

# ICT Service Management

## Information technology in a business environment

- ➔ Function = collection of related processes (ex. Marketing)
- ➔ Business process = set of activities (ex. Create campaign)
- ➔ Activity = simple action (ex. Determine target group)

Each function adds to the value chain of Porter.

- ➔ Primary activities: contribute directly to add value
- ➔ Supporting activities: ensure primary activities run smoothly
- ⇒ Difference is in the margin to create value

Create competitive advantage

- ➔ Use information systems (=collective of equipment, services, humans,)
- ➔ Used to support and automate business processes

How is IT used in businesses?

- ➔ Data processing
  - Storage and processing
- ➔ Task automation
  - Aim to automate complete process
- ➔ Integrated information systems (increase overall efficiency and a complete chain of processes)
  - Integration: ex. With ERP
  - Adjustment of business processes to information systems
  - Complex systems: ex. Complex software

Important aspects when implementing integration:

- Use a structured approach
- Consider the whole organization
- Have a clear vision
- The information system is designed as one united
- There will be change
- Takes several phases to implement
- It should not only be the task of IT specialists

Most important problems are not technical

- ➔ Ever-changing user equipment
- ➔ Budget limits
- ➔ Unmotivated staff
- ➔ Unacceptable project delays
- ⇒ The introduction of an information system should be thoroughly aligned with the strategy.

## The benefits of information systems

- ➔ Operational: more efficiently
- ➔ Tactical: easier to realize goal
- ➔ Strategic: may be able to develop better strategy
- ➔ Quantifiable benefits: increase in profits
- ➔ Non-quantifiable benefits: better customer service

## Information systems and a competitive advantage

- ➔ IT resources = abundantly available on the market (windows)
- ➔ IT capabilities = takes years to develop, this makes a difference (the way an organization uses its resources)

## A framework for information management

### A Framework

Different elements:

- ➔ Information system (runs through a life cycle)
  - The business process (activities)
  - The data (information)
  - The application (support)
  - The infrastructure (runs application)
- ➔ IT management
  - Decisions on its lifetime cycle
  - IT of all departments
- ➔ IT governance
  - Regulate the relationship between business and IT function
- ➔ The concerns
  - Worries and issues of the stakeholders

## The information systems

- ➔ The domains:
  - Business processes = what happens in the organization
  - The data: content and structure are important
  - Application: like ERP
  - Infrastructure: hardware, software, ...
- ➔ Mutual relationship between the four domains:
  - Business process and data: data is needed for daily processes
  - Business process and application: application supports daily processes
  - Application and data: data is needed to run application
  - Application and infrastructure: application needs hardware/software to operate
  - Data and infrastructure: datacentre
- ➔ Life cycle:
  - Conception: starting point of design and implementation (tactical and strategic choices are made)
  - Architecture: description of how the information system will look like
  - Development: information system is built
  - Roll-out: system is made operational

- Operations: longest phase, system is used daily
- Decommissioning: retired of use, can bring security problems when scrapping hardware

## IT management

IT function needs to be managed

- ➔ Basic management activities:
  - Project manager
  - Operations management keeps operational information systems running
  - Services delivery management delivers IT services to the users
  - Financial management: cos-benefit analysis of IT projects
  - Quality management
  - Supplier management
  - Human resource management

## IT governance

Interaction between the business as a whole and its IT function ➔ objective is to create value

- ➔ Activities:
  - Business-IT alignment
  - Setting up and maintaining IT decision structures
  - Exerting control: ensure that business goals are met as required

## The concerns

Worries and issues related to stakeholders

- ➔ Business concerns:
  - Products and services
  - Economic aspects
  - Compliance
- ➔ System concerns:
  - Service levels
  - Usability
  - security

## IT Management

### IT as a service

IT function is organised as a service for users

Properties of IT services:

- ➔ Services catalogue clearly describes the services
- ➔ Service unit: price associated with unite
- ➔ Users: customers/employees

Service quality:

- ➔ Effectiveness: it does the right thing
- ➔ Efficiency: sufficient capacity and performance

Service types:

- ➔ End-user services
- ➔ Basic services: needed to implement end-user services
- ➔ Extra services: in addition to the services (maintenance)

Service classes:

- ➔ Desktop services
- ➔ Storage
- ➔ Printing
- ➔ Network
- ➔ Application services
  - Usage
  - Development
- ➔ Support services
  - Assistance
  - Maintenance and repair
- ⇒ Failure to bundle support led to problems:
  - Insufficient users subscribe
  - Users do not subscribe and request maintenance

The service unit

- ➔ Subscription based units:
  - Independent of intensity of use
  - Most common
  - Easiest to define
- ➔ Volume-based units
  - Depends on intensity of use
  - Variable
  - Difficult to measure

## IT services sourcing

Provider is internal:

- ➔ One shared central IT department
  - +: Economies of scale
  - +: High degree of standardization
  - +: Room for the development of new capabilities and new services
  - -: Ineffective services
  - -: IT is too far from business
  - -: Lack of flexibility and agility
- ➔ One separate IT department per division
  - +: Customer intimacy
  - +: Opportunity to specialize in IT services
  - -: High cost
  - -: IT is not managed close enough
- ➔ Hybrid
  - Splits between centralized and decentralized
  - Basics provided by central department

### Outsourcing:

- ➔ Organization wants to focus on key competences
- ➔ There are insufficient IT competences
- ➔ Cost reduction
- ➔ Better service
- ➔ Choices:
  - Complete outsourcing
  - Outsourcing of system support: extern is responsible for daily operations and management of the infrastructure and applications
  - Outsource it servers
  - Outsources applications: SAP
  - Desktop outsourcing: personal computer

