

Concepts in Enterprise Resource Planning

Fourth Edition

Chapter Eight

*RFID, Business Intelligence (BI), Mobile
Computing, and the Cloud*

Objectives

After completing this chapter, you will be able to:

- Define RFID and its role in logistics and sales
- Define business intelligence (BI), and provide examples of its uses
- Explain how in-memory computing will change the use of BI
- Discuss the importance of mobile applications to businesses
- Describe cloud computing and why it is becoming important for ERP providers

Objectives (cont'd.)

- Explain how the service-oriented architecture (SOA) concept has changed ERP development
- Describe Web services, and outline the unique components of NetWeaver
- Define software as a service (SaaS), and identify the advantages and disadvantages of using this software delivery model

Introduction

- An Enterprise Resource Planning (ERP) system allows a company to accomplish tasks that cannot be done well, if at all, without such a system
- Traditionally:
 - ERP systems have been software applications that are run on a company's own computer systems
 - Focus of ERP has been on managing business transactions

Introduction (cont'd.)

- Technologies, such as radio frequency identification (RFID), are increasing the amount of data that is contained in ERP systems
- Business intelligence technologies are turning data in ERP systems into valuable information
- Cloud computing and mobile technologies are changing where ERP data is stored and how it is delivered

Radio Frequency Identification (RFID) Technology

- **Radio frequency identification** technology
 - Known commonly as RFID
 - Becoming an increasingly efficient tool for tracking items through a supply chain
- RFID device
 - Can be attached to products
 - A small package (or tag) made up of a microprocessor and an antenna

Radio Frequency Identification (RFID) Technology (cont'd.)

- RFID reader
 - Can determine location of an item with an RFID tag
 - Emits radio waves and receives signals back from the tag
 - Sometimes called an interrogator
- Advantages of RFID technology:
 - Does not need a line-of-sight connection
 - Can withstand most environmental stresses

Radio Frequency Identification (RFID) Technology (cont'd.)

- Walmart is on the leading edge of the move to integrate RFID technology into the supply chain
- Pharmaceutical firms are evaluating the use of RFID technology
- RFID technology is being employed to track medical devices
 - Spectrum Health's Meijer Heart Center is using RFID technology to track stents

Business Intelligence/Business Analytics

- **Business intelligence (BI)**
 - Also referred to as *business analytics*
 - A range of different applications and technologies used to extract and analyze large amounts of data to aid in decision making
 - Includes data-mining tools and querying tools
 - Often interactive and visual
- There has been significant growth in the BI market in recent years

