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## TIM 50 - Business Information Systems

### Lecture 9

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Instructor: Terry Allen  
UC Santa Cruz  
10/26/2011

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## Outline

- Announcements
  - Review: ERP
  - Student Presentation
  - E-commerce (cont'd)
  - Student Presentation
  - Information Technology
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## Announcements

- Key for Homework 2 will be on web site
  - MIDTERM next Wednesday, November 2
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## Announcements

- Reading for next class
    - Messerschmitt Ch 5 (139-154)
    - Sun-N Tier Case (145-164 + figs)
      - SUGGESTION: Start with Messerschmitt
    - This material will NOT be included in the midterm
      - Midterm only through concepts in Chapter 4
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## Announcements

### Forthcoming presentations

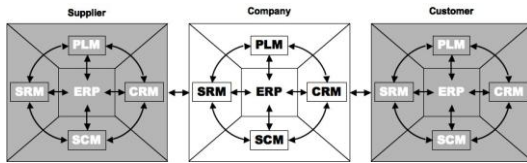
- 10/28
    - ?? (news story)
    - ?? (Case: Sun-N Tier)
  - 10/31
    - ?? (news story)
    - ?? (news story)
  - Send me your slides the night before
  - All presentations will be posted
    - Open the presentation list and follow the links
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## Review: ERP applications

- ERP applications support different business processes that are standardized across organizations
    - Accounting, sales, HRM, material management, CRM, supply chain management, project management, etc...
  - Key features:
    - Multi-functional
    - Integrated
    - Modular
-

## The application suite



PLM: product lifecycle management  
SRM: supplier relationship management

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## SAP ERP Solution Map

SAP ERP Solution Map						
Analytics	Financial Analytics		Operations Analytics		Workforce Analytics	
Financials	Financial Supply Chain Management		Treasury	Financial Accounting	Management Accounting	Corporate Governance
Human Capital Management	Talent Management		Workforce Process Management		Workforce Deployment	
Procurement and Logistics Execution	Procurement	Inventory and Warehouse Management		Inbound and Outbound Logistics	Transportation Management	
Product Development and Manufacturing	Production Planning		Manufacturing Execution		Product Development	Life-Cycle Data Management
Sales and Service	Sales Order Management		Aftermarket Sales and Service		Professional-Service Delivery	
Corporate Services	Real Estate Management	Enterprise Asset Management	Project and Portfolio Management	Travel Management	Environmental, Health, and Safety Compliance Mgmt.	Quality Management
					Global Trade Services	

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## Student Presentations

- 10/26
  - ?? (case: Alibris)
  - ?? (news story)
  - ?? (news story)

## Review: E-Commerce

- Major Categories
  - Consumer (B2C)
  - Inter-consumer (C2C)
  - Inter-enterprise (B2B)

## B2C Examples



## Consumer e-commerce (B2C)

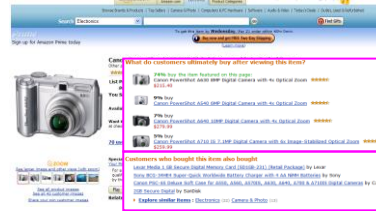
- What are the advantages and disadvantages compared to a retail store or direct mail catalog?

## Some Advantages

- **For the Consumer**
  - Check prices at many vendors with minimal effort
  - Anonymity
  - Mass customization
  - Order tracking
  - Recommendations
- **For the Business**
  - Global reach
  - Automate order taking (cost savings)
  - Price Discrimination

## Recommender Systems

How do they work?



## C2C Examples



## Inter-Enterprise E-Commerce (B2B)

- **Procurement**
  - One enterprise purchases goods or services from another
- **Direct Procurement**
  - Ongoing, consistent, and scheduled procurement
- The relationship between firms involved in direct procurement often called a **Supply Chain**

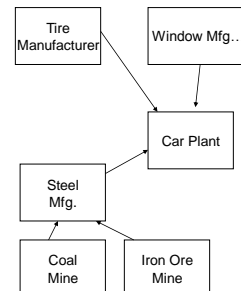
## Supply Chain Management (SCM)

SCM is the set of activities associated with managing a supply chain.



