ISM 50 Final Study Guide
Spring 2007

The final is comprehensive. Your reading material includes the chapters of the reader and
the book that were covered in class, the handouts (cash flows, data mining), and the
lecture slides. You may also find it helpful to download the student presentations of the
case studies.

ROR Analysis
• Net Present Value (NPV)
  o What is it?
  o What is the formula for it?
    • as a function of interest rate $i$
    • as a function of discount factor $\delta$
• Rate of Return (RoR)
  o What is it?
  o How do you compute it?
• Be able to decide if a plan is worth investing in

IT History
• What distinguished the Data Processing Era from the Micro-Era?
• What distinguished the Micro-Era from the Networking Era?
• Why did Data Processing Managers feel threatened in the Micro-Era?

O'Brien Chapter 2
• Porter's Competitive Forces
• Why is Porter’s Competitive model useful?
• Porter’s Strategies
  o Cost Leadership Strategy
  o Differentiation Strategy
  o Innovation Strategy
  o Growth Strategy
  o Alliance Strategy
• Lock in customers and suppliers
• Switching Costs
• Barriers to Entry
• Porter’s Value Chain
• Business Function
• Business Process (also in Messerschmitt 3.3.1)
• Business Process Re-engineering (also called Business Transformation in
  Messerschmitt 3.3.1)
• Agile company
• Virtual company
• Intranets, Extranets (also in Messerchmit 4.5)
• Knowledge vs. Information
• Knowledge Management
Messerschmitt 2.3
- Data
- Information
- Knowledge
- Authors, Publishers, Indexers, Recommenders
- Information Push
- Information Pull

Messerschmitt 3
- Departmental and Enterprise Applications
- Transaction Processing Systems
- Batch transaction processing (see lecture slides)
- On-line Transaction Processing (OLTP) (also in slides of 5/24)
- Workflow
- Business Processes
- Business Transformation (Business Process Re-engineering) (also covered in O'Brien Ch2)
- ERP (Enterprise Resource Planning)
- Legacy Applications
- Decision Support
  - Knowledge Management (also in O’Brien Ch2)
  - Data Warehouse, On-line Analytical Processing (OLAP) (also covered in slides of lectures 16 and 17)
- Electronic Commerce
- Inter-enterprise Commerce (B2B)
  - Direct Procurement
  - Indirect Procurement
  - Supply chain Management (SCM)
  - Mass Customization
  - Electronic Data Interchange (EDI)
- Consumer Commerce (B2C)
- Inter-consumer Commerce (C2C)
- Matching Buyers and Sellers
  - Catalog, Advertising, Intermediary Recommendation
- Negotiating Terms and Conditions
  - Auction, Fixed Price, Price Discrimination
- Consummation
  - Order, Fulfillment, Payment
- Customer Relationship Management (CRM)
- Recommender Systems (see slides)

Messerschmitt 4
- Data vs. Information
- Information represented as data
• Is it always possible to recover information from data?
• System Architecture Elements
  o Decomposition
  o Functionality
  o Interaction
• Why architect systems in this way?
• Software Layering
• What is the benefit of architecting software with layers?
• Operating System
• Middleware
• File System
• Database Management System
• Network Functions
  • Message
  • Packet
• internet
• Internet
• intranet
• extranet

Messerschmitt 5
• Client-Server Architecture
• Two-tier Client Server Architecture
• Three-Tier Client Server Architecture
  o Client
  o Application Server
  o DBMS
• Thin Clients
• Scalability
• Peer-to-Peer (P2P)

Messerschmitt 6
• Modularity
• Granularity
• Hierarchy
• Interfaces – actions, parameters, and returns
  o Data types
  o Data properties – Name, Type, Value
• Implementation vs. Interfaces
• Encapsulation
• Interface Protocols
• The Layering Principle
• Layers of computing Infrastructure
  o Applications, Components, Middleware, Operating System, Networks
• Data and Information in Layers
  o Separation of concerns
  o Abstraction
  o Encapsulation