### Cloud computing:

- ➔ Flexible on demand service
- ➔ Metered use: only charged for used resource
- ➔ Universal access
- ➔ Services:
  - IAAS (infrastructure-as-a-service)
    - Provider supplies computing processing, storage, and network capacity to customer
  - PAAS (Platform-as-a-service)
    - Provider supplies additional system software and supporting software as part of the cloud service
  - SAAS (Software-as-a-service)
    - Provider supplies an application
- ➔ How to offer:
  - Public cloud: to provide services to all users
  - Private cloud: reserved for one user
  - Community cloud: shared by certain customers
  - Hybrid
- ➔ Advantages:
  - Shift from capital to expense
  - Scalable
  - Cost saving
  - Limited staff required
- ➔ Risk:
  - Security and privacy
  - Regulations and compliance
  - Lock-in

## IT management standards and frameworks

### Five standards

#### → ITIL:

- Best practice standard
- Flexible
- Describes architecture to set up IT services
- Five books:
  - Service strategy: helps develop general strategy
  - Service design
  - Service transition
  - Service operation: guidelines for internal management
  - Continual service improvement

#### → ISO/IEC 20000:

- Predictive
- Nine parts, most important:
  - Service management systems requirements
  - Guidance on the application of service management systems
  - Process reference model
  - Exemplar implementations

#### → IT4IT:

- Approaches from the stance of the supply chain
- Independent from vendors or software
- Flexible
- Also, stable enough

#### → COBIT:

- General framework for IT governance

#### → CMMI-SVC:

- Best practices to improve processes
- Describes processes
- Defines four capability levels:
  - Incomplete: Process is absent or partly implemented Some process goals not reached
  - Performed: Process realizes specific goals Not institutionalized
  - Managed: Planned and executed according to predefined policy Monitored, controlled, reviewed, evaluated
  - Defined: Managed process Maintained process description Derived from set of (overall) standard processes
- Defines five maturity levels:
  - Initial:
    - Processes are unstable and ad-hoc
    - Success depends on who is doing the process
    - Overcommitted results
    - Not executed when problems
    - Success cannot be repeated
  - Managed:
    - Key processes are institutionalized
    - Agreements and contractual requirements defined

- Configuration management, quality assurance
- Planned processes, sufficient resources
- People have assigned responsibilities and are trained
- Process execution is evaluated
- Defined:
  - Implementation best practices (service continuity, incident handling)
  - Processes rigorously defined and described
  - Establishment consistent standard processes (variants in particular circumstances)
  - Proactive process management
- Quantitatively managed:
  - Quantitative measurement of process objectives and performance
  - Objectives based on customer requirements
  - Quality, performance statistically defined and managed
  - Process performance is predictable and consistent
- Optimized:
  - Outcome and performance variations managed quantitatively
  - Continuous focus on performance improvement (incremental, innovative)
  - Established and revisable quality and performance objectives
  - Process improvement effects measured

## Services delivery management

### The service catalogue

Description of the services offered

- ➔ Name of service
- ➔ Version
- ➔ Description
- ➔ Offered service levels
- ➔ The group of users for whom the service is intended
- ➔ Service units and its pricing
- ➔ Specific terms and conditions for requesting the service

### Service request handling

Two main channels:

- ➔ The user contacts the service desk
  - Smaller requests
- ➔ The request is handled by the IT service manager
  - Larger request

Request will be evaluated:

- ➔ Genuine
- ➔ Requestor is authorized
- ➔ Part of the catalogue

Request is categorized:

- ➔ Simple request
- ➔ Complex request, further inspection is needed:
  - Urgency
  - Resources needed
  - Estimated lead time
  - Financial consequences for the customer
  - Financial consequences for the IT department

If service is approved, it will be fulfilled. After fulfilment, the request will be closed

## Services planning

Ensures that the correct service volumes are available when needed

Capacity forecast made on three levels (they are all related):

- ➔ The business process: forecast the volume of business process
- ➔ Service consumption: volumes at different services consumed
- ➔ Resources: volume of resources needed

Two main techniques to obtain useful forecasts:

- ➔ User forecast:
  - Users are asked to provide forecast
  - Not always reliable
  - Good for capturing large changes in business volume that are due to changes in the business constellation: mergers, ...
- ➔ Trend analysis:
  - Extrapolate the past consumption
  - Cannot detect large changes in business
- ➔ Reliable forecasts are usually a combination of the different techniques

## Financial management

### IT project cost benefit analysis

Fundamentally is the IT department not different than other department in case of the financial management.

IT delivers services in a complex environment → difficult to calculate

They will charge their users the service they provide through internal transfer/invoice

### IT services cost calculation

Two options to recover cost:

- ➔ Costs are pure indirect costs:
  - Added to the general overhead cost
- ➔ Costs are distributed across the users of the ICT services
  - The ICT costs of the central department reappears on the cost budgets of the user



To calculate cost (7 steps):

- ➔ Identification of the costs
  - Usually classified according to cost type
- ➔ Identification of the services
  - As described in the catalogue
- ➔ Identification of resources
  - Hardware, software, ...
  - Correct choice is important = easy calculation
  - IT resources should be a complete system, ex. A network, server, ...
- ➔ Consolidation of the personnel costs
- ➔ Calculation of the cost of each resource: cost of each IT resource
- ➔ Allocation of the resources to the services
  - For each resource, determine the fraction of it used to implement each of the services
- ➔ Calculation of the service unit price
  - Total cost divided by the number of service units

### IT services charge-out

Charged out = internal IT department still calculates cost

The purpose is to shift the costs from the IT department to the individual budget of the users

Advantage: costs will become visible per user budget encouraging better management and cost control

Principles:

- ➔ Understandable: customers and users should be able to understand the services definition and the service unit
- ➔ Fair: user should only pay for the service they used
- ➔ Predictable: user could easily make a prediction of the time used and the cost
- ➔ Verifiable: the costs are clearly stated
- ➔ Consistent: when users utilise the same service, they should be invoiced the same

Internal charge-out system in three steps:

- ➔ Services definition
  - In service catalogue
  - Important to define appropriate service unit
- ➔ Cost calculation
  - Cost associated to each service unit
  - Price charged is equal to the cost
- ➔ Charge-out of consumed service
  - Actual use is charged to the user

Difference in total charge-out and actual cost can be different:

- ➔ Difference between forecast and actual use
- ➔ Difference between budget and actual IT cost
- ➔ Differences should be absorbed in the cost of the enterprise

The aim of an IT department is to reach a zero net balance!

