

ERP Course: Introduction

Peter Dolog dolog [at] cs [dot] aau [dot] dk E2-201 Information Systems September 15, 2006



ERP Course Organization

2 hours lecture (Wednesday, Friday – 10:15 – 12:00) 2 hours lab (Wednesday, Friday – 8:15 – 10:00) B2-104

Lectures in 3 themes:

- ERP domains
- ERP architectures and deployment
- Challenging Topics
 6 Labs: E3-208, E3-210, E3-212
 Time to consult: just in Labs



Lectures	I	15 9 2006, Friday	Introduction and Course Organization
	2	20 9 2006, Wednesday	Sales and Marketing Module
	3	22 9 2006, Friday	Accounting and Finances Module
	4	27 9 2006, Wednesday	Production and Material Module
	5	29 9 2006, Friday	Human Resources Module
	6	II 10 2006, Wednesday	Supply Chain Management Module
	7	13 10 2006, Friday	Knowledge Management and Learning
	8	25 10 2006, Wednesday	Analysis Patterns I
	9	27 10 2006, Friday	Analysis Patterns II
	10	III 2006, Wednesday	ERP Systems Development
		3 11 2006, Friday	Re-Engineering
	12	8 II 2006, Wednesday	Workflow Management Systems
	13	10 11 2006, Friday	Management of ERP Projects
	14	15 11 2006, Wednesday	Architectures of ERP Systems
	15	17 11 2006, Friday	Systems Integration

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Labs

I	20 – 27 Ѕер. 2006	Choosing an ERP package
2	29 Sep – 11 Oct 2006	Sales and Marketing Module
3	13 Oct – 25 Oct 2006	Acounting and Finance Module
4	27 Oct – I Nov 2006	Production and Material Management
5	3 Nov – 8 Nov 2006	Human Resources
6	10 Nov – 17 Nov 2006	Supply Chain Management and Integration

