MIT 3103
Advanced MIS

Chapter 6

Enterprise Management of Information Technology

Acknowledgements

- Notes adapted from Management Information Systems by James A Obrien and George Marakas 10ᵗʰ Edition

Learning Outcomes

- By the end of this chapter, the learner should be able to:

    - Describe major components of IT Management.

    - Describe IT business planning process.

    - Justify reasons for outsourcing and offshoring.

    - Use IT Governance approach in making IT business decisions.

Business and IT

- The strategic and operational importance of information technology in business is no longer questioned.

  – Companies throughout the world are intent on transforming themselves into global business powerhouses through major investments in global e-business, e-commerce, and other IT initiatives.

Business and IT

- Thus, there is a real need for business managers and professionals to understand how to manage this vital organizational function.

Managing Information Technology

- Information technology is an essential component of business success for companies today.

- However, information technology is also a vital business resource that must be properly managed.

Managing Information Technology

- Management of information technologies plays a pivotal role in ensuring the success or contributing to the failure of a company's strategic business initiatives.
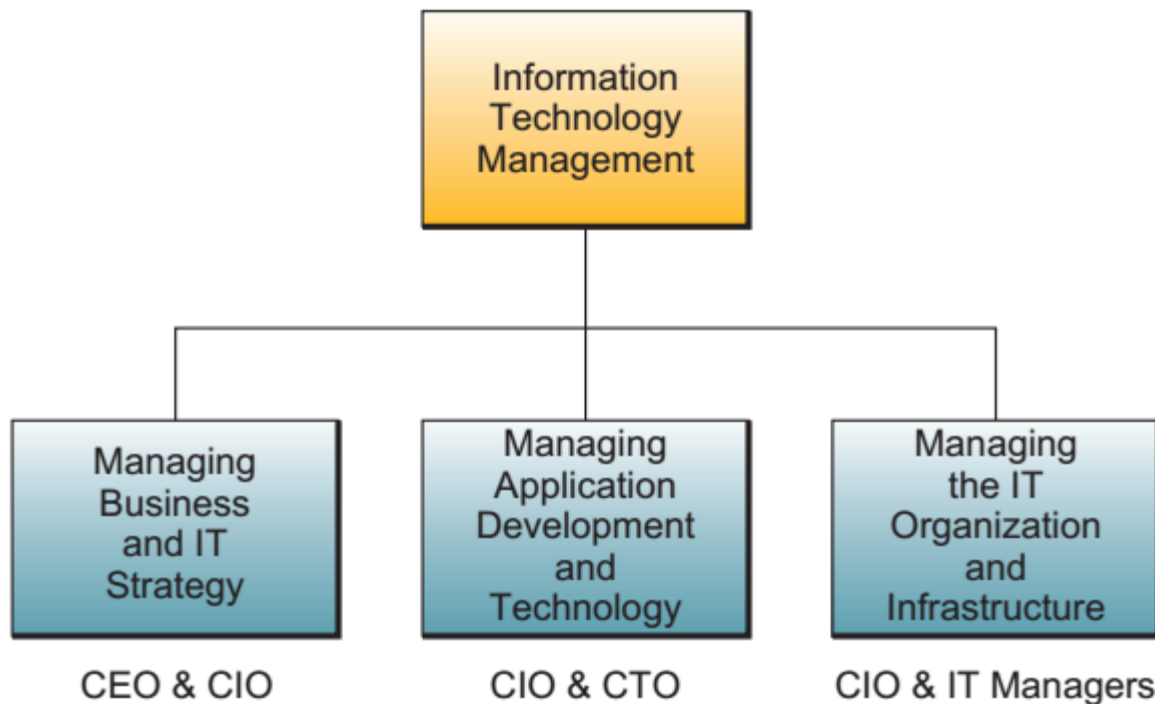
Managing Information Technology

- Therefore, managing the information systems and technologies that support the modern business processes of companies today is a major challenge for both business and IT managers and professionals.

