ES – ERP – CRM

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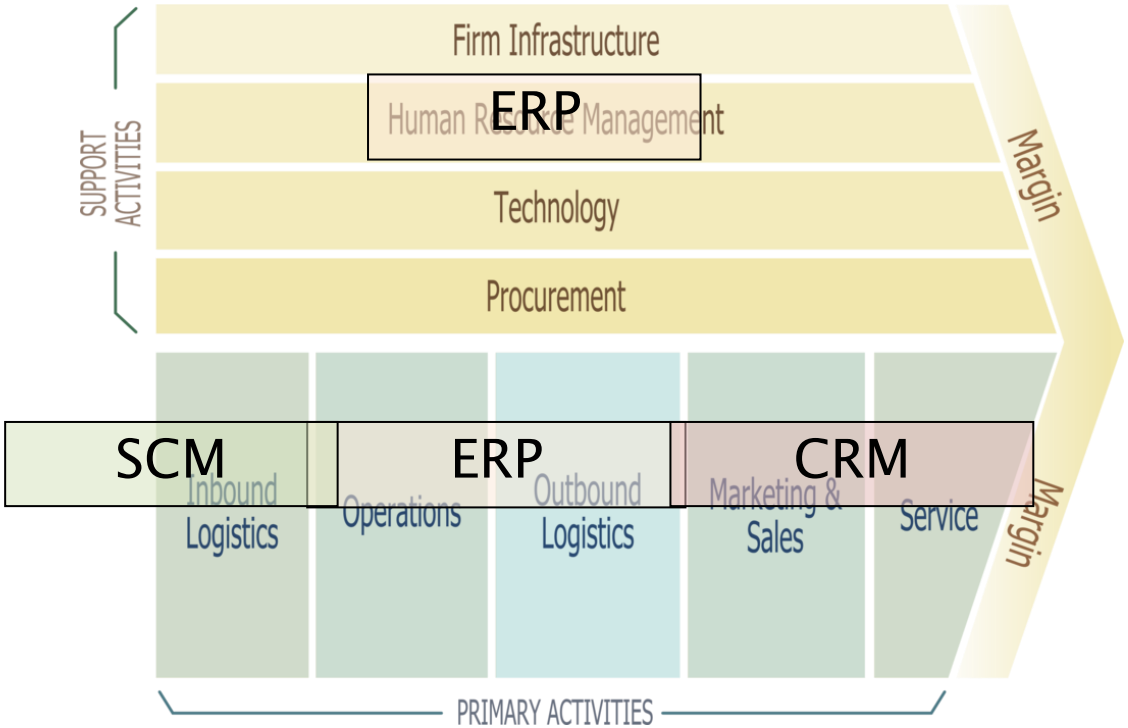
Software applications

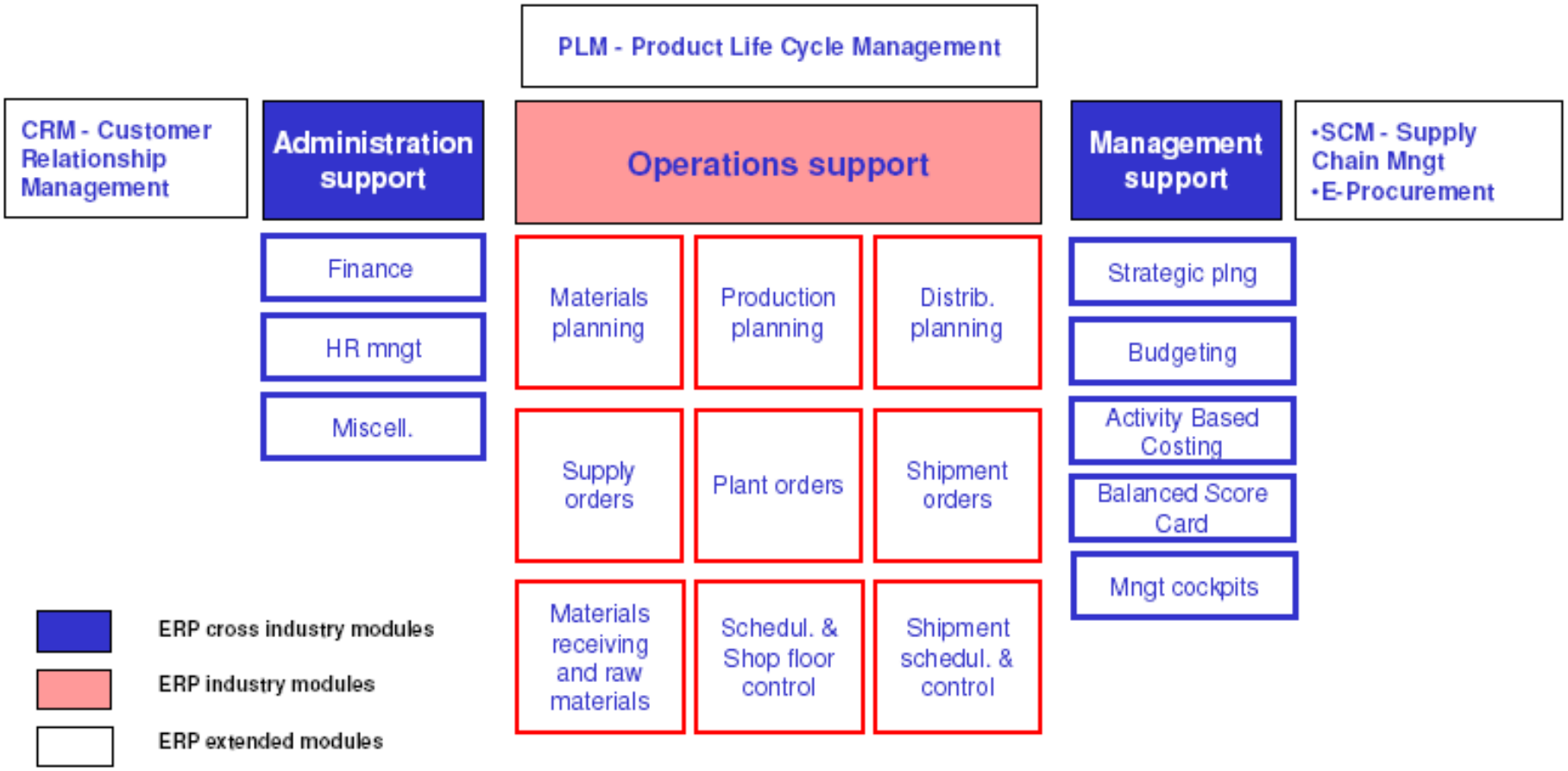
- To support core business processes



Drawing by Dinesh Pratap Singh

- ERP
  - Enterprise Resource Planning
- CRM
  - Customer relationship management
- SCM
  - Supply chain management
- ES
  - Enterprise systems = ERP + CRM + SCM

Modules

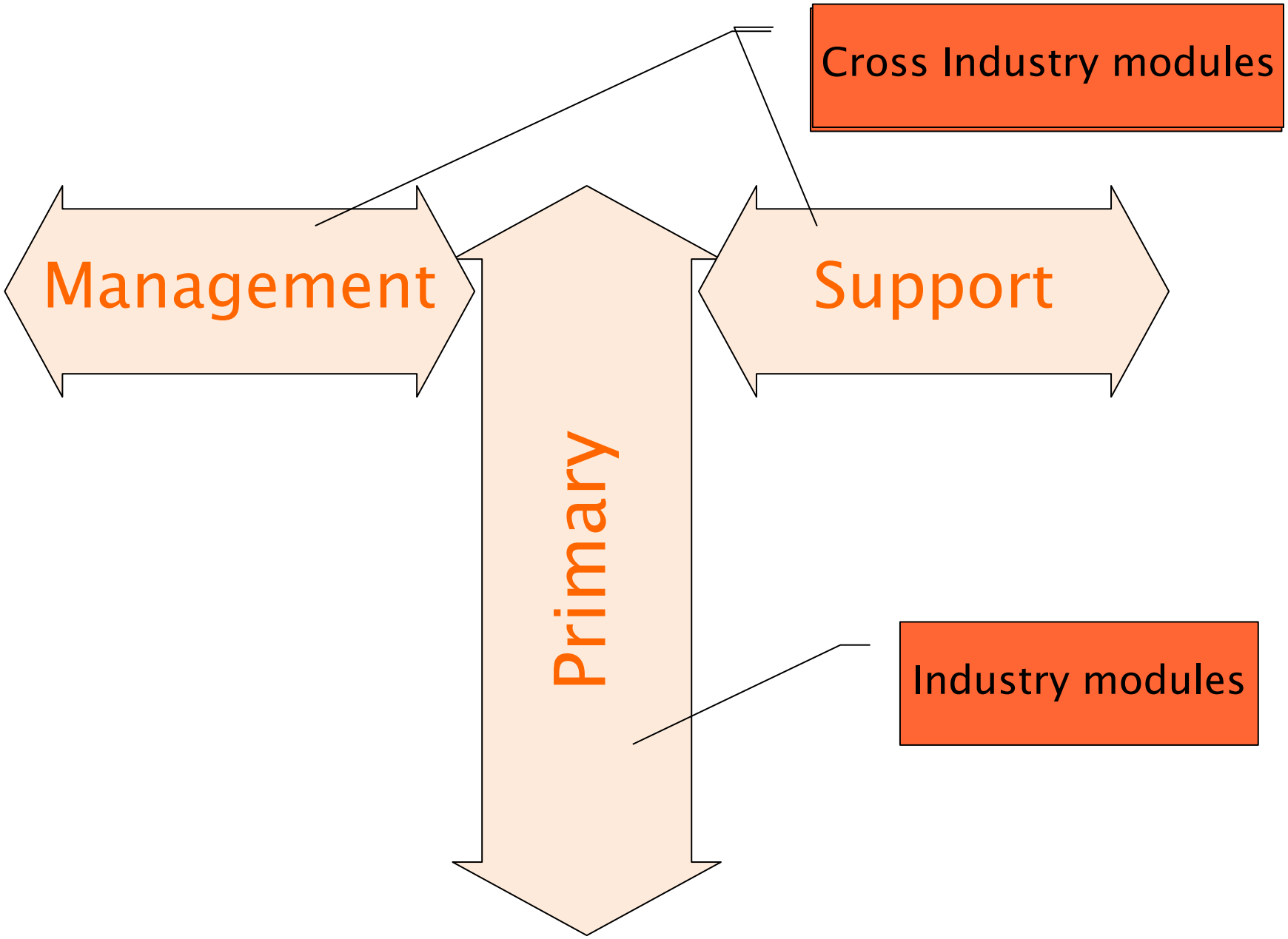

PLM - Product Life Cycle Management
CRM - Customer Relationship Management
Administration support
Operations support
Management support
•SCM - Supply Chain Mngt
•E-Procurement
Finance
HR mngt
Miscell.
Materials planning
Production planning
Distrib. planning
Supply orders
Plant orders
Shipment orders
Materials receiving and raw materials
Schedul. & Shop floor control
Shipment schedul. & control
Strategic plng
Budgeting
Activity Based Costing
Balanced Score Card
Mngt cockpits
ERP cross industry modules
ERP industry modules
ERP extended modules

Modules

- Cross industry modules

- Industry modules
  - Specific to automotive, chemical, ..
- Extended modules
  - On the boundary company – companies or company customer (CRM, SCM, ..)

