



LISBON
**SCHOOL OF
ECONOMICS &
MANAGEMENT**
UNIVERSIDADE DE LISBOA

Academic Year: 2020/2021

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IT INFRASTRUCTURE



Learning Goals

Students will be able to:

- Describe and analyze IT in the context of society and organizations
- **Propose, select, choose and build solutions of IT infrastructure and IT applications**
- Reflect and evaluate IT management and development



5. IT Infrastructure and Emerging Technologies

1. What is IT infrastructure, and what are the stages and drivers of IT infrastructure evolution?

Set of physical devices and software required to operate an enterprise

Set of firm-wide services including:

- Computing platforms providing computing services

- Physical facilities management services

- IT management, education, and other services

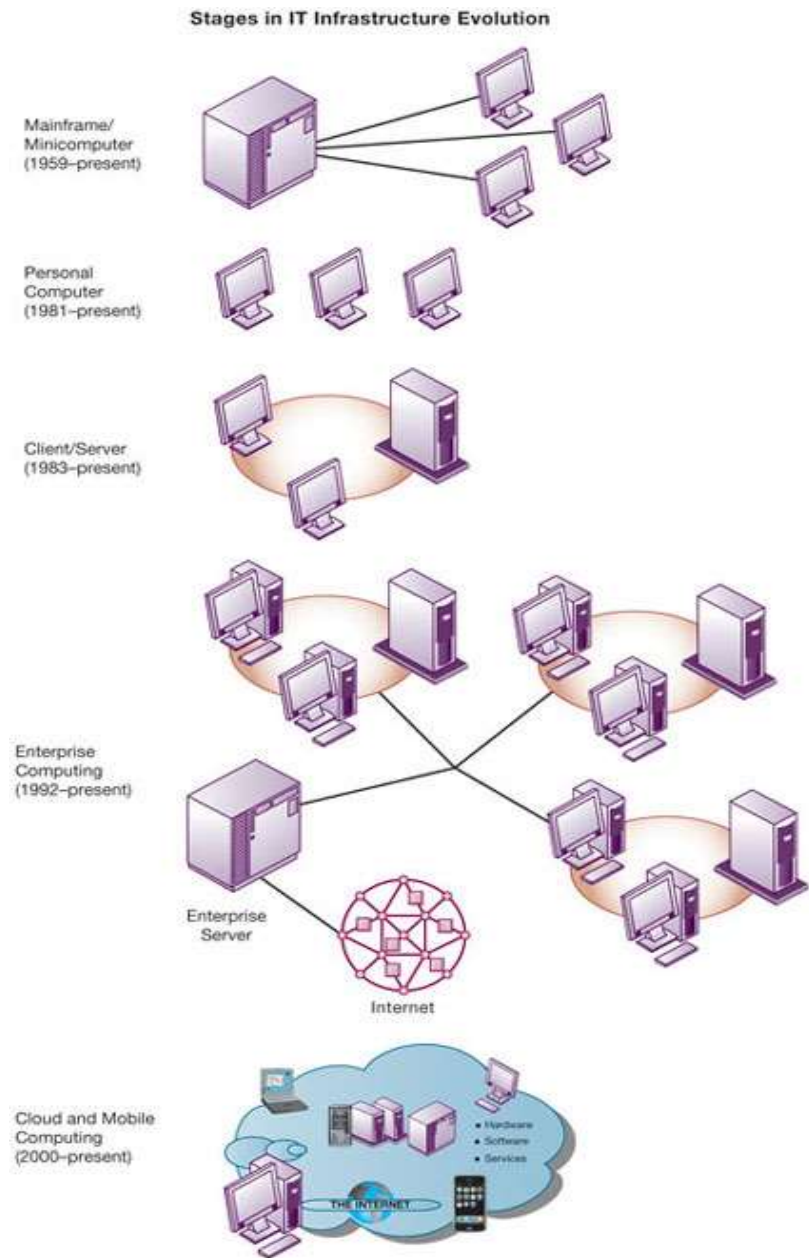
“Service platform” perspective

- More accurate view of value of investments



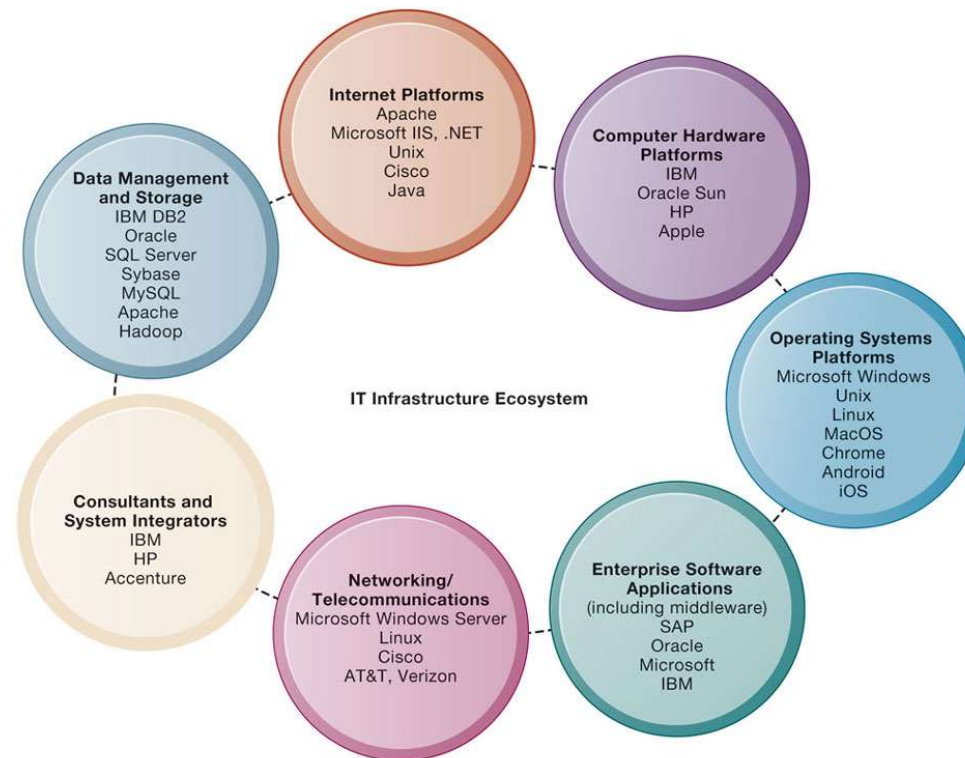
