

LECTURE 3: OVERVIEW OF ENTERPRISE RESOURCE PLANNING

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OUTLINE

- 1 INTRODUCTION OF ERP
- 2 FUNDAMENTAL FACTS OF ERP
- 3 CREATING REQUIREMENT FOR INFORMATION SYSTEM PROJECT
- 4 FRAMEWORK FOR IS/IT PROJECT
- 5 FUNDAMENTAL OF MODELS RELATED TO ERP

WHAT IS ERP?

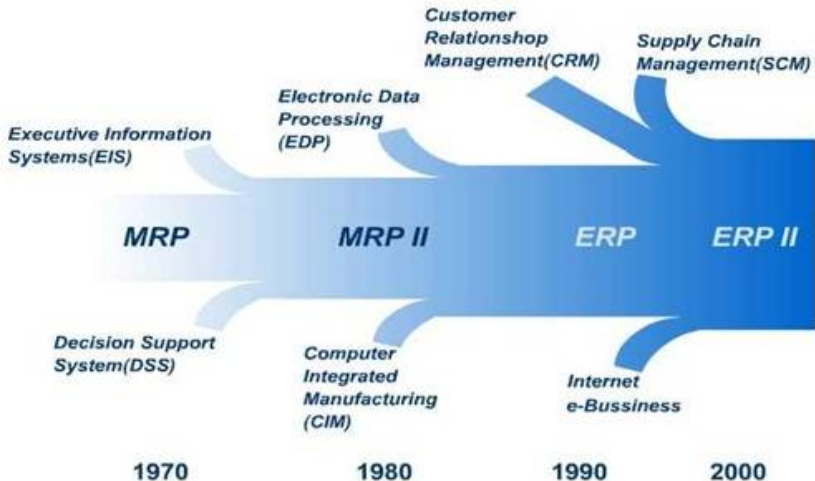
- **Stand for:** Enterprise Resource Planning
- **Key function:** information system for **integration** and **back office** operations
- **Key rationales:** standard business practice, strategic competitive, technology enabler

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

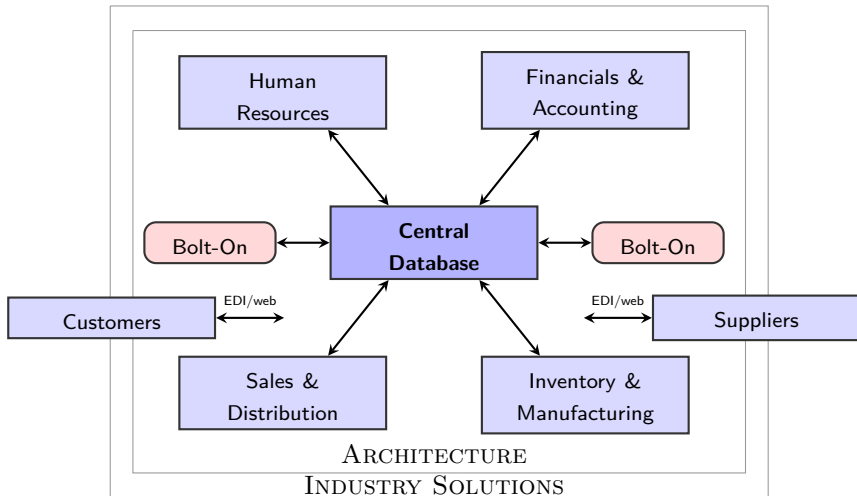
source: Gartner's Research Note SPA-12-0420

EVALUATION OF ERP



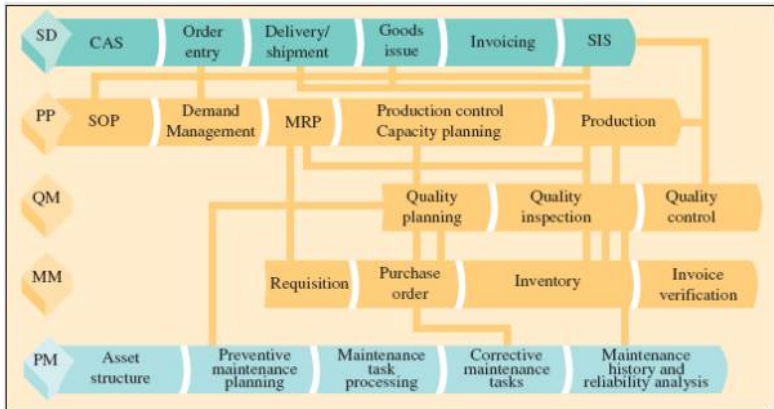
source: www.arhum.com

OVERVIEW OF ERP SYSTEM: MODULE



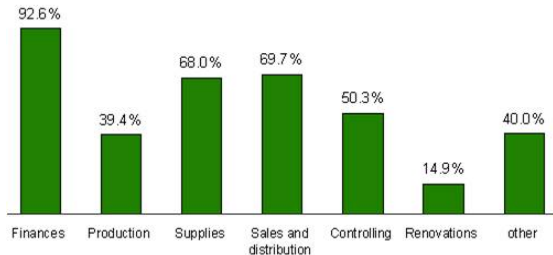
source: Mabert et al. 2001. "ERP: Common Myths Versus Evolving Reality".

