Systems and Infrastructure Lifecycle Management

Introduction

- Unit 1 -

Agenda

- Introduction
- IT Auditor’s role in System and Infrastructure lifecycle
- Project and Visio
- IT Auditor’s responsibilities and roles
- Information system development – a brief history
- Type of business information systems
- Quiz

Introduction

Introduce yourself briefly to your instructor and the class

- Education
- Work history
- Experience with Information Systems Development
- Goal for the class

Introduction

This course will introduce you to the methods used as organizations builds an enterprise information system architecture within an environment of internal control

Topics include:

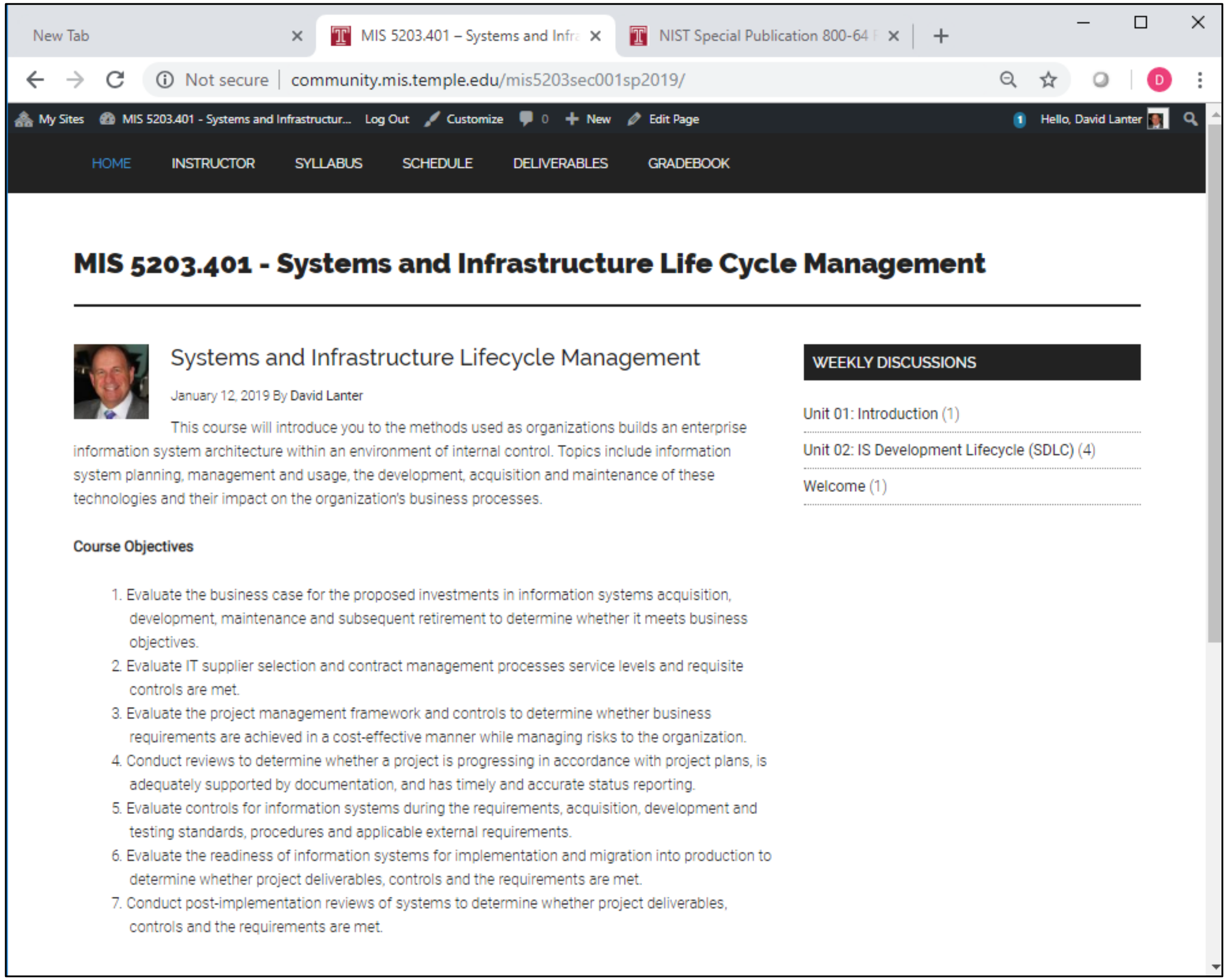
- Information system planning, development, acquisition and maintenance of these technologies and their impact on the organization’s business processes

Introduction

Course objective - help you understand what it means to:

- Evaluate the business case for the proposed investments in information systems
- Evaluate the project management framework and controls to determine whether business requirements are achieved in a cost-effective manner while managing risks to the organization
- Conduct reviews to determine whether a project is progressing in accordance with project plans, is adequately supported by documentation, and has timely and accurate status reporting
- Evaluate controls for information systems during the requirements, acquisition, development and testing standards, procedures and applicable external requirements
- Evaluate the readiness of information systems for implementation and migration into production to determine whether project deliverables, controls and the requirements are met
- Conduct post-implementation reviews of systems to determine whether project deliverables, controls and the requirements are met

Introduction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HOME
INSTRUCTOR
SYLLABUS
SCHEDULE
DELIVERABLES
GRADEBOOK

MIS 5203.401 - Systems and Infrastructure Life Cycle Management

Systems and Infrastructure Lifecycle Management

January 12, 2019 By David Lanter

This course will introduce you to the methods used as organizations builds an enterprise information system architecture within an environment of internal control. Topics include information system planning, management and usage, the development, acquisition and maintenance of these technologies and their impact on the organization's business processes.

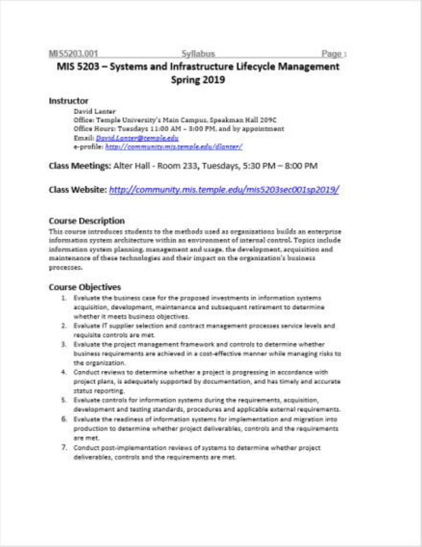
Course Objectives

1. Evaluate the business case for the proposed investments in information systems acquisition, development, maintenance and subsequent retirement to determine whether it meets business objectives.
2. Evaluate IT supplier selection and contract management processes service levels and requisite controls are met.
3. Evaluate the project management framework and controls to determine whether business requirements are achieved in a cost-effective manner while managing risks to the organization.
4. Conduct reviews to determine whether a project is progressing in accordance with project plans, is adequately supported by documentation, and has timely and accurate status reporting.
5. Evaluate controls for information systems during the requirements, acquisition, development and testing standards, procedures and applicable external requirements.
6. Evaluate the readiness of information systems for implementation and migration into production to determine whether project deliverables, controls and the requirements are met.
7. Conduct post-implementation reviews of systems to determine whether project deliverables, controls and the requirements are met.

WEEKLY DISCUSSIONS

- Unit 01: Introduction (1)
- Unit 02: IS Development Lifecycle (SDLC) (4)
- Welcome (1)

Introduction - Syllabus



MIS5203.001 Syllabus Page 1

MIS 5203 – Systems and Infrastructure Lifecycle Management
Spring 2019

Instructor

David Lanter
Office: Temple University's Main Campus, Speakman Hall 209C
Office Hours: Tuesdays 11:00 AM – 3:00 PM, and by appointment
Email: David.Lanter@temple.edu
e-profile: http://community.mis.temple.edu/dlanter/

Class Meetings: Alter Hall - Room 233, Tuesdays, 5:30 PM – 8:00 PM

Class Website: *http://community.mis.temple.edu/mis5203sec001sp2019/*

Course Description

This course introduces students to the methods used as organizations builds an enterprise information system architecture within an environment of internal control. Topics include information system planning, management and usage, the development, acquisition and maintenance of these technologies and their impact on the organization's business processes.

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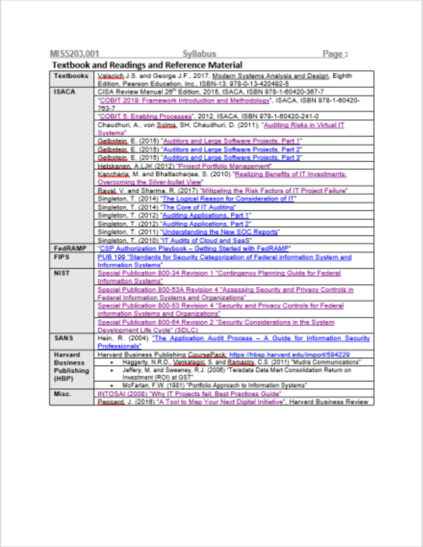
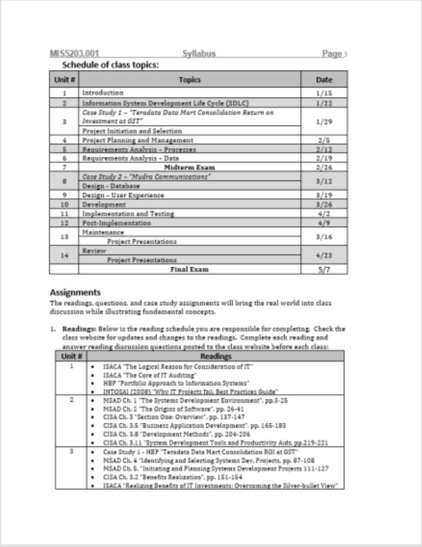


MIS5203.001 Syllabus Page 2

Textbook and Readings and Reference Material

Textbooks	Valacich J.S. and George J.F., 2017, Modern Systems Analysis and Design, Eighth Edition, Pearson Education, Inc., ISBN-13: 978-0-13-420492-5
ISACA	CISA Review Manual 26th Edition, 2015, ISACA, ISBN 978-1-60420-367-7
	"COBIT 2019: Framework Introduction and Methodology", ISACA, ISBN 978-1-60420-763-7
	"COBIT 5: Enabling Processes", 2012, ISACA, ISBN 978-1-60420-241-0
	Chaudhuri, A., von Solms, SH, Chaudhuri, D. (2011), "Auditing Risks in Virtual IT Systems"
	Gelbstein, E. (2015) "Auditors and Large Software Projects, Part 1"
	Gelbstein, E. (2015) "Auditors and Large Software Projects, Part 2"
	Gelbstein, E. (2016) "Auditors and Large Software Projects, Part 3"
	Helskanen, A.LJK (2012) "Project Portfolio Management"
	Kancharla, M. and Bhattacharjee, S. (2010) "Realizing Benefits of IT Investments: Overcoming the Silver-bullet View"
	Raval, V. and Sharma, R. (2017) "Mitigating the Risk Factors of IT Project Failure"
	Singleton, T. (2014) "The Logical Reason for Consideration of IT"
	Singleton, T. (2014) "The Core of IT Auditing"
	Singleton, T. (2012) "Auditing Applications, Part 1"
	Singleton, T. (2012) "Auditing Applications, Part 2"
	Singleton, T. (2011) "Understanding the New SOC Reports"
	Singleton, T. (2010) "IT Audits of Cloud and SaaS"
FedRAMP	"CSP Authorization Playbook – Getting Started with FedRAMP"
FIPS	PUB 199 "Standards for Security Categorization of Federal information System and Information Systems"
NIST	Special Publication 800-34 Revision 1 "Contingency Planning Guide for Federal Information Systems"
	Special Publication 800-53A Revision 4 "Assessing Security and Privacy Controls in Federal Information Systems and Organizations"
	Special Publication 800-53 Revision 4 "Security and Privacy Controls for Federal information Systems and Organizations"
	Special Publication 800-64 Revision 2 "Security Considerations in the System Development Life Cycle" (SDLC)
SANS	Hein, R. (2004) "The Application Audit Process – A Guide for Information Security Professionals"
Harvard Business Publishing (HBP)	Harvard Business Publishing CoursePack: https://hbsp.harvard.edu/import/594229
	• Haggerty, N.R.D., Venkatagiri, S. and Ramastry, C.S. (2011) "Mudra Communications"
	• Jeffery, M. and Sweeney, R.J. (2006) "Teradata Data Mart Consolidation Return on Investment (ROI) at GST"
	• McFarlan, F.W. (1981) "Portfolio Approach to Information Systems"
Misc.	INTOSAI (2008) "Why IT Projects fail, Best Practices Guide"
	Peppard, J. (2016) "A Tool to Map Your Next Digital Initiative", Harvard Business Review



MIS5203.001 Syllabus Page 3

Schedule of class topics:

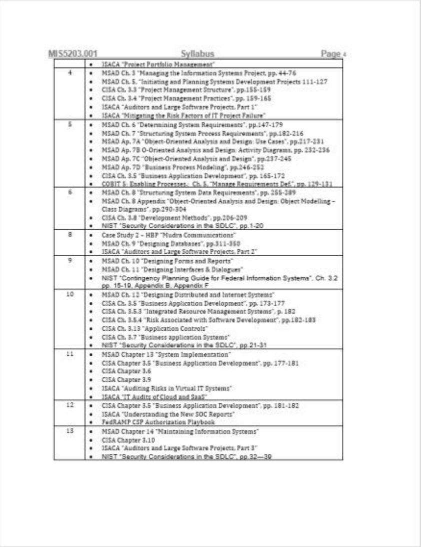
Unit #	Topics	Date
1	Introduction	1/15
2	Information System Development Life Cycle (SDLC)	1/22
3	*Case Study 1 – "Teradata Data Mart Consolidation Return on Investment at GST"*	1/29
	Project Initiation and Selection	
4	Project Planning and Management	2/5
5	Requirements Analysis – Processes	2/12
6	Requirements Analysis – Data	2/19
7	**Midterm Exam**	2/26
8	*Case Study 2 – "Mudra Communications"*	3/12
	Design - Database	
9	Design – User Experience	3/19
10	Development	3/26
11	Implementation and Testing	4/2
12	Post-Implementation	4/9
13	Maintenance	3/16
	Project Presentations	
14	Review	4/23
	Project Presentations	
	Final Exam	5/7

Assignments

The readings, questions, and case study assignments will bring the real world into class discussion while illustrating fundamental concepts.