→ Compare with T-model


Cross Industry modules
Management
Support
Primary
Industry modules

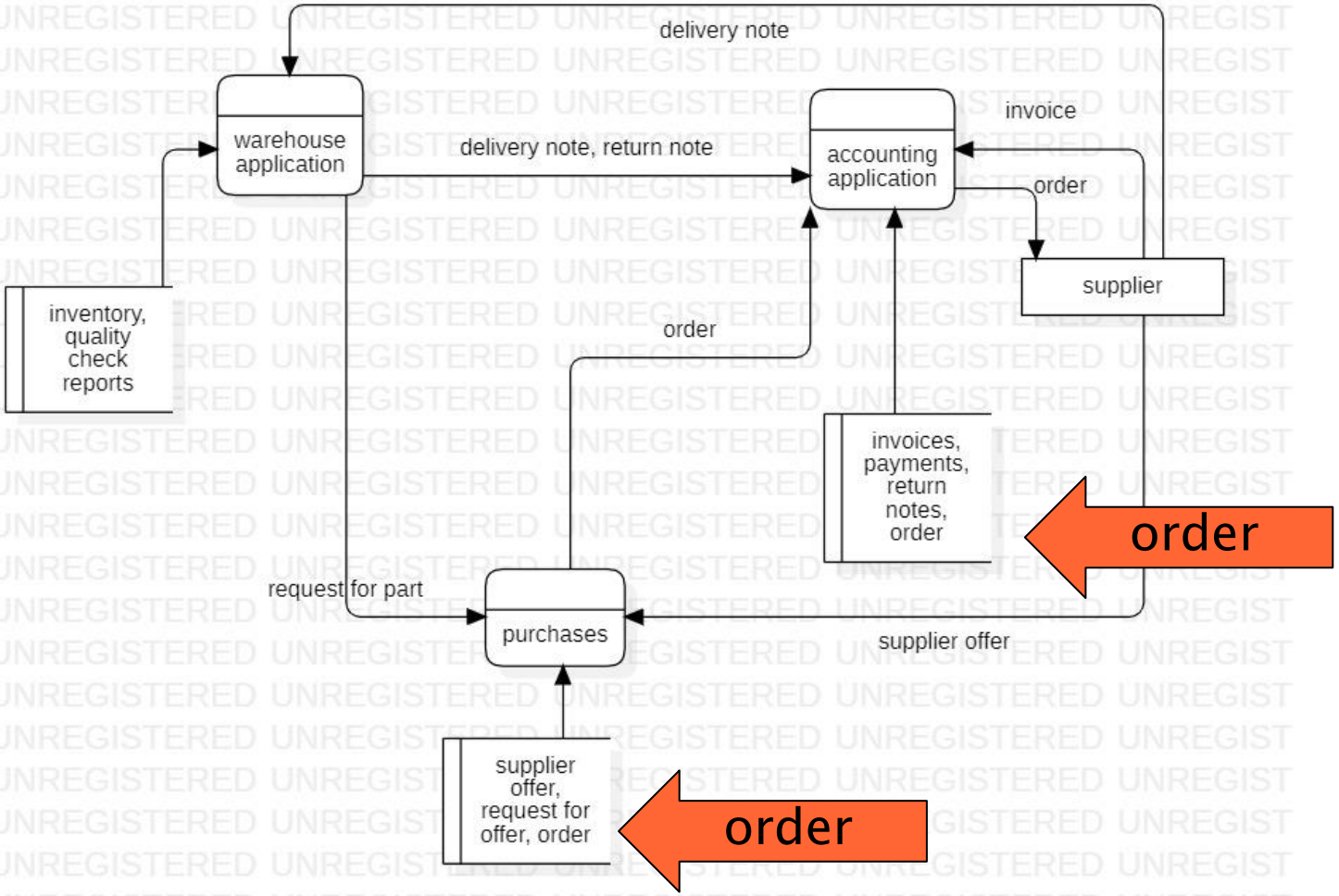
ES Levels

- Suite
  - Set of software applications sharing one or more DB
  - Supports set of business processes
- Module
  - Software application
  - Supports business process
  - Made of functions
- Software Function
  - Supports simple operation/activity

The ES model

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

Data replication: *legacy* islands



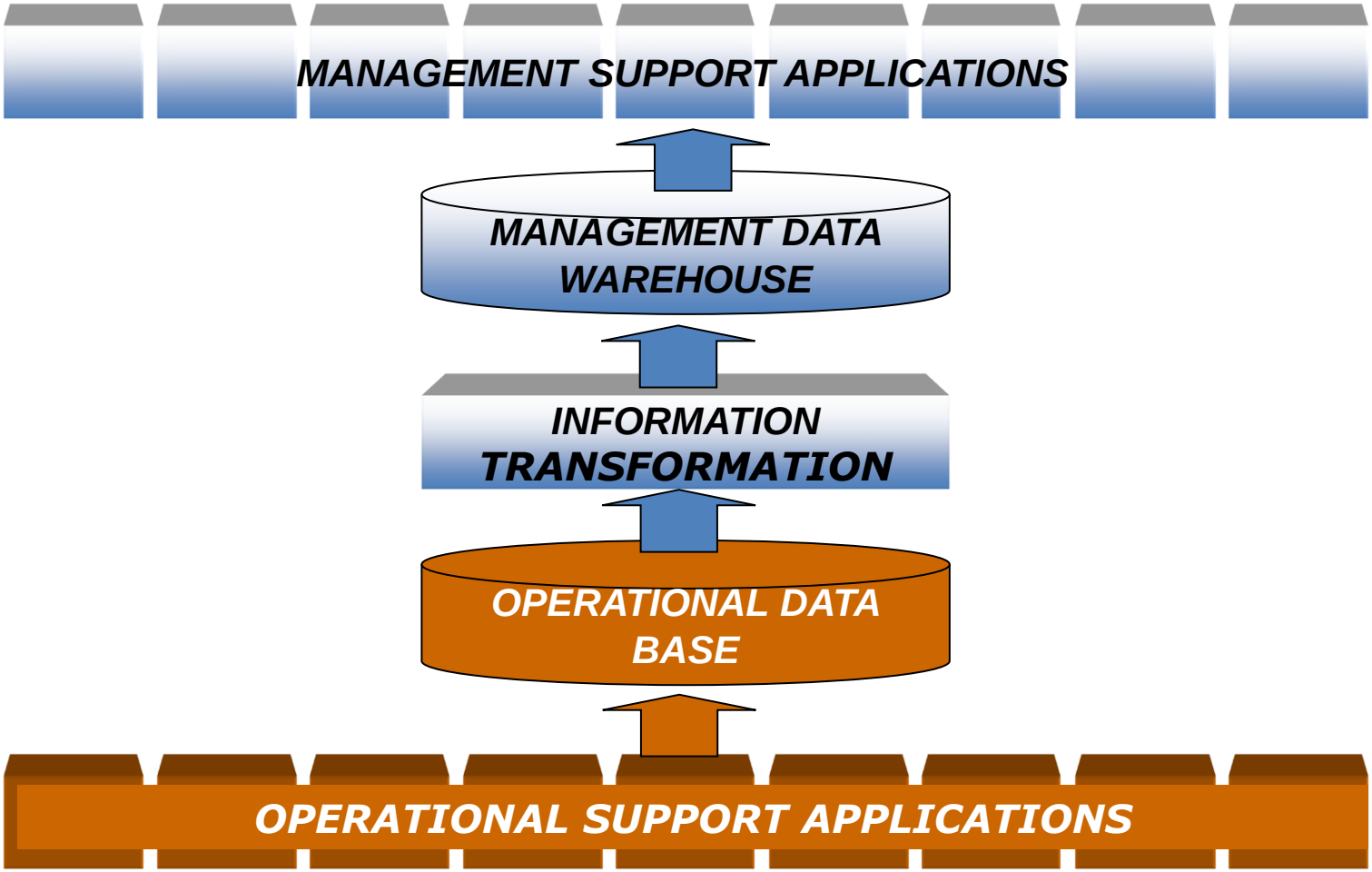
Data replication

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

Data replication

- Each ‘data island’ typically matches a business function of the company
  - Accounting, warehouse, sales ..
- IS have a history, they are typically developed bottom up
- Unless a top down governance effort is made
  - See later IT organization chapter

ES: data sharing



ES: data sharing

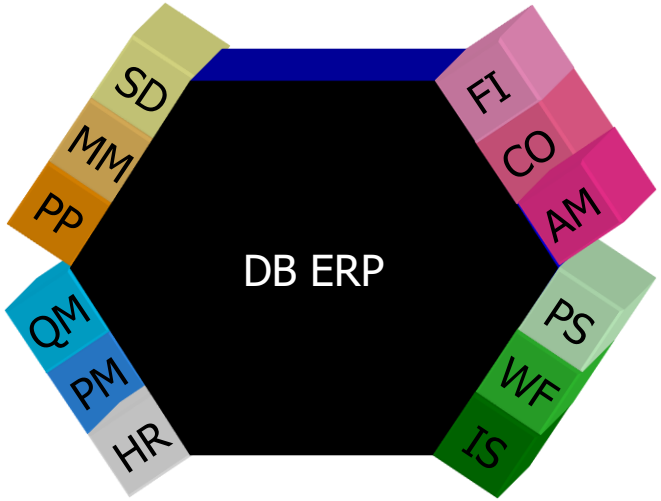
- One DB or replicas with automatic synchronization
- One data model

- 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)

Modularity

Ex.: SAP R/3 for Manufacturing

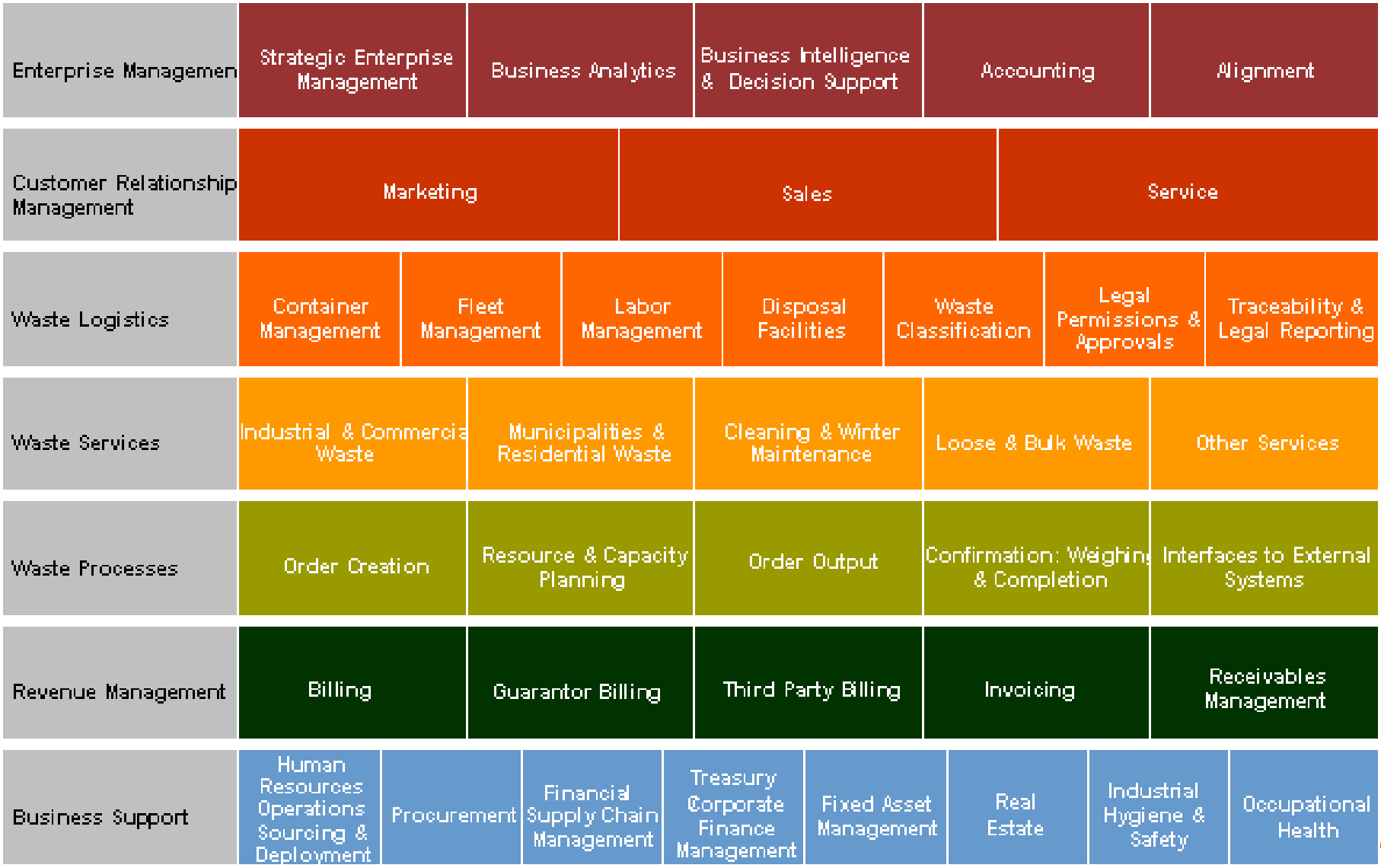
- SD Sales And Distribution
- MM Materials Management
- PP Production Planning
- QM Quality Management
- PM Plant Management
- HR Human Resource
- FI Finance
- CO Controlling
- AM Asset Management
- PS Project
- WF Work Flow
- IS Information System (summary data)