Major Components of IT Management


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                    ┌──────────────────┐
                    │   Information    │
                    │   Technology     │
                    │   Management     │
                    └──────────────────┘
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        ┌────────────────────┼────────────────────┐
        │                    │                    │
┌───────────────┐   ┌───────────────┐   ┌───────────────┐
│   Managing    │   │   Managing    │   │   Managing    │
│   Business    │   │  Application  │   │    the IT     │
│    and IT     │   │  Development  │   │ Organization  │
│   Strategy    │   │     and       │   │     and       │
│               │   │  Technology   │   │ Infrastructure│
└───────────────┘   └───────────────┘   └───────────────┘
   CEO & CIO           CIO & CTO         CIO & IT Managers
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Managing the Joint Development and Implementation of Business/IT Strategies

- Led by the CEO (chief executive officer) and CIO (chief information officer), proposals are developed by business and IT managers and professionals regarding the use of IT to support the strategic business priorities of the company.

Managing the Joint Development and Implementation of Business/IT Strategies

- This business/IT planning process aligns IT with strategic business goals.

- The process also includes evaluating the business case for investing in the development and implementation of each proposed business/IT project.

Managing the Development and Implementation of New Business/IT Applications and Technologies

- This step is the primary responsibility of the CIO and CTO (chief technology officer).

- This area of IT management involves managing the processes for information systems development and implementation, as well as the responsibility for research into the strategic business uses of new information technologies.

Managing the IT Organization and the IT Infrastructure

- The CIO and IT managers share responsibility for managing the work of IT professionals who are typically organized into a variety of project teams and other organizational subunits.

Managing the IT Organization and the IT Infrastructure

- In addition, they are responsible for managing the IT infrastructure of hardware, software, databases, telecommunications networks, and other IT resources, which must be acquired, operated, monitored, and maintained.

Business/IT Planning Process

- Business/IT planning process focuses on discovering innovative approaches to satisfying a company's customer value and business value goals.

- This planning process leads to the development of strategies and business models for new business applications, processes, products, and services.

Business/IT Planning Process

- Then a company can develop IT strategies and an IT architecture that supports building and implementing its newly planned business applications.
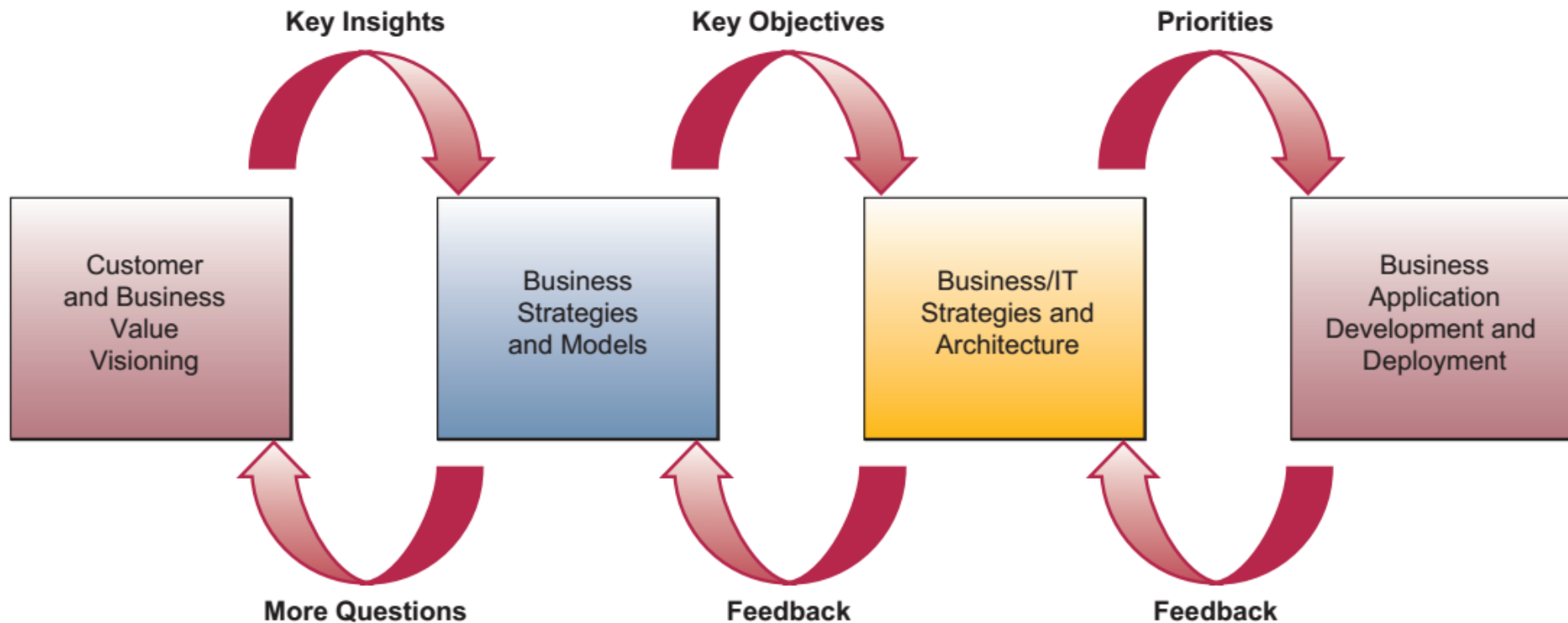
Business/IT Planning Process