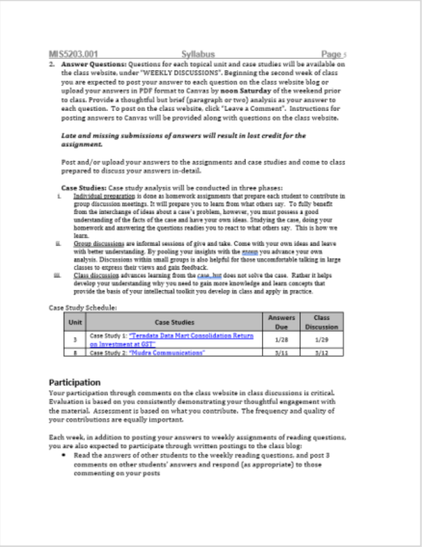
1. **Readings:** Below is the reading schedule you are responsible for completing. Check the class website for updates and changes to the readings. Complete each reading and answer reading discussion questions posted to the class website before each class:

Unit #	Readings
1	• ISACA "The Logical Reason for Consideration of IT" • ISACA "The Core of IT Auditing" • HBP "Portfolio Approach to Information Systems" • INTOSAI (2008) "Why IT Projects fail, Best Practices Guide"
2	• MSAD Ch. 1 "The Systems Development Environment", pp.3-25 • MSAD Ch. 2 "The Origins of Software", pp. 26-41 • CISA Ch. 3 "Section One: Overview", pp. 137-147 • CISA Ch. 3.5 "Business Application Development", pp. 165-183 • CISA Ch. 3.8 "Development Methods", pp. 204-206 • CISA Ch. 3.11 "System Development Tools and Productivity Aids, pp.219-221
3	• Case Study 1 - HBP "Teradata Data Mart Consolidation ROI at GST" • MSAD Ch. 4 "Identifying and Selecting Systems Dev. Projects, pp. 87-108 • MSAD Ch. 5, "Initiating and Planning Systems Development Projects 111-127 • CISA Ch. 3.2 "Benefits Realization", pp. 151-154 • ISACA "Realizing Benefits of IT Investments: Overcoming the Silver-bullet View"



MIS5203.001 Syllabus Page 4

	• ISACA "Project Portfolio Management"
4	• MSAD Ch. 3 "Managing the Information Systems Project, pp. 44-76 • MSAD Ch. 5, "Initiating and Planning Systems Development Projects 111-127 • CISA Ch. 3.3 "Project Management Structure", pp.155-159 • CISA Ch. 3.4 "Project Management Practices", pp. 159-165 • ISACA "Auditors and Large Software Projects, Part 1" • ISACA "Mitigating the Risk Factors of IT Project Failure"
5	• MSAD Ch. 6 "Determining System Requirements", pp.147-179 • MSAD Ch. 7 "Structuring System Process Requirements", pp.182-216 • MSAD Ap. 7A "Object-Oriented Analysis and Design: Use Cases", pp.217-231 • MSAD Ap. 7B O-Oriented Analysis and Design: Activity Diagrams, pp. 232-236 • MSAD Ap. 7C "Object-Oriented Analysis and Design", pp.237-245 • MSAD Ap. 7D "Business Process Modeling", pp.246-252 • CISA Ch. 3.5 "Business Application Development", pp. 165-172 • COBIT 5: Enabling Processes,- Ch. 5, "Manage Requirements Def.", pp. 129-131
6	• MSAD Ch. 8 "Structuring System Data Requirements", pp. 255-289 • MSAD Ch. 8 Appendix "Object-Oriented Analysis and Design: Object Modelling – Class Diagrams", pp.290-304 • CISA Ch. 3.8 "Development Methods", pp.206-209 • NIST "Security Considerations in the SDLC", pp.1-20
8	• Case Study 2 – HBP "Mudra Communications" • MSAD Ch. 9 "Designing Databases", pp.311-350 • ISACA "Auditors and Large Software Projects, Part 2"
9	• MSAD Ch. 10 "Designing Forms and Reports" • MSAD Ch. 11 "Designing Interfaces & Dialogues" • NIST "Contingency Planning Guide for Federal Information Systems", Ch. 3.2 pp. 15-19, Appendix B, Appendix F
10	• MSAD Ch. 12 "Designing Distributed and Internet Systems" • CISA Ch. 3.5 "Business Application Development", pp. 173-177 • CISA Ch. 3.5.3 "Integrated Resource Management Systems", p. 182 • CISA Ch. 3.5.4 "Risk Associated with Software Development", pp.182-183 • CISA Ch. 3.13 "Application Controls" • CISA Ch. 3.7 "Business application Systems" • NIST "Security Considerations in the SDLC", pp.21-31
11	• MSAD Chapter 13 "System Implementation" • CISA Chapter 3.5 "Business Application Development", pp. 177-181 • CISA Chapter 3.6 • CISA Chapter 3.9 • ISACA "Auditing Risks in Virtual IT Systems" • ISACA "IT Audits of Cloud and SaaS"
12	• CISA Chapter 3.5 "Business Application Development", pp. 181-182 • ISACA "Understanding the New SOC Reports" • FedRAMP CSP Authorization Playbook
13	• MSAD Chapter 14 "Maintaining Information Systems" • CISA Chapter 3.10 • ISACA "Auditors and Large Software Projects, Part 3" • NIST "Security Considerations in the SDLC", pp.32—39



MIS5203.001 Syllabus Page 5

2. **Answer Questions:** Questions for each topical unit and case studies will be available on the class website, under "WEEKLY DISCUSSIONS". Beginning the second week of class you are expected to post your answer to each question on the class website blog or upload your answers in PDF format to Canvas by **noon Saturday** of the weekend prior to class. Provide a thoughtful but brief (paragraph or two) analysis as your answer to each question. To post on the class website, click "Leave a Comment". Instructions for posting answers to Canvas will be provided along with questions on the class website.

   Late and missing submissions of answers will result in lost credit for the assignment.

   Post and/or upload your answers to the assignments and case studies and come to class prepared to discuss your answers in-detail.

   Case Studies: Case study analysis will be conducted in three phases:

   i. Individual preparation is done as homework assignments that prepare each student to contribute in group discussion meetings. It will prepare you to learn from what others say. To fully benefit from the interchange of ideas about a case's problem, however, you must possess a good understanding of the facts of the case and have your own ideas. Studying the case, doing your homework and answering the questions readies you to react to what others say. This is how we learn.
   ii. Group discussions are informal sessions of give and take. Come with your own ideas and leave with better understanding. By pooling your insights with the group you advance your own analysis. Discussions within small groups is also helpful for those uncomfortable talking in large classes to express their views and gain feedback.
   iii. Class discussion advances learning from the case, but does not solve the case. Rather it helps develop your understanding why you need to gain more knowledge and learn concepts that provide the basis of your intellectual toolkit you develop in class and apply in practice.

Case Study Schedule:

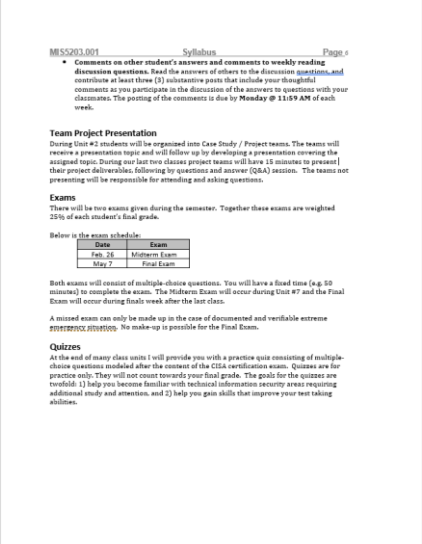
Unit	Case Studies	Answers Due	Class Discussion
3	Case Study 1: "Teradata Data Mart Consolidation Return on Investment at GST"	1/28	1/29
8	Case Study 2: "Mudra Communications"	3/11	3/12

Participation

Your participation through comments on the class website in class discussions is critical. Evaluation is based on you consistently demonstrating your thoughtful engagement with the material. Assessment is based on what you contribute. The frequency and quality of your contributions are equally important.

Each week, in addition to posting your answers to weekly assignments of reading questions, you are also expected to participate through written postings to the class blog:

- Read the answers of other students to the weekly reading questions, and post 3 comments on other students' answers and respond (as appropriate) to those commenting on your posts



MIS5203.001 Syllabus Page 6

- **Comments on other student's answers and comments to weekly reading discussion questions.** Read the answers of others to the discussion questions, and contribute at least three (3) substantive posts that include your thoughtful comments as you participate in the discussion of the answers to questions with your classmates. The posting of the comments is due by **Monday @ 11:59 AM** of each week.

Team Project Presentation

During Unit #2 students will be organized into Case Study / Project teams. The teams will receive a presentation topic and will follow up by developing a presentation covering the assigned topic. During our last two classes project teams will have 15 minutes to present their project deliverables, following by questions and answer (Q&A) session. The teams not presenting will be responsible for attending and asking questions.

Exams

There will be two exams given during the semester. Together these exams are weighted 25% of each student's final grade.

Below is the exam schedule:

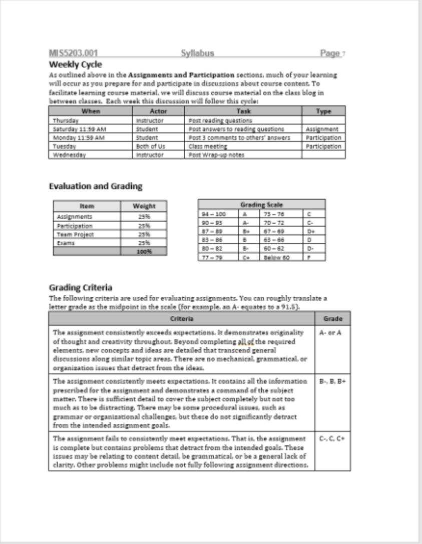
Date	Exam
Feb. 26	Midterm Exam
May 7	Final Exam

Both exams will consist of multiple-choice questions. You will have a fixed time (e.g. 50 minutes) to complete the exam. The Midterm Exam will occur during Unit #7 and the Final Exam will occur during finals week after the last class.

A missed exam can only be made up in the case of documented and verifiable extreme emergency situation. No make-up is possible for the Final Exam.

Quizzes

At the end of many class units I will provide you with a practice quiz consisting of multiple-choice questions modeled after the content of the CISA certification exam. Quizzes are for practice only. They will not count towards your final grade. The goals for the quizzes are twofold: 1) help you become familiar with technical information security areas requiring additional study and attention, and 2) help you gain skills that improve your test taking abilities.



MIS5203.001 Syllabus Page 7

Weekly Cycle

As outlined above in the **Assignments and Participation** sections, much of your learning will occur as you prepare for and participate in discussions about course content. To facilitate learning course material, we will discuss course material on the class blog in between classes. Each week this discussion will follow this cycle:

When	Actor	Task	Type
Thursday	Instructor	Post reading questions	
Saturday 11:59 AM	Student	Post answers to reading questions	Assignment
Monday 11:59 AM	Student	Post 3 comments to others' answers	Participation
Tuesday	Both of Us	Class meeting	Participation
Wednesday	Instructor	Post Wrap-up notes	

Evaluation and Grading

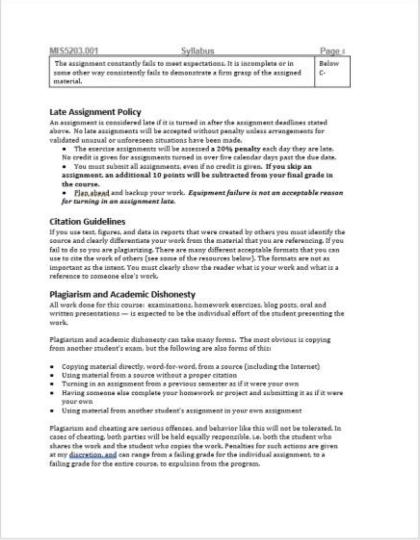
Item	Weight
Assignments	25%
Participation	25%
Team Project	25%
Exams	25%
	100%

Grading Scale			
94 – 100	A	73 – 76	C
90 – 93	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83 – 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
77 – 79	C+	Below 60	F

Grading Criteria

The following criteria are used for evaluating assignments. You can roughly translate a letter grade as the midpoint in the scale (for example, an A- equates to a 91.5).

Criteria	Grade
The assignment consistently exceeds expectations. It demonstrates originality of thought and creativity throughout. Beyond completing all of the required elements, new concepts and ideas are detailed that transcend general discussions along similar topic areas. There are no mechanical, grammatical, or organization issues that detract from the ideas.	A- or A
The assignment consistently meets expectations. It contains all the information prescribed for the assignment and demonstrates a command of the subject matter. There is sufficient detail to cover the subject completely but not too much as to be distracting. There may be some procedural issues, such as grammar or organizational challenges, but these do not significantly detract from the intended assignment goals.	B-, B, B+
The assignment fails to consistently meet expectations. That is, the assignment is complete but contains problems that detract from the intended goals. These issues may be relating to content detail, be grammatical, or be a general lack of clarity. Other problems might include not fully following assignment directions.	C-, C, C+



MIS5203.001 Syllabus Page 8

The assignment constantly fails to meet expectations. It is incomplete or in some other way consistently fails to demonstrate a firm grasp of the assigned material.	Below C-

Late Assignment Policy

An assignment is considered late if it is turned in after the assignment deadlines stated above. No late assignments will be accepted without penalty unless arrangements for validated unusual or unforeseen situations have been made.

- The exercise assignments will be assessed **a 20% penalty** each day they are late. No credit is given for assignments turned in over five calendar days past the due date.
- You must submit all assignments, even if no credit is given. **If you skip an assignment, an additional 10 points will be subtracted from your final grade in the course.**
- Plan ahead and backup your work. ***Equipment failure is not an acceptable reason for turning in an assignment late.***

Citation Guidelines

If you use text, figures, and data in reports that were created by others you must identify the source and clearly differentiate your work from the material that you are referencing. If you fail to do so you are plagiarizing. There are many different acceptable formats that you can use to cite the work of others (see some of the resources below). The formats are not as important as the intent. You must clearly show the reader what is your work and what is a reference to someone else's work.

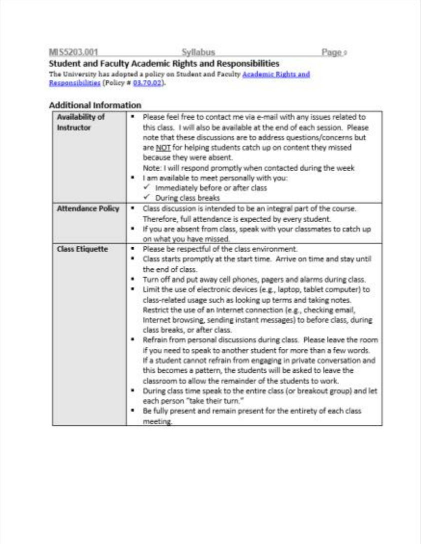
Plagiarism and Academic Dishonesty

All work done for this course: examinations, homework exercises, blog posts, oral and written presentations — is expected to be the individual effort of the student presenting the work.

