

# **MODULE : ENTERPRISE INFORMATION MANAGEMENT**

## **UNIT 2: Enterprise Resource Planning**

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# INTRODUCTION TO ENTERPRISE INFORMATION SYSTEMS

- An **enterprise information system (EIS)** is any kind of information system which improves the functions of an enterprise business processes by integration.
- **What is an enterprise?**

An enterprise is a group of people with a common goal, which has certain resources at its disposal to achieve this goal.

An enterprise is divided into different units based on the functions they perform. These departments function in isolation and have their own systems of data collection and analysis.

We can consider the enterprise as a system and departments as subsystems.

**What is Information system ?**

A set of interrelated elements or components that collect(input), manipulate(process) and disseminate (output) data and information and provide a feedback mechanism to meet an objective.

# INTRODUCTION TO ENTERPRISE INFORMATION SYSTEMS (CTD)

- EIS provide a technology platform that enables organizations to integrate and coordinate their business processes.
- A **business process** is a collection of activities that takes one or more kinds of input and creates an output, such as a report or forecast, that is of value to the customer

# ERP

## What is an ERP System – definitions

### Simplistic Definition

ERP - Enterprise Resource Planning

### Detailed Definition

“a business **strategy** and set of **industry-domain-specific** applications that build customer and shareholder **communities** value network system by enabling and optimising enterprise and **inter-enterprise** collaborative operational and financial processes”(Source: Gartner’s Research Note SPA-12-0420).

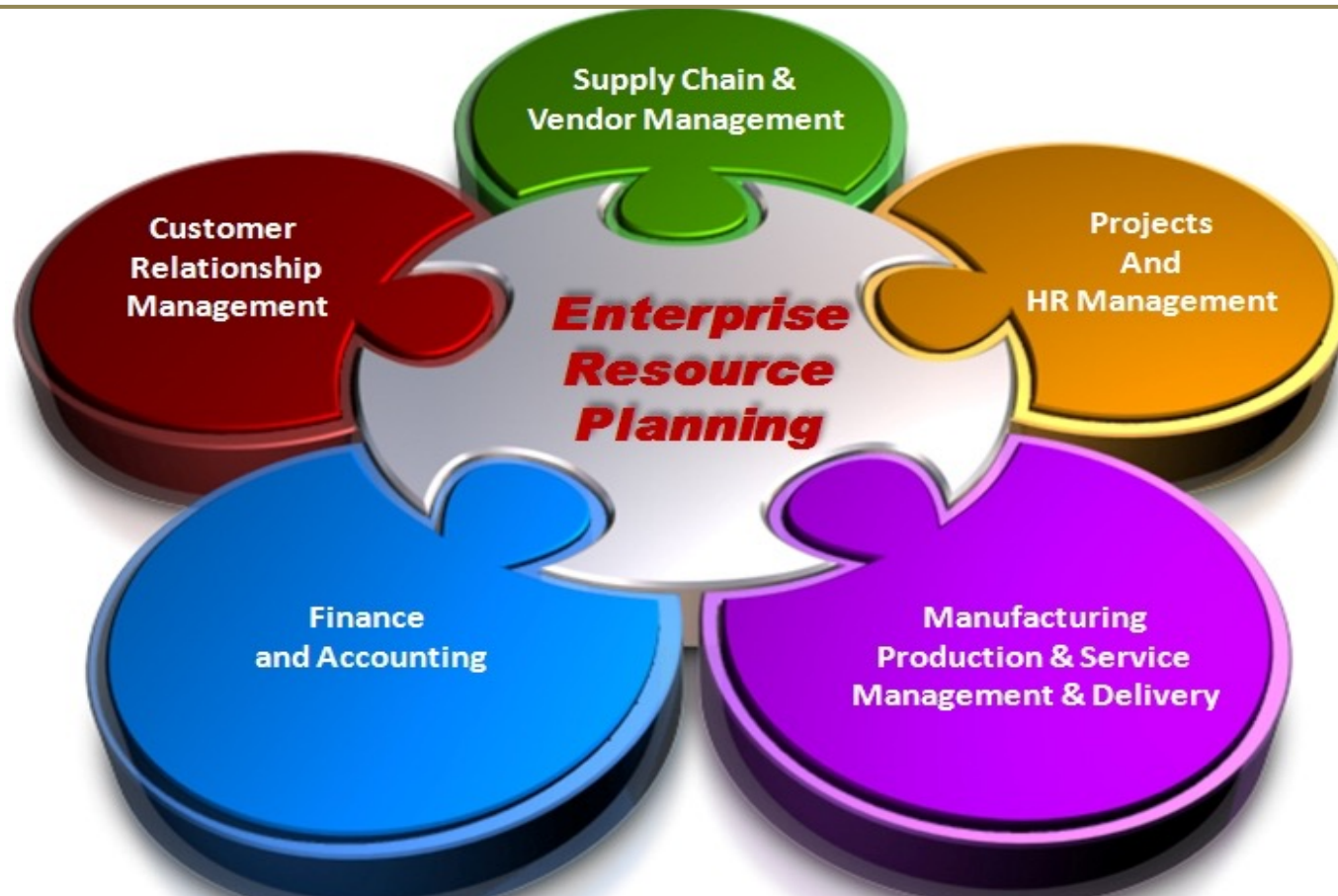
- ERP attempts to integrate all departments and functions across a company onto a single computer system that can serve all those different departments’ particular needs.
- ERP automates the tasks involved in performing a business process •
- If installed correctly, it can have a tremendous payback

### **Historical system architectures**

Historically, companies created “islands of automation”. A hodge-podge of various systems that operated or managed various divergent business processes. Sometimes these systems were integrated with each other and sometimes they weren’t. Sometimes they were loosely interfaced and sometimes they were more tightly interfaced.

# ERP SYSTEMS

- ❑ Enterprise Resource Planning (ERP) systems are core software programs used by companies to integrate and coordinate information in every area of the business.
- ❑ ERP is a set of integrated business applications, or modules which carry out common business functions such as general ledger, accounting, or order management



# ERP – KEY CHARACTERISTICS

## Integration

seamless integration of all the information flowing through a company – financial and accounting, human resource information, supply chain information, and customer information.

## Packages

Enterprise systems are not developed in-house

- IS life cycle is different
  1. Mapping organisational requirements to the processes and terminology employed by the vendor and
  2. Making informed choices about the parameter setting.
- Organisations that purchase enterprise systems enter into long-term relationships with vendors. Organisations no longer control their own destiny.

# ERP – KEY CHARACTERISTICS

## **Best Practices**

- ERP vendors talk to many different businesses within a given industry as well as academics to determine the best and most efficient way of accounting for various transactions and managing different processes. The result is claimed to be “industry best practices”.
- The general consensus is that business process change adds considerably to the expense and risk of an enterprise systems implementation. Some organisations rebel against the inflexibility of these imposed business practices.

## **Some Assembly Required**

Only the software is integrated, not the computing platform on which it runs. Most companies have great difficulty integrating their enterprise software with a package of hardware, operating systems, database management systems software, and telecommunications suited to their specific needs.

- Interfaces to legacy systems
- Third-party bolt-on applications
- Best of Breed Strategy

# ERP – KEY CHARACTERISTICS

## **Evolving**

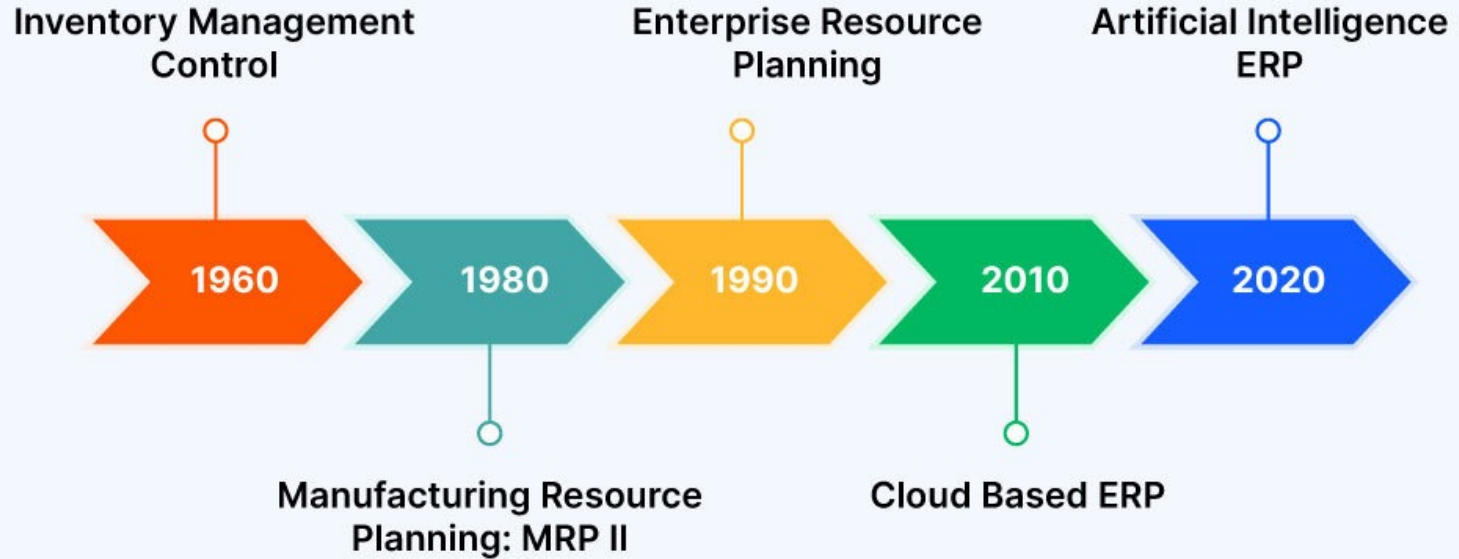
Enterprise Systems are changing rapidly

- Architecturally: Mainframe, Client/Server, Web-enabled, Object-oriented, Componentization
- Functionally: front-office (i.e. sales management), supply chain (advanced planning and scheduling), data warehousing, specialised vertical industry solutions, etc.