5. IT Infrastructure and Emerging Technologies

1. What is IT infrastructure, and what are the stages and drivers of IT infrastructure evolution?



5. IT Infrastructure and Emerging Technologies

2. What are the components of IT infrastructure?



5. IT Infrastructure and Emerging Technologies

3. What are the current trends in computer hardware platforms?

- The mobile digital platform
- Consumerization of IT and BYOD (bring your own device)
- Quantum computing
- Virtualization
- Cloud computing (SAAS, PAAS, IAAS)
- Edge computing
- Green computing (Green IT)
- High performance, power-saving processors



5. IT Infrastructure and Emerging Technologies

4. What are the current computer software platforms and trends?

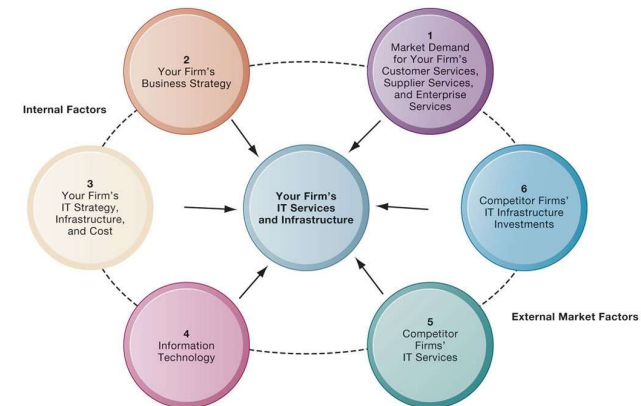
- Linux and open-source software
- Software for the web: Java, HTML, and HTML5
- Web services and service-oriented architecture
- Software outsourcing and cloud services
- Mashups and apps