Plagiarism and academic dishonesty can take many forms. The most obvious is copying from another student's exam, but the following are also forms of this:

- Copying material directly, word-for-word, from a source (including the Internet)
- Using material from a source without a proper citation
- Turning in an assignment from a previous semester as if it were your own
- Having someone else complete your homework or project and submitting it as if it were your own
- Using material from another student's assignment in your own assignment

Plagiarism and cheating are serious offenses, and behavior like this will not be tolerated. In cases of cheating, both parties will be held equally responsible, i.e. both the student who shares the work and the student who copies the work. Penalties for such actions are given at my discretion, and can range from a failing grade for the individual assignment, to a failing grade for the entire course, to expulsion from the program.



MIS5203.001 Syllabus Page 9

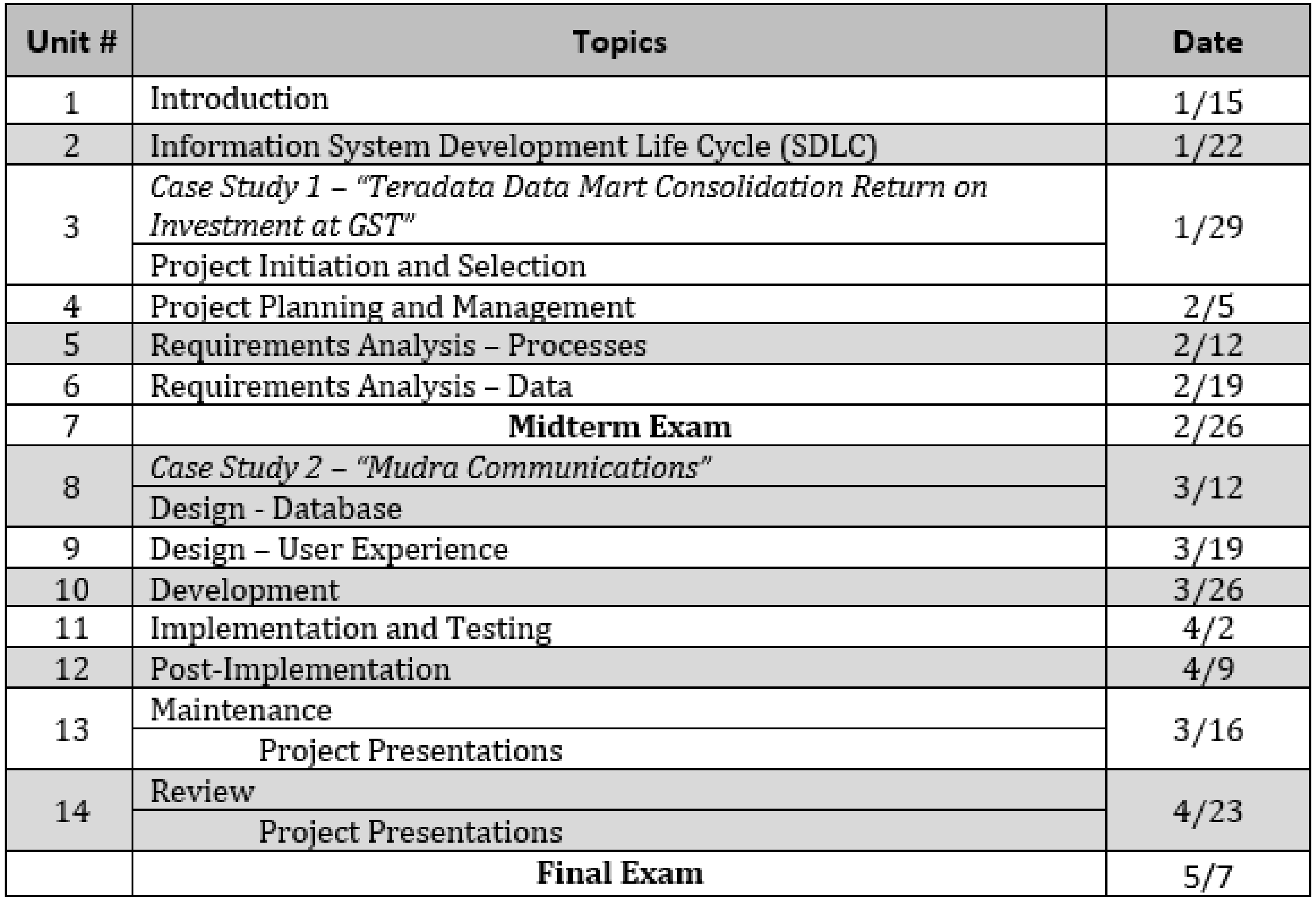
Student and Faculty Academic Rights and Responsibilities

The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02).

Additional Information

Availability of Instructor	▪ Please feel free to contact me via e-mail with any issues related to this class. I will also be available at the end of each session. Please note that these discussions are to address questions/concerns but are NOT for helping students catch up on content they missed because they were absent. Note: I will respond promptly when contacted during the week ▪ I am available to meet personally with you: ✓ Immediately before or after class ✓ During class breaks
Attendance Policy	▪ Class discussion is intended to be an integral part of the course. Therefore, full attendance is expected by every student. ▪ If you are absent from class, speak with your classmates to catch up on what you have missed.
Class Etiquette	▪ Please be respectful of the class environment. ▪ Class starts promptly at the start time. Arrive on time and stay until the end of class. ▪ Turn off and put away cell phones, pagers and alarms during class. ▪ Limit the use of electronic devices (e.g., laptop, tablet computer) to class-related usage such as looking up terms and taking notes. Restrict the use of an Internet connection (e.g., checking email, Internet browsing, sending instant messages) to before class, during class breaks, or after class. ▪ Refrain from personal discussions during class. Please leave the room if you need to speak to another student for more than a few words. If a student cannot refrain from engaging in private conversation and this becomes a pattern, the students will be asked to leave the classroom to allow the remainder of the students to work. ▪ During class time speak to the entire class (or breakout group) and let each person "take their turn." ▪ Be fully present and remain present for the entirety of each class meeting.

Introduction - Schedule



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4	Project Planning and Management	2/5
5	Requirements Analysis – Processes	2/12
6	Requirements Analysis – Data	2/19
7	**Midterm Exam**	2/26
8	*Case Study 2 – "Mudra Communications"*	3/12
	Design - Database	
9	Design – User Experience	3/19
10	Development	3/26
11	Implementation and Testing	4/2
12	Post-Implementation	4/9
13	Maintenance	3/16
	Project Presentations	
14	Review	4/23
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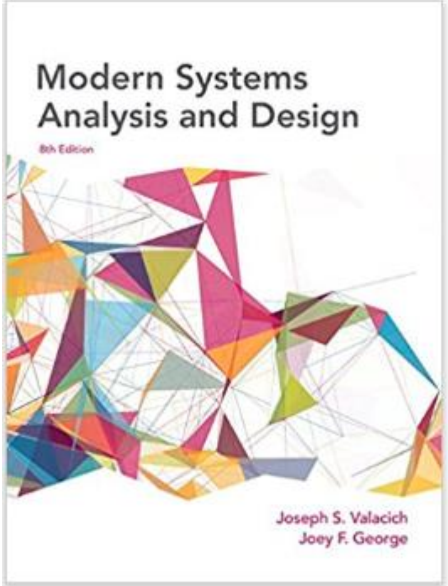
	Final Exam	5/7

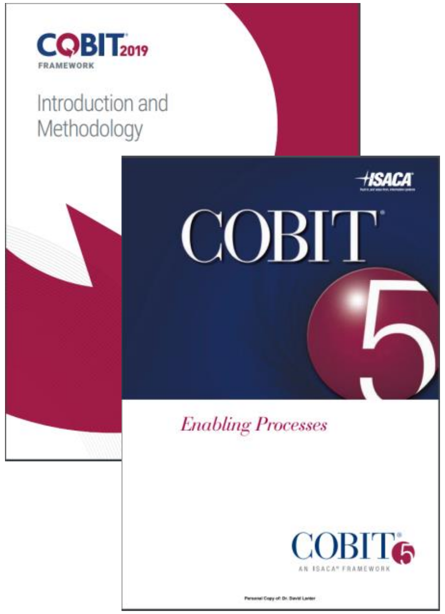
Introduction - Readings



Modern Systems Analysis and Design

8th Edition

Joseph S. Valacich
Joey F. George



COBIT 2019 FRAMEWORK

Introduction and Methodology

ISACA

COBIT 5

Enabling Processes

COBIT 5 AN ISACA FRAMEWORK

Feature

Auditing Security Risks in Virtual IT Systems

IS Audit Basics

Auditors and Large Software Projects, Part 1
Can Auditors Prevent Project Failure?

Feature

Project Portfolio Management

Journal Online

Realizing Benefits of IT Investments: Overcoming the Silver-bullet View

Mitigating the Risk Factors of IT Project Failure

PLAN
COLLABORATE
DELIVER

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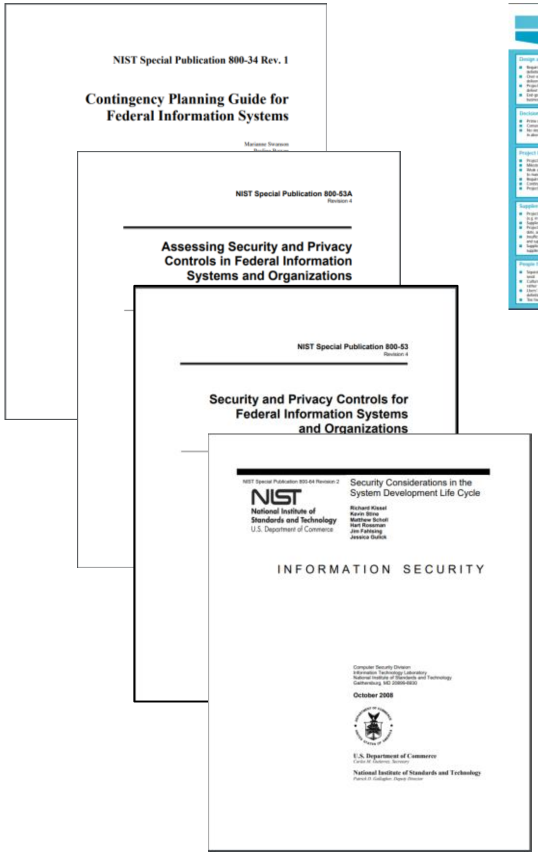


NIST Special Publication 800-34 Rev. 1

Contingency Planning Guide for Federal Information Systems

Marianne Swanson

NIST Special Publication 800-53A
Revision 4

Assessing Security and Privacy Controls in Federal Information Systems and Organizations

NIST Special Publication 800-53
Revision 4

Security and Privacy Controls for Federal Information Systems and Organizations

NIST Special Publication 800-64 Revision 2

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Security Considerations in the System Development Life Cycle

Richard Kissel
Kevin Stine
Matthew Scholl
Hart Rossman
Jim Fahlsing
Jessica Gulick

INFORMATION SECURITY

Computer Security Division
Information Technology Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8930

October 2008

U.S. Department of Commerce

National Institute of Standards and Technology

Why IT Projects Fail

Causes of Failure

Impact on Project

Design and Definition Failures

Decision Making Failures

Project Discipline Failures

Supplier Management Failures

People failure

Ultimately, failure is designed in

Ultimately, a failed project evolves

Responsible Leadership

Experience

BEST PRACTICE

Why IT Projects Fail

Harvard Business Review

CHANGE MANAGEMENT

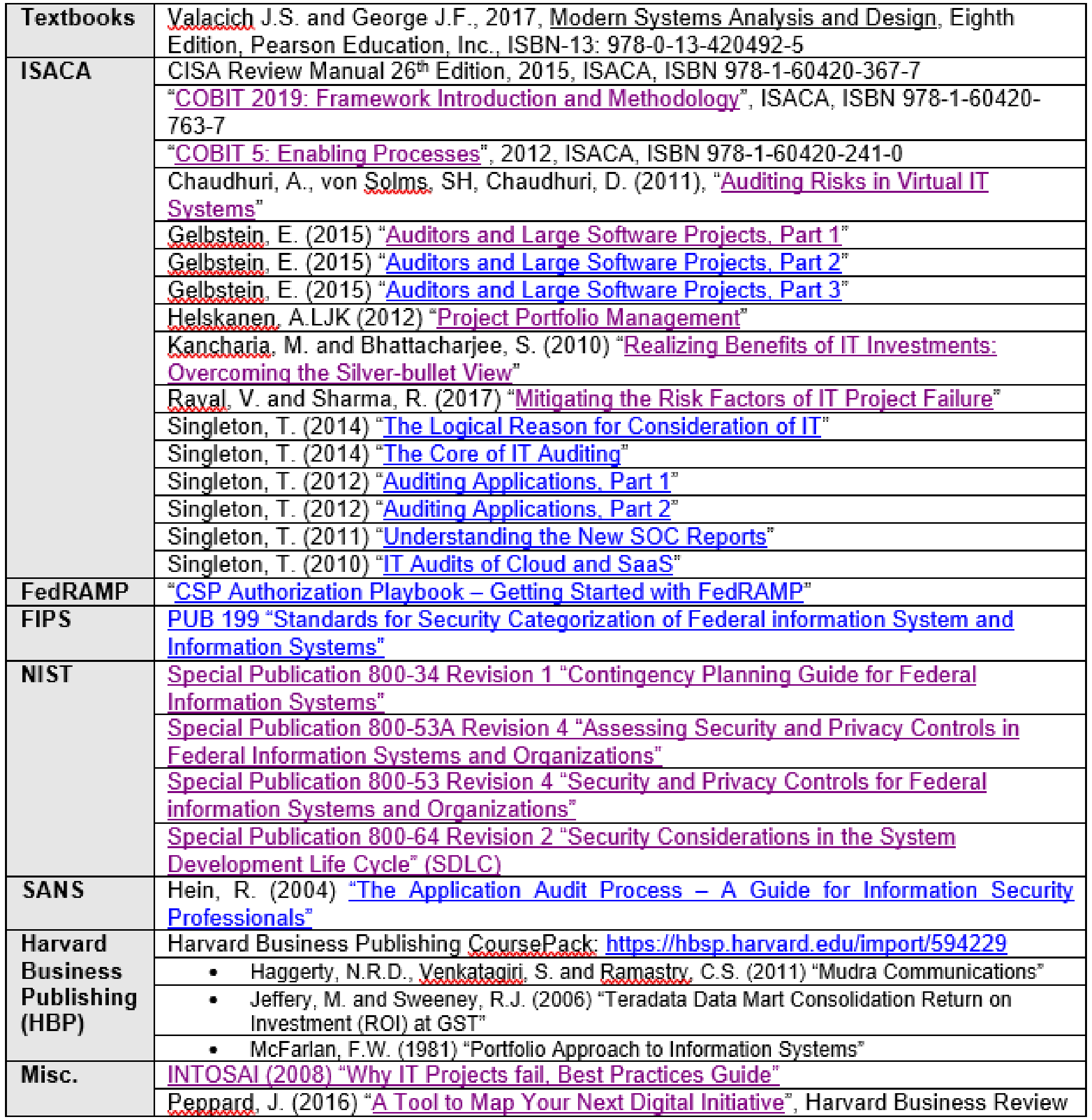
A Tool to Map Your Next Digital Initiative

by Joe Peppard

Given all the attention that "digital" is getting at the moment, you would be forgiven for thinking that it is somehow new. In fact, the relentless drive to embrace digital technologies has been ongoing for many decades.

