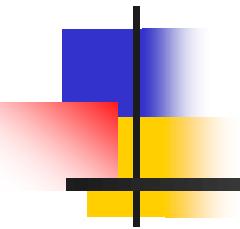
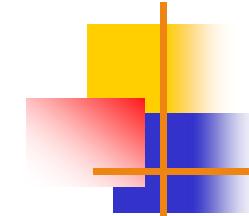


Decision Support and Business Intelligence Systems (9th Ed., Prentice Hall)

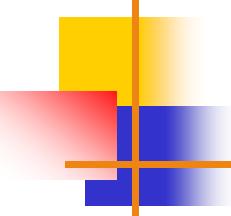


**DECISION SUPPORT SYSTEM [D10K-5B01]:
Management Support Systems:
Emerging Trends and Impacts**



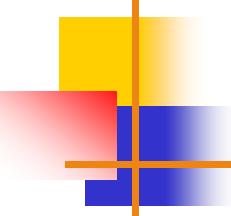
Learning Objectives

- Explore some of the emerging technologies that may impact MSS
- Know how RFID data analysis can help improve supply-chain management and other operations
- Describe how massive data acquisition techniques can enable reality mining
- Describe how virtual-world technologies can be used for decision support
- Describe how virtual-world applications can result in additional data for BI applications
- Describe the potential of cloud computing in business intelligence



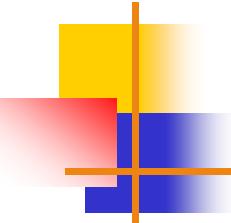
Learning Objectives

- Understand social networking concepts, selected applications, and their relationship to BI
- Describe organizational impacts of MSS
- Learn the potential impacts of MSS on individuals
- Describe societal impacts of MSS



RFID and BI

- Wal-Mart's RFID mandate in June 2003
- DoD, Target, Albertson's, Best Buy,....
- **RFID** is a generic technology that refers to the use of radio frequency waves to identify objects
- **RFID** is a new member of the automatic identification technologies family, which also include the ubiquitous **barcodes** and **magnetic strips**

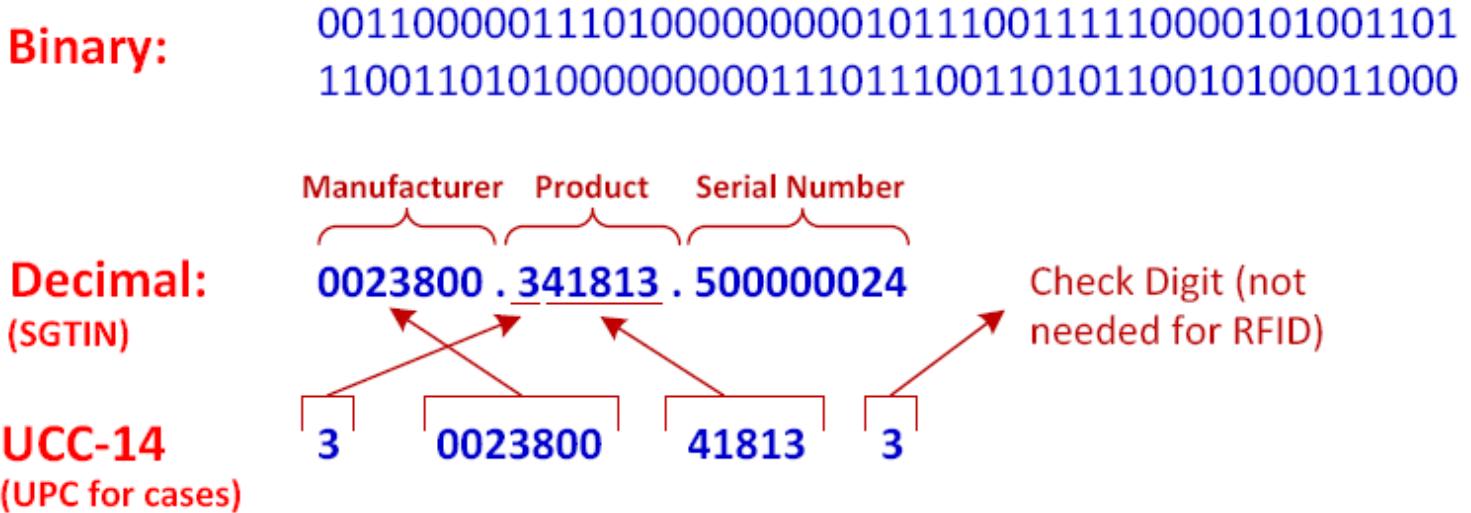


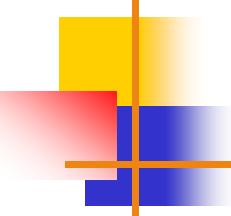
How does RFID work?