External charge-out:

- ➔ In principle market conditions = cost + mark-up
- ➔ Pricing resembles internal transfer pricing

## Operations management

Support daily activities within IT department

### Resource tracking

One of the basic activities

- ➔ Stored in item database
- ➔ Consists of two activities:
  - Resource inventory creation
  - Resource data management
    - Newly purchased product = create
    - Made operational: status is changed, relationships created
    - Modified: ex. Update
    - Decommissioned: status changed; relationships removed
- ➔ Resource manager decides the granularity

Relationship between resource items:

- ➔ Can consist of another item
- ➔ Is installed on another item
- ➔ Connected to another item
- ➔ Associated with another item

Extra services handled with resource tracking:

- ➔ Event handling
- ➔ Incident handling
- ➔ Problem handling
- ➔ Change handling
- ➔ Financial management
- ➔ Service planning

### Change handling

Three kinds of changes:

- ➔ Standard change:
  - Described in catalogue as standard
  - Can be ordered by user
- ➔ Urgent change:
  - Consequences of an incident
  - Performed immediately
  - Assessed and approved, always evaluated

- ➔ Normal change
  - Normal operation

All change start with:

- ➔ Request for change:
  - Technical staff
  - Service desk
  - IT service manager
  - External supplier
- ➔ Evaluate of request is genuine, requestor is authorized, reasonable and feasible and if the request type is correct (done by change manager)
- ➔ Preparation considerations:
  - Detailed evaluation
  - Risk involved in the change
  - Detailed implementation planning
  - Back-out plan
  - Estimate cost involved
- ➔ Task change committee (assess all normal and urgent changes)
  - Prioritizing important changes
  - Approving change
  - Recommending
  - Define guidelines
- ➔ Change themselves are performed by technical staff
- ➔ Post implementation review:
  - Are the results realized?
  - Are there undocumented side effects?
  - Carried out in the timeframe and budget given?

## Event, incident, and problem handling

Event:

- ➔ Events signal normal operations
- ➔ Threshold events: ex. Memory threshold exceeded
  - Are symptoms of a problem
- ➔ Events reporting expectations
- ➔ Events reporting malfunctions

Event handling:

- ➔ Built-in detection: operating system signals events
- ➔ Monitoring tools: network monitor detects transmission error
- ➔ User reports (to service desk)
- ➔ Needs to be logged:
  - All relevant data will be stored

Incident (an unwanted interruption) handling:

- ➔ Identification of service desk
  - Examines problem in detail
  - Parameters:
    - Scope: what services and which users are affected
    - Severity: measure of degradation of the IT services
- ➔ Determine severity:
  - Minor incident: small impact, solved immediately by service desk staff
  - Major incident: ex. Failing application server, escalate to second-line support
  - Disaster: ex. Flooded server room
- ➔ Diagnose of incident:
  - Diagnostic scripts
  - Incident matching
- ➔ Incident solution:
  - Component replacing
  - Back-up measures
  - Workaround: typical temporary solution
- ➔ Possible escalation:
  - Escalation to third line support: assistance of vendor
  - Escalation to fourth line support: developers of system
  - Hierarchical escalation: escalation to higher management
- ➔ Incident review: for major incidents

Problem (underlying persistent cause of one or more incidents) handling:

- ➔ Detection of problem
  - One or more incidents
  - Incident review indicates problem
  - One or more incidents not leading to incidents
  - Specific reports by system engineers and vendors
- ➔ Registration in database
- ➔ Problem is examined
- ➔ Diagnosing the root problem:
  - Diagnostic script
  - Problem matching
  - Problem replication: in a testing environment
- ➔ Possibility to install workaround:
  - Install back up system
  - Substitute service
  - Restrict system usage
- ➔ Action to solve problem:
  - Hardware repair or replacement
  - Software modification or upgrade
  - Installation of additional resources
- ➔ Problem review

# Quality management

## Service levels

Quantitatively definition of a minimum quality requirement

- ➔ about quality
- ➔ Defines minimum requirements
- ➔ Is quantitative

“In at least **x%** of all measurements of parameter **y** of the service, performed over a period **p**, a value will be obtained of at least/at most/equal to **z**” ➔ “In at least **99%** of all measurements of the **response time of a database query**, performed over **one month**, a value will be obtained of at most **2 seconds**”

Types of service levels (defined with the same structure as noted supra):

- ➔ Availability

Availability: The fraction of the time a piece of infrastructure, a resource or a service can effectively be used. ➔  $\beta = (\text{MTBF} / (\text{MTBF} + \text{MTTR}))$ , unavailability =  $1 - \beta$

Composite systems:

$$\beta_S = \prod_{i=1}^N \beta_{C_i}$$

unavailable:

$$1 - \beta_S = \sum_{i=1}^N 1 - \beta_{C_i}$$

$\sum (1 - \beta_{C_i}) \ll 1$   
e.g. 5%

Failure rate and reliability: The uninterrupted amount of the time a piece of infrastructure, a resource or a service can effectively be used

Availability improvement techniques:

- Servers
  - Goal: remove single points of failure
- Storage:
  - RAID (redundant array of inexpensive disks)
    - RAID 1: Disk (data) mirroring ➔ expensive to create copy on remote site
    - RAID 5: Block level striping (Write subsequent blocks to different disks) + redundancy (Write one parity block P per n blocks)
  - Combine multiple disks into one system Looks as one single disk system
  - Have more disks than necessary
  - Use extra disk(s) to store redundant information or spread redundant information over all disks
  - When component fails: use this redundant information to restore data (restoring data is possible without performance degradation)
- UPS:
  - Guards against power failure

- Disaster recovery:
  - Have a plan
- ➔ Capacity
  - Sufficient internet connection, network storage, minimum process capacity, printing....
- ➔ Performance
  - Responds time, ...
- ➔ Administration and support,
  - Standard request fulfilment ➔ maximum lead time, ...