# ERP EVOLUTION

## History of ERP Systems



# FUNCTIONAL AREAS OF OPERATION



# ERP ADDED VALUE

What makes ERP different:

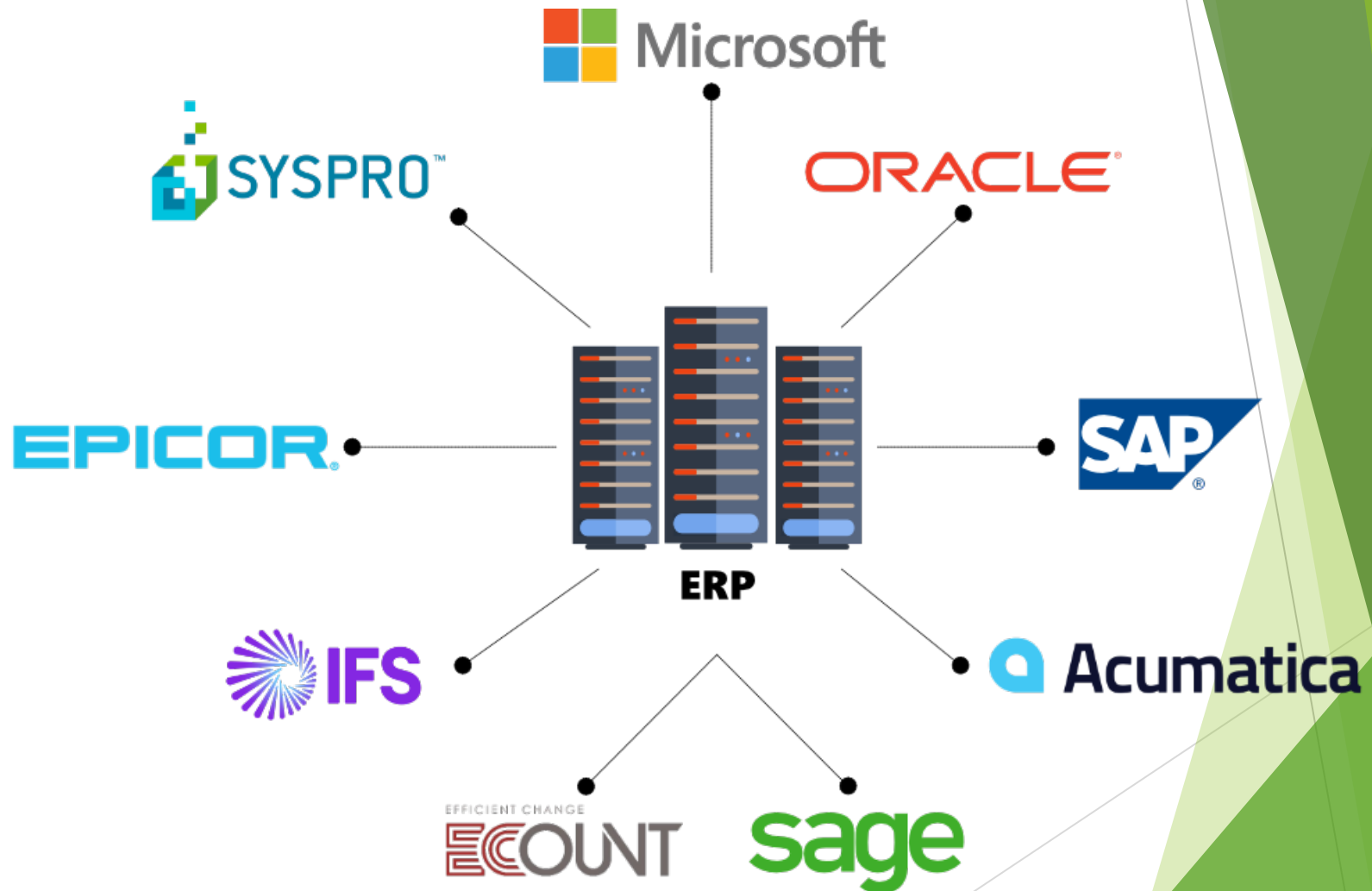
- Integrated modules
- Common definitions
- Common database
- Update one module, automatically updates others
- ERP systems reflect a specific way of doing business
- Must look at your value chains, rather than functions

# BENEFITS OF ERP

Integrated information systems can lead to more efficient business processes that cost less than those in unintegrated systems.

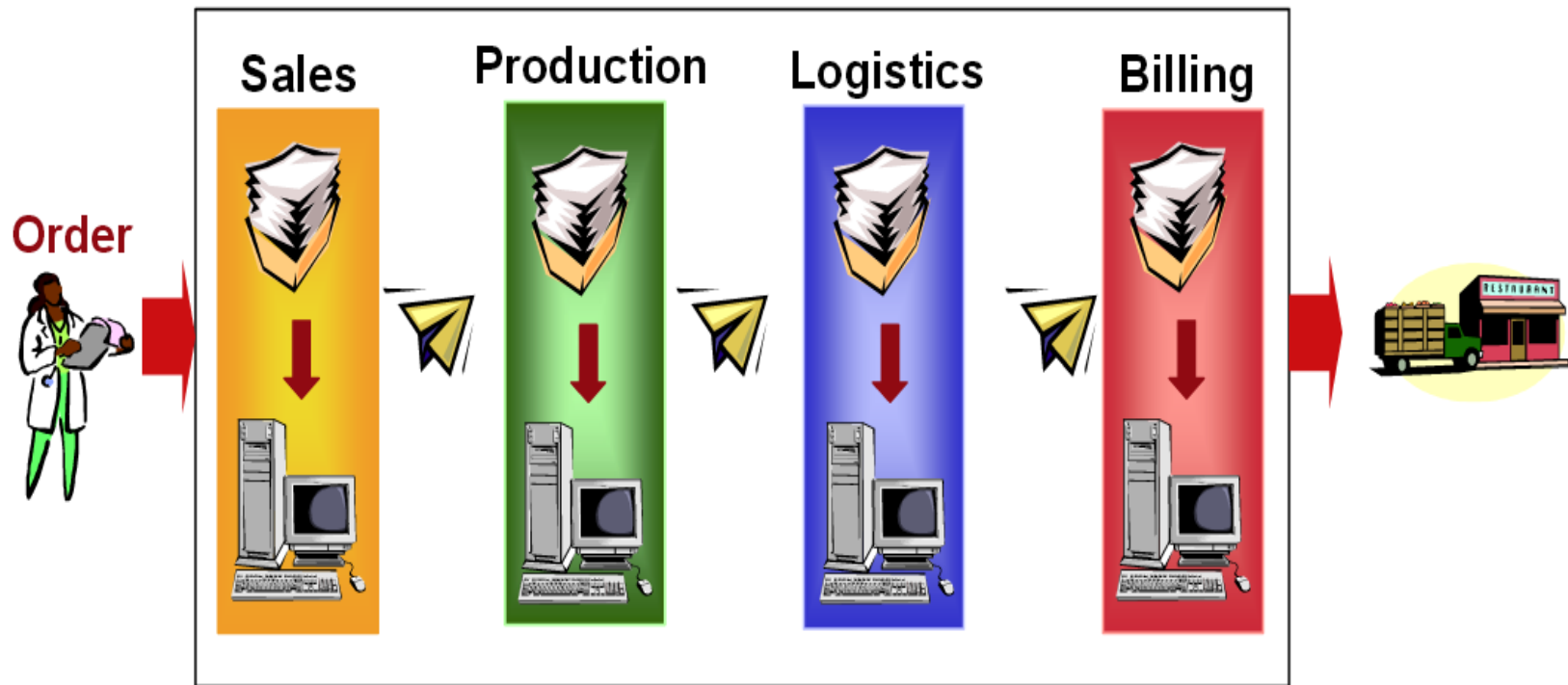
- Help in integrating applications for decision making and planning (global integration)
- Common set of data
- ERP integrates people and data
- Allow departments to talk to each other
- Easy to integrate by using processes built into ERP software
- A way to force BPR (reengineering)
- ERP allows management to actually manage operations, not just monitor them
- reduce costs and improve operational efficiency.

