Stating System Analysis

• Chapter Three in Text
  – Requirements
  – Events
  – Process of careful precise requirements
• Why?
  – Often differing views of what system should / could / must / might do
  – Prevent delay of key decisions

Overview

The principal goal of information systems analysis is to state accurately users’ requirements for a new information processing system.

Chapter 3 introduces a six-step process for object-oriented analysis. Together, these six steps produce an event model, a use case model, system sequence diagrams, a model of the problem domain, and system operation contracts.
Requirements...

- TEXT: The principal goal of information systems analysis is to state accurately users’ requirements for a new information processing system.
- Systems Analysis: state requirements precisely, accurately, concisely, unambiguously, and understandably.
- Systems Analysis: constrain development to do the right thing. Specify the essential, logical requirements.

Overview (continued)

The initial step is business event analysis, which results in an event model, presented as an event table.

Event analysis treats the system as a black box and views it from a stimulus-response perspective.

Overview (continued)

An event is an occurrence which takes place at a specific time and triggers a predetermined response from the system. Because events occur independently of each other, event analysis is a powerful technique for breaking up a large or complex system into small, manageable, cohesive, independent parts.
Events

- "Independent Event" does NOT mean
  - Events are unrelated
  - One event cannot typically or always follow another
- "Specified Time" does NOT mean
  - Time known ahead
  - To rule out asynchronous events
- "Predetermined" does NOT mean
  - Same event always causes the same response

Event Analysis (continued)

Overview (continued)

Event analysis identifies the events to which the system is expected to respond, names the inputs and outputs, and identifies the actors – those who interact with the system by providing inputs and receiving outputs.
Names

–Precision begins with names
  • Often a style guide
  • Often a glossary

Characteristics of a Statement of System Requirements

• Graphic: Uses diagrams
• Partitioned: Organizes the system description into comprehensible parts
• Non-redundant: A change can be made in a single place
• Accurate: Rigorous, precise, clear, consistent, and complete
• Minimal: Eliminates non-essentials, while including all critical details

Show Off Time

• Who here is a good user of names?
  – Willing to answer a few questions about our CTA Red Line system?
  – What is the set of occurrences or events that the system must respond to?
Event-Driven Systems

Event analysis takes a stimulus-response perspective —

• The system does nothing until it is triggered by an event.
• When an event occurs, the system responds as completely as possible.
• After the response is complete, the system waits until another event occurs.

Events

An event is an occurrence which takes place at a specific time and initiates or triggers a predetermined response from the system.

• An external event is an event which occurs outside the system boundary.
• An internal event is an event which occurs inside the system boundary.
• A temporal event is an event which occurs at a prespecified time.

Event Analysis

Event analysis creates a system description by identifying:

1. The events to which the system is expected to respond
2. The incoming message (event flow or data flow) associated with each event
3. The desired response
4. The actions or behaviors required to generate the response for each stimulus
Events may have parameters

- Events with no application or event-specific data
  - "events"
- Events that come with data attached
  - "data flows"

Use "Event" as a generic term for both….

Events hard to find unless you think "systems"

- Easy to Find (sometimes)
  - Direct recognition
    - Event sends a indication to the system
- Harder to Find (usually)
  - Indirect recognition
    - Event deduced by the system
    - Data from environment compared to or used in calculations along with internal state of the system

Event Definition

- ACTOR
  - Provide inputs and receive outputs
  - Person, System, something in the environment
    - May "cause" an event
- INPUT
  - Information entering the system
    - "data flow" events
- OUTPUT
  - Information leaving the system
    - Usually back to some actor
    - Not all events have output
Learning Objectives

• State and discuss the goals of systems analysis.
• Characterize a statement of system requirements as well as the process of systems analysis.
• Define the term event and understand the implications of this definition.

(continued)

• Explain the difference between a temporal event and an external event.
• Give appropriate names to events and recognize whether or not an event is named appropriately.
• Carry out a business event analysis for a system and present the results in an event table.

Review Questions

• See text Review Questions:
  – 3-1, 3-5, in particular
• Key Ideas (Deep Knowledge):
  – EVENT – wdim?
  – Precise Definitions – names, actors, inputs, outputs
**Identify the Business Events**

Event List for the Public University Registration System

- **External** 1. Department submits class schedule
- **Temporal** 2. Time to produce university class schedule
- **External** 3. Student registers for classes
- **Temporal** 4. Time to produce class roster

---

**Identify the Actors, Inputs, and Outputs**

Who supplies system inputs?
- **Department** submits a Department Class Schedule.
- **Student** supplies a list of desired classes (a Registration Request).

---

**Identify the Actors, Inputs, and Outputs (continued)**

Who receives system outputs?
- **Departments**, **Professors**, and **Students** receive the University Class Schedule.
- **Student** receives a Class List.
- **Professors** receive Class Rosters.
# Event Table

![Image](image-url)  

**Figure 3.6**

<table>
<thead>
<tr>
<th>Event Number</th>
<th>Event Description</th>
<th>System Input</th>
<th>Actor Providing Input</th>
<th>System Output</th>
<th>Actor Receiving Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Department submits class schedule</td>
<td>Department Class Schedule</td>
<td>Department</td>
<td>University Class Schedule</td>
<td>Student Department Professor</td>
</tr>
<tr>
<td>2</td>
<td>Time to produce class schedule</td>
<td></td>
<td></td>
<td>Student Class List</td>
<td>Student</td>
</tr>
<tr>
<td>3</td>
<td>Student registers for classes</td>
<td>Registration Request</td>
<td>Student</td>
<td>Class Roster</td>
<td>Professor</td>
</tr>
<tr>
<td>4</td>
<td>Time to produce class roster</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>