COMP3008 Midterm Notes

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1   Design Concepts

1.1   What is Design/UX?

- interaction design
  - ➢ make interactive products
  - ➢ support the way people communicate interact
  - ➢ interdisciplinary
    - ▪ not just HCI
- user experience (UX)
  - ➢ how a product behaves when used by people
  - ➢ how people feel about it
  - ➢ every product has a UX
    - ▪ software
    - ▪ ketchup bottle
    - ▪ elevator

1.1.1   Stages of Design Process

- requirements
- design alternatives
- prototyping
- evaluating

1.2   Advantages of Involving Users in the Design Process

- authenticity
  - ➢ domain expertise
  - ➢ perspective
- pragmatics
  - ➢ expectation management
  - ➢ make users active stakeholders (ownership)

1.3   Usability Goals and Testing

- usability means (EESUML)
  1. Effective
  2. Efficient
  3. Safe to use
  4. Utility
  5. Memorability
  6. Learnability

1.3.1   Testing of Usability Goals

- we care about *human performance*, not *computer performance*
- iterative design
  - ➢ find problems
  - ➢ fix them
  - ➢ do more tests

- Agile Development (Figure 1.1)
  - ➢ sprint $N \implies$ test $N - 1$ and plan $N + 1$
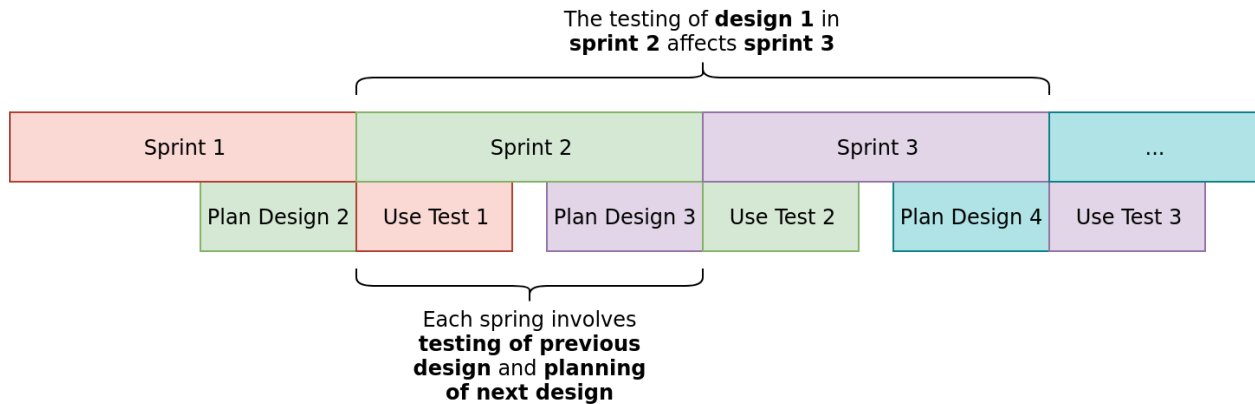
Figure 1.1: The agile development process.

