Information System Management

Topics to cover

Chapter 1: Information Systems and Management

- Basics of IS management (definition, importance, benefits, trends, leadership role)
- IS organizations and planning (strategic, tactical, operational, sense-and-respond, techniques)
- CIO and IT leadership (roles, responsibilities, qualifications, CIO vs IT director)
- IS in business & strategy (role of IT, strategic uses, value chain analysis, digital Bangladesh)
- Information systems vs Information technology (components, challenges, decision support)
- Management Information Systems (MIS – definition, characteristics, importance)
- E-business & E-commerce basics
- Information system security and management tools
- Impact of AI in MIS

Chapter 2: Managing Essential Technologies

- Architecture vs infrastructure, IT infrastructure levels
- Distributed systems (attributes, types, examples)
- Open source, server-based vs peer-to-peer computing
- Telecommunications (definition, roles, elements, future, costs, technologies)
- Databases & data concepts (data vs information vs knowledge, models, data warehouse, 3-level DB concept)
- Information governance, security & privacy management
- Enterprise Resource Planning (ERP – benefits, challenges, cloud vs on-premise)
- Structured vs unstructured data, data visualization, business intelligence
- Cloud computing, ECS (Enterprise Collaboration System), TCP/IP model, network topology

Chapter 3: Managing System Development

- System development basics (phases, structured development, prototyping, 4GL, CASE tools)
- Object-oriented development & system integration approaches
- ERP systems (integration, middleware, inter-organizational systems)
- Project management (PMP, project manager roles, legacy system improvement)
- IS governance, success factors, content management systems
- Functional business systems

Chapter 4: Systems for Supporting Knowledge Work

- Decision Support Systems (DSS) and Executive Support Systems (ESS)
- Knowledge Management Systems (KMS) – role, benefits, challenges, process, components
- Data mining (definition, techniques, process, challenges, ethics, legal implications)
- Expert systems & executive information systems
- Customer Relationship Management (CRM) – phases, benefits, challenges
- Real-time enterprise and collaboration tools (groupware, virtual workplaces, virtual organizations)
- Intellectual capital (human, structural, relational)
- MIS vs DSS, Business Intelligence, GDSS

Chapter 5: Acquisition of Hardware, Software, Networks, and Services

- RFP (Request For Proposal) & RFQ (definitions, benefits, differences)
- Software acquisition (methods: buying, leasing, outsourcing, in-house development)
- Outsourcing (strategies, objectives, advantages & disadvantages)
- Purchase & evaluation of alternatives (AoA, MOA, stages, criteria)
- Software acquisition contracts (licensing, support, warranties)

Chapter 6: People and Technology

- Work environment (definition, adjustment strategies, good environment)
- Self-organizing principles & teams (definition, principles, self-organization vs self-management)
- Learning organizations (characteristics, benefits, examples)
- Digital mindset (definition, benefits, impact on mindset)
- Camel technology/software (special topic)
- IT executives (roles, importance, required skills)
- Networks (value, benefits)
- Problems of traditional file environment

A) Abbreviations that **appear in Syllabus** (exact matches)

- **IS** — *Information Systems*.
- **IT** — *Information Technology*.
- **CIO** — *Chief Information Officer*.
- **COX** — *"COX model for IT"* (named as such in your syllabus; follow your class notes for the intended model).
- **MIS** — *Management Information System*.
- **TPS** — *Transaction Processing System*.
- **AI** — *Artificial Intelligence* (e.g., "impact of AI in MIS").
- **ERP** — *Enterprise Resource Planning*.
- **TCP/IP** — *Transmission Control Protocol / Internet Protocol* (TCP/IP model).
- **ECS** — *Enterprise Collaboration System*.
- **CASE** — *Computer-Aided Software Engineering*.
- **PMP** — *Project Management Professional*.
- **SOA** — *Service-Oriented Architecture*.

- **DSS** — *Decision Support System*.
- **ESS** — *Executive Support System*.
- **CRM** — *Customer Relationship Management*.
- **RFP** — *Request for Proposal*.
- **RFQ** — *Request for Quotation*.
- **AoA** — *Alternative Analysis / Analysis of Alternatives* (given explicitly as "AoA (alternative analysis)").
- **MOA** — Commonly *Memorandum of Agreement* (sometimes *Memorandum of Association* in business law—use your course context).
- **AOA** — In your list paired with MOA ("Difference between MOA and AOA"); often *Articles of Association* in business contexts.

> Note: Terms like **E-business**/**E-commerce** are written with the "E-" prefix (not as standalone acronyms) in previous year questions.

B) Near-relevant acronyms to know (frequently examined alongside these topics)

Strategy, governance & value

- **ITIL** (IT Infrastructure Library), **COBIT** (Control Objectives for Information & Related Technologies), **TOGAF** (The Open Group Architecture Framework), **BSC** (Balanced Scorecard), **KPI** (Key Performance Indicator), **CSF** (Critical Success Factor), **ROI** (Return on Investment), **TCO** (Total Cost of Ownership), **NPV** (Net Present Value), **IRR** (Internal Rate of Return), **SISP** (Strategic Information Systems Planning).

