

BTEC Level 3 Information Technology

Unit 1: Information Technology Systems Study Cards

- What are the main types of digital devices that form part or all of IT systems?
- Multifunctional devices, personal computers, mobile devices, servers, entertainment systems, digital cameras, navigation systems, data capture and collection systems, communication devices and systems.

- What are some of the main functions and uses of digital devices?
- Education and training, personal use, social use, retail, organisational use for business operations and information dissemination, creative tasks.

What are some examples of peripheral devices used with digital devices in an IT system?

- Input devices like keyboards, output devices like printers, and storage devices like external hard drives.

What is the difference between manual and automatic data processing?

- Manual data processing involves human operators, while automatic data processing uses computing technology.

What are some examples of accessibility devices used with IT systems?

- Screen readers, alternative keyboards, speech recognition software.

What are the main types of operating systems?

- Real-time operating system, single-user single task, single-user multi-tasking, multi-user.

What are some roles of the operating system?

- Networking, security, memory management, multi-tasking, device drivers.

What are some factors that affect the choice and use of operating systems?

- User experience, user needs, specifications, compatibility, connectivity, cost, efficiency, implementation timescales.

What is utility software and what affects its use?

- Software designed to help manage, maintain, and optimize computer systems. Factors are user needs, efficiency, compatibility.

What is application software and what affects its use?

- Software designed to carry out specific tasks like word processing or accounting. Factors are user experience, cost, productivity.

What are some common file types used for images, video, and applications?

- Images: JPG, PNG, GIF.
- Video: MP4, MOV, AVI.
- Applications: DOC, XLS, PPT.

What are some examples of emerging technologies that affect IT systems?

- Artificial intelligence, quantum computing, blockchain, augmented reality, 3D printing.

What are some key factors affecting choice of digital technology for an IT system?

- User experience, user needs, specifications, compatibility, connectivity, cost, efficiency, security.

What are some examples of wireless connection methods?

- WiFi, Bluetooth, infrared, cellular networks.

What are some examples of wired connection methods?

- Ethernet, USB, HDMI.

What are some types of networks used to connect devices?

- PAN, LAN, WAN, VPN.

What protocols are used for common internet tasks?

- HTTP for web pages, SMTP/IMAP/POP3 for email, VoIP for internet calls, SSL/TLS for secure payments.

What factors affect network bandwidth and latency?

- Number of users, device capabilities, network infrastructure, distance, network congestion.

What are two main types of data compression?

- Lossy and lossless compression.

What are some personal uses of cloud storage and computing?

- File storage and backup, media storage, application access, collaboration.

What are some implications of using cloud services instead of local storage and systems?

- Reliance on internet connectivity, data privacy concerns, recurring subscription costs

What are some ways of interacting with online communities?

- Social media, blogs, wikis, chat rooms, instant messaging, podcasts, forums.

What are some threats to data security and integrity?

- Malware, hackers, accidental damage, unauthorized access.

What are some methods of protecting data?

- Passwords, encryption, backups, antivirus software, firewalls, physical security.

What legislation helps protect user data and systems?

- Data protection laws, computer misuse laws, privacy regulations.

What are some uses of online services for retail and financial sectors?

- Online shopping, mobile e-commerce, internet banking, investment platforms.

What are some impacts of IT systems on business productivity?

- Improved efficiency, employee training needs, new security issues, reliance on technology.

What are some common sources of data for analysis?

- Surveys, questionnaires, government datasets, scientific measurements.

What are some methods to ensure accuracy of collected data?

- Verification, validation, quality control protocols.

What are some ways to present analyzed data or results?

- Reports, dashboards, graphs, charts, diagrams, summaries.

What are some moral concerns related to use of IT systems?

- Privacy, censorship, acceptable use policies, digital divides in access.

What legislation helps ensure accessibility of IT systems?

- Disability discrimination laws, website accessibility standards and guidelines.

What are some purposes of professional IT codes of practice?

- Setting standards, promoting security, establishing responsibilities, defining best practices.

What legislation covers computer misuse?

- Computer Misuse Act in the UK, CFAA in the US.

How can the design of user interfaces impact the use of a data system?

- Improving ease of use, reducing errors, increasing accessibility.

What are some business uses of IT systems for core functions?

- Inventory and supply chain management, data analysis, office productivity, security systems.

What are some ways transactional data is generated and used?

- By collecting user data from site visits, purchases, account usage. Used for marketing.

What are some risks from threats to data security and integrity?

