HCI Design Process

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No scene from pre-history is quite so vivid as that of the mortal struggles of great beasts in tar pits. In the mind's eye one sees dinosaurs, mammoths, and sabre-toothed tigers struggling against the grip of the tar...

Large system programming has over the past decade been such a tar pit, and many great and powerful beasts have thrashed violently in it. Most have emerged with running systems – few have met goals, schedules, and budgets. Large and small, massive or wiry, team after team has gotten entangled in the tar. No one thing seems to be the cause of difficulty – any particular paw can be pulled away. But the accumulation of simultaneous and interacting factors brings slower and slower

Process Models

- HCI design process (AJ)

- Garret's model (JJG)
- Contextual design process (HB/KH)
- Usability engineering lifecycle (DM)
- Goal driven design (AC/RR)

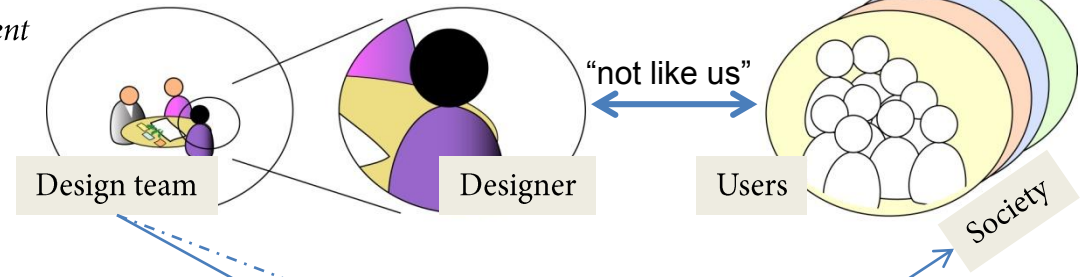
Designers design, producers produce

Technology changes

Collaboration

Inherent resistance to change

Client / management
Producers
Marketers
Purchasers
Users / operators



Design for a population, but...

... meet the needs of an individual

User needs and expectations change

Products change the society

Community — Problems not visible

System — No tools to hold complexity

Product — Design by drawing

Parts — Drawings hold complexity

*Great many people will have to lose their belief in the stability of the present before it becomes socially feasible to plan on the basis of what **will be** possible in the future, rather than on the basis of what **was** possible in the recent past... (Jones, 1970)*

Interaction design: "Harmonising form, content and behaviour"

Design: "Making a change in man-made things"

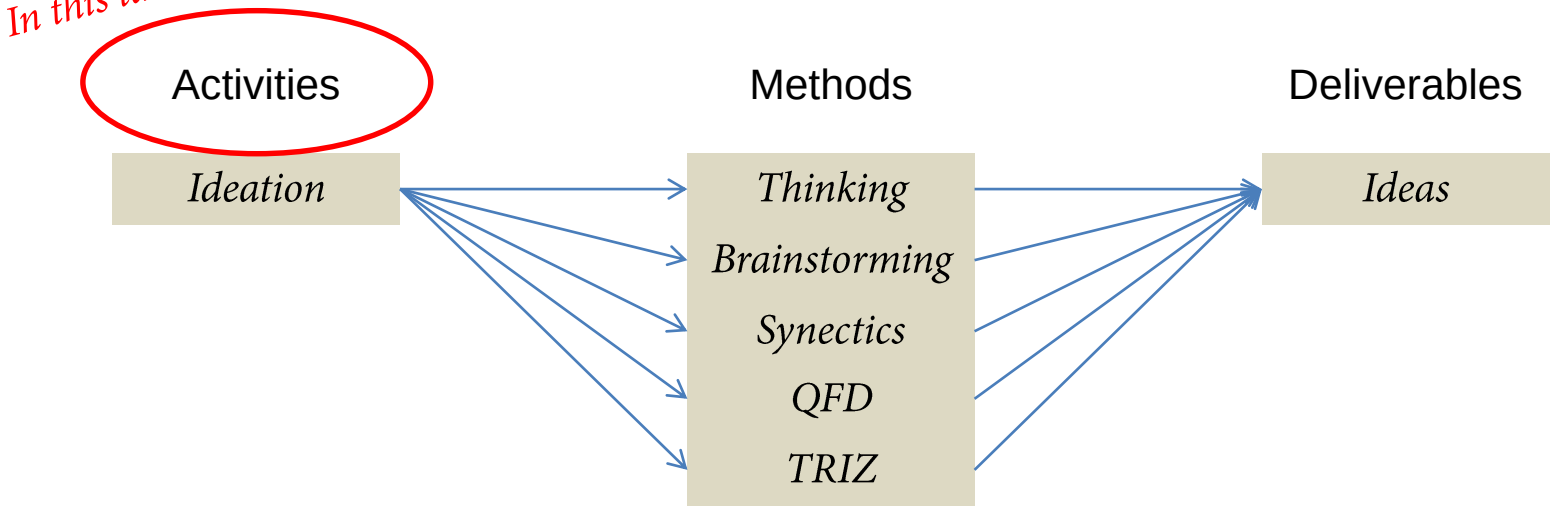
... predicting and controlling that change at all levels