- Both the CEO and the CIO of a company must manage the development of complementary business and IT strategies to meet its customer value and business value vision.

- This coadaptation process is necessary because information technologies are a fast-changing but vital component in many strategic business initiatives.

Business/IT Planning Process

Components of Business/IT Planning Process

- The business/IT planning process has three major components:

  - Strategy Development

  - Resource Management

  - Technology Architecture

Components of Business/IT Planning Process

- Strategy Development:

  - Developing business strategies that support a company's business vision.

  - E.g. using information technology to create innovative e-business systems that focus on customer and business value.

Components of Business/IT Planning Process

- Resource Management:
  - Developing strategic plans for managing or outsourcing a company's IT resources, including:
    - IS personnel
    - Hardware
    - Software
    - Data, and
    - Network resources.

Components of Business/IT Planning Process

- Technology Architecture:

  – Making strategic IT choices that reflect an information technology architecture designed to support a company's business/IT initiatives.

IT Architecture

- The IT architecture created by the strategic business/IT planning process is a conceptual design, or blueprint, that includes the following major components:

  - Technology Platform

  - Data Resources

  - Applications Architecture

  - IT Organization.

IT Architecture

- Technology Platform:

    - The Internet, intranets, extranets, and other networks, computer systems, system software, and integrated enterprise application software provide a computing and communications infrastructure, or platform, that supports the strategic use of information technology for e-business, e-commerce, and other business/IT applications.

IT Architecture

- Data Resources:

  – Many types of operational and specialized databases, including data warehouses and Internet/intranet database, store and provide data and information for business processes and decision support.

IT Architecture

- Applications Architecture:

  - Business applications of information technology are designed as an integrated architecture *or portfolio* of enterprise systems that support strategic business initiatives, as well as cross-functional business processes.

  - E.g. an applications architecture should include support for developing and maintaining the interenterprise supply chain applications and integrated enterprise resource planning and customer relationship management applications.

IT Architecture

- IT Organization:

  - The organizational structure of the IS function within a company and the distribution of IS specialists are designed to meet the changing strategies of a business.

  - The form of the IT organization depends on the managerial philosophy and business/IT strategies formulated during the strategic planning process.

Managing Application Development

- Application development management involves managing activities such as:

  – Systems analysis and design

  – Prototyping,

  – Programming

  – Project management

  – Quality assurance, and

  – System maintenance for all major business/IT development projects

Managing Application Development

- Managing application development requires managing the activities of teams of systems analysts, software developers, and other IS professionals working on a variety of information systems development projects.

Managing Application Development

- Thus, project management is a key IT management responsibility if business/IT projects are to be completed on time, within their budgets, and meet their design objectives.

Managing Application Development

- In addition, some systems development groups have established development centers staffed with IS professionals.

  - Their role is to evaluate new application development tools and help information systems specialists use them to improve their application development efforts.

Managing IS Operations

- IS operations management is concerned with the use of hardware, software, network, and personnel resources in the corporate or business unit data centers (computer centers) of an organization.

- Operational activities that must be managed include:

  - Computer system operations

  - Network management

  - Production control, and production support.

Managing IS Operations

- Most operations management activities are being automated by the use of software packages for computer system performance management.

- These **system performance monitors:**
  - Look after the processing of computer jobs
  - Help develop a planned schedule of computer operations that can optimize computer system performance, and
  - Produce detailed statistics that are invaluable for effective planning and control of computing capacity.

- Such information evaluates computer system utilization, costs, and performance.

Managing IS Operations

- This evaluation provides information for:

  – Capacity planning

  – Production planning and control, and

  – hardware/software acquisition planning.