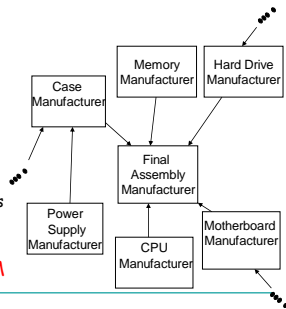
## SCM (supply chain management)

- **Need to manage the procurement of parts**
  - Don't run out of any one
  - Don't order too many
  - Order far enough in advance
- **Ideally**
  - Know in advance
    - # cars
    - features



## SCM - Mass customization

- Thousands of orders per day, each with different requirements!
- Adjusting orders from suppliers constantly according to demand
- Minimal inventories
  - Cut costs
  - Much more sensitive to errors or disruptions
- **Mass customization** requires sophisticated SCM



## Networked Computing in direct procurement

- **Electronic Data Interchange (EDI)**
  - Exchange order information between firms involved in direct procurement
  - Existed since 70's
  - Usually large firms who could afford proprietary communication links
  - Initially order and invoice
- **Financial EDI (FEDI)** later added EFT payment capability

## Networked Computing in direct procurement

- XML (Extensible Markup Language) is another data interchange format making an impact on inter-enterprise commerce

## Indirect Procurement

- Sporadic purchase of goods and services to support organizational objectives
  - Example: Office Furniture, office supplies, etc.

## The Founding of Alibris

- In the rare, used, and out-of-print book business.
- Started as a small business named Interloc.
- Interloc's website
  - just a bulletin board service, or BBS, which only connected book buyers with various locally based suppliers from all over the country.
- Interloc made money by charging dealers a fee for listing their books on Interloc's servers.
- Consisted of 1,300 dealers and 5 million books

## Alibris Goal

- World wide place order with Alibris, first send from dealer,
- Fast Search (used by Amazon)
- Then controlled shipping/customer service
  - Sparks facility
- Increase their order fill rate and only do business with dealers with over 1,000 books in stock
- Collect 20% of sales and increase the sale price of the books.

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## Solution -results

- Thunderstone solved the crisis
    - "great uncertainty" that a small company could do it
    - Thunderstone could handle their software needs
  - An investor offered \$200,000 to keep the company afloat- demanded control over the company and the firing of most of the IT staff.
  - This case shows(?) that a start-up can't be run by consultants.
  - Alibris now has over 60 million used, new, and out of print books
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## Alibris

- Why did Interloc succeed so early on?
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## Alibris

- If Interloc is so successful, why change it?
  - What will change as Interloc becomes Alibris?
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## Alibris

- Why did Manley feel they needed the Sparks facility?
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## Alibris

- Should Alibris actually buy books and fill up the Sparks facility?
- 

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## Alibris

- Why is Alibris having so much trouble setting up simple e-commerce capabilities?
  - Is this really that hard??
  - Is it rare for a new software product from an established, reputable vendor not to work properly (who's that laughing out there?!)?
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## Alibris

- Should Alibris stick with Oracle? Or switch back to Thunderstone?

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## Alibris

- Should Manley take the "white knight's" offer and fire the whole IT staff??!

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## Alibris

- Rejects "white knight" offer
- Manley secures another bridge loan
- Goes Live in 1998
- Thunderstone's software works "well enough"
  - (What? You want it to work better than that?)
- 1 million books at Sparks warehouse by 2000
  - Originally all on consignment from dealers
  - Later, purchased books 'on spec'
- 2002 - Revenue \$31 million, loss \$7.2 million
- 2003 - Revenue \$45.5 million, loss \$4.8 million
- March 2004 files for "auction based" IPO
  - May 2004, withdraws IPO (initial public offering) after price too low
  - Relying on Private Financing (venture capital) until 2006 when it was purchased by a private equity firm

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## Data and information

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## Key concept

- The key commodity manipulated by information technology is information
- In order to be manipulated in a computing/networking environment, information must be represented by data

### What is information?

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## Information

- From a user (human) perspective...
  - ....recognizable patterns that influence you in some way (perspective, understanding, behavior...)
- In the computing infrastructure, information has a somewhat different connotation as structure and interpretation added to data

## Data

### Binary digit

- A bit is "0" or "1" — the atom of the information economy
- Data is a collection of bits, like
  - "0101110111010110"
  - "0000011"
  - "11101110101101011010111011011010"
- Note: the terms data and information are not always used consistently!

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## Data -> Information

- Data itself does not represent anything meaningful
  - E.g. "101111"
- Should also know:
  - Structure
  - Interpretation mechanism
- This representation is necessary in order to recover the information
  - It is not unique!

