Wearable Computing

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Task Models

ConcurTaskTrees

- Temporal Operators
- Examples

Context Toolkit

- Context Toolkit
  - Context Abstraction
  - Design Methodology

HCI Lecture Summary

- Theories
  - Levels-of-analysis
  - Stages-of-action
  - GOMS
  - Widget-level
  - Context-of-use
  - Object Action Interface models

Describing user interaction

- Remember GOMS - Goals, Operators, Methods, Selection Rues
- The user wants to reach a Goal, he uses Operators and Methods that he selects via Selection Rules
- With GOMS, we can look at a sequence of Methods and analyze it.
- We can analyze a system using GOMS, but a GOMS model does not tell us how to implement a system
- Question: How can a GOMS-like system support development?
- A *Task Model* can be used to guide the implementation.

Task Model

- Task models indicate the logical activities that an application should support to reach users' goals.(Paterno, 1999)
- Goals are either state changes or inquiries
- Tasks can be highly abstract or very concrete
- Task models can be build for existing systems, future systems and for the user's view of the system
- Task models are formalized, other methods are often informal

What's the use of a Task Model?

- Understand the application domain
- Record the result of user discussions
- Support effective design
- Support usability evaluation
- Directly support the user in using the system
- Documentation

Task Model Representation

- GOMS can represent a task model
- GOMS is mainly textual
- GOMS cannot represent concurrency, interruption, order independence, optionality and iteration.
- Alternative: ConcurTaskTrees (Paterno, 1999)

