Multimedia Design (2)

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Last week.....

- Overview of the Multimedia Design Cycle

- Multimedia design principles

Today....

- Design Methodologies
  - The City Design Method
  - The Reeves Model (1994)

- Design Stages and activities/processes

- Design documents

Multimedia Design Methods

- Any Multimedia Design Model should include attention to:
  - analysis
  - design
  - production/implementation
  - evaluation

- Design artefacts/documents often produced along the way to assist each stage of design

  - We will look at some examples of these throughout

The City Design Method

The City Design Method

- Developed by **Alistair Sutcliffe** (Director, Centre for Human Computer Interaction Design, UMIST) and **Stephanie Wilson** (Centre for HCI Design, City University)

- Focus: (multimedia) *information presentation*

- Provides a sequence of activities, linked to semi-formal specification techniques
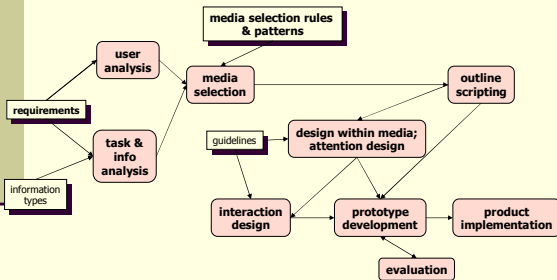
City Method Design Guidelines

- Thematic congruence
- Manageable information load
- Viewpoints
- Reinforcement
- Appropriate media selection
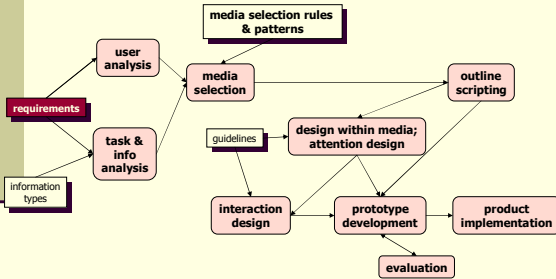- Avoid attention conflicts

The City Design Method

- The City Design Process
  - **Requirements**
  - **Task and Information Analysis**
  - **Media selection**
  - **Scripting**
  - **Interaction Design**
  - *Prototyping*
  - *Evaluation*

The City Design Method: **Requirements**

media selection rules & patterns

user analysis

requirements

media selection

outline scripting

task & info analysis

guidelines

design within media; attention design

information types

interaction design

prototype development
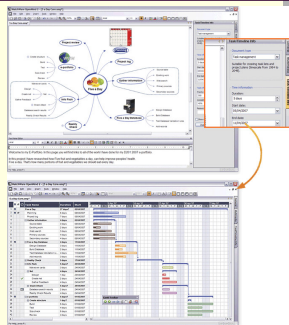
product implementation

evaluation

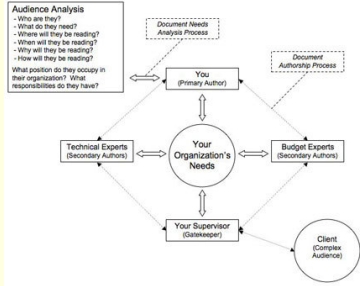## The City Design Method: **Requirements**

Requirements

- What do you want this product to accomplish?
  - your goals
- Who do you need to reach, how can you reach them, and what do they want?
  - implies choice: high end vs low end PC; WWW vs CD-ROM etc.
- What content do you have the time/money/resources to create or obtain?
  - Much video and sounds will need to be recorded, photos taken, graphics drawn, prose written. What is available?
- What technologies will you use to create and deliver the content?
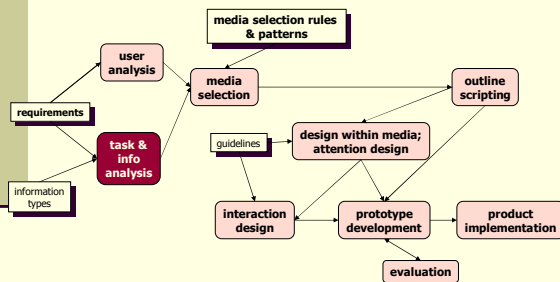 - Authoring tool, on-line publishing, electronic document, presentation software, programming language…