5. IT Infrastructure and Emerging Technologies

5. What are the challenges of managing IT infrastructure and management solutions?

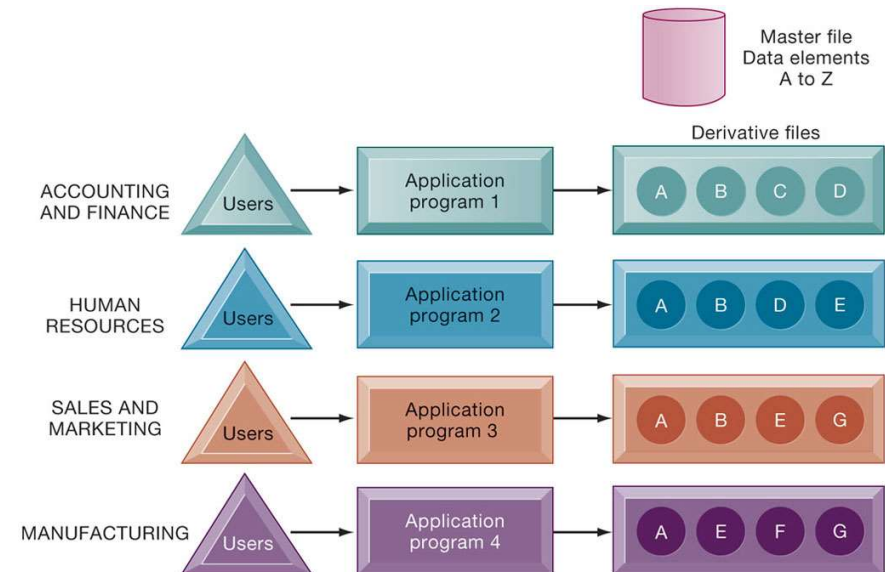
- Dealing with Platform and Infrastructure Change
- Management and Governance
- Making Wise Infrastructure Investments
- Total Cost of Ownership (TCO) Model



6. Foundations of Business Intelligence: Databases and Information Management

1. What are the problems of managing data resources in a traditional file environment?

- Files maintained separately by different departments
- Data redundancy
- Data inconsistency
- Program-data dependence
- Lack of flexibility
- Poor security
- Lack of data sharing and availability



6. Foundations of Business Intelligence: Databases and Information Management

2. What are the major capabilities of database management systems (D B M S), and why is a relational DBMS so powerful?

- Database
 - Serves many applications by centralizing data and controlling redundant data
- Database management system (DBMS)
 - Interfaces between applications and physical data files
 - Separates logical and physical views of data
 - Solves problems of traditional file environment
 - Controls redundancy
 - Eliminates inconsistency
 - Uncouples programs and data
 - Enables organization to centrally manage data and data security



6. Foundations of Business Intelligence: Databases and Information Management

2. What are the major capabilities of database management systems (DBMS), and why is a relational DBMS so powerful?

• Relational Databases

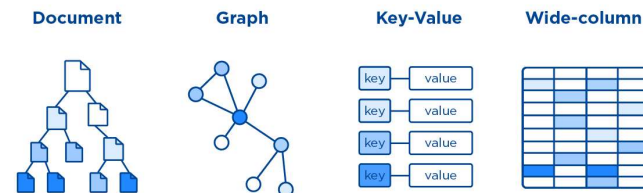
- Represent data as two-dimensional tables
- Each table contains data on entity and attributes
- Table: grid of columns and rows
 1. Rows (tuples): Records for different entities
 2. Fields (columns): Represents attribute for entity
 3. Key field: Field used to uniquely identify each record
 4. Primary key: Field in table used for key fields
 5. Foreign key: Primary key used in second table as look-up field to identify records from original table

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Non Relational Databases

- Non-relational databases: “No S Q L”
 - More flexible data model
 - Data sets stored across distributed machines
 - Easier to scale
 - Handle large volumes of unstructured and structured data
- Databases in the cloud
 - Appeal to start-ups, smaller businesses
 - Amazon Relational Database Service, Microsoft SQL Azure
 - Private clouds

 mongoDB.



6. Foundations of Business Intelligence: Databases and Information Management

3. What are the principal tools and technologies for accessing information from databases to improve business performance and decision making?