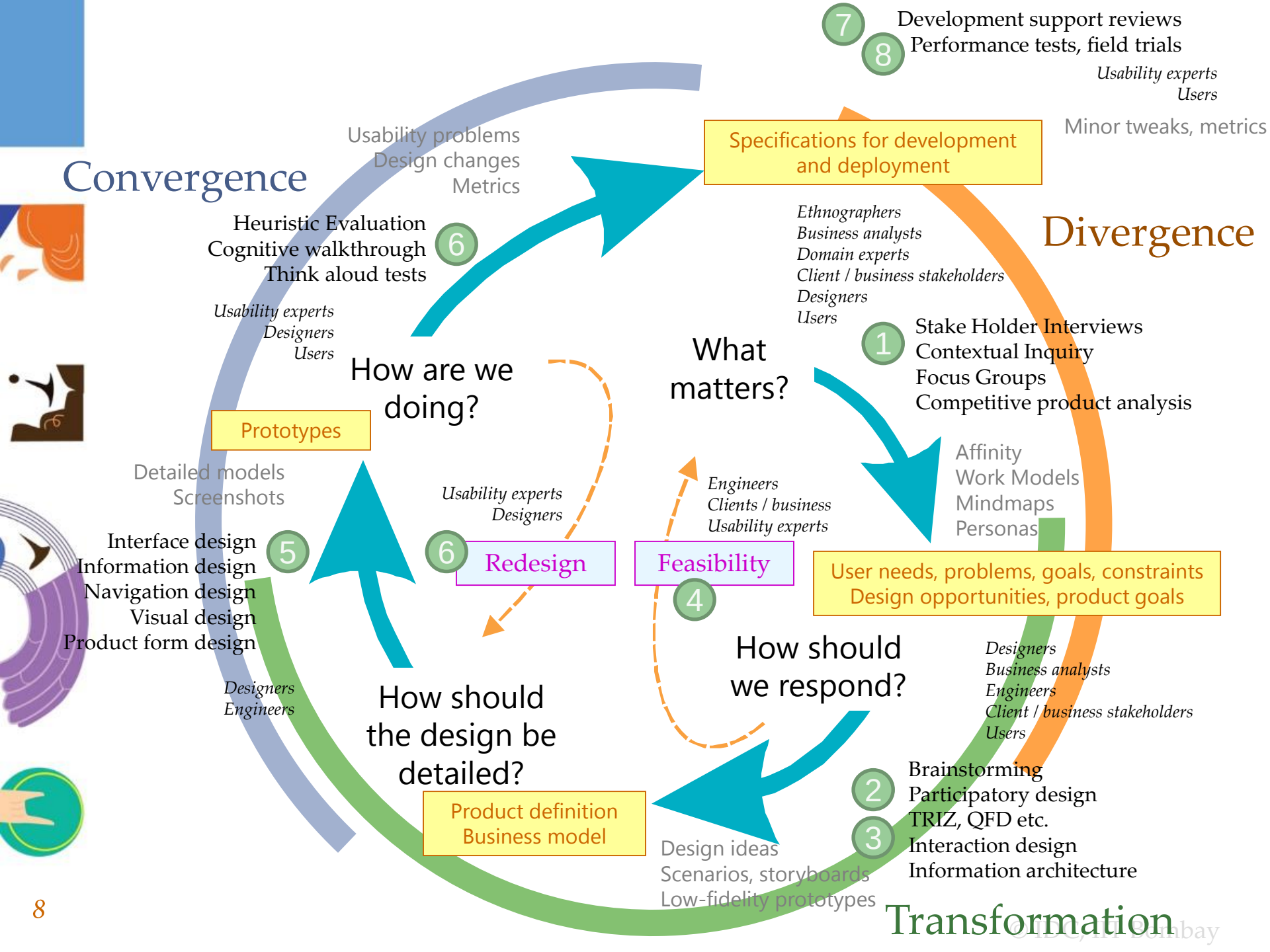
1. **Complexity**
2. **Don't know what to build**
3. **Distance from users**
4. **Dynamic situation**
5. **Distance from making**

Problem setting ↓ Problem solving

Design Process

In this talk, we are focussing on





7 Development support reviews
8 Performance tests, field trials

Heuristic Evaluation
Cognitive walkthrough
Think aloud tests
6

- User studies, modelling, competitive product analysis
- Ideation
- Product definition / IA / wireframes
- Usability evaluation 1 (formative) and refinement
- UI prototyping
- Usability evaluation 2 (formative) of prototype
- Development support by usability team
- Usability evaluation 3 (summative) of an early version

1 Stake Holder Interviews
Contextual Inquiry
Focus Goups
Competitive product analysis

Interface design
Information design
Navigation design
Visual design
Product form design
5

6 Redesign

Feasibility
4

2 Brainstorming
Participatory design
3 TRIZ, QFD etc.
Interaction design
Information architecture

Activities

1. User studies, modelling, competitive product analysis
2. Ideation
3. Product definition / IA / wireframes
4. Usability evaluation 1 (formative) and refinement
5. UI prototyping
6. Usability evaluation 2 (formative) of prototype
7. Development support by usability team
8. Usability evaluation 3 (summative) of an early version

Activities	Deliverables / outcomes
1) User studies, user modelling, market analysis	Analysis User models User needs, problems, goals and constraints Opportunities for design interventions Product goals
2) Ideation	Design ideas
3) Product definition	High-level scenarios Low fidelity prototypes, wireframes Business model Strategy, scope and structure of Garrett's model
4) Formative usability evaluation 1 and refinement	Refined and approved product definition and product goals Technology feasibility approval Business feasibility approval
5) Design detailing	Medium to high fidelity UI prototypes Structure, skeleton and surface of Garrett's model
6) Formative usability evaluation 2 and refinement	Usability problems Metrics Refined, detailed UI prototypes UI specification
7) Development support	Minor tweaks
8) Summative usability evaluation 3	Usability approval Metrics

Activities	Deliverables / outcomes	Methods	Disciplines involved
1) User studies, user modelling, market analysis	Analysis of individual interviews User models such as affinity, work models, mind-maps, personas User needs, problems, goals and constraints* Opportunities for design interventions Product goals (including usability goals)*	Stakeholder interviews Contextual inquiry Focus groups Competitive product analysis	Ethnographers, business analysts, domain experts, client / business stakeholders, designers, users
2) Ideation	Design ideas	Brainstorming Participatory design TRIZ QFD	Designers, business analysts, engineers, client / business stakeholders, ethnographers, users
3) Product definition	High-level use scenarios, storyboards Low fidelity prototypes, wireframes of software, foam models of hardware Business model Strategy, scope and structure of Garrett's model	Interaction design Information architecture	
4) Formative usability evaluation 1 and refinement	Refined and approved product definition and product goals* Technology feasibility approval* Business feasibility approval*	Heuristic evaluation	Engineers, client / business stakeholders, usability experts
5) Design detailing	Medium to high fidelity UI prototypes through iterations Structure, skeleton and surface of Garrett's model	Interface design Information design Navigation design Visual design Product form design	Designers, engineers
6) Formative usability evaluation 2 and refinement	Usability problems Metrics Refined, detailed UI prototypes* UI specification*	Heuristic evaluation Cognitive walkthrough Think aloud test Card sorting Same as in design detailing	Usability experts, designers, users
7) Development support	Minor tweaks	Reviews during development	Designers, usability experts
8) Summative usability evaluation 3	Usability approval* Metrics	Usability performance test Field trials	Usability experts, users

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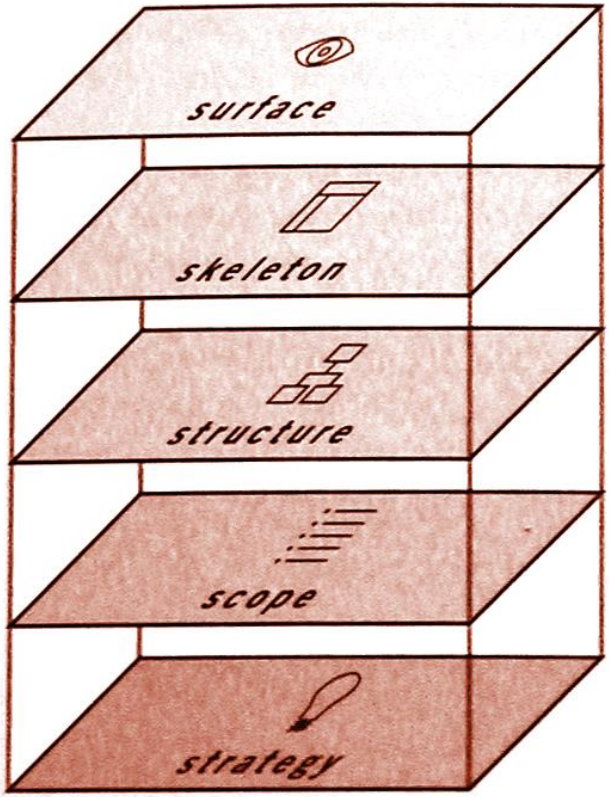
Elements of User Experience