## Service level agreements

Between customers and IT provider

When levels are not met, action should be taken:

- ➔ Meeting on affected service level with proposals for improvement
- ➔ Discount on charges
- ➔ Fines
- ➔ (Partial) contract termination

## Supplier management

### Different suppliers

- ➔ Hardware
- ➔ Software
- ➔ Commodity
- ➔ Service supplier
  - Workforce services
  - Advisory (consulting)
  - Networking services
  - Outsourcing services (cloud)

### Supplier classification

- ➔ Strategic: partners, often sharing confidential information
- ➔ Tactical: represent significant commercial activity and business interaction
- ➔ Operational: supply products and services
- ➔ Commodity

### Supplier management activities

- ➔ Identify new suppliers and suppliers' requirements
- ➔ Evaluate new suppliers and new offerings
- ➔ Establish new suppliers and contracts
- ➔ Manage supplier and contract performance
- ➔ Renew or terminate supplier contracts

# Human resource management

## IT personnel

Four broad categories:

### ➔ Management

- Management and coordination
  - Senior: overall management
    - CIO: overall IT manager
    - Services director/service delivery manager: all services provision
  - Project management
    - Project manager
    - Team leader

### ➔ Architecture

- Design and maintenance of new information systems
  - Business architect
  - Technical architect
- Requires knowledge of management and information systems

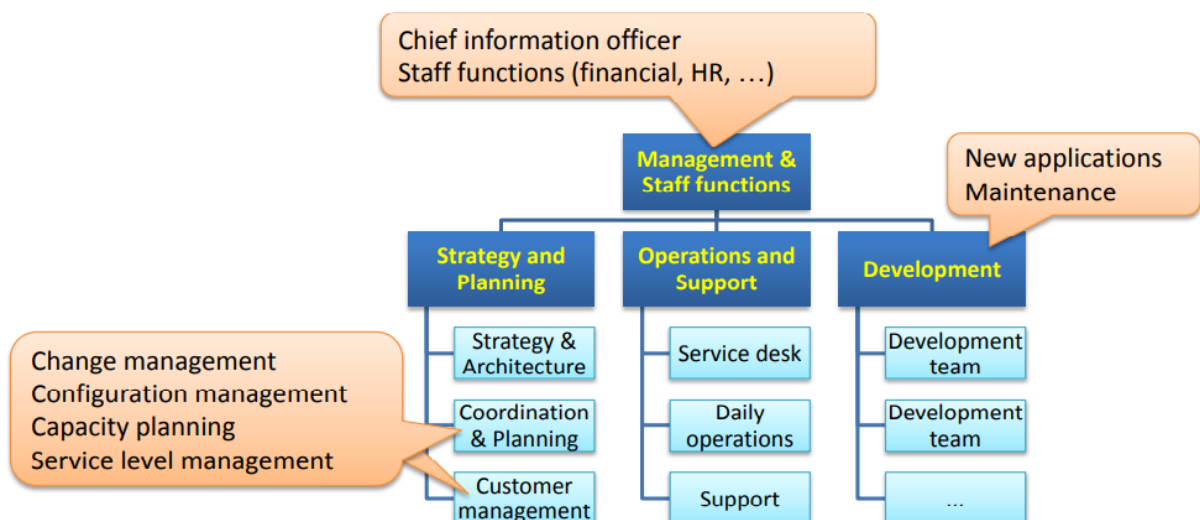
### ➔ Service delivery

- Service manager/coordinator
- Service desk staff member
- Security officer

### ➔ Technical and administrative

- System development
  - Analyst
  - Programmer
  - Tester
- Support
  - System engineer
  - System administrator
  - Operator

## The organizational structure of an IT department



## IT governance

What is IT governance?

- ➔ IT governance is concerned with the global relationship between the business and the
- ➔ IT function IT governance aims at ensuring that the IT function behaves properly and delivers value to the business
- ➔ IT governance defines and implements policies, procedures, processes, structures, and control mechanisms

## IT governance standards

- ➔ ISO/IEC 38500
  - Framework with guidelines
    - Responsibility
      - Individuals and groups understand and accept responsibilities in respect to IT supply and demand.
      - Those responsible have authority
    - Strategy
      - Business strategy considers current and future IT capabilities.
      - Strategic IT plans satisfy current and ongoing business strategy needs
    - Acquisition
      - T Acquisitions are made for valid reasons
      - ...are based on proper analysis
      - ...balance benefit, opportunity, cost, risk
      - ...in the short term and the long term
    - Performance
      - IT is fit for purpose in supporting business
      - IT provides services, service quality meeting current and future business requirements
    - Conformance
      - IT complies with all mandatory legislation and regulations
      - Policies are clearly defined, implemented, and enforced
    - Human behaviour
      - Policies, practices, and decisions respect human behaviour
      - IT considers current and evolving needs of all the people in the process



- Three main responsibilities of directors
  - Evaluate current and future use
  - Direct preparations and implementation of plans and policies
  - Monitor performance
- Guidelines for corporate
  - Responsibility
    - Evaluate:
      - Evaluate options for assigning responsibilities w.r.t. current and future use of IT
      - Evaluate competence of those given responsibility to decide on IT
    - Direct:
      - Ensure that plans are carried out according to responsibilities
      - Directors should receive information needed to meet responsibilities and accountability
    - Monitor:
      - Appropriate IT governance mechanisms should be established
      - Those responsible should acknowledge and understand responsibilities
      - Performance of those responsible for governance should be monitored
  - Strategy
    - Evaluate:
      - Ensure that IT provides support for future business needs
      - Ensure IT aligns with organization's objectives
      - Ensure appropriate risk assessment
    - Direct:
      - Direct preparation and use of plans and policies to ensure benefits from developments in IT
      - Encourage submission of proposals for innovative use of IT
    - Monitor:
      - Ensure that proposals achieve objectives within time and resources
      - Ensure that use of IT achieves intended benefits
  - Acquisition
    - Evaluate:
      - Evaluate options for providing IT
    - Direct:
      - IT assets should be acquired in an appropriate manner
      - Supply arrangements should support business needs
    - Monitor:
      - Ensure that IT investments provide required capabilities
      - Monitor shared understanding of organization's IT acquisition intent