  – It is also used in quality assurance programs, which emphasize the quality of services to business end users.

Managing IS Operations

- System performance monitors also supply information needed by **chargeback systems** that allocate costs to users on the basis of the information services rendered.

- All costs incurred are recorded, reported, allocated, and charged back to specific end user business units, depending on their use of system resources.

Managing IS Operations

- When companies use this arrangement, the information services department becomes a service center whose costs are charged directly to business units rather than being lumped with other administrative service costs and treated as overhead costs.

Managing IS Operations

- Many performance monitors also feature **process control** capabilities.

  - Such packages not only monitor but also automatically control computer operations at large data centers.

  - Some use built-in expert system modules that are based on knowledge gleaned from experts in the operations of specific computer systems and operating systems.

Managing IS Operations

- These performance monitors provide more efficient computer operations than human operated systems.

  - They also enable "lights out" data centers at some companies, where computer systems are operated unattended, especially after normal business hours.

IT Staff Planning

- The success or failure of an information services organization rests primarily on the quality of its people.

- Many firms consider IT staff planning, or recruiting, training, and retaining qualified IS personnel, as one of their greatest challenges.

IT Staff Planning

- Managing information services functions involves the management of managerial, technical, and clerical personnel.

- One of the most important jobs of information services managers is to recruit qualified personnel and develop, organize, and direct the capabilities of existing personnel.

IT Staff Planning

- Employees must be continually trained to keep up with the latest developments in a fast-moving and highly technical field.

- Employee job performances must be continually evaluated, and outstanding performances must be rewarded with salary increases or promotions.

IT Staff Planning

- Salary and wage levels must be set, and career paths must be designed so that individuals can move to new jobs through promotion and transfer as they gain seniority and expertise.

Technology Management

- The management of rapidly changing technology is important to any organization.

- Changes in information technology, like the rise of the PC, client/server networks, and the Internet and intranets, have come swiftly and dramatically and are expected to continue into the future.

Technology Management

- Developments in information systems technology have had, and will continue to have, a major impact on the operations, costs, management work environment, and competitive position of many organizations.

Technology Management

- Thus, all information technologies must be managed as a technology platform for integrating internally focused or externally facing business applications.

    – Such technologies include the Internet, intranets, and a variety of e-commerce and collaboration technologies, as well as integrated enterprise software for customer relationship management, enterprise resource planning, and supply chain management.

Technology Management

- In some companies, **technology management** is the primary responsibility of a **chief technology officer (CTO)**, who is in charge of all information technology planning and deployment.

Managing User Services

- Teams and workgroups of business professionals commonly use PC workstations, software packages, and the Internet, intranets, and other networks to develop and apply information technology to their work activities.

Managing User Services

- Thus, many companies have responded by creating user services, or client services, functions to support and manage end-user and workgroup computing.

- End-user services provide both opportunities and problems for business unit managers.

  - E.g., some firms create an information center group staffed with user liaison specialists or Web-enabled intranet help desks.

Managing User Services

- IS specialists with titles such as user consultant, account executive, or business analyst may also be assigned to end-user workgroups.

- These specialists perform a vital role by:
  - Troubleshooting problems
  - Gathering and communicating information
  - Coordinating educational efforts, and
  - Helping business professionals with application development.

Outsourcing IT and IS

- An increasingly popular approach to managing the IS and IT functions of the organization is to adopt an outsourcing strategy.

  - Outsourcing, in broad terms, is the purchase of goods or services that were previously provided internally from third-party partners.

Outsourcing IT and IS

- Outsourcing is a generic term used for a broad range of information technology functions that are selectively contracted to an external service provider.

Outsourcing IT and IS

- A commonly outsourced IS function is software application development.

- This process includes:

  - Contracting (or subcontracting) with an external organization for the development of complete or partial software products/projects.

  - The purchase of packaged or customized package software products, or activities and/or resources that aid in the software development life cycle.

Five Main Reasons Behind A Decision To Outsource

- Save Money—Achieve Greater Return on Investment (ROI)

- Focus on Core Competencies

- Achieve Flexible Staffing Levels

- Gain Access to Global Resources.

- Decrease Time to Market.

Five Main Reasons Behind A Decision To Outsource

1. Save Money—Achieve Greater Return on Investment (ROI):

   – Outsourcing IS/IT functions to skilled service providers is often a strategic approach to stretching strained budgets.