- RFID system –
 - a tag (an electronic chip attached to the product to be identified)
 - an interrogator (i.e., reader) with one or more antennae attached
 - a computer (to manage the reader and store the data captured by the reader)
- Tags –
 - Active tag versus Passive tags

Data Representation for RFID

- RFID tags contain 96 bits of data in the form of serialized global trade identification numbers (SGTIN) [see epcglobalinc.org]



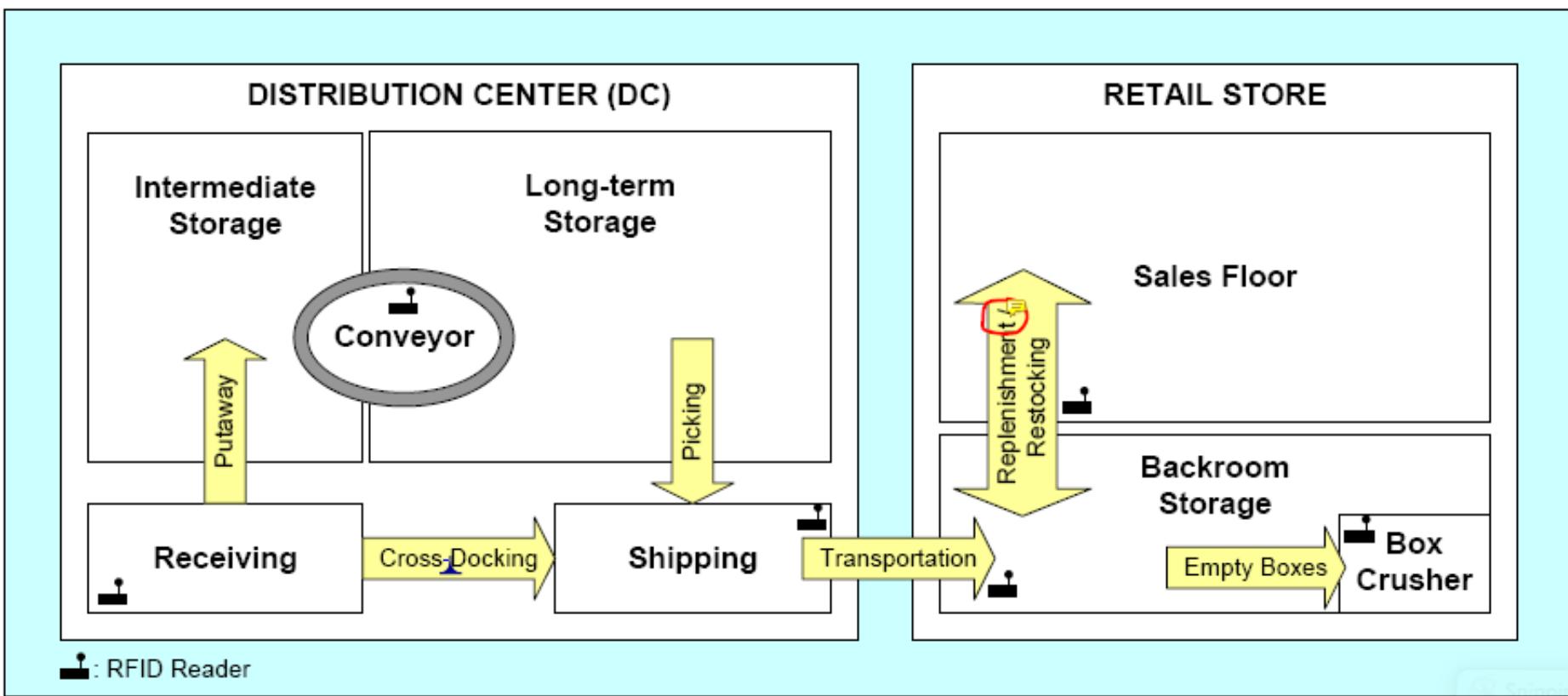


RFID for Supply Chain BI

- RFID in Retail Systems
 - Functions in a distribution center
 - receiving, put-away, picking, and shipping
 - Sequence of operations at a receiving dock
 1. unloading the contents of the trailer
 2. verification of the receipt of goods against expected delivery (purchase order)
 3. documentation of the discrepancy
 4. application of labels to the pallets, cases, items
 5. sorting of goods for put-away or cross-dock

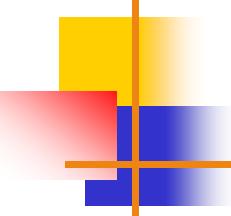
RFID for Supply Chain BI

■ RFID in Retail Systems



RFID Data Sample

Location	EPC	Date/Time	Reader
DC 123	0023800.341813.500000024	08-04-05 23:15	Inbound
DC 123	0023800.341813.500000024	08-09-05 7:54	Conveyor
DC 123	0023800.341813.500000024	08-09-05 8:23	Outbound
ST 987	0023800.341813.500000024	08-09-05 20:31	Inbound
ST 987	0023800.341813.500000024	08-09-05 20:54	Sales floor
ST 987	0023800.341813.500000024	08-10-05 1:10	Sales floor
ST 987	0023800.341813.500000024	08-10-05 1:12	Backroom
ST 987	0023800.341813.500000024	08-11-05 15:01	Sales floor
ST 987	0023800.341813.500000024	08-11-05 15:47	Sales floor
ST 987	0023800.341813.500000024	08-11-05 15:49	Box crusher



RFID for BI in Supply Chain

- Better SC visibility with RFID systems
 - Timing/duration of movements between different locations – especially important for products with limited shelf life
 - Better management of out-of-stock items (optimal restocking of store shelves)
 - Help streamline the backroom operations: eliminate unnecessary case cycles, reorders
 - Better analysis of movement timings for more effective and efficient logistics

RFID + Sensors for Better BI

- Knowing the location and health of goods (i.e., exception) during transportation

Location	EPC	Date / Time	Reader
DC 123	0023800.341813.500000024	9/25/06 16:09	Inbound
...