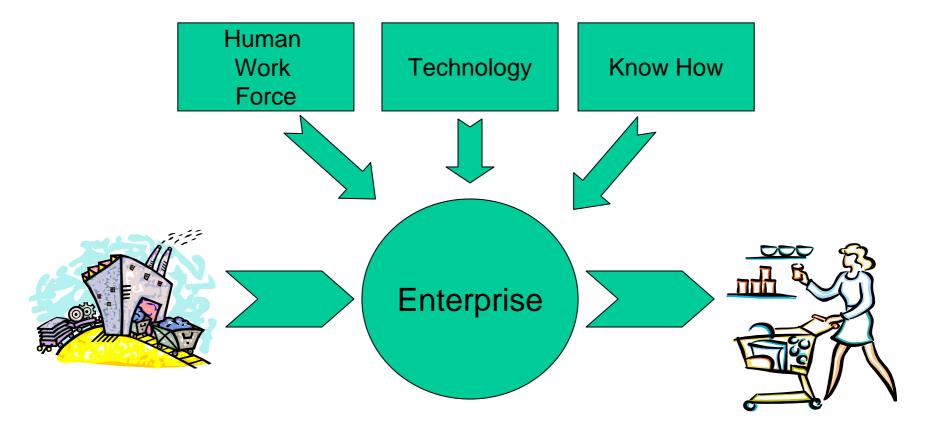


Motivations for ERP

Mary Sumner: Enterprice Ressource Planning Chapter I



A Company





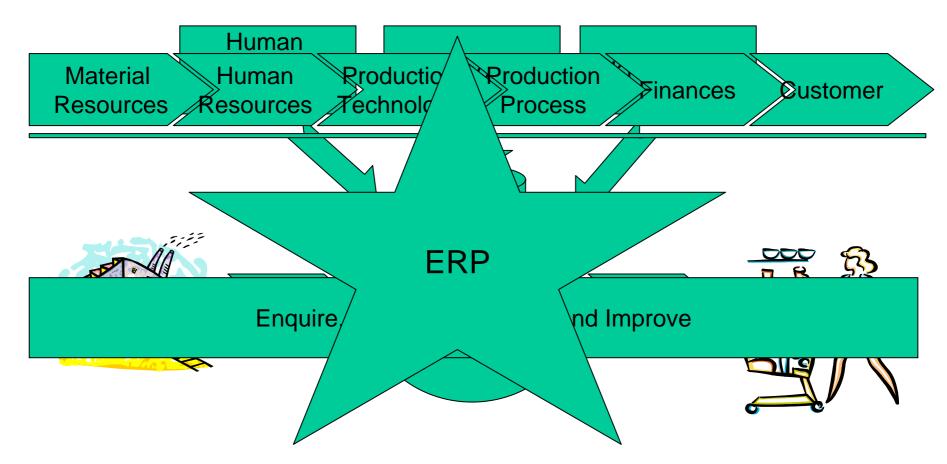
What is ERP Sytem

A system of software tools to manage enterprise data A packaged business software system to

- automate and integrate majority of business processes
- share common data and practices
- produce and access information real time



A Company





Integrated processes

Supply Chain Receiving Inventory Management Customer Order Management Production Planning Shipping Accounting Human Resource Management



History

Types of Systems	Time	Purpose	Systems	
Reorder point systems	1960	to forecast future inventory demand	to manage high- volume production of few products	
Material Requirement Planning Systems (MRP)	1970	demand-based planning manufacture of products	focus on marketing, grater production integration and planning	
MRP-II	1980	MRP + capacity planning	quality and process control	
MRP-II + manufacturing execution planning (MES)	1990	adaptations of production schedules to meet customer needs	focus on the ability to create and adapt new products to customer needs	
ERP	late 1990	integrated business process support throughout the enterprise	integrates supplier, manufacturing, and customer data throughout the supply chain	

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ERP as Integrated System

The goal is to provide quick and effective access to information From standalone systems to integrated system to support business processes Common information model Standardized interfaces



Systems Attributes

Information Systems – integrated Coordination – accross business functions Databases – same meaning across multiple functions Maintanance – uniform, changes affect multiple systems Interfaces – standardized Information – consistent real time information System Architecture – client/server Processes – consistent business processes based upon an information model Applications – single applications to support certain business

functions – single applications to support certain business



Business Attributes

Cycle time (time and cost reduction of business processes) Transactions processing (reduced costs of multiple updates) **Financial Management** Business Processes (conforms best practices) Productivity (improvement in financial management and customer service) Supply Chain Management (linkages with suppliers and customers) eBusiness (web interface to integrated system) Information (cross functional data accessed uniformly for planning and control) Communication (facilitates organizational communications with

customer and supplier)



Business Benefits from ERP

ERP Performance Outcomes	Sweeden Average	U.S. Average
Quickend information response time	3.81	3.51
Increased interaction acrosss the enterprise	3.55	3.49
Improved order management/order cycle	3.37	3.25
Decreased financial close cycle	3.36	3.17
Improved interaction with customers	2.87	2.92
Improved on-time delivery	2.82	2.83
Improved interaction with suppliers	2.78	2.81
Reduced direct operation costs	2.74	2.32
Lowered inventory levels	2.6	2.7

Scale from I - 5

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Some Examples of Benefits

Responses to customer billing inquiries in real time at IBM Storage Product Company (before 15-20min)
Simplification of processes at Boeing, real time access to data across the organization at Diebold
90% reduction on cycle time for quitations at Fujitsu and so on



Motivations to Implement ERP

Replace legacy systems Simplify and standardize systems Gain strategic advantage Improve interactions with supliers, customers Ease of upgrading systems Link to global activities Restructure company organization



Tangible benefits of ERP implementation

Inventory reduction 32% Personnel reduction 27% Productivity improvement 26% Order management improvement 20% Financial close cycle reduction 19% IT cost reduction 14% Cash management improvement 11% Revenue/profit increase 11% Transportation/logistics cost reduction 9% Maintanance reduction 7% On-line delivery improvement 6%