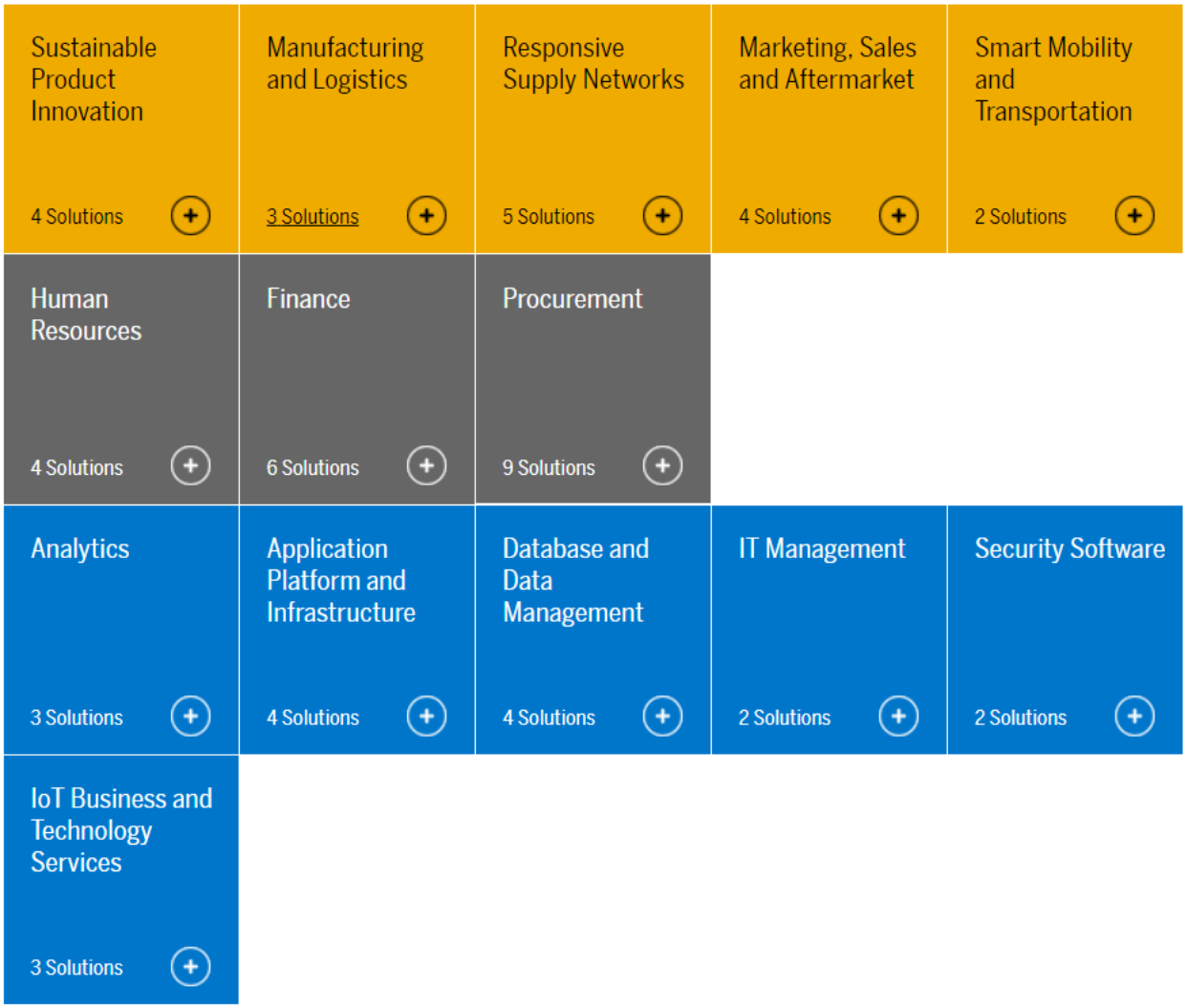
Segmentation, car rental

	Marketing and Customer Management	Products	Rentals Management	Rental Fleet Logistics	Business Administration
Plan	Customer Segmentation	Rental Product Strategy	Location and Channel Strategy	Fleet Strategy	Corporate / LOB Strategy
	Customer Relationship Strategy	Product Development/ Design	Location Design and Layout	Fleet Planning	Financial Management and Planning
	Marketing Strategy and Planning		Channel Design and Layout	OEM Relationship Planning	Real Estate Planning
Manage	Customer Behavior Modeling	Promotions Management	Channel and Location Profitability	OEM Performance Management	Alliance Management
	Market and Competitor Research	Pricing Management	Location Operations Management	Inbound Logistics	Business Performance Reporting
	Segmentation Management		Reservations Management		Legal and Regulatory Compliance
	Call Center		Workforce Management		Real Estate and Construction Management
					Risk Management
					Stock Ledger
	Campaign Management				HR Management (Career Development, Training, Recruiting)
Execute	Customer Service	Purchasing/ Sourcing	Rentals and Reservations	Location Operations	HR Administration / Payroll
	Preferred Member Management	Demand Forecasting	Time and Attendance	Fleet Servicing	Corporate Audit
	Customer Communications			Fleet Management	Corporate Accounting (GL, AP, A/R, Treasury, etc.)
	Mass Marketing and Advertising				Indirect Procurement
	Target Marketing				PR and Investor Relations
					IT Systems and Operations

Segmentation, waste management



Segmentation (Sap, automotive)



Modularity

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

Prescriptivity

- ES modules contain a business logic
  - Ex.: Supply part can be accepted only of 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

Approaches

- Traditional:
  - Understand business process,
  - Develop software supporting it
- ES:
  - Adapt business process to ES
  - Actually ES software can be parameterized and customized

Gap analysis

Activity	Current	ES	Process Actions	Software Actions
Receive materials	Only recording, no control vs. order	Control on order: entering materials must have been ordered	Adapt process to ES prescription	–
Quality Control	Driven by predefined rules	Result recording (no rules within system)	–	Adaptation of ES software
Storage	IS drives selection of warehouse location	Only recording of completed storage	–	Adaptation of ES software
Retrieve from storage	IS suggest location where to retrieve	Only recording of completed retrieval	–	Adaptation of ES software
Inventory change	Change values in db (overwrite)	Values are corrected through correction transactions	Adapt process to ES prescription	

Transition to ES in company

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

Scenario: large corporation

- Large company (turn over > 50MEuro)
  - Constraints: Multi currency, multilanguage, multilegal systems
  - IT office with many employees
  - ES (Sap, Oracle, ..) + BPR activity
    - Core modules + industry modules
    - Transition risks
    - Delay (>12 months)
    - Cost (0,5 – 10 M)

Scenario: SME

- SME (turn over < 50M Euro)
  - Constraints: one language, one currency, one legal system
  - Small or no IT office
  - ES from national vendor,
  - core modules only (accounting, warehouse, sales ..)
- VSME (<5MEuro)
  - No IT office

Vendors

- Major players, world
  - SAP Business One, Oracle ERP cloud, Microsoft Dynamics NAV
  - Oligopoly in large companies, multinationals
- Local producers and products
  - For medium / small companies
  - Metafresh, StartyERP, ERPNext, ePromis
  - TeamSystem, Zucchetti, TargetCross

Vendors

- Open source
  - Adempiere, Apache OFBiz, Blueseer

Vending options

- Cloud vs. on-premise
- Pay
  - Per license
    - From 20.000 $ up
  - Per user per month
    - 5 $ to 200 $

SAP

- 1972 foundation
- 1980 – SAP R/2 multilanguage multicurrency
- 1990 – SAP R/3 client server
- 2000 – CRM

Oracle

- 1977 – only DB
- 1995 enters ERP market with buyout of
  - PeopleSoft, JD Edwards (ERP)
  - Siebel (CRM)
  - Hyperion (management)

Options

- SMEs
  - Package for accounting
  - Package specific to domain
  - ERP light
  - ERP in as a service mode

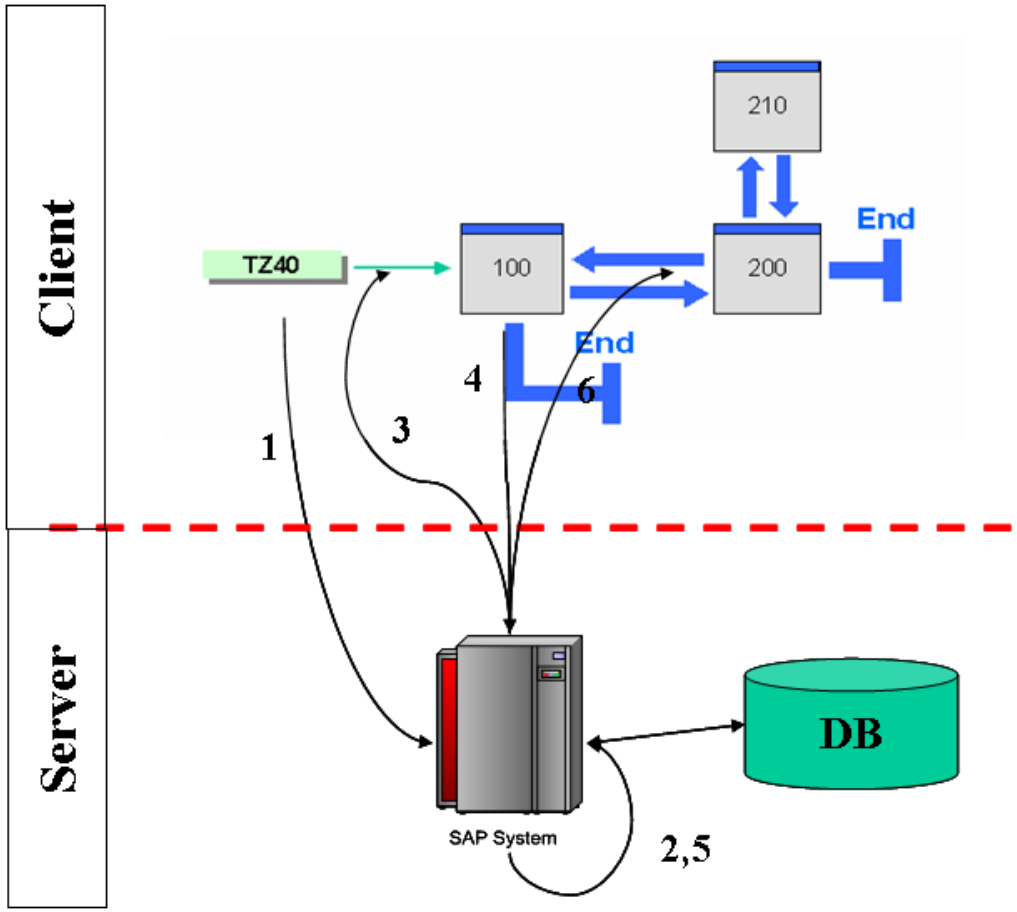
SAP – architecture

- Database
  - Information storage services
- Kernel
  - Low-level predefined operations
    - DB access
    - Simple transactions execution
    - Communication with other sw suite
    - Monitoring and system administration
    - User and permission management
- Package
  - Set of consistent and customizable features (e.g. accounting)
  - Leverage kernel functions

