Human-Computer Interaction IS4300

1

Ethnography Homework I3

2

Team Projects Clarification – T2

- User analysis.
  - Identify stakeholders (primary, secondary, tertiary, facilitating)
  - For Primary Stakeholders
    - Demographics
    - Persona(s)
- Task analysis
  - 6+ representative tasks
  - For each
    - Task scenario
    - Hierarchical Task Analysis

3

Requirements Analysis

- What does the system/interface need to do?
- Who is the user?
- What does the user need to do?

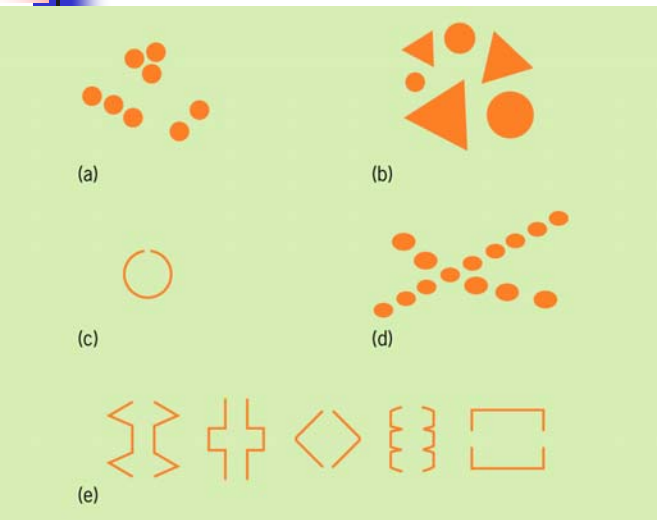
4

Stone Ch 5 – Knowledge of User Interface Design

- Mostly review of Norman
- Point: You need to have an understanding of what is possible (within constraints) so you don't write specs for a system that you can't build.
  - Knowledge of general user capabilities
  - Knowledge of technology
  - Knowledge of design
  - **Experience!**