- Early Developer Method
  - ➢ involve developers in design process early
  - ➢ figure out technical limitations
  - ➢ less knowledge transfer
- Continued Designer Involvement Method
  - ➢ design reviews, deliverables
  - ➢ more design at start, more development at end
- Royce's Waterfall (Figure 1.2)
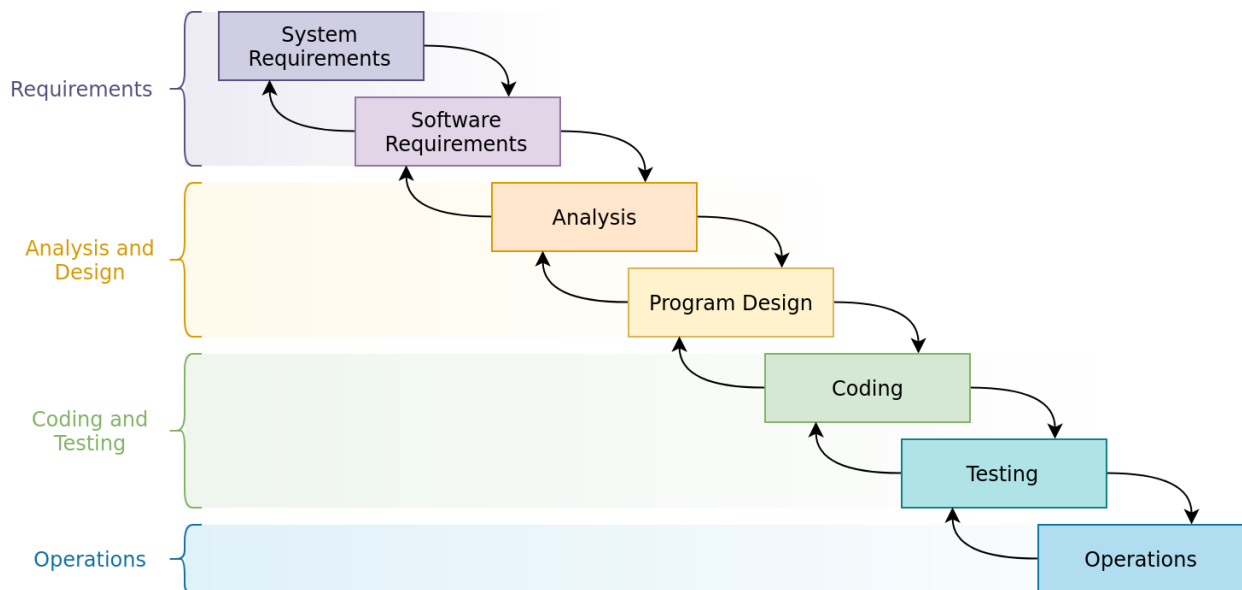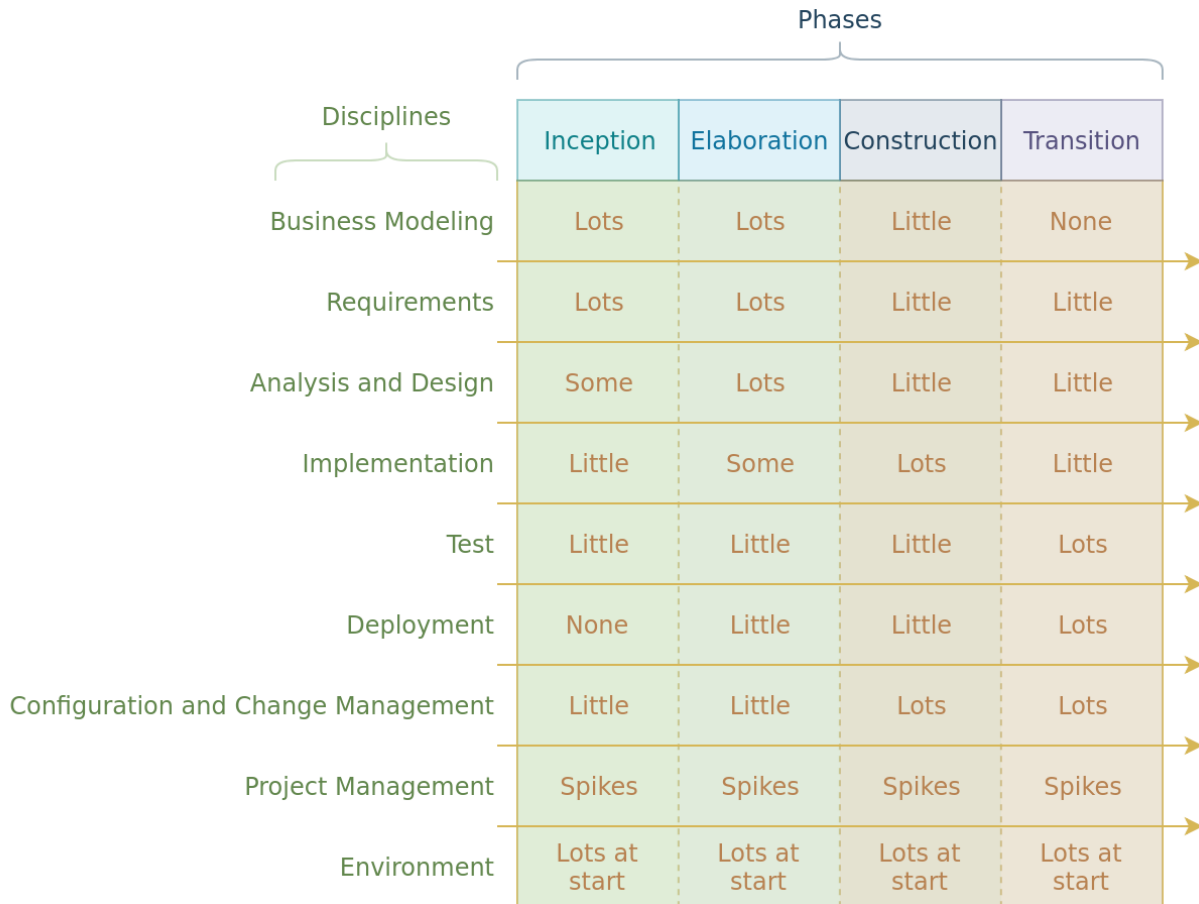 - ➢ not a great choice
  - ➢ iteration is better