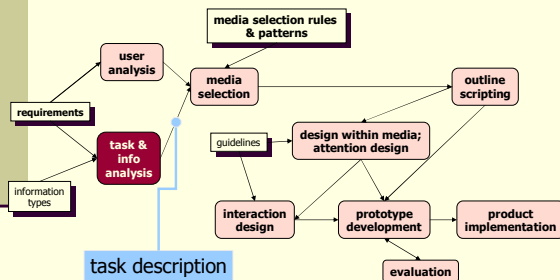## Requirements Document: Project Plan

Audience Analysis

Audience Analysis
- Who are they?
- What do they need?
- Where will they be reading?
- When will they be reading?
- Why will they be reading?
- How will they be reading?

What position do they occupy in their organization? What responsibilities do they have?

Document Needs Analysis Process

You
(Primary Author)

Document Authorship Process

Technical Experts
(Secondary Authors)

Your Organization's Needs

Budget Experts
(Secondary Authors)

Your Supervisor
(Gatekeeper)

Client
(Complex Audience)

The City Design Method:
Task & Information Analysis

media selection rules & patterns

user analysis

requirements

task & info analysis

information types

media selection

outline scripting

guidelines

design within media; attention design

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The City Design Method:
Task Analysis

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task description

Task Description

- Task trees
  - GOMS
  - TKS (Task Knowledge Structures)
  - ConcurTaskTrees

- Task tables (UAN and XUAN)
- State transition diagrams (inc. Petri Nets)
- Timeline-based representation

Example: TaskTrees

- Hierarchic task modelling notation
- Graphical
- Nodes represent subtasks
- Goal
- Constraints
- Decomposition into subtasks
- Good at expressing temporal properties of complex tasks
- All the "action" is at the leaf nodes

Example Task Tree

Browse Program

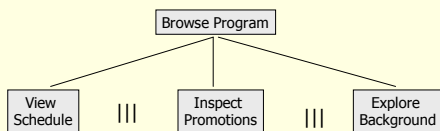View Schedule — Inspect Promotions — Explore Background
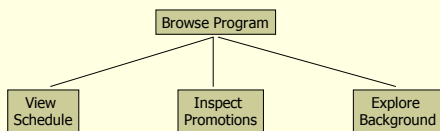
ConcurTaskTrees

- Form of hierarchic task modeling

- Good at expressing temporal properties of complex tasks

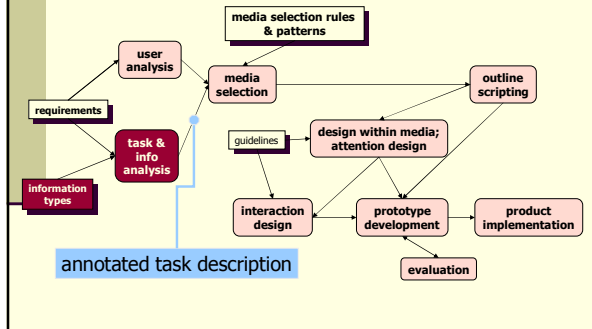- Can show dynamic relationship of media and interaction

ConcurTaskTree
temporal operators

T [] T2	choice
T1 >> T2	enabling
T1 ||| T2	interleaving
T1 |[]| T2	synchronization
T1 []>> T2	enabling with info passing
T1 [> T2	deactivation
T*	iteration
T(n)	finite iteration
[T]	optional task

ConcurTaskTrees

Browse Program

View Schedule ||| Inspect Promotions ||| Explore Background

The City Design Method:
Information Analysis

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annotated task description

evaluation

Task Flowchart

101
Creator Creates A Digital Work

102
Usage Rights Attached To Digital Work and Deposited In Repository 1

103
Repository 2 Initiates A Session With Repository 1

104
Repository 2 Requests Access To Digital Work for A Stated Purpose

105
Repository 1 Checks Usage Rights of Digital Work To Determined If Access May Be Granted

Access Denied

Access Granted

106
Repository 1 Terminates Session With Error

107
Repository 1 Transmits Digital Work To Repository 2

108
Repository 1and 2 Each Generate Billing Information and Transmit To Credit Server

Information Design

- Identify information needs from task model
- Group information content
- Identify key information items
- Determine information type
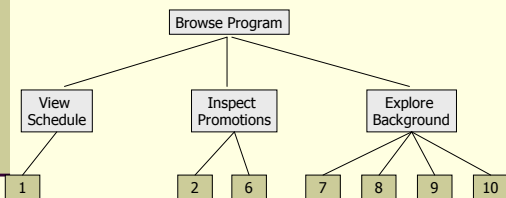- Annotate onto task model/ content structure diagram

