiple users, ensuring efficient resource utilization. 4. **Rapid Elasticity**: Cloud resources can be rapidly scaled up or down based on demand. This allows for flexibility in resource allocation. 5. **Measured Service**: Cloud resources usage can be metered, monitored, and billed based on actual usage. This provides transparency and cost control for users.

Q5.	**What is a blockchain and how does it ensure security and transparency in transactions? Provide an example scenario.**
Ans	**Blockchain Definition:** **Security and Transparency:** 1. **Cryptography:** Transactions are secured using cryptographic techniques. Each transaction is verified and recorded in a way that makes it extremely difficult to alter or forge. 2. **Decentralization:** The ledger is maintained by a network of nodes (computers) rather than a central authority. This decentralization reduces the risk of a single point of failure or malicious attack. 3. **Consensus Mechanisms:** Blockchain networks use consensus algorithms (e.g., Proof of Work, Proof of Stake) to validate and agree on the state of the ledger. This ensures that all nodes agree on the validity of transactions. **Example Scenario:** Consider a scenario where Alice wants to send 5 Bitcoins to Bob using a blockchain-based cryptocurrency. When Alice initiates the transaction, it is broadcasted to the network. Miners validate the transaction using cryptographic algorithms, and once verified, the transaction is grouped with others into a block. This block is then added to the blockchain, creating a permanent record of the transaction. The ledger is updated across all nodes in the network, providing transparency. If anyone attempts to alter the transaction, it would require the consensus of a majority of nodes, making it computationally infeasible.
05 Case Based Questions (5 Marks)	
Q1.	ABC Corporation implemented an AI-powered chatbot to enhance their customer service experience. The chatbot uses Natural Language Processing (NLP) to understand customer queries and provide relevant responses. It is designed to handle common inquiries, such as order status, product information, and troubleshooting. **Question 1:** What technology does the chatbot in this case study primarily rely on? A) Machine Learning B) Natural Language Processing (NLP) C) Computer Vision D) Neural Networks **Question 2:** What is the main purpose of implementing the chatbot? A) Enhance customer service B) Streamline internal communication C) Monitor employee performance D) Improve product development **Question 3:** What type of inquiries is the chatbot designed to handle? A) Technical support only B) Common inquiries C) Legal inquiries D) Marketing inquiries **Question 4:** How does the chatbot understand and respond to customer queries? A) Through complex algorithms B) By analyzing facial expressions C) Using Natural Language Processing (NLP) D) By accessing external databases **Question 5:** What is one potential benefit of using a chatbot in customer service? A) Decreased customer satisfaction B) Reduced response time

	C) Limited scalability D) Increased manual workload
Ans	*Solution 1:* B) Natural Language Processing (NLP) *Solution 2:* A) Enhance customer service *Solution 3:* B) Common inquiries *Solution 4:* C) Using Natural Language Processing (NLP) *Solution 5:* B) Reduced response time
Q2.	ABC Web Services, a web hosting company, transitioned their hosting infrastructure to the cloud. They chose a cloud provider known for its reliability and scalability. This allows ABC Web Services to easily handle fluctuations in website traffic and provide a seamless experience for their clients. *MCQ Questions:* **Question 1:** Why did ABC Web Services transition their hosting infrastructure to the cloud? A) To reduce website traffic B) To handle fluctuations in website traffic and provide scalability C) To limit their hosting options D) To decrease reliability **Question 2:** What is one benefit of using a reliable cloud provider for web hosting? A) Limited scalability options B) Reduced accessibility C) Ability to handle fluctuations in website traffic D) Decreased security **Question 3:** How does cloud hosting help ABC Web Services with scalability? A) It restricts website traffic B) It allows for easy adjustment of resources based on demand C) It limits the number of websites hosted D) It does not affect scalability **Question 4:** What is one potential benefit of using cloud hosting for web services? A) Limited control over resources B) Inability to handle fluctuations in traffic C) Improved website performance and reliability D) Higher costs compared to traditional hosting **Question 5:** What is one consideration ABC Web Services should have regarding data security when using cloud hosting? A) No need to worry about data security B) Ensuring proper security measures and encryption are in place C) Ignoring data security concerns D) Reliance solely on the cloud provider for security
Ans	*Solution 1:* B) To handle fluctuations in website traffic and provide scalability *Solution 2:* C) Ability to handle fluctuations in website traffic *Solution 3:* B) It allows for easy adjustment of resources based on demand *Solution 4:* C) Improved website performance and reliability *Solution 5:* B) Ensuring proper security measures and encryption are in place
Q3.	ABC Corporation, a global food distributor, implemented a blockchain-based supply chain solution. The system tracks the journey of food products from the farm to the consumer's table. Each step of the process, including harvesting, processing, packaging, and transportation, is recorded on the blockchain. This provides consumers with transparent and verifiable information about the origin and handling of the food they consume.