Procurement & contracts

- **RFI** (Request for Information), **SOW** (Statement of Work), **SLA** (Service Level Agreement), **MSA** (Master Services Agreement), **NDA** (Non-Disclosure Agreement), **PO** (Purchase Order).

Architecture, integration & web services

- **API** (Application Programming Interface), **REST**, **SOAP**, **WSDL**, **UDDI**, **XML**, **JSON**, **EAI** (Enterprise Application Integration), **EDI** (Electronic Data Interchange), **BPM** (Business Process Management), **BPMN** (Business Process Model & Notation).

Systems development & project management

- **SDLC** (Systems Development Life Cycle), **UML** (Unified Modeling Language), **OOP** (Object-Oriented Programming), **RAD** (Rapid Application Development), **JAD** (Joint Application Development), **CI/CD** (Continuous Integration/Continuous Delivery), **TDD** (Test-Driven Development), **UAT** (User Acceptance Testing), **SIT** (System Integration Testing), **WBS** (Work Breakdown Structure), **PERT**, **CPM**.

Data, analytics & warehousing

- **DBMS** (Database Management System), **RDBMS** (Relational DBMS), **NoSQL**, **OLTP** (Online Transaction Processing), **OLAP** (Online Analytical Processing), **ETL** (Extract, Transform, Load), **BI** (Business Intelligence), **KDD** (Knowledge Discovery in Databases), **DWH/DW** (Data Warehouse), **Data Lake** (term, not an acronym).

Security & privacy

- **CIA** (Confidentiality–Integrity–Availability), **IAM** (Identity & Access Management), **RBAC** (Role-Based Access Control), **MFA** (Multi-Factor Authentication), **SSO** (Single Sign-On), **PKI** (Public Key Infrastructure), **DLP** (Data Loss Prevention), **SIEM** (Security Information & Event Management), **IDS/IPS** (Intrusion Detection/Prevention System), **VPN** (Virtual Private Network), **GDPR** (General Data Protection Regulation), **HIPAA** (Health Insurance Portability and Accountability Act).

Networking & telecom

- **LAN**, **WAN**, **MAN**, **WLAN**, **PAN**, **DNS**, **DHCP**, **QoS**, **VoIP**.

Cloud & operations

- **IaaS**, **PaaS**, **SaaS**, **FaaS**, **VM** (Virtual Machine), **BYOD** (Bring Your Own Device), **SRE** (Site Reliability Engineering).

Enterprise & knowledge systems

- **SCM** (Supply Chain Management), **SRM** (Supplier Relationship Management), **PLM** (Product Lifecycle Management), **HRIS/HRMS** (HR Information/Management System), **KMS** (Knowledge Management System), **EIS** (Executive Information System), **GDSS** (Group Decision Support System), **ECM** (Enterprise Content Management), **CMS** (Content Management System), **LMS** (Learning Management System), **RTE** (Real-Time Enterprise), **RPA** (Robotic Process Automation).

Quick study tip

Use Section **A** to memorize the exact acronyms your instructor already used, then skim Section **B** to fill common gaps (many of those appear implicitly in your questions—e.g., web services standards, BI/ETL, SDLC).

Chapter 1 – Information Systems and Management (Detailed Notes)

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1. Information Systems Management (ISM)

Information Systems Management is the process of planning, organizing, controlling, and overseeing the resources and activities related to an organization's **information systems** (IS). IS includes hardware, software, databases, networks, and human resources that work together to collect, process, store, and distribute information.

- ISM ensures that information systems are **aligned with business goals**.
- Responsibilities include system acquisition, maintenance, security, budgeting, and ensuring that IT investments provide measurable value.
- Example: A retail company managing its ERP, CRM, and supply chain systems so they all support smooth operations and customer satisfaction.

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2. Importance of IS Management in Business

- Businesses rely heavily on information systems to remain competitive.
- IS management ensures **timely, accurate, and relevant information** for decision-making.
- It improves **efficiency**, supports **customer service**, and allows **automation** of routine processes.
- It also enables **data-driven strategies** and helps adapt to changes in the global market.
- Example: Banks using IS management to provide mobile apps for customer access while ensuring security.

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3. Benefits of IS Management

1. **Operational efficiency** – Streamlined processes and reduced manual work.
2. **Cost reduction** – Automation lowers resource and labor costs.
3. **Improved decision-making** – Real-time reports and dashboards.
4. **Competitive advantage** – Organizations can innovate and adapt faster.
5. **Security & compliance** – Protects sensitive data, ensures legal compliance.
6. **Customer satisfaction** – Enhances responsiveness and personalized services.