Intangible benefits of ERP implementation

Information/visibility 55% New/improved processes 24% Customer responsiveness 22% Integration 13% Standardization 12% Flexibility 9% Globalization 9% Y2K 8% Business performance 7% Supply/demand chain 5%



Cost-Benefit Analysis

ERP implementation is an investment decision
It must create measurable benefits
To compare costs of software, services and internal costs to tangible and intangible benefits
Recurring and non-recurring costs



ERP costs components

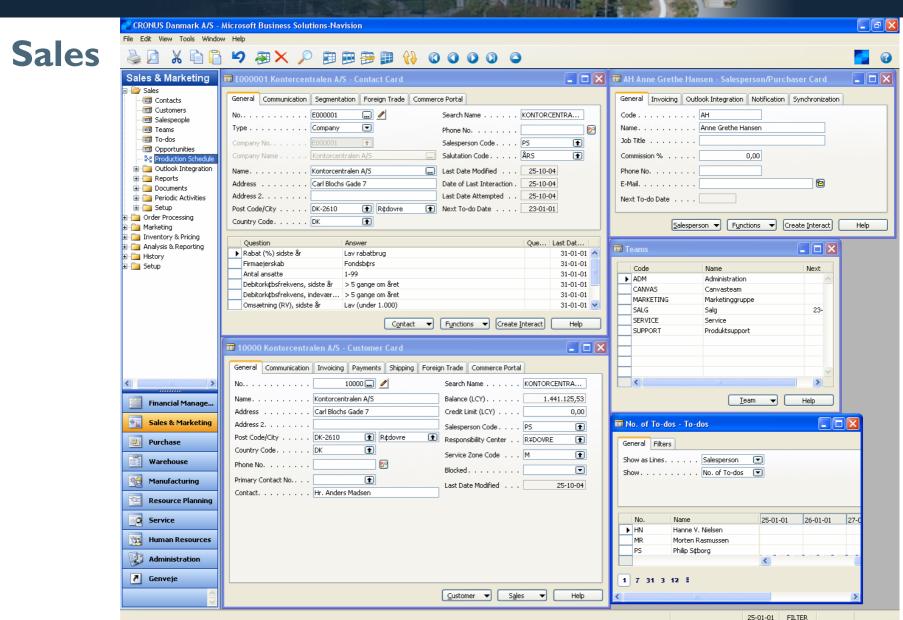
Software 24.2% – 30.2% Hardware 17-8% – 18.5% Consulting 24.1% – 30.1% Training 10.9% – 13.8% Implementation team 12.0% – 13.6%