- Performance
  - Evaluate:
    - ...proposals of managers to ensure that IT will support business processes with required capability and
    - ...risks from IT to continued operation of business
    - ...risks to integrity of information and assets
    - ...options for assuring effective and timely decisions on IT
    - ...effectiveness and performance of IT governance
  - Direct:
    - Ensure allocation of sufficient resources to meet organization needs
    - Those responsible should ensure that IT supports business
  - Monitor:
    - ...extent to which IT supports business
    - ...extent to which allocated resources and budgets are prioritized
    - ...extent to which policies are followed properly
  - Benefits:
    - Implementation and operation of appropriate assets
    - Responsibility and accountability of IT supporting organization goals
    - Business continuity and sustainability
    - Alignment of IT with business needs
    - Efficient allocation of resources
    - Services, markets, and business innovation
    - Good practice in stakeholder relationships
    - Cost reduction
    - Realization of benefits from investments in IT
- Conformance
  - Evaluate:
    - ...whether IT satisfies obligations (regulatory, legislation, common law, contractual)
    - ...whether IT satisfies internal policies, standards, and professional guidelines
    - ...internal conformance to IT governance
  - Direct:
    - Those responsible should ensure that IT complies with obligations, standards, and guidelines
    - Policies should be established and enforced enabling the organization to meet internal obligations in use of IT
    - Staff should follow relevant guidelines
    - All actions relating to IT should be ethical
  - Monitor:
    - ...IT compliance and conformance
    - ...IT activities

- Benefits:
  - Balance risks
  - Encourage opportunities from IT
  - Establish vocabulary Assure conformance with obligations
  - Regulatory, legislation, common law, contractual
  - Security and privacy
  - Spam
  - Trade practices
  - Property rights & licensing
  - Record keeping ○ Environment, health & safety
  - Accessibility, social responsibility
- Human behaviour
  - Evaluate:
    - Identify and consider human behaviours
  - Direct:
    - IT activities should be consistent with identified human behaviour
    - Anyone may identify and report risks, opportunities, issues, and concerns at any time
    - Risks should be managed
  - Monitor:
    - Human behaviour should remain relevant
    - Proper attention should be given to human behaviour
    - Work practices should be consistent with appropriate use of IT

## COBIT

### Five principals

- ➔ Meeting stakeholders needs
  - Four groups:
    - Financial goals (transparency in IT cost)
    - Customer related goals (delivery of IT service in line with business requirements)
    - Internal goals (IT agility)
    - Goals related to learning and growth (competent and motivated IT staff)
- ➔ Enabling a holistic approach
  - Enablers: process, an organizational structure, or a piece of information (influences the IT governance and management ➔ factors determining whether or not governance works)
    - Principles, policies, and framework: to implement
    - Processes: to organise
    - Organizational structures
    - Culture, ethics, and behaviour
    - Information
    - Services, infrastructure, and applications
    - People, skills, and competences

- ➔ Separating governance from management
  - Governance is concerned with the stakeholders needs; management focuses on running operational activities
  - Five governance processes and thirty-two management processes
    - Governance: ex. Evaluate, direct and monitor
    - Management:
      - Align, plan, and organize
      - Build, acquire and implement
      - Deliver, service and support
      - Monitor, evaluate and assess
- ➔ Covering the enterprise end-to-end
- ➔ Applying a single integrated framework

### IT decision-making

Five domains where decisions need to be taken:

- ➔ General principles
- ➔ IT investment
- ➔ IT architecture
- ➔ IT infrastructure
- ➔ Applications

Parties involved

- ➔ Top management
- ➔ IT management
- ➔ Departments representing the users

Two phases in IT decision making process

- ➔ The input for the decisions
- ➔ The actual decision making

### IT spending and funding

Four areas, important to balance investments:

- ➔ Strategic projects
  - Improve strategic position (usually outside operational systems)
  - Evaluate new technology
  - 10-15 % spending
- ➔ Informational systems
  - Information for business tactics and strategy
  - Business intelligence
  - Increase control, acquire useful information
  - 20% spending
- ➔ Transactional systems
  - Business process automation (more efficient, less labour, save cost)
  - Accounting, order processing, invoicing
  - 10-15% spending

- ➔ Infrastructure
  - Foundation of IT systems
  - Networks, clients, servers, storage, printing
  - Office and communication applications
  - 50% spending

IT fundings:

- ➔ Charge-out: users pay
- ➔ Overhead: IT is general overhead cost
- ➔ Heterogenous funding (hybrid)

## Business IT alignment

### What is business IT alignment

Business strategy influences IT strategy ⇔ IT opportunities influence business strategy

Business IT alignment → Henderson & Venkatraman (close related to COBIT)

Definitions:

- ➔ A state:
  - Business-IT alignment leads to competitive advantages for the company
- ➔ A process:
  - A (continuous) journey, not necessarily ending in a stable end state
- ➔ Formal:
  - A formally established process seeking the alignment state
- ➔ Informal:
  - Supposedly achieved without explicit process (but e.g., through governance)

Alignment when... (by Luftman)