KEY ERP MODULES AND OPERATION



source: Jacob. et al 2011.

KEY ERP MODULES



source: www.cceitandtelecom.com

SAP MODULE

FI Financial Accounting

CO Controlling

SD Sales and Distribution

MM Materials Management

PP Production Planning

HR Human Resources

source: <http://www.hareshpradhan.com>

BIG 5 OF ERP VENDORS

	Origin	Key features	Market share	
			1999 [#]	2011 [†]
SAP	Germany	Pioneer and largest firm	32%	28%
Oracle	USA	Flexibility, Newcomer, but quickly gaining share	13%	15%
PeopleSoft	USA	Originally focused on HR	9%	-
BAAN	Holland	Early ERP Vendor	7%	-
J.D. Edwards	USA	Internet emphasis	7%	-
MS Dynamic	USA	SME leader, .NET, good service	-	12%
Infor	USA	Specializing in SCM	-	7%
Epicor	USA	Excellent in service industry	-	5%

source:

Olson, D. 2004

[#] AMR Research[†] ERP Market Share and Vendor Evaluation 2011

market share 24.2 billion USD

ERP COST BREAKDOWN

	Average cost	Range
Consulting	30%	20-60%
Hardware	25%	0-50%
Implementation team	15%	5-20%
Training	15%	10-20%
Software	15%	10-20%

source: Olson, D, 2004

WHY DOES A COMPANY IMPLEMENT ERP?

- **Streamline financial:** speed process (CU-ERP), development of supply chain, eOrdering,
- **Integrate customer order information:** order tracking (USAA–empowerment)
- **Reduce inventory:** consolidated order, visualizing inventory, reducing dead stock,
- **Standardize HR process:** reducing man-hour
- **Standardize manufacturing process:** enforce practice

TYPICAL ERP IMPLEMENTATION OBJECTIVE

- **Integration:** financial, customer order, accounting, purchasing
- **Standardization:** HR information, merge processes, eliminate variation
- **Visualizing inventory:** realtime inventory, Smooth business process flow & WIP,

ERP MYTHS VS REALITIES

Myths	Realities
<ul style="list-style-type: none">• Holy grail of IS• Simplified process• Reducing costs & workers• Integrating all, locally & globally	<ul style="list-style-type: none">• no: \exists improvement/replacement, legacy system• depend: lv. customization, adopting of best practice• depend:, BPR,• depend: scopes & scales of implementation

FAILED ERP PROJECTS

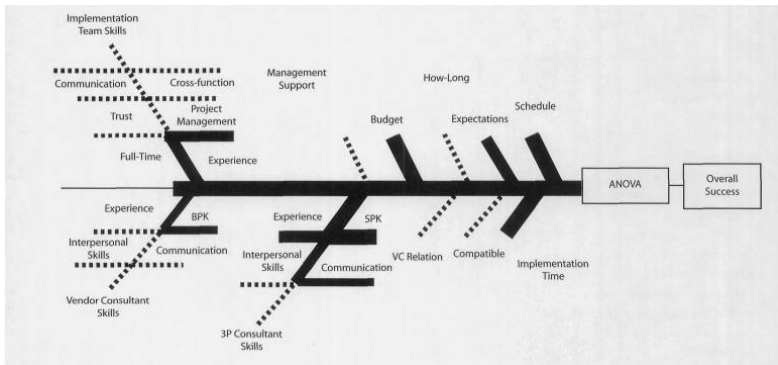
- **HERSHEY:** a classical IT/IS failure
 - **Effects:** delayed shipments → 12% sale decline & 29% inventory cost
 - **Root causes:** high expectation, multiple IT vendors, project scheduling
- **FOXMEYER DRUG:** a classical ERP failure
 - **Effects:** late order, incorrect & lost shipments → \$15 million lose
 - **Root causes:** high expectation, project management scheduling
- **NIKE:** a shoes giant stumbled
 - **Effects:** failed order system → \$80-100 million lose sales
 - **Root causes:** high customization, no testing plan
- **WHIRLPOOL:** ERP stumble (Hershey II)
 - **Effects:** failure in full scale system & delay shipments → ordering mistake
 - **Root causes:** high expectation, communication