# VENDORS



# EXAMPLE ERP: ORDER FULFILLMENT

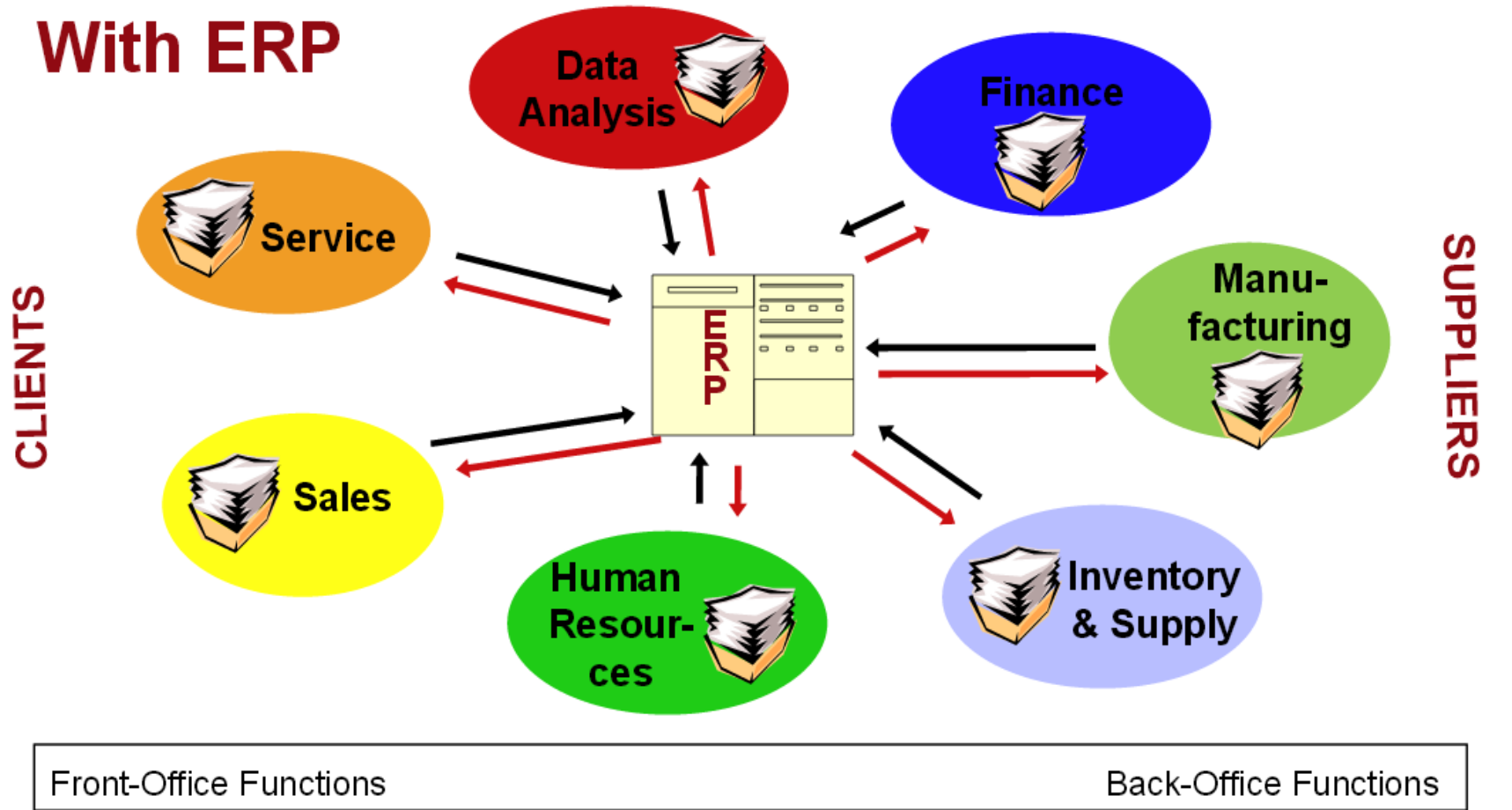
## Before ERP



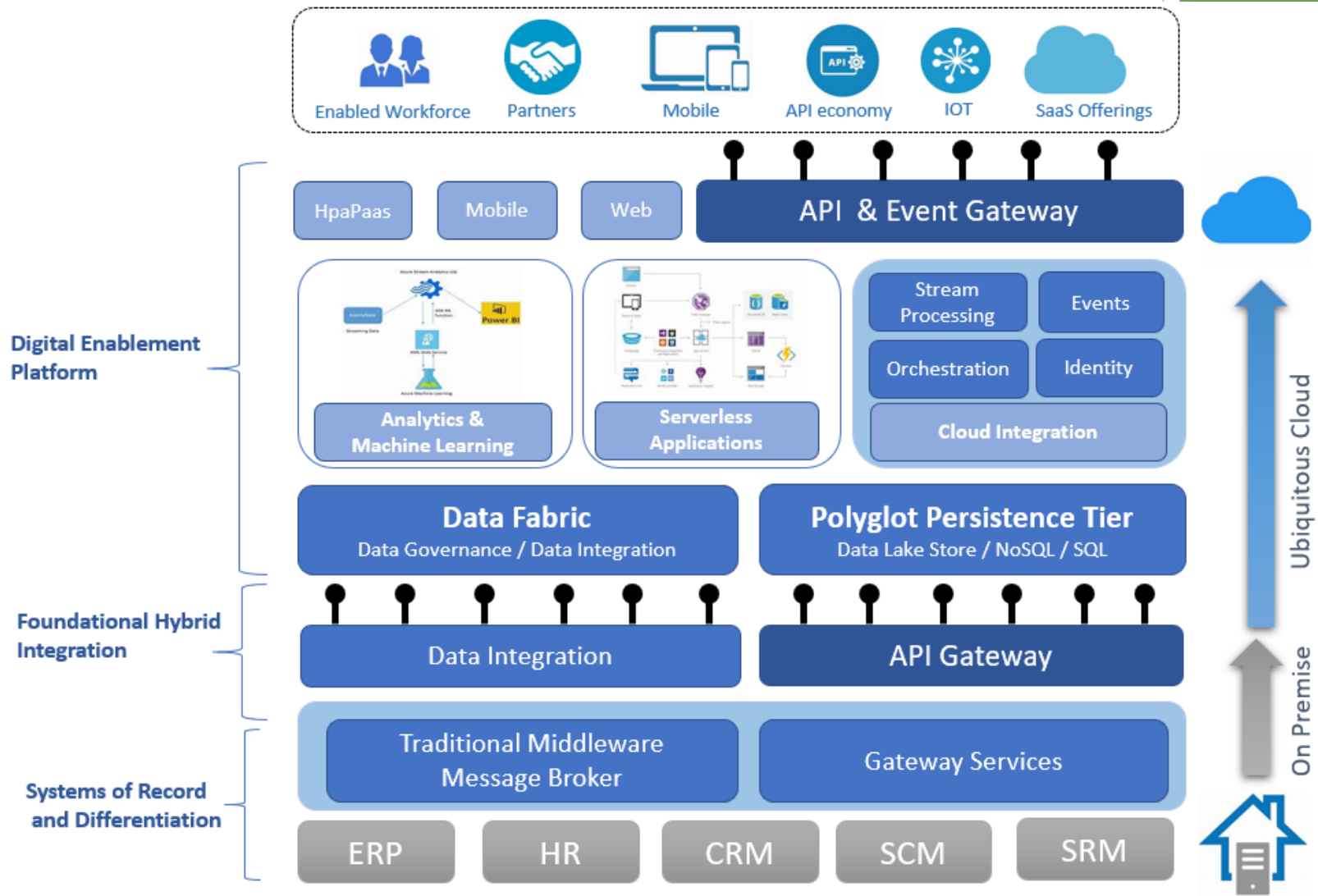
Problems: Delays, lost orders, keying into different computer systems invites errors

# EXAMPLE ERP: ORDER FULFILLMENT (2)

## With ERP



# TYPICAL ARCHITECTURAL COMPONENTS





# BUSINESS PROCESS REENGINEERING(BPR)

- Business Reengineering is the fundamental rethinking and radical re-design of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost , quality service and speed”
- In today’s ever changing world, the only thing that doesn’t change is **change**.
- Business World driven by Cs: Customer, competition and Change.
- Companies are looking for new solutions for their business problems.
- BPR focuses on processes and not on tasks, job or people

# BPR PHASES

○ 7 phases define a successful BPR projects:

1. Begin organizational change
2. Building the reengineering organization
3. Identifying BPR opportunities
4. Understanding the existing process
5. Reengineer the process
6. Blueprint the new business system
7. Perform the transformation

# CHALLENGES FACED BY RE-ENGINEERING EFFORTS

- Resistance
- Tradition
- Time requirements
- Cost
- Skepticism
- Job losses

# BPR PRINCIPLES

- Organize around outcomes, not tasks.
- Have those who use the output of the process perform the process.
- Subsume information-processing work into the real work that produces the information.
- Treat geographically dispersed resources as though they were centralized.
- Link parallel activities instead of integrating their results.
- Put decision points where the work is performed and build controls into the process.
- Capture information once and at the source.

Source: Michael Hammer, "Reengineering Work: Don't Automate, Obliterate," Harvard Business Review, July-August, 1990, pp. 104-112.