SAP – Database

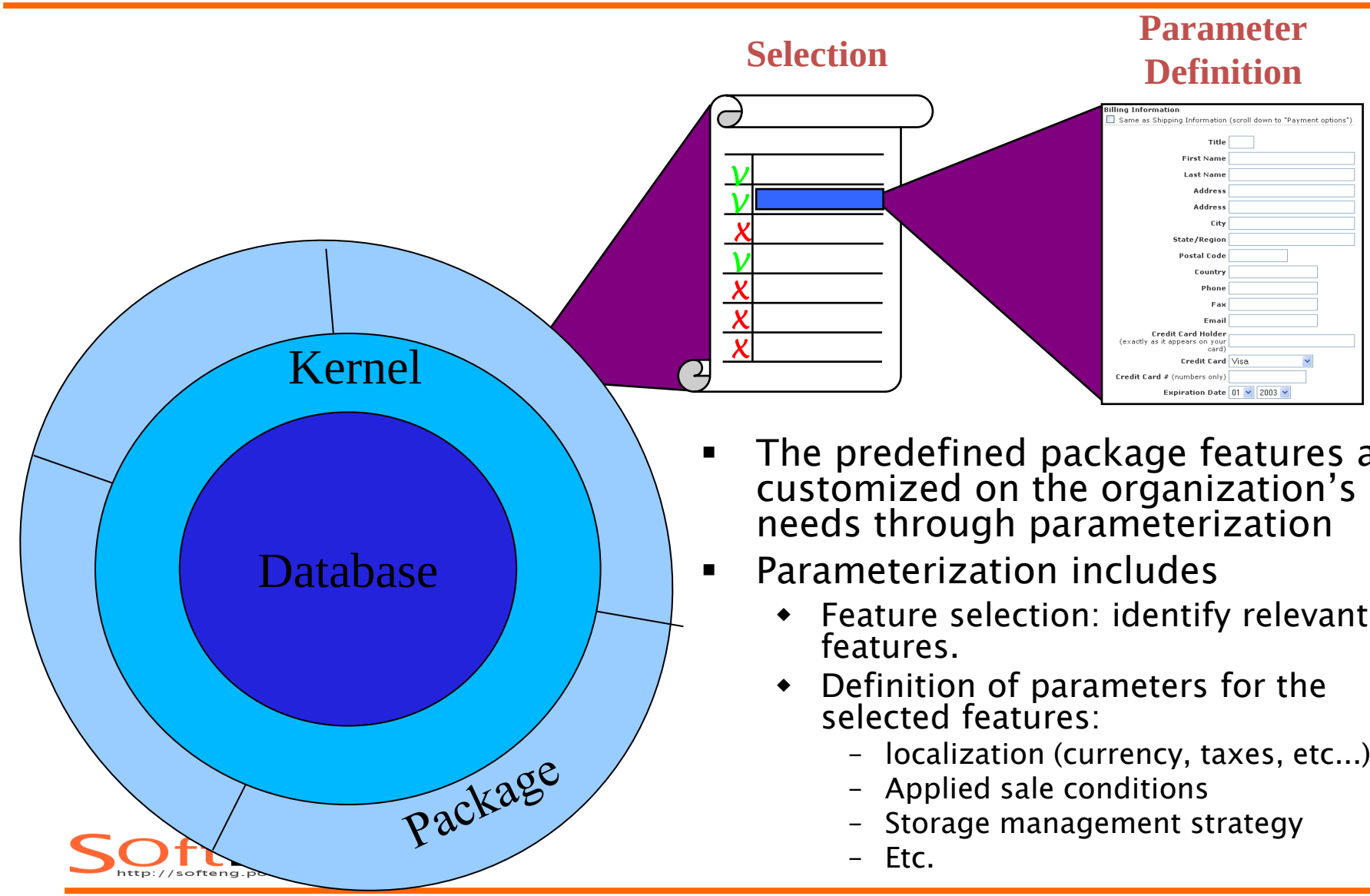
- 64.000 Tables
  - Schema are ready and non-modifiable by programmers
  - It is possible to add new tables
- Including
  - System configuration tables (name T*), e,g.:
    - Countries
    - Type of materials
    - Currencies
  - Organization management data, e.g.:
    - Suppliers
    - Materials
    - Customers
    - Customer orders

SAP – a transaction



- Steps:
  1. Call transaction
  2. Program compilation;
  3. Compiled code loading on client
  4. Data from client to server
  5. Processing of next screen
  6. Communication to client of new screen
- At the end of the transaction the system stores the data from all completed screens

SAP – Parameterization



- The predefined package features are customized on the organization's needs through parameterization
- Parameterization includes
  - Feature selection: identify relevant features.
  - Definition of parameters for the selected features:
    - localization (currency, taxes, etc...),
    - Applied sale conditions
    - Storage management strategy
    - Etc.

ES in summary

- Cover the core processes of an organization
- Process oriented
- Modular and based on a single database
- Prescriptive
- Complex

CRM

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Customer Relationship Management

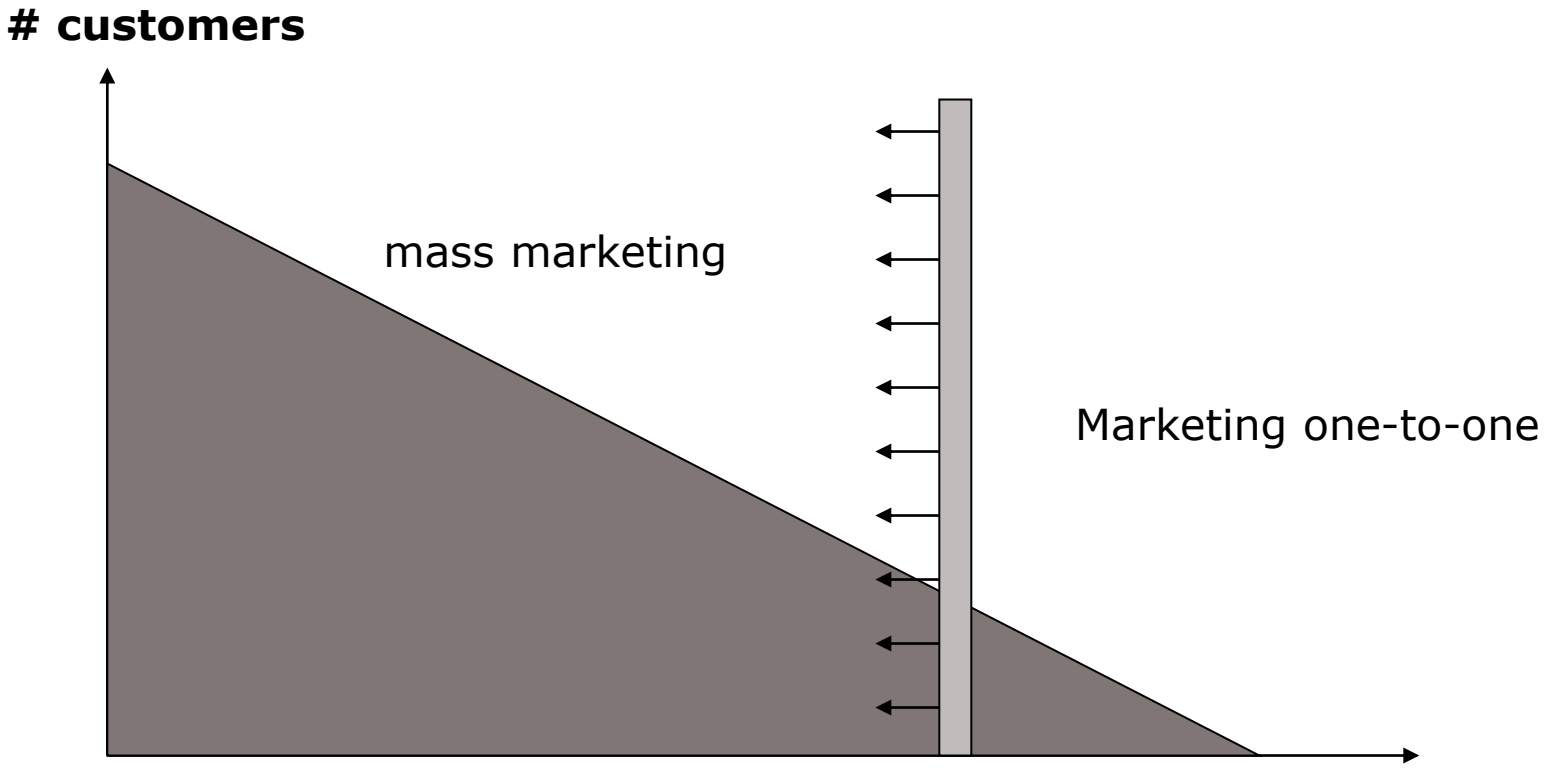
- Definition
  - An approach
  - Supporting tools

CRM approach

- [Seybold 1998, 2000]
- Integrated and structured process to interact with customers
  - Fetch new customers
  - Retain existing customers
- Goal: build with customer long term relationship, increase her satisfaction, increase value of company for her and viceversa

CRM context

- Deregulation (90's) and lower switching cost for customer
- Not all customers are equal

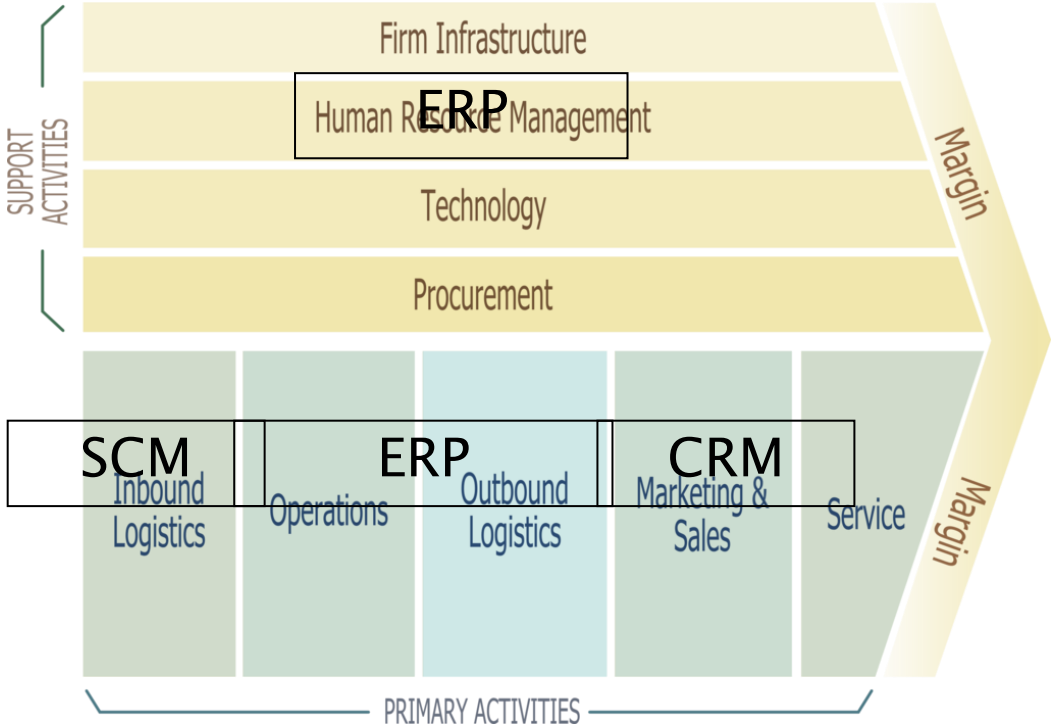


CRM approach

- Customer becomes core aspect of commercial strategy
- The company
  - Makes access to product/services as easy as possible
  - Produces customized offers
  - Provides complete access, from pre-sale to post-sale
  - Collects complaints and suggestions

CRM – tools

- CRM approach not feasible without tool support
- CRM starts with Siebel (1993)



Drawing by Dinesh Pratap Singh

CRM paradigm

- Multichannel
  - Customer accesses company through any channel
    - Mobile phone, web, call center, counter, (mail)
- Uniqueness of data and service
  - Access is consistent through all channels
    - Data (on product, on customer) is the same and does not depend on channel
- End to end service chain
  - Front end: contact with customer (CRM)
  - Back end: service provision, delivery, administration

Service chains

- Can be more or less complex
  - Level 1: reservations
  - Level 2: product sale
  - Level 3: customer care