ConcurTaskTrees

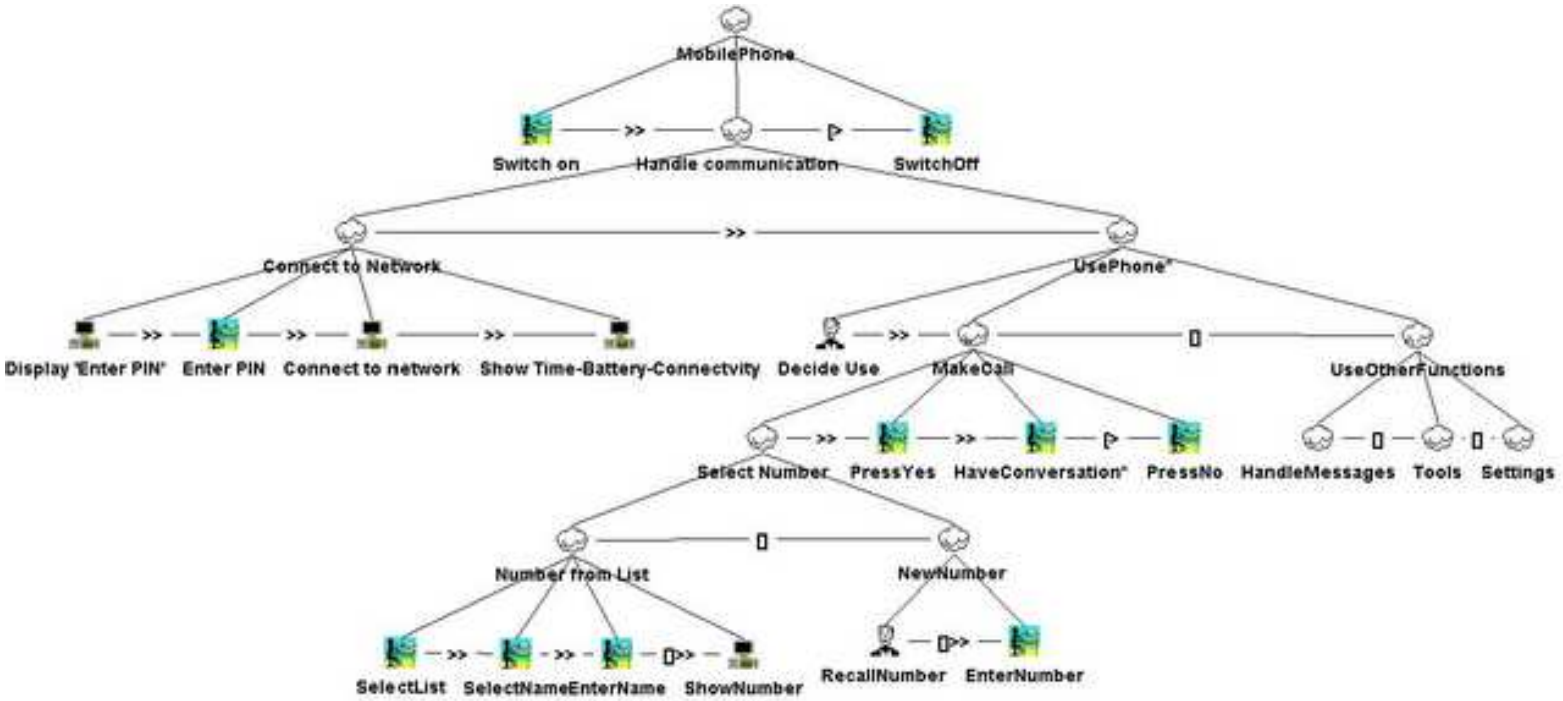
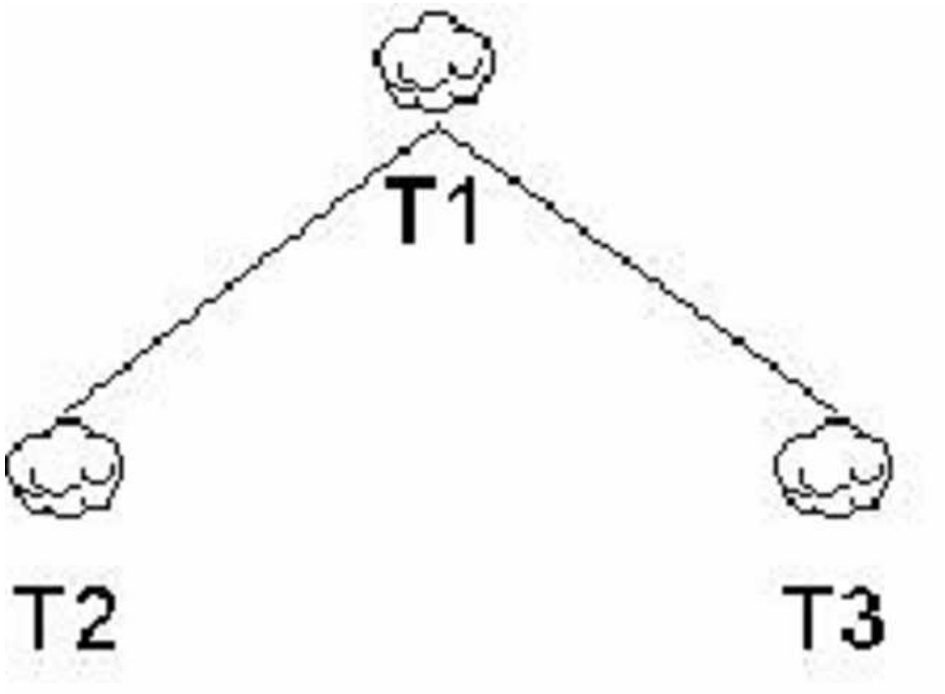


Image from Paterno, 1999

CTT: Features

- Hierarchical structure
- Graphical Syntax
- Many temporal operators
- Focus on activities