RFID-based Location Information



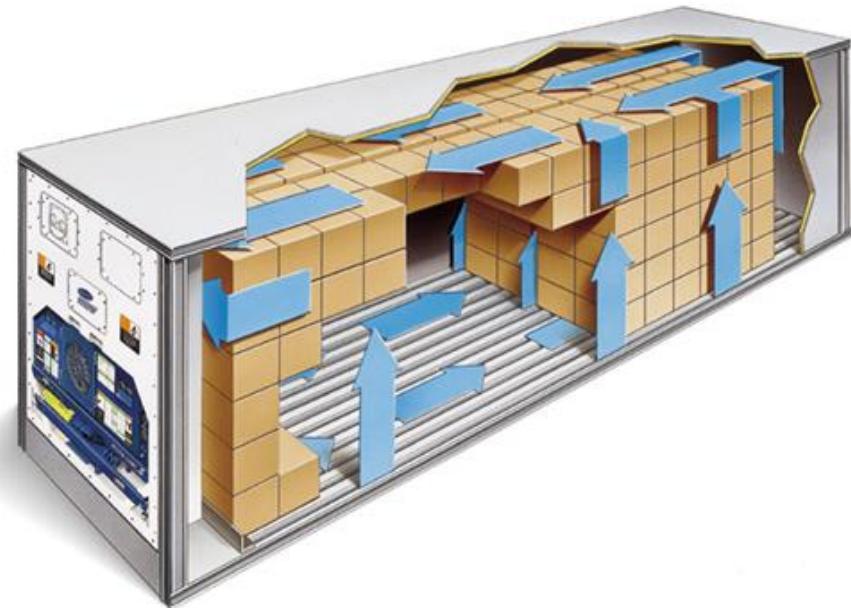
Date / Time	Temp
9/25/06 16:09	41.0
9/25/06 16:24	41.0
9/25/06 16:39	41.0
9/25/06 16:54	39.2
9/25/06 17:09	39.2
9/25/06 17:24	39.2
9/25/06 17:39	39.2
9/25/06 17:54	39.2
9/25/06 18:09	39.2
9/25/06 18:24	37.4
9/25/06 18:39	37.4
9/25/06 18:54	37.4
9/25/06 19:09	35.6
9/25/06 19:24	35.6
9/25/06 19:39	35.6
...	...

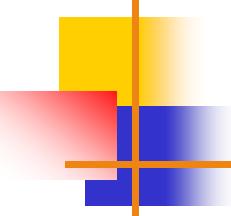
Sensor-based Temperature Information



Exception Reporting

Exception	Date / Time
Exceeded temperature limit	9/25/06 16:09
Exceeded temperature limit	9/25/06 16:24
Exceeded temperature limit	9/25/06 16:39
...	...





Reality Mining

- Identifying aggregate patterns of human activity trends (see sensenetworks.com by MIT and Columbia University)
- Many devices send location information
 - Cars, buses, taxis, mobile phones, cameras, and personal navigation devices
 - Using technologies such as GPS, WiFi, and cell tower triangulation
- Enables tracking of assets, finding nearby services, locating friends/family members, ...