ERP RISK FACTORS

- **Organization fit:** insufficient of resources & failures of **redesign process** and **data integration**
- **Skill mix:** insufficiencies of staffs, **re-skilling**, **internal expertise**, **business analysis**, and retain ERP qualified developer
- **Management:** lacks of **champion**, communication, and control
- **Software design:** lacks of requirements & **integration**
- **Involvement & training:** lack of full time commitment, end-user training, change management
- **Technology integration:** attempt to build bridge with legacy system
- **Project management:** lack of measurement system
- **Social commitment:** inability to recognize problem

source: "Risk factors in enterprise-wide/ERP project" *Sumner, M 2000.*

ERP SUCCESS FACTORS



5 MOST IMPORTANT FACTORS

- 1 **Budget reliability:**
- 2 **Company expectation:**
- 3 **Implementation time:**
- 4 **Schedule reliability:**
- 5 **Process knowledge:**

STRATEGIC & TACTICAL SUCCESS FACTORS

Strategic	Tactical
<ul style="list-style-type: none">• Top management support• Change management• Implementation strategy• Consultant selection• Visioning & planning• Project champion	<ul style="list-style-type: none">• BPR & software configuration• Training & job redesign• Project team• Balanced team• Communication plan

source: 'ERP implementation' *Finny, S & Corbett, M. 2007*

TERMINOLOGY

BEST PRACTICE application deemed the best way for a certain process (coined by SAP)

BEST-OF-BREED mixing ERP modules from different vendors

POSITIVE DISASTER **technically** successful, but get **criticism** from key users

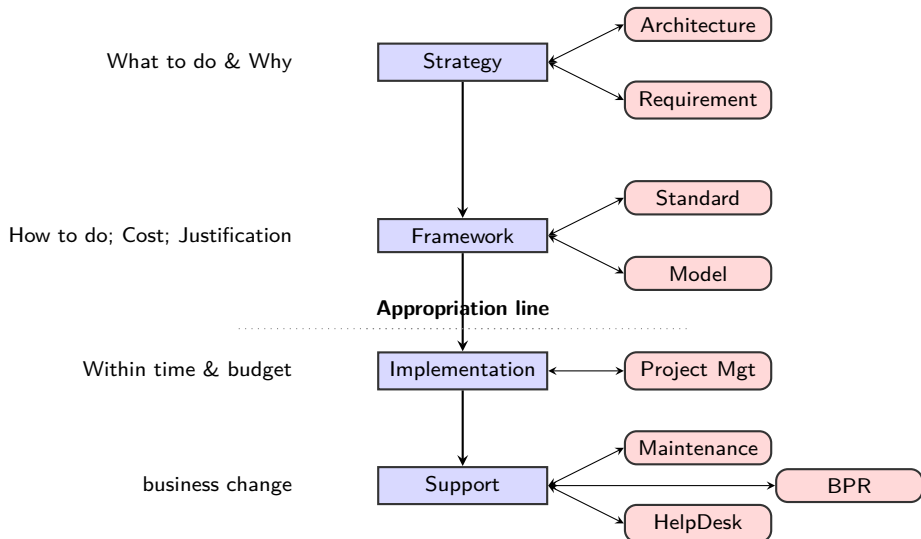
NEGATIVE DISASTER total **failure** (abandonment or major reversal) of project

VANILLA ERP PROJECT a basic version of ERP with no or minimal customization

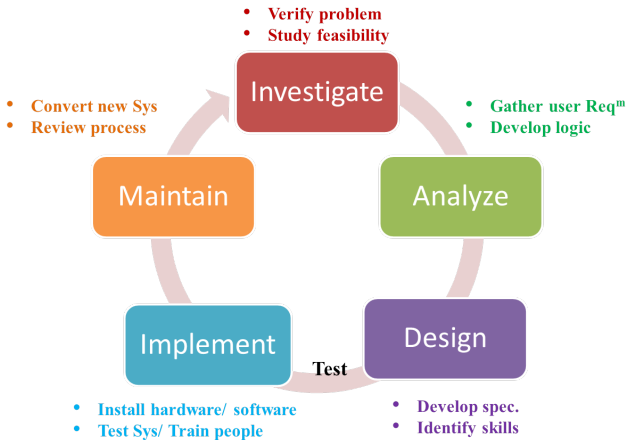
CUSTOMIZATION modified software to meet specific requirements of an organization