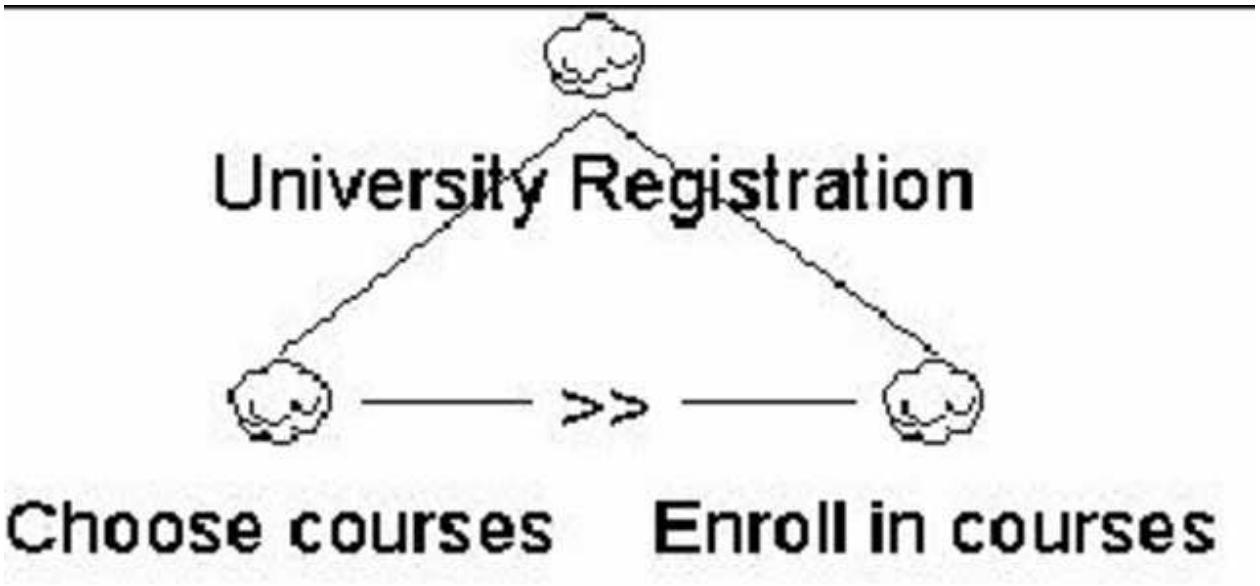
CTT: Temporal Operators



- Hierarchy

Image from Paterno, 1999

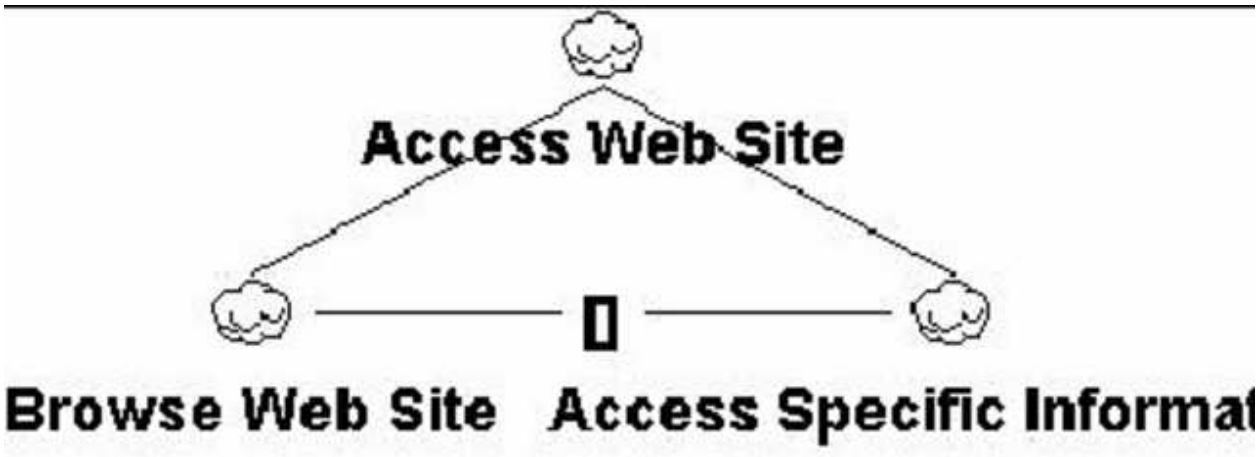
CTT: Temporal Operators



- Enabling

Image from Paterno, 1999

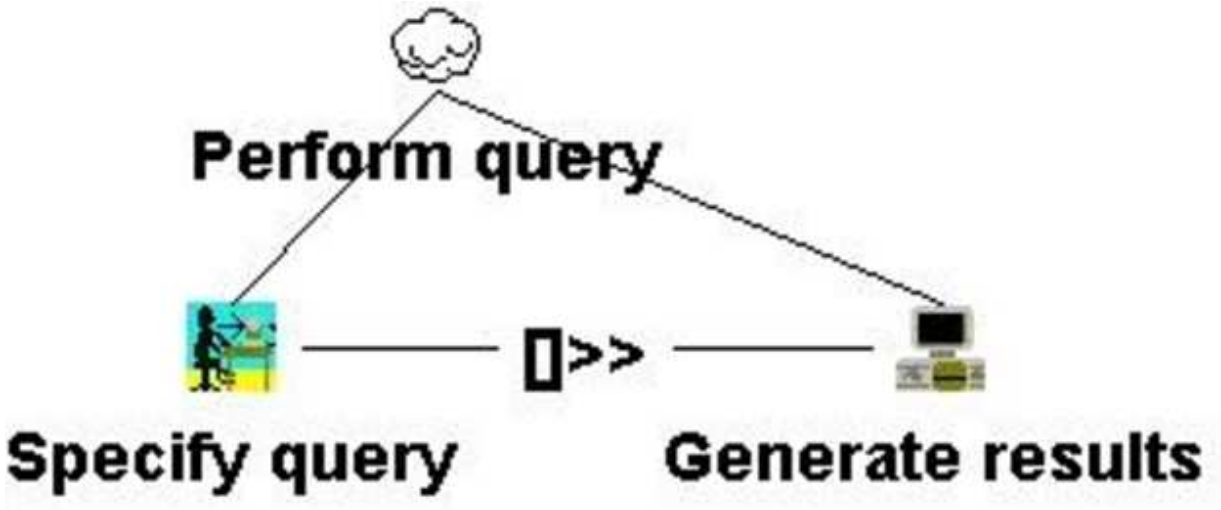
CTT: Temporal Operators