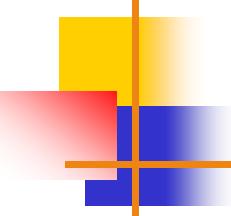
Reality Mining

- Citisense: finding people with similar interests

A map of an area of San Francisco with density designation at place of interests

See
www.sensenetworks.com/citysense.php for real-time animation of the content



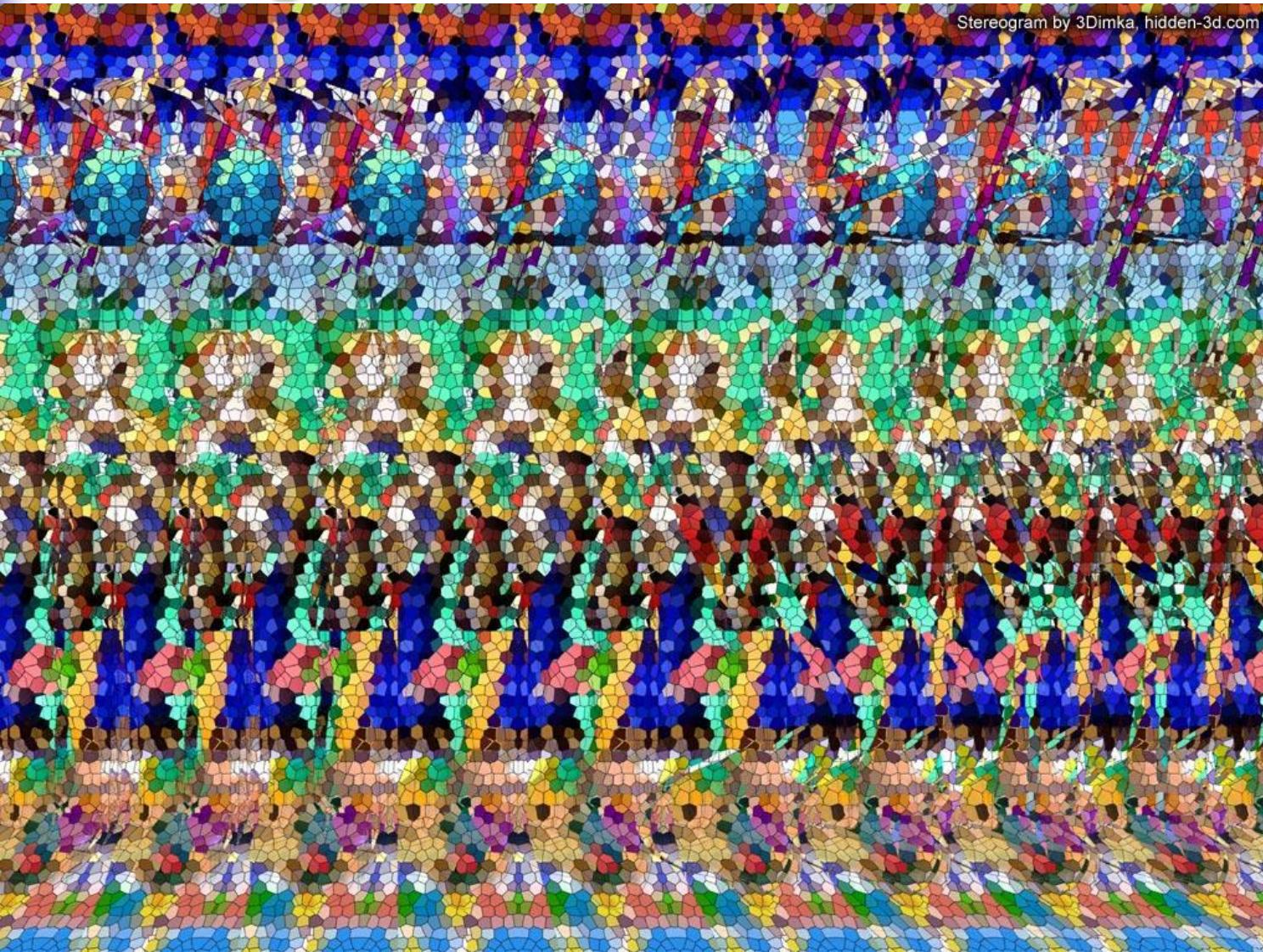


Virtual Worlds

- Virtual worlds have existed for a long time in various forms - stereoscopes, Cinerama, simulators, computer games, ...
- They are artificial worlds created by computer systems in which the user has the impression of being immersed
- Examples:
 - Second Life (secondlife.com)
 - Google Lively (lively.com)
 - EverQuest (everquest.com)

Avatars ?