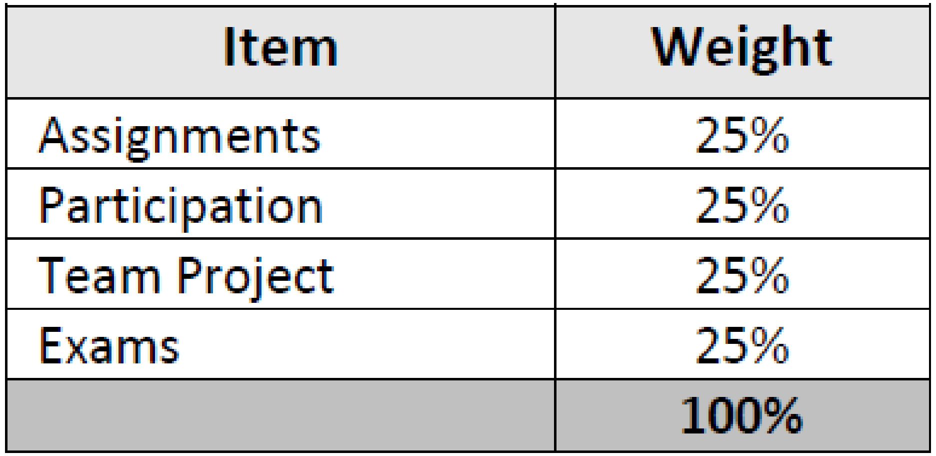
What also seems to have been forgotten are the lessons from these earlier attempts to leverage IT (remember that IT is a digital technology). Unfortunately, the history of IT investments in most organizations is far from stellar: Research over the years suggests that the overall failure rate of IT

Introduction - Readings



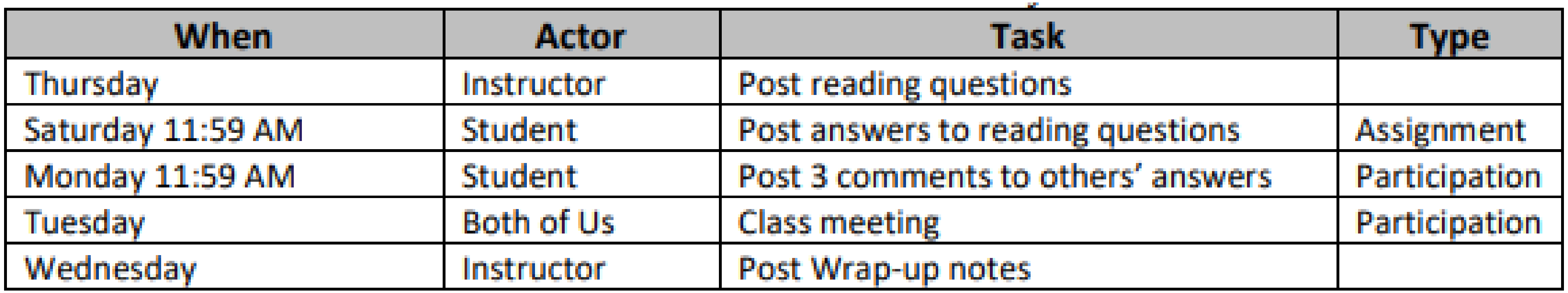
Textbooks	Valacich J.S. and George J.F., 2017, Modern Systems Analysis and Design, Eighth Edition, Pearson Education, Inc., ISBN-13: 978-0-13-420492-5
ISACA	CISA Review Manual 26th Edition, 2015, ISACA, ISBN 978-1-60420-367-7
	"COBIT 2019: Framework Introduction and Methodology", ISACA, ISBN 978-1-60420-763-7
	"COBIT 5: Enabling Processes", 2012, ISACA, ISBN 978-1-60420-241-0
	Chaudhuri, A., von Solms, SH, Chaudhuri, D. (2011), "Auditing Risks in Virtual IT Systems"
	Gelbstein, E. (2015) "Auditors and Large Software Projects, Part 1"
	Gelbstein, E. (2015) "Auditors and Large Software Projects, Part 2"
	Gelbstein, E. (2015) "Auditors and Large Software Projects, Part 3"
	Helskanen, A.LJK (2012) "Project Portfolio Management"
	Kancharia, M. and Bhattacharjee, S. (2010) "Realizing Benefits of IT Investments: Overcoming the Silver-bullet View"
	Raval, V. and Sharma, R. (2017) "Mitigating the Risk Factors of IT Project Failure"
	Singleton, T. (2014) "The Logical Reason for Consideration of IT"
	Singleton, T. (2014) "The Core of IT Auditing"
	Singleton, T. (2012) "Auditing Applications, Part 1"
	Singleton, T. (2012) "Auditing Applications, Part 2"
	Singleton, T. (2011) "Understanding the New SOC Reports"
	Singleton, T. (2010) "IT Audits of Cloud and SaaS"
FedRAMP	"CSP Authorization Playbook – Getting Started with FedRAMP"
FIPS	PUB 199 "Standards for Security Categorization of Federal information System and Information Systems"
NIST	Special Publication 800-34 Revision 1 "Contingency Planning Guide for Federal Information Systems"
	Special Publication 800-53A Revision 4 "Assessing Security and Privacy Controls in Federal Information Systems and Organizations"
	Special Publication 800-53 Revision 4 "Security and Privacy Controls for Federal information Systems and Organizations"
	Special Publication 800-64 Revision 2 "Security Considerations in the System Development Life Cycle" (SDLC)
SANS	Hein, R. (2004) "The Application Audit Process – A Guide for Information Security Professionals"
Harvard Business Publishing (HBP)	Harvard Business Publishing CoursePack: https://hbsp.harvard.edu/import/594229
	• Haggerty, N.R.D., Venkatagiri, S. and Ramastry, C.S. (2011) "Mudra Communications"
	• Jeffery, M. and Sweeney, R.J. (2006) "Teradata Data Mart Consolidation Return on Investment (ROI) at GST"
	• McFarlan, F.W. (1981) "Portfolio Approach to Information Systems"
Misc.	INTOSAI (2008) "Why IT Projects fail, Best Practices Guide"
	Peppard, J. (2016) "A Tool to Map Your Next Digital Initiative", Harvard Business Review

Introduction - Evaluation and Grading



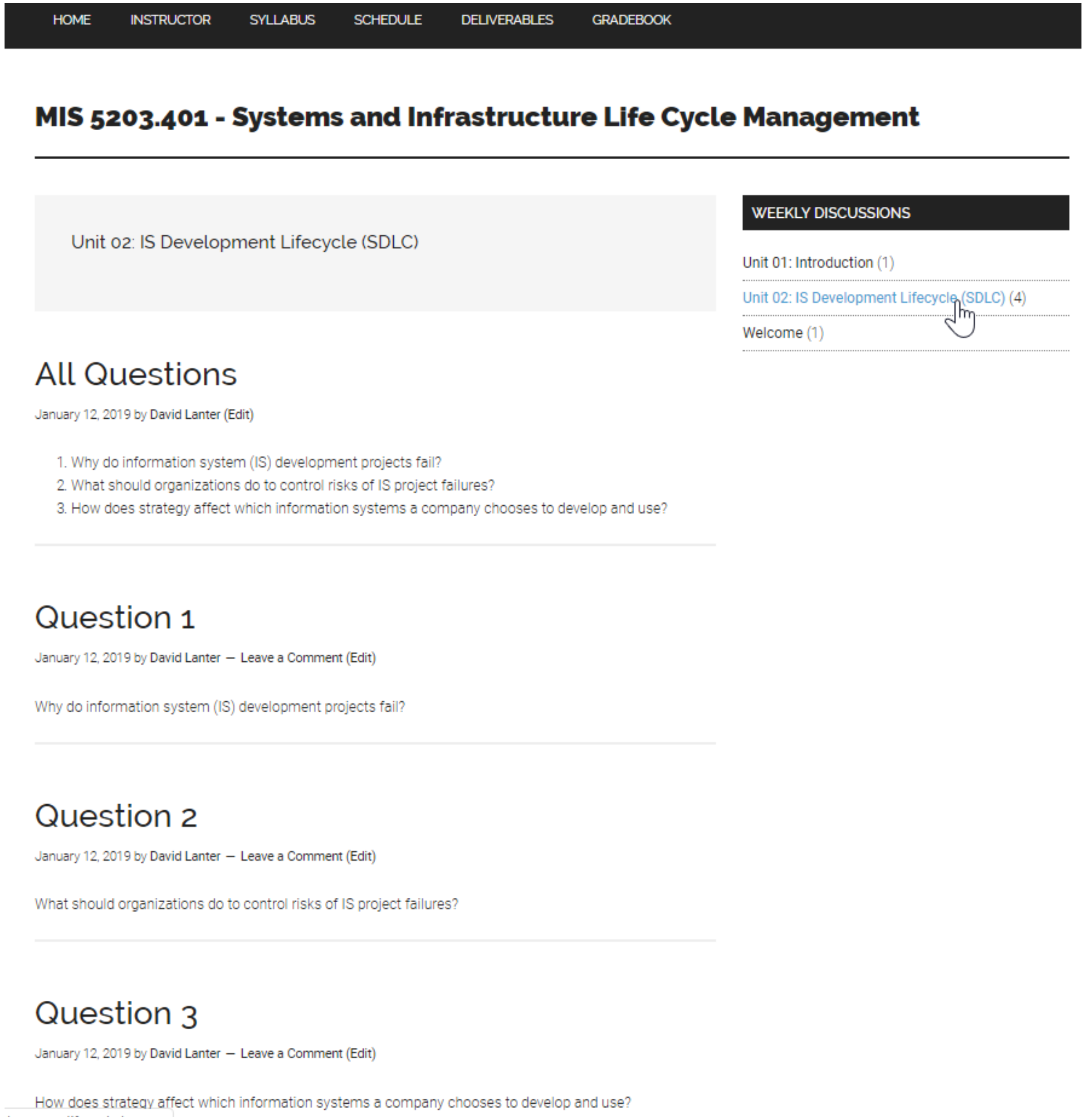
Item	Weight
Assignments	25%
Participation	25%
Team Project	25%
Exams	25%
	100%

Introduction - Weekly cycle



When	Actor	Task	Type
Thursday	Instructor	Post reading questions	
Saturday 11:59 AM	Student	Post answers to reading questions	Assignment
Monday 11:59 AM	Student	Post 3 comments to others' answers	Participation
Tuesday	Both of Us	Class meeting	Participation
Wednesday	Instructor	Post Wrap-up notes	

Introduction - Weekly Questions and Comments



MIS 5203.401 - Systems and Infrastructure Life Cycle Management

Unit 02: IS Development Lifecycle (SDLC)

WEEKLY DISCUSSIONS

- Unit 01: Introduction (1)
- Unit 02: IS Development Lifecycle (SDLC) (4)
- Welcome (1)

All Questions

January 12, 2019 by David Lanter (Edit)

1. Why do information system (IS) development projects fail?
2. What should organizations do to control risks of IS project failures?
3. How does strategy affect which information systems a company chooses to develop and use?

Question 1

January 12, 2019 by David Lanter — Leave a Comment (Edit)

Why do information system (IS) development projects fail?

Question 2

January 12, 2019 by David Lanter — Leave a Comment (Edit)

What should organizations do to control risks of IS project failures?

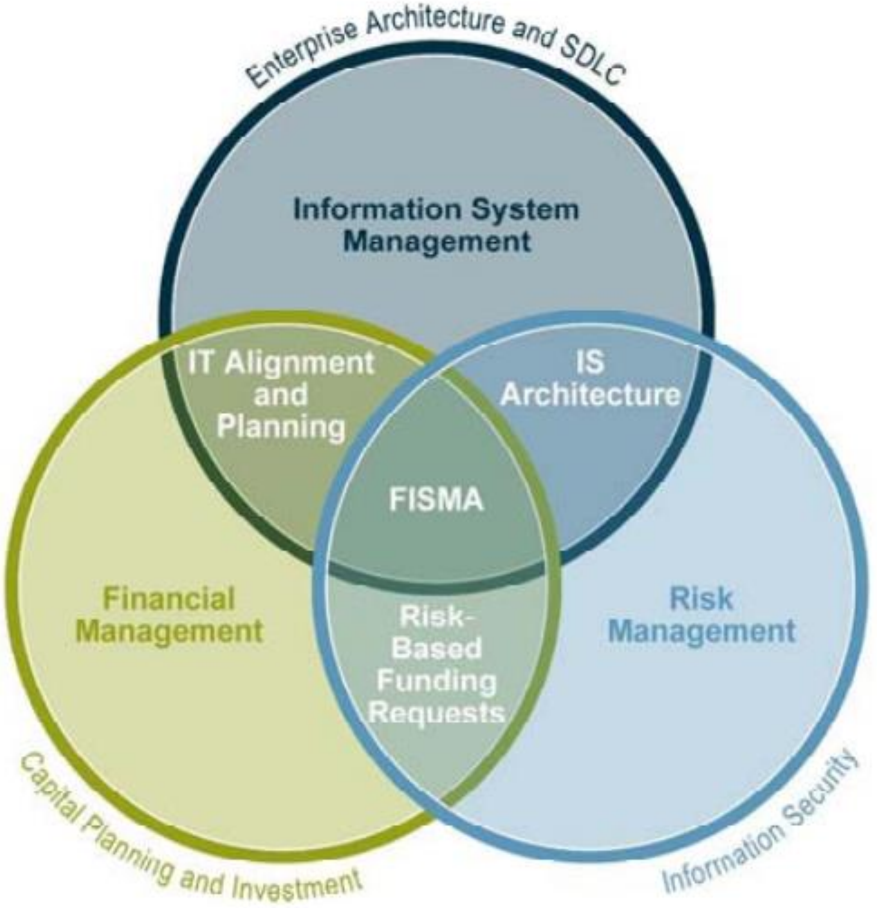
Question 3

January 12, 2019 by David Lanter — Leave a Comment (Edit)

How does strategy affect which information systems a company chooses to develop and use?