Blockchain

The Challenge of Big Data

Business Intelligence Infrastructure

Analytical Tools: Relationships, Patterns, Trends

Online Analytical Processing (O L A P)

Data Mining

Text Mining and Web Mining



6. Foundations of Business Intelligence: Databases and Information Management

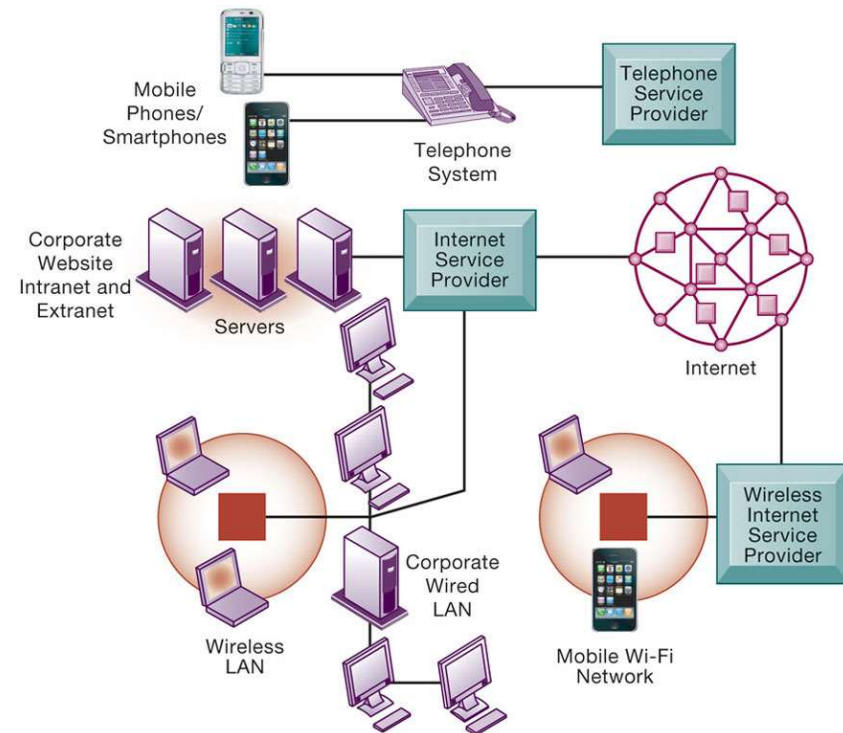
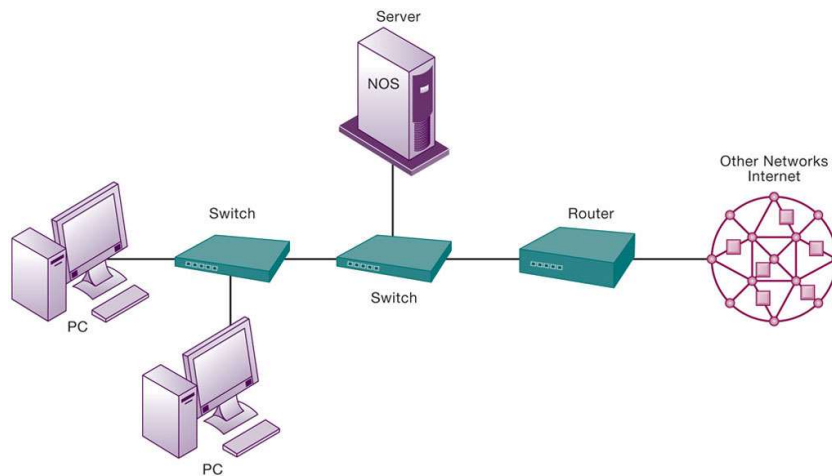
4. Why are information policy, data administration, and data quality assurance essential for managing the firm's data resources?

