INTRODUCTION TO ERP

PREPARED BY: LUIS MEING

OBJECTIVES:

01 Definition

02 Components

03 ERP Systems Vendor

04 ERP Modules

ERP

- Enterprise resource planning (ERP) systems are the specific kind of enterprise systems to integrate data across and be comprehensive in supporting all the major functions of the organization

ERP

- ERP is the use of shared computer systems across the business

2.1 Components

2.1 Components

Client-Server Architecture

- architecture of a computer network in which many clients (remote processors) request and receive service from a centralized server (host computer)

Client-Server Architecture

- it explains how computers talk to each other when they need something from the other

Client-Server Architecture

Client-Server Architecture

Client-Server Architecture

Hardware

- the physical parts of a computer

Hardware: A Computer

- a machine that can store and process information

Software

- instructions that tell a computer what to do

Peopleware

- the 'human' component of a computer system

Microsoft

- Dynamics 365

Oracle/Peoplesoft

- Fusion Cloud ERP

SAP

- SAP ERP

TABLE 1 ERP Modules from Three Vendors

Function	SAP Modules	Oracle/PeopleSoft Enterprise Modules	Microsoft Dynamics Modules
Sales	Sales and distribution, sales opportunity	Marketing and sales, supply chain management	Retail POS, field service management
Procurement	Purchasing, supplier relationship management	Procurement and supplier relationship management	Supply chain management
Production	MRP, product life cycle management	Manufacturing	Manufacturing
Accounting	Financial accounting	Financial management	Financial management
Distribution	Warehouse management	Supply chain management	Distribution management
Customer services	CRM	CRM	CRM
Corporate performance and governance	Governance, risk, and compliance management	Corporate performance management	Analytics
Human resources	Human capital management,	Human capital management	HR management
Miscellaneous	Banking	Campus solutions	e-Commerce, portals

Source: Adapted from Web sites of SAP Global, Oracle Applications, and Microsoft Dynamics. www.sapfans.com/sapfans/sapfmod.htm; www.oracle.com/applications/home.html; www.microsoft.com/en/us/default.aspx (accessed January 15, 2007).

SAP

- Is the industry leader in ERP systems
- has over 40 years of enterprise resource planning experience across industries and business sizes

SAP

- SAP: Systemanalyse Programmentwicklung
- founded in 1972
- Is modernly known today as SAP SE

Specialization vs Generalization

(in software engineering)

Proprietary vs Open Source

(in software engineering)

SAP ERP

- SAP ERP is an enterprise resource planning software developed by the German company SAP SE

SAP S/4HANA Cloud

- a future-ready enterprise resource planning (ERP) system with built-in intelligent technologies, including AI, machine learning, and advanced analytics

SAP S/4HANA Cloud

- this version of SAP uses Cloud Technology and Data Analytics coupled with Low Code Environment

Production Module

- helps in planning and optimizing the manufacturing capacity, parts, components, and material resources using historical production data and sales forecasting

Purchasing Module

- streamlines the procurement process of required raw materials and other supplies

Inventory Management Module

- facilitates the processes of maintaining the appropriate level of stock in a warehouse

Sales and Marketing Module

- implements functions of order placement, order scheduling, shipping, and invoicing

Finance Module

- is the core of many ERP software systems
- gather financial data from various functional departments and generate valuable financial reports

(e.g., budgets, balance sheet, general ledger, trail balance, and quarterly financial statements)

Human Resource Module

- streamlines the management of human resources and human capital

Miscellaneous Modules

- business intelligence
- self-service
- project management
- e-commerce

ERP IN MANAGEMENT

PREPARED BY: LUIS MEING

OBJECTIVES:

01 **Architecture**

02 **ERP Implementation**

02 **Benefits and Limitations of ERP**

Architecture

- must be conceived after the selection of ERP software
- usually, the architecture is conceived before buying or developing software in other IT implementations

1.2 Types of ERP Architecture

Logical

Logical

- Lowest tier: Database Schema of Entities and Relationships
- Second Tier: core business processes and business logic

Logical

- Third Tier: provides details on the applications that support the various business functions built in to the ERP system

1.2 Types of ERP Architecture

Physical

Business Process Management

- is the understanding, visibility, and control of business processes

Business Process Management

ERP Lifecycle

Introduction to Enterprise Systems for Management

Chocolate

- An implementation with considerable modifications to the ERP software package
- increase the chances of success with the users

Chocolate

- modifications increase the investment in the system and introduce higher implementation risk

Vanilla

- are minimally modified (or as-is)

Benefits and Limitations of ERP

- require investment in terms of cost, time, and people

Benefits of ERP

- Integration of data and applications across functional areas of the organization