Jesse James Garrett,
The Elements of User Experience,
New Riders (2003)

Second edition (2010)
http://www.jjg.net/elements/



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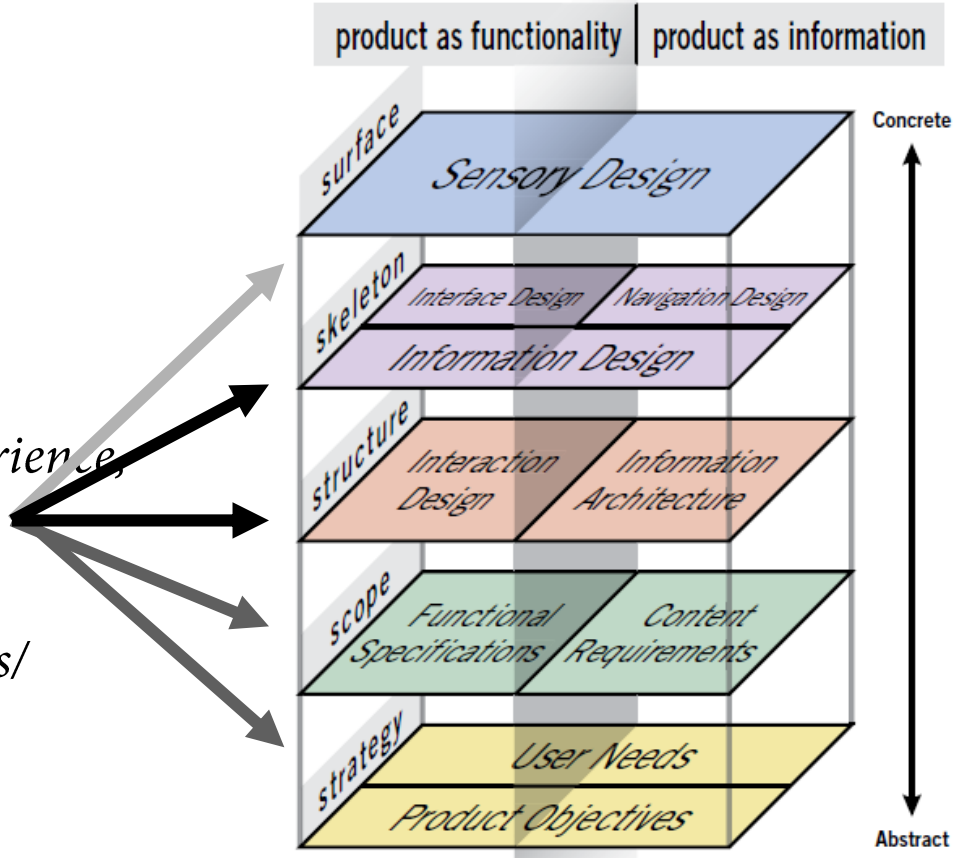
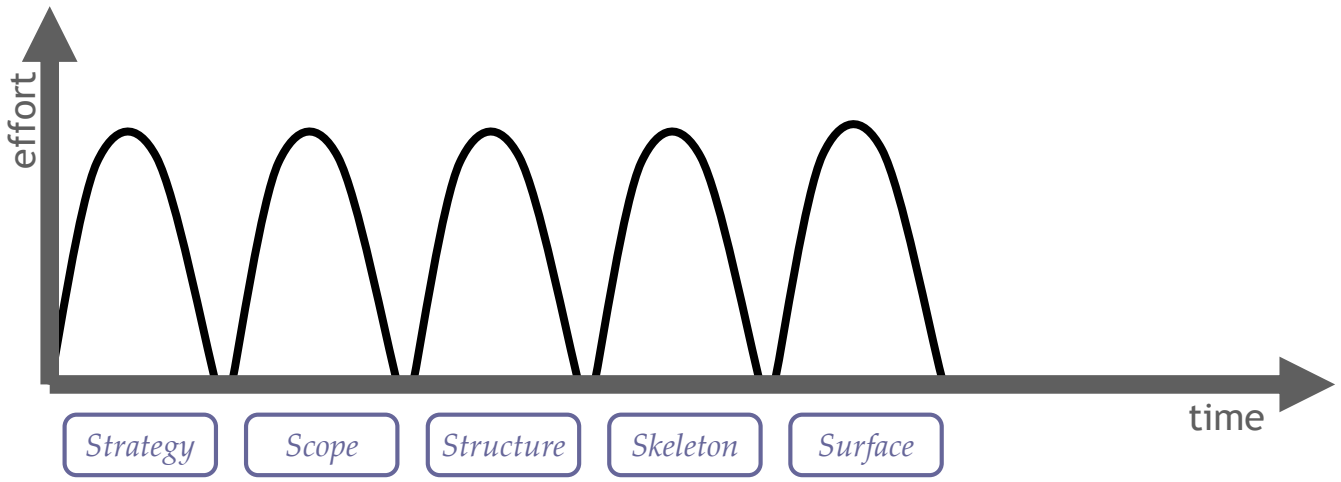


Process



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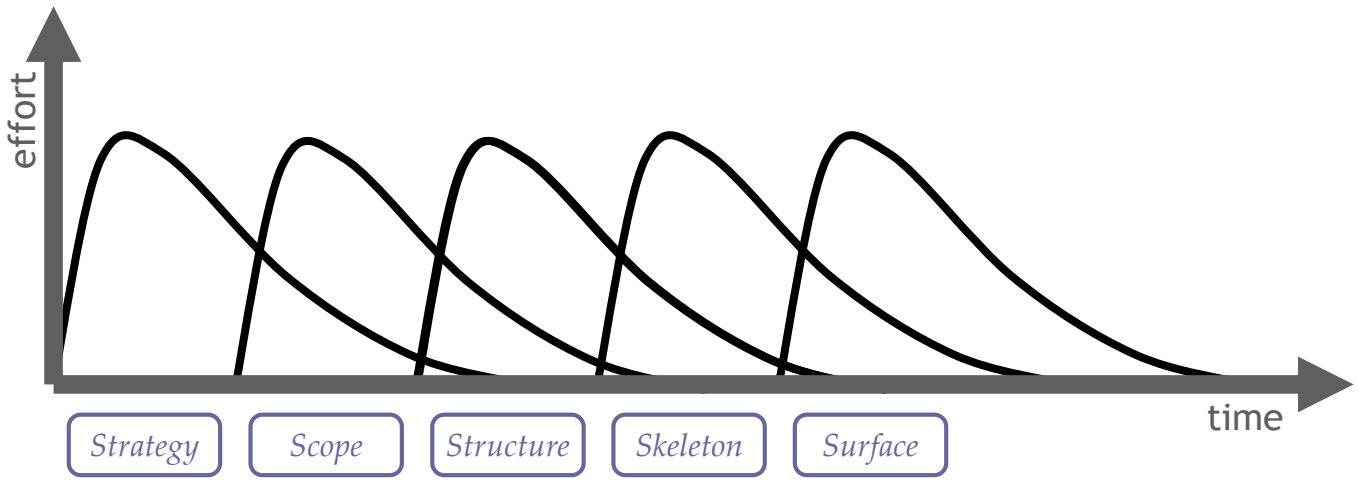