FEDERALIZATION tailor ERP differently for each **regional unit** of an organization

IT/IS PROJECT LIFE CYCLE

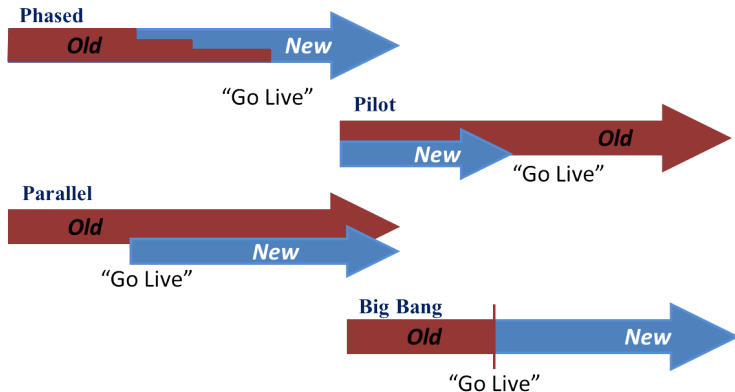


SYSTEM DEVELOPMENT LIFE CYCLE



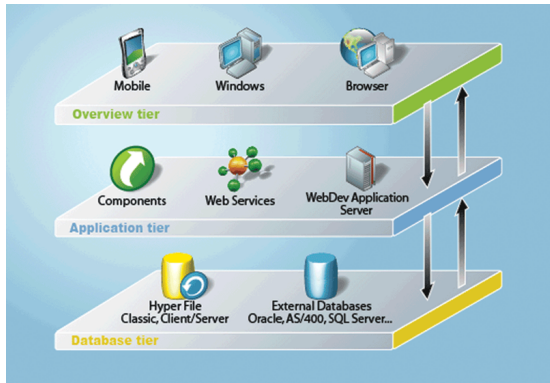
source: Motiwalla, L. and Thompson, J.

IMPLANTATION METHOD



source: Motiwalla, L. and Thompson, J.

THREE-TIER ARCHITECTURES



source: Motiwalla, L. and Thompson, J.

- **Pro:** scalable, flexibility, security,
- **Con:** hardware, complexity

WHAT IS REQUIREMENT?

Specification **physically** and **functionally** that a particular product or service must be or perform (to ensue **satisfaction** and **success** of clients)

- **Business requirements:** **what** value created
- **Product requirements:** **properties** of product/service created (how to accomplish business requirements)
- **Process requirements:** **activities** to deliver such properties

WHY DO WE NEED REQUIREMENTS?

- **Reducing project efforts:** reveal hidden issues & key persons
- **Establishing functional baseline:** agreement between **users** & **project team**
- **Estimating project cost:** 'peer' comparison
- **Documenting thought process for future changes:**
- **Defining test, validation, and verification:** milestones,

source: Ake *et al.* 2004. "Information Technology for Manufacturing."

"One can end-up doing a prefect job of building the wrong product"

source: Wiegers, K. 2004. 'In search of excellent requirements.'

KEY QUESTIONS IN SOFTWARE REQUIREMENT

- Who are **stakeholder** of this software?
- What the software **must do** and **must be** to **add value** for the stakeholder?
- What **limitations** and necessary **documents** throughout development life cycle?
- How software compliment with **surrounding issues**?
- How to **validate requirement** using peer review?

source: Westfall, L. 2005. "Software Requirements Engineering"

GOOD REQUIREMENT SHOULD COVER

- **Strategic:** expansion, practice, response time, & control
- **Analysis tool:** executive report, decisions
- **Functional:** e.g., support Silver-Meal
- **Technological:** e.g., support RF, RFID, # users/group

TECHNIQUES FOR REQUIREMENTS GATHERING

- **Requirements-Driven:** most popular, slowest defining
- **Solution-Driven:** rapid ERP implementations
- **Configuration-Driven:** old system \subseteq new system, good for replacement, existing system limitations

ITERATIVE METHOD:

- 1 **Listen to your customer:** high-level requirements \rightarrow software supporting business
- 2 **Lead your customer:** illustrate software, gathering exceptions, validate business requirements
- 3 **Negotiate with your customer:** defining value-added business requirements, addressing all business exceptions and scenarios

source: [Best approach for gathering ERP requirements.](#)

WHY DO WE NEED FRAMEWORK?