Ex.: reservations

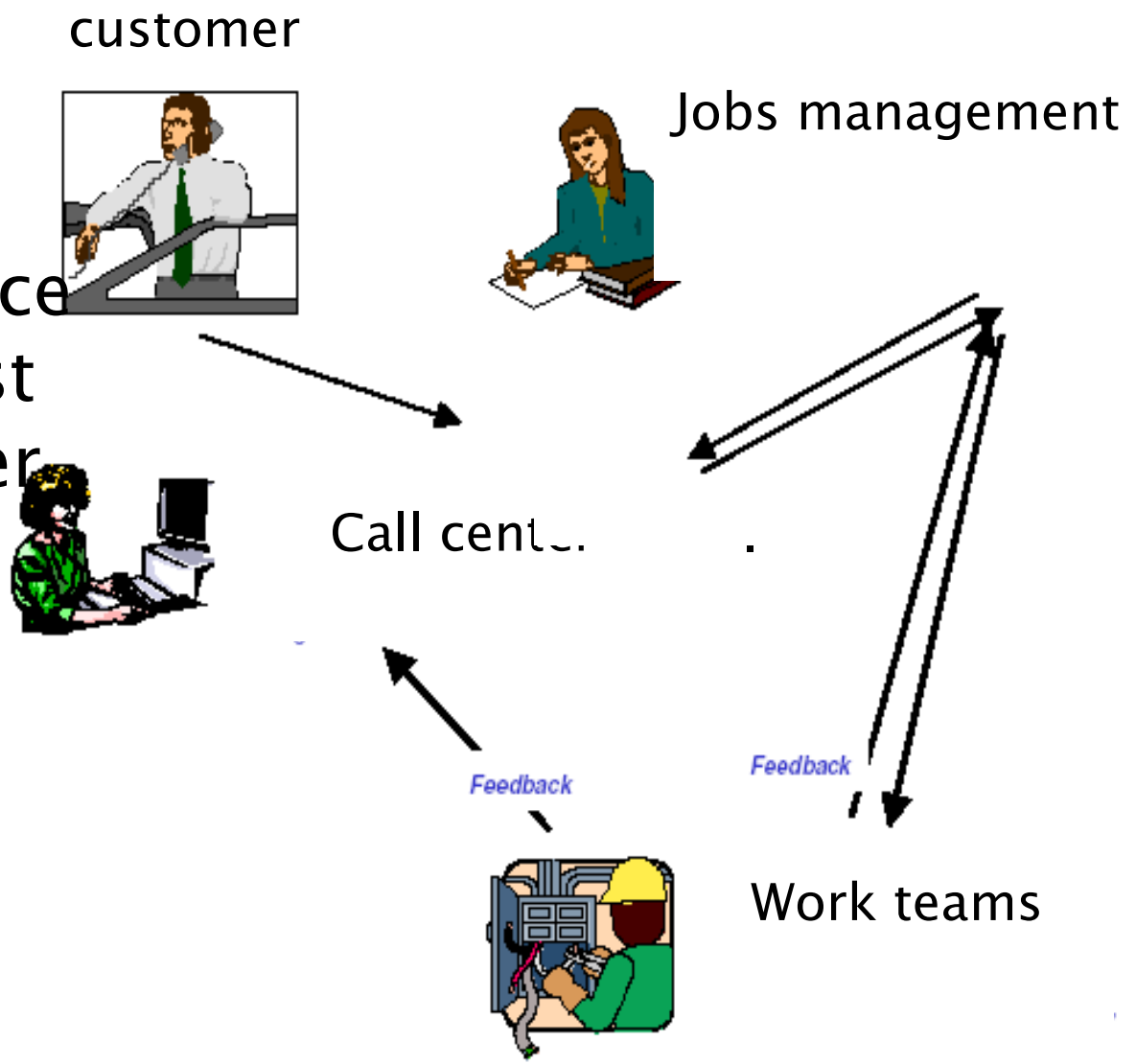
- Health services, flights, movies ..
- Database with availability of product/service + (multichannel) front end
- Simple service chain
  - Sale of right to a service (no service/product itself)

Ex.: E-commerce

- Computers, books, music
- Complete service chain
  - Sale of product (payment) + delivery
    - Amazon
  - Sale of product + production + delivery
    - Dell

Ex. Customer care

- Telephone services,
- Complex service chain to assist customer after sale



Evolution of tools

- 80's
  - Sales Force Automation (SFA): tools to support salesperson
- 90's
  - Toll free numbers, call centers
  - Informational services
  - Reservation services
    - Airlines, health services
  - After sales support (help desk)
  - Sales (tele selling, telemarketing)

Sales force

- Context: B2B
  - Company selling to other companies
    - Few number of customers buying regularly (large) quantities
  - Ex supplier of automotive parts
  - Ex supplier of food items to large retailers
  - Sale person maintains contact with a number of buyers, collects needs, produces offers, negotiates, closes sale

B2B

- Buyer buys many items together
- Few buyers
- Negotiation of price
- Offer, order, delivery,invoice, payment

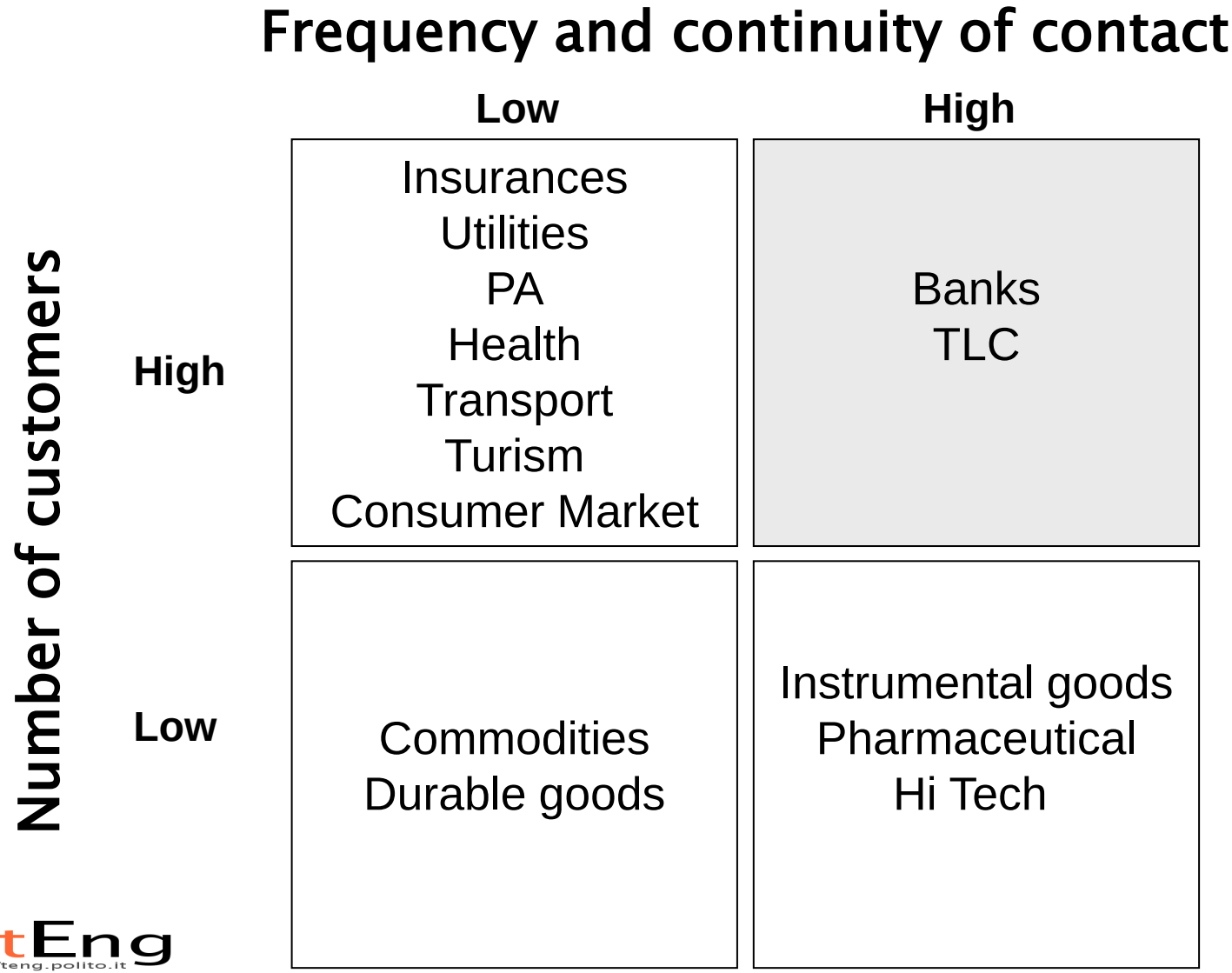
B2C

- Buyer buys one (few items) at a time
- Many buyers
- Fixed price
- Pay immediately

Evolution of tools

- 1995: WEB
  - Informational sites
  - Sales
    - B2C (www.Amazon.com)
    - B2B (CISCO)
- 00
  - Integration of SFA, call center, web into CRM suites

CRM, needs


Frequency and continuity of contact
Low
High
Number of customers
High
Low
Insurances
Utilities
PA
Health
Transport
Turism
Consumer Market
Banks
TLC
Commodities
Durable goods
Instrumental goods
Pharmaceutical
Hi Tech

CRM, needs

- Not all business domains have the same need for CRM, that depends on
  - Intensity of relationship with customer (frequency of contact, duration of contract)
  - Size of customer pool
  - Loyalty of customer
  - Multichannel or not

CRM tools: key functions

Commercial Logistics

+

Interaction w/ customer
Inbound & outbound
(telemarketing)
Customer care

+

Post-sale support
+ loialty
management

+

Customer
behavior analysis
(Analytic CRM)

- Commercial logistics
  - Also offered by ERP tools
- Support for multichannel interaction w customer
  - Inbound, outbound
- After sales
- Analysis of customers (analytic CRM)

CRM : modules

Front-end Modules

Salesperson

Call center

Internet

- Support to contact w/ customer, on all lifecycle and all channels

Data Clients, Products

back-end modules (ERP)

Execute requests from customer
Manage customer

Campaigns and marketing

Analysis (Analytic CRM)