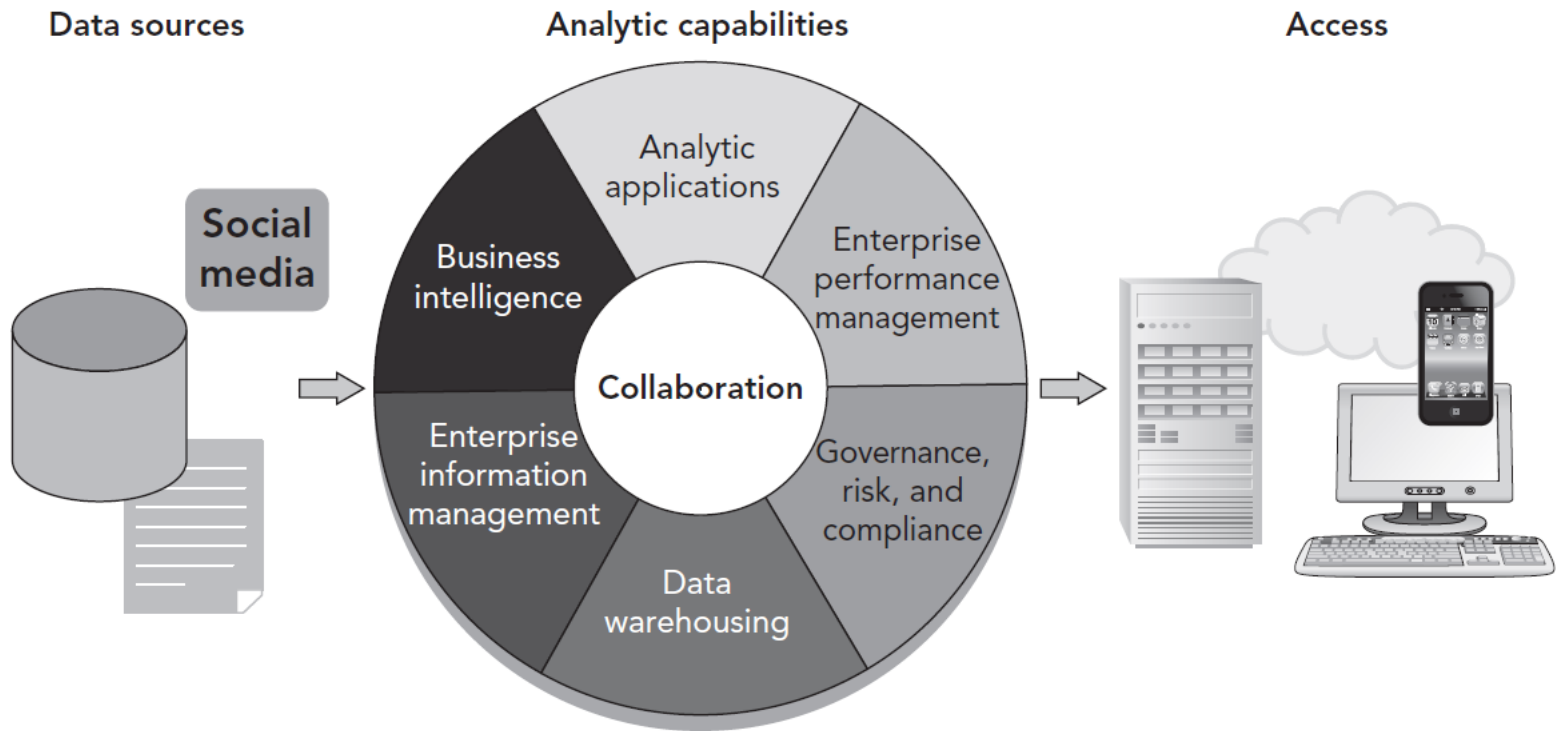


Figure 8-1 SAP Business Intelligence (BI) framework

Business Intelligence/Business Analytics (cont'd.)

- Analytic applications and business intelligence
 - Similar sets of data analysis tools
- Analytic applications
 - Data analysis tools applied to specific industries
- Enterprise performance management
 - Concept of developing strategic goals for the organization
 - Gathering data to evaluate how the organization is performing in relation to those goals

Business Intelligence/Business Analytics (cont'd.)

- Governance, risk, and compliance category
 - A group of activities focused on ensuring an organization is functioning ethically and legally
- Data warehousing
 - Technology used to store the large volumes of data used in the analysis
- **Enterprise information management**
 - Describes the business and technology functions that manage information as a corporate asset

In-Memory Computing

- Data in a data warehouse are structured as **multidimensional data cubes**
 - Allow for relationships in the data to be analyzed quickly
- Two main challenges with using a multidimensional cube structure
 - A significant level of technical expertise is needed to construct a cube
 - A multidimensional cube necessarily restricts how the data can be analyzed

In-Memory Computing (cont'd.)

- Accessing data from memory much faster than accessing data from a hard disk
- Reason why data warehouses use disk memory: storage capacity
 - Hard disks can store one thousand times more data than memory for a comparable cost
- Data compression provided by column storage
 - Makes it possible to store large volumes of data in memory without aggregation
 - Multidimensional cubes are not required

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Figure 8-2 Material master data table

In-Memory Computing (cont'd.)

- Both SAP's and Oracle's in-memory solutions are designed to analyze “big data”
- Big data
 - Enormous amount of data that is now available for BI use from all the available sources, including:
 - ERP systems, Web sites, corporate databases, scientific research, Twitter, and other social networking applications
- BI analytics was the top technology priority for CIOs in 2012

Mobile Computing

- Increasing use of smartphones, tablet computers, and other mobile computing devices
- Mobile applications need to be developed for different kinds of smartphones, with different operating systems
- Companies need to make many decisions about the use of mobile devices by employees
- Mobile devices provide users with information and can also be sources of information

From Internet-Enabled to Cloud Computing

- Cloud computing
 - Delivery of a software product to a user via the Internet
 - The user typically accesses the cloud product through a Web browser or a lightweight (meaning small and simple) application for a computer or mobile device
- Cloud computing is not a completely new concept
 - It represents the latest stage of the development of computing and the Internet

SAP and the Internet

- 1996: SAP introduced its joint Internet strategy with Microsoft
- Internet Transaction Server (ITS)
 - A server-based software system that enabled efficient communication between an SAP ERP system and the Internet
 - Core of SAP's first effort to integrate the Internet with its products

SAP and the Internet (cont'd.)