Stereograms



Stereogram by 3Dimka, hidden-3d.com

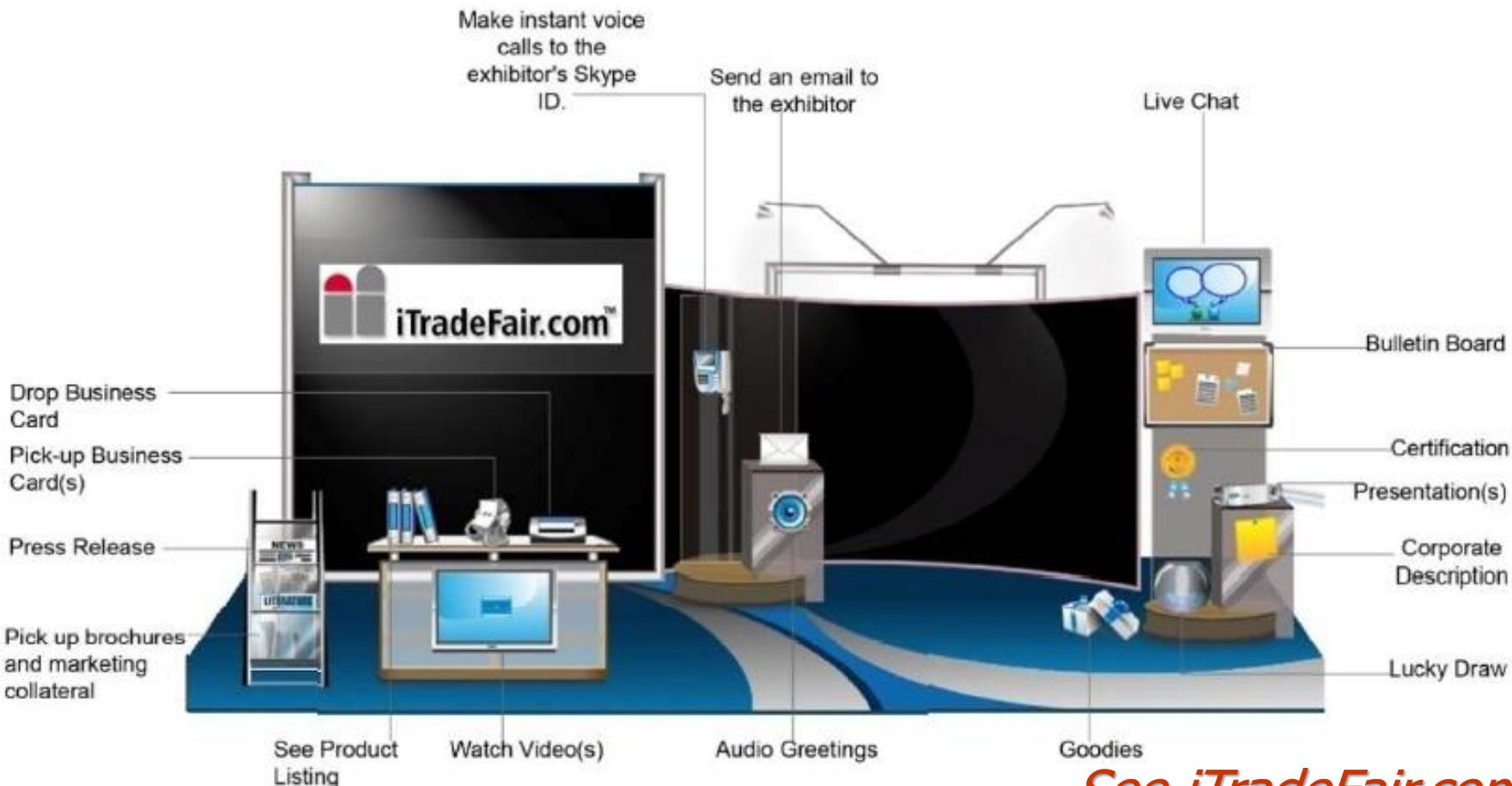
Stereograms

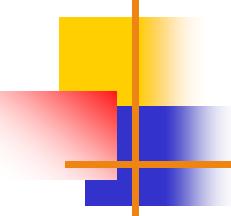


FDR Memorial, Great Depression, Food Line, Washington D.C.
Photograph and 3D-Stereogram by 3Dimka. Rendered with Stereogram Lab v 0.1

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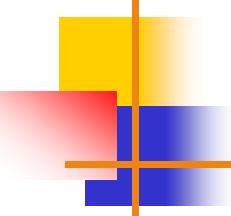
Virtual Tradeshows





Virtual (Internet) Communities

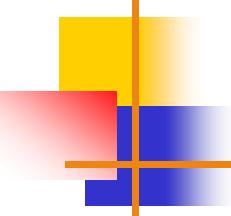
- A group of people with common interests who interact with one another over a computer network, mainly the Internet
- Similar to typical physical communities, such as neighborhoods, clubs, or associations, but people do not meet face-to-face
- It is a social network organized around a common interest, idea, task, or goal
- Members interact across time, geographic location, and organizational boundaries



Virtual (Internet) Communities

Elements of Interaction

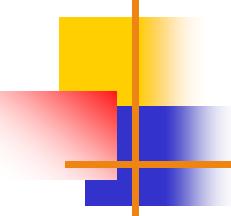
Category	Element
Communication	Bulletin boards (discussion groups) Chat rooms/threaded discussions (string Q&A) E-mail and instant messaging and wireless messages Private mailboxes; Newsletters, "netzines" Blogging, wikis, and <u>mushups</u> Web postings; Voting
Information	Directories and yellow pages Search engine Member-generated content Links to information sources Expert advice
EC element	Electronic catalogs and shopping carts Advertisements Auctions of all types Classified ads Bartering online



Virtual (Internet) Communities

Types of Virtual Communities

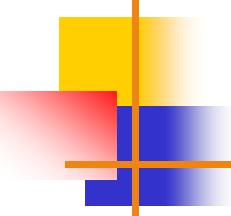
- Transaction and other business activities
 - Buying/selling – ausfish.com.au
- Purpose or interest
 - Exchange of information – fool.com, mp3.com
- Relations or practices
 - ivillage.com, seniornet.com, isworld.com
- Fantasy (e.g., espn.com)
- Social networks (e.g., myspace.com)
- Virtual worlds (e.g., Secondlife.com)



Virtual (Internet) Communities

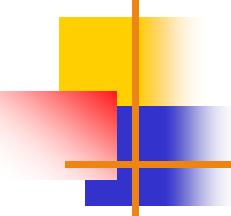
Types of Virtual Communities

- Public Versus Private Communities
 - Membership being open or close others
 - Public: MySpace and Facebook
 - Private: IBM's Virtual Universe Community
- Internal and External Private Communities
 - Internal: limited to employees, retirees, suppliers, and customers (e.g., Pfizer, FedEx, IBM, ...)
 - External: also include business partners (e.g., Sony PlayStation 3 videogame network)
- There are other classifications based on the classification of members