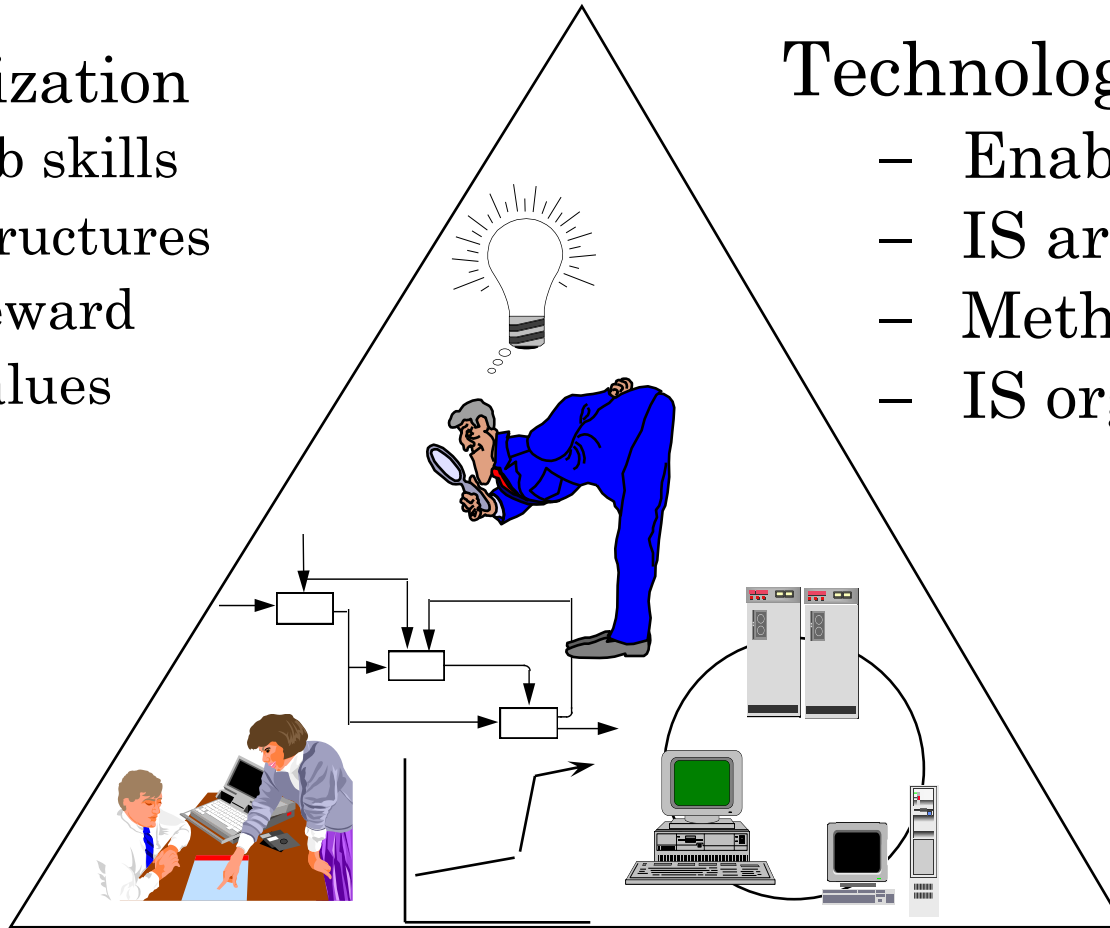
# A BPR FRAMEWORK

## Organization

- Job skills
- Structures
- Reward
- Values

## Technology

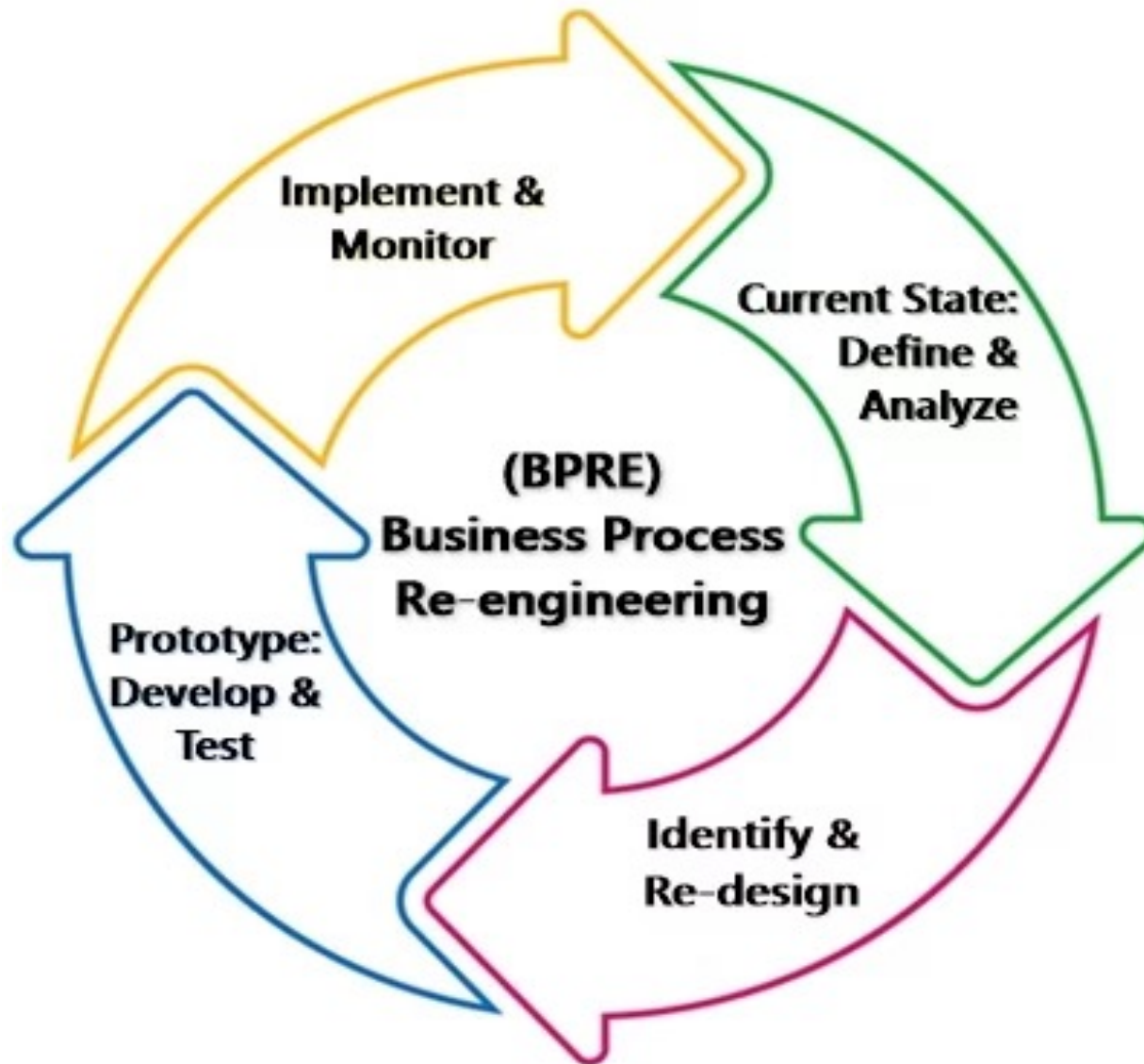
- Enabling technologies
- IS architectures
- Methods and tools
- IS organizations



