ISM50 Final Study Guide
Spring 2010

The final is comprehensive—you will be responsible for knowing everything on the midterm study guide as well as all of the material outlined here.

ROR Analysis (see cash flow handout)
- NPV
  -> What is it?
  -> What is the formula for it?
    - As a function of the interest rate, “i”
    - As a function of the discount factor, “delta”

Messerschmitt Ch. 5 – client server computing
- Client Server Architecture
- Three tier client server architecture
- Thin Clients

Messerschmitt Ch. 6 – Modularity and Layering
- Modularity
- Granularity
- Hierarchy
- Interfaces – actions, parameters, and returns
- The layering principles
  -> Layers of computing infrastructure
    - applications, components, middleware, operating system, networks
  -> Data and information in layers
- Abstraction & Encapsulation

Messerschmitt Ch. 7 - Computer and Comm. Industries
- Infrastructure and applications
- Decomposition and Assembly
- Components and Custom development
- Interoperability
- Outsourcing
- System Integration
- Products and Services
- Stovepipe (turn-key) and integrated infrastructure
- Vertical integration and diversification
- Standardization
  - why do we need standards?
  - why do companies participate?
  - reference models and interfaces
  - de facto / de jure standards
  - Standards Bodies
  - Open Standards
**Messerschmitt Ch. 15 – Data Sharing**
- DBMS
  - Capabilities—manage storage and processing and retrieval of information from one or more databases; maintain data integrity; access control
- Relational Database
  - Record, field, database operations
- SQL

**Messerschmitt Ch. 9 – Applications and the Organization**
- Buy vs. Make vs. Outsource
- Application Lifecycle Model of Development

**Messerschmitt Ch 10 – Application Architecture**
- Object Oriented Programming (OOP)
- Object – attributes, behavior
  - Methods, Interfaces, Classes
- Software Reuse – why is it important/how does OOP help?
- Software Components
- Component Assembly Tools—what are they?
  - Visual (IDE) vs. Scripting
- Software Frameworks – what are they? Any examples?

**Networks Reading**
- Basic Concepts of:
  - Hosts/Routers/Links
  - What is a packet? Packet Switching?
  - Difference between IP / MAC address?
  - Main idea of what a routing table does
  - Longest Prefix Match—what does it do?
  - Error Detection – what is a parity bit? Why might it not work?
  - Congestion in network
  - Flow Control
  - DNS, WWW, HTTP
- Layering of architecture
  - Physical Layer
  - Link Layer
    - Ethernet, MAC addresses, Hubs/Switches
  - Network Layer
    - Routing Table, Packet Forwarding, IP Addresses
  - Transport Protocols – TCP/UDP
- Typical Network Topologies (home, ISP, small business, large e-biz)
- Web Caching
Case Studies

Sun case
-Why was the total cost of ownership (TCO) of a windows PC much higher than the purchase price?
-What’s a thin client? How does it reduce TCO?

Thin vs. Fat Client
-Why does Sun push thin Client? Why does Microsoft prefer fat-client?
-What is Java? What does it offer?

What OS dominates the web-server market?

MySQL
-What are the different segments of the database market? Which segment is MySQL strongest in? Which segment is the largest portion of the database market?
-Who are the three biggest suppliers of database management systems? What competitive advantages over the major DBMS suppliers does MySQL have in the Web Site data segment of the market?
-Why would large enterprises prefer to manage their mission-critical, enterprise-wide data with database software from one of the three major DBMS providers, rather than using MySQL’s product which is much cheaper?
-What is a General Public License (GPL)? Why were MySQL’s customers willing to pay for the product, when they could get the product for free under a GPL?

Akamai
-Where are the bottlenecks in the Internet according to the case study?
-What is a Content Distribution Network (CDN)? What does it provide over ordinary web Caching?
-Where did Akamai locate its servers? What barriers to entry existed for a new entrant to build a CDN to compete with Akamai?
-Did Akamai choose to market its products with a direct sales force or through distribution partners? What are the advantages of each choice?
-Why did Akamai’s marketing strategy have to change when they transitioned from the Free Flow product to the Edge Suite product?

American Airlines
-What application was built? Why was it needed?
-What programming methodology did they use?
-Was it good for making changes?
-Did they follow an application lifecycle?
-What are some extensions they made for their flight tracking application?