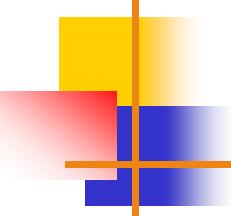
Online Social Networking – Basics and Examples

- A **social network** is a place where people create their own space, or homepage, on which they write blogs; post pictures, videos, or music; share ideas; and link to other Web locations they find interesting
 - The mass adoption of social networking Web sites points to an evolution in human social interaction
- The size of social network sites are growing rapidly, with some having over 100 million members – growth for successful ones 40 to 50 % in the first few years and 15 to 25 % thereafter



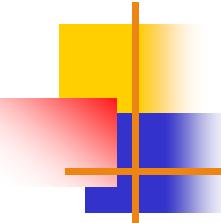
Online Social Networking – Social Network Analysis Software

- It is used to identify, represent, analyze, visualize, or simulate networks with
 - Nodes – agents, organizations, or knowledge
 - Edges – relationships identified from various types of input data (relational and non-relational)
- Various input and output file formats exist
- SNA software tools include
 - Business-oriented social network tools such as InFlow and NetMiner
 - Social Networks Visualizer, or SocNetV, which is a Linux-based open source package



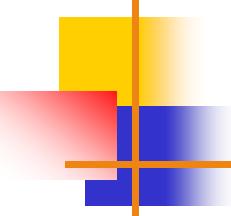
Mobile Social Networking

- Social networking where members converse and connect with one another using cell phones or other mobile devices
- MySpace and Facebook offer mobile services
- Mobile only services: Brightkite, and Fon11
- Basic types of mobile social networks
 1. Partnership with mobile carriers (use of MySpace over AT&T network)
 2. Without a partnership ("off deck") (e.g., MocoSpace and Mobikade)
- Mobile Enterprise Networks
- Mobile Community Activities (e.g., Sonopia)



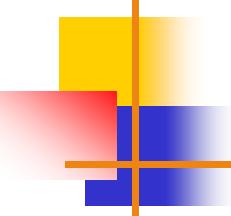
Major Social Network Services

- **Facebook: The Network Effect**
 - Launched in 2004 by Mark Zuckerberg (former Harvard student)
 - It is the 2nd largest social network service in the world with more than 200 million active users worldwide (as of April 2009)
 - Initially intended for college and high school students to connect to other students at the same school
 - In 2006 opened its doors to anyone over 13; enabling Facebook to compete directly with MySpace



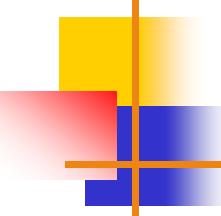
Implications of Business and Enterprise Social Networks

- Business oriented social networks can go beyond “advertising and sales”
- Emerging enterprise social networking apps:
 - Finding and Recruiting Workers
 - See Application Case 14.2 for a representative example
 - Management Activities and Support
 - Training
 - Knowledge Management and Expert Location
 - e.g., innocentive.com; awareness.com; Caterpillar
 - Enhancing Collaboration
 - Using Blogs and Wikis Within the Enterprise ...>



Implications of Business and Enterprise Social Networks

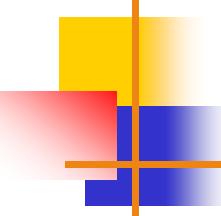
- Survey shows that best-in-class companies use blogs and wikis for the following applications:
 - Project collaboration and communication (63%)
 - Process and procedure document (63%)
 - FAQs (61%)
 - E-learning and training (46%)
 - Forums for new ideas (41%)
 - Corporate-specific dynamic glossary and terminology (38%)
 - Collaboration with customers (24%)



Cloud Computing and BI

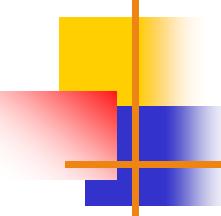
■ Cloud Computing

- A style of computing in which dynamically scalable and often virtualized resources are provided over the Internet
- Users need not have knowledge of, experience in, or control over the technology infrastructures in the cloud that supports them
- Related terms: utility computing, application service provider grid computing, on-demand computing, software as a service (SaaS)
- Cloud = Internet (as it is represented in diagrams)



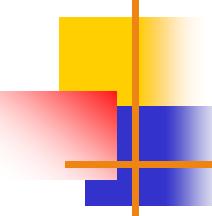
Cloud Computing and BI

- Fragments of cloud computing
 - Infrastructure as a service (IaaS)
 - Platforms as a service (PaaS)
 - Software as a service (SaaS)
 - Data as a service (DaaS)
- Example: Web-based e-mail and Google Docs
- Cloud-computing service providers
 - Salesforce.com, IBM, Sun Microsystems, Microsoft (Azure), Google, and Yahoo!
- Different service compensation models exist



Cloud Computing and BI

- Cloud computing, like many other IT trends, has resulted in new offerings in business intelligence
 - Cloud-based data warehousing (by 1010data, LogiXML, Lucid Era)
 - Cloud-based dashboard and data management tools (by Elastra, Rightscale)
- **Advantage:** rapid diffusion, cutting-edge technology, less investment,...
- **Concerns:** loss of control and privacy, legal liabilities, cross-border political issues, ...

