Chapter 9: People in Information Systems

- The Creators of Information Systems
  - Systems Analyst
  - Programmer
  - Computer Engineer
    - Hardware engineer
    - Software engineer
    - Systems engineer
    - Network engineer
- Info-Systems Operations and Administration
  - Computer Operator
  - Database Administrator
  - Help-Desk/Support Analyst
  - Trainer

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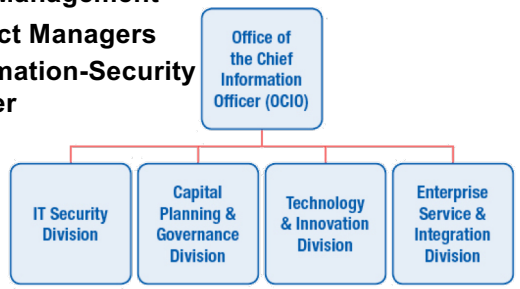
Managing Information Systems

- CIO or Chief Information Officer
- Functional Manager
- ERP Management
- Project Managers
- Information-Security Officer



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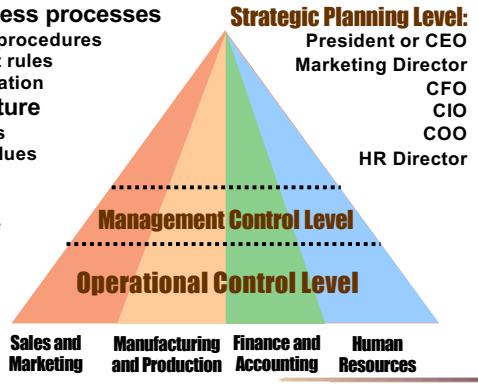
Organizational Dimension of Information Systems

- Separate business functions within hierarchy
- Unique business processes
  - Operational procedures
  - Management rules
  - IT for Automation
- Business culture
  - Assumptions
  - Accepted Values
  - Ethics
- Politics
  - Compromise
  - Resources
  - Conflict



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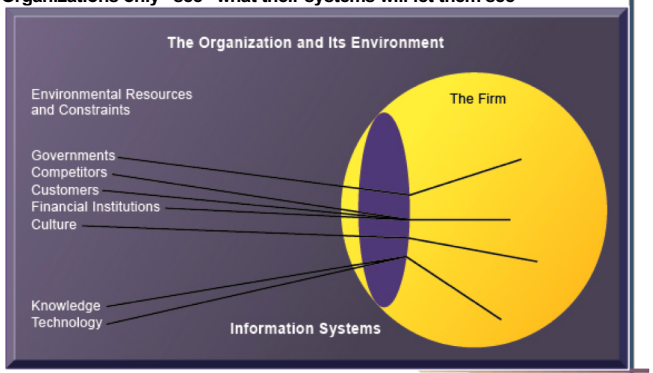
Environments and Organizations

- Organizations are open to, dependent on, and can influence environment
- Organizations only "see" what their systems will let them see



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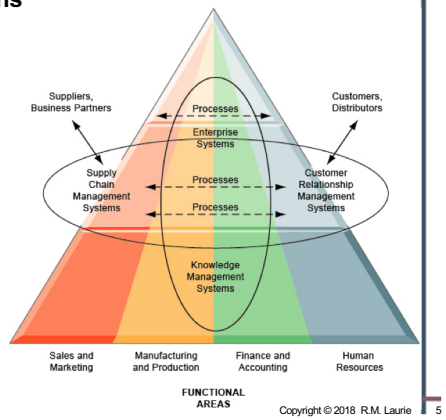
Enterprise Application Architecture

Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization



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Systems that Span the Enterprise

- Enterprise applications
  - Span functional areas
  - Execute business processes across firm
  - Include all levels of management
- Major applications:
  - Enterprise Resouce Planning systems (All Layers)
  - Executive Support Systems (Strategic Management)
  - Decision Support Systems (Middle Management)
  - Supply Chain Management systems (Operational)
  - Transaction Processing Systems (Operational)
  - Customer Relationship Management systems (Operational)