- **'Focus' & scope tasks:**
- **Comply with standard:** existing, communication, flexibility
- **Speed implementation & avoid pitfalls:** selecting 'right' project consulting & software vendor

COMPONENT OF A GOOD FRAMEWORK: understand inside-out of framework

- **Assumption & constraint:**
- **Data & process flow:**
- **Data migrations & achieving:** storing historical data & make use of it
- **User interface:** prioritize users

FRAMEWORKS OF ERP & ERP II

- **Core (foundation):** integrated database → ER diagram
- **Central (process):** business process → documents
- **Corporate (analytical):** decision support → data mining
 - SCM production & distribution of goods
 - CRM customer service & patterns
 - SRM supplier evaluation & patterns
 - CPM KPI matrices, gap analysis
- **Collaborative (portal):** to customers, to business, to employees,

source: Moller. 2005. "ERP II: a conceptual framework for next-generation enterprise system?."

STANDARD: DOES IT MATTER?

- Standard \neq permanently established practices
- Standard is **transient** (constantly change)

LIVE WITHIN TRANSIENT OF STANDARDS

- **Stay tuned to the market:**
- **Understand technology infrastructure:** benefits & necessity
- **Establish 'meaningful' company standards:** few exceptions, not too rigid, key process,
- **Avoid last legs technology:**

source: Ake et al. 2004. "Information Technology for Manufacturing."

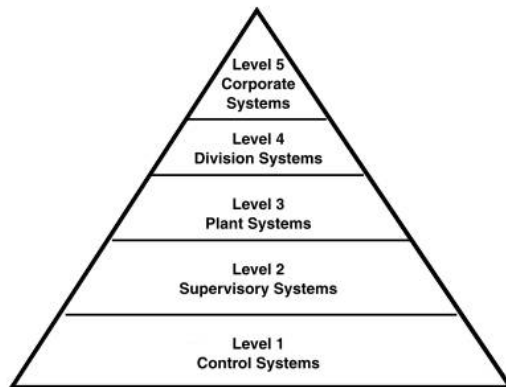
WHY DO WE NEED MODEL?

- **Simplification:** understand, remove factor, communication
- **Convey messages:** show trade-off, reason & connection
- **Prediction:** capture **ideal world**

MODEL AWARENESS

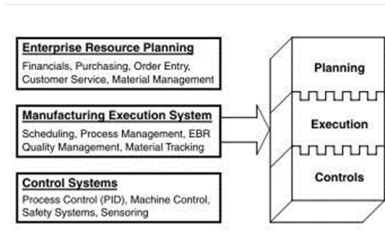
- Model is starting point and evaluation tool, not **absolute**
- Model \neq Real environment
- Model \nrightarrow Success
- Model must fit in 'right' context
- Model serves as communication and organization tool, check list, & ideal

CIM PYRAMID MODEL

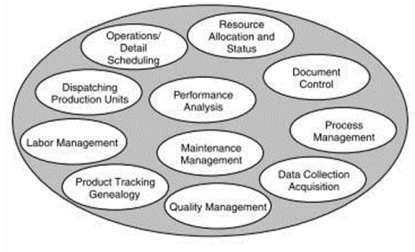


source: Ake *et al.* 2004. "Information Technology for Manufacturing."

AMR 3 & MESA



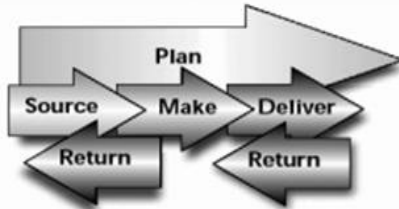
AMR Model



MESA

source: Ake *et al.* 2004. "Information Technology for Manufacturing."

SCOR MODEL: OVERVIEW



source: Ake et al. 2004. "Information Technology for Manufacturing."

- **What:** hierarchy business process model
- **Scopes:** all customer's interaction, product transactions, market interactions
- **Benefit:** ∃ best practice, matrices for benchmark, communication
- **Issues:** no details operation, ignored sale and markets, R&D
- **Trivial:** developed by PRTM and endorsed by the Supply-Chain Council

SCOR MODEL: LEVEL 1 SCOPE

- **Plan:** balance aggregate demand and supply to all requirements
 - balance **resources** with requirements
 - manage business rules, data, performance, capital, transportation
 - communicate plans for the whole supply chain
- **Source** procure components of goods
 - **schedule** deliveries, receive, verify, transfer
 - select & assess suppliers
- **Make:** transform product to a finished goods to meet demands
 - schedule production
- **Deliver:** provide finished goods to meet demand
 - perform order management i.e., quote, warehouse, route, ship, verify
- **Return:** returning or receiving returned products
 - manage return business & rules
 - perform return, substitution, refund, restock

source: <http://supply-chain.org/scor>