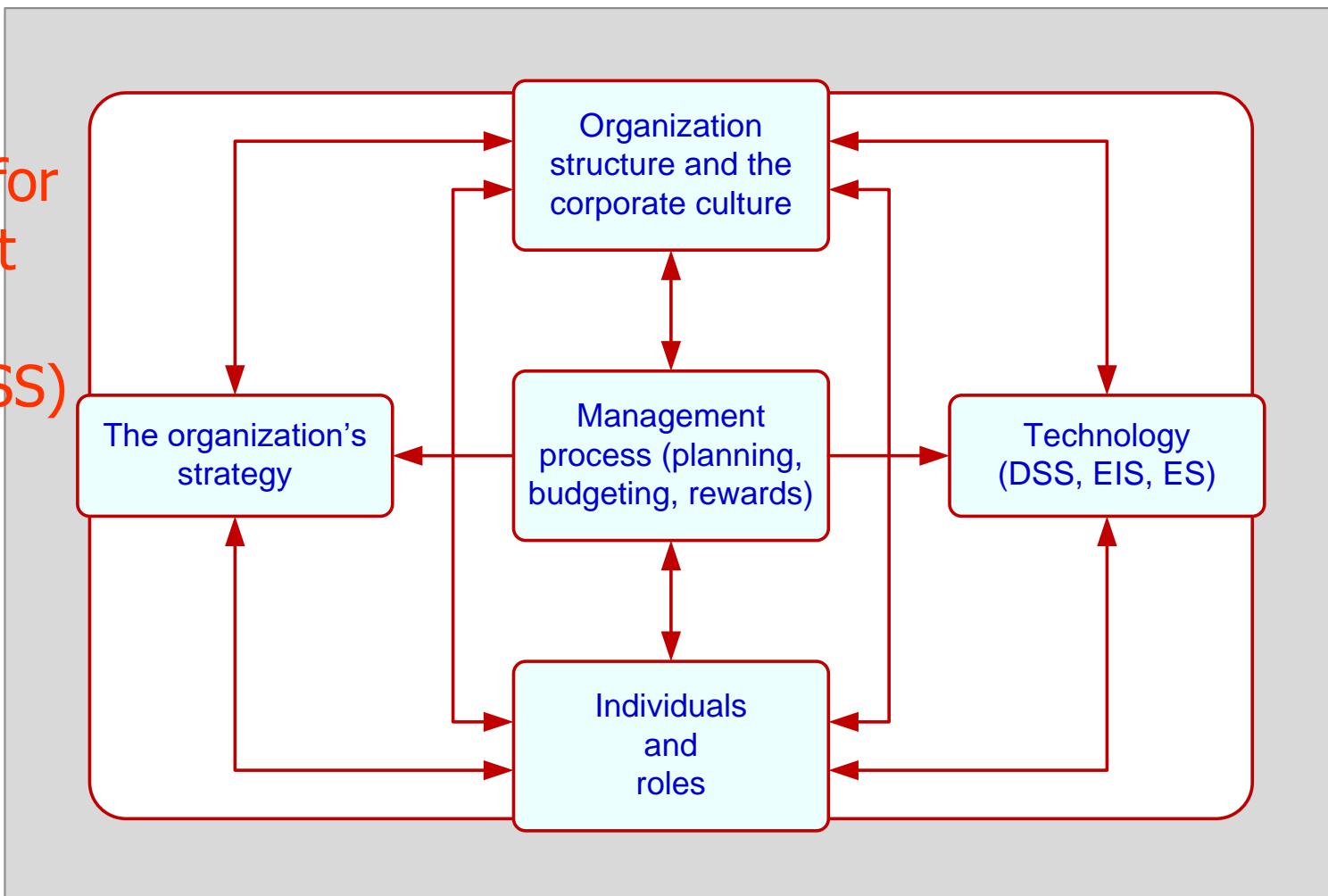


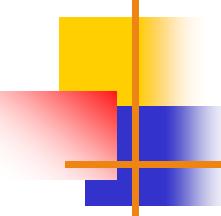
The Impacts of MSS – An Overview

- Management support systems are important factors in the information, Web, and knowledge revolution
 - Often cauterized as a cultural transformation with which most people are only now coming to terms
- This revolution is taking place very quickly
- According to Garner Group a 37.5 percent compound annual growth rate is expected
- Separating the impact of MSS from that of other computerized systems is a difficult

The Impacts of MSS – An Overview

A Generic Framework for Management Support Systems (MSS)