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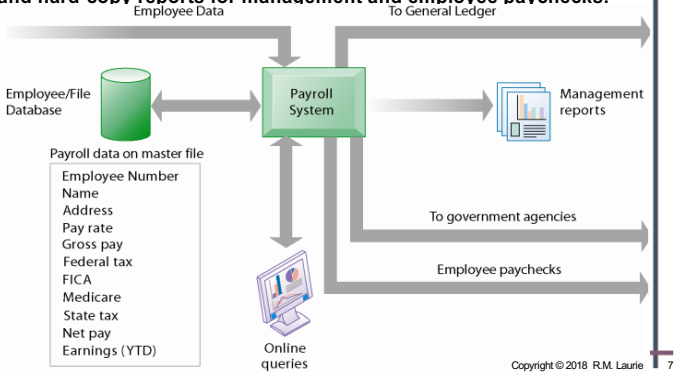
Transaction Processing Systems

TPS for payroll processing inputs employee wage transaction data (such as a time card). System outputs include online and hard-copy reports for management and employee paychecks.



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Quality Management

- Fine-tuning business processes to improve quality in their products, services, and operations
  - The earlier in the business cycle a problem is eliminated, the less it costs the company
  - Quality improvements lower costs
- Total Quality Management (TQM):
  - Achievement of quality control is end in itself
  - Everyone is expected to contribute to improvement of quality
  - Focuses on continuous improvements over time
  - Goal is zero defects in product manufacturing
  - W. Edwards Demming
    - Founder of Quality Management in Japan and later USA
    - Demming's 14 points of Quality Management
- Common Quality Standards
  - ISO9000 ISO9001
    - Corporate certification describes that they are managing business processes in an effective way
  - Six sigma: Statistical analysis tools to detect flaws and adjust

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Total Quality Management

- Dr Demming TQM 1 2 3 in Japan 1970's in USA 1980's
  - Deming's concepts based on statistical process control
  - Deming's Seven Deadly Diseases of Management
    1. Lack of constancy of purpose
    2. Management by use only of data, with little consideration of data that are unknown or unknowable
    3. Evaluation of performance, merit rating, or annual review
    4. Emphasis on short-term profits
    5. Mobility of management; job hopping
    6. Excessive costs of liability
    7. Excessive medical costs
  - Demming Videos to view
    1. Demming - Part 1 https://youtu.be/GHvnlm9UEoQ
    2. Demming - Part 2 https://youtu.be/mKFGj8sK5R8
    3. Demming - Part 3 https://youtu.be/6WeTaLRb-Bs
    4. https://deming.org/explore/seven-deadly-diseases
    5. https://deming.org/explore/fourteen-points

ISO 9001:2015

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Chapter 10: Information Systems Development

- Structural organizational change enabled by IT
  - **Automation =** replace manual tasks increase efficiency
  - **Rationalization**= Streamline operating procedures
- Business process reengineering (BPR)
  - Analyze, simplify, and redesign business processes
  - Benefits result from redesigning business processes
  - **Work flow management** - Process of streamlining business procedures documents for efficiently
  - Understand how improving the right processes will help the firm execute its business strategy
  - Measure performance of current processes
  - **Paradigm shifts**
    - Rethink nature of business, define new business model, change nature of organization

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Business Process Management (BPM)

- Helps firms manage incremental process changes that are less disruptive BPR
- Uses process-mapping tools to:
  - Identify and document existing processes
  - Create models of improved processes that can be translated into software systems
  - Measure impact of process changes on key business performance indicators
- Includes:
  - Work flow management
  - Quality measurement and management
  - Change management
  - Process monitoring and analysis

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Business Process Modeling

- Used to document Business Processes
- Modeling methodologies
  - **Entity Relationship Diagrams**
  - **Data dictionary:** Contents of data tables
  - **Flow Charts** – describes sequential processes that branch based on decisions or repeat
  - **Data flow diagram –** models **p**rocesses and data flow
  - **Process specifications:** Describes transformation occurring within lowest level of data flow diagrams