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4. Key Trends Impacting IS Management

- **Cloud computing** – Scalable, pay-as-you-go infrastructure.
- **Big data & analytics** – Extracting insights from massive datasets.
- **Artificial Intelligence (AI)** – Automating decision support, fraud detection, personalization.
- **Mobile computing** – Remote work and access to business systems anywhere.
- **Cybersecurity** – Increasing need for security strategies.
- **Digital transformation** – Using IT to fundamentally change business models.

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5. IS Organizations

The IS function in a company is usually divided into:

- **Operations** (system maintenance, backups, performance monitoring).
- **Development** (designing and building new applications).
- **Support** (help desk, user training).
- **Data management** (databases, reporting).
- **Security** (protecting assets, compliance). Good structure ensures that IT resources are managed efficiently and aligned with business priorities.

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6. Leadership Role of IS Management

- Leaders like the **CIO** ensure technology supports strategic business goals.

- They balance innovation with risk management.
- They manage budgets, recruit IT staff, and influence corporate strategy.
- Strong IS leadership enables digital transformation and organizational agility.

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7. Strategic, Tactical, and Operational Planning

- **Strategic planning**: Long-term (3–5 years), defines mission, vision, and IT alignment.
- **Tactical planning**: Medium-term, converts strategy into projects, sets timelines & budgets.
- **Operational planning**: Short-term (daily/weekly), focuses on immediate execution. ⤷ Example: Strategic = Adopt e-commerce platform; Tactical = Select vendor & design; Operational = Train employees and run daily operations.

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8. Role of IT in Business

- Automates manual processes.
- Enables faster communication and collaboration.
- Supports data-driven decision making (e.g., BI dashboards).
- Creates **new opportunities** like e-commerce, online marketing, and digital services.
- Example: Uber relies entirely on IT platforms to connect drivers with riders.

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9. COX Model for IT

- A planning model/framework (depending on your syllabus) that relates IT investment to corporate value and strategy.
- Focuses on **IT as an enabler** for business competitiveness.
- Often referenced in IT planning & governance literature.

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10. Importance of IT in Organizations

- Essential for day-to-day operations, competitiveness, and innovation.
- Helps in process improvement, customer relationship management, and market expansion.
- Without IT, many businesses cannot survive in today's digital-first economy.

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11–14. Chief Information Officer (CIO)

- **Role**: Senior executive managing IT strategy.
- **Responsibilities**: Align IT with business, manage budgets, ensure security, predict trends.

- **Qualifications**: IT + business expertise, leadership skills, strategic thinking.
- **CIO vs IT Director**: CIO = strategic, future-oriented. IT Director = operational, focused on daily IT.

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15–19. IS Planning & Strategic Uses of IT

- Ensures IT investments align with business strategy.
- Benefits: improved resource allocation, risk management, innovation.
- **Strategic uses of IT**: cost leadership, differentiation, innovation, supply chain management.
- **Why planning is difficult**: uncertainty, rapid tech change, resistance.
- **Sense-and-respond planning**: modern adaptive planning (instead of fixed rigid plans).

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20. Sense-and-Respond Approach

- Unlike fixed plans, this approach is **adaptive**.
- Focuses on sensing customer/market changes quickly and responding in real-time.
- Core principles: customer focus, waste reduction, standardization, continuous feedback.
- Example: Agile software development and DevOps practices.

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21. Planning Techniques

- **SWOT analysis** (strengths, weaknesses, opportunities, threats).
- **Balanced Scorecard** (measuring performance beyond finance).
- **Scenario planning** (preparing for possible futures).
- **Benchmarking** (comparing with best practices).
- **Agile planning** (short iterations, feedback-driven).

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22. Procedure-based vs Knowledge-based Activities

- **Procedure-based**: Routine, rule-driven (e.g., payroll entry).
- **Knowledge-based**: Analytical, requires expertise (e.g., designing strategy, problem solving).

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23–24. Framework & Components of IS Management

- **Technology**: hardware, software, networks, databases.
- **People**: users, specialists, managers.
- **Processes**: rules, policies, procedures.
- **Applications**: business uses of IS.

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25. IS vs IT

- **IT** = technology (hardware, software, networks).
- **IS** = IT + people + processes + data → produces meaningful information.

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26. Global Use of IS

- IS is used worldwide: banking, communication, education, health, commerce.
- In a globalized world, every person interacts with IS in daily life.

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27. Components of IS

- **Hardware** (devices), **Software** (apps, OS), **Data**, **People**, **Processes/Networks**.

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28. Challenges of IS

- Cybersecurity, high costs, data privacy, rapid obsolescence, resistance to change.

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29. IS in Managerial Decision-Making

- MIS provides structured reports.
- DSS helps with simulations/forecasts.
- EIS gives summaries for executives.

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30. Roles of IS in Organizations

- Automating processes, decision support, communication, innovation, knowledge management.