IT Auditors’ responsibilities

- Providing assurance that enterprise objectives are being met by information systems and infrastructure management practices
- Identifying which elements may represent greatest risk, and which controls are most effective at mitigating this risk

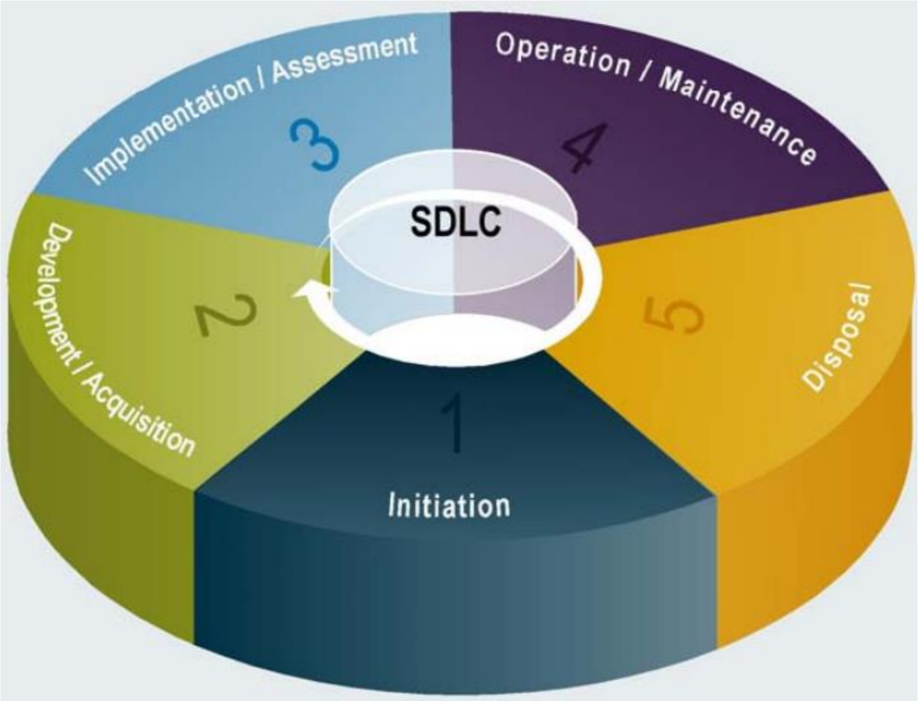


Enterprise Architecture and SDLC
Information System Management
IT Alignment and Planning
IS Architecture
FISMA
Financial Management
Risk-Based Funding Requests
Risk Management
Capital Planning and Investment
Information Security

NIST SP 800-64r2 Security Considerations in the System Development Life Cycle

IT Auditors are responsible for

- Understanding which methodologies are in use for:
  - Systems development, acquisition and maintenance
  - Identifying potential vulnerabilities and points requiring control
- Advising project team and senior management of deficiencies and best practices within each of these processes



NIST SP 800-64r2 Security Considerations in the System Development Life Cycle

IT Auditor’s Role in Information System Development

Two alternative approaches

1. Review end-stage deliverables throughout the development process, without becoming part of the process
   - Auditor reviews each stage’s deliverables to ensure:
     1. What was planned from the previous stage has been accomplished and the planning of the next stage has been refined appropriately
     2. Planning of the next stage has been refined appropriately

2. Internal control consultant, becoming part of the systems development process
   - Auditor provides ongoing proactive recommendations by participating in selected project-management meetings including: risk-assessment, systems-design, development, and systems delivery meetings
   - Auditor’s independence may be compromised, but this is mitigated by another auditor who should find a system with well-designed controls incorporated

IT Auditor’s Role in Information System Development

Produce and provide formal audit reports to the appropriate business managers including:

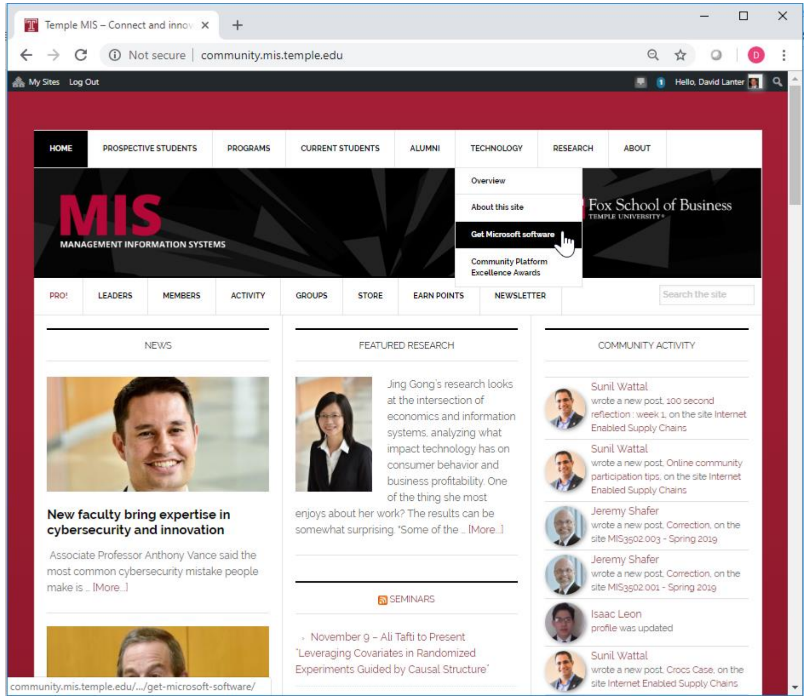
1. Overall assessment of the controlled progress of the project
2. Areas requiring improvement to complete the project, as specified, within budget and at an appropriate level of quality

Requires an in-depth understanding of both:

1. The overall information systems development processes adopted
2. The business processes being computerized

Acquire and install tools

- Microsoft Project
- Microsoft Visio



New faculty bring expertise in cybersecurity and innovation

Associate Professor Anthony Vance said the most common cybersecurity mistake people make is … [More…]

Jing Gong's research looks at the intersection of economics and information systems, analyzing what impact technology has on consumer behavior and business profitability. One of the thing she most enjoys about her work? The results can be somewhat surprising. "Some of the … [More…]

November 9 – Ali Tafti to Present "Leveraging Covariates in Randomized Experiments Guided by Causal Structure"

Sunil Wattal wrote a new post, 100 second reflection : week 1, on the site Internet Enabled Supply Chains

Sunil Wattal wrote a new post, Online community participation tips, on the site Internet Enabled Supply Chains

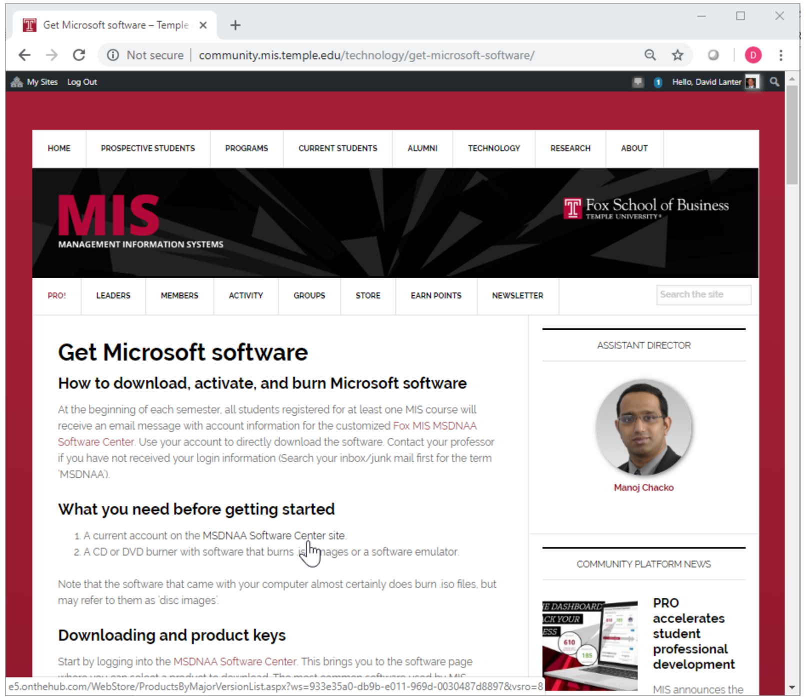
Jeremy Shafer wrote a new post, Correction, on the site MIS3502.003 - Spring 2019

Jeremy Shafer wrote a new post, Correction, on the site MIS3502.001 - Spring 2019

Isaac Leon profile was updated

Sunil Wattal wrote a new post, Crocs Case, on the site Internet Enabled Supply Chains

community.mis.temple.edu/.../get-microsoft-software/



Get Microsoft software

How to download, activate, and burn Microsoft software

At the beginning of each semester, all students registered for at least one MIS course will receive an email message with account information for the customized Fox MIS MSDNAA Software Center. Use your account to directly download the software. Contact your professor if you have not received your login information (Search your inbox/junk mail first for the term 'MSDNAA').

What you need before getting started

1. A current account on the MSDNAA Software Center site.
2. A CD or DVD burner with software that burns .iso images or a software emulator.

Note that the software that came with your computer almost certainly does burn .iso files, but may refer to them as 'disc images'.

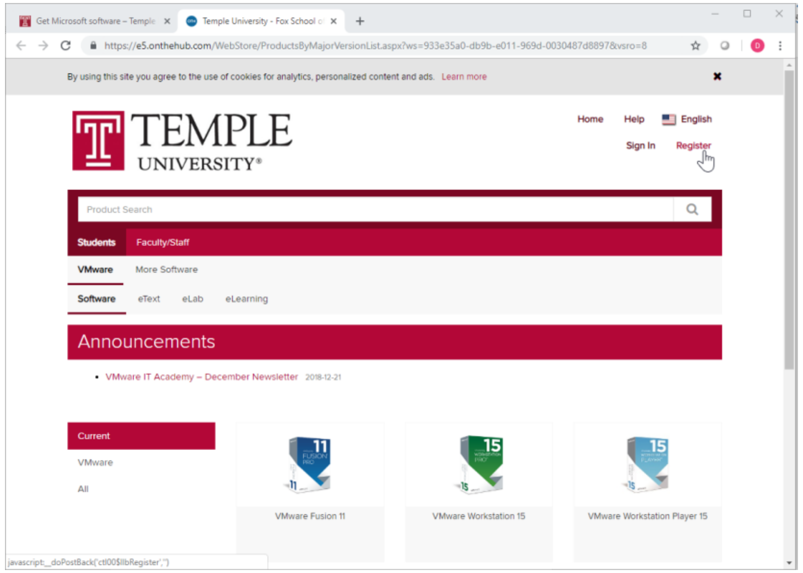
Downloading and product keys

Start by logging into the MSDNAA Software Center. This brings you to the software page

PRO accelerates student professional development

MIS announces the

e5.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?ws=933e35a0-db9b-e011-969d-0030487d8897&vsro=8


Get Microsoft software – Temple
Temple University - Fox School o
https://e5.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?ws=933e35a0-db9b-e011-969d-0030487d8897&vsro=8
TEMPLE UNIVERSITY
Home
Help
English
Sign In
Register
Product Search
Students
Faculty/Staff
VMware
More Software
Software
eText
eLab
eLearning
Current
VMware
All
VMware Fusion 11
VMware Workstation 15
VMware Workstation Player 15

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Announcements

- VMware IT Academy – December Newsletter 2018-12-21

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Information Systems Development – a brief history

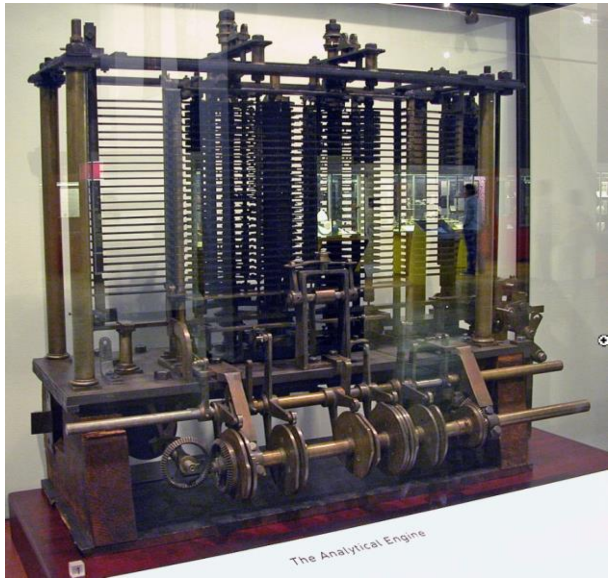
- **Prior 1946** - Before “stored-program” digital computers
  - Devices were pure hardware and had no software - their computing powers were directly tied to their specific form and engineering

  - Computing as a concept goes back to ancient times
    - Beginning with devices such as the **abacus**
      - Calculating tool used in China, Europe, and Russia centuries before adoption of written Hindu-Arabic numeral system we use today

    - Continuing on through early examples of computing such as the **Antikythera** mechanism
      - Ancient Greek analog computer used as a calendar to predict eclipses and astronomical positions decades in advance

Wikipedia – History of Software

Information Systems Development – a brief history



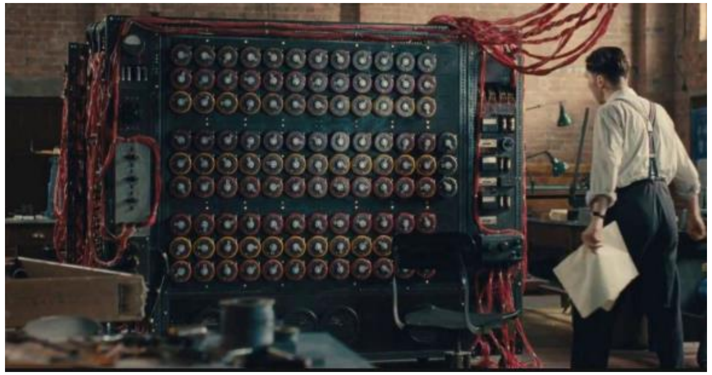
- **Prior 1946** - Before “stored-program” digital computers
  - 1837 – **The Analytical Engine**
    - First design for a general-purpose computer
    - Designed by English mathematician Charles Babbage
    - Incorporated:
      - Integrated memory
      - Arithmetic logic unit
      - Control flow in the form of conditional branching and loops
    - Logical structure essentially the same as the computer design that dominates in today’s electronic era
    - First known computer program was written by Ada Lovelace to implement Luigi Menabrea’s equations for generating a Bernoulli number sequence of rational numbers
      - The Analytical Engine predated the techniques of electrical engineering needed to run it