## Example

- Bits: 0, 1
- Data: A sequence of bits
  - 101111
- Interpretation, Structure:
  - Base-2 number (least significant bit is on the right)
- Represents a number
  - $101111 \rightarrow 2^5 + 2^3 + 2^2 + 2^1 + 2^0 = 47$
- On a higher level this number may represent something else
  - e.g. The amount of \$\$ in my bank account :(

## ASCII

Alphabet	Hex	Binary
<7>	/x37	00110111
<8>	/x38	00111000
<9>	/x39	00111001
<A>	/x3A	00111010
<B>	/x3B	00111011
<C>	/x3C	00111100
<D>	/x3D	00111101
<E>	/x3E	00111110
<F>	/x3F	00111111
<@>	/x40	01000000
<A>	/x41	01000001
<B>	/x42	01000010
<C>	/x43	01000011
<D>	/x44	01000100

Interpretation \ Structure

### American Standard Code for Information Interchange

•Character encoding (128 characters= $2^7$ )

•Note that this representation is not unique...

....this one happens to be a **standard** (ANSI X3.110-1983)

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## Data Representation

- Takes the place of the original
- Equivalent to, in the sense that the original can be reconstructed from its representation
- Often the original can only be approximately reconstructed, although it may be indistinguishable to the user
  - e.g. audio or video

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## A picture



This picture conveys information

This information is represented in this computer, but how?

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## Representation of picture: image



Expanding a small portion of the picture, we see that it is represented by square pixels....

....300 tall by 200 wide....

....with a range of 256 intensities per pixel

Structure

Interpretation

$300 \cdot 200 \cdot 8 \text{ bits} = 480,000 \text{ bits}$  (but it can be [compressed](#))

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## Color picture



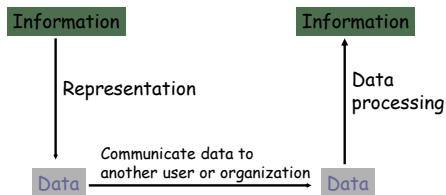
A color picture can be represented by three monochrome images...

RGB

...at the expense of three times as many bits

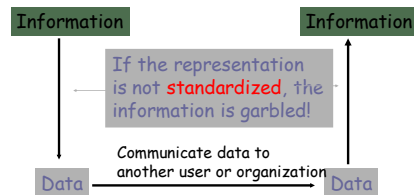
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## Terminology



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## Representation needs to be standardized



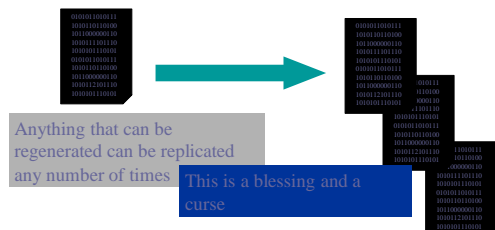
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## Regeneration

- Make a precise copy of the data (copy bit by bit)
- If you know the representation, this is equivalent to making a precise copy of the information
- Each such precise copy is called a generation
- The process is called regeneration

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## Replication of information





## Analog information cannot be regenerated



Analog information can be copied, but not perfectly reconstructed

We may never know exactly what the original of this Rembrandt looks like (or exactly what this Rembrandt looked like originally).

## Discrete information can be regenerated

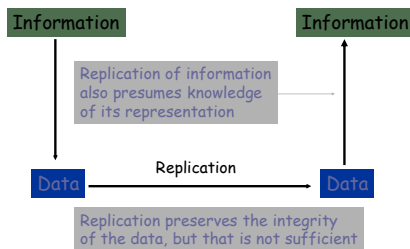


Regeneration can preserve data (but not its original physical form)

Regeneration is possible for information represented digitally (which is tolerant of physical deterioration)

$0 + \text{noise} \approx 0$   
 $1 + \text{noise} \approx 1$

## Replication of information requires knowledge of representation



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## Implications

- Digitally represented information can be preserved over time or distance in its precise original form by occasional regeneration
  - digital library
  - digital telephony
- Replication of data is easy and cheap

## Implications (con't)

- Replication of information requires knowledge of the structure and interpretation
  - Standardization or some other means
- You can give away or sell and still retain
- Unauthorized replication or piracy relatively easy

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