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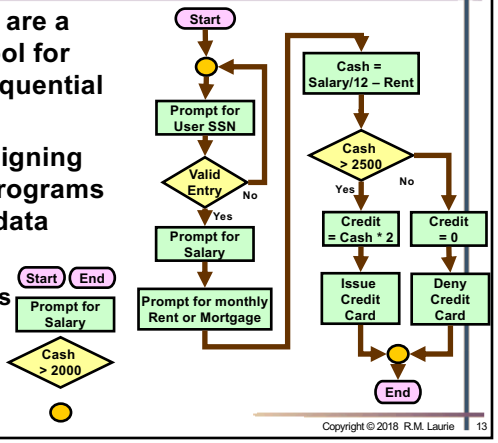
Flow Charts

- Flow charts are a modeling tool for mapping sequential processes
- Tool for designing computer programs to process data
- Symbols
  - Terminators
  - Processes
  - Selection
  - Junction



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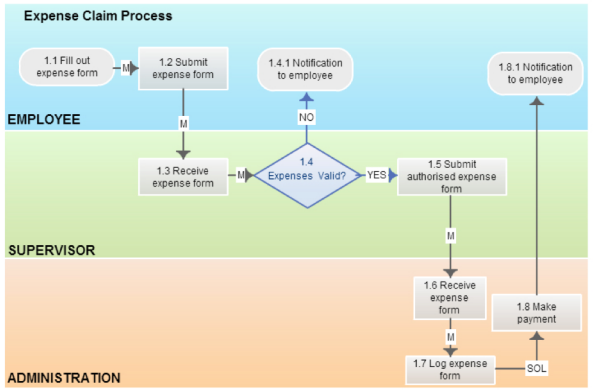
Flow Charts – Sequential Business Processes



M - Manual
Sol - Facilitated by Solution

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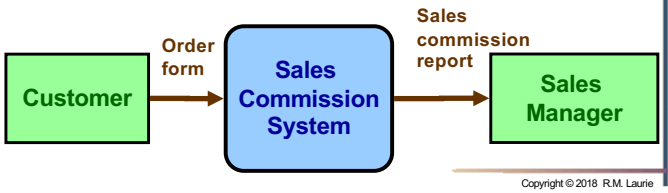
Data Flow Diagrams (DFDs)

- Graphic representation of data flows through interconnected processes
  - Emphasis on Processes rather than data
    - Actions that capture, store, manipulate, and distribute data
- DFD - Context Diagram
  - The most top level diagram that shows system as a single process within environment



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DFDs have Four Symbols

- *Terminators*
  - Environmental elements or other systems
  - Originator or receiver of information outside system
  - Square boxes labeled with nouns
- *Processes* transform inputs to outputs
  - Data transformation subsystem
  - Rounded boxes labeled with verb and object
  - Implement using a program, DB query, or module
- *Data flows* are data in motion
  - Represented by arrows that can diverge or converge
  - Labeled with a noun representing file or record
  - Networked data flowing between processes
- *Data stores* are data at rest
  - Open boxes with dashed border
  - Database file, table, or record

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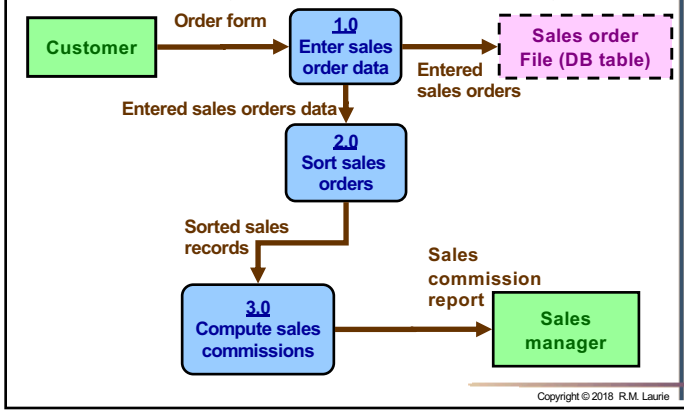
Level 0 Diagram: Sales Commission System