- Choice

Image from Paterno, 1999

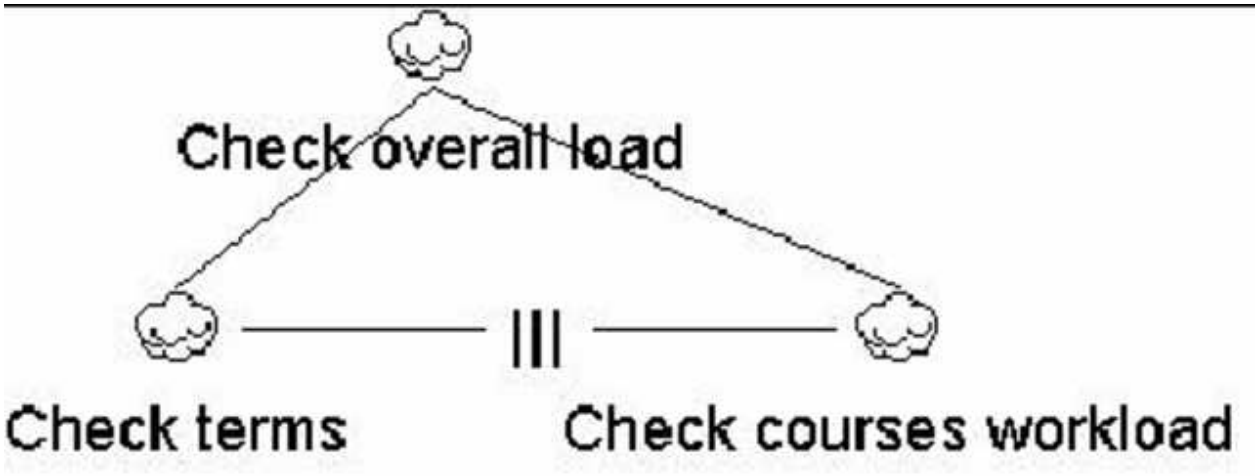
CTT: Temporal Operators



- Enabling with information passing

Image from Paterno, 1999

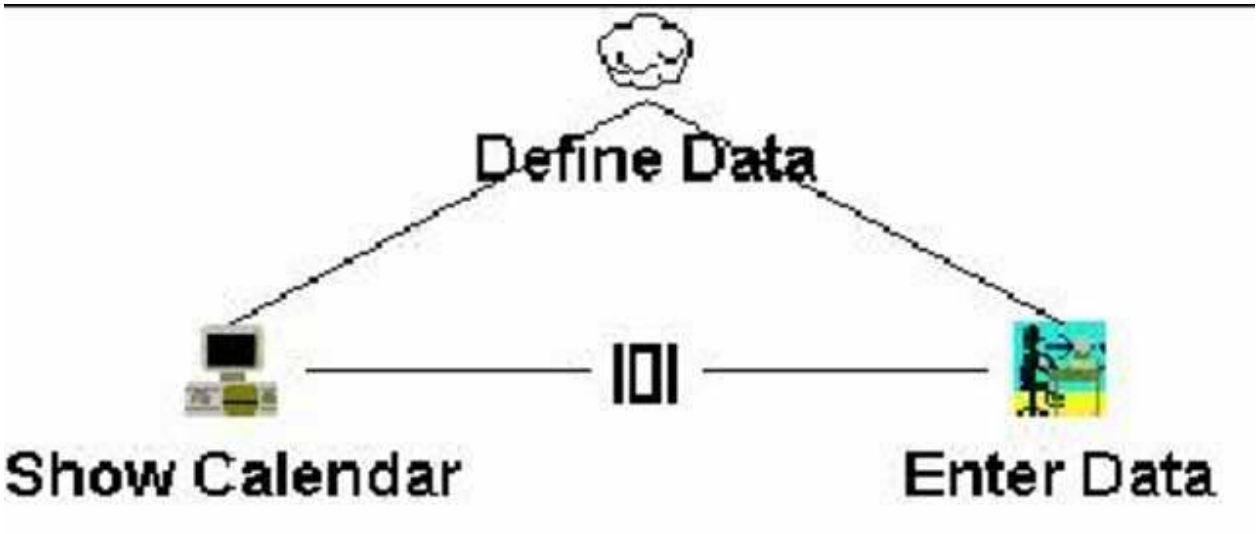
CTT: Temporal Operators



- Concurrent Tasks

Image from Paterno, 1999