Messerschmitt 7
• Infrastructure and Applications
• Decomposition and Assembly (also covered in Ch 10)
• Components and Custom Development (also covered in Ch 9)
• Interoperability
• Outsourcing (also covered in Ch 9)
• System Integration
• Supplier Types
• Products and Services
• Bundled vs. Unbundled Applications
• Stovepipe and Integrated Infrastructure
• Vertical Integration and Diversification
• Standardization
  o Why are they needed?
  o Scope
  o Why do companies participate?
  o De Facto and De Jure Standards
  o Standards Bodies
  o Open Standards

Messerschmitt Ch 9
• Buy vs. Make vs. Outsource
• Application Lifecycle Model of Development
  o Conceptualization
  o Analysis
  o Architecture
  o Development Evolution
  o Testing
  o Deployment
  o Operations, Maintenance, and Upgrade

Messerschmitt Ch 10 -- Application Architecture
• Decomposition vs. Assembly
• Object Oriented Programming (OOP)
• Object
  o attributes, behavior
  o Method
  o Interface
• Object Class
• Object Instance
• Software Reuse – Why is it important? How does OOP help?

Messerschmitt Ch 15 & Handouts & Lecture Slides
• Databases, DBMS
• Aggregation and Sharing
• Relational Model
  o Relational Table (see also slides)
    • Record, Field/Attribute
    • Data properties
    • Keys
  o SQL
    • Database Operations – SELECT, PROJECT, JOIN
• Markup Languages
  o XML vs. HTML
  o Uses
• Transaction Processing (also covered partially in Ch 3)
• OLTP
  o The ACID properties
• Data Warehouses (see slides, also covered partially in Ch3)
  o What is a data warehouse?
  o Data warehouses vs. operational databases
  o OLAP vs. OLTP
• Data Mining (see handouts and slides)
  o Knowledge Discovery
  o Application Areas
  o Data Mining for Customer Modeling
  o Major data mining tasks
  o Privacy Issues

Messerschmitt Ch 11.2 & Ch 18
• Locating Things (Ch 11.2)
  o Names
  o Addresses
  o References
  o Name services
• Domain Name System (DNS)
  o IP addresses and host names
  o Hierarchy
• Routing in the Internet
  o Routers
  o Packet forwarding
  o Routing Tables
• Time Division Multiplexing
• Statistical Multiplexing

**Case Studies**

**Frito-Lay Case**
• What was the HHC?
• What were the main reasons why Frito Lay deployed the HHC?
• What changes in marketing strategy did Frito-Lay believe the HHC data would help enable?
• How might the HHC project change Frito-Lay’s competitive position with its direct competitors, new entrants, and its customers?

**Cisco ERP**
• What are some of the actions that Cisco took that contributed to the successful deployment of their ERP?
• What mistakes did Cisco make?
• What are the most important lessons that another company that wants to deploy ERP could learn from Cisco’s experience?
• What was the role of Oracle and KPMG?

**Alibris Case**
• How did Alibris plan to change Interloc’s revenue model?
• What were the potential benefits and risks of this change?
• Why did Alibris abandon Thunderstone software, and why did it choose to switch to Oracle? What happened at the end?
• What made Alibris’ IT challenge particularly difficult compared to what other E-commerce companies faced?

**Sun Case**
• Why is the total cost of ownership (TCO) of a Windows PC much higher than the purchase price?
• What is a thin-client? Why might it have the potential to reduce the TCO?
• What are the drawbacks of having a thin-client vs. a traditional fat-client? The advantages?
• What selfish reasons does Sun have for advocating a thin-client model? Why does Microsoft prefer maintaining the dominance of the fat-client model?
• What is Java, and what advantages does it have over other languages?
• How does the N-tier Architecture work?

**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 was the open source movement? Who where part of it? In what areas? Who where threatened by it and why?
• 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 and why?
• What is a Content Distribution Network (CDN)?
• Where did Akamai locate its servers? What barriers to entry existed for a new entrant to build a CDN to compete with Akamai?
• How did EdgeSuite differ from Akamai’s FreeFlow product?
• 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 (tentative)**

• What do flight dispatchers do, and what information do they need to make their decisions? How did the dispatch automation package assist the flight dispatchers?
• What stages of development did the flight dispatch automation package go through?
• What were some of the benefits of good architecture and Object Oriented Programming in the context of the flight dispatch automation package?
• How did the flight dispatch automation package interact with AA’s legacy systems?