Overview of the ERP Course

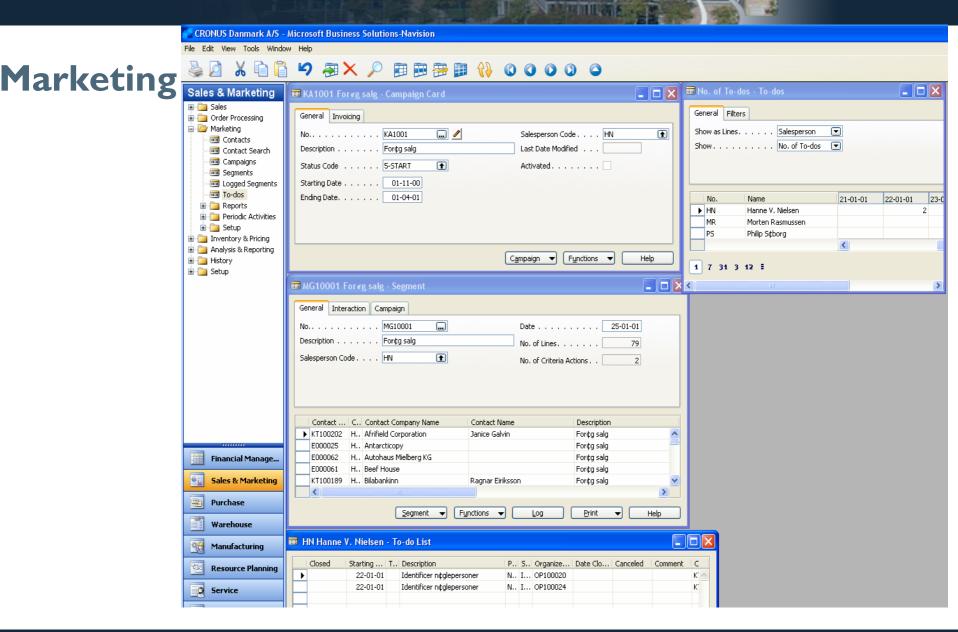


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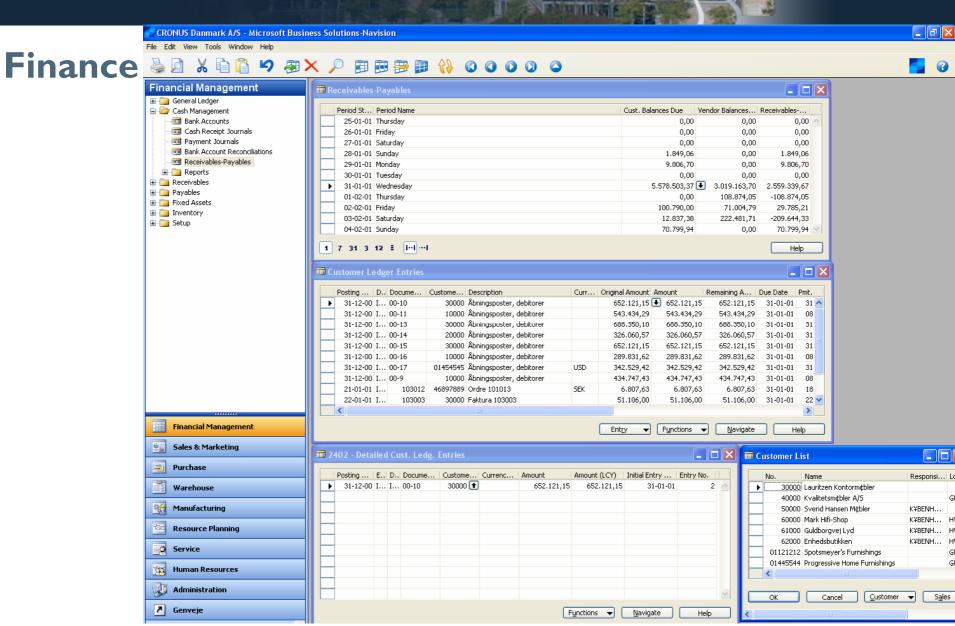


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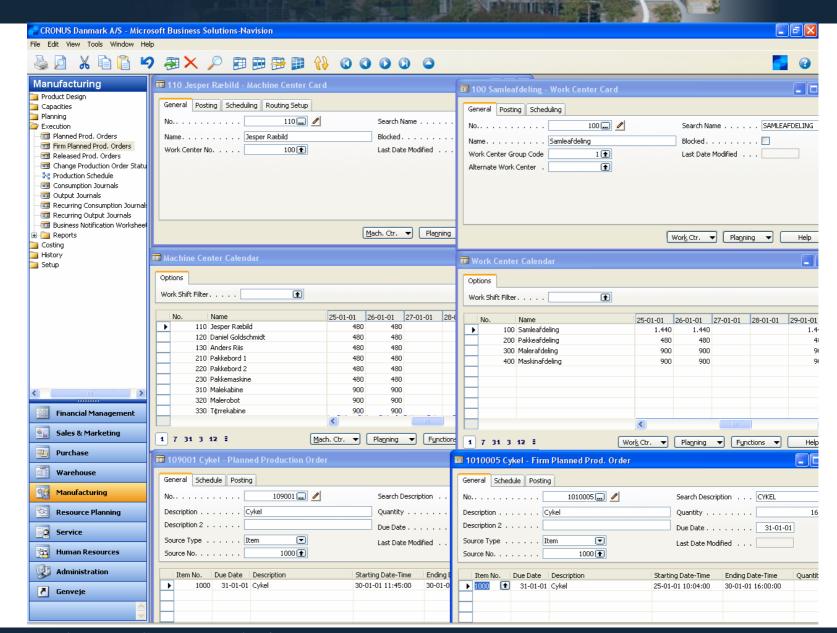