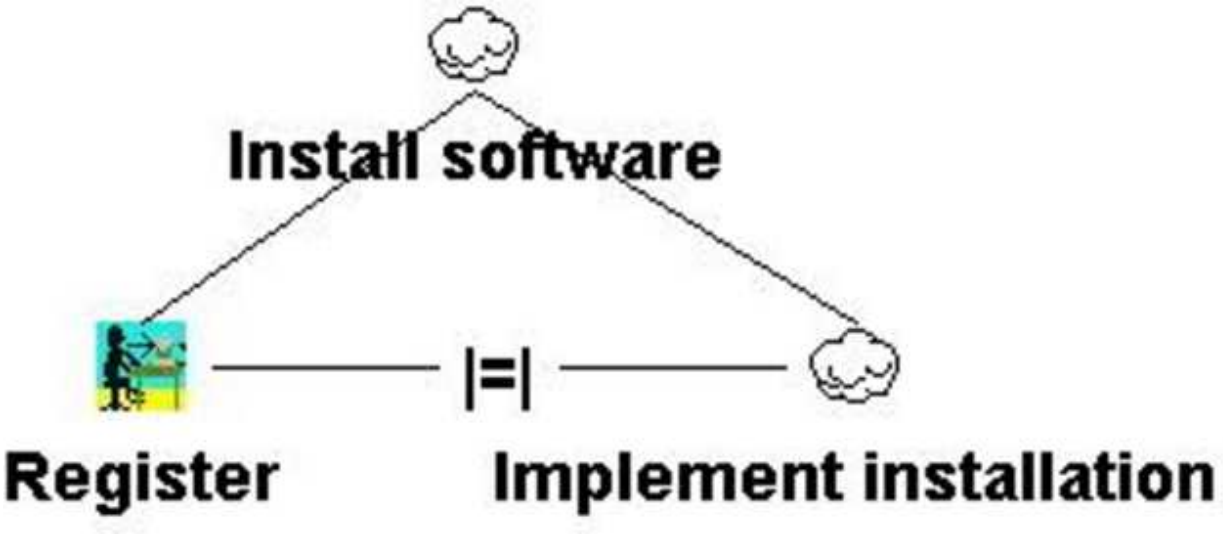
CTT: Temporal Operators



- Concurrent Communicating Tasks

Image from Paterno, 1999

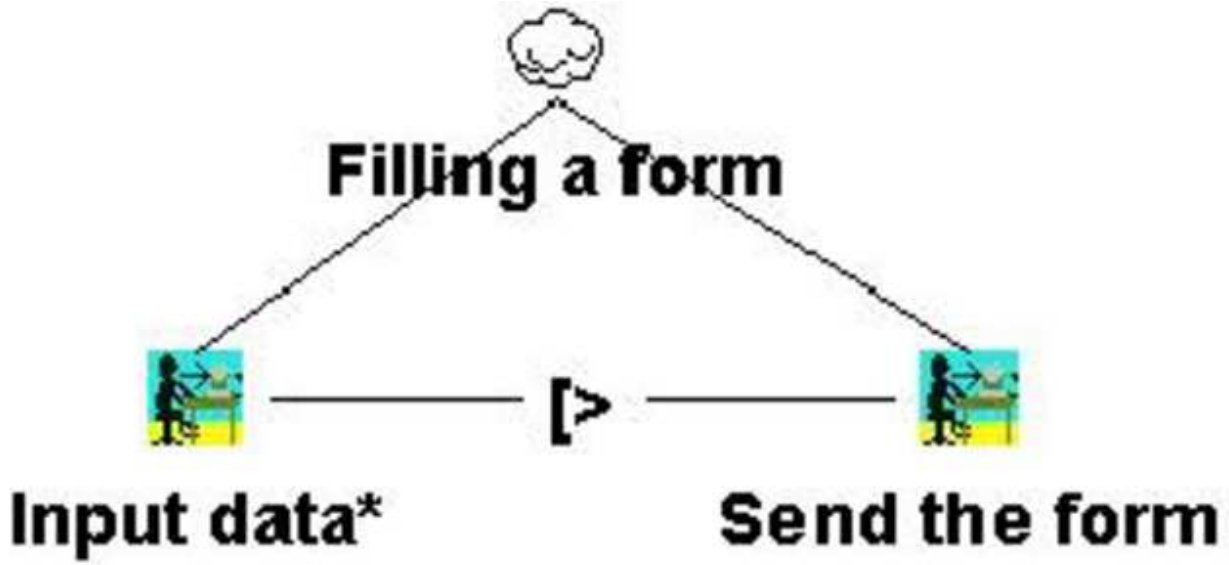
CTT: Temporal Operators



- Task Independence

Image from Paterno, 1999

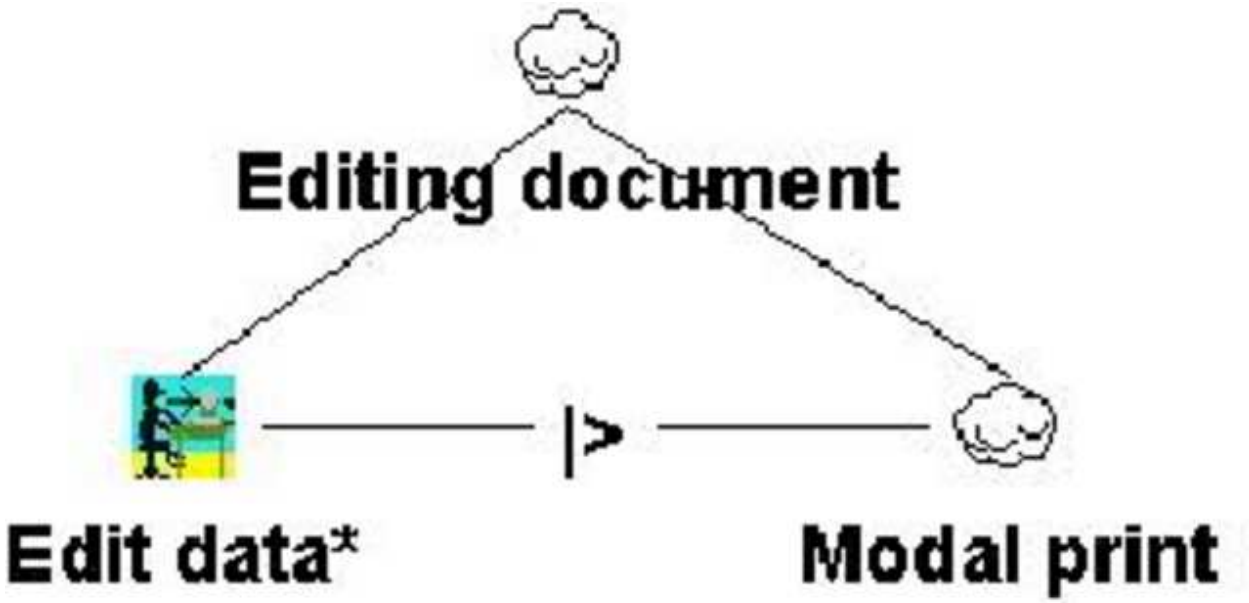