Figure 1.2: Royce's Waterfall design process.

- Rational Unified Process (Figure 1.3)
  - ➢ not a great choice
  - ➢ iteration is better

Disciplines	Phases			
	Inception	Elaboration	Construction	Transition
Business Modeling	Lots	Lots	Little	None
Requirements	Lots	Lots	Little	Little
Analysis and Design	Some	Lots	Little	Little
Implementation	Little	Some	Lots	Little
Test	Little	Little	Little	Lots
Deployment	None	Little	Little	Lots
Configuration and Change Management	Little	Little	Lots	Lots
Project Management	Spikes	Spikes	Spikes	Spikes
Environment	Lots at start	Lots at start	Lots at start	Lots at start

Figure 1.3: The Rational Unified Process for design.

1.4   Common Design Principles

1.4.1   Visibility

- show state of system, possible actions
  - ➢ make it clear what user needs to do

1.4.2   Affordance

- actions suggested by design of an object
  - ➢ perceived must match actual
  - ➢ false affordance
    - ■ "looks like a button but can't be pressed"

1.4.3   Constraints

- limit actions based on appearance
  - ➢ physical
  - ➢ cultural

> ➢ logical

1.4.4 Consistency

- establish similarities
  - ➢ similar operation and elements for similar tasks
  - ➢ consistency with other software
  - ➢ consistency with real world

1.4.5 Feedback

- show consequences after actions
  - ➢ auditory
  - ➢ visual
  - ➢ haptic

2 Requirements Gathering

2.1 Basic Tasks

- requirements
- design alternatives
- prototyping
- evaluating

2.2 Basic Principles

- early focus on tasks/users
- empirical measurement
  - ➢ quantifiable usability criteria
- iterative design

2.3 Personas

- reflect stakeholders
- capture user characteristics
- bring them to life
  - ➢ name
  - ➢ background
  - ➢ characteristics
  - ➢ goals
  - ➢ frustrations
- advantages
  - ➢ have a clear picture of users
  - ➢ humanize the design process

2.4 Scenarios

- description of someone using a product to achieve a goal
  - ➢ keep product general
  - ➢ include setting, actors, background, tools/objects
  - ➢ use stakeholders' language

3   Data Gathering

3.1   Types of Data

- qualitative, quantitative
    - ➢ qualitative = descriptions
    - ➢ quantitative = numerical
- objective, subjective
    - ➢ objective = facts
    - ➢ subjective = opinions

Figure 3.1: Objective/Subjective, Quantitative/Qualitative data.

3.2   Questionnaires

- good for background requirements
- good to measure system usability
- what people say is not always what they think

3.2.1   Open-Ended vs Closed-Ended Questions

- closed $\implies$ easier to analyze
- open $\implies$ not limited to what researcher considered

3.2.2   Likert Orindal Scale Questions

- rate from strongly agree to strongly disagree
  - ➢ odd number $\implies$ neutral option
  - ➢ even number $\implies$ no fence-sitting
- reverse half of questions to avoid acquiescence bias

3.2.3   Semantic Scales

- similar to Likert
  - ➢ opposite adjectives on either end of the scale

3.2.4   Ranked

- rank a list in order of preference
  - ➢ forced choice

3.2.5   Multiple Choice

- make sure all options are covered

3.3   Observation

3.3.1   Simple Observation

- user is given a task
  - ➢ just watch them complete it
- no insight into through process

3.3.2   Think-Aloud

- user is given a task
  - ➢ watch them complete it
  - ➢ they describe what they are thinking at each step
- can be unnerving for participants

3.3.3   Co-Discovery

- two users work together on a task
  - ➢ watch them complete it
  - ➢ they talk to each other
- more natural than think-aloud
  - ➢ still gives insight into through process