   – Companies that take a well-managed approach to outsourcing can gain cost savings of upwards of 40–80 percent.

Five Main Reasons Behind A Decision To Outsource

2. Focus on Core Competencies:

   – Outsourced professionals allow an organization and its employees to focus on the business they are in rather than a business in which they are not.

   – By using an outsourcing strategy for application development, an organization can focus its IS professionals on identifying and solving business problems rather than on programming and prototyping new applications.

Five Main Reasons Behind A Decision To Outsource

3. Achieve Flexible Staffing Levels:

 – Strategic use of an outsourcing approach to IS/IT functions can result in business growth without increasing overhead.

 – Outsourcing provides a pool of qualified professionals available for unique, niche, or overflow projects.

 – If the unique skill set required by an organization is difficult to find or expensive to maintain in-house, outsourcing can allow for the acquisition of the needed expertise.

Five Main Reasons Behind A Decision To Outsource

4.   Gain Access to Global Resources:

–   The Outsourcing Institute asserts that the rules for successfully growing a business have changed: "It's no longer about what you own or build. . . . [Instead] success is hinged to resources and talent you can access."

–   Using global expertise allows an organization to gain the advantage of skilled labor, regardless of location, and significantly increase the quality of its deliverables.

–   As such, outsourcing can create opportunities for smaller businesses that might not otherwise be possible due to costs or geophysical constraints.

Five Main Reasons Behind A Decision To Outsource

5.   Decrease Time to Market

– Outsourcing extends the traditional small business benefits of flexibility and responsiveness, allowing smaller organizations to compete effectively against bigger firms.

– Supplementing an existing workforce with offshore support could allow for productivity 24 hours a day.

– Having access to resources able to work on key projects even while local employees are asleep can serve to accelerate time to market and provide a key competitive advantage.

Offshoring IT and IS

- Although often confused with outsourcing, offshoring is also increasingly becoming part of a strategic approach to IS/IT management.

  - Offshoring can be defined as a relocation of an organization's business processes (including production/manufacturing) to a lower-cost location, usually overseas.

Offshoring IT and IS

- Offshoring can be considered in the context of either production offshoring or services offshoring.

- After its accession to the World Trade Organization (WTO), China emerged as a prominent destination for production offshoring.

- After technical progress in telecommunications improved the possibilities of trade in services, India became a country that chose to focus on this domain.

Offshoring IT and IS

- The growth of services offshoring in information systems is linked to the availability of large amounts of reliable and affordable communication infrastructure following the telecom bust of the late 1990s.

- Coupled with the digitization of many services, it became possible to shift the actual delivery location of services to low-cost locations in a manner theoretically transparent to end users.

Failures in IT Management

- Managing information technology is not an easy task.

- The information systems function often has performance problems in many organizations.

- The promised benefits of information technology have not occurred in many documented cases.

Failures in IT Management

- Studies by management consulting firms and university researchers have shown that many businesses have not been successful in managing their use of information technology.

Failures in IT Management

- Thus, it is evident that in many organizations, information technology is not being used effectively and efficiently, and there have been failures in IT management.

Failures in IT Management

- For example:
  - Information technology is not being used *effectively* by companies that use IT primarily to computerize traditional business processes instead of developing innovative e-business processes involving customers, suppliers, and other business partners, e-commerce, and Web-enabled decision support.
  - Information technology is not being used *efficiently* by information systems that provide poor response times and frequent downtimes, or by IS professionals and consultants who do not properly manage application development projects.

Solution to Failures in the Information Systems Function

- The experiences of successful organizations reveal that extensive and meaningful managerial and end-user involvement is the key ingredient of high-quality information systems performance.

  - Involving business managers in the governance of the IS function and business professionals in the development of IS applications should thus shape the response of management to the challenge of improving the business value of information technology.

Solution to Failures in the Information Systems Function

- Involving managers in the management of IT (from the CEO to the managers of business units) requires the development of governance structures (e.g., executive councils, steering committees) that encourage their active participation in planning and controlling the business uses of IT.

Solution to Failures in the Information Systems Function

- Thus, many organizations have policies that require managers to be involved in IT decisions that affect their business units.

  - This requirement helps managers avoid IS performance problems in their business units and development projects.