CTT: Temporal Operators



- Disabling

Image from Paterno, 1999

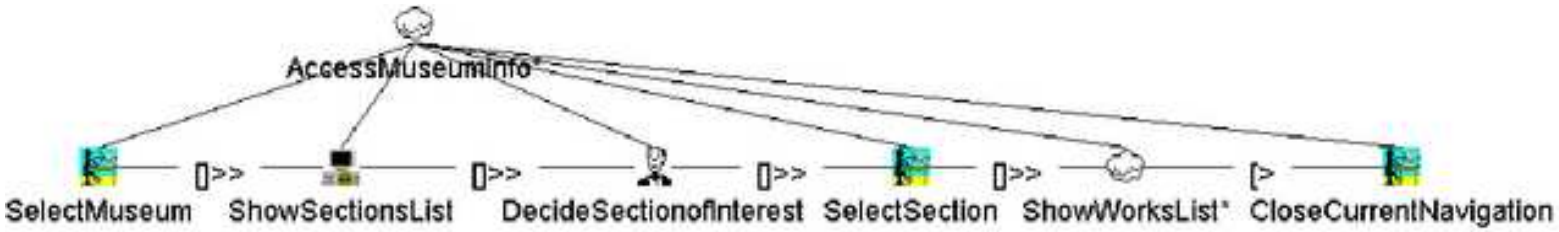
CTT: Temporal Operators



- Suspend-Resume

Image from Paterno, 1999

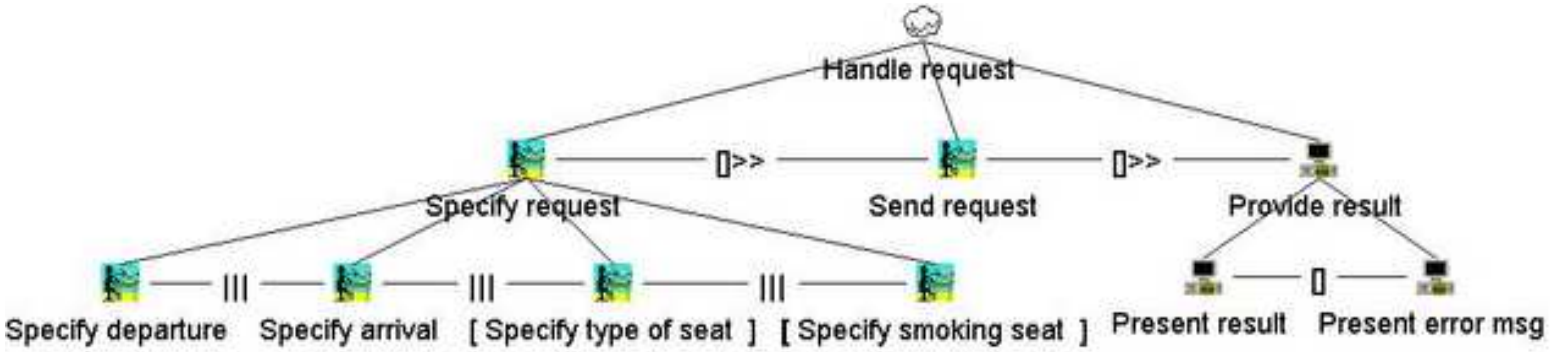
CTT: iterative task