- May 1999: SAP announced mySAP.com
 - A new strategy designed to completely realign the company and its product portfolio
 - Goal: combine e-commerce solutions with SAP's existing ERP applications, using cutting-edge Web technology
- 2000: SAP began building on the mySAP.com vision
 - Added the capability for electronic marketplaces and corporate portals

NetWeaver

- 2004: SAP introduced its first version of SAP NetWeaver
 - A collection of components that support business transactions over the Internet
 - Provide seamless connectivity of diverse applications
- SAP's enterprise service-oriented architecture (enterprise SOA)
 - Goal of making all of its business applications service based

NetWeaver (cont'd.)

- Web services
 - Combination of software tools that enables an organization's various systems and applications to communicate with other applications
- SAP's NetWeaver
 - A Web services platform that allows various vendor applications to share data over the Internet

NetWeaver (cont'd.)

- One benefit of adopting SOA
 - Ability to quickly add new applications, making the organization more responsive
 - Use of open standards
- Implementing SOA is not easy
- Return on an SOA investment is often difficult to determine

NetWeaver Tools and Capabilities

- SAP's NetWeaver platform is a collection of modules, including:
 - Enterprise Portal
 - Mobile Infrastructure
 - Business Intelligence
 - Master Data Management
 - Exchange Infrastructure

NetWeaver Tools and Capabilities (cont'd.)

- SAP Enterprise Portal gives users complete access to all their work on a single screen
 - All information is available through the Web services provided by NetWeaver
- NetWeaver's Mobile Infrastructure module allows users to access and work with data through mobile devices such as smartphones and pagers

NetWeaver Tools and Capabilities (cont'd.)

- Business Intelligence (BI) works with any database management software and any operating system that is running NetWeaver
- Master Data Management provides data consistency within a company's SAP system
- NetWeaver's Exchange Infrastructure module allows different applications to share data

NetWeaver at Work for Fitter

- Examining how NetWeaver can help Fitter
- Fitter has an SAP ERP system
- Fitter's two top salespeople, Amy Sanchez and Donald Brown, are busy selling NRG bars directly to customers and to distributors

SaaS: Software As A Service

- A software delivery model
- A software product is hosted by a company—such as SAP—on its servers and is accessed by customers via a Web browser
- Sometimes described as a utility
- A subset of cloud computing

SAP Business ByDesign

- An example of SaaS for the ERP market
- First released in 2007
- A full ERP system delivered to customers via the cloud
- For small to medium-sized companies:
 - Lowers the total cost of ownership of the software
 - Enables a rapid and smooth implementation