- Financial loss, identity theft, service disruptions, loss of confidential data.

Why is validating data inputs important for data accuracy?

- To check for errors, inconsistencies, missing information, or nonsensical values.

How do latency and bandwidth affect performance of networks?

- Higher latency and lower bandwidth lead to slower transfers and more lag.

What are IT help desks and what is their role?

- A service that provides technical support and assistance to system users.

What is the purpose of encrypting stored and transmitted data?

- Protecting confidentiality and integrity of data by making it unreadable to unauthorized parties.

What are some impacts of consumer rights laws regarding IT systems?

- Protecting users from defects, errors, or misrepresentation. Allows recourse if issues arise.

Why must care be taken when collecting user opinions and survey data?

- To avoid bias, leading questions, or breaches of ethics and privacy.

What are some potential IT implementation issues for a business?

- Employee training, system downtime, testing, data migration, roll back plans if issues emerge.

What are some ways IT has impacted organizations?

- Telecommuting, global operations, increased productivity, reliance on technology.

What is the purpose of website accessibility standards like WCAG?

- To ensure equal accessible to websites for those with disabilities.

What is data modeling and what is it used for?

- Representing data, entities, relationships for analysis and database design. Helps understand business information.

What are some ways emerging technologies will impact IT systems?

- Improved connectivity, processing power, human-computer interaction, automation, data capabilities.

Why must care be taken when collecting and analyzing personal data?

- To protect privacy of individuals and adhere to relevant regulations and laws.

- Explain the role and functions of codecs when transmitting audio and video over digital networks. What factors need to be considered when selecting an appropriate codec?
- Codecs balance compression ratio, quality, and computational requirements. Lossy codecs like MP3 reduce file sizes but lose some fidelity. Ideal codec depends on available bandwidth, device capabilities, and needed quality.

- Discuss potential security vulnerabilities that can arise with the widespread adoption of IoT devices and emerging technologies. What measures can be taken to mitigate these risks?
- IoT security risks include unpatched vulnerabilities, insecure connections, and lack of encryption. Measures like network segmentation, access controls, and encryption can help.

- Analyze the tradeoffs between open source and proprietary operating systems and software. Compare their advantages, disadvantages, and implications for use in personal and professional contexts.
- Open source advantages are cost, customization, and community support. Proprietary offers user support and integrated features. Implications depend on user needs and capabilities.

- Assess the impacts of legislation such as GDPR, CCPA, and data protection acts on how businesses and organizations collect, process, store, and transmit user data. How have practices had to adapt to increased regulation?
- Legislation adds compliance burdens but protects user privacy. Practices adapt through data minimization, consent requirements, deletion protocols, restricted processing activities.

- Evaluate the effectiveness of IT systems used for core business functions such as inventory management, data analysis, and internal communications. How could systems be improved or optimized to increase productivity?
- Improvement areas may include reducing redundant data entry, integrating systems, workflow automation, upgraded inventory tracking capabilities, real-time data analytics.

- Discuss the role of professional codes of practice in the ethical use of IT systems. Provide examples of how adherence to standards protects individuals and promotes responsible computing.
- Adherence to standards and ethical codes promotes user trust, responsible disclosure, accessibility, system integrity. Examples include showing care with user data, avoiding conflicts of interest.

- Analyze a corporate IT breach or cyberattack case study. Assess the vulnerabilities or security failures that enabled the attack, the impacts on the organization, and what preventative measures could have been taken.
- Analysis should cover factors that enabled the breach, damage to organization, and security holes that need addressing - like inadequate access controls or unpatched systems.

- Compare and contrast IT implementation approaches such as direct cutover, pilot testing, and parallel operations. What are the advantages and risks associated with each? When are they appropriate to use?
- Each implementation approach has tradeoffs in downtime, resource needs, and rollback options. Choice depends on scale, complexity, and criticality.

- Assess the impacts of social media and online communities on society, relationships, and mental health. How does anonymity affect online behavior and discourse? What responsibilities do platforms have?
- Anonymity can promote harmful behavior due to reduced accountability. Responsibilities include content moderation, harassment policies, age limits.

- Discuss the environmental impacts of electronic waste from IT systems and devices. What disposal methods are most responsible? How can resource extraction, manufacturing, and recycling processes be made more sustainable?
- Proper e-waste disposal prevents toxic materials entering landfills. Improved design, recyclability, and responsible sourcing/manufacturing can reduce environmental impacts.