RUTGERS

Rutgers Business School
Newark and New Brunswick

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Accounting Information Systems

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A.I.S. Class 4: Outline

- A.I.S. Registration Process
- Learning Objectives for Chapter 2
- Elements of Information Systems
- Discussion Questions and Problems
- Group Contracts
- Group Project Stage 1 – Some Hints

A.I.S. Registration Process

- Some students did not register at all
- Many students did not provide all the required information
- Students who were not registered by the deadline must still register in order to receive any credit for the course

A.I.S. Registration Process

- 147 forms were completed and submitted
- (0) was completely blank this year!
- (4) were (incomplete) duplicates
- 6 A.I.S. students did not register yet
- 0 registered student is NOT enrolled in A.I.S
- 149 students are enrolled in A.I.S.
- 30 students (???) are taking A.I.S. but not I.A.

A.I.S. Registration Process

- Of the 143 AIS students who registered:
  * 0 gave the wrong student ID
  * 3 entered the wrong A.I.S. section
  * 1 entered no A.I.S. section – so why register?
  * 37 entered no I.A. section even though many are enrolled
  * 0 gave no email address
  * 23 think that "NJ" is a Zip Code
  * 5 were incapable of typing their names in CAPITALS
  * 15 capitalized their other names also
  * 0 had no first names
  * 0 were neither Male or Female!

A.I.S. Registration Process

- The following students still need to complete the registration process if they plan to take the class:
  * EKE, Sevil
  * FAN, Yue
  * HUANG, Wuji
  * LEUNG, Jennifer
  * LOUROS, Nick
  * TING, Chao-Hsuan

Learning Objectives for Chapter 2

- After studying this chapter you should be able to:
  * distinguish between data and information
  * explain the hierarchy of data
  * describe alternative field formats, record keys, and coding systems
  * explain various types of files
  * discuss the steps in the data processing cycle
  * discuss data input options
  * explain the various file organization, file access, and file update options
  * discuss the relative merits and drawbacks of batch versus on-line processing
  * describe and discuss the systems approach

Data versus Information

- Data represents raw facts
- Information is data made meaningful
- Meaningful data is:
  * relevant - able to affect the user's decision
  * reliable
  * timely
  * accurate, free from errors
  * complete

Hierarchy of Data

- Bit (BInary digiT)
- Byte (usually 8 bits)
- Field (multiple bytes making a unit of data - e.g., a name, a value)
- Record (group of related fields - e.g., an individual customer)
- File (group of records - e.g., all customers)
- Database (multiple logically related files)

Data Representation

- EBCDIC v ASCII
- Field Formats
  * Numeric
  * Text (alphanumeric)
  * Currency
  * Date/Time
  * Boolean
  * Counters
  * BLOBS
- Field Sizes

Record Keys

- Primary key
- Candidate keys
- Composite keys (concatenated keys)
- Non-key attributes
- Secondary key
- Foreign keys (will appear in Chapter 6)

Coding Systems

- Sequence code - each item sequentially numbered
- Block code- ranges of numbers reserved for each category of items
- Group code - each digit or group of digits signifies a different aspect
- Mnemonic code - letters suggestive of the item being coded

Check Digits

- A **check digit** consists of a single digit computed from the other digits in the message.
- With a check digit, one can detect simple errors in the input of a series of digits, such as a single mistyped digit, or the permutation of two successive digits.

Mod-10 Check Digits (Luhn)

- Devised by IBM scientist Hans Luhn in 1954
- Patented 1960
- Widely used (e.g., credit cards)
- Detects single digit errors, transpositions
- The Verhoeff algorithm is more powerful – but also much more complicated
- ISBNs use a different algorithm – and take the remainder on dividing by 11 – which is why the last digit is sometimes X

Mod-10 Check Digits (Luhn)

- Checking validity:
  * Number digits from the right
  * Double every even-numbered digit
  * Sum the digits of the products, and add the unnumbered odd digits
  * Check the remainder on dividing by 10 – if zero, the number is valid
- E.g.:
  * 1 2 3 4 5 6 7 8
  * 2 1 2 1 2 1 2 1
  * 2 2 6 4 10 6 14 8
  * 2 2 6 4 1 6 5 8 – total is 34 – remainder 4 - INVALID

Mod-10 Check Digits (Luhn)