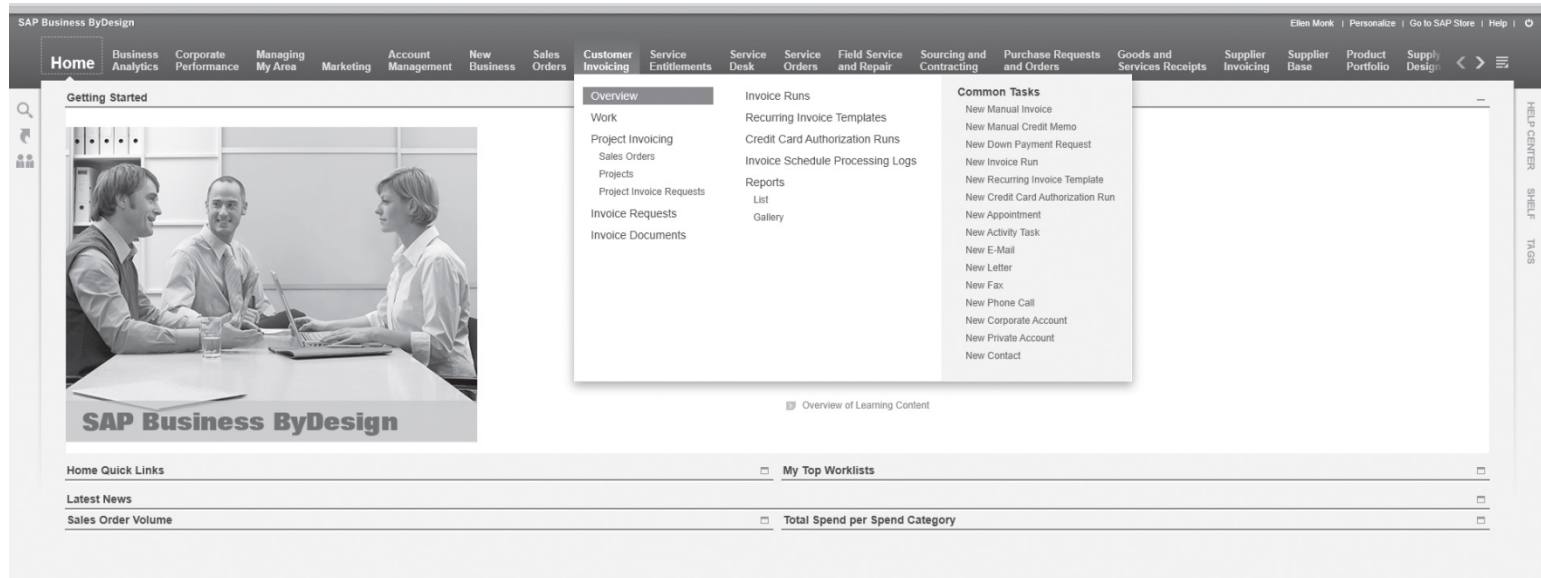


Figure 8-4 SAP Business ByDesign main screen

SAP Business ByDesign (cont'd.)

- PlaNet Finance
 - A small organization that offers microloans to customers in 30 international offices
 - Finds Business ByDesign is a good fit for its needs

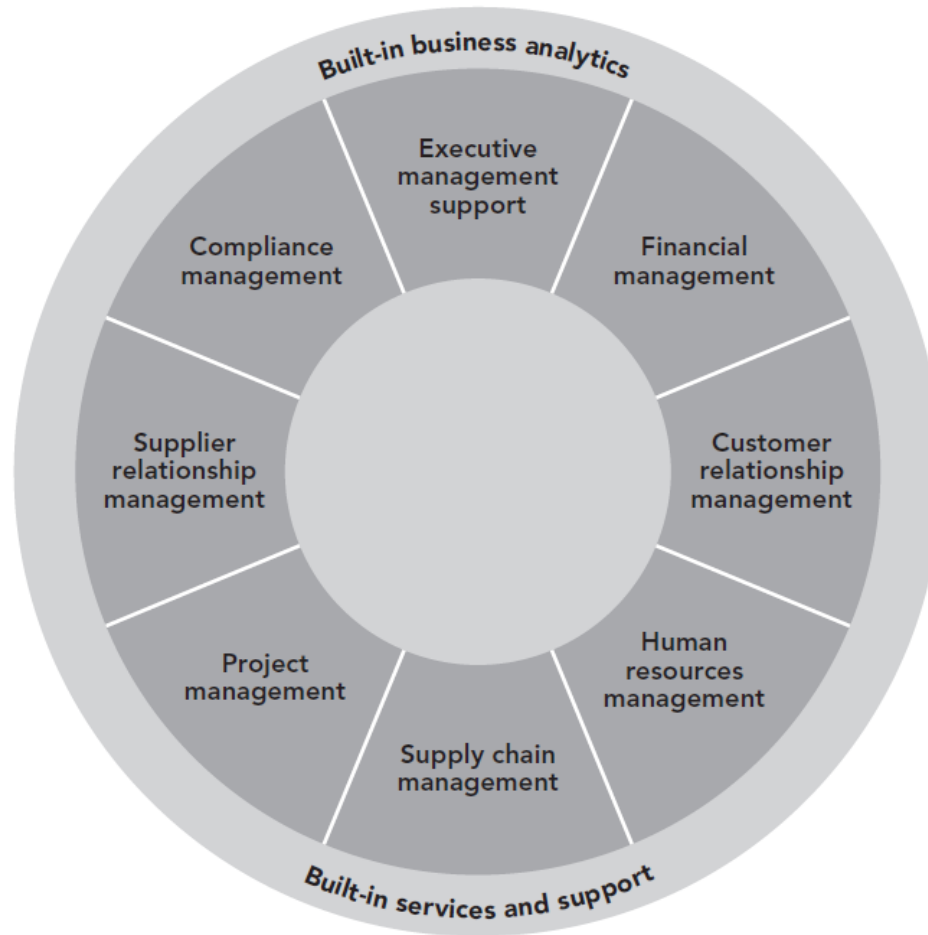


FIGURE 8-5 SAP Business ByDesign's key capabilities

Advantages of Using SaaS

- Initial affordability
 - Lower cost to implement software provided through SaaS
- Shorter implementation time
 - Implementation time usually shorter as the user does not have to worry about technical issues
- Lower support costs and complexity
 - Do not need to hire additional IT personnel to implement new systems and applications