3 D Model of Information Types

- Conceptual vs physical
- Static vs dynamic
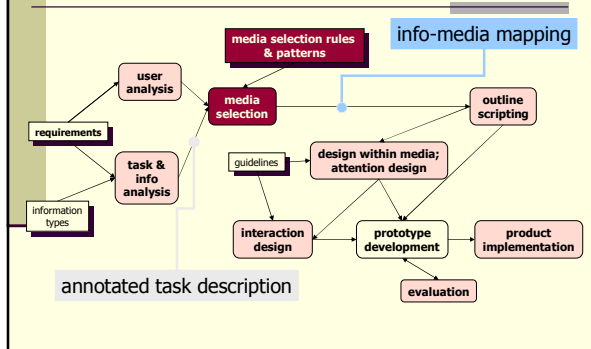- Descriptions, events, actions, procedures, states, values, spatial information

The City Design Method: Information Categorisation

ID	Information Group	Information Type
1	Play schedule	Descriptive, conceptual
2	Players	Descriptive, conceptual & physical
3	Seating plan	Spatial, descriptive, physical
4	Seat prices	Descriptive, conceptual, values
5	Seat reservation	Descriptive, conceptual, event, time
6	Play content (theme, synopsis)	Descriptive, conceptual
7	Actors' biography	Descriptive, conceptual & physical
8	Director's biography	Descriptive, conceptual & physical
9	Company details	Descriptive, conceptual
10	Theatre location & facilities	Spatial descriptive, physical

ConcurTaskTrees

Browse Program

- View Schedule
  - 1
- Inspect Promotions
  - 2
  - 6
- Explore Background
  - 7
  - 8
  - 9
  - 10

The City Design Method: Media Selection

media selection rules & patterns

info-media mapping

user analysis

requirements

media selection

outline scripting

task & info analysis

guidelines

design within media; attention design

information types

interaction design

prototype development

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Media Design: Mapping Information to Media

- Associate information with media using guidelines, keeping in mind:
  - User tasks and communication goals
  - User characteristics and preferences
  - Context of use

- There is no deterministic mapping from task, user, context, information type to media

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The City Design Method: Media Selection

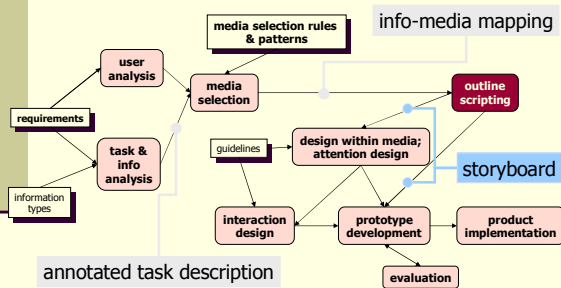| ID	Information Group	Media Type
1	Play schedule	Diagram (chart), text
2	Players	Text, Image (photographs)
3	Seating plan	diagram
4	Seat prices	Text, table
5	Seat reservation	Text, list, diagram (link to 3)
6	Play content (theme, synopsis)	Text, speech, image, moving images
7	Actors' biography	Image (photos), speech/text
8	Director's biography	Image (photos), speech/text
9	Company details	Text, image
10	Theatre location & facilities	Photos, diagram, text caption

Media Patterns

- How to Do It
    - text to explain the goal
    - procedure steps via speech & still image
    - animations to reinforce & integrate actions
    - text bullet points to summarise