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31. IS & Digital Bangladesh

- IS supports **e-government, e-learning, e-health**, transparency, and digital inclusion.

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32–34. Value Chain Analysis

- Introduced by Michael Porter.
- **Primary activities**: inbound logistics, operations, outbound logistics, marketing, service.
- **Support activities**: procurement, HRM, technology development, firm infrastructure.
- Helps find opportunities for cost reduction and differentiation.

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35–36. MIS (Management Information Systems)

- Collects, processes, stores, and delivers information for decision-making.
- **Characteristics**: accurate, timely, reliable, user-friendly, flexible.
- **Importance**: bridges IT and business needs.

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37. E-Business vs E-Commerce

- **E-commerce**: Online buying and selling.
- **E-business**: Broader, includes e-commerce + supply chain, HR, customer services.

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38–39. Security Management of IS

- Tools: firewalls, IDS/IPS, antivirus, IAM, SIEM, encryption.
- Policies: access control, risk assessment, training.

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41. E-Commerce – Features

- Online buying/selling, 24/7 access, global reach, interactivity, personalization, low entry cost.

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43. Tactical vs Operational Planning

- **Tactical** = medium-term (how to achieve strategy).
- **Operational** = daily execution.

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44. TPS (Transaction Processing System)

- Records daily transactions (e.g., sales, payroll).
- Example: ATM, POS system.

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45. BPM (Business Process Management)

- A method for analyzing, automating, and improving processes.
- Steps: Model → Automate → Monitor → Improve.

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46. Impact of AI in MIS

- AI enables predictive analytics, automation, fraud detection, customer personalization.
- Enhances decision-making and efficiency.
- Risks: bias, ethical issues, transparency.

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Chapter 2 – Managing Essential Technologies (Detailed Notes)

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1. Architecture vs Infrastructure

- **Architecture** = the blueprint/design of an IT system (how components should be arranged and interact).
- **Infrastructure** = the actual hardware, software, networks, and facilities that implement the architecture.
  → Example: Cloud architecture (design) vs AWS data centers, servers, and networks (infrastructure).

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2. Attributes of Distributed Systems

Distributed systems = multiple computers working together as one system. Attributes:

1. **Transparency** (users see it as one system).
2. **Openness** (standard interfaces, interoperability).
3. **Reliability** (fault-tolerant, robust).
4. **Scalability** (can grow easily).

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3. Open-source

Software with source code available for modification and redistribution. Examples: Linux, Apache, MySQL. Benefits: cost savings, flexibility, large community. Risks: support & security responsibility falls on user.

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4. Server-based vs Peer-to-Peer Computing

- **Server-based**: Central server provides resources (e.g., Gmail, banking).
- **Peer-to-peer (P2P)**: Devices share resources directly without central control (e.g., BitTorrent).

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5. Types of Distributed Systems

- **Client-Server**
- **Peer-to-Peer**
- **Clustered systems**
- **Cloud-based distributed systems** Each has different scalability and reliability trade-offs.

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6. Structure/Levels of IT Infrastructure

Typical four levels:

1. **Hardware** (servers, PCs, devices).
2. **Software** (OS, applications).
3. **Network** (LAN, WAN, internet).
4. **Data management** (databases, storage).

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7. IT Infrastructure vs Public Infrastructure

Analogy: Like roads, bridges, and electricity grids, IT infrastructure provides shared foundational services (networks, servers, internet) that businesses depend on.

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8. Views of Infrastructure

- **Technical view**: hardware & software.
- **Service view**: IT services delivered to users.
- **Business view**: infrastructure as an investment & enabler of strategy.

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9. Standards Underlying Web Services

Common standards:

- **SOAP** (messaging)
- **WSDL** (description)
- **UDDI** (directory)
- **XML/JSON** (data formats)
- **HTTP/HTTPS** (transport)
- **REST** (architectural style)

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10. Causes of Excessive Telecom Costs

- Inefficient contracts
- Redundant services
- Poor bandwidth management
- Legacy infrastructure
- Lack of monitoring

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11. Telecommunications & Role in IS

Telecommunication = electronic transmission of info over distance. Roles in IS:

- Connects users globally
- Enables real-time communication
- Supports data sharing & cloud computing

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12. Types of Information Systems (IS)

- TPS (Transaction Processing System)
- MIS (Management Information System)
- DSS (Decision Support System)
- ESS (Executive Support System)
- KMS (Knowledge Management System)

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13. Data, Information, Knowledge

- **Data**: raw facts (e.g., 100, "Dhaka").
- **Information**: processed data with meaning (e.g., 100 students in Dhaka).

- **Knowledge**: applying info to decisions (e.g., predicting demand for schools).