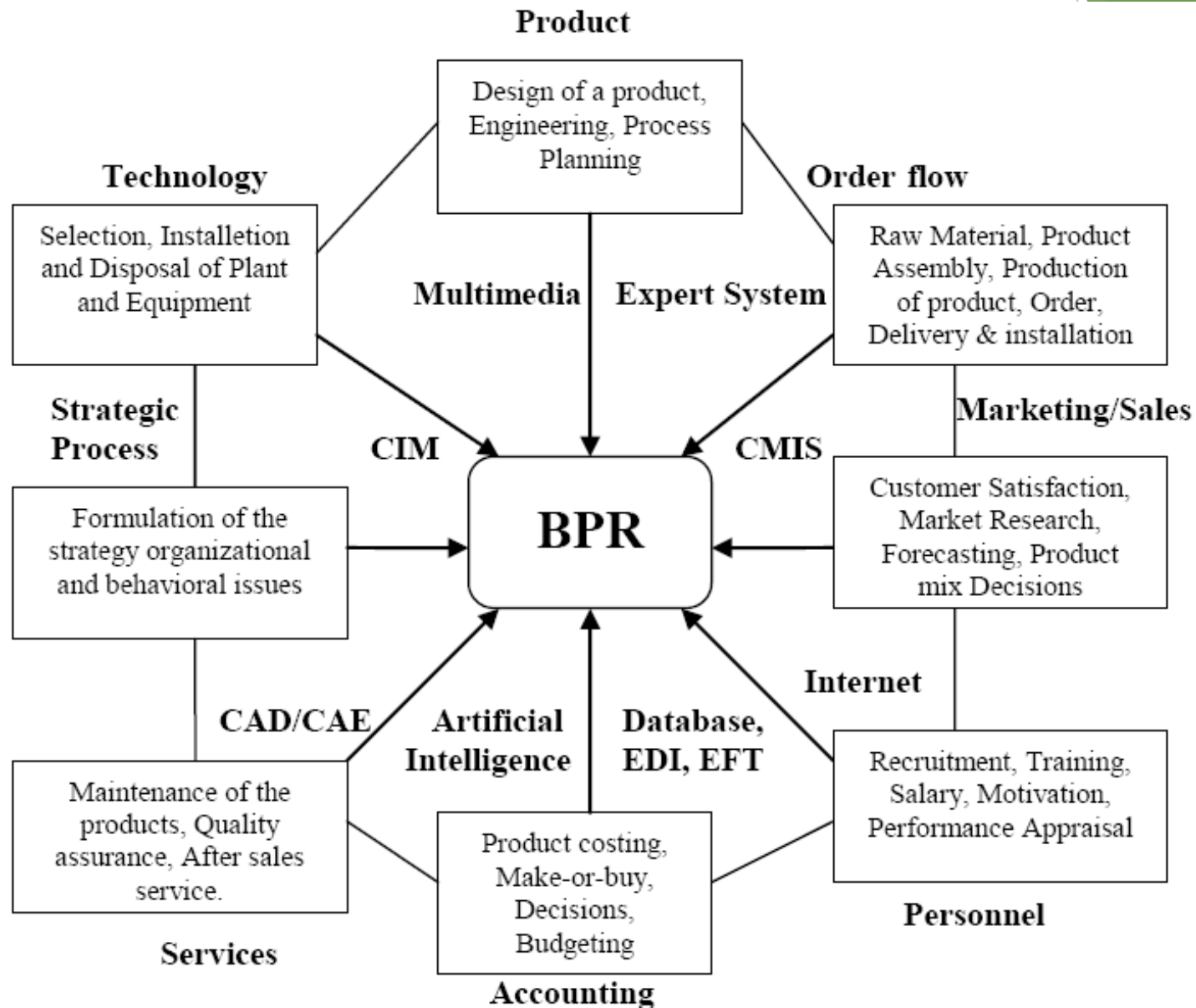
## Process

- Core business processes
- Value-added
- Customer-focus
- Innovation

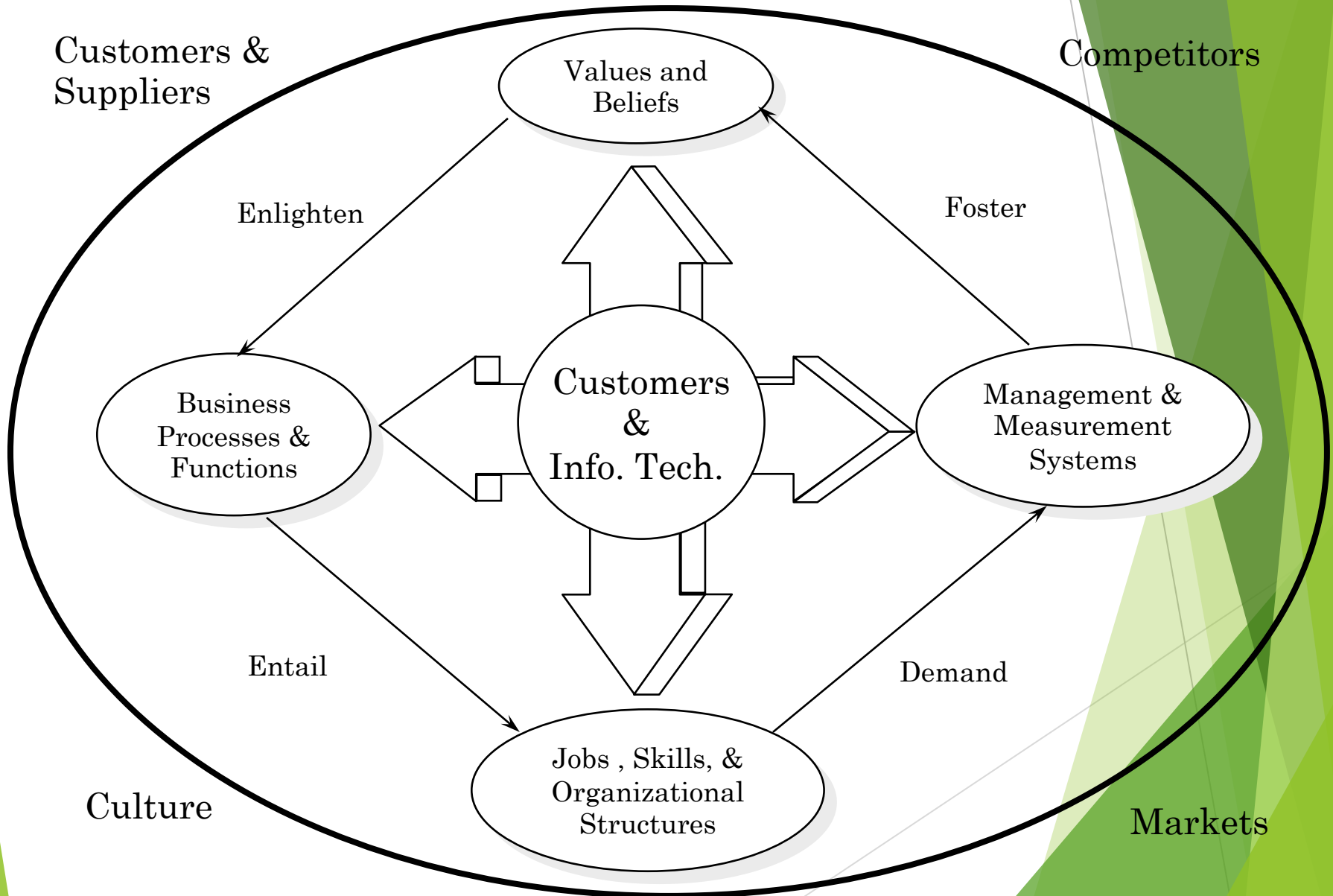
# BUSINESS PROCESS REENGINEERING LIFE CYCLE



# ENABLING IT TO CONSIDER



# THE REENGINEERING DIAMOND





# BUSINESS MODELLING FOR ERP

- Business modeling is a precursor to business process reengineering, ERP implementation, etc.
- A business model is a diagrammatic representation of different business systems and processes, and their interconnections and interdependencies.
- The purpose of business modeling is to provide a general overview of the operations of a business without going into the technical details of the processes and systems.
- It defines the activities performed and workflow structure in a broad manner.

# BUSINESS PROCESS MODELING

- **Business process modeling** (BPM) in systems engineering is the activity of representing processes of an enterprise, so that the current process may be analyzed or improved.
- BPM is typically performed by business analysts, who provide expertise in the modeling discipline; by subject matter experts, who have specialized knowledge of the processes being modeled; or more commonly by a team comprising both.
- In practice, a management decision to invest in business process modeling is often motivated by the need to document requirements for an information technology project

# BUSINESS PROCESS MODELING TOOLS

- Business process modeling tools provide business users with the ability to model their business processes, implement and execute those models, and refine the models based on as-executed data.

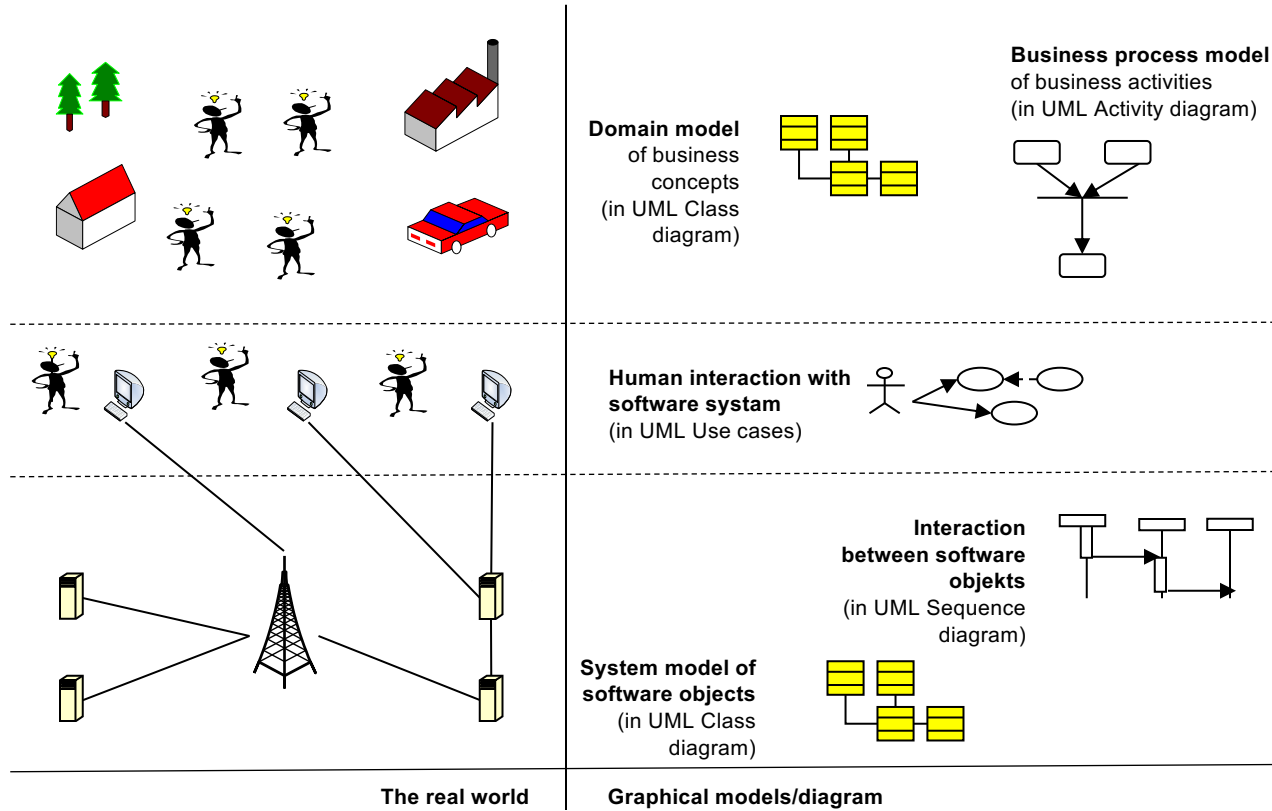
Business process modeling techniques are:

- Business Process Model and Notation(BPMN)
- Cognition enhanced Natural language Information Analysis Method(CogNIAM)
- Extended Business Modeling Language (xBML)
- Event-driven process chain (EPC)
- ICAM DEFinition(IDEF0)
- Unified Modeling Language (UML),