- DFD shows major numbered processes of system



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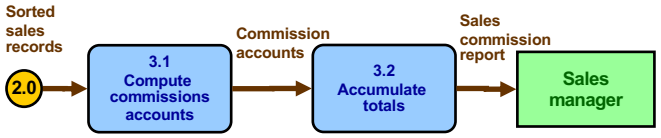
Level n Diagrams

- Documents a single process of a DFD in a greater amount of detail
- *n* represents the number of the process on the next higher level that is being documented
  - This DFD is the Level 3 diagram with sub-processes 3.1 and 3.2
  - Note that the input is from process 2.0
  - Restrict each diagram to 8 processes maximum



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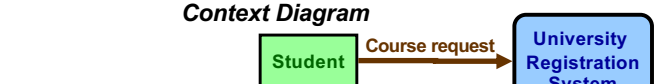
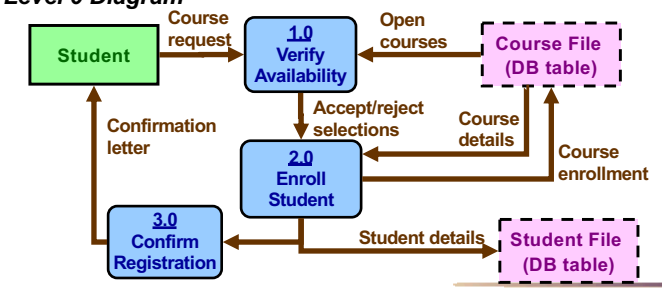
DFDs: Mail-in University Registration System

Context Diagram



Level 0 Diagram



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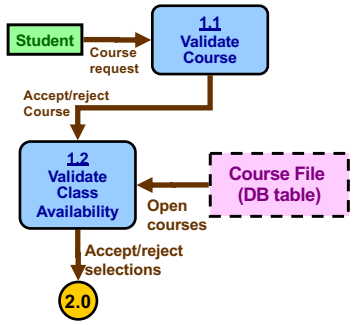
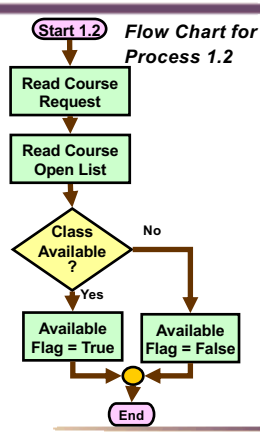
DFDs: Mail-in University Registration System

Level 1 Diagram: Verify Availability



Flow Chart for Process 1.2



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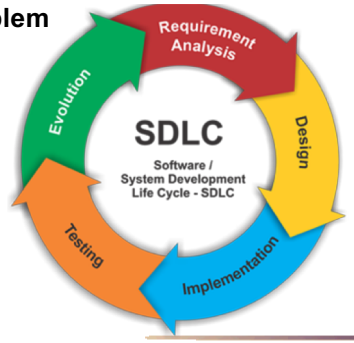
Systems Development

- **Core activities that go into producing an information system solution to an organizational problem or opportunity**
  1. **Systems analysis**
  2. **Systems design**
  3. **Programming**
  4. **Testing**
  5. **Conversion**
  6. **Production and maintenance**



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1. Systems Analysis

- Analysis of problem that will be solved by system
  - Defining the problem and identifying causes
  - Identifies and examines alternative solutions
  - Identifying **information requirements**
- **Feasibility Study (Final Project)**
  - Is solution feasible based on technical, organizational constraints
  - Is solution a good financial investment?
  - Is required technology, skill available?
  - Establishing information requirements
    - Who needs what information, where, when, and how?
    - Define objectives of new/modified system
    - Detail the functions new system must perform
- Faulty requirements analysis is leading cause of systems failure and high systems development cost