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14. Three-Level Database Concept

- **External level**: user view
- **Conceptual level**: logical design of DB
- **Internal level**: physical storage & performance

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15. Database Models

- Hierarchical
- Network
- Relational (most common)
- Object-oriented
- NoSQL (modern, scalable)

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16. Information Governance

Framework of rules, processes, and roles for handling information responsibly. Ensures compliance, security, and value extraction from data.

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17. ERP (Enterprise Resource Planning)

- Integrated system managing finance, HR, supply chain, sales, etc.
- Benefits: efficiency, data consistency, better decisions.
- Challenges: costly, complex, requires change management.
- **Cloud ERP**: cheaper, scalable. **On-prem ERP**: more control but costly.

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18. Structured vs Unstructured Data

- **Structured**: organized in databases (numbers, records).
- **Unstructured**: videos, emails, social media, documents.
- Businesses use **BI & analytics** to analyze both.

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19. TCP/IP Model Layers

1. Application
2. Transport
3. Internet
4. Network Access (or Link)

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20. Network Topologies

- **Ring**: each node connected in a circle.
- **Mesh**: each node connected to many/all others (high reliability).

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21. Cloud Computing

- Characteristics: on-demand, scalable, pay-per-use, accessible anywhere.
- Types: IaaS, PaaS, SaaS.
- Benefits: flexibility, cost reduction.

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22. Enterprise Collaboration Systems (ECS)

- Systems that improve communication, document sharing, teamwork.
- Examples: Microsoft Teams, Slack, Google Workspace.
- Goals: collaboration, knowledge sharing, efficiency.

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23. Data Visualization

Presenting data in charts, dashboards, infographics for decision-making. Example: Sales dashboard showing trends.

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(Missed Topics) – Additional Notes

Wireless Technology

- **Definition**: Transfer of information between devices without wires (radio waves, infrared, Bluetooth, Wi-Fi, cellular).
- **Types**: Wi-Fi, Bluetooth, Zigbee, 4G/5G, satellite.
- **Business use**: mobility, IoT, remote access.

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Steps in a Data-Warehousing Project

1. Business requirement analysis
2. Data modeling & design
3. ETL (Extract, Transform, Load) development
4. Data warehouse implementation
5. Testing & deployment
6. Maintenance & optimization

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Challenges of Managing IT Resources in Large Organizations

- Data silos & duplication
- High costs & budget constraints
- Cybersecurity threats
- Integration with legacy systems
- Skill shortages
- Regulatory compliance

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Ensuring Security & Privacy of Information Resources

- Use of encryption, IAM, firewalls, IDS/IPS
- Data governance policies
- Compliance with laws (e.g., GDPR)
- Regular audits and monitoring
- Employee training

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Chapter 3 – Managing System Development (Full Notes)

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1. What is System Development?

The process of creating, maintaining, and improving information systems. Includes planning, analysis, design, implementation, testing, and maintenance.

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2. Examples of System Development

ERP systems, online banking apps, hospital management software, e-commerce platforms.

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3. Phases of System Development (SDLC)

1. **Planning**
2. **System analysis**
3. **Design**
4. **Implementation**
5. **Testing**
6. **Deployment**
7. **Maintenance**

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4. Structured Development

Traditional, step-by-step (waterfall) approach. Highly documented, rigid, predictable but less flexible.

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5–7. Software Prototyping

- **Definition**: Early working model of a system.
- **Advantages**: Better user feedback, reduced risk.
- **Disadvantages**: May lead to scope creep, extra cost.
- **Need**: Helps clarify vague requirements.

🔍 Google Search

8–10. Fourth-Generation Languages (4GL)

- **Definition**: High-level languages closer to human language (SQL, MATLAB, Python frameworks).
- **Characteristics**: Declarative, minimal coding.
- **Advantages**: Faster development.
- **Disadvantages**: Less control over system-level tasks.

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11–14. CASE (Computer-Aided Software Engineering) Tools

- **Definition**: Tools that automate SDLC tasks.
- **Advantages**: Higher productivity, fewer errors.
- **Disadvantages**: Expensive, steep learning curve.

- **Types**: Upper CASE (planning, analysis), Lower CASE (coding, testing), Integrated CASE.
- **Components**: Repository, modeling tools, code generators.

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15–16. Object-Oriented Development

- **Definition**: Based on objects (data + behavior).
- **4 pillars**: Encapsulation, Abstraction, Inheritance, Polymorphism.
- **Phases**: Analysis, design, implementation.

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17. System Integration Approaches

1. **Point-to-point** – direct connections.
2. **Middleware** – software that links systems.
3. **SOA (Service-Oriented Architecture)** – loosely coupled services.

🔎 Google Search

18–19. ERP System Characteristics & Challenges

- **Characteristics**: Integration, modularity, real-time updates.
- **Challenges**: High cost, complexity, resistance to change.

🔎 Google Search

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20. Middleware & Inter-organizational System Development

- **Middleware**: bridges different applications/databases.
- **Inter-organizational Systems**: connect multiple companies (e.g., EDI).