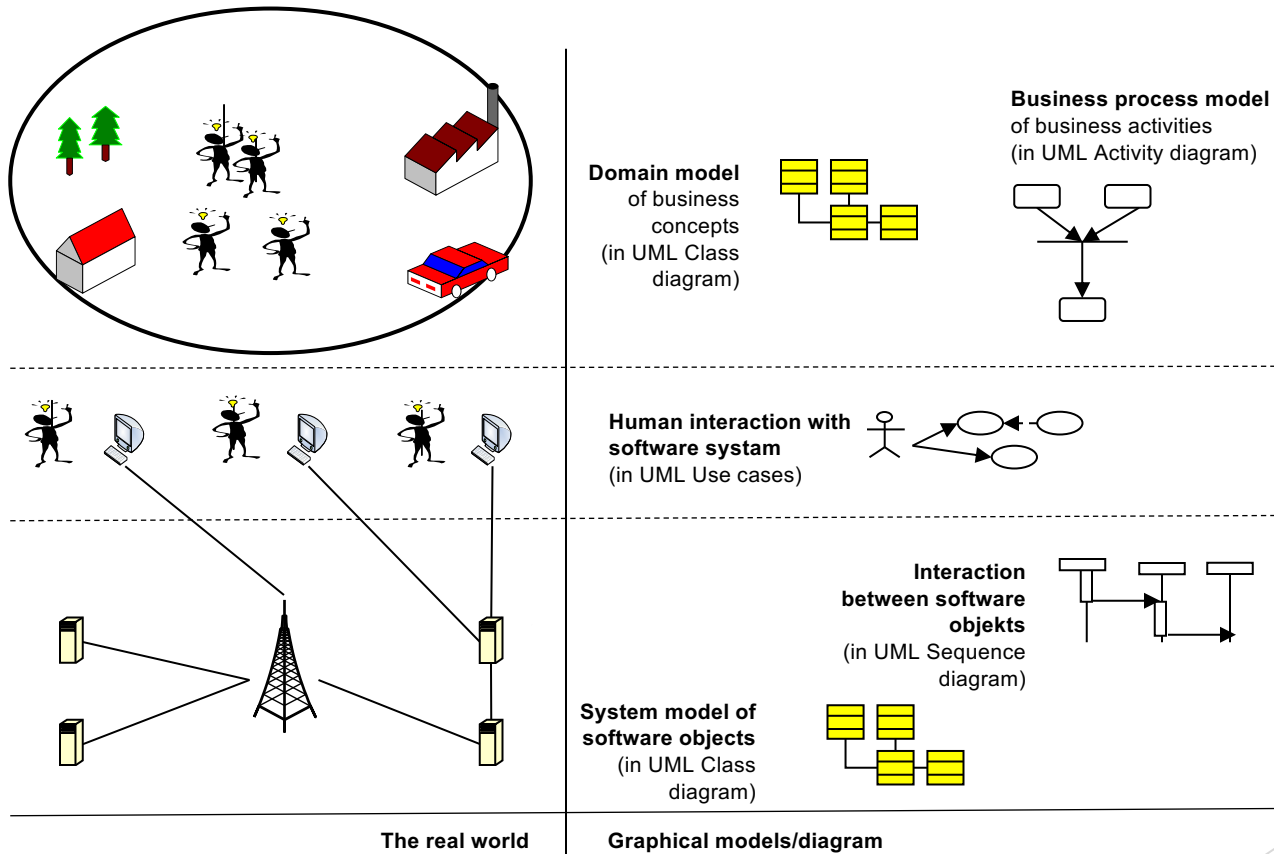
# Modelling Languages

- ▶ There are many different modelling languages (sometimes called modelling techniques) that can be used for modelling business processes. The different languages focus on different concepts and thereby give different focus on the business processes
- ▶ Business Process Modelling Languages can focus on:
  - ▶ the order of the activities (such as UML Activity Diagrams, Event Process Chain, BPMN)
  - ▶ input and output (such as IDEF0)
  - ▶ states of a process (such as UML State Machine Diagrams)

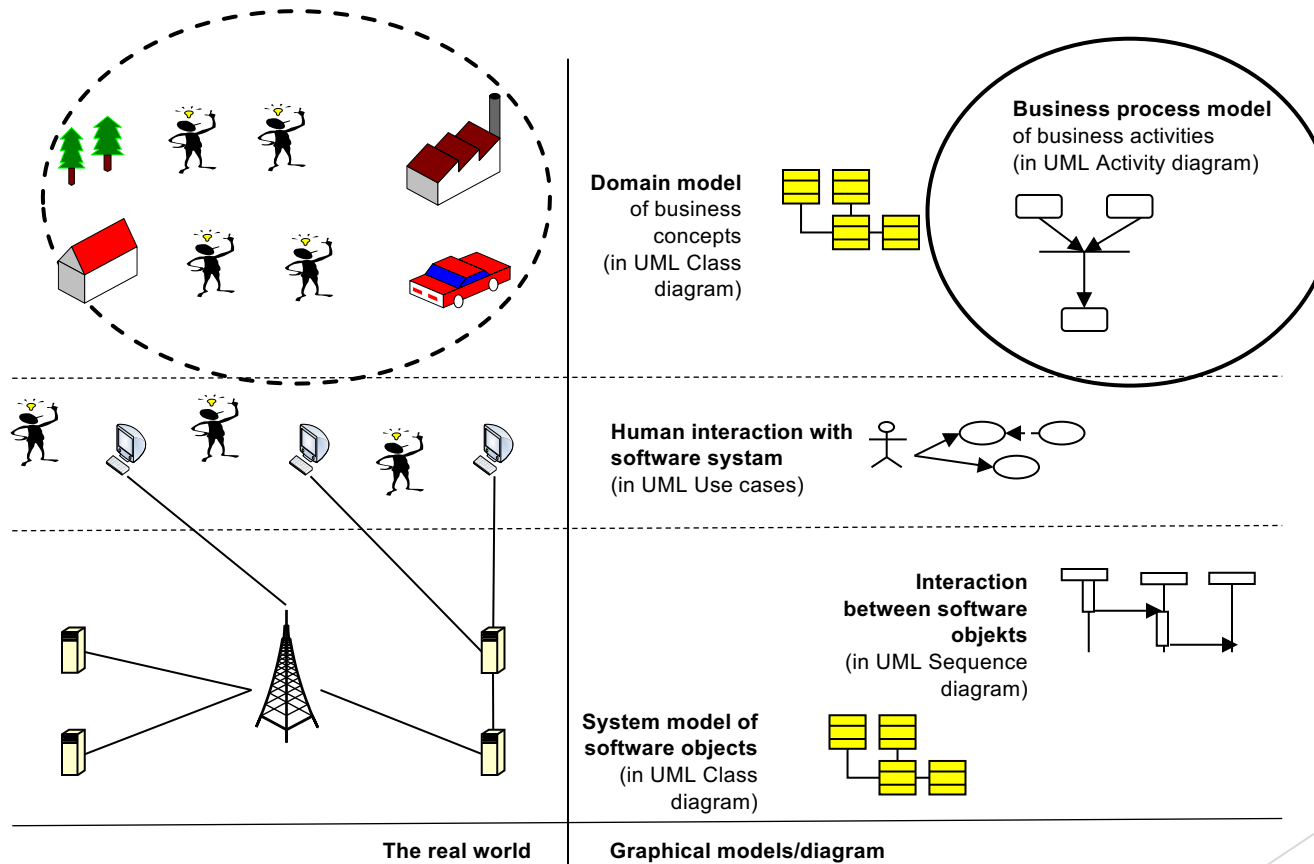
# Real World and Models



# Business Processes (in Real World)



# Business Process Models

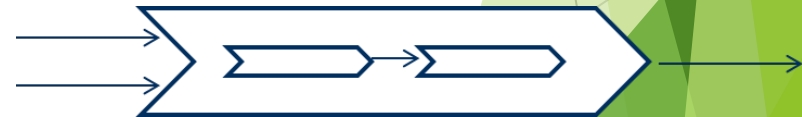
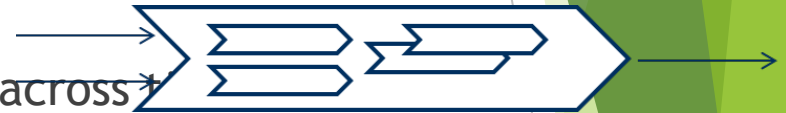


## Business Processes (in the Real World)



# Definitions of Business Process

- ▶ "A set of activities that takes one or more types of input and turns them into an output of greater value to the customer" [Hammer]
- ▶ "A specific ordering of work activities across place, with a beginning, an end, and clearly-defined inputs and outputs" [Davenport]



## Which Business Processes Exists?

It is the organization itself that decide what business processes exists, which activities are included in the processes, and how the processes start and end

### **Example of business processes in an organization:**

- Sales process
- Production process
- Order process (which can be part of the sales process)
- Delivery process (which also can be part of the sales process)
- Quality assurance process
- Procurement process
- Labour hiring process

# Business Process Instance

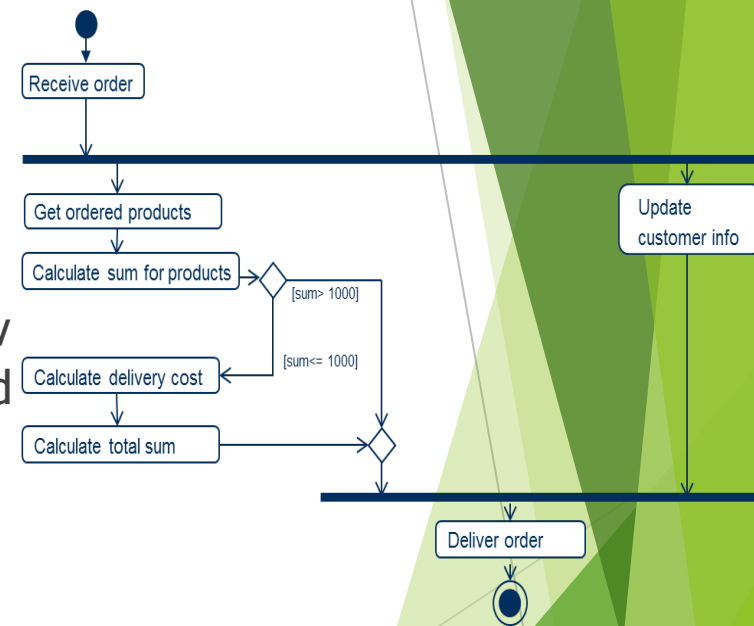
- ▶ By business process we either mean a business process instance or business process type
- ▶ A **business process instance** (sometimes called case) is the actual carrying out (often called execution) of the process in the real world, resulting in the production of actual goods and/or services.