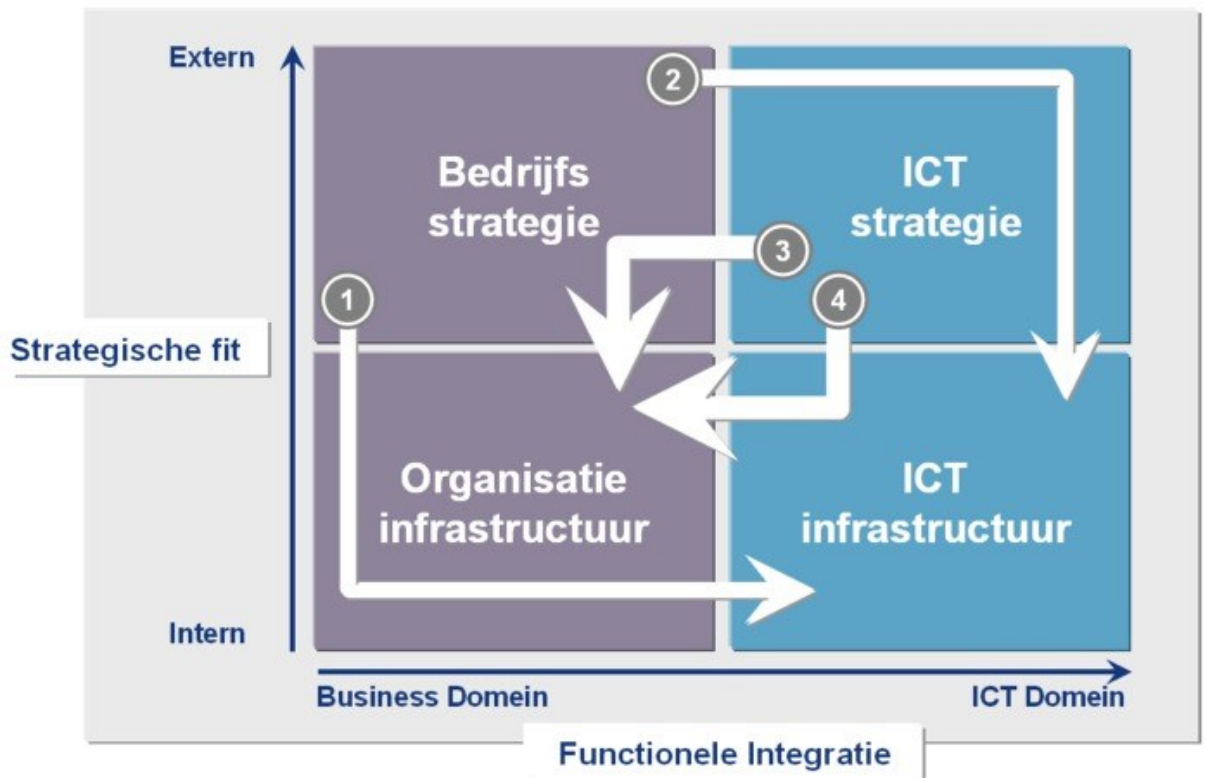
- ➔ There is mature and integrated communication between the business and IT
- ➔ IT demonstrates value to the business There is proper governance of IT
- ➔ There is a partnership between the business and IT
- ➔ IT can provide flexible and customizable systems, supporting the business
- ➔ IT skills are at a higher level

In summary:

Business alignment = The proper governance of the IT function in accordance with the requirements of the business and the proper use of IT capabilities in the business

## Business IT alignment models

Strategic alignment model (SAM) → Henderson & Venkatraman



### (1) Strategy execution

- Well-defined business strategy
- Business strategy determines organizational infrastructure and then drives development of IT infrastructure
- IT manager implements strategy
- Common in traditional businesses
- Classic view on strategic management
- IT is a cost of business operations
- Little or no IT strategy

### (2) Technology transformation

- Starts from business strategy
- Business strategy drives IT strategy
- IT infrastructure follows from IT strategy
- Top management develops vision on technology
- IT managers develop information architecture
- Business envisioning technological leadership

### (3) Competitive potential

- Use opportunities, offered by information technology
- Start from IT strategy
- Determine influence on business strategy
  - i. (Adjust business strategy to new IT opportunities)
- Derive organizational infrastructure from business strategy
- Top management has visionary role
  - i. (How IT trends shape the business strategy)
- IT manager is catalyst
  - i. Identifies and evaluates new trends
  - ii. Assists senior management in development of vision
- Businesses leveraging technology to gain competitive advantage

### (4) Service level

- Create excellent IT service delivery
- IT strategy is starting point
- Determine IT infrastructure supporting the business “What do users want?”
- Top management sets priorities
- IT manager is the true leader
  - i. (Setting up services portfolio)
- Businesses with focus on service

There is no best approach → depends on organization

Issues:

- ➔ IT should consider external factors (the “business”) for alignment
- ➔ How business-IT alignment is achieved depends on the organization (requires a broad vision on the role of IT)
- ➔ Roles and responsibilities of business and IT managers are very diverse: visionaries, leaders, executive managers
- ➔ Evaluating IT is diverse:
  - (1) as a cost centre (cost efficiency)
  - (2) as a service centre (services quality)
  - (3) as a profit centre (sense of IT market)
  - (4) as an investment centre (how IT competencies are enhanced)

The business value of information technology in the organization, four categories:

- ➔ Support mode
  - Small industrial companies
  - IT is “standard” function
  - IT is rather unimportant
  - Minor cost in business operations
  - Technological “follower”
  - Standard IT solutions (“vertically integrated”)
- ➔ Factory mode
  - Hospital/airline reservation
  - IT is very important
  - More aggressive use of IT does not yield competitive advantage
  - Core business supported by on-line systems
  - Focus on reliable and stable IT
- ➔ Strategic mode
  - Retail bank
  - IT is of strategic importance
  - Critical on-line systems, 100% uptime
  - Innovation is critical
    - renew systems at fast pace
    - acquire or maintain competitive advantage
  - Managing IT is a challenge
- ➔ Turnaround mode
  - E-government
  - No need for particularly reliable systems
  - However: strong need to innovate
  - Cost savings through innovation
  - ...often temporary situation on the way to “Support” mode





## Three-level business IT alignment framework

Three layers

- ➔ Strategic:
  - Business strategy ⇔ IT strategy
- ➔ Tactical:
  - Business projects/programs ⇔ IT projects/programs
- ➔ Operational:
  - Business operations ⇔ IT operations
- ➔ Vertical and horizontal integration

Summary: Business and IT must be aligning with itself and each other

## Strategic business IT alignment

Four focus points:

- ➔ Financial focus (Ryanair, EasyJet...)
  - Business:
    - Focus on low cost, high return
    - Strict cost management
    - Dominated by purchasing and financial control
    - Small, standardized product offering
  - IT:
    - Implements strict cost management
    - Strict rules for IT funding
    - Relation IT funding – requirements management
    - Closely monitored purchasing and supplier management
- ➔ Operational focus (Toyota, Phillips...)
  - Business:
    - Operational efficiency, governance, compliance
    - Efficient and automated production facilities (large volumes)
    - R&D focused on process improvements
    - Efficient distribution channels
    - Access to extensive capital
    - Dominated by production/manufacturing
  - IT:
    - IT used to automate business processes to maximum extent (large-scale transaction processing)
    - IT is efficient
    - Reliable, high-performance systems and services
    - Stable and efficient basic infrastructure
    - IT operations is primary focus
    - Continuous improvement of IT processes, services, and systems
    - Active contribution to operational business process improvement
    - Sufficient capital available

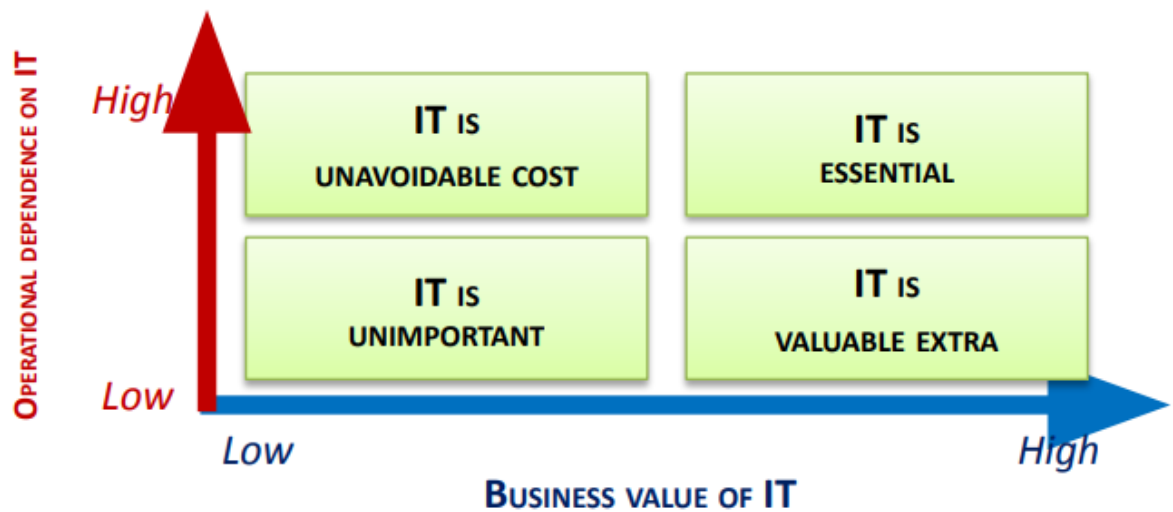
➔ Product focus (Apple, Zara...)

- Business:
  - High-value products
  - Continuous innovation, aimed at differentiation
  - Emphasis on product development
  - Rapid follow-up of product generations
  - Flexible manufacturing/services delivery
  - Outsourcing
  - Extensive marketing and branding
- IT:
  - IT is flexible and agile (e.g., supporting product diversity, granular pricing)
  - IT supports creative processes (product development, prototyping), implementing communication and collaboration tools
  - IT delivers non-standard services
  - IT actively contributes to business products and services
  - IT supports marketing (e.g., business intelligence)
  - IT outsourcing

➔ Customer Focus (emirates, Government...)

- Business:
  - Excellent customer service
  - Customer intimacy
  - Understanding customer needs
  - Flexible needs fulfilment
  - Dominated by customer-oriented departments (sales, customer service)
  - Agile sales and after-sales processes
  - Staff empowered to serve customer
- IT:
  - CRM
  - Support customer side of supply chain (delivery, after-sales)
  - Actively support customer purchasing improvement initiatives (e.g., web, mobile)
  - Actively support post-sales improvement initiatives

## Strategic attitude towards IT



Evolution patterns:

- ➔ Right to left = Erosion of competitive advantage
- ➔ Bottom to top = IT becomes indispensable

## Tactical business IT alignment

Alignment through enterprise architecture

Four operating models:

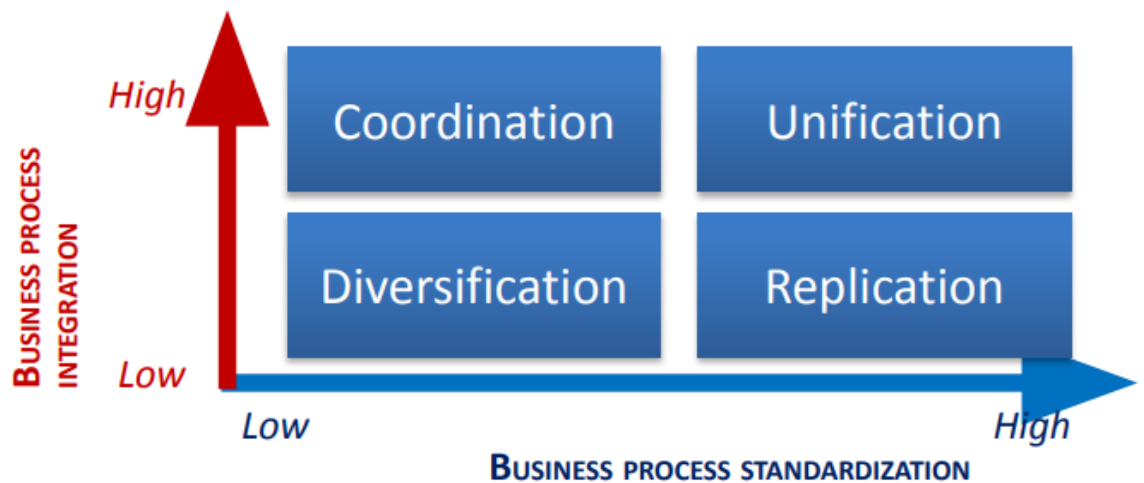
- ➔ Coordination (Partena)
  - 'Silos' to support business units
  - No or few data standards
  - Separate IT departments
  - Role of central IT limited (if any)
  - Independent business units
  - Autonomously managed
  - Few shared suppliers and customers
- ➔ Replication (Carrefour, MC Donald's)
  - Central enterprise architecture
  - Identical silos
  - Often local data responsibility
  - Central role of IT in silo design and management
  - Central business design
  - Similar business units
  - Independent business transactions (usually aggregated)
  - Locally owned business data