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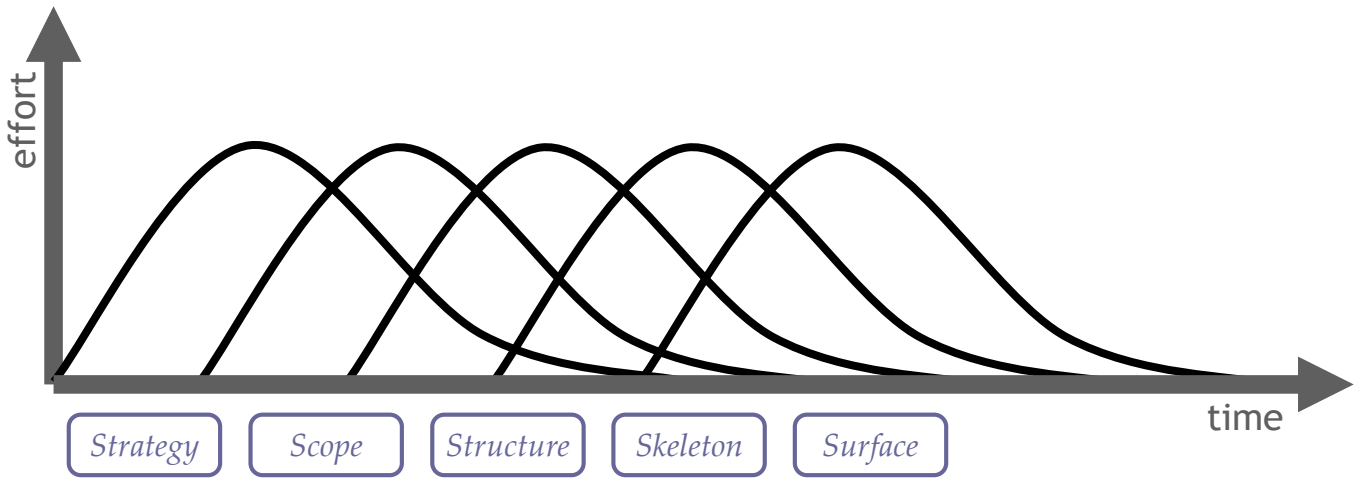

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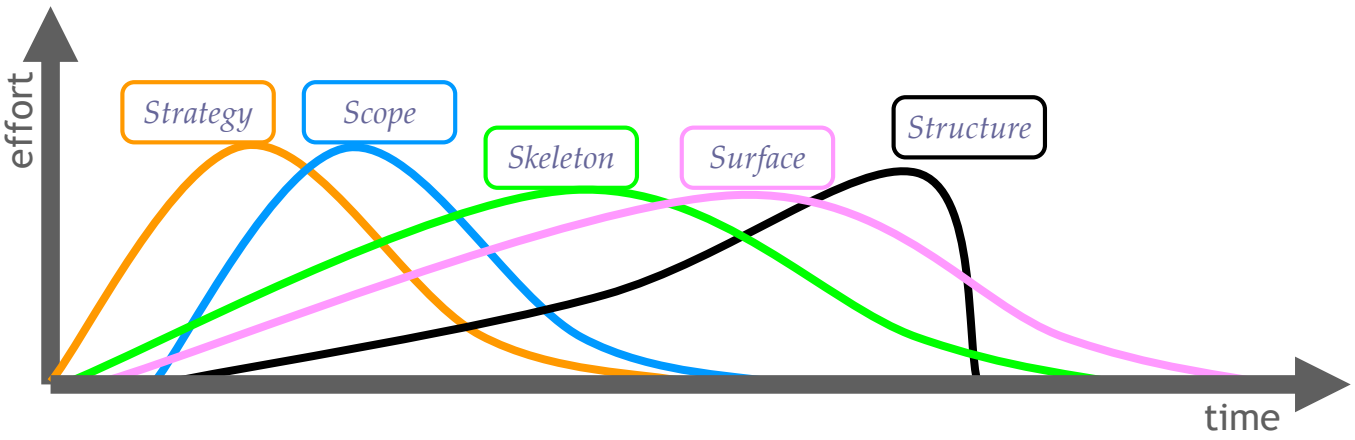