Media Patterns

- Causal Explanation

    - text to introduce domain
    - text to introduce main objects, illustrated with diagram
    - cause-effect sequence via diagrams and speech
    - animation to reinforce sequence
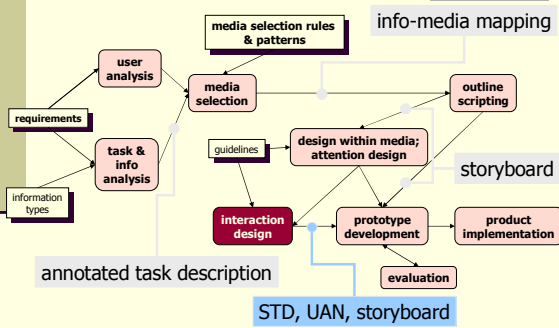   - diagram and text captions to summarise
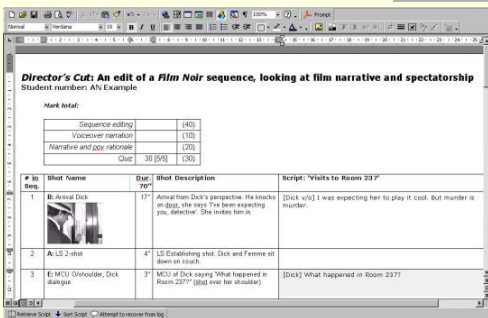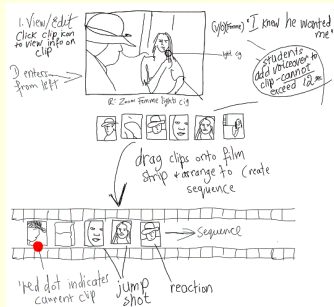
The City Design Method: **Scripting**

media selection rules & patterns

info-media mapping

user analysis

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design within media; attention design

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storyboard

task & info analysis

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Scripting

- Sequential vs Concurrent Presentation
- Segmentation
- Storyboards
  - series of images of what the screens will look like
  - only key screens and sample sections need be drawn
  - similar to and inspired by storyboards in movie industry

Story Boards

Story Boards

Story Boards

The City Design Method: **Interaction Design**

media selection rules & patterns

info-media mapping

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STD, UAN, storyboard

Scripting

Annotated Storyboard

Interaction Design

- How much interaction is suitable for your goals?
- How will users be guided through the system?
- What controls will the user have?

Page Layout and Interaction design
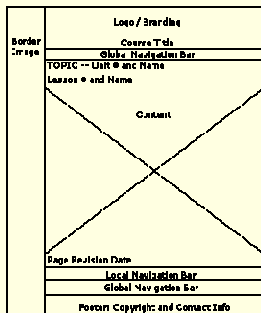
Interaction Design: Control

- Pace
  - click when you're ready to advance
  - set presentation speed for dynamic media
- Sequence
  - choose what you want to watch
- Media
  - start/stop videos; search text; scroll/zoom
- Parameterised configuration
 - change the outcome of a chart; customise a variable

Multimedia Mapping
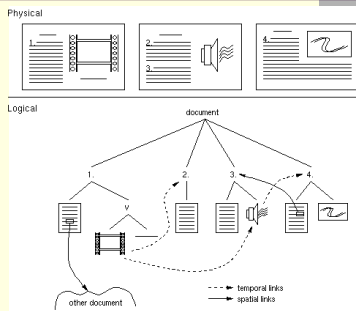
Interaction Design: Control

- Transaction
  - enter a password; pay a bill; send a message
- Objects
  - move things around; other game actions
- Simulation
  - change view, orientation, speed

Orientation and Navigation

- Browser style
- Video style
- Content-based
  - thumbnails
- Navigation markers
  - bookmarks, history, maps
- Active controls
  - guided tours, active links

Navigation Structure
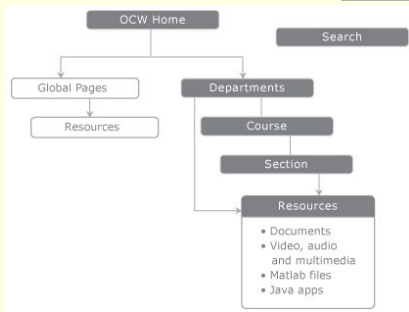
City Design Process Overview