- Support to marketing processes

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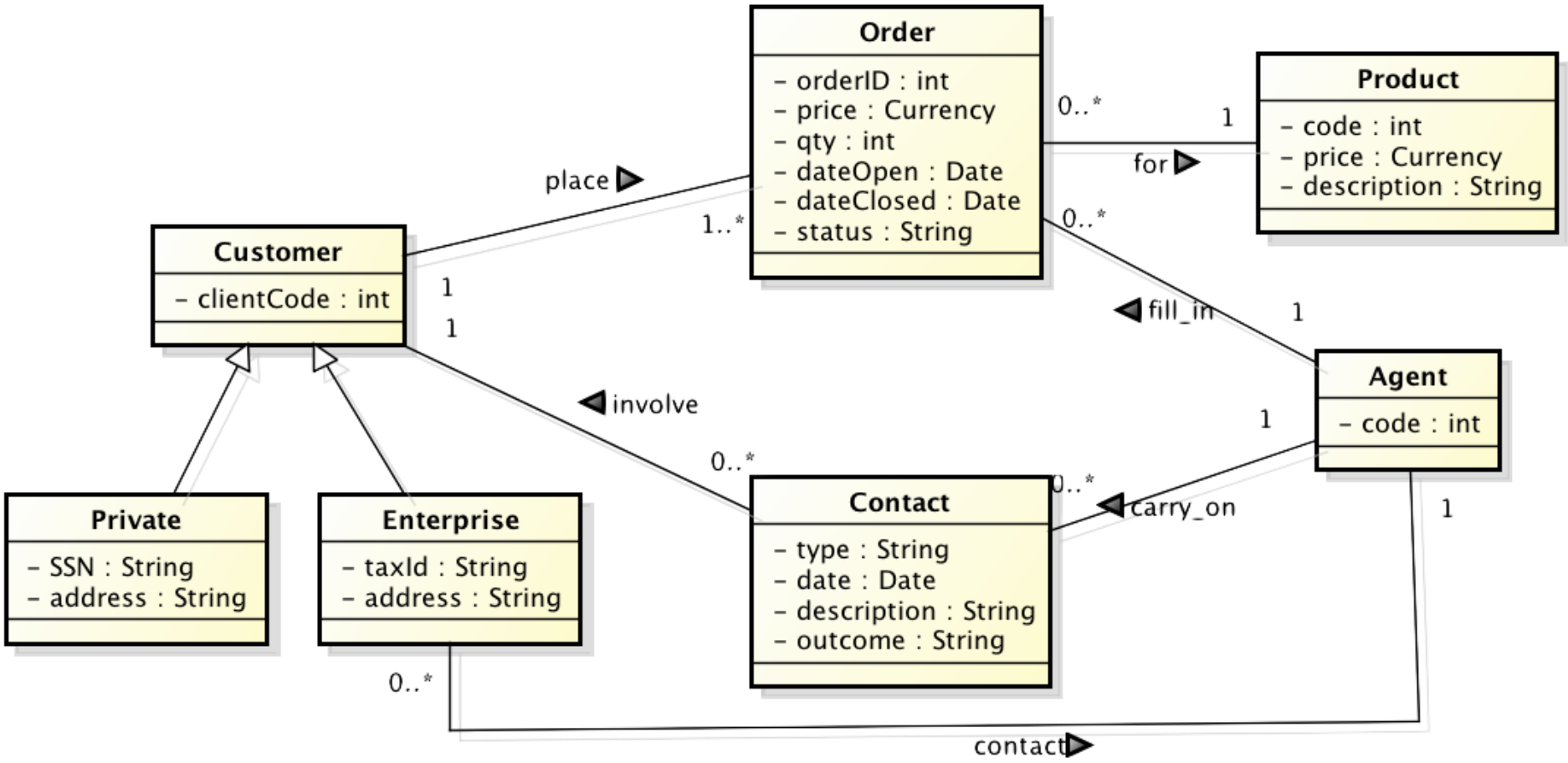
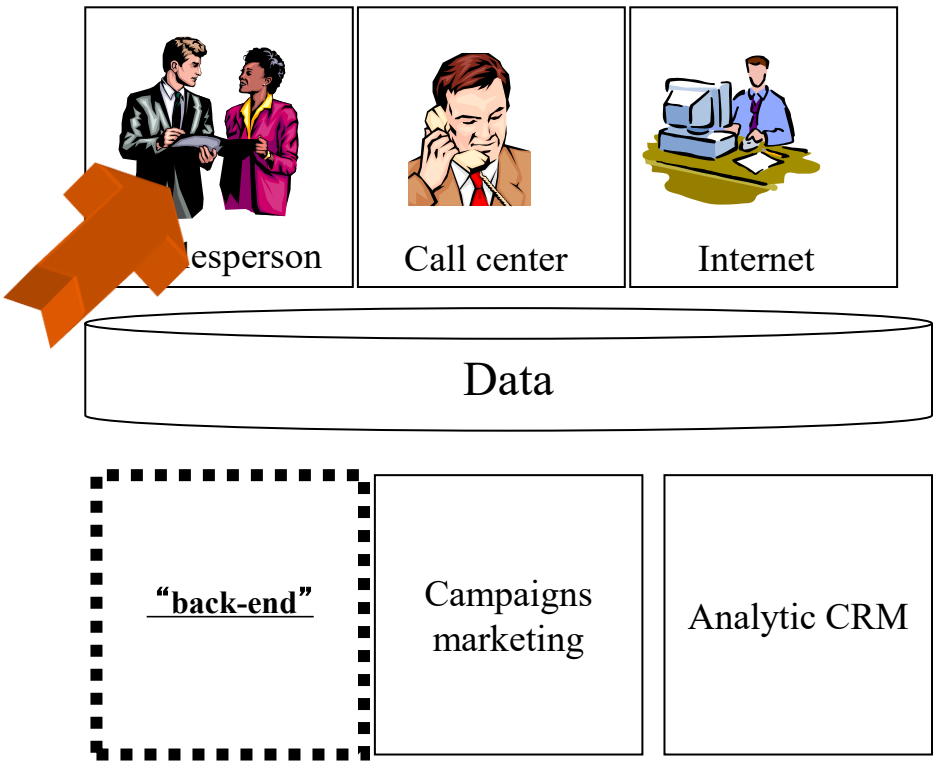
CRM, db

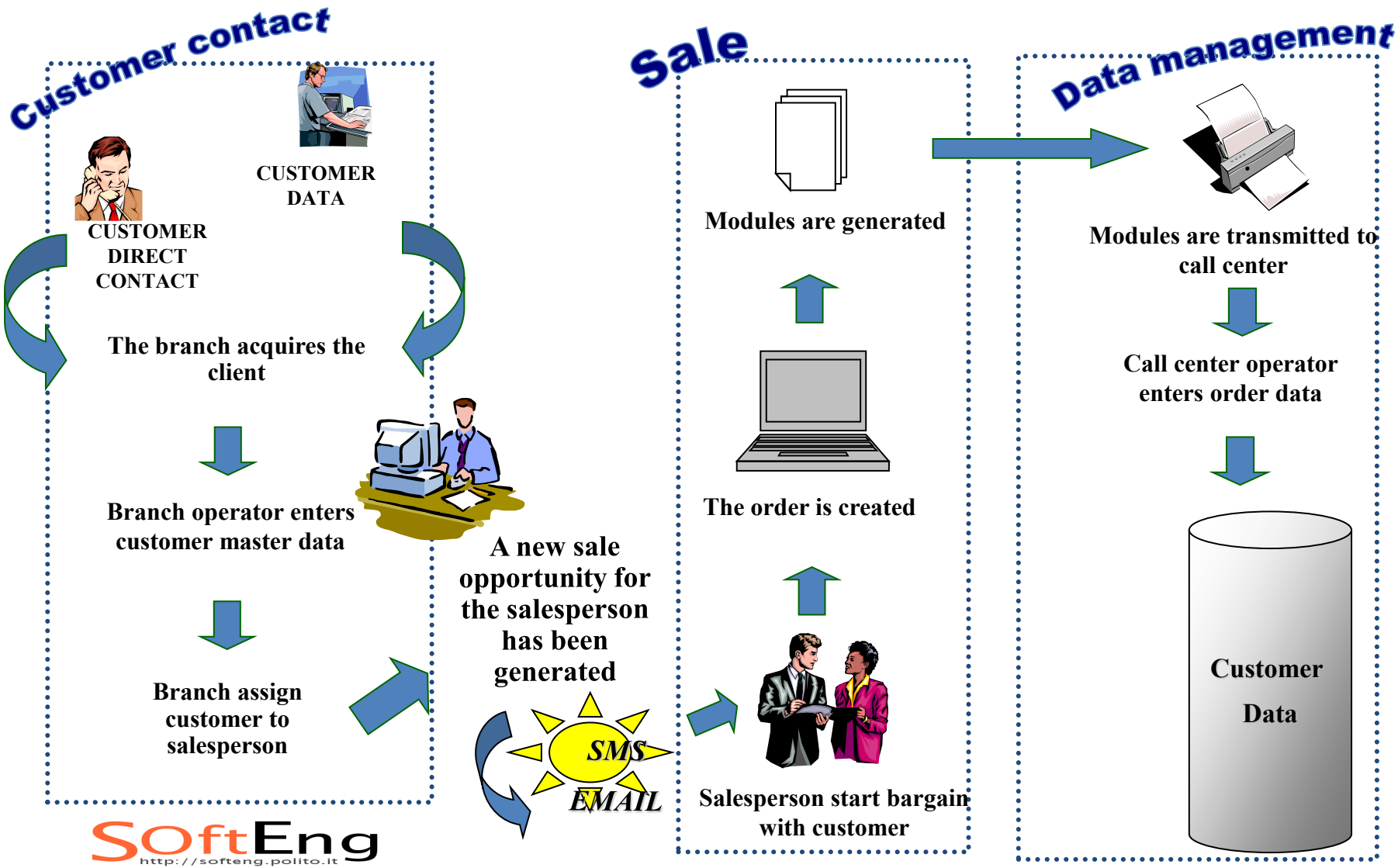

Order
- orderID : int
- price : Currency
- qty : int
- dateOpen : Date
- dateClosed : Date
- status : String
Product
- code : int
- price : Currency
- description : String
Customer
- clientCode : int
Agent
- code : int
Contact
- type : String
- date : Date
- description : String
- outcome : String
Private
- SSN : String
- address : String
Enterprise
- taxId : String
- address : String
place
for
fill_in
involve
carry_on
contact
0..*
1
1..*
1
1
0..*
0..*
1
0..*
1
0..*

Sales Force Automation channel

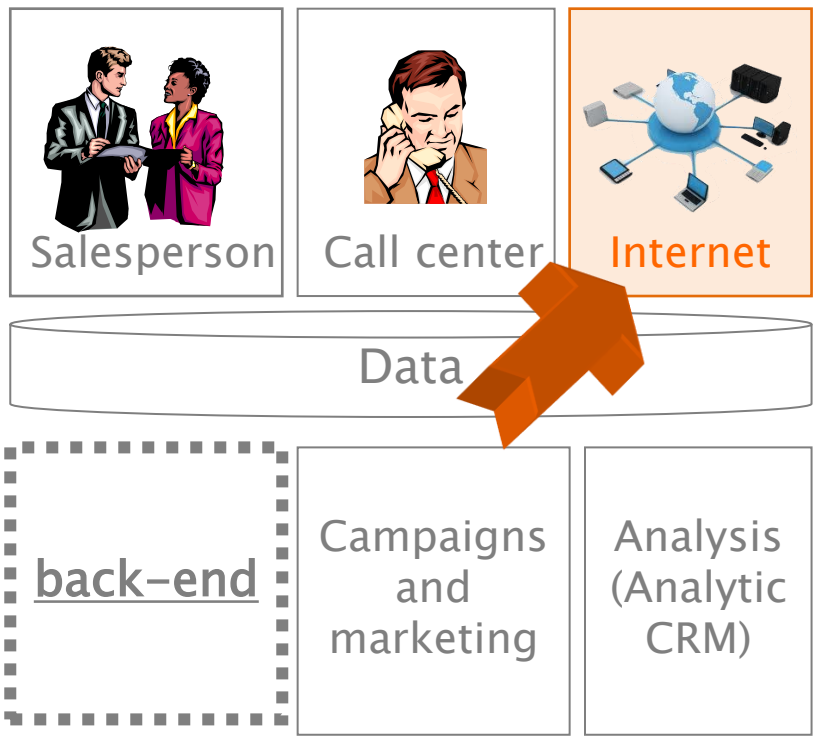


- Planning and control
  - Prospects, actual sales
- Interaction customer – vendor
  - Offers
  - Offer templates
  - Offer validation
  - History