Wikipedia – History of Software

Information Systems Development – a brief history

Prior 1946 - Before “stored-program” digital computers

- **1935** – Alan Turing proposed the first modern theory of **software**
  - Software requires
    - A **general-purpose processor** - described as a Turing machine
    - **Computer memory**
      - In which reusable sets of routines and mathematical functions comprising programs can be stored, started, and stopped individually
  - This concept is recent in human history, led to the creation of the twin academic fields of **computer science** and **software engineering**

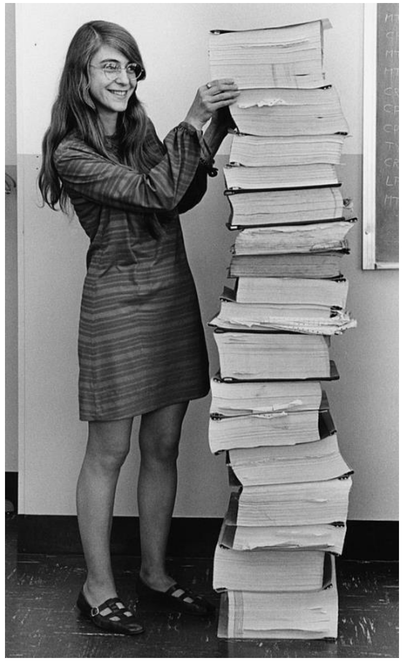


Wikipedia – History of Software

Information Systems Development – a brief history

- **1948 – 1979** Early days of computer software
  - 1948 - Claud Shannon “Father of Information Theory” wrote *A Mathematical theory of Communication* and provided an outline for how **binary logic** could be **implemented to program a computer**
    - Subsequently, the first computer programmers used binary code to instruct computers to perform various tasks
  - 1948 – ***Birth of Software*** Tim Kilburn at the University of Manchester UK wrote the first program code stored in an electronic memory to calculate the highest factor of an integer
  - 1950’s – 1960’s ***Development of high-level computer languages*** Fortran, LISP, COBOL and BASIC allowed programs to be specified in an abstract way, independent of the precise details of the hardware architecture of the computer

Grace Hopper developed the “self-documenting” COBOL (COmmon Business Oriented Language)



Margaret Hamilton led development of the onboard flight software for NASA’s Apollo spacecraft coined the term “software engineering”

Wikipedia – History of Software

Information Systems Development – a brief history

- **1948 – 1979** Early days of computer software
  - 1960's – Massachusetts Institute of Technology, AT&T Bell Labs, and General Electric jointly developed an experimental **time sharing operating system** called Multics
    - Allowing multiple users to access a ***mainframe computer*** simultaneously
  - 1970's – Bell Lab's researchers left the team and implemented a **self-hosting operating system that became UNIX** on a ***minicomputer***
    - Included concepts of computer processes, device files, hierarchical file system, command-line interpreter, editor, programing shell, and assembler
    - Text editor and first text formatting and publishing program written in assembly language
    - 1971 – *UNIX Programmer's Manual written*
    - 1973 – Unix Version 3 rewritten in higher-level C language
    - Most popular variant of Unix today is macOS Mac OS X
    - Linux is closely related

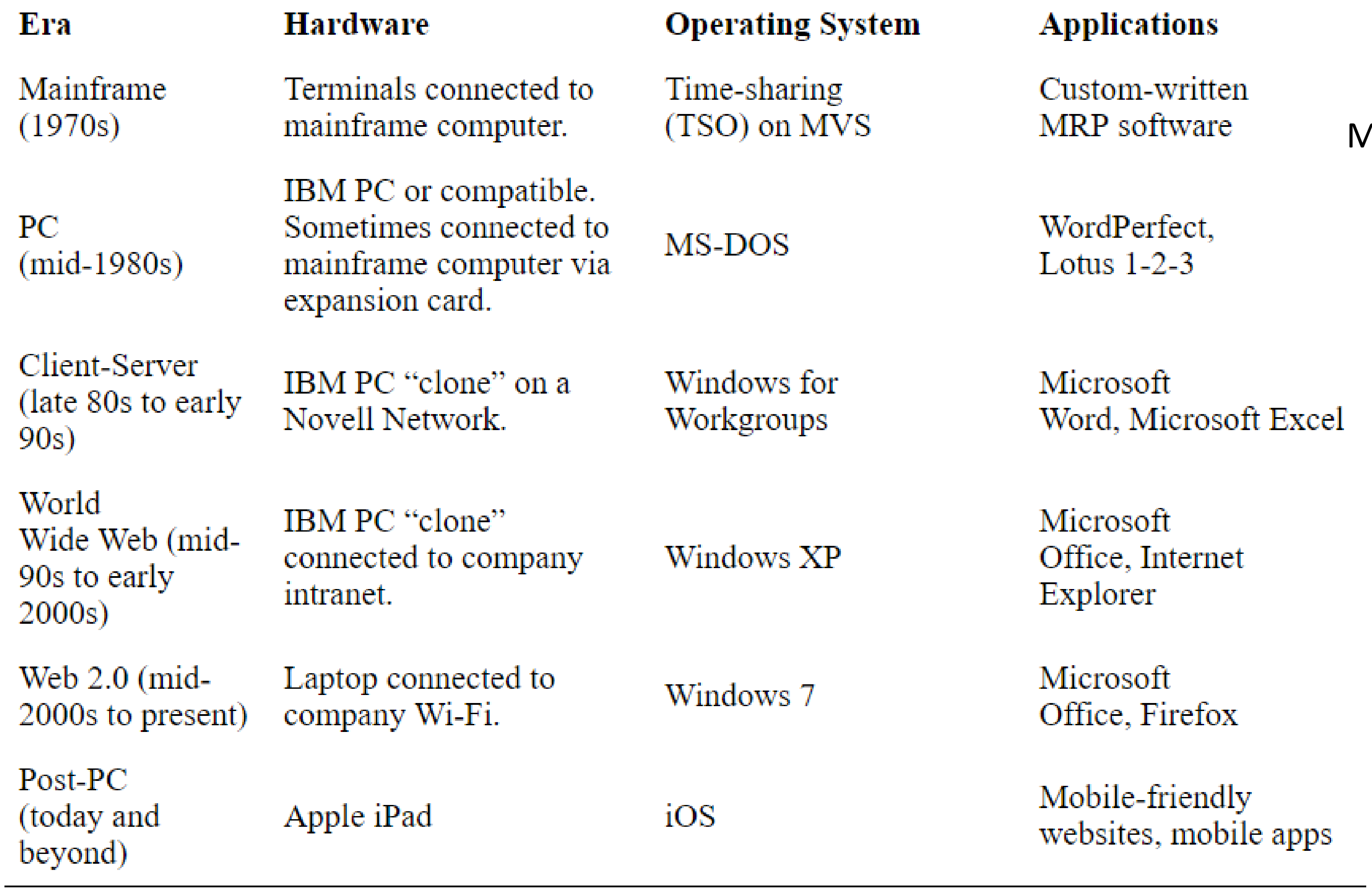
Wikipedia – History of Software

Information Systems Development – a brief history

- **1975 -** Early days of computer software
  - 1975 – Micro Instrumentation and Telemetry Systems begins selling Altair 8800 microcomputer kit by mail order
    - Microsoft released its first product Altair BASIC Operating system
  - Before microcomputers – a successful software program sold for $50,000 - $60,000 each in units of 1,000 units; PC software sold thousands of copies for $50 - $700 each

Wikipedia – History of Software

Information systems Development – a brief history



Era	Hardware	Operating System	Applications
Mainframe (1970s)	Terminals connected to mainframe computer.	Time-sharing (TSO) on MVS	Custom-written MRP software
PC (mid-1980s)	IBM PC or compatible. Sometimes connected to mainframe computer via expansion card.	MS-DOS	WordPerfect, Lotus 1-2-3
Client-Server (late 80s to early 90s)	IBM PC "clone" on a Novell Network.	Windows for Workgroups	Microsoft Word, Microsoft Excel
World Wide Web (mid-90s to early 2000s)	IBM PC "clone" connected to company intranet.	Windows XP	Microsoft Office, Internet Explorer
Web 2.0 (mid-2000s to present)	Laptop connected to company Wi-Fi.	Windows 7	Microsoft Office, Firefox
Post-PC (today and beyond)	Apple iPad	iOS	Mobile-friendly websites, mobile apps

Manufacturing Resource Planning (ERP)

Enterprise Resource Planning (ERP)

https://bus206.pressbooks.com/chapter/chapter-1/

Information Systems Development – a brief history

- **First-generation computer programming Languages “1GLs” (1948 – 1950’s)**

- **Second-generation “2GLs” (1950’s - today)**

- **Third-generation “3GLs” (1950’s – today)**

- **Fourth-generation “4GLs” (1970’s – today)**

- **Fifth-generation “5GLs” (1980’s – today)**

Citation: https://www.revolvy.com

Information Systems Development – a brief history

- **First-generation "1GLs" (1948 – 1950's)**
  - Binary machine languages entered through front panel switches
- **Second-generation "2GLs" (1950's - today) -** Machine-dependent assembly languages
  - Code read and written by a programmer, to run on a computer it must be converted into a machine readable form, a process called assembly
  - Assembly language is specific to a particular processor family and environment (today usually found in device drivers)
  - Considered "**low-level**" because they are designed for and executed by physical hardware without further translation required.
- **Third-generation "3GLs" (1950's – today) -** High-level programming languages, such as FORTRAN, LISP, COBOL, BASIC, Pascal, C, C++, C#, Java, and Javascript
  - Machine independent, more programmer-friendly, considered "**high-level"** because they are closer to human languages and further from machine languages, and hence require compilation or interpretation
  - Must be translated into machine language by a compiler or directly into behavior by an interpreter or compiler
  - Support structured programming, some support object-oriented programming

Citation: https://www.revolvy.com

Information Systems Development – a brief history

- **Fourth-generation "4GLs" (1970's – today)** - Add additional features within general purpose 3GL environments, attempt to get closer to human language and require less coding than lower-level languages, such as Python, Ruby and Perl
  - Command-line languages that may includes support for general processing (e.g. UNIX Shell, Visual DataFlex, PowerBuilder, Cognos PowerHouse 4GL, DataFlex, IBM Rational EGL, Oracle Application, Development Framework,…)
  - Database management (e.g. SQL, FOCUS, OPenROAD, NATURAL, Informix-4GL,..)
  - Report generation (e.g. RPG-II, Oracle Reports, Progress 4GL)
  - Data manipulation and mathematical analysis (e.g. SAS, SPSS, R, S, PL/SQL, Stata, MATLAZB, MathProg,…)
  - Graphical User Interface (GUI) development (XUL, Visual DataFlex, Progress 4GL, OPenRoad, 4th Dimension,…) ,
  - Web development (e.g. ActiveVFP, CFML, Wavemaker, OutSystems…)

- **Fifth-generation "5GLs" (1980's – today) -** Solve problems by providing constraints to a general inferencing program without a programmer writing additional code or developing additional algorithms
  - Mainly used in artificial intelligence languages built on LISP (e.g. OPS5, SNEPS, Mercury…)
  - In 1980s, fifth-generation languages considered "way of the future". Some predicted they would replace all other languages for system development, with exception of low-level languages
  - 1982 to 1993, Japan invested heavily in 5th generation computer systems project, hoping to design a massive computer network of general inferencing machines
  - Development of larger programs revealed flaws of the approach
    - Given a set of constraints defining a particular problem, deriving an efficient algorithm to solve it is a very difficult problem
    - This crucial step cannot yet be automated and still requires the insight of a human developer

Citation: https://www.revolvy.com

Information Systems Development – a brief history

Most information systems today are developed with a combination of 3GL and 4GL capabilities

Third-generation "3GLs" (1950's – today)

- High-level programming languages, such as FORTRAN, LISP, COBOL, BASIC, Pascal, C, C++, C#, Java, and Javascript

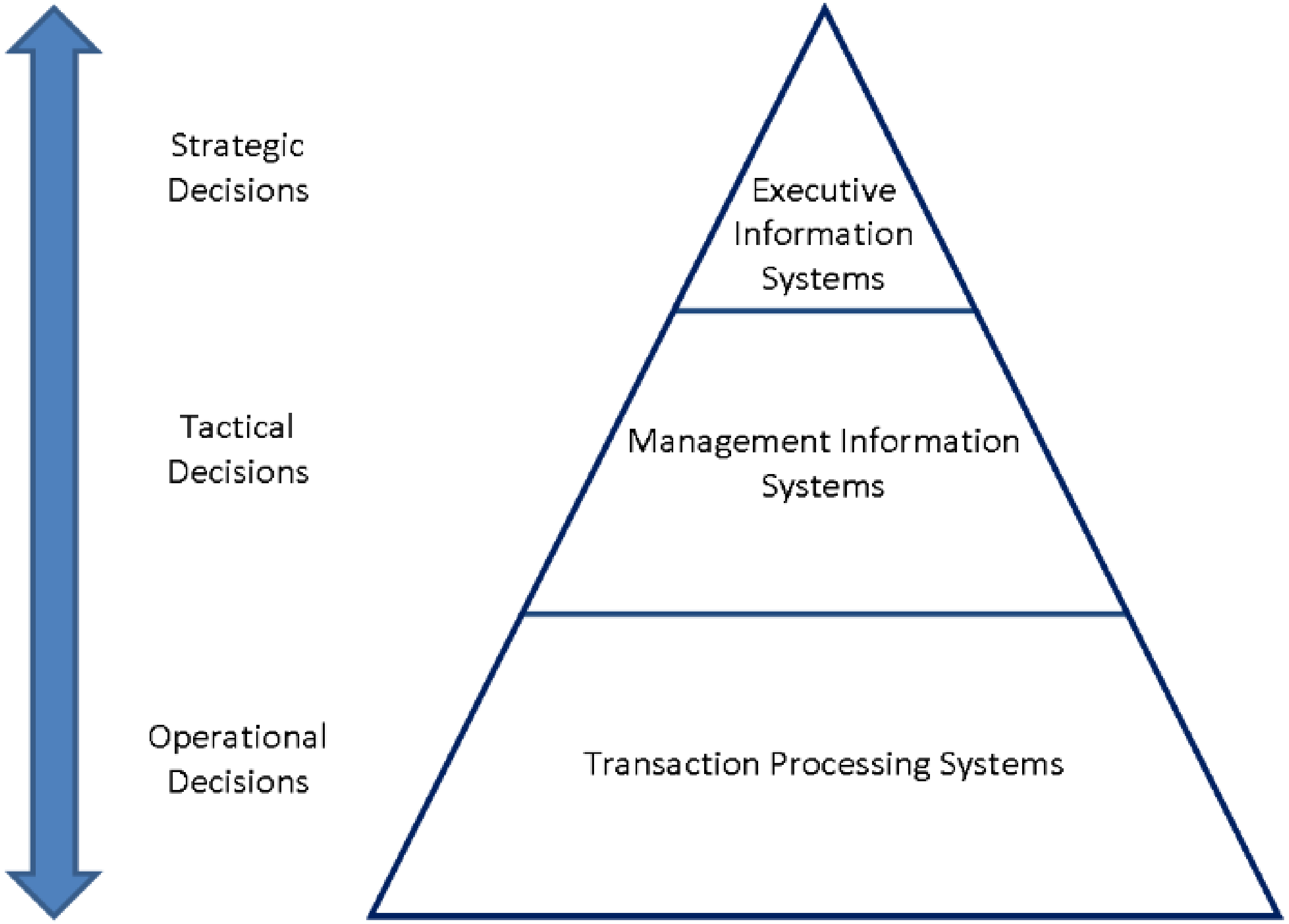
Fourth-generation "4GLs" (1970's – today)