- Firm's rules, procedures, roles for sharing, managing, standardizing data
- Data administration
 - Establishes policies and procedures to manage data
- Data governance
 - Deals with policies and processes for managing availability, usability, integrity, and security of data, especially regarding government regulations
- Database administration
 - Creating and maintaining database
- More than 25 percent of critical data in Fortune 1000 company databases are inaccurate or incomplete
- Before new database is in place, a firm must:
 - Identify and correct faulty data
 - Establish better routines for editing data once database in operation
- Data quality audit
- Data cleansing



7. Telecommunications, the Internet, and Wireless Technology

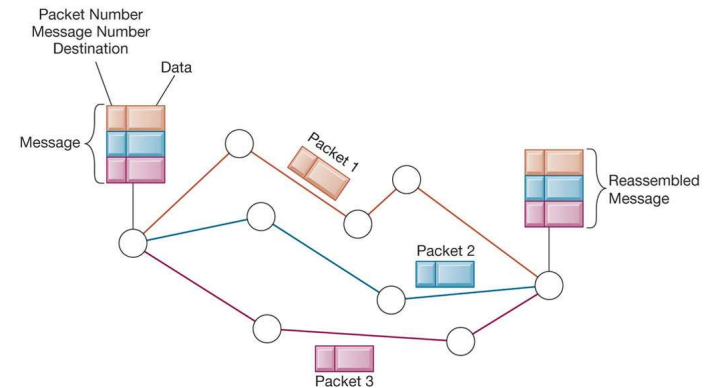
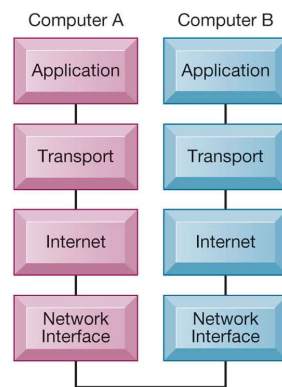
1. What are the principal components of telecommunications networks and key networking technologies?



7. Telecommunications, the Internet, and Wireless Technology

1. What are the principal components of telecommunications networks and key networking technologies?

- Client/server computing
- Packet switching
- TCP/IP and connectivity



7. Telecommunications, the Internet, and Wireless Technology

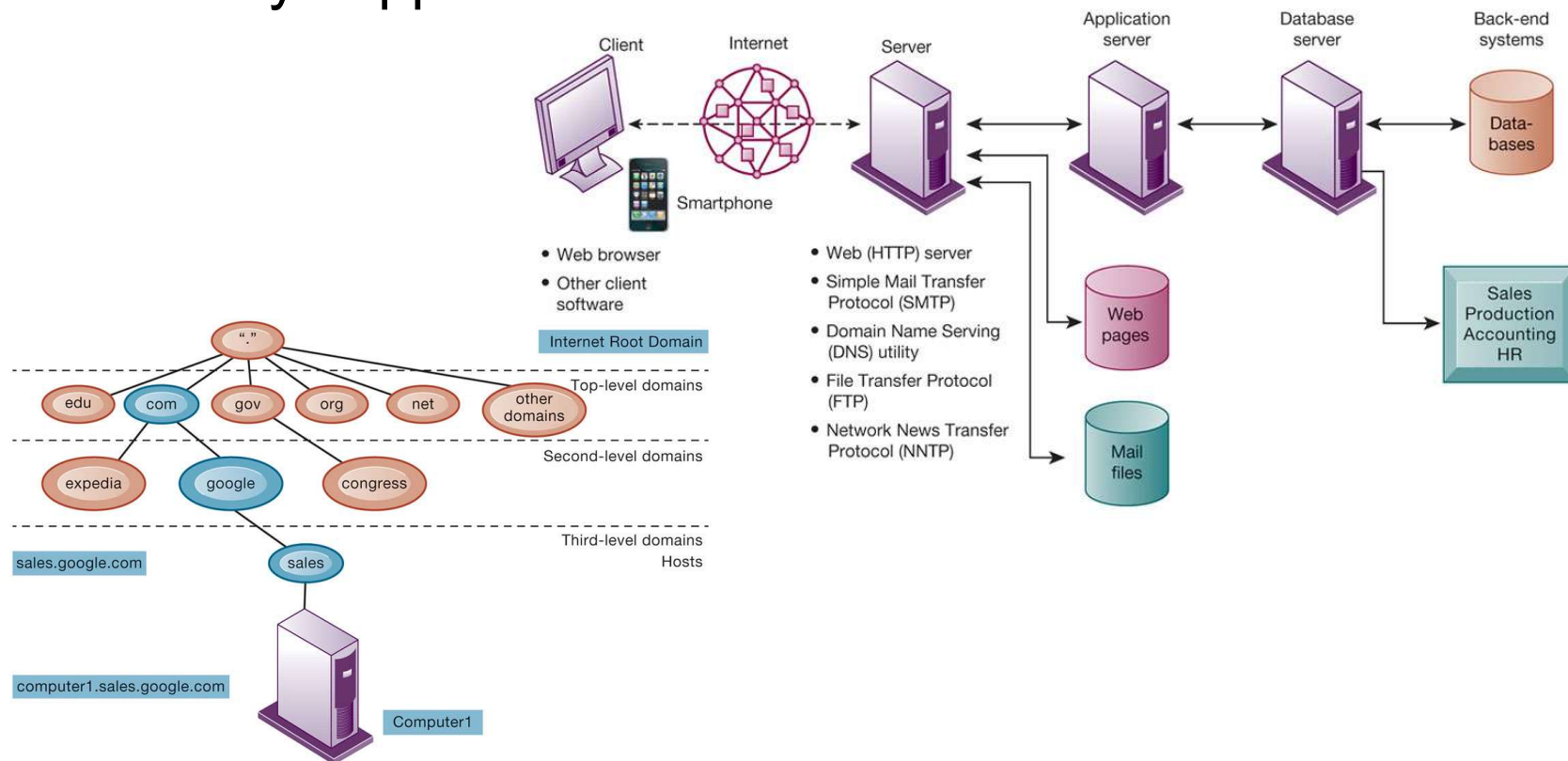
2. What are the different types of networks?