Sales Force Automation - Process

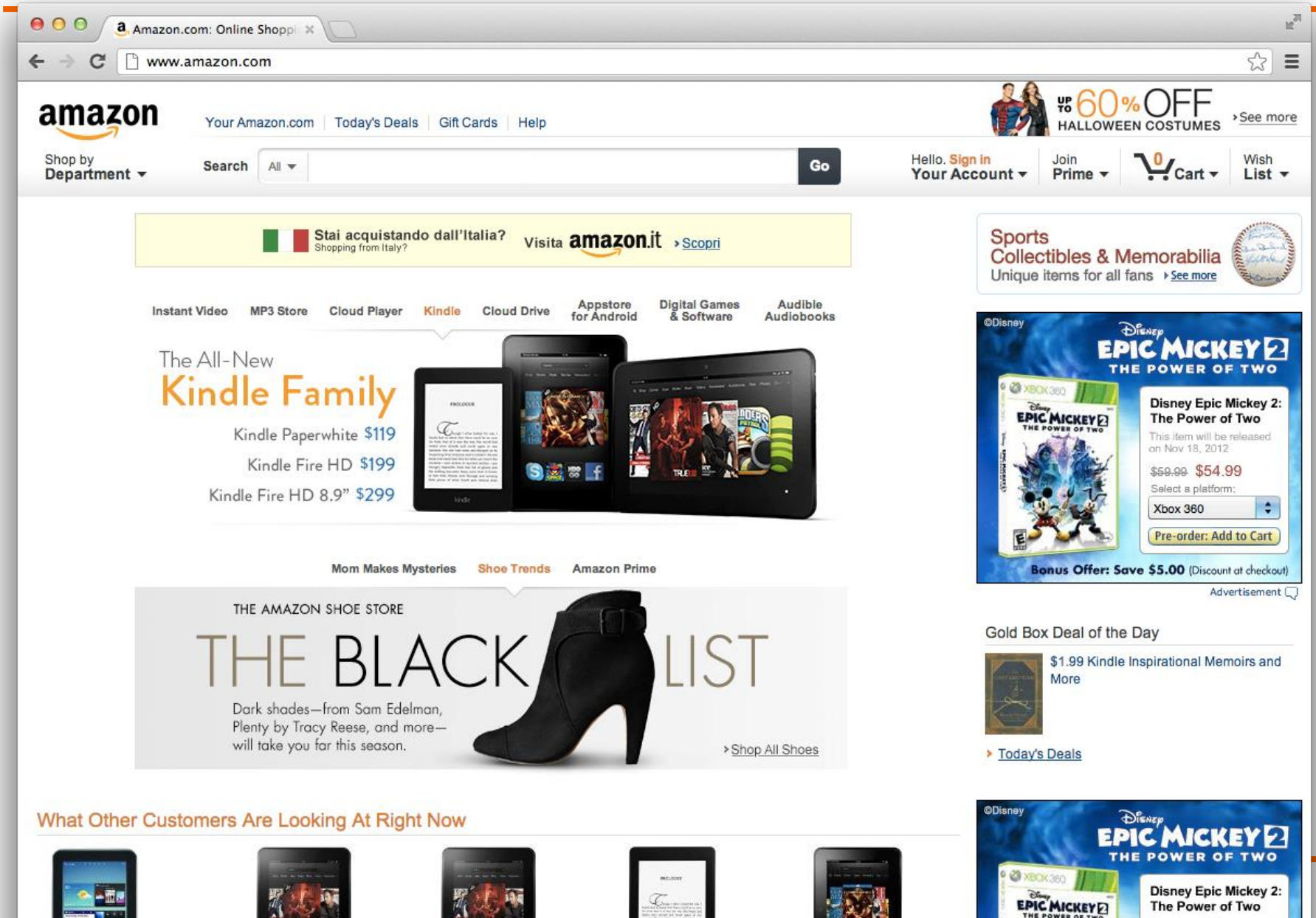


Internet channel

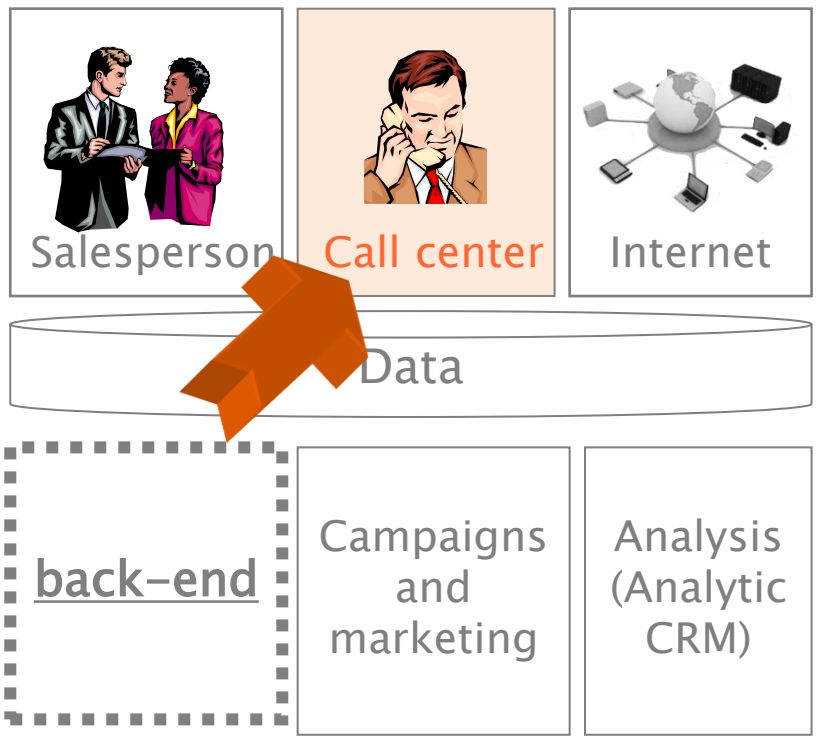


- Business vs Consumer customers
- General informations, Catalogue of products
- Purchase: suggestion of products, configuration, shopping cart, checkout
- Information on all transactions of the customer, and their state
- After sale: complaints and suggestions
- Log of all customer actions

Internet channel

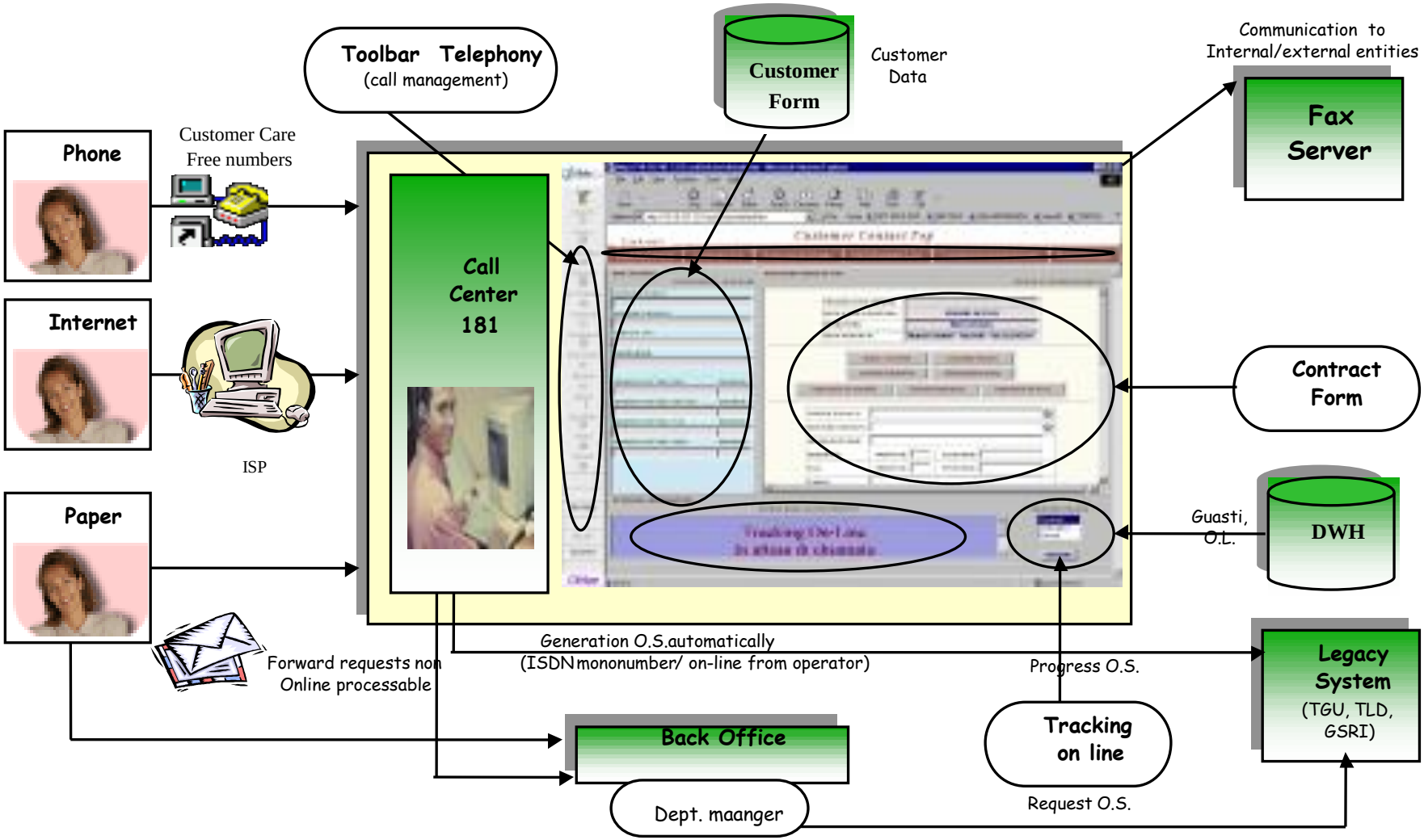


Call center channel



- CTI – Computer Telephone Integration)
  - IVR (Interactive Voice Response)
  - ACD (Automatic Call Distribution)
  - Voice recognition
  - Caller recognition
  - Speech to text
- Functions
  1. Information on company and products
  2. Purchase
  3. Status of purchases or other transactions
  4. Complaints
  5. History of interactions with customer
  6. Telemarketing inbound outbound, following scripts

Ex.: Customer Care



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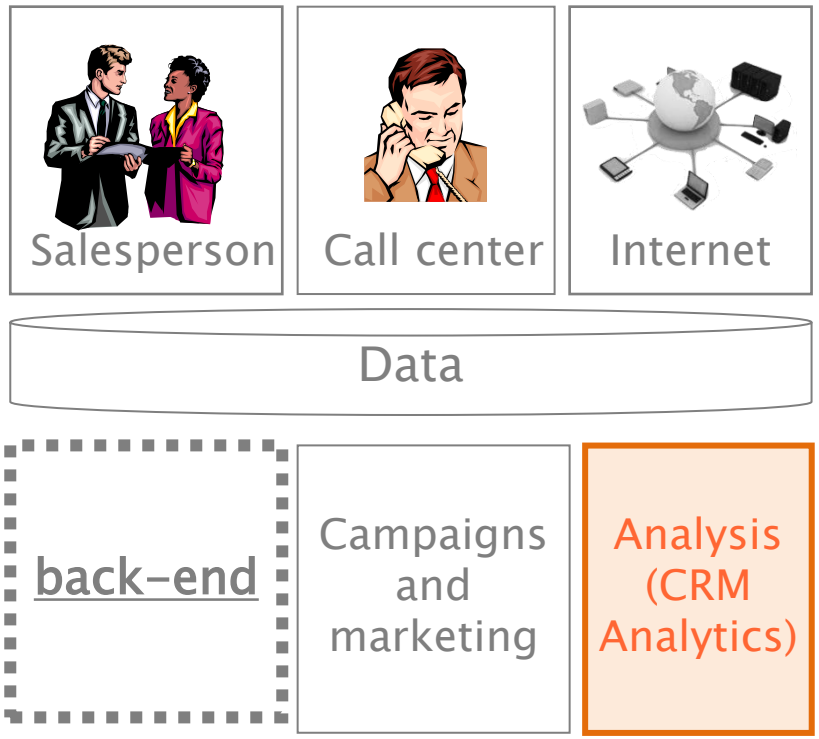
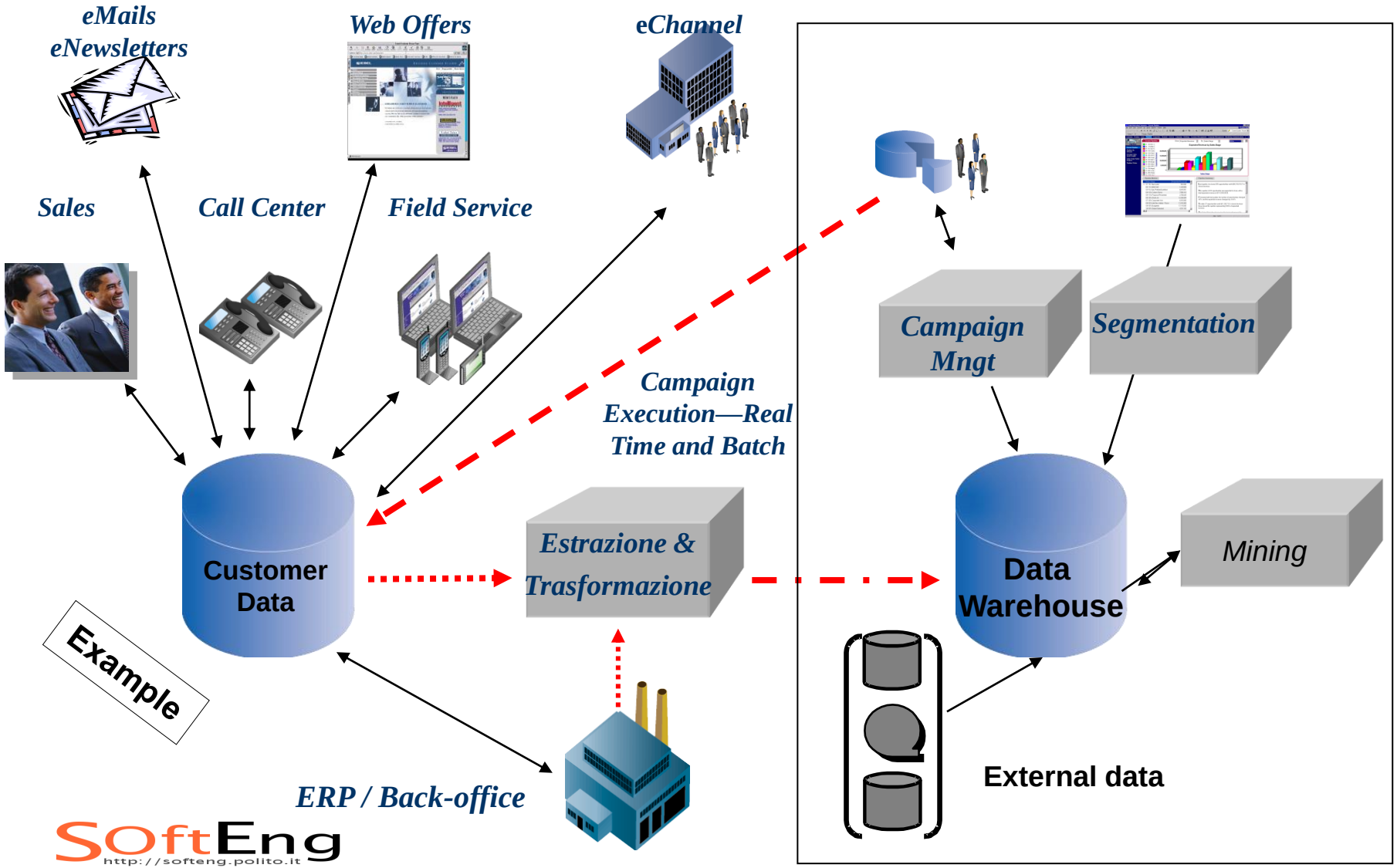
CRM Analytics