🔎 Google Search

21–25. Project Management

- **Definition**: Planning, executing, controlling IT projects.
- **PMP**: Project Management Professional certification.
- **Project manager role**: plan, coordinate, monitor, deliver.
- **Skills**: leadership, budgeting, risk management.
- **Tips**: good communication, stakeholder involvement.

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26. Benefits of IS in Business

Efficiency, improved decisions, automation, better customer service.

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27. Improving Legacy Systems (7 ways)

- Reengineering, modularization, cloud migration, updating UI, documenting code, adding APIs, improving testing.

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28. Berger's Three Roles of Systems

1. **Support**
2. **Factory**
3. **Strategic** (Shows how IS support different organizational roles).

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29–31. Job Design & Motivation

- **Keys to motivating jobs**: variety, autonomy, feedback.
- **Five characteristics**: skill variety, task identity, task significance, autonomy, feedback.
- **3 techniques**: job rotation, job enlargement, job enrichment.

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32–34. ERP Systems Integration

- **Definition**: Linking ERP with CRM, SCM, HRMS, etc.
- **Approaches**: point-to-point, middleware, SOA.
- **Factors**: data quality, system compatibility, change management.

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35–36. Middleware in Inter-organizational Systems

- Types: Message-oriented, Database-oriented, Transaction-processing.
- **Challenges**: compatibility, standardization, performance.

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37. Key Issues in IS Management

Reliability, scalability, security, cost control. Poor management impacts performance & competitiveness.

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38. Governance in IS Management

- **Definition**: Framework of policies & decision rights for IT.
- **Models**: centralized, decentralized, hybrid.
- **Benefits**: better control, alignment, security.

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39. Functional Business Systems

Examples: HRIS, Accounting, Finance, Marketing, Supply Chain systems.

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40–41. IS Planning Paradox & Success Factors

- **Planning paradox**: fast tech changes make rigid long-term IS plans risky.
- **Success factors**: critical areas that must go right (quality data, user adoption).

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42. Content Management System (CMS)

Software to create, manage, and publish digital content (e.g., WordPress, Drupal).

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43. ERP – Benefits

Integration, efficiency, better data visibility, reduced redundancy, improved decision-making.

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Chapter 4 – Systems for Supporting Knowledge Work (Detailed Notes)

1. Decision Support System (DSS)

- **Definition**: A computer-based system that helps managers make semi-structured or unstructured decisions by analyzing large amounts of data.
- **Example**: A DSS that helps a bank decide whether to approve a loan using customer data and risk models.

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2. Characteristics of DSS

- Interactive and user-friendly.
- Supports "what-if" and scenario analysis.
- Uses models and data to help decision-making.
- Provides flexibility, not fixed reports.

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3. Executive Support System (ESS)

- High-level system designed for senior executives.
- Provides summary data (dashboards, KPIs, trend reports).
- Example: CEO dashboard showing sales performance across regions.

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4. How ESS Helps Senior Managers

- Gives "big picture" summaries.
- Supports strategic planning, forecasting, long-term goals.
- Helps identify problems and opportunities quickly.

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5. Knowledge Management System (KMS)

- Collects, organizes, and shares organizational knowledge.
- Example: A company intranet with training documents, policies, FAQs.

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6. Role of Knowledge Management Programs

- Capture tacit (in minds) & explicit (documented) knowledge.
- Promote knowledge sharing, innovation, and efficiency.
- Prevent knowledge loss when employees leave.

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7. Benefits of Intelligence Techniques in KM

- AI/ML can find hidden patterns in knowledge bases.
- Improves search, recommendations, personalization.
- Speeds up decision-making.

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8. Challenges of KMS

- Cultural resistance to sharing.
- Costly to maintain.
- Information overload.
- Security & privacy issues.

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9–11. Data Mining

- **Definition**: Discovering patterns in large datasets.
- **Benefits**: customer segmentation, fraud detection, prediction.
- **Techniques**: classification, clustering, association rules, regression.
- **Example**: Amazon recommending products.

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12–14. Expert System

- **Definition**: AI-based system that mimics human expert reasoning.
- **Types**: rule-based, fuzzy logic, neural networks.
- **Components**: knowledge base, inference engine, user interface, explanation system.
- **Example**: MYCIN (medical diagnosis system).

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15–18. Executive Information System (EIS)

- Similar to ESS but focuses more on decision data visualization.
- **Characteristics**: easy access, graphical reports, user-friendly.
- **Advantages**: quick insight, time-saving.
- **Disadvantages**: expensive, risk of oversimplification.

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19–21. CRM (Customer Relationship Management)

- **Definition**: System for managing customer interactions.

- **Benefits**: loyalty, targeted marketing, improved service.