- Add additional features within general purpose 3GL environments, attempt to get closer to human language and require less coding than lower-level languages, such as Python, Ruby and Perl

Citation: https://www.revolvy.com

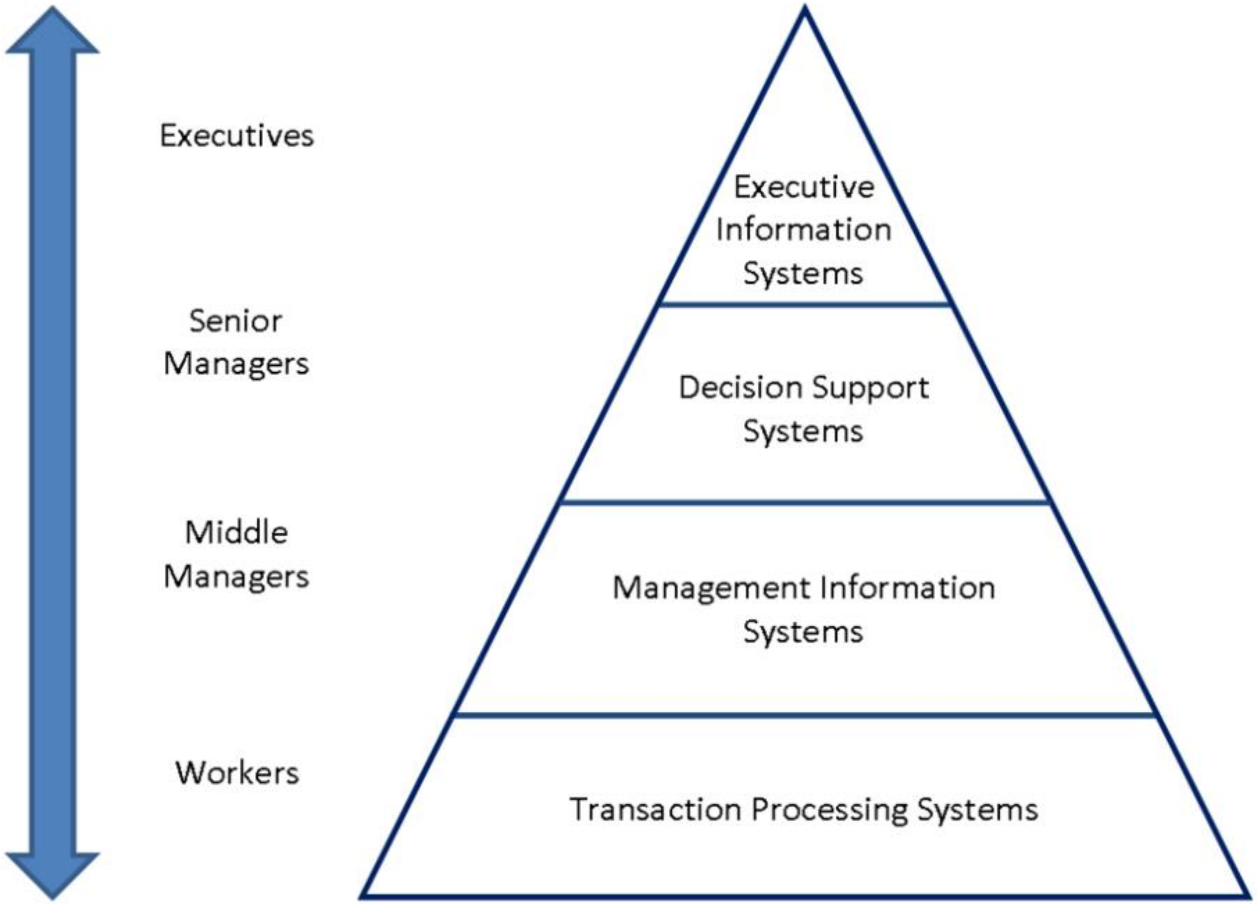
Types of Business Information Systems

What types of information systems are used in businesses today?


Strategic Decisions
Tactical Decisions
Operational Decisions
Executive Information Systems
Management Information Systems
Transaction Processing Systems

Types of Business Information Systems

What types of information systems are used in businesses today?



Executives
Senior Managers
Middle Managers
Workers
Executive Information Systems
Decision Support Systems
Management Information Systems
Transaction Processing Systems

Some categories of Business Information Systems

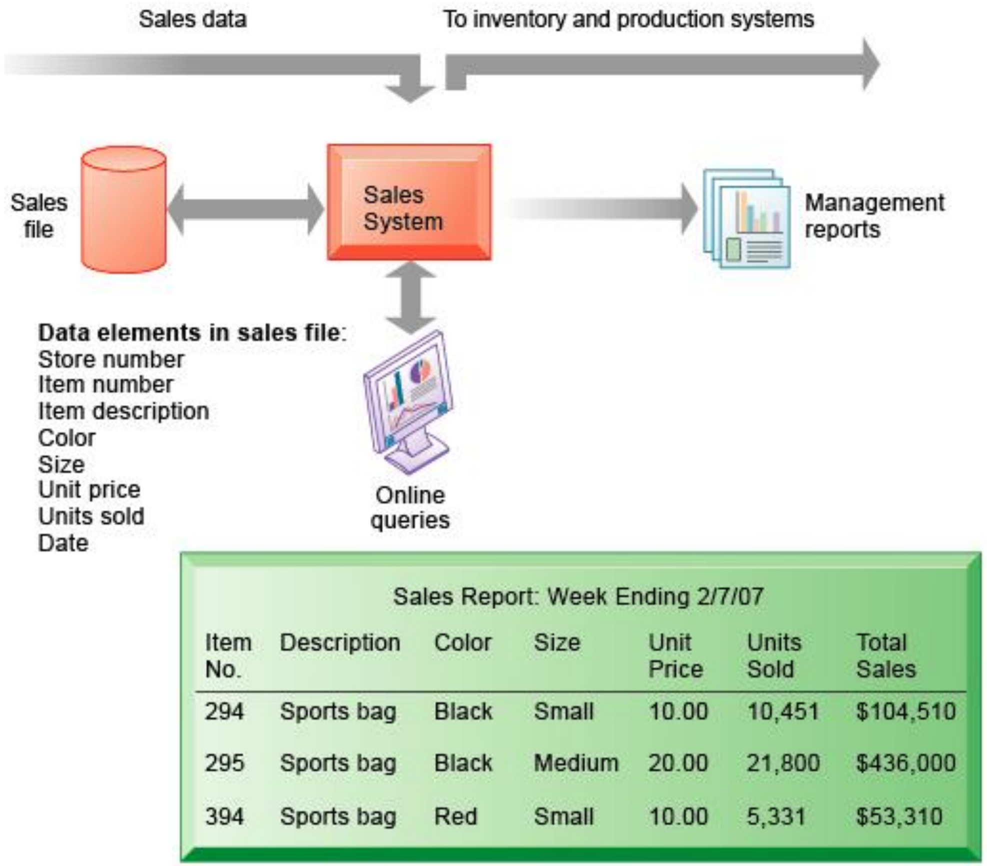
Sales and marketing information systems

Help the firm with marketing business processes

- identifying customers for the firm's products or services
- developing products and services to meet their needs
- promoting products and services

and sales processes

- selling the products and services
- taking orders contacting customers
- providing customer support



Data elements in sales file:
Store number
Item number
Item description
Color
Size
Unit price
Units sold
Date

Sales Report: Week Ending 2/7/07

Item No.	Description	Color	Size	Unit Price	Units Sold	Total Sales
294	Sports bag	Black	Small	10.00	10,451	$104,510
295	Sports bag	Black	Medium	20.00	21,800	$436,000
394	Sports bag	Red	Small	10.00	5,331	$53,310

Laudon, K.C. and Laudon, J.P. Management Information Systems 10th Edition

Some categories of Business Information Systems

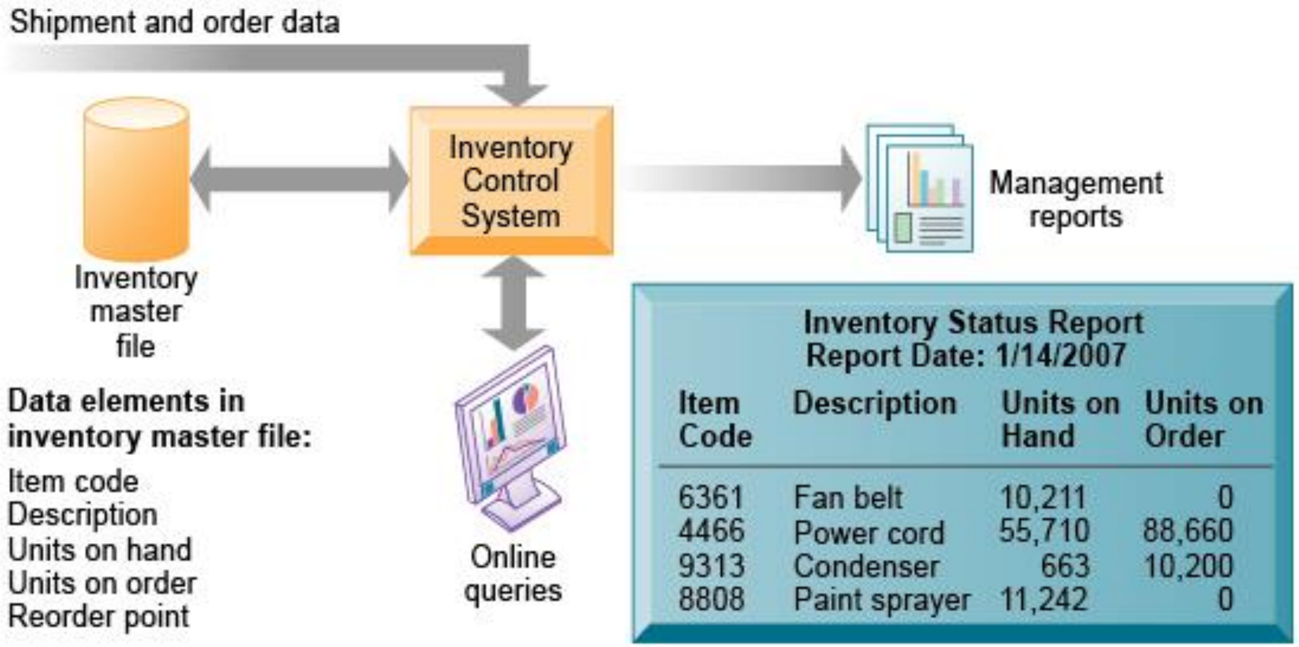
Manufacturing and production information systems

Deal with

- planning
- development
- production

of products and services

and controlling the flow of production



Inventory Status Report
Report Date: 1/14/2007

Item Code	Description	Units on Hand	Units on Order
6361	Fan belt	10,211	0
4466	Power cord	55,710	88,660
9313	Condenser	663	10,200
8808	Paint sprayer	11,242	0

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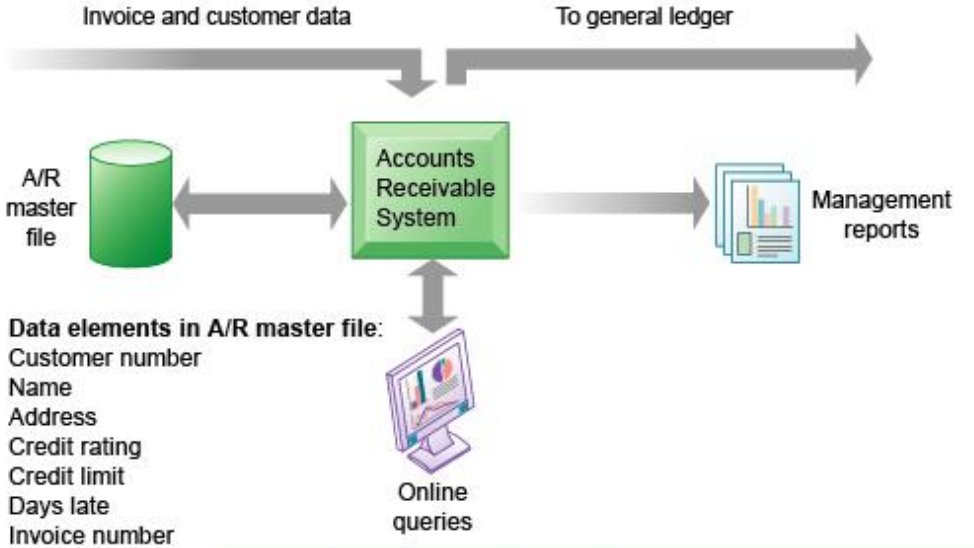
Some categories of Business Information Systems

Finance and accounting information systems

Keep track of the firm's financial assets and fund flows



Data elements in A/R master file:
Customer number
Name
Address
Credit rating
Credit limit
Days late
Invoice number
Amount paid
Balance