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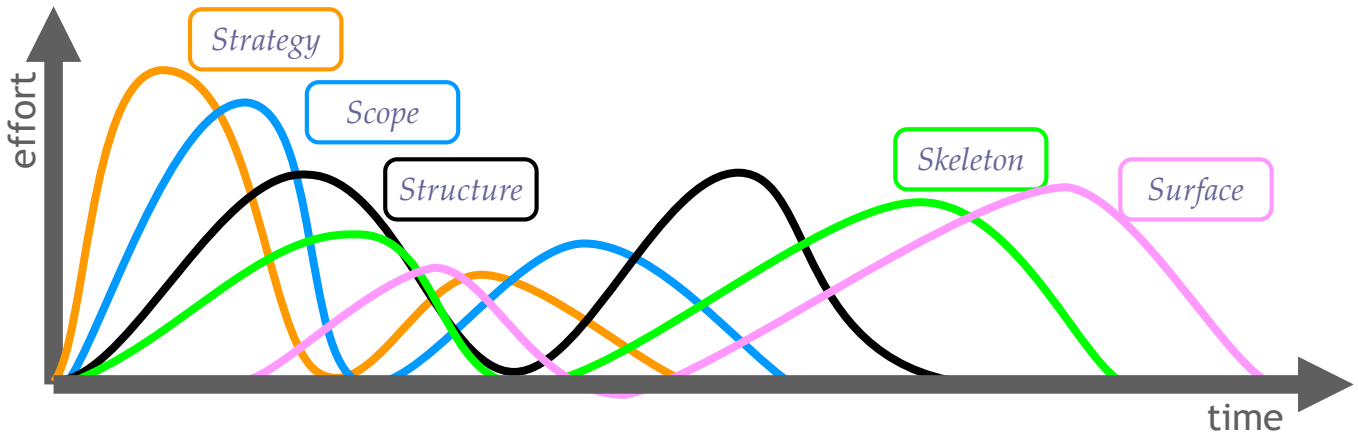
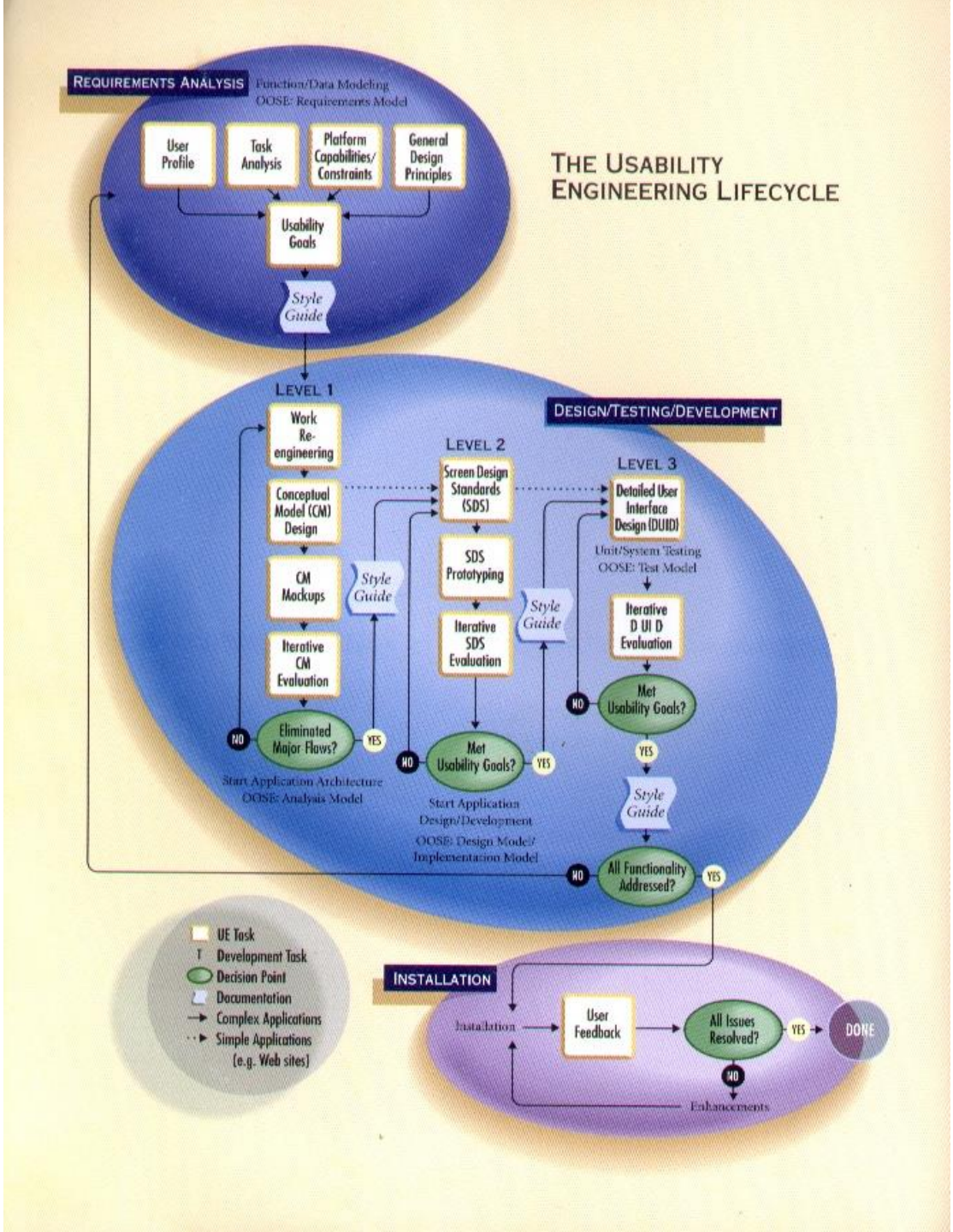
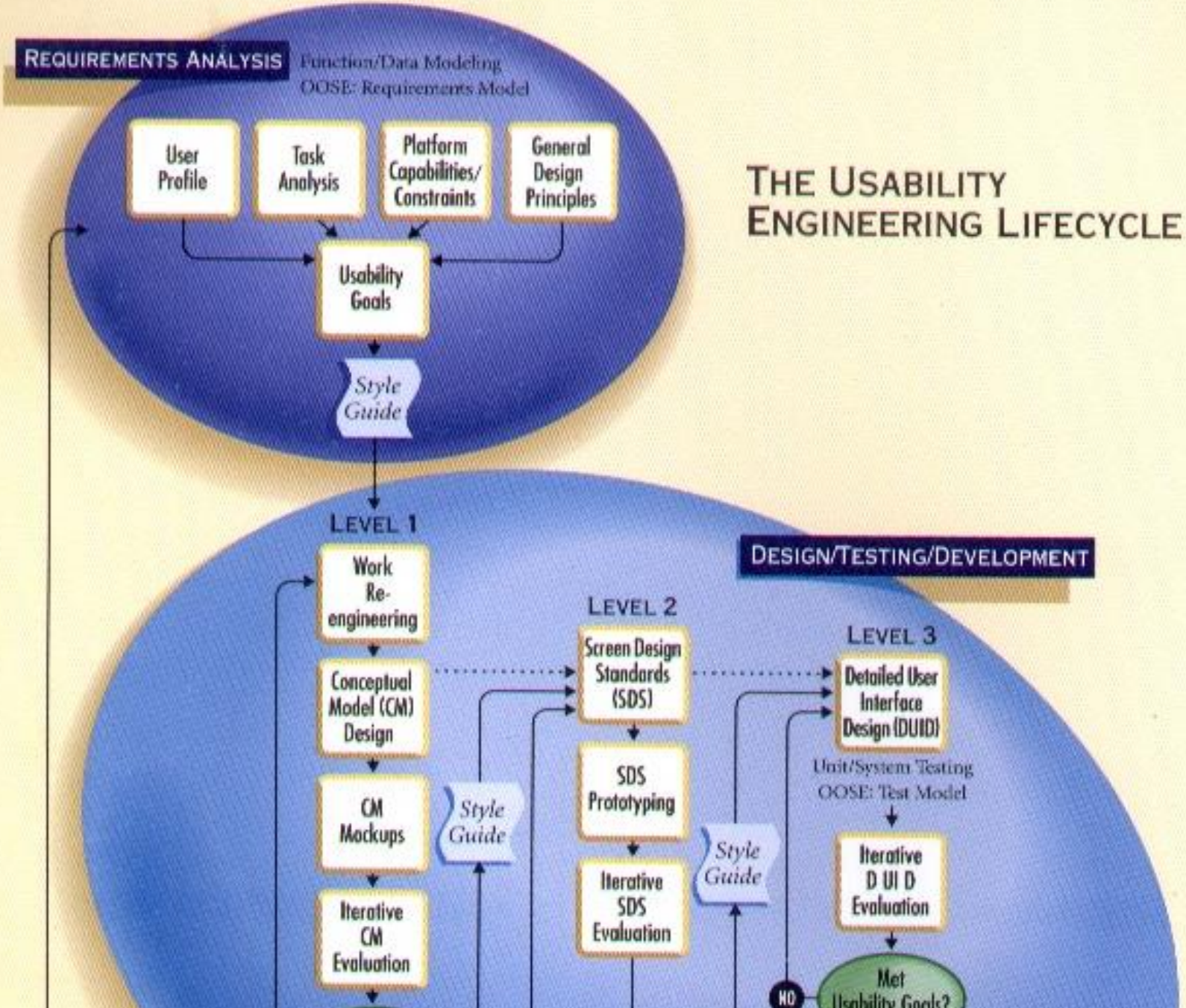