5

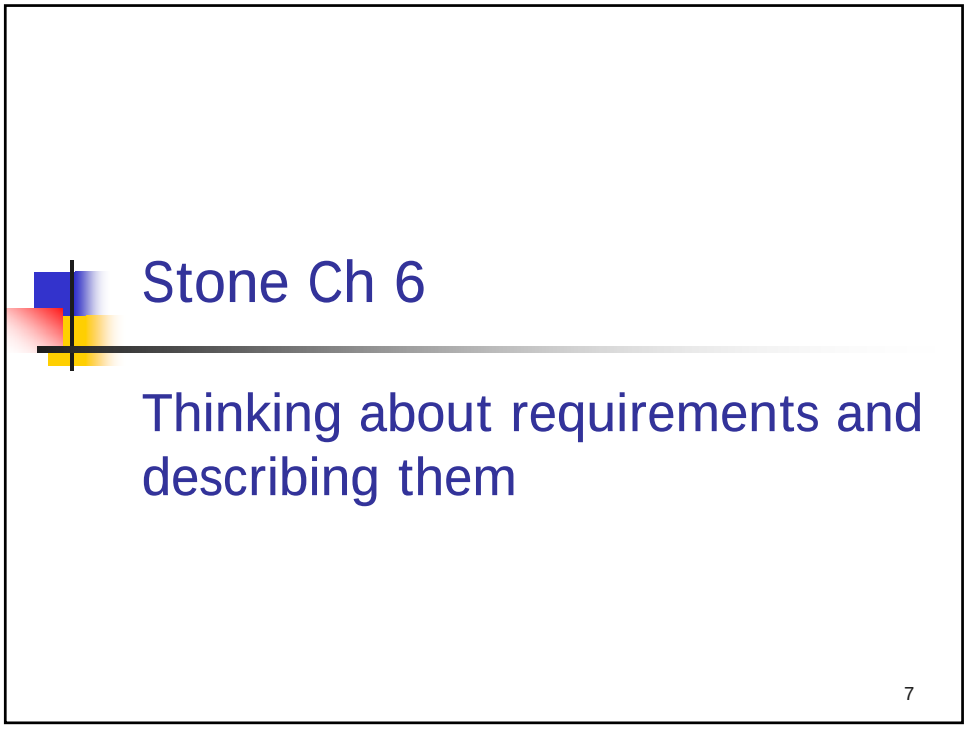
Principles of Perceptual Organization

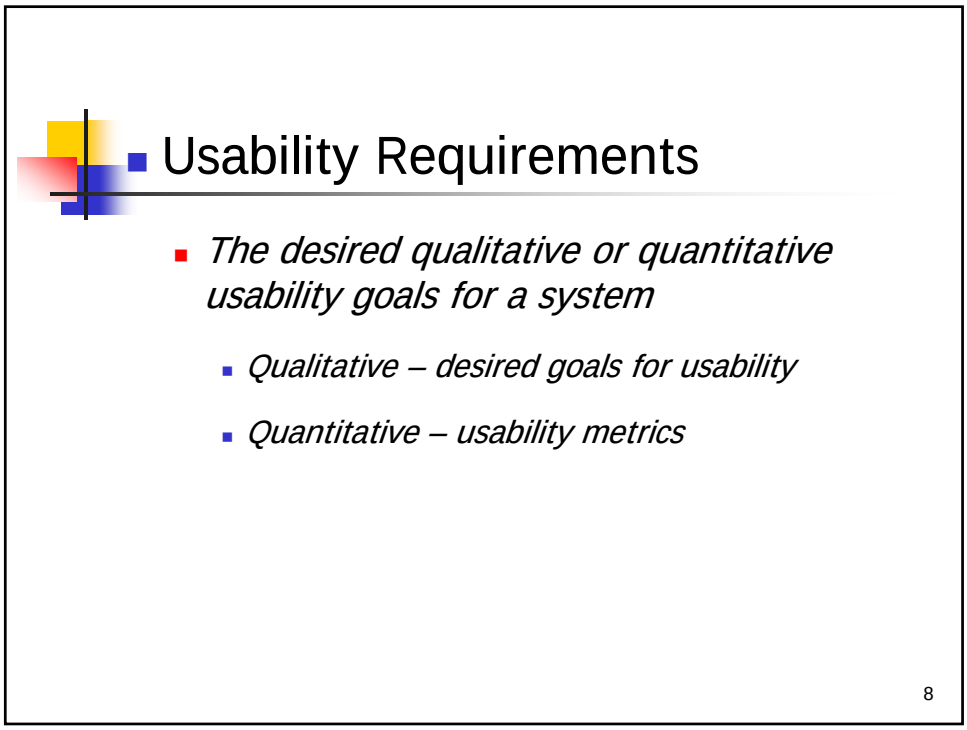


a. proximity
b. similarity
c. closure
d. continuity
e. Symmetry

Why is this important?

6


Stone Ch 6
Thinking about requirements and describing them
7


Usability Requirements
The desired qualitative or quantitative usability goals for a system
Qualitative – desired goals for usability
Quantitative – usability metrics
8

Usability

- Quensenberry's dimensions
  - Effective
  - Efficient
  - Engaging
  - Error tolerant
  - Easy to learn

10

Nielsen's Usability Dimensions

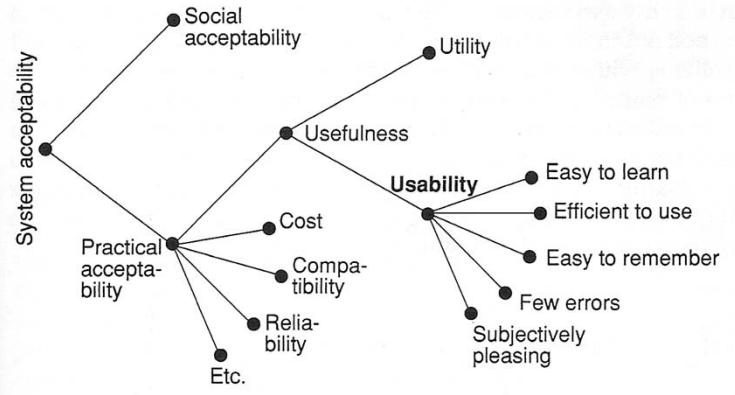


Figure 1 *A model of the attributes of system acceptability.*

From Nielsen, Usability Engineering

11

Capturing Overall System Efficacy in Requirements

- Advertising / Marketing
  - Customer click throughs
  - Engagement / Stickiness
  - Gaze time
- Healthcare
  - Number of ED visits
  - Medication adherence
- Sales support
  - Sales volume

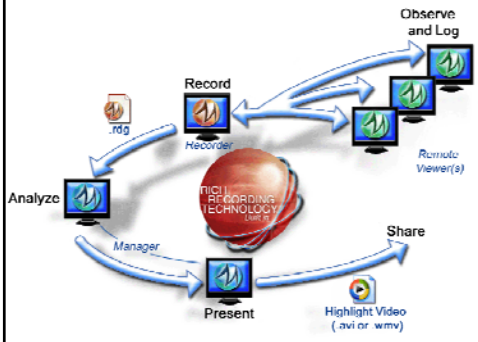
12

Other ways of measuring usability...

13

Other ways of measuring usability…

- Quantitative behavioral measures
  - Number of frowns per task



Exercise

- List some quantitative usability requirements for the optometrist web site.
- Representative Tasks:
  - T1. Find the cost of these:
  - T2. Find the standard warranty on Ray Ban frames.
  - T3. Order 3 red, 3 green of these: given the following payment info …

Exercise

- How will you assess usability as you progress through the design?

16

- Constraints and Trade-offs in Relation to Requirements Gathering
  - Costs/Budgets/Timescales
  - Technical Constraints
  - Trade-Offs

17

Prototyping

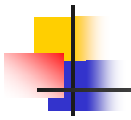
- What is a prototype?
- Why prototype?
- What does prototyping have to do with Requirements Analysis?

19

What is a prototype?

