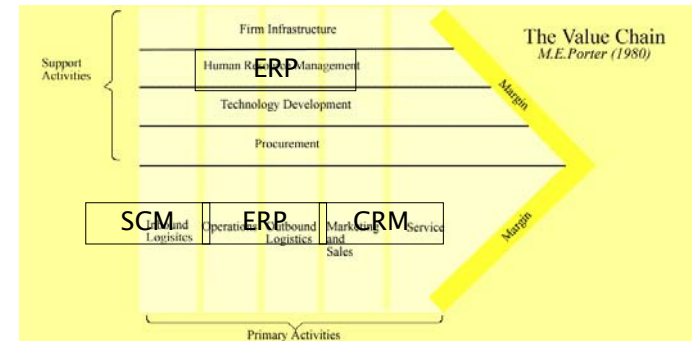


ERP

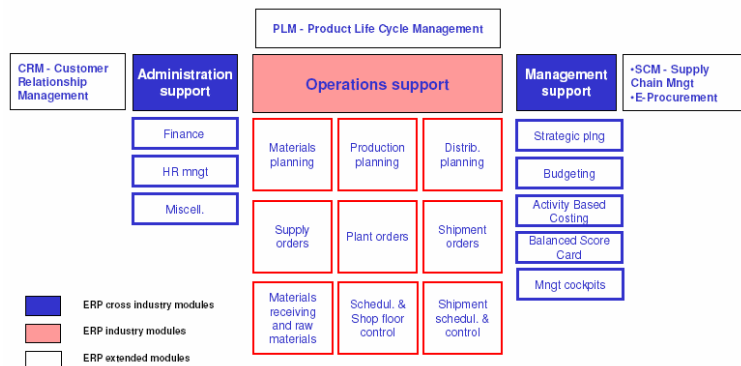


Enterprise Resource Planning

- Definition
 - Integrated suite of modules supporting (core) business processes



ERP modules



ERP – modules

- Cross industry modules
- Industry modules
 - Specific to automotive, chemical, ..
- Extended modules
 - On the boundary company – companies or company customer (CRM, SCM, ..)
 - (very wide view of ERP becomes ES)



ERP – levels

1. Suite

Set of software applications sharing one or more DB
Supports set of business processes

2. Module

Software application
Supports business process
Made of functions

3. Function

Supports simple operation/activity

Diffusion (Motta 2003)

Vendor (dati 2000 da AMR 2001)	Vendite (M di \$)	Quota mercato
SAP	5.839	30%
Oracle	2.870	15%
Peoplesoft	1.736	9%
J.D.Edwards	980	5%
Others	7.127	41%

Number of installations (I) or clients (C)	Vendor		
	Oracle (C)	Peoplesoft (C)	SAP (I)
1999			
WW	(ND)	4.000	20.415
Europe	(ND)	900	13.500*
Italy	(ND)	(ND)	517
2000			
WW	10.000	4.700	28.968
Europe	3.600	1.000*	19.300*
Italy	180	40	807
2001			
WW	(ND)	5.700*	38.251
Europe	(ND)	1.300*	25.500*
Italy	(ND)	50	1.256

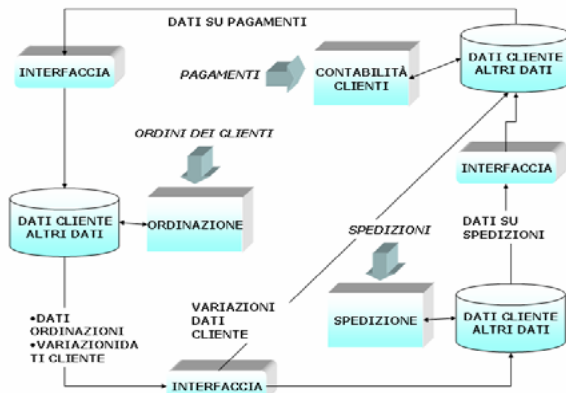
Diffusion

- Major players, world
 - ♦ SAP, Oracle, Peoplesoft
 - ♦ Oligopoly in large companies, multinationals
- SMEs, Italy
 - ♦ Local producers, products

The ERP model

- Data sharing
 - ♦ No data replication
- Modularity
 - ♦ Independent modules
- Prescriptivity
 - ♦ The approach is the same for all companies (pro and con)

Data replication: *legacy* islands



- Same data in several (legacy) systems
- Dedicated interfaces to synchronize (point to point)
 - Cost
 - Delays
 - Unfeasibility (of overnight synchronization)
 - Company must become system integrator

SoftEng

9

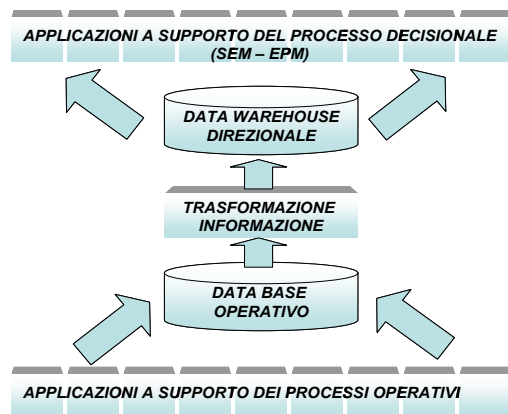
Data replication

- Same data in several (legacy) systems
- Dedicated interfaces to synchronize (point to point)
 - ♦ Cost
 - ♦ Delays
 - ♦ Unfeasibility (of overnight synchronization)
 - ♦ Company must become system integrator