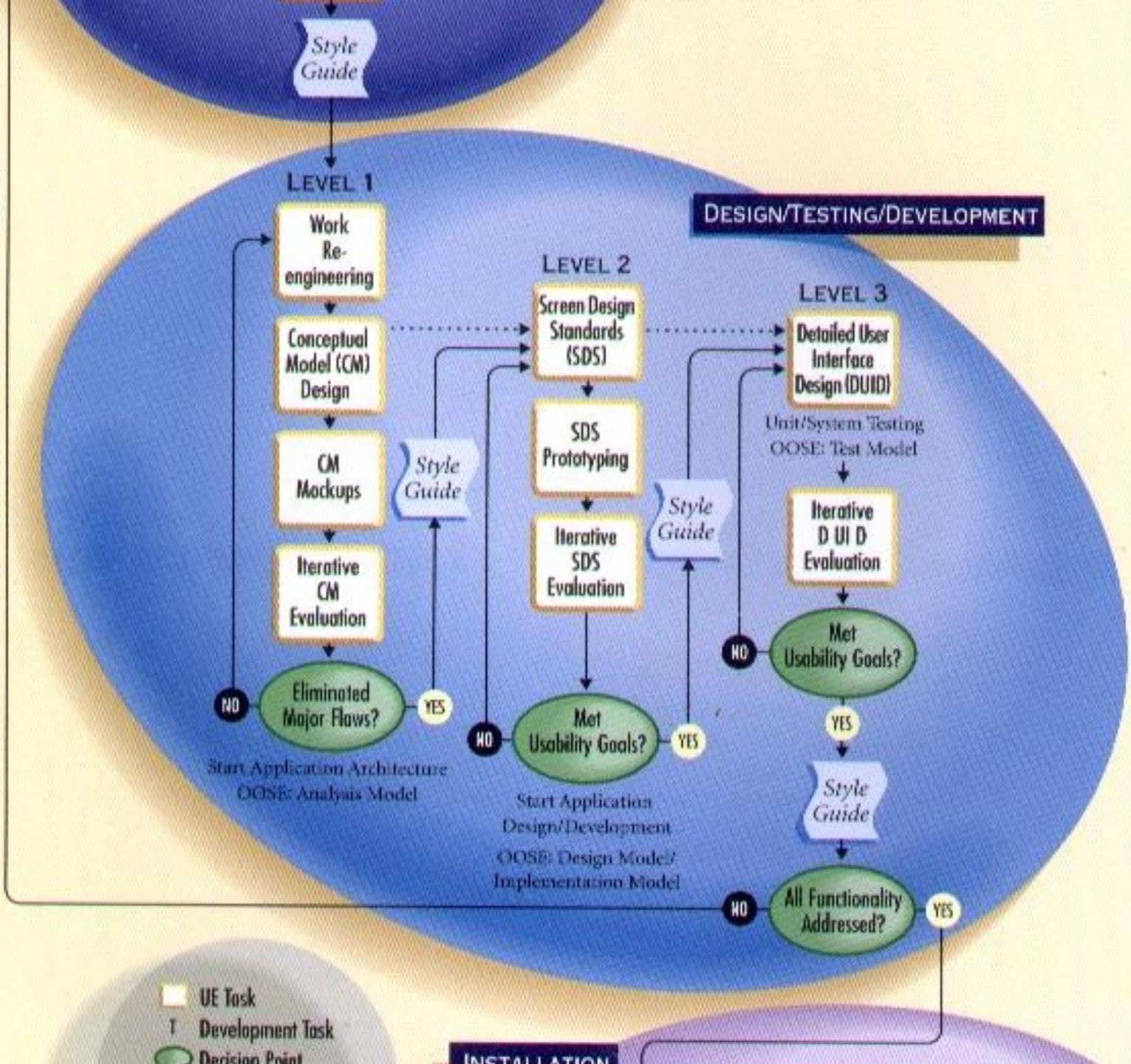
Usability Engineering Life Cycle

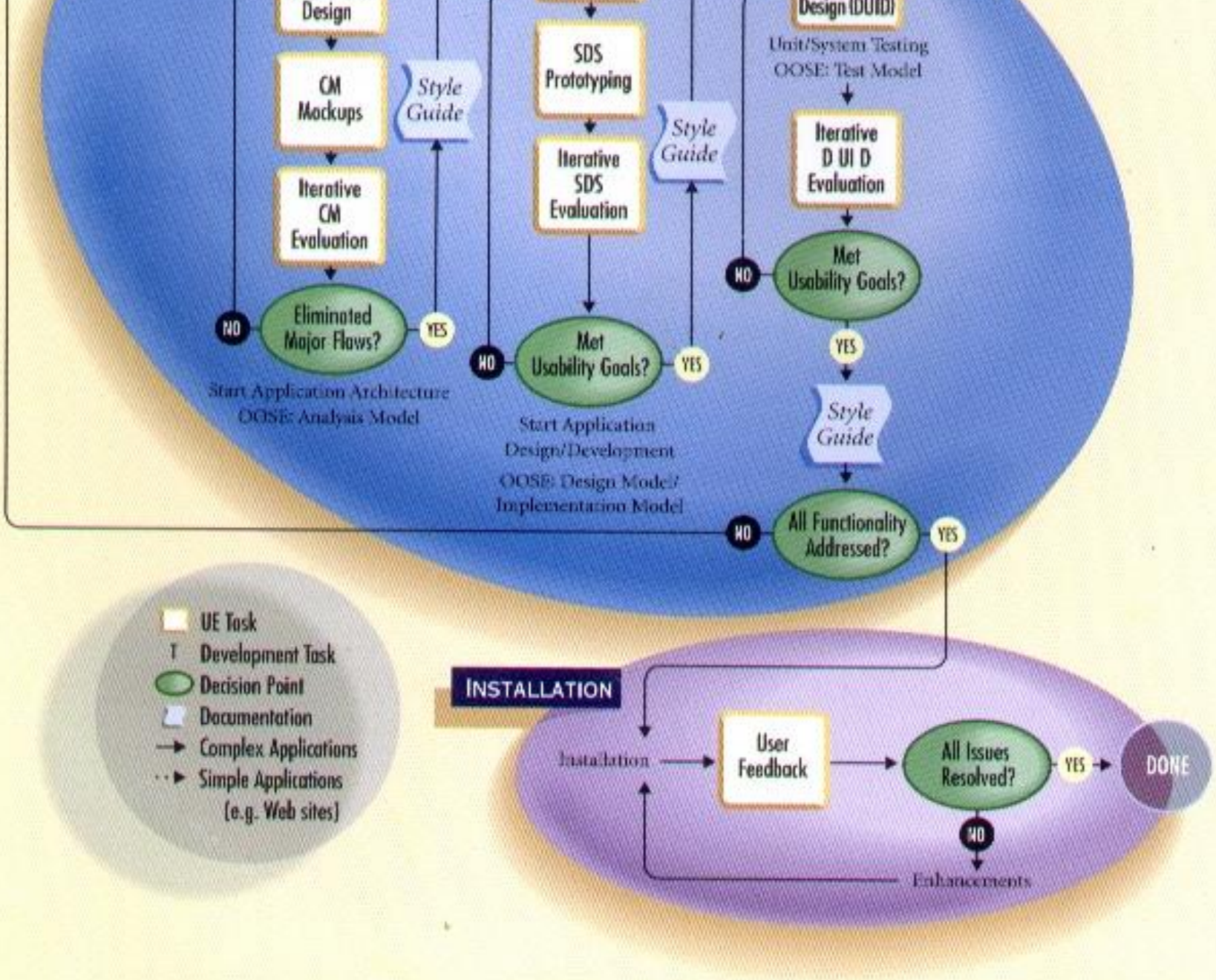
- Deborah Mayhew



THE USABILITY ENGINEERING LIFECYCLE




Style Guide
LEVEL 1
DESIGN/TESTING/DEVELOPMENT
Work Re-engineering
Conceptual Model (CM) Design
CM Mockups
Iterative CM Evaluation
Eliminated Major Flaws?
NO
YES
Start Application Architecture
OOSE: Analysis Model
LEVEL 2
Screen Design Standards (SDS)
SDS Prototyping
Iterative SDS Evaluation
Met Usability Goals?
NO
YES
Start Application Design/Development
OOSE: Design Model/ Implementation Model
LEVEL 3
Detailed User Interface Design (DUID)
Unit/System Testing
OOSE: Test Model
Iterative D UI D Evaluation
Met Usability Goals?
NO
YES
All Functionality Addressed?
NO
YES
UE Task
Development Task
Decision Point
INSTALLATION


Design
CM Mockups
Iterative CM Evaluation
Style Guide
NO
Eliminated Major Flaws?
YES
Start Application Architecture
OOSE: Analysis Model
SDS Prototyping
Iterative SDS Evaluation
Style Guide
NO
Met Usability Goals?
YES
Start Application Design/Development
OOSE: Design Model/ Implementation Model
Design (DUID)
Unit/System Testing
OOSE: Test Model
Iterative D UI D Evaluation
NO
Met Usability Goals?
YES
Style Guide
NO
All Functionality Addressed?
YES
UE Task
Development Task
Decision Point
Documentation
Complex Applications
Simple Applications (e.g. Web sites)
INSTALLATION
Installation
User Feedback
All Issues Resolved?
YES
DONE
NO
Enhancements

Contextual Design

- Hugh Beyer
- Karen Holtzblatt