- Task sequence with iteration: only the last transition ends the iteration

Image from Paterno, 1999

CTT: optional tasks



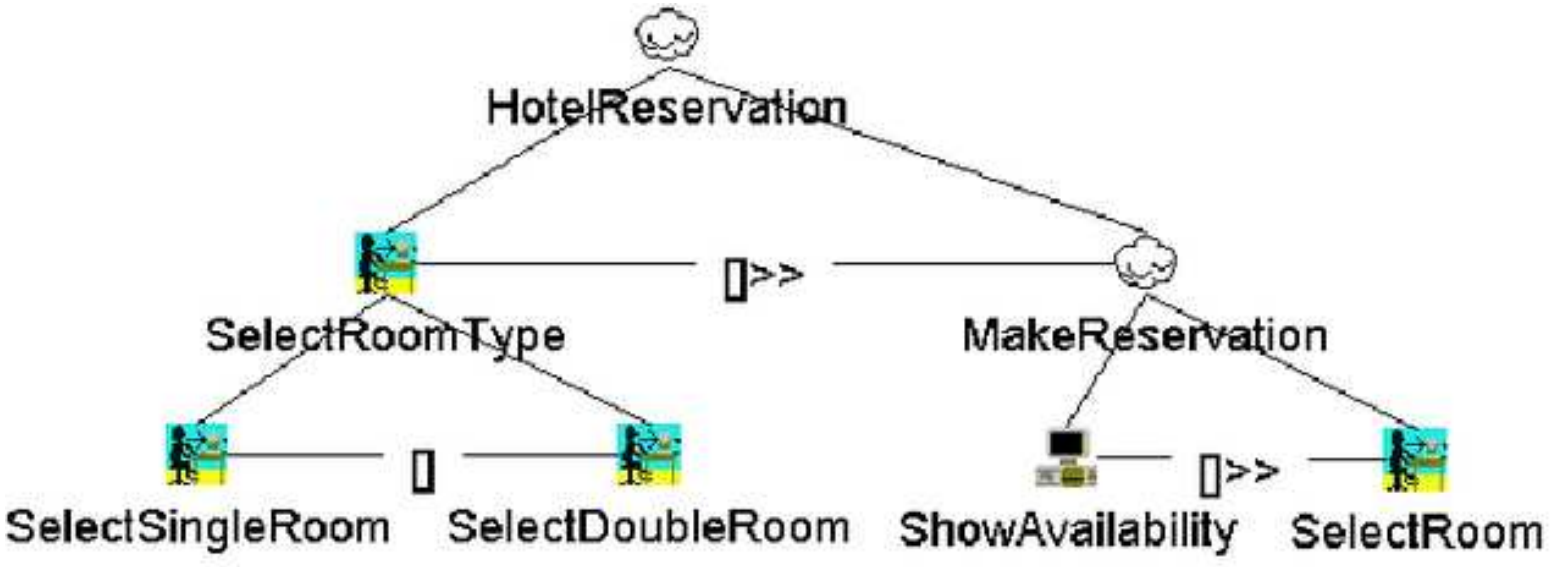
- Optional Tasks are marked with

  and

  brackets

Image from Paterno, 1999

CTT: inheritance of temporal constraint



- ShowAvailability inherits the temporal constraint (executed after SelectRoomType) from its parent MakeReservation

Image from Paterno, 1999

Summary

- Task Trees
  - Formal specification of user interaction
  - Can be used to support development
- ConcurTaskTrees
  - Temporal Operators
  - Examples