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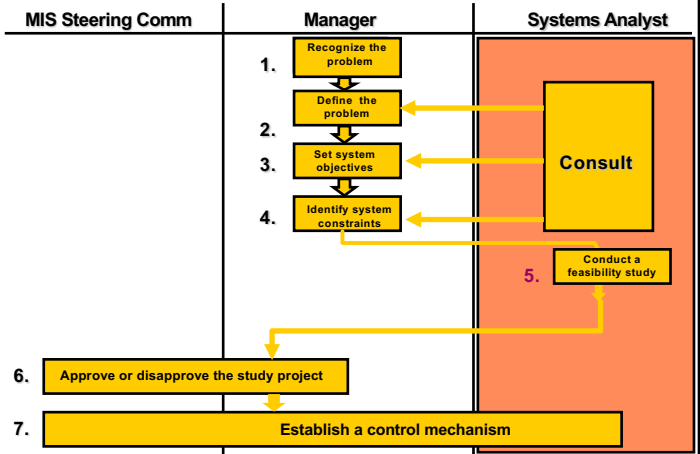
System Analysis Phase



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Outline of Feasibility Study

1. **Introduction**
2. **Description of current systems**
   2.1 System objectives and constraints
   2.2 Problems with current system
3. **Expected impact of a new system**
   3.1 Impact on firm's organization structure 3.2 Impact on the firm's operations
   3.3 Impact on the firms resources
   3.4 Economic and Noneconomic return
4. **The scope of recommended system design project**
   4.1 Tasks to be performed
   4.2 Human resource requirements
   4.3 Schedule of work
   4.4 Estimated cost
5. **Identify end-user information needs**
6. **Summary**

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2. Systems Design

- **Describe system specifications that will deliver functions identified during systems analysis**
- **Should address all managerial, organizational, and technological components of system solution**
- **Role of end users**
  - User information requirements drive system building
  - Users must have sufficient control over design process to ensure that system reflects their business priorities and information needs
  - Insufficient user involvement in design effort is major cause of system failure

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Design Specifications

OUTPUT
Medium
Content
Timing

INPUT
Origins
Flow
Data entry

USER INTERFACE
Simplicity
Efficiency
Logic
Feedback
Errors

DATABASE DESIGN
Logical data model
Volume and speed requirements
File organization and design
Record specifications

PROCESSING
Computations
Program modules
Required reports
Timing of outputs

MANUAL PROCEDURES
What activities
Who performs them
When
How
Where

CONTROLS
Input controls (characters, limit, reasonableness)
Processing controls (consistency, record counts)
Output controls (totals, samples of output)
Procedural controls (passwords, special forms)

SECURITY
Access controls
Catastrophe plans
Audit trails

DOCUMENTATION
Operations documentation
Systems documents
User documentation

CONVERSION
Transfer files
Initiate new procedures
Select testing method
Cut over to new system

TRAINING
Select training techniques
Develop training modules
Identify training facilities

ORGANIZATIONAL CHANGES
Task redesign
Job redesign
Process design
Organization structure design
Reporting relationships

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Outline of System Design Document

1. Introduction \
2. System objectives and constraints
3. Possible system alternatives
4. The recommended design project
   - 4.1 Tasks to be performed
   - 4.2 System Specifications
   - 4.3 System Design to include: DFD's, ERD's, Flowcharts
   - 4.4 Human resource requirements
   - 4.5 Schedule of work
   - 4.6 Estimated cost - Create Excel spreadsheet evaluating costs
5. Expected impact of the system
   - 5.1 Impact on the firm's organization structure
   - 5.2 Impact on the firm's operations
   - 5.3 Impact on the firms resources
6. Summary

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3. 4. 5. Implementation Activities

- **3. Programming**
  - System specifications from design stage are translated into software program code
  - Software may be purchased, leased, or outsourced
- **4. Testing**
  - **Unit testing:** Tests each program in system separately
  - **System testing:** Tests functioning within whole system
  - **Acceptance testing:** Ready for production setting
- **5. Conversion =** Changing from old to new system
  - Parallel strategy = old system phased out
  - Direct cutover = plug in new, pull plug on old system
  - Pilot study = new system installed for subset of firm
  - Phased approach = new system introduce in units
  - **Requires end-user training**
- **6. Production and maintenance**

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