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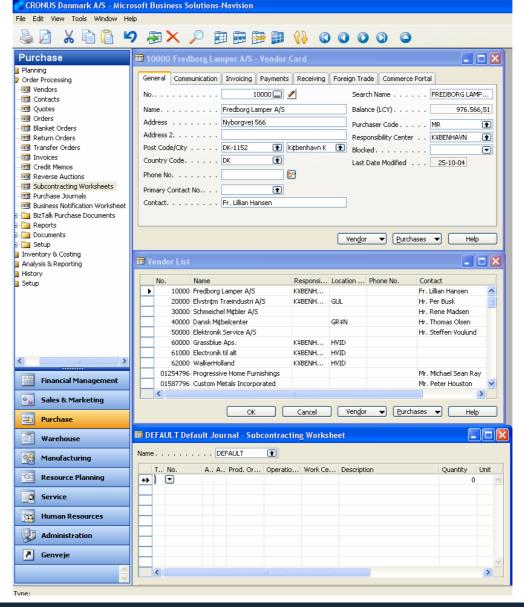
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Supply Chain Management



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Analysis Patterns

Group of concepts representing common construction in business modeling [Martin Fowler: Analysis Patterns]
May be domain related or spanning across several domains
Conceptual models linked to interfaces rather than implementations
Represent a good starting point for any project

Used for communication in project team



Analysis Patterns and ERP

Patterns in account modeling – accounting and financies Patterns in organizational hierarchies – human resources, Observation and measurements in corporate finance Inventories and acounting – accounting and finance Planning – in production planning Trading, contracts – customers and supliers



ERP Systems Development

Combination of packaged deployment and customization Business process change vs. product customization Integration with other software which exists and is used on place Focus on proper analysis of organizational structures and work processes Deploying the whole package or just one module to be

integrated with the existing systems



Re-Engineering

Re-engineering from business point of view and from technical point of view

Understanding and optimizing the primary activities behind the modules (value chain) and how they interact with secondary (supporting) activities



Primary activities

Flow of orders and invoices Process for approving an investment or a purchase Approval of a new production plan Credit authorization procedures and so on



Secondary activities

Ho electronic mail communication is organized Human resources organization/skills Use of technology in the work processes On-line links to suppliers databases



Workflow Management Systems

Systems that manage and execute work activities Workflow automation

- Business or workflow model as activity graph or event flows graphs
- Usually used for workflow automation of administration

processes

- Binding the functionality of workflow management to functions in ERP system (sending a notification, mail, document to another unit, task for another person,...)
- Principles and practices in using workflow management



Management of ERP Projects

Risk resulting from complexity Technology Lack of User Involvement Lack of Management Involvement Methodological issues Communication Management of the risks within the projects



Architectures of ERP Systems

Monolitic/Mobile desktop applications synchronized with a mainfraim Client/Server Three Tier Architecture N-Tier Architecture



Systems Integration

Custom APIs and Integration Loosely coupled RPC Corba Web Services IDL Interaction Models Inter-organizational workflows



Lab I

Choosing an ERP Open Source for your project. Analyze existing available open source software. Guidelines:

- Find success stories on open source ERP software (library/web). What factors contributed to the success stories and how they can influence your selection?
- Look for open source software packages on the web and in the articles. Try to experience them (install them, learn about their technixal requirements and which modules they have, what are licence agreements or requirements,...)

Read also about other commercial vendors: SAP, Navision, ...

Choose one ERP software package you will use in the semester and report on that (remebmer your criteria you used for selection, you will use them to compare to the experience you have gained at the end of the semester)