	MCQ Questions: **Question 1:** What is the primary purpose of implementing blockchain in ABC Corporation's supply chain? A) To decrease transparency in the supply chain B) To provide consumers with transparent and verifiable information about the origin and handling of food products C) To limit the tracking of food products D) To reduce the efficiency of the supply chain **Question 2:** How does the blockchain system record information in this supply chain? A) By storing physical labels on food products B) By recording each step of the process on the blockchain C) By encrypting data on a central server D) By using a centralized database **Question 3:** What benefit does the blockchain-based system provide to consumers? A) Limited information about the origin of food products B) Transparent and verifiable information about the journey of food products C) Reduced accessibility to information D) Decreased trust in the supply chain **Question 4:** What is one potential advantage of using blockchain in the food supply chain? A) Decreased consumer trust B) Enhanced traceability and accountability in the supply chain C) Limited access to information D) Increased inefficiency in tracking products **Question 5:** What type of data is primarily recorded on the blockchain in this case study? A) Financial transactions B) Information about the origin and handling of food products C) Personal identification information D) Entertainment content
Ans	*Solution1 :* B) To provide consumers with transparent and verifiable information about the origin and handling of food products *Solution 2:* B) By recording each step of the process on the blockchain *Solution3 :* B) Transparent and verifiable information about the journey of food products *Solution 4:* B) Enhanced traceability and accountability in the supply chain *Solution 5:* B) Information about the origin and handling of food products
Q4.	ABC Retail, a multinational clothing brand, integrated augmented reality (AR) into their mobile app. Customers can use the app to virtually try on clothes before making a purchase. The AR feature superimposes virtual clothing onto the customer's live video feed, allowing them to see how the clothes fit and look in real-time. *MCQ Questions:* **Question 1:** What is the main application of AR in ABC Retail's case study? A) Virtual tour of the store B) Virtual try-on of clothes C) Online payments D) Virtual store navigation **Question 2:** How does the AR feature work in the ABC Retail app? A) By providing a 360-degree view of the store B) By superimposing virtual clothing onto the customer's live video feed C) By offering augmented reality games D) By providing product descriptions **Question 3:** What is one benefit of using AR in retail for customers? A) Limited access to products B) Ability to virtually try on clothes before purchasing

	C) Reduced interaction with store staff D) Decreased product variety **Question 4:** What is one potential advantage for ABC Retail in implementing AR? A) Decreased customer engagement B) Enhanced customer experience and increased conversion rates C) Reduced use of technology D) Limited customer interaction **Question 5:** What type of technology is primarily used in this case study? A) Virtual Reality (VR) B) Augmented Reality (AR) C) Mixed Reality (MR) D) Artificial Intelligence (AI)
Ans	*Solution 1:* B) Virtual try-on of clothes *Solution 2:* B) By superimposing virtual clothing onto the customer's live video feed *Solution 3:* B) Ability to virtually try on clothes before purchasing *Solution 4:* B) Enhanced customer experience and increased conversion rates *Solution 5:* B) Augmented Reality (AR)
Q5.	XYZ Consulting, a small business, decided to migrate their data storage to the cloud. They opted for a popular cloud storage service that offers secure, scalable, and cost-effective storage solutions. The cloud storage allows XYZ Consulting to access their files from anywhere with an internet connection and enables easy collaboration among team members. *MCQ Questions:* **Question 1:** What is one benefit of using cloud storage for XYZ Consulting? A) Limited access to files B) Scalable and cost-effective storage C) Restricted collaboration options D) Dependence on physical hardware **Question 2:** Why did XYZ Consulting choose to migrate their data storage to the cloud? A) To decrease accessibility B) To limit collaboration C) To access files from anywhere with an internet connection D) To increase dependence on physical hardware **Question 3:** What is a key advantage of using a cloud storage service? A) Decreased security B) Limited storage capacity C) Easy collaboration among team members D) Higher costs compared to physical storage **Question 4:** How does cloud storage benefit XYZ Consulting in terms of scalability? A) It provides limited storage options B) It allows for easy expansion of storage capacity as needed C) It restricts access to files D) It does not affect storage capacity **Question 5:** What is one potential risk of relying solely on cloud storage? A) Limited accessibility to files B) Dependency on physical hardware C) Data security concerns D) Difficulty in collaboration
Ans	*Solution 1:* B) Scalable and cost-effective storage *Solution 2:* C) To access files from anywhere with an internet connection *Solution 3:* C) Easy collaboration among team members *Solution 4:* B) It allows for easy expansion of storage capacity as needed *Solution 5:* C) Data security concerns