Solution to Failures in the Information Systems Function

- With this high degree of involvement, managers can improve the strategic business value of information technology.

- Only direct end-user participation in system development projects can solve the problems of employee resistance and poor user interface design.

- Overseeing such involvement is another vital management task.

IT Governance

- Information technology governance (ITG) is a subset discipline of corporate governance focused on the information technologies (IT), information systems (IS), their performance, use, and associated risks.

- The rising interest in IT governance is due, in part, to governmental compliance initiatives.

IT Governance

- Additional motivation comes from the acknowledgment that IT projects can easily get out of control and profoundly affect the performance of an organization.

- A characteristic theme of IT governance discussions is that the IT capability can no longer be thought of as a mythical black box, the contents of which are known only to the IT personnel.

IT Governance

- This traditional handling of IT management by board-level executives is due to limited technical experience and the perceived complexity of IT.

- Historically, key decisions were often deferred to IT professionals.

IT Governance

- IT governance implies a system in which all stakeholders, including the board, internal customers, and related areas such as finance, have the necessary input into the decision-making process.
  - This prevents a single stakeholder, typically IT, from being blamed for poor decisions.
  - It also prevents users from later complaining that the system does not behave or perform as expected.

IT Governance

- The focus of ITG is specifying decision inputs and rights along with an accountability framework such that desirable behaviors toward and in the use of IT are developed.

- It highlights the importance of IT-related matters in contemporary organizations and ensures that strategic IT decisions are owned by the corporate board, rather than by the CIO or other IT managers.

IT Governance

- The primary goals for information technology governance are to:

    1. Assure that the significant organizational investments in IT and IS generate their maximum business value and

    2. Mitigate the risks that are associated with IT.

IT Governance

- ITG is accomplished by implementing an organizational structure with well-defined roles for the responsibility of the decisions related to the management and use of IT such as:

  - Infrastructure

  - Architecture

  - Investment, and

  - Use.

ITG Approach

- One very popular approach to IT governance is COBIT (Control Objectives for Information and related Technology).

- COBIT is a framework of best practices for IT management created by the Information Systems Audit and Control Association (ISACA) and the IT Governance Institute (ITGI).

ITG Approach

- COBIT provides all members of the organization with a set of generally accepted measures, indicators, processes, and best practices to help them maximize the benefits derived through the use of information technology and in developing appropriate IT governance and control structures in a company.

ITG Approach

- COBIT has 34 high-level processes covering 210 control objectives categorized in four domains:

  - Planning and Organization

  - Acquisition and Implementation

  - Delivery and Support, and

  - Monitoring

ITG Approach

- Managers benefit from COBIT because it provides them with a foundation upon which IT-related decisions and investments can be based.

ITG Approach

- Decision making is more effective because COBIT helps management:

  - Define a strategic IT plan

  - Define the information architecture

  - Acquire the necessary IT hardware and software to execute an IT strategy

  - Ensure continuous service, and monitor the performance of the IT system.