- Local area networks (LANs)
Ethernet
Client/server vs. peer-to-peer
- Wide area networks (WANs)
- Metropolitan area networks (MANs)
- Campus area networks (CANs)



7. Telecommunications, the Internet, and Wireless Technology

3. How do the Internet and Internet technology work, and how do they support communication and e-business?



7. Telecommunications, the Internet, and Wireless Technology

4. What are the principal technologies and standards for wireless networking, communication, and Internet access?

- Cellular Systems
- Wireless Computer Networks and Internet Access (Bluetooth (802.15), Wi-Fi (802.11), WiMax (802.16))
- Radio Frequency Identification (RFID)
- Wireless Sensor Networks (WSNs)



8. Securing Information Systems

1. Why are information systems vulnerable to destruction, error, and abuse?

- Security
 - Policies, procedures, and technical measures used to prevent unauthorized access, alteration, theft, or physical damage to information systems
- Controls
 - Methods, policies, and organizational procedures that ensure safety of organization's assets; accuracy and reliability of its accounting records; and operational adherence to management standards
- Accessibility of networks
- Hardware problems (breakdowns, configuration errors, damage from improper use or crime)
- Software problems (programming errors, installation errors, unauthorized changes)
- Disasters
- Use of networks/computers outside of firm's control
- Loss and theft of portable devices



8. Securing Information Systems

2. What is the business value of security and control?

- Failed computer systems can lead to significant or total loss of business function
- Firms now are more vulnerable than ever
 - Confidential personal and financial data
 - Trade secrets, new products, strategies
- A security breach may cut into a firm's market value almost immediately
- Inadequate security and controls also bring forth issues of liability



8. Securing Information Systems

3. What are the components of an organizational framework for security and control?

IS controls may be automated or manual

General controls

Govern design, security, and use of computer programs and security of data files in general throughout organization

Software controls, hardware controls, computer operations controls, data security controls, system development controls, administrative controls,

Application controls

Controls unique to each computerized application

Input controls, processing controls, output controls



8. Securing Information Systems

4. What are the most important tools and technologies for safeguarding information resources?

Identity management software

- Automates keeping track of all users and privileges
- Authenticates users, protecting identities, controlling access

Authentication

- Password systems
- Tokens
- Smart cards
- Biometric authentication
- Two-factor authentication

Firewall

- Combination of hardware and software that prevents unauthorized users from accessing private networks
- Packet filtering
- Stateful inspection
- Network address translation (NAT)
- Application proxy filtering

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Next Session

- IT in Business and Society
- IT Infrastructure
- **Key Systems Applications**
- Build and Manage Systems