➔ Diversification (KBC)

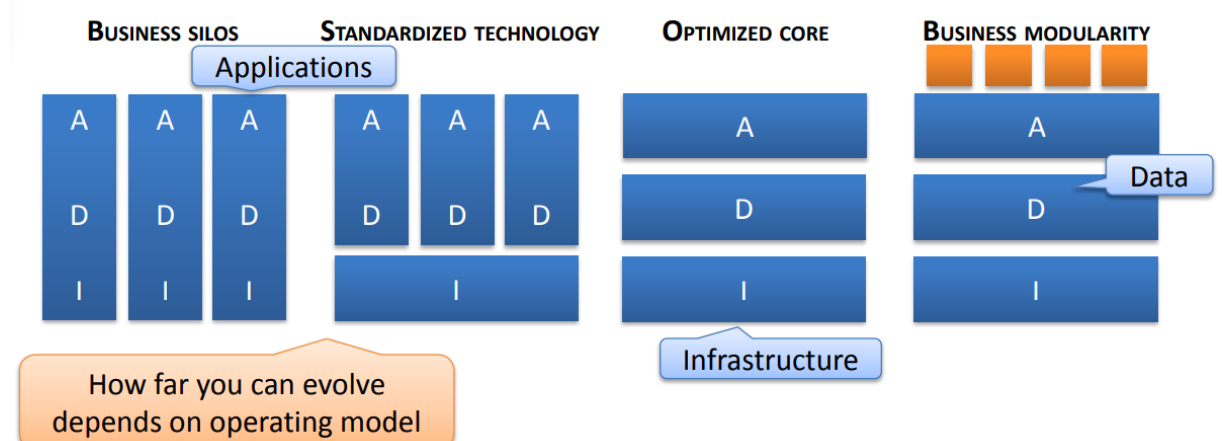
- Company has diverse business processes
- Standardized and shared business data
- Shared customers, products, suppliers
- Autonomous business units
- Shared data or replicated data
- Typical different applications

➔ Unification (BMW, Delta)

- Company operates as if single entity
- Centralized management
- Central business process design
- Central business data management
- Full integration of data
- Single application suite
- Strongly centralized IT



Architecture:



➔ Business Silos

- Low level of business-IT alignment
- Local alignment only (per business unit)
- No global alignment efforts

- ➔ Standardize technology
  - Full business-IT alignment on infrastructure level
  - Some effort towards global alignment (highest level for diversification operating model)
- ➔ Optimized core
  - Global business-IT alignment
- ➔ Business modularity
  - Agility on top of global business-IT alignment
  - Combination of 'local' and 'global' alignment

## Operational business IT alignment

Alignment through services management

## Measuring business IT alignment

Luftman model:

- ➔ Criteria:
  - Communications maturity:
    - How good does IT understand the business?
    - How good does the business understand IT?
    - The quality of the organizational learning.
    - How the interaction between business and IT is regulated.
    - The organization of knowledge sharing between business and IT.
    - The breadth and effectiveness of the liaison between business and IT.
  - Competence/value measurements maturity:
    - The quality of the IT metrics. The quality of the business metrics.
    - The link between the business and IT metrics.
    - The extent of use of service level agreements.
    - The use of benchmarking.
    - The use of formal assessments and reviews of the IT investments.
    - The implementation of continuous improvement programs.
  - Governance maturity:
    - The extent of formal business strategic planning.
    - The extent of formal IT strategic planning.
    - How does IT fit into the organization?
    - The reporting relationship between the CIO and the organization.
    - The way IT costs are budgeted.
    - The rationale for IT spending.
    - The role of the IT steering committee.
    - The prioritization of IT projects.
  - Partnership maturity:
    - The business perception of IT.
    - The role of IT in the business strategic planning.
    - The extent to which the business and IT share risks and rewards.
    - The management of the business-IT relationship.
    - The business-IT relationship style.
    - The sponsoring of IT projects from the business.

- Technology scope maturity:
  - The use of the primary systems.
  - The enforcement of standards.
  - The integration of the IT architecture into the business.
  - The perception of the IT architecture.
- Skills maturity:
  - The entrepreneurial environment and the encouragement of innovation.
  - Who takes the key decisions on IT human resources management?
  - The attitude towards change.
  - The frequency of career cross-over.
  - The implementation of cross-functional training and job rotation.
  - The level of social interaction between IT, the business and the customers and partners.
  - The ability to attract and retain top level talented staff.

➔ Maturity levels:

- Ad hoc
  - Lowest level
  - Minimal awareness
  - Alignment is improbable
- Committed process
  - Commitment to begin
  - Still minimal awareness
- Established process
  - Focused alignment awareness
  - IT embedded into business
  - IT used throughout enterprise
- Improved process
  - Effective governance
  - IT considered valuable, innovative, contributing to business
- Optimal process
  - Governance mature
  - Integration IT strategic plan into business plan
  - IT used in supply chain

➔ 4-step approach

- From an assessment team
  - Typically, 10 to 30 executives of investigated organization
  - Both business and IT
- Gather information
  - Team members evaluate criteria, giving maturity level
  - Scores are discussed
- Decide on scores of each criterion
  - Agreement on average scores for each criterion
  - Calculation of average for each of the six categories
- Decide on overall alignment score
  - Total score = average over six categories
  - Discussion and agreement on total score