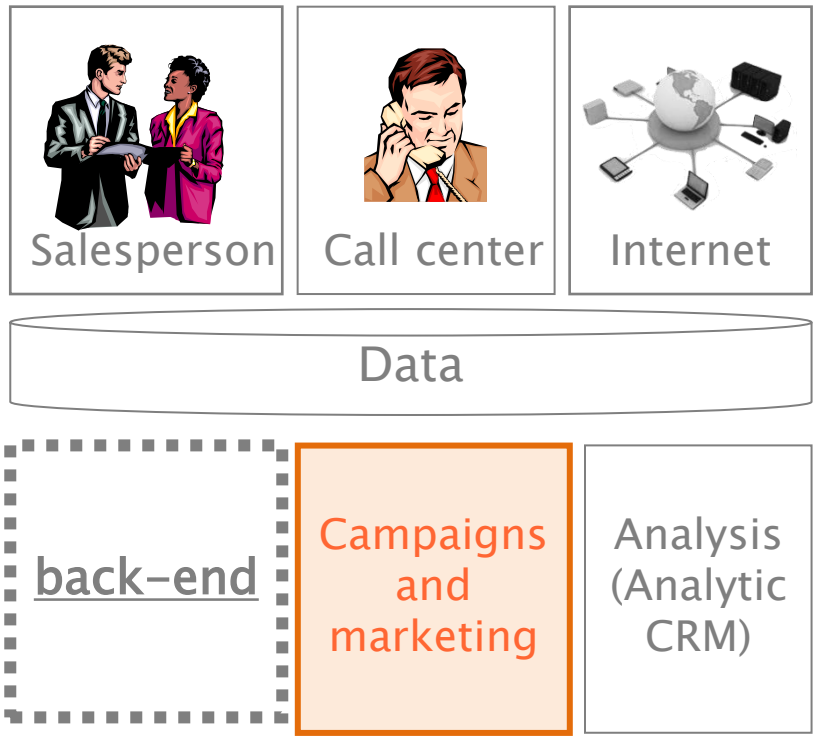


- Data from data warehouse
- Functions
  1. Segmentation indexes (profitability etc)
  2. Data mining to compute predictive indexes
  3. Reports on customers, production of dashboards
  4. Definition of segments, customers per segments

Analytic CRM: architecture

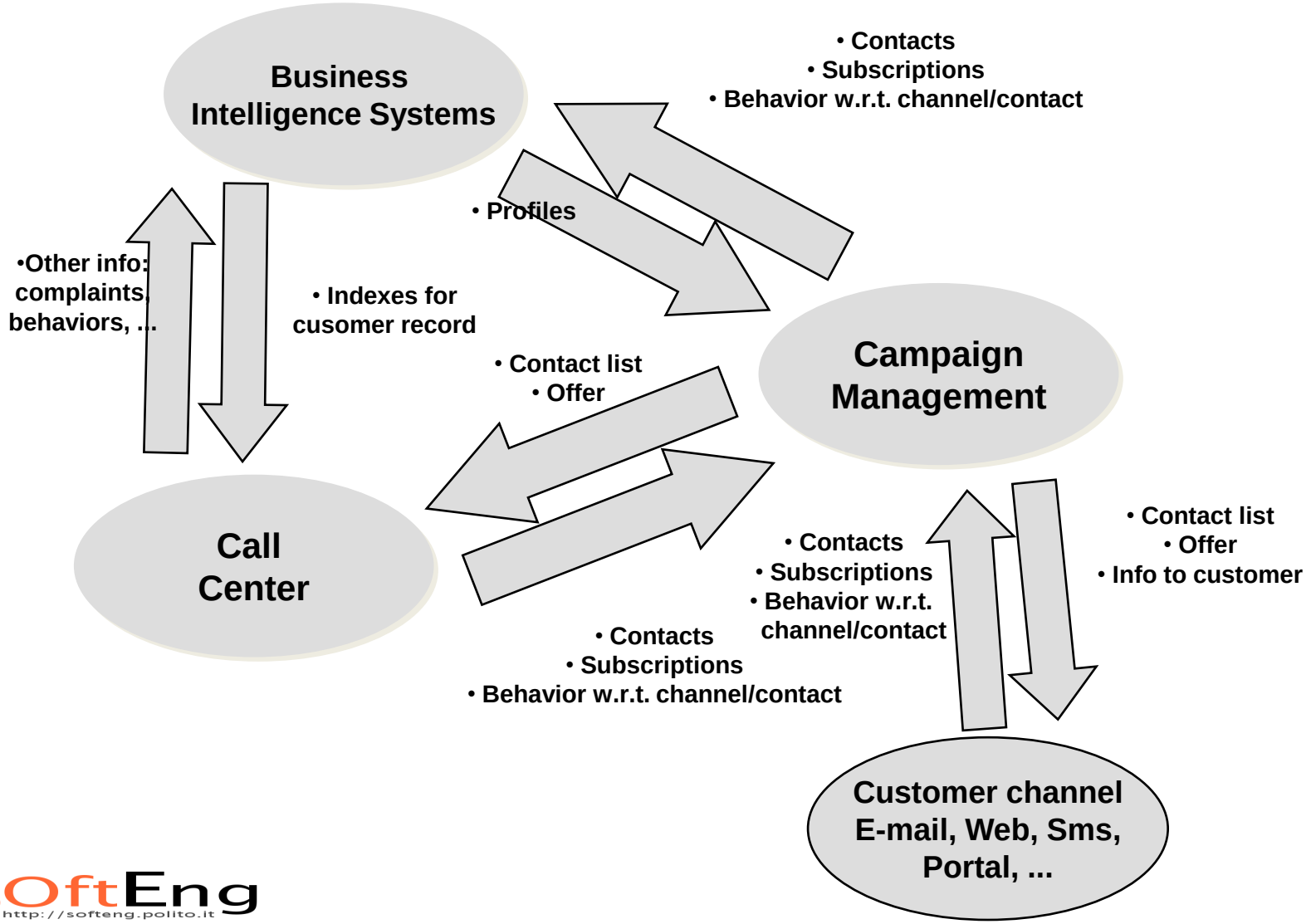


Campaign management

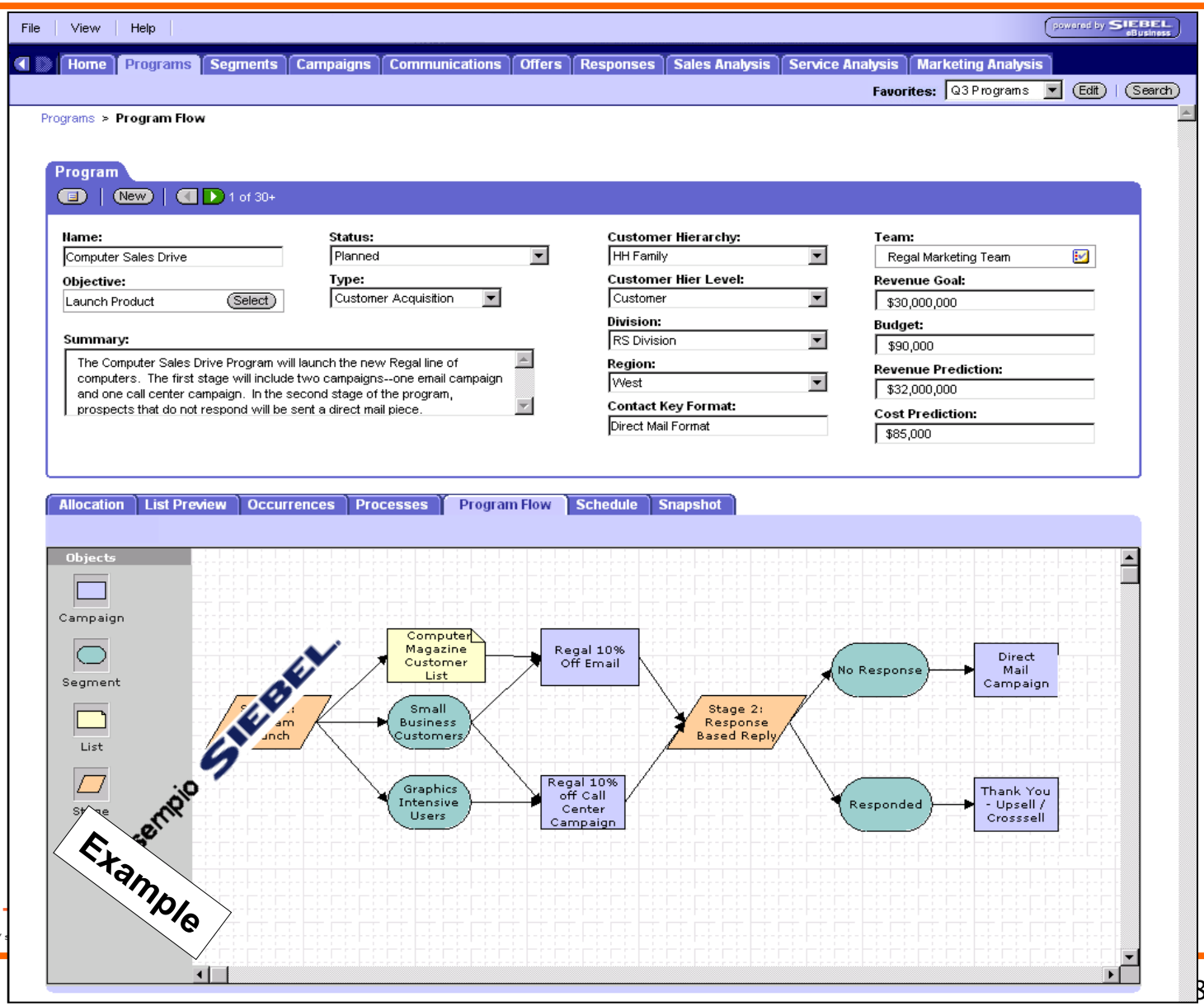


- Planning and execution of campaigns
- Functions:
  1. Selection of customer lists
  2. Design and plan campaign
  3. Transfer data from anaylitic CRM to operational IS

Campaign management : flow



Campaign: workflow functions



CRM vendors

- Full-liners: suite ERP + CRM + BI
  - Peoplesoft (Oracle), Siebel (Oracle)
  - SAP CRM
  - Salesforce
  - Microsoft Dynamics
- Analytic CRM, Business Intelligence
  - SAS
  - BO
  - Others: Data Mining / Text Mining suites
- Telephone technology vendors