IS 300 — Lecture 12

- Why are Transaction Processing Systems (TPS) important?
- What are typical TPSs?
- What are the typical requirements of a TPS?
- How are batch-processing cycles and on-line processing cycles similar? How are they different?
- How do we ensure data quality in a TPS?
- How are TPS involved in e-commerce?
- Enterprise Resource Planning (ERP)

Why are Transaction Processing Systems (TPS) important?

- Everyone uses TPS.
- Most TPSs are essential in business (Mission Critical) – some even user very expensive fault-tolerant systems.
- Many management reports depend on TPS data.
- A TPS involves lots of people and computing resources – it is expensive.
- Customer impressions of a business are influenced by its TPSs.

What are typical TPSs?

General Ledger
Accounts Receivable
Accounts Payable
Budget

Payroll

Invoicing
Receiving
Order Entry
Inventory

Etc. (See figure 8.3)

Only skim material on pp 347-366

What are the typical requirements of a TPS?

Characteristics that are generally found in a TPS problem domain

- Requirements are well defined – most agree on what the requirements are (they agree what "order entry" means).
- Requirements are stable – the requirements of order entry do not change from day to day.
- Decision making is highly structured – it requires minimal human judgement.

How are batch-processing cycles and on-line processing cycles similar? How are they different?

The typical TPS cycle (generic)

See Figure 8.4

The batch-processing cycle (figure 8.2)

- Batches of transactions are collected
- These batches are processed against a master file periodically
- Implications
  - Batch cycle impacts currency of data
  - Recovery from failure not complex
  - Overall system not complex (inexpensive and reliable)

The on-line cycle (figure 8.2)

- "Update in place" main technology
- Implications
  - Databases more current
  - Easier to correct some types of errors (source data issue)
  - More expensive hardware and networks
  - Recovery difficult and complex

How do we ensure data quality in a TPS?

It is critical that data entered into a TPS be accurate and correct

Source Data Automation (discussed in hardware lecture) important

- Goal is to improve efficiency and reduce errors
- Technology includes machine-readable data (bar codes, magnetic strips, MICR, etc.) and prerecorded data that does not change.
- Capture data as soon as possible after the event and as close to the source as possible.

Application Controls

Control Totals – generally apply only to batch systems

- Record Counts (batch totals) – simple document count
- Quantitative Totals – sum of a field across transactions where the sum has some meaning in the context of the application.
- Hash Totals – sum of a field across transactions where the sum has no meaning in the context of the application.

Programmed Edit Checks – not limited to batch systems

- Reasonableness Check – values must fall within certain pre-defined limits (they are reasonable).
- Format Check – is there are letter where a digit should be?
- Existence Check – does a particular code exist?
- Dependency Check – do several values that make sense alone make sense together?

Check Digits – used to verify accuracy of key fields. These help reduce transcription and transposition errors.

Modulas-11 check digit algorithm

X X X X X X X – X
8 7 6 5 4 3 2

1. Sum the products
2. Divide sum by 11
3. Subtract remainder from 11
4. Result is check digit (10 = X, 11 = 0)

How are TPS involved in e-commerce?

Options:

Consumer focus – .com
- Order entry
- Order tracking/shipping
- Customer service
- Technical support

Intrabusiness focus – b2b
- All of the above
- Most of the systems in figure 8.3 except payroll and accounting functions

"Bots" short for robots or autonomous agents.

Small pieces of code sent out to scan the Internet to bring back information like lowest price.

Typical consumer call with "live agent" -- $33
Handling same call with a "bot" -- $1.17
Forrester Research

mySimon.com good example of "bot" technology
Some sites (eBay) have tried to block bots.

What is ERP and what are its benefits?

Enterprise Resource Planning (ERP)

A system that supports real-time monitoring of business functions. Facilitates real-time analysis of

- quality
- availability
- customer satisfaction
- performance
- profitability

Advantages

- Replaces inflexible and high maintenance legacy systems
- Improves work processes
- Supports integrated, enterprise-wide operational information for decision support
- Facilitates upgraded technology infrastructure (client/server)

Disadvantages

- Cost – both initial and ongoing
- Organizational turmoil (ERP defines operational procedures)
- Vendor dependency (too expensive to change vendors)