- **Phases**:

    1. Acquisition (find customers)

2. Enhancement (increase value)
3. Retention (keep customers).

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22–24. Real-Time Enterprise (RTE)

- An enterprise that uses IT to respond immediately to events.
- **Goal**: agility, efficiency, customer responsiveness.
- **Technology used**: cloud, IoT, AI, real-time analytics.

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25–28. Collaboration & Groupware

- **Collaboration**: working together to achieve goals.
- **Types**: synchronous (chat, video calls), asynchronous (email, forums).
- **Groupware**: tools like MS Teams, Slack, Google Docs.
- **Virtual workplace**: remote work setup using groupware.

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29–32. Knowledge Management – Process & Components

- **Process**: create → capture → share → apply knowledge.
- **Components**: people, technology, processes, culture.
- **Benefits**: reduces duplication, speeds innovation, improves learning.

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33–42. Virtual Organizations & Workforce

- **Virtual organization**: no physical boundaries, relies on IT.
- **Characteristics**: flexibility, global talent, cost reduction.
- **Benefits**: agility, lower costs.
- **Challenges**: communication gaps, trust issues.
- **Managing virtual workforce**: clear communication, KPIs, collaboration tools.

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43–44. Computer Ethics

- **Definition**: Moral principles guiding IT use.
- **Types**: privacy, intellectual property, accuracy, accessibility.
- Example: ethical debate on AI use in hiring.

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45–47. Data Mining Advanced Topics

- **Steps**: data cleaning → integration → selection → mining → evaluation → presentation.
- **Challenges**: data quality, model accuracy, interpretability.
- **Ethical & legal issues**: privacy, consent, data misuse.

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48–49. Intellectual Capital

- **Definition**: knowledge assets of an organization.
- **Types**: human (skills), structural (processes, IP), relational (customers).
- **Challenges**: retaining talent, fostering innovation.

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50. MIS vs DSS

- **MIS**: Provides routine reports for managers.
- **DSS**: Helps with non-routine, complex decisions using models.

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51. Knowledge Management & Organizational Learning

- KM promotes organizational learning by encouraging sharing, collaboration, and continuous improvement.
- Leads to innovation and adaptability.

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52. Business Intelligence (BI)

- **Definition**: Use of data analysis & reporting tools to support decisions.
- Related to databases & data warehouses.
- Example: Power BI dashboards showing sales trends.

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53. Group Decision Support System (GDSS)

- DSS extended for group decision-making.
- Provides brainstorming tools, electronic voting, anonymous input.
- Example: GDSS for boardroom decisions.

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Chapter 5 – Acquisition of Hardware, Software, Networks, and Services (Detailed Notes)

1. Request for Proposal (RFP) – Definition & Example

- **Definition**: A formal document inviting vendors to propose solutions for an organization's IT needs.
- Includes scope, requirements, timelines, and evaluation criteria.
- **Example**: A university issues an RFP to buy a new learning management system (LMS).

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2. Requirements of RFP

- Detailed business and technical requirements.
- Budget constraints.
- Vendor qualifications.
- Service-level expectations.
- Legal & compliance issues.

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3. Benefits of RFP

- Transparency in vendor selection.
- Helps compare multiple vendors.
- Ensures competitive pricing.
- Documents expectations clearly.

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4. Difference between RFP and RFQ

- **RFP (Request for Proposal)**: seeks full solution (what & how).
- **RFQ (Request for Quotation)**: asks only for price quotes for specific items.

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5. Purpose of RFP

- To solicit structured proposals from vendors.
- Ensures alignment with business goals.
- Reduces procurement risks.

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6. Most Important Part of RFP

- Clear description of requirements (technical + business).
- Evaluation criteria (how proposals will be judged).

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7. Software Acquisition – Definition

The process of obtaining software (buying, leasing, outsourcing, developing in-house).

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8. Steps in Software Acquisition Process

1. Identify business need.
2. Prepare RFP/RFQ.
3. Evaluate vendor proposals.
4. Negotiate contract.
5. Implement and test.

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9. Acquisition vs Purchase Method

- **Acquisition**: broader, includes buying, leasing, outsourcing, renting.
- **Purchase**: strictly buying software.

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10–12. Leasing as Software Acquisition

- **Leasing**: renting software over a period instead of outright purchase.

- **Methods**:

  1. Straight lease (monthly/annual fee).
  2. License lease.
  3. Cloud SaaS subscriptions.

- **Benefits**: lower upfront cost, flexibility.

- **Drawbacks**: long-term costs may be higher.

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13. Methods of Software Acquisition

- In-house development.
- Outsourcing.
- Buying off-the-shelf.
- Leasing / SaaS.

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14–15. Alternative Concepts of Development

- **In-house development**: system built internally (full control, but costly).
- **Outsourcing**: hiring third-party vendor.
- **Prototyping & Agile**: alternative to traditional SDLC.
- In-house is sometimes "best" due to control and customization.