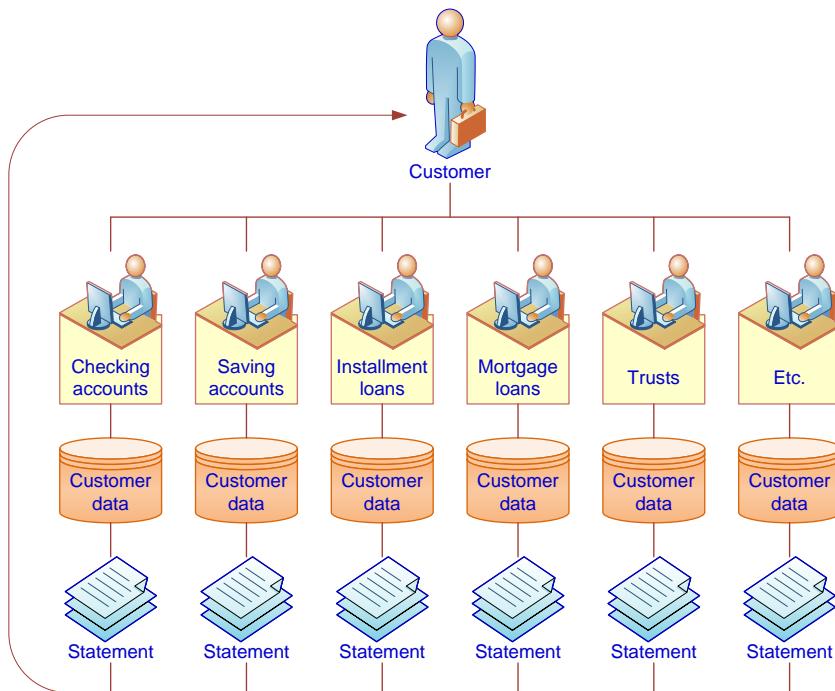
MSS Impacts on Organizations

- New organizational units
- Organizational culture
- Restructuring Business Processes and Virtual Teams
- Simulation Modeling and Organizational Restructuring
- The Impacts of ADS Systems
- Other Organizational Impacts
 - Increased productivity, speed, customer satisfaction, quality, and supply-chain efficiency

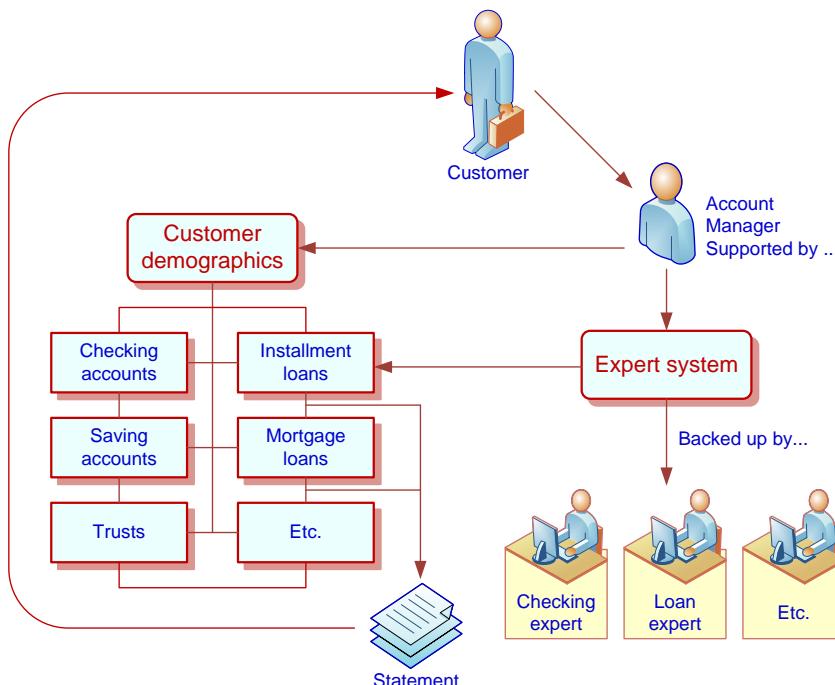
MSS Impacts on Organizations

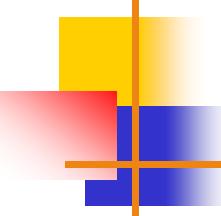
Example: Restructuring a Bank with an ES

Without
Expert
System



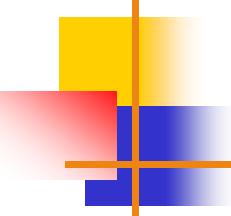
With
Expert
System





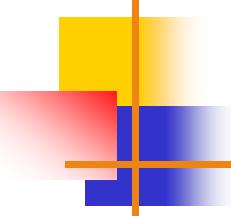
MSS Impacts on Individuals

- Job Satisfaction
- Inflexibility, Dehumanization, Stress, Anxiety
 - Frustration with not being able to master computers as well as others
 - Frustration with the quality of information available on the Web
 - Frustration due to having too many online sources of information
 - Frustration due to guilt associated with not being better informed or being informed too late
- Cooperation of Experts



Automating Decision Making and The Manager's Job

- Less expertise (experience) is required
- Faster decision making is possible
- Less reliance on experts and analysts
- Power is being redistributed among managers
- Support for complex decisions: faster/better
- Information needed for high-level decision making is expedited or even self-generated
- Automation of routine decisions or phases in the decision-making process by using ADS may eliminate some managers (?)



Automating Decision Making and The Manager's Job

- Can managers' jobs be fully automated?
 - Automation of parts/some steps of the process...
 - Different managerial levels
 - Level of structuredness of the decision situation
 - Other factors to consider...

- Can business analysts' jobs be fully automated?
 - Can BI replace business analysts?
 - Why; why not?