# Business Process Type

- ▶ A **business process type** is a grouping business process instances that aim at reaching similar goal in a similar way.
- ▶ A business process type can be seen as a idea or understanding of how a business process instances of the same type are or should be carried out

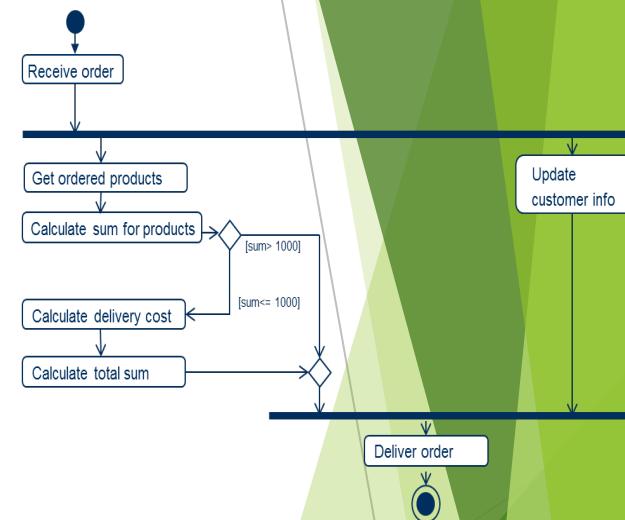
# Business Process Model

- ▶ Both business process types and business process instances can be represented as models
- ▶ However, it is **usually the business process types that are represented as models**, thereby presenting a map of how business processes instances are or should be carried out



# Business Process Model

- ▶ A **business process model** is a representation of a business process type (if it is not explicitly stated that it is an instance)
- ▶ The business process model may be illustrated by means of diagrams of various kinds complemented by textual descriptions and perhaps formal rules

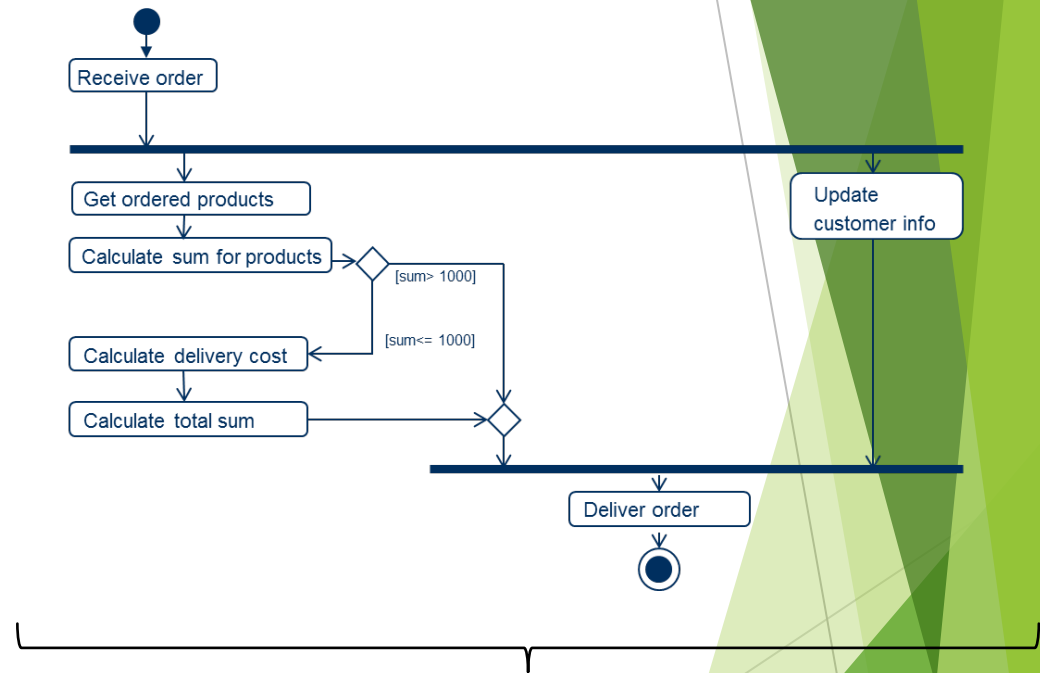


## Process Models

# Business Processes Models



Abstract description  
of a Sales Process



Detailed description of Sales Process



# Why Create Process Models? 1(2)

## Different goals for creating a business process model:

- **To better understand the business**, that is, understand what activities are actually carried out in what order
- **To analyse business processes to find problems** within the existing business processes
- **To design more effective business process** - for example, more productive/efficient processes, higher quality processes, more compliant processes

## Why Create Process Models? 2(2)

### Different goals for creating a business process model (cont):

- **To automate business processes** - or part of them, to create more productive/efficient processes. Such automation require that it is made clear what part of the process that should be automated
- **To identify requirements on IT** - since IT needs to be designed to support business processes

# From Whom's Perspective are Process Models Created?

Examples of perspectives:

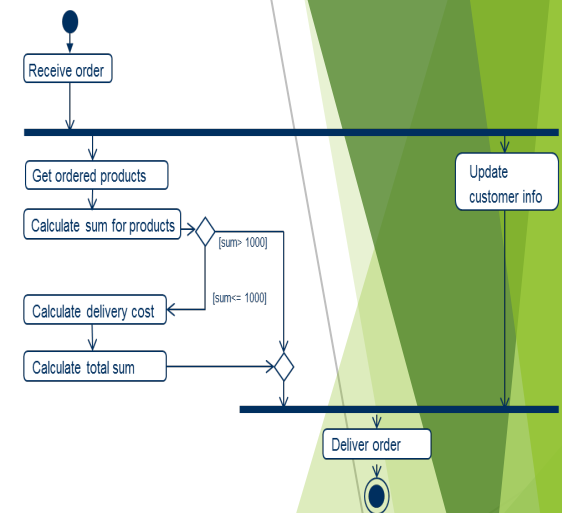
- The organization's perspective, or more precisely:
  - Owners' perspective
  - Executive/Management's perspective
  - Process Participants' perspective
- The customers' perspective
- The suppliers' perspective

# Goal and Perspective

The goal (purpose) and perspective of business process models should be explicitly stated - to support the design as well as interpretation of the process models

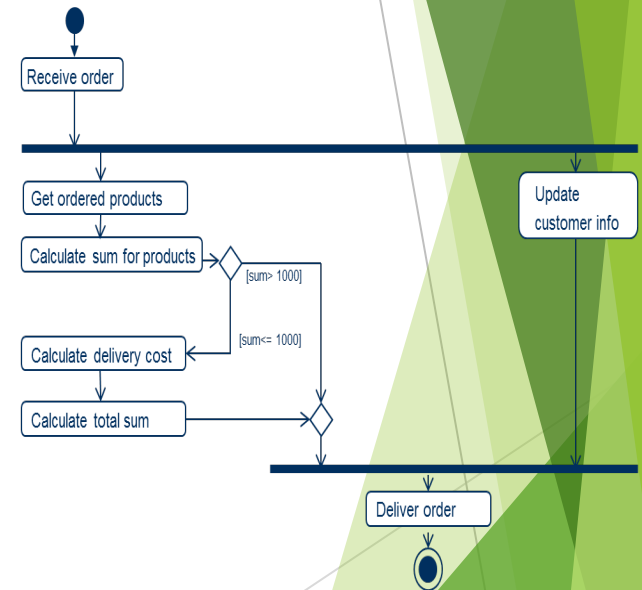
*Example:*

- *Goal of Business Process Model:* To identify requirements on IT
- *Perspective of Business Process Model:* Executive/Management's perspective



# As-is vs. To-be Process Models

- ▶ Business process models can be **descriptive**, i.e. they depict the current way working of the process. These models are often called **as-is models**
- ▶ Business process models can be **prescriptive**, i.e. they prescribe a desired state. The models are often called **to-be models**



# ERP IMPLEMENTATION

Why implement an ERP System?

- To support business goals
  - Integrated, on-line, secure, self-service processes for business
  - Eliminate costly mainframe/fragmented technologies
- Improved Integration of Systems and Processes
- Lower Costs
- Empower Employees
- Enable Partners, Customers and Suppliers

# HOW SHOULD WE IMPLEMENT ERP SYSTEMS



Obtain the right mix of people, processes and technology!!

## How should we implement ERP systems (ctd)

- People
  - Project Structure
  - Should be aligned to processes
- Process
  - Implementation Process (outlined in detail)
  - Adapt your processes to those of the ERP.
- Technology
  - Hardware
  - Software
  - Integrated Systems



# TECHNOLOGY

- Technology is an enabler, not the driver (it is there to assist the organisation to achieve business goals)
- It is a means to an end, not the end

# ERP IMPLEMENTATION CRITICAL SUCCESS FACTORS

- Vendor Selection
- Choosing an Implementation Consultant
- Change Management
- Data Cleansing
- Leadership commitment
- Team Talent
- Testing.
- User Training
- Spending Wisely
- Adapting Business Processes
- Defining Success

# ERP IMPLEMENTATION SUMMARY

- ERP systems provide a mechanism for implementing systems where a high degree of integration between applications is required
- The Business Case or Value Proposition for implementation must be outlined
- To successfully implement a proper mix of people, processes and technology should be maintained

# ROLES AND RESPONSIBILITIES OF ERP CONSULTANTS

- Consultants are responsible for administering each of the phase of the implementation so that the required activities occur at the scheduled time and at the desired level of quality and with effective participation of all those who must participate.
- For keeping the promises that the consultants have made during the negotiations, they have to transform their approaches and methodologies into detailed work plans.
- The methodology will have to be converted into tasks and should be allocated to the right people.
- The time schedule for each phase and each task has to be determined and the project plan has to be finalized.