3.3.4 Ethnography

- observe the user in a natural setting
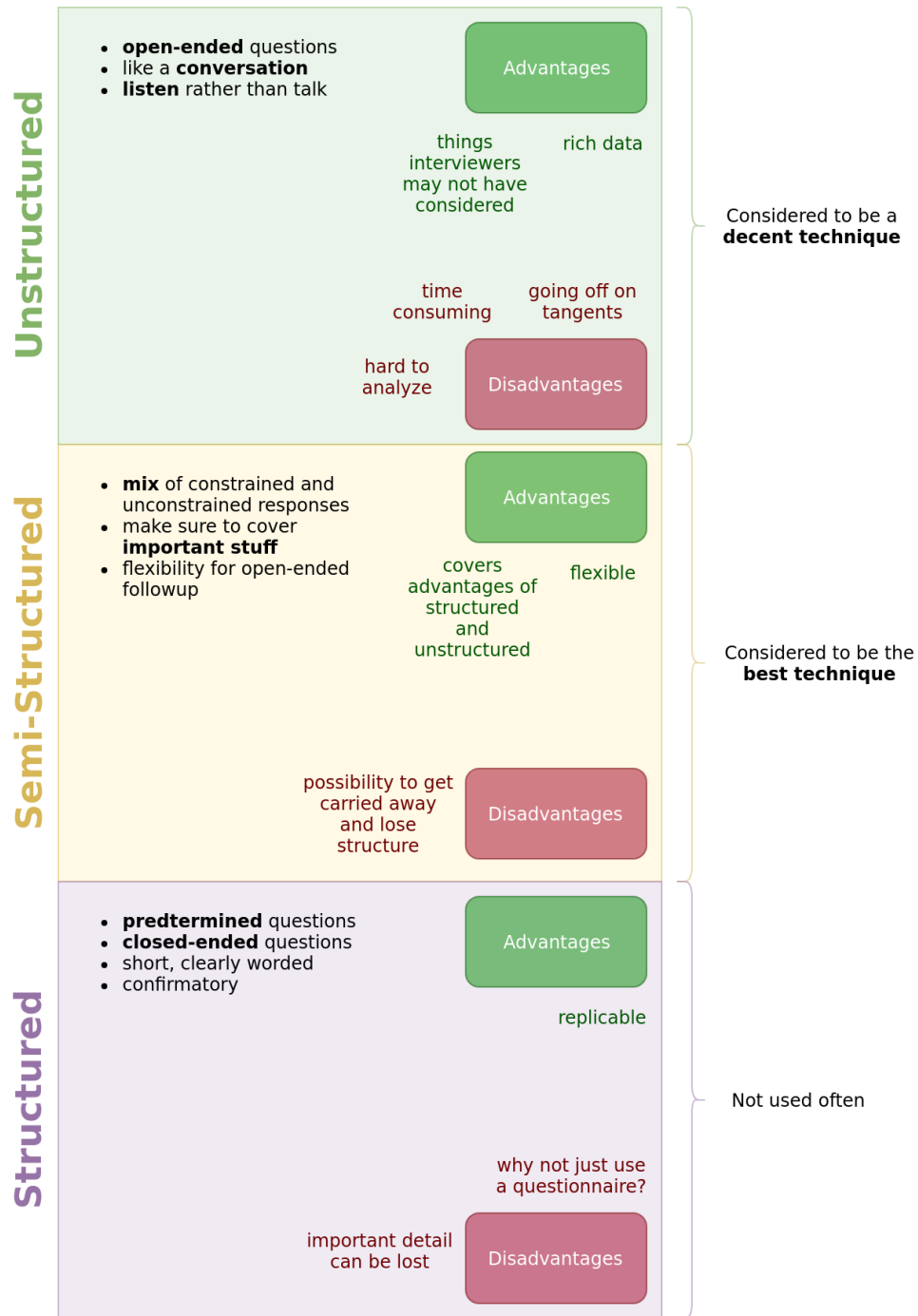 - ➤ how do they solve their everyday problems?

3.4 Interviews

Figure 3.2: Types of interview.

4   User Studies

5   Prototyping

6   Qualitative Analysis and Cognitive Processes

7   Inspection Methods

8   Cognitive Frameworks

9   Conceptual/Mental Models

10   Types of Interfaces in HCI