Benefits of ERP

- This positively affects security, consistency of inputs, ease of maintenance, and efficiency

Limitations of ERP

- Complexity of installing, configuring, and maintaining the system increases, thereby requiring specialized IT staff, hardware, network, and software resources

Limitations of ERP

- corporate white-collar crimes such as questionable accounting and marketing practices, privacy violations, unauthorized data sharing, spam mail, viruses, snooping, phishing, and identity theft

Functional Silos

- are basically compartmentalized operating units isolated from their environment

Horizontal Silos

Organization						
Planning	Organizing	Staffing	Directing	Coordinating	Reporting	Budgeting

Vertical Silos

ERP IN GAME THEORY

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OBJECTIVES:

01 **Definition**

02 **Analytics**

03 **Functional Areas and Business Processes**

Game Theory

- is the study of the ways in which interacting choices of agents produce outcomes with respect to the preferences of those agents, where the outcomes in question might have been intended by none of the agents

Game Theory

- is the study of the consequences of your actions

- introduced von Neumann & Morgenstern (1944)

Game

- All situations in which at least one agent can only act to maximize their utility through anticipating the responses to his actions by one or more other agents

Game

- where a player tries to predict the effects of their actions against or with another player

Player

- Agents involved in games

The Prisonner's Dilemma

- Suppose that the police have arrested two people whom they know have committed an armed robbery together. Unfortunately, they lack enough admissible evidence to get a jury to convict.

The Prisonner's Dilemma

- They do, however, have enough evidence to send each prisoner away for two years for theft of the getaway car.

- The chief inspector now makes the following offer to each prisoner:

The Prisonner's Dilemma

- If you will confess to the robbery, implicating your partner, and they do not also confess, then you'll go free and they'll get ten years. If you both confess, you'll each get 5 years. If neither of you confess, then you'll each get two years for the auto theft.

The Prisonner's Dilemma

The Prisoner's Dilemma		Player 2	
		Confess	Keep Quiet
Player 1	Confess	2, 2 years	0, 10 years
	Keep Quiet	10, 0 years	5, 5 years

DOTA Medusa Exploit

Garry Kasparov vs. Deep Blue

Analytics

- is a field of computer science that uses math, statistics, and machine learning to find meaningful patterns in data

2.2 Types Analytics

Descriptive Analytics

- What happened

- Presents its findings using reports, pivot tables, and visualizations like :
  - histograms,
  - line graphs,
  - pie charts,
  - and box and whisker plots

Descriptive Analytics

	A	B	C	D
1	Respondent Number	Age	Gender	Favorite Car Color
2	1	22	M	White
3	2	37	F	Silver
4	3	45	F	Black
5	4	62	F	Gray
6	5	28	M	Red
7	6	45	M	Green
8	7	88	F	Brown
9	8	61	M	White
10	9	95	M	Black
11	10	27	M	White
12	11	39	F	Green
13	12	43	M	Brown
14	13	55	F	Black
15	14	59	F	White

RAW DATA

Descriptive Statistics

Diagnostic Analytics

- Why it did happen
- Focus on root cause and effect (root cause analysis)
- It aims to identify and explain anomalies and outliers

Diagnostic Analytics

September 17th Google algorithm change: link

Predictive Analytics

- What might happen in the future
- Uses deep learning, machine learning algorithm to find patterns

Predictive Analytics

Prescriptive Analytics

- What should we do next?
- “the future of data analytics”

Prescriptive Analytics

Business Analytics

- is analytics applied to business data

Short-Term Data Collection

- barely allows researchers to develop a deep understanding of participants' characteristics, experiences, and beliefs

Long-Term Data Collection

- dropout rate is high

2.1 Analytics

	LONG-TERM	SHORT-TERM
DURATION	lasts several months up to a few years	1 week to 3 months
NO. OF RESPONDENTS	hundreds to thousands of participants	less than 50
OBJECTIVES	multiple research objectives	one main objective to accomplish
FREQUENCY	longer contribution intervals as scheduled by the researcher	frequent contribution in short timeframe
PROS	exploring a wider range of interconnected topics in greater detail	easy to manage, collect, and verify data bona fides from a smaller sample
CONS	dropout rate is high due to burnout	barely allows researchers to develop a deep understanding of participants
BUDGET	Expensive due to length of study and amount of respondents	Lower-cost, based on completion of study or number of contributions

Marketing and Sales

Inputs:

- Customer data
- Order data
- Sales trend data
- Per-unit cost
- Company travel expense policy

Marketing and Sales

Outputs:

- Sales strategies
- Product pricing
- Employment needs

Marketing and Sales

Supply Chain Management

Inputs:

- Product sales data
- Production plans
- Inventory levels
- Layoff and recall company policy

Supply Chain Management

Outputs:

- Raw material orders
- Packaging orders
- Resource expenditure data
- Production and inventory reports
- Hiring information

Supply Chain Management

Accounting and Finance

Inputs:

- Payments from customers
- Accounts receivable data
- Accounts payable data
- Sales data
- Production and inventory data
- Payroll and expense data

Accounting and Finance

Outputs:

- Payments to suppliers
- Financial reports
- Customer credit data

Accounting and Finance

Human Resources

Inputs:

- Personnel forecasts
- Skills data

Human Resources

Outputs:

- Regulation compliance
- Employee training and certification
- Skills database
- Employee evaluation and compensation

Human Resources

ERP CASE STUDY

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OBJECTIVES:

01 **Reflection**

02 **Marketing and Sales POV**

1.1 Reflection

Lemonade Tycoon 2

Lemonade Tycoon 2

- Published in 2004 by MumboJumbo, LLC
- Chosen as the UI and the game mechanics are complicated but easy enough to understand

Lemonade Tycoon 2

- Although the real world has more variables, the game is predictable
- ERP systems and analytics exist here

2.1 Marketing and Sales

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2.2 Marketing and Sales: To and From the Customer

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2.1 Marketing and Sales

2.3 Marketing and Sales: To and From SCM

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2.1 Marketing and Sales

2.4 Marketing and Sales: To and From Accounting and Finance

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2.1 Marketing and Sales

2.5 Marketing and Sales: To and From Human Resources

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MARKETING AND SALES

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OBJECTIVES:

01 **Definition**

02 **Sales in ERP**

03 **SAP Modules Involved**

Sale

- the exchange of a commodity for money
- the action of selling something

Marketing

- the activity or business of promoting and selling products or services
- includes market research and advertising

2.1 Sales in ERP

Presales Activities

- customers can get pricing information about the company's products
- an inquiry or a sales quotation

Presales Activities

- include marketing activities such as tracking customer contacts—including sales calls, visits, and mailings
- enhances targeted marketing efforts

Sales Order Processing

- series of activities that must take place to record a sales order
- can start from a quotation or inquiry

Sales Order Processing

- Any information that was collected from the customer to support the quotation (contact name, address, phone number) is immediately included

Sales Order Processing

- include recording the items to be purchased, determining the selling price, and recording the order quantities

Sales Order Processing

- can use product-specific pricing, such as establishing quantity discounts for a particular item

Sales Order Processing

- SAP ERP system checks the accounts receivable tables in the SAP ERP database to confirm the customer’s available credit

Inventory Sourcing

- SAP ERP system checks the company's inventory records and the production planning records to see whether the requested material is available and can be delivered on the date the customer desires

Inventory Sourcing

- This available-to-promise (ATP) check includes the expected shipping time, taking into account weekends and holidays

Inventory Sourcing

- availability is automatically checked, and the system can recommend an increase in planned production if a shortfall is expected

Inventory Sourcing

- also keeps a record of all open orders, so even if product for a particular order is still in the warehouse, the system will not allow it to be sold to another customer

Delivery

- creating a delivery means releasing the documents that the warehouse uses to pick, pack, and ship orders

Delivery

- consider a policy of either FOB Destination or Shipping Point
- process allows deliveries to be created so the warehouse and shipping activities are carried out efficiently

Delivery

- Once the system has created the documents for picking, packing, and shipping, the documents are transferred to the Materials Management module, where the warehouse activities of picking, packing, and shipping are carried out

Billing

- creates an invoice by copying the sales order data into the invoice document

- Accounting can print this document and mail it, fax it, or transmit it electronically to the customer

Billing

- Accounting records are also updated at this point

Payment

- timely recording of this transaction has an effect on the timeliness and accuracy of any credit checks for the customer

Payment

- If the payment is made electronically, it can be automatically processed by the SAP ERP system, which records the payment as an electronic sales order document

Payment

- If the customer sends a check, a clerk must manually enter the payment information, at which point the system updates all information related to the sale

Sales and Distribution (SD)

- to record prices, sales, and the delivery

Customer relationship management (CRM)

- to record customer information

Controlling (CO)

- tracks the costs associated with producing products

Human capital management (HCM)

- also termed as "SuccessFactors"
- is responsible for Human Resource Management

Production planning (PP)

- Forecast inventory and production

Investment management (IM)

- To maintain stock and update stock level

Supply chain management (SCM)

- to take note of delivery status

Customer service (CS)

- to take care of any concerns after delivery

Enterprise performance management (EPM)

- to produce figures on status of company