# ROLES AND RESPONSIBILITIES OF ERP CONSULTANTS (CTD)

- Consultants should add value to the project. They bring know-how about the package and about implementation. This also known as practical knowledge is derived from their expertise, which stems from practical experience, because the consultants have seen many project and have made or seen many mistakes, they can avoid the phenomenon of 're-inventing the wheel'.
- They will know what will work and what will not. Thus, by eliminating the trial and error method of implementation and doing it right the first time the consultants help in saving huge amounts of money, time and effort.

# ROLES AND RESPONSIBILITIES OF ERP VENDORS?

- The vendor should supply the product and its documentation as soon as the contract is signed.
- After the software is delivered, can the company develop the training and testing environment for the implementation team.
- The vendors are responsible for fixing any problems in the software that the implementation team encounters. So the vendor should have a liaison officer who should constantly interact with the implementation team.
- Provide the initial training for the company's key users, people who will play lead roles in the implementation of the system.
- These key users are the one who will define, together with the consultants, how the software is to serve the company (in-house functional experts who will decide how the functionalities are to be implemented, as well as how to use or adapt the product to suit the company's unique requirements).
- The role of the vendor does not end with the training. The vendor also plays an important project support function and must exercise quality control with respect to how the product is implemented

# ERP IMPLEMENTATION METHODOLOGIES

- Different companies may install the same ERP software in totally different processes. The same company may implement different ERP software in the same approach.
- There are three commonly used methodologies for implementing ERP systems.
  1. **The Big Bang**
    - Companies layout a grand plan for their ERP implementation
    - The installation of ERP systems of all modules happens across the entire organization at once
    - The big bang approach promised to reduce the integration cost in the condition of thorough and careful execution.
    - This method dominated early ERP implementations, it partially contributed the higher rate of failure in ERP implementation.

## 2. Modular Implementation

- The method of modular implementation goes after one ERP module at a time
- This limits the scope of implementation usually to one functional department.
- This approach suits companies that do not share many common processes across departments or business units.
- Independent modules of ERP systems are installed in each unit, while integration of ERP modules is taken place at the later stage of the project
- This has been the most commonly used methodology of ERP implementation.
- Modular implementation reduces the risk of installation, customization and operation of ERP systems by reducing the scope of the implementation
- The successful implementation of one module can benefit the overall success of an ERP project.



### **3. Process-Oriented Implementation**

- The process-oriented implementation focuses on the support of one or a few critical business processes which involves a few business units.
- The initial customization of the ERP system is limited to functionality closely related to the intended business processes
- The process-oriented implementation may eventually grow into a full-blown implementation of the ERP system.
- This approach is utilized by many small to mid-sized companies which tend to have less complex internal business processes.

# COMMERCIAL AND OPEN SOURCE ERP SOFTWARE

10 factors while comparing commercial and open source ERP softwares.

- Pricing
- Flexibility
- Duration
- Dependence
- Results
- Training
- Security
- visibility
- Ease of integration with current systems
- Longevity

# SUPPLY CHAIN MANAGEMENT SYSTEMS

- Supply chain management (SCM) is the combination of art and science that goes into improving the way your company finds the raw components it needs to make a product or service and deliver it to customers.
- SCM is track –It is a series of complex calculations that optimize enterprise plans within a given set of constraints , backed by fully integrated suite of financial, distribution and HRM.
- The SCM encompasses all activities relating to the supply chain. This includes vendor selection, negotiation, relations and performance. To increase efficiencies , companies are also focusing on core competencies and filling the gaps with strategic outsourcing partnerships

## COMPONENTS OF SCM

The following are five basic components of SCM.

1. **Plan**—This is the strategic portion of SCM. Companies need a strategy for managing all the resources that go toward meeting customer demand for their product or service. A big piece of SCM planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.
2. **Source**—Companies must choose suppliers to deliver the goods and services they need to create their product. Therefore, supply chain managers must develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships.
3. **Make**—This is the manufacturing step. Supply chain managers schedule the activities necessary for production, testing, packaging and preparation for delivery.

## COMPONENTS OF SCM

The following are five basic components of SCM.

4. **Deliver**—This is the part that many SCM insiders refer to as logistics, where companies coordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and set up an invoicing system to receive payments.
5. **Return**—This can be a problematic part of the supply chain for many companies. Supply chain planners have to create a responsive and flexible network for receiving defective and excess products back from their customers and supporting customers who have problems with delivered products.

# WHAT DOES SUPPLY CHAIN MANAGEMENT SOFTWARE DO?

- Supply chain management software is possibly the most fractured group of software applications on the planet. Each of the five major supply chain steps previously outlined is comprised of dozens of specific tasks, many of which have their own specific software.

## Business benefits of SCM are

- Faster response to changes in supply and demand
- Increased customer satisfaction (equity holders and purchaser, employees etc)
- Compliance with regulatory requirement
- Improved cash flow
- Higher margins
- Greater synchronization with business priorities

# CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

- **Customer relationship management (CRM)** is a system for managing a company's interactions with current and future customers.
- It often involves using technology to organize, automate, and synchronize sales, marketing, customer service, and technical support
- Companies without a good connection between their workers and their customers run the risk of losing business.
- **Customer relationship management (CRM) software can help companies** streamline their interactions with customers to ensure a consistent message.
- Gartner Inc defines CRM as “ A business strategy , the outcomes of which optimize profitability , revenue and customer satisfaction by organizing around customer segments, fostering customer –satisfying behaviors , and implementing customer centric processes.
- By definition then CRM technologies enable greater customer insight, increased customer access, more effective interactions and integration throughout all customer channels and back office enterprise functions”.
- There are three fundamental components in CRM – operational, analytical and collaborative
- **Business Intelligence is a broad category of applications and technologies for gathering ,** providing access to, and analyze data for the purpose of helping enterprise users make better business decisions.



CRM software supports the following activities and tools:

- *One-to-one marketing*—Once a customer is categorized, for example, based on the products they buy and the volume in which they buy those products, the company can tailor products, promotions, and pricing accordingly. Customers can be offered products related to what they are now buying (cross-selling), or the company could choose to promote higher-margin products in the same lines (up-selling) to those customers.
- *Sales force automation (SFA)*—Using the CRM software, occurrences of customer contacts are logged in the company's database. The SFA feature of CRM software can automatically route certain customers who contact the company to a particular sales representative. Companies can also use SFA tools to forecast customer needs, based on the customer's history and transactions, and to alert sales representatives accordingly. Sometimes this software is called "lead management software" because a transaction can be tracked from the initial lead to post-sale follow-up.
- *Sales campaign management*—This software feature lets a company organize a marketing campaign and compile its results automatically.
- *Marketing encyclopedias*—This feature serves as a database of promotional literature about products. The material can be routed to sales representatives or customers as needed.

- *Call center automation*—When customers call a company to get assistance with a company's products, representatives can query a knowledge management database containing information about the product.

## **The Benefits of CRM**

CRM software can provide companies with the following benefits:

- *Lower costs*—CRM can lead to operational efficiencies, such as better response times in call center operations and better use of sales force time, which lower costs.
- *Higher revenue*—Segmenting customers leads to better selling opportunities and revenue increases.
- *Improved strategy and performance measurement*—Installing and operating an ERP system requires management and staff to think of the company as a whole.

# CRM AND SOCIAL MEDIA

- Customer relationship management tools now also include social media channels that consist of not only the more prominent ones—such as Facebook and Twitter—but also blogs, wikis, YouTube, and other purpose-built Web sites.
- For example, Salesforce.com, a company that provides CRM software via the Internet, has a product that searches for specific products and brands being mentioned on social networks
- The rise in popularity of social media means that companies must find ways to address these new avenues of communication with their customers.
- A company needs to make the most of any chance to connect with its customers, but these new opportunities can be challenging. Any response to a Facebook post or a tweet must be immediate; customers expect no less.

# RFID,BUSINESS INTELLIGENCE(BI),MOBILE COMPUTING,AND THE CLOUD

## RFID

- Radio frequency identification technology, known commonly as RFID, is becoming an increasingly efficient tool for tracking items through a supply chain.
- An RFID device, which can be attached to products, is a small package (or tag) made up of a microprocessor and an antenna. The location of an item with an RFID tag can be determined using an RFID reader, which emits radio waves and receives signals back from the tag.
- The reader is also sometimes called an interrogator because it “interrogates” the tag.

# BUSINESS INTELLIGENCE

- **Business Intelligence:** is a broad category of applications and technologies for gathering, providing access to, and analyze data for the purpose of helping enterprise users make better business decisions.
- The term implies having a comprehensive knowledge of all the factors that effect organization's business.
- The ultimate objective of business intelligence is to improve the timeliness and quality of the information.
- BI reveals following
  1. The position of the firm in comparison to its competitors
  2. Changes in customer behavior and spending patterns
  3. The capabilities of the firm
  4. Market conditions, future trends, demographic and economic information
  5. The social, regulatory and political environment
  6. What other firms in market are doing

# BUSINESS INTELLIGENCE (CTD)

- BI information is regarded as the second most important resource a company has ( a company's most valuable assets are its people)
- BI system to work effectively, enterprises must address the following technical issues: security and specified user access to the warehouse , data volume (capacity), how long data will be stored, data retention and performance targets
- ERP systems use the business intelligence generated using data mining , OLAP, multidimensional analysis and other data analysis techniques for a variety of applications like demand forecasting, production planning, product design, retailing, CRM, credit card management etc

**END**