Disadvantages of Using SaaS

- Security
- Bandwidth/response time
- Flexibility
- No frills
- Technical, not business focus
- Exercise 8.2
 - Fitter has made the decision to acquire an ERP system

Advantages of purchasing software and computers for ERP	Advantages of using SaaS to run ERP

FIGURE 8-7 Arguments for purchasing ERP system and software versus using SaaS

Option 1: Buying Computers and Software Rights for an ERP System

- Estimated costs to set up its own ERP system:
 - Database server
 - Application server
 - PCs
 - Computer maintenance
 - Licensing rights
 - Installation
 - User training
 - Ongoing consulting
 - Network and database administrator

Option 2: Using an SaaS Provider to Deliver ERP Software

- Estimated costs for using an SaaS provider to deliver ERP software:
 - PCs
 - Computer maintenance
 - Software through the SaaS provider
 - User training

Calculate the NPV and Make a Recommendation

- You will set up a spreadsheet to total all the costs of each option
- In each scenario, you must deal with the net present value (NPV) of money
- NPV
 - A way to figure out whether an investment is profitable
 - In this case, to compare outlay of funds from one method to another
 - Addresses the time value of money

Calculate the NPV and Make a Recommendation (cont'd.)

- When calculating two different investment options, NPV calculation allows:
 - Different future expenses or earnings to be calculated as an equivalent amount in the present time
- NPV can be calculated over a number of years
 - In example: we need a five-year outlay of funds for the ERP project

Calculate the NPV and Make a Recommendation (cont'd.)

- In an Excel spreadsheet, the syntax of NPV calculation:
=NPV (hurdle rate percentage, range of values)
 - Values in range can be positive or negative numbers
 - Hurdle rate
 - Rate of discount over the period
 - Minimum acceptable rate of return on a project that a company will accept

ERP Purchasing Options							
Option 1 - Buying computers and software outright							
<u>Items</u>			<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Database server			70000				
Application server			40000				
10 PCs			15000				
Software			500000				
Consultants - initial (6 months)			486000				
Training (2 weeks)			23000				
Consultants - maintenance (1 day per month)				36000	36000	36000	36000
PC maintenance				12000	12000	12000	12000
Network administrator			200000	200000	200000	200000	200000
<u>Total</u>			1334000	248000	248000	248000	248000
<u>NPV</u>			\$1,646,671.81				
Option 2 - Using SaaS							
PCs			15000				
PC maintenance				7200	7200	7200	7200
ASP cost			400000	400000	400000	400000	400000
<u>Total</u>			415000	407200	407200	407200	407200
<u>NPV</u>			\$1,224,277.26				
Hurdle rate			20%				

Figure 8-8 Cost comparisons: buying versus SaaS

Calculate the NPV and Make a Recommendation (cont'd.)

- Perform the following steps:
 - Calculate the cost of the two methods of implementing an ERP system for five years
 - Consider using different hurdle rates for each option
 - Why might varying hurdle rates be applicable for this decision?
 - Write a memo, with your spreadsheet attached, to the CIO
 - Answer this question: Which method should Fitter choose, and why?

Summary

- Technologies such as radio frequency identification (RFID) and smartphones are fueling explosive growth in the amount of data available for businesses to process
- Business intelligence (BI) tools are growing in sophistication and power
 - Technologies such as in-memory computing will provide greater speed and flexibility to BI users
- Mobile computing technology is increasing the use of ERP and BI data

Summary (cont'd.)

- Cloud computing is the delivery of a software product to a user via the Internet
- Web services and service-oriented architecture offer a combination of software tools that enables various programs within an organization to communicate with other applications
- SAP's Web services platform is NetWeaver
 - A collection of components that support business transactions over the Internet by providing seamless connectivity of diverse applications through the Internet

Summary (cont'd.)

- Software as a service (SaaS) is a software delivery model in which a software product is hosted by a company—such as SAP—on its servers and is accessed by customers via a Web browser
 - SaaS model allows companies to use ERP without a large initial investment
 - SaaS solutions allow for more rapid improvements in the software through user communities
 - There are some risks associated with using an SaaS provider