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16–20. Outsourcing in IT

- **Definition**: contracting external vendors for IT services/software.
- **Advantages**: lower cost, access to expertise, focus on core business.
- **Disadvantages**: less control, dependency on vendor, security risks.
- **Strategies**: total outsourcing, selective outsourcing, offshore outsourcing.
- **Objectives**: cost reduction, scalability, innovation.
- **Example**: A company outsourcing cloud hosting to AWS.

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21–23. Alternative Analysis (AoA) in Project Management

- **Definition**: Evaluating different options before making a decision.
- **Steps**: list alternatives → evaluate costs/benefits → choose best.
- **Buying process**: consumers evaluate alternatives based on cost, features, usability, vendor reputation.

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24. Stages of Purchase Process

1. Recognize need.
2. Gather information.
3. Evaluate alternatives.
4. Purchase decision.
5. Post-purchase evaluation.

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25. Key Purchasing Criteria

- Price.
- Quality.
- Vendor reputation.
- Support & maintenance.
- Scalability.

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26–27. Renting in IT Acquisition

- Organizations often rent hardware/software (cloud services, printers, storage).
- **Advantages**: no large upfront cost, scalability, flexibility.
- **Most rented items**: servers, networking devices, SaaS software.

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28–30. AoA vs MOA

- **AoA (Analysis of Alternatives)**: evaluates choices based on data.
- **MOA (Memorandum of Agreement)**: formal legal agreement.
- **AOA (Articles of Association)**: corporate legal document.

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31–32. Comparing Acquisition Methods

- **In-house**: high control, expensive, long time.
- **Buying**: faster, proven, less flexible.
- **Leasing**: flexible, but recurring costs.
- **Outsourcing**: access to expertise, risk of dependency. Factors: cost, time, customization, maintenance.

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33. Software Acquisition Contracts – Key Considerations

- Licensing terms (perpetual vs subscription).
- Maintenance and support.
- Updates & upgrades.
- Warranties.
- Penalties for failure.

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Chapter 6 – People and Technology (Detailed Notes)

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1. Work Environment – Definition & Example

- **Definition**: The conditions (physical, cultural, technological, social) in which people work.
- **Example**: A modern IT office with open seating, high-speed internet, and collaborative software vs. a factory floor with specialized machinery.

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2–4. Adjusting to a New Work Environment

- **Strategies**:

    - Observe and learn company culture.
    - Build relationships with coworkers.
    - Use collaboration tools effectively.
    - Seek feedback and stay flexible.

- **Good Work Environment**: safe, inclusive, supportive, with access to necessary tools and technology.

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5–6. Self-Organizing Principle

- **Definition**: Teams organize themselves without heavy external control, adjusting roles and processes dynamically.
- **Four principles**: autonomy, collaboration, adaptability, continuous learning.

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7–8. Self-Organized ≠ Self-Managed

- **Self-organized**: teams decide how to perform tasks.
- **Self-managed**: teams also decide *what* to do, goals, and budgets.
- Difference: level of autonomy and decision-making power.

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9–10. Self-Organizing Teams

- Groups of individuals who take collective responsibility for their work.
- **How they work**: distribute tasks, hold regular stand-ups, adapt roles.
- Benefits: flexibility, innovation, engagement.

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11–14. Learning Organization

- **Definition**: An organization that continuously learns and adapts to change.

- **Characteristics**: knowledge sharing, open communication, employee empowerment, continuous improvement.
- **Benefits**: innovation, adaptability, employee growth.
- **Example**: Google encourages 20% time for innovation projects.

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15–17. Digital Mindset

- **Definition**: A way of thinking that embraces technology, data, and digital transformation.
- **Benefits**: faster adoption of tools, better innovation, adaptability.
- **Technology changes mindset**: exposure to AI, cloud, automation pushes people toward agility, experimentation, and collaboration.
- **Example**: Managers who use analytics tools to guide decisions.

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18–20. Camel Technology

- Historically, camels were a **technology** for transport in desert regions (biological tech).
- **Camel software**: Apache Camel — an open-source framework for integration and routing of messages between systems.
- Shows how "technology" can mean both **tools in nature** and **modern IT tools**.

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21–23. IT Executives

- **Role**: oversee technology strategy, budgets, security, and innovation.
- **Importance for managers**: IT enables business growth, efficiency, and competitiveness.
- **Skills required**: leadership, strategic thinking, technical expertise, risk management.

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24–25. Value & Benefits of a Strong Network

- **Strong professional network** provides: career opportunities, knowledge exchange, collaboration, innovation.
- **Business benefits**: partnerships, vendor relationships, customer loyalty.

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26. Problem of Traditional File Environment

- In older systems (before databases):
  - Data redundancy (duplicate copies).

- Lack of integration.
- Inconsistency across files.
- Difficult to update and secure.

- Modern solution: **DBMS** and integrated systems.

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