SoftEng

10

ERP: data sharing



SoftEng

11

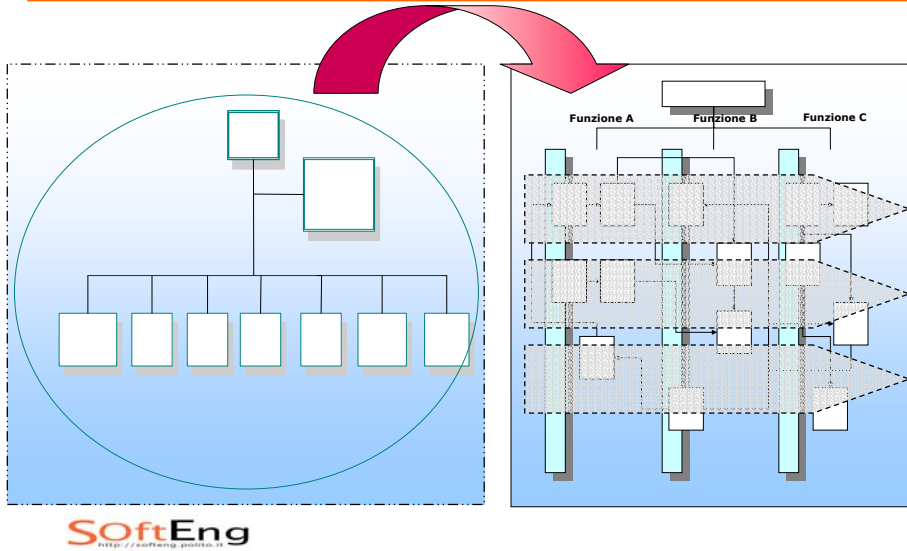
ERP: data sharing

- ♦ One DB or replicas with automatic synchronization
- ♦ One data model
- Horizontal integrity of data
 - ♦ All applications/modules share same data, with same data model
- Vertical integrity
 - ♦ From operation level to management level (aggregates of data)

SoftEng

12

From functions to processes



13

Modularity

Ex.: SAP R/3 for Manufacturing

- ♦ SD Sales And Distribution
- ♦ MM Materials Management
- ♦ PP Production Planning
- ♦ QM Quality Management
- ♦ PM Plant Management
- ♦ HR Human Resource
- ♦ FI Finance
- ♦ CO Controlling
- ♦ AM Asset Management
- ♦ PS Project
- ♦ WF Work Flow
- ♦ IS Information System (summary data)



SoftEng
http://softeng.polito.it

14

DG

Modularity

- Smoother transition, extensibility
- Large module offer
- One stop shopping
 - ♦ All modules from same vendor, ease of integration
- Best of breed
 - ♦ Modules from different vendors

SoftEng
http://softeng.polito.it

15

Prescriptivity

F

- ERP modules contain a business logic
 - ♦ Ex.: Supply part can be accepted only if related order has been issued
 - ♦ Ex.: Supply can be ordered only if authorized role needs it
- Current business process in company may or may not comply

P

SoftEng
http://softeng.polito.it

16

Approaches

- Traditional: Understand business process, develop software supporting it
- ERP: Adapt business process to ERP
 - ♦ Actually ERP software can be parameterized and changed

Gap analysis

Attività	Modello funzionale corrente	Funzionalità ERP	Azioni sul processo	Azioni sul software
Ricevimento materiali	Solo registrazione; nessun controllo su ordine fornitore	Controllo sull'ordine al fornitore "i materiali che entrano in azienda devono essere stati ordinati"	Adeguamento del processo alla prescrizione ERP	-----
Controllo qualità	Guidato da regole predefinite	Solo registrazione dell'esito del controllo (le regole non sono incorporate nel sistema)	-----	Adeguamento software ERP
Carico a magazzino	Il SI guida la scelta della ubicazione di magazzino in cui stivare	Solo registrazione dell'evento di avvenuto carico a magazzino	-----	Adeguamento software ERP
Prelievo a magazzino	Il SI guida la scelta della ubicazione di magazzino da cui prelevare	Solo registrazione dell'evento di avvenuto prelievo da magazzino	-----	Adeguamento software ERP
Rettifica inventariale	Modifica dei valori nella base dati (sovrascrittura)	I valori delle scorte sono corretti mediante apposite transazioni di rettifica	Adeguamento del processo alla prescrizione ERP	-----

Transition to ERP in company

- Cost of licenses + personalization
 - ♦ Especially for SMEs
- Delay
- Changes to business processes
 - ♦ Acceptance, human factors
- Heavy solution?
 - ♦ Especially for SMEs

Options

- Large company (turn over > 50MEuro)
 - ♦ ERP (Sap, Oracle, ..) + BPR activity
 - Core modules + industry modules
 - Transition risks
 - Delay (> 12 months)
 - Cost (0,5 - 10 M)
 - ♦ Same as for SME

Options

- SMEs
 - ♦ Package for accounting
 - ♦ Package specific to domain
 - ♦ ERP light
 - ♦ ERP in ASP mode

Packages for accounting

- 'gestionale': Esatto, Zucchetti, Buffetti
 - ♦ Sometimes rigid (data: like bill of materials, processes)
 - ♦ Reduced cost: ~ 50K
 - ♦ Hard to scale up

Vertical packages

- Often used by SMEs
- On open (Unix, MS) or close platform (AS/400)
- Specific to domain
- Sometimes with different vendors
- Cost: ~100K

ERP light

- Reduced, precustomized versions of SAP, Oracle, etc
 - ♦ Inherit complexity of parent product
 - ♦ Cost: ~150K
- New products of traditional local vendors (ESA, Formula)
 - ♦ Good coverage of processes
 - ♦ Less impact for customization
 - ♦ Cost: ~100K

ASP modes

- Pay service and not product
 - ♦ Pay per client, per transaction
- Access through Internet/Browser
 - ♦ Ex.: BtoBiscom – RDS, SEMA, EDS, AONet
– Formula,