Designing From Data

- We need ways to *find* user data
  - *See the right needs, including latent needs*
- We need ways to *represent* user data
  - *Document, so that mind is free to do other things*
- We need ways to *share* user data
  - *Make sure everyone is on the same page*
- Respond to the complete picture
  - *Don't create new problems while you solve old ones*
- Designing from data is still a *creative leap*
  - *Data shows problems, not solutions*

Contextual Design in Five Minutes

- Provides explicit steps and deliverables
  - *For collecting and representing data*
- Optimized for large projects
  - *Working in large teams*
  - *Scales down for smaller ones*
- Externalizes good design practice
  - *So that everyone in the team can work together*
- Designing from data is *still* a creative leap

Contextual Design in Five Minutes…

- Contextual Inquiry
  - *Interview users while they work*
  - *Do an interpretation session with the team*
- Work Modeling
  - *Represent people's work in diagrams*
  - *Useful for understanding complex and unfamiliar work domain*
  - *Flow, Sequence, Culture, Artifact, Physical*

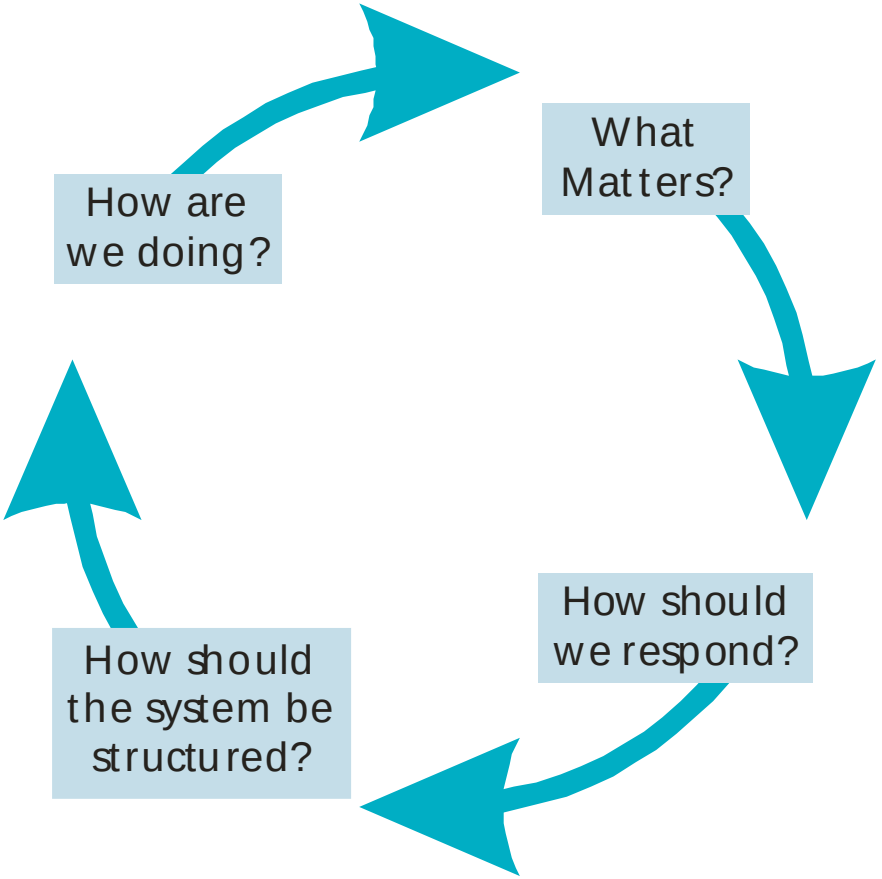
Contextual Design in Five Minutes…

- Affinity Diagram
  - *Creates a single picture of the population the system will address*
- Consolidation of Work Models
  - *Pull individual diagrams together to see the work of all users*
  - *Consolidated work models show the underlying pattern and structure in the work*