- Checking validity:
  * Number digits from the right – assume final check digit is 0
  * Double every even-numbered digit
  * Sum the digits of the products, and add the unnumbered odd digits
  * Check digit is whatever would make the total the next multiple of 10
- E.g.:
  * 1 2 3 4 5 6 7 0
  * 2 1 2 1 2 1 2 1
  * 2 2 6 4 10 6 14 0
  * 2 2 6 4 1 6 5 0 – total is 26 – so check digit is 4

File Types

- Master files - permanent information
- Transaction files - used to update
- Reference files - used for lookup
- Table files - same as reference
- History files - old archives
- Backup files - duplicates for security
  - Grandfather - father - son
- Suspense files – temporary storage pending resolution

The Data Processing Cycle

- Data input
  - batch
  - on-line
- Data preparation
  - validation
  - sorting
- Data processing
  - batch
  - real-time
- File maintenance
- Information output

File Access

- Sequential files
- Random (or direct) access files
- Hashing algorithms
- Clashes
- Overflow areas
- Indexed files (ISAM)

File Maintenance

- Batch processing
  * efficiency
  * control
- On-line processing
- Real-time processing
  * master file up-to-date
  * no separate data preparation required
  * faster access to master file data
- Report-time processing

The General Systems Model

- A system is a set of elements which operate together to achieve some objective
  - Recall our definition of organizations!
- Systems have
  - inputs
  - processes
  - outputs
  - boundaries
  - environments

Factoring Systems

- Factoring - subsystems
- Interfaces
- Independence
- Decoupling (e.g. inventory)
- Buffers
- Control systems
  * sensor
  * standard
  * comparison
  * activation

Reminder

- Learning Objectives
- Discussion Questions: Group responsibility
- Key Terms
  * be sure you can explain what each of these is

Discussion Questions and Problems

- Working in your new groups, review the Discussion Questions for Chapters 1 & 2 and identify any that the group collectively cannot answer
- Develop agreed group solutions for Chapter 2 Problems 3, 4, 5 & 7
- Discuss the narrative and flowcharts in the Chapter 1 Appendix for automated sales
  * Groups will be asked to present solutions in class

Discussion Questions and Problems

- Working in your new groups, discuss the responsible behaviors that group members are expected to exhibit, which will be incorporated into the group contracts due September 16

Group Contracts

- In defining your codes of conduct, consider:
  * How to balance the rights of individuals against the needs of the group
  * What needs to be unanimous and when the majority will prevail
  * Policies on communication and notification
  * Policies on absence with or without notice, and tardiness
  * Respect for each other's views and feelings
  * Acceptable / unacceptable behaviors
  * Policies on completion of tasks to be performed outside group meetings, on timeliness, and on quality
  * Procedures for review of individuals' work on behalf of the group
  * Compromises on scheduling and location of group meetings

Group Projects

Groups - - - - - -	Stage 1	Stages 2–5	Stage 6
1 7 13 19 & & & & 4 10 16 22	Client Services, Billings & Cash Collections (CSB&CC)	Human Resources Management	(CSB&CC)
2 8 14 20 & & & & 5 11 17 23	Client Services, Billings & Cash Collections (CSB&CC)	Purchases	(CSB&CC)
3 9 15 21 & & & & 6 12 18 24	Client Services, Billings & Cash Collections (CSB&CC)	Fixed Assets	(CSB&CC)

Group Project Stage 1 – Some Hints

- Allocate different flowcharts to group members
  - There is no time for everyone to work on everything
- Don't leave any out by accident
- Most people have never done this before, and won't do perfect work – so plan to meet, review, compare, criticize and rework before submission
- Substance matters most . . .
- . . . but neatness counts, too!
  - bear in mind we have to grade hundreds of diagrams from 24 groups! (*Sound of violins playing softly in the twilight . . .*)

Group Project Stage 1 – Some Hints

- Aim for a consistent presentation regardless of which group members prepare a specific diagram
- Adopt a uniform size for symbols
- Check spellings carefully
- Name documents consistently
- Beware of documents that appear mysteriously from nowhere . . .
- . . . or that go into processes and are never seen again!

Flowcharting Software

- You may use whatever software is convenient for the Group to prepare flowcharts and other project diagrams
- However, we have installed Microsoft Visio 2003 in the Levin Labs for this purpose
  * For Stage 1 of the project, use the Flowchart Template with the Basic Flowchart Stencil