ITG Approach

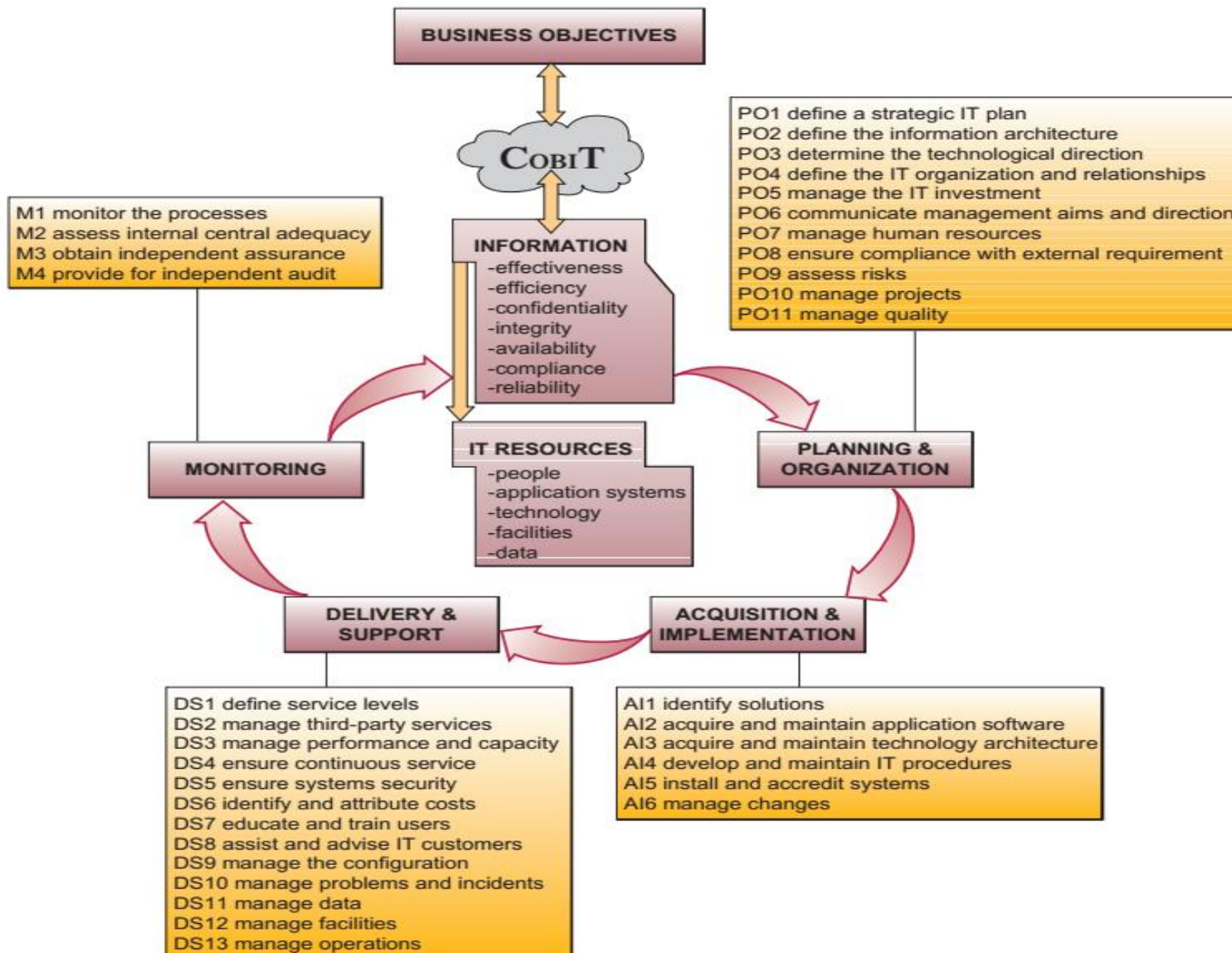- IT users benefit from COBIT because of the assurance provided to them by COBIT's defined controls, security, and process governance.

- COBIT also benefits auditors because it helps them identify IT control issues within a company's IT infrastructure, and it helps them corroborate their audit findings.

Relationships Between The Four Domains In COBIT

Relationships between the four domains in COBIT and categories of both high-level processes and control objectives associated with them.

BUSINESS OBJECTIVES

COBIT

M1 monitor the processes
M2 assess internal central adequacy
M3 obtain independent assurance
M4 provide for independent audit

INFORMATION
-effectiveness
-efficiency
-confidentiality
-integrity
-availability
-compliance
-reliability

PO1 define a strategic IT plan
PO2 define the information architecture
PO3 determine the technological direction
PO4 define the IT organization and relationships
PO5 manage the IT investment
PO6 communicate management aims and direction
PO7 manage human resources
PO8 ensure compliance with external requirement
PO9 assess risks
PO10 manage projects
PO11 manage quality

MONITORING

IT RESOURCES
-people
-application systems
-technology
-facilities
-data

PLANNING & ORGANIZATION

DELIVERY & SUPPORT

ACQUISITION & IMPLEMENTATION

DS1 define service levels
DS2 manage third-party services
DS3 manage performance and capacity
DS4 ensure continuous service
DS5 ensure systems security
DS6 identify and attribute costs
DS7 educate and train users
DS8 assist and advise IT customers
DS9 manage the configuration
DS10 manage problems and incidents
DS11 manage data
DS12 manage facilities
DS13 manage operations

AI1 identify solutions
AI2 acquire and maintain application software
AI3 acquire and maintain technology architecture
AI4 develop and maintain IT procedures
AI5 install and accredit systems
AI6 manage changes

End of Chapter