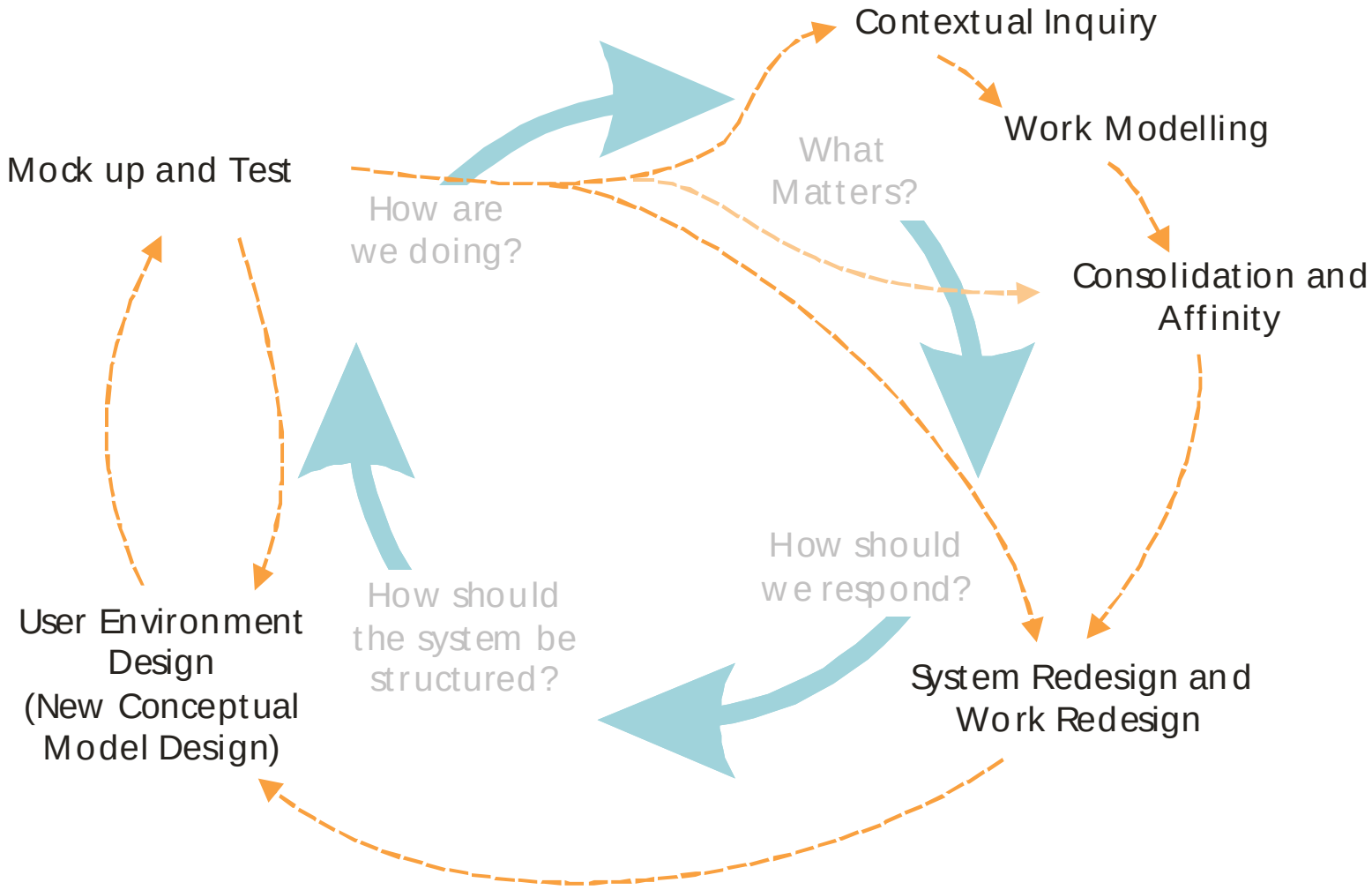
Contextual Design in Five Minutes…

- Work Redesign
  - *Create a corporate response to the users' needs*
  - *Focus on improvement of structure of the work rather than technology solutions*
  - *Storyboards define the new system*
- User Environment Design
  - *Design a new conceptual model*
  - *Structure the system work model to fit the work*
- Mock up and test with users
  - *Test your ideas with users through paper prototypes*

Contextual Design in Five Minutes…



Contextual Design in Five Minutes…



About Face 2.0

- Alan Cooper
- Robert Reimann

Goal Directed Design Process - Phases

- Initiate
- Design
- Code
- Test
- Ship

Goal Directed Design Process - Phases

- Initiate - managers
- Design - designers
- Code - programmers
- Test - QA / Usability
- Ship - marketing

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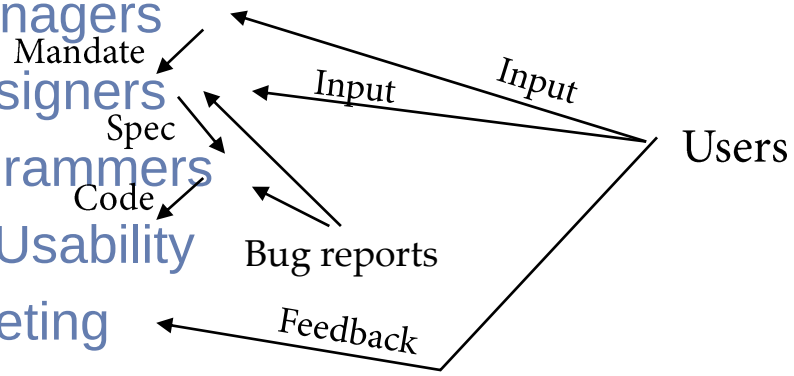

Goal Directed Design Process - Phases

- Initiate
- Design
- Code
- Test
- Ship




The Design Phase

- Research
  - *Users and the domain*
    - ~ *CI, ethnography, focus groups*

The Design Phase

- Research
- Modelling
  - *Users and use contexts*
  - *User goals and personas*
    - ~ *Personas, work models, affinity*

The Design Phase

- Research
- Modelling
- Requirements
  - *User, business and technical needs*
    - *Primary goals, usability goals*

The Design Phase

- Research
- Modelling
- Requirements
- Framework
  - *Defining design structure and flow*
  - *Scenarios drive design*
    - ~ *Vision, conceptual model, scenarios*

The Design Phase

- Research
- Modelling
- Requirements
- Framework
- Refinement
  - *Behaviour, form and content*
    - ~ *Interaction design, information architecture, interface design, navigation design, information design*

The Design Phase

- Research
- Modelling
- Requirements
- Framework
- Refinement

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