Accounts Receivable Aging Report

Cust. No.	Name	Current Balance	1–30 Days Past Due	31–60 Days Past Due	61+ Days Past Due	Total
5043	Myers Co.	0	500.00			500.00
6219	JT Garden	1,500.00		700.00		2,200.00
6932	Best Home	1,000.00				1,000.00

Laudon, K.C. and Laudon, J.P. Management Information Systems 10th Edition

Some categories of Business Information Systems

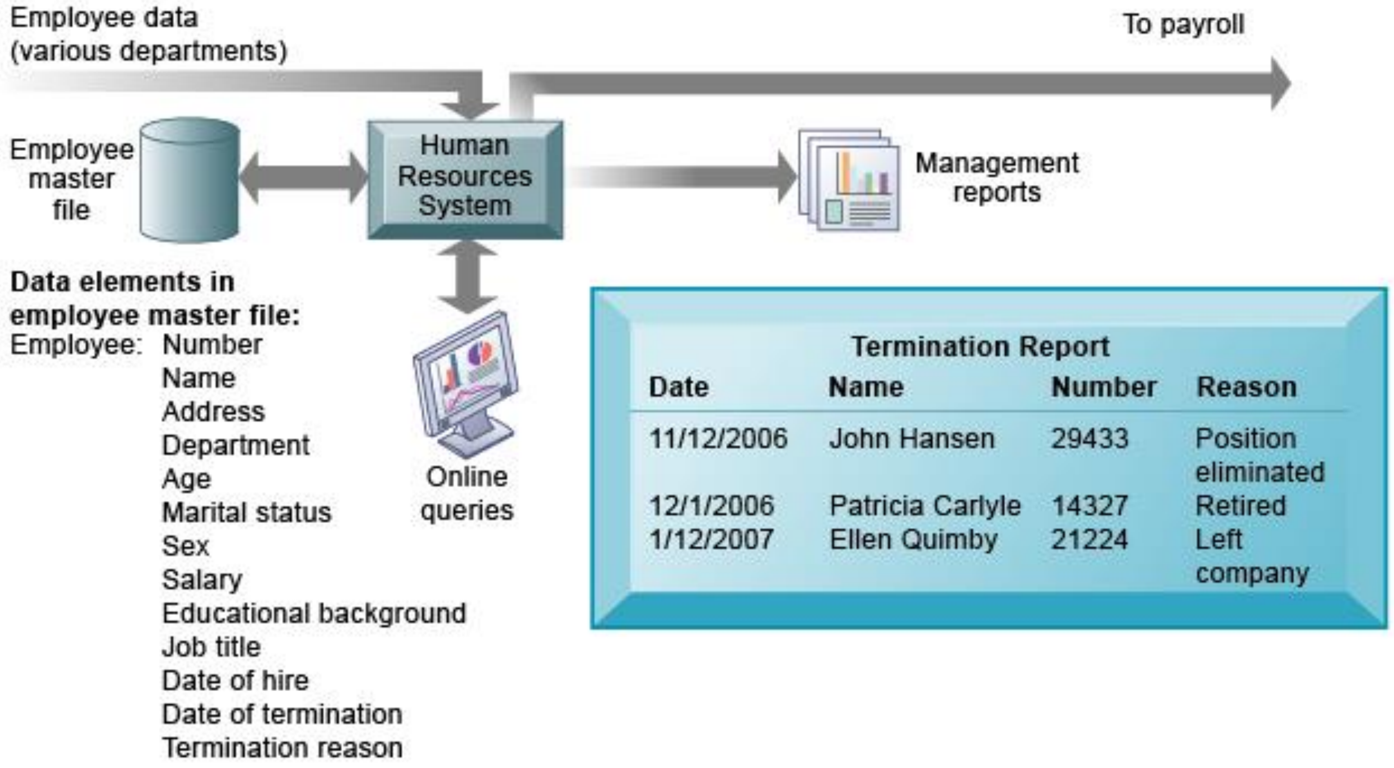
Human resources information systems

Maintain employee records, tracking

- employee skills
- job performance
- Training

Support planning for

- employee compensation
- career development



Data elements in employee master file:

Employee: Number
Name
Address
Department
Age
Marital status
Sex
Salary
Educational background
Job title
Date of hire
Date of termination
Termination reason

Termination Report

Date	Name	Number	Reason
11/12/2006	John Hansen	29433	Position eliminated
12/1/2006	Patricia Carlyle	14327	Retired
1/12/2007	Ellen Quimby	21224	Left company

Laudon, K.C. and Laudon, J.P. Management Information Systems 10th Edition

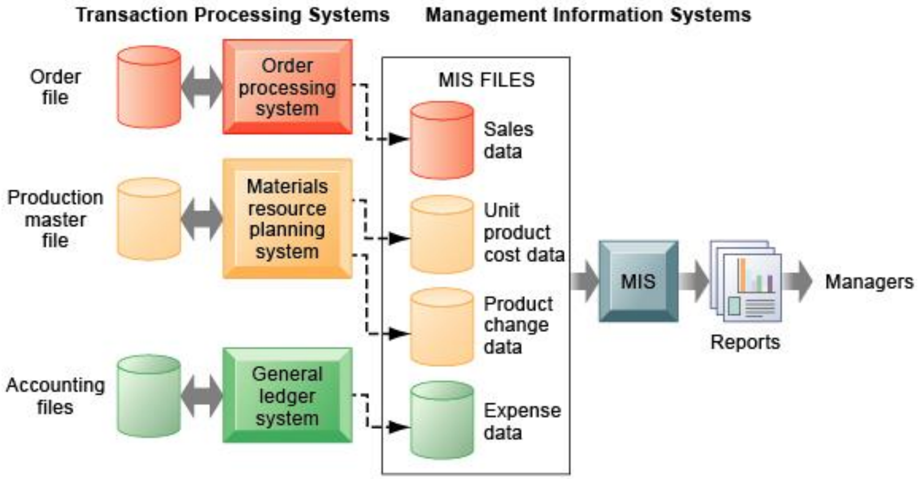
Some categories of Business Information Systems

1. **Transaction processing systems (TPS)**

   Basic business systems serving operations by recording daily routine transactions for conducting business, such as payroll and sales receipts

2. **Management information systems (MIS)**

   Provide current and historical performance information aiding planning, controlling, and decision making.



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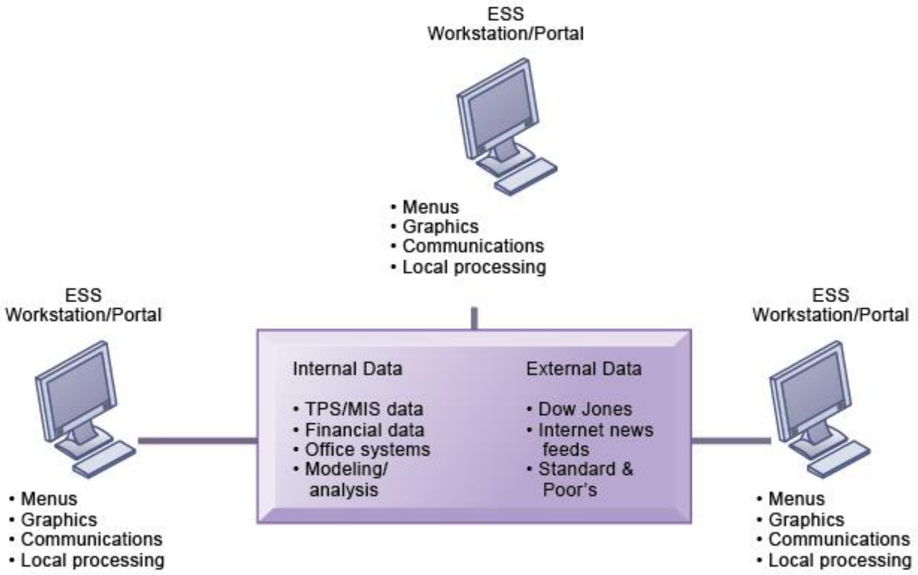
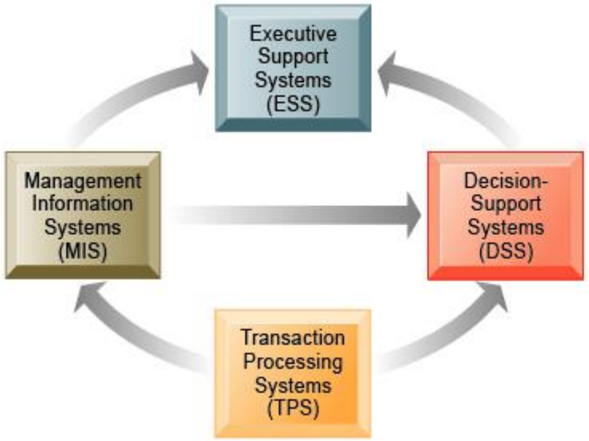
Some categories of Business Information Systems

3. **Decision support systems (DSS)** a.k.a. business intelligence systems
   - Support non-routine decisions not easily specified in advance
   - Use a variety of analytic models applied to large amounts of internal and external data
4. **Executive support systems (ESS)**
   - For non-routine strategic decisions requiring judgment, evaluation, and insight
   - Visual presentations of data within an interactive interface easy for senior managers to use
   - Information often delivered via a web portal as integrated information




Executive Support Systems (ESS)
Management Information Systems (MIS)
Decision-Support Systems (DSS)
Transaction Processing Systems (TPS)

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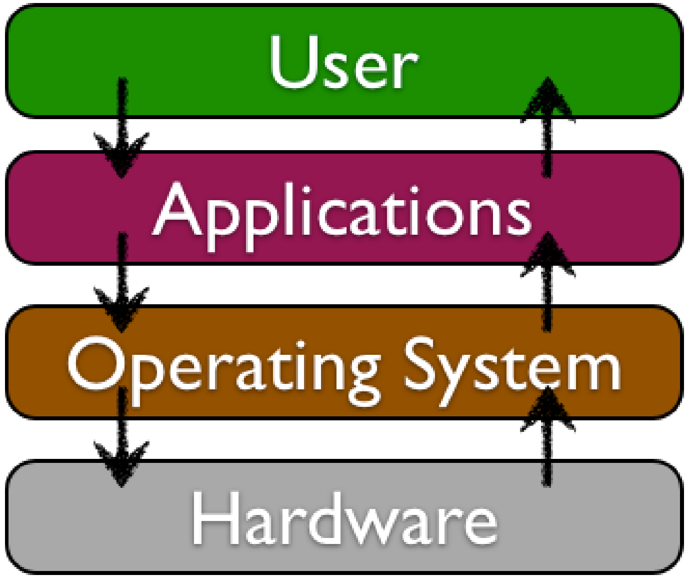
Components of Information Systems

- **Hardware**- these are the devices like the monitor, processor, printer and keyboard, all of which work together to accept, process, show data and information
- **Networks**- are a connecting system that allows diverse computers to distribute resources.
- **Software**- are the programs that allow the hardware to process the data.
  - **Databases**- are the gathering of associated files or tables containing related data.
  - **Procedures**- are the commands to the software and databases (for combining the components above to process information and produce the preferred output)

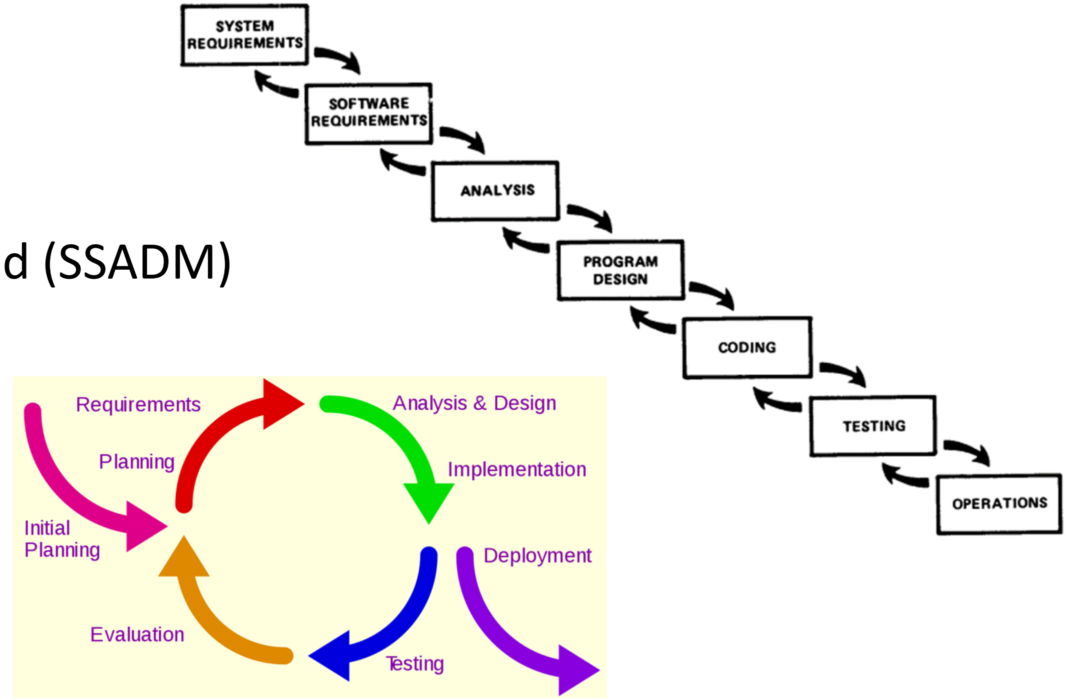


Information System Development Methods – Next week Unit #2

Software development lifecycle (SDLC) models are formal management processes for guiding the development of information systems

These include:

- Waterfall Models
  - Waterfall
  - Structured Systems Analysis and Design Method (SSADM)
- Spiral and Iterative Models
  - Structured Rapid Prototyping
  - Rapid Application development (RAD)
  - Agile Models
  - Rational Unified Model



If execution of the SDLC methodology is inadequate, however, the project may fail to meet business and user needs.

- ***IS Auditor is responsible for verifying that the SDLC model is appropriate for the project’s goals and is properly implemented***

Quiz

Normally, it would be essential to involve which of the following stakeholders in the initiation stage of a project?

a) System owners
b) System users
c) System designers
d) System builders

An IS auditor has been asked to participate in project initiation meetings for a critical project. The IS auditor's MAIN concern should be that the:

a) complexity and risk associated with the project have been analyzed.
b) resources needed throughout the project have been determined.
c) technical deliverables have been identified.
d) a contract for external parties involved in the project has been completed.