- **Information design**
  outcome example: high-level script, task tree, structure diagram and/or state transition diagram, information structure diagram
- **Interaction design**
  outcome example: storyboard
- **Media design**
  outcome examples: selection of media for information components ; media-specific designs (scripts, images, etc)
- **Presentation design**
  outcome examples: sketches, prototype

Design Process Overview

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Multimedia Design Summary

- Know your (multi)media
- Know when to use (and not use) each
- Know when and how to combine them
- Know how to select and design different content for different tasks, for different users
- Know the stages of the Multimedia Design Methods
  - Esp. City Design Method
- Know the artefacts/documents that can be produced at each stage of design

Reeves Design Method

Another Example of a Multimedia Design Method

- Reeves, 1994

  - Analysis
  - Design
  - Production
  - Evaluation

Example of a Multimedia Design Method (Reeves, 1994)

- Analysis Activities
  - Conducting Needs Assessment
  - Preparing Audience Assessment
  - Specifying Content and Objectives
  - Selecting Authoring and Delivery Systems
  - Planning Project
  - Planning Evaluation Strategies

Example of a Multimedia Design Method (Reeves, 1994)

- Analysis Artefacts

  - Needs Assessment Report
  - Content Outline
  - Instructional Objectives
  - Authoring System Specs.
  - Delivery System Specs.
  - Project Timetable
  - Evaluation Plan

Example of a
Multimedia Design Method (Reeves, 1994)

- Design Activities

  - Specifying Instructional Interactions
  - Flowcharting
  - Prototyping
  - Writing Scripts
  - Formatting Screens
  - Conducting Formative Reviews

Example of a
Multimedia Design Method (Reeves, 1994)

- Design Artefacts

  - Treatment Description
  - Flowcharts
  - Screen Design Specifications
  - Scripts
  - Format Sheets
  - Prototypes

Example of a
Multimedia Design Method (Reeves, 1994)

- Production Activities

  - Authoring Interactions
  - Creating Graphics
  - Preparing Adjunct Materials
  - Conducting Preproduction
  - Conducting Production
  - Conducting Postproduction
  - Mastering Media
  - Integrating Media and Authoring Code

Example of a
Multimedia Design Method (Reeves, 1994)

- Production Artefacts

  - Interactive Code
  - Graphics
  - Adjunct Materials
  - Program Documentation
  - Video/Film
  - Audio
  - Edited Video Masters
  - Videodisc/CD-ROM

Example of a
Multimedia Design Method (Reeves, 1994)

- Evaluation Activities

  - Documenting Project
  - Testing
  - Validating
  - Conducting Impact Evaluation

Example of a
Multimedia Design Method (Reeves, 1994)

- Evaluation Artefacts

  - Project Documentation
  - Functionally Valid application
  - Instructionally Valid application
  - Formative Evaluation Report
  - Effectiveness Evaluation Report
  - Impact Evaluation Report

Design Documents Summary

Design Documents Summary

- No set standards for correct documents to produce in order to arrive at a successful multimedia application.
- Consideration at each stage is what is required and these documents often encourage such structured consideration.
- Such documents also help to communicate your ideas to others.

Design Documents

- You should be able to produce a selection of design documents you feel are appropriate to your idea for your multimedia application.

- Ideas can be modified or even completely scrapped – this is all part of the design process.

Design Documents

- Non-exhaustive selection of design documents used in practice:
  - Task-Information Analysis
  - Treatment outline form
  - Client content map
  - Storyboard
  - Annotated storyboard
  - Screen sketches
  - Content description
  - Goal outline
  - Learning hierarchy

Design Documents

- Non-exhaustive selection of design documents used in practice:
  - Learning hierarchy
  - Instructional objectives
  - Thematic description
  - Audience analysis
  - Task breakdown flowchart
  - Media selection justification
  - Information content cards
  - Delivery system specification
  - Screen shot sequences

Design Documents

- Non-exhaustive selection of design documents used in practice:
  - Script
  - Project timetable
  - Evaluation plan
  - Screen design
  - Contact point illustrations
  - Prototype
  - Navigation maps
  - Task hierarchy diagram
  - Interaction diagram
  - Needs assessment report
  - ....

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