- Prototyping is a technique in which different aspects of novel products are tested by testing a model
  - approximations of final system
  - prototypes can be “throw away” (e.g., scale models) or go into commercial use (Concorde!)
- In software development prototypes can be
  - software-based
  - Paper-based
  - Other media

20



What is a prototype?

In interaction design it can be (among other things):

a series of screen sketches
a storyboard, i.e. a cartoon-like series of scenes
a Powerpoint slide show
a video simulating the use of a system
a lump of wood (e.g. PalmPilot)
a cardboard mock-up
a piece of software with limited functionality written in the target language or in another language

21

Why Prototype?

- Users are bad at hypotheticals (e.g., focus groups – “Do you think you would like the interface to...?”)
- You can’t test until you implement something.
- Implementation is expensive and time consuming.

22

Why Prototype?

The goal of prototyping is to resolve uncertainty about

- functional and user requirements
- operation sequences
- user support needs
- required representations
- "Look and Feel" of the interface
- appropriateness of the design

23

What do you use prototyping for?

- Check feasibility of ideas with users
- Check usefulness of the application
- Allow users to contribute
- Allow users to test ideas
- Validate requirements
- Negotiate requirements

24

Different kinds of prototyping

- "Throw away" prototyping (a.k.a. "rapid prototyping")
  - used exclusively in requirements gathering
- Incremental prototyping
  - not actually prototyping at all, but the delivery of prioritised functions incrementally to a single, overall design
- Evolutionary prototyping (a.k.a "Rapid Application Development, RAD)
  - as for incremental prototyping but with evolving design

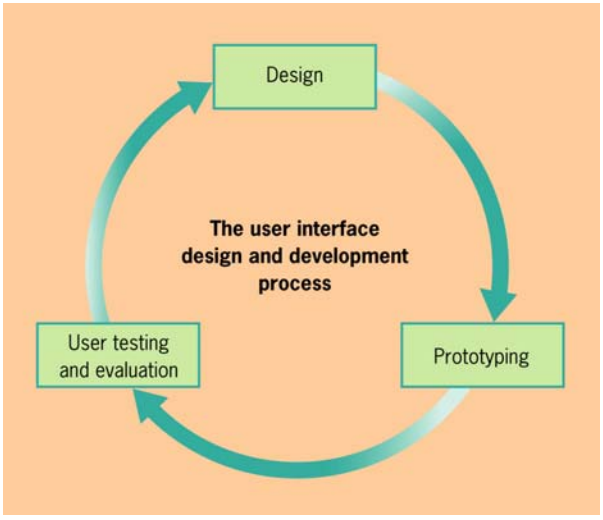
25

Different kinds of prototyping

- Full prototype
  - full functionality, lower performance than production software
- Horizontal prototype
  - displays "breadth" of functionality, no lower level detail "back end" support Eg. Database link
- Vertical prototype
  - full functionality and performance of a "slice" or small part of the system

26

What does prototyping have to do with Requirements Analysis?



27

Prototyping principles

- Only use as much fidelity as you need to test.
  - e.g. testing design for a new smart phone you might give users a block of wood cut to the right size.
- Why?
  - You don't want feedback of details that are not relevant to your current design decisions.
  - Prevent getting locked into details
  - Prevent "investment" trap
- Corollary: avoid software as long as possible

28

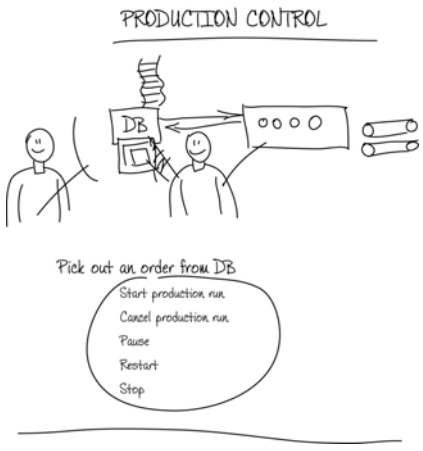
Prototyping principles

- Proper attitude towards prototypes in Requirements Analysis:
  - A prototype exists to answer a question then be thrown away.
  - A prototype is not your final product!

29

Low-fidelity Prototypes

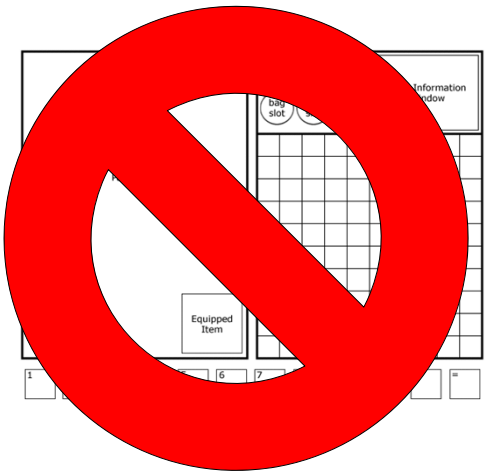
- Sketching
- Screen Mockups
- Storyboards



30

Low-fidelity Prototypes

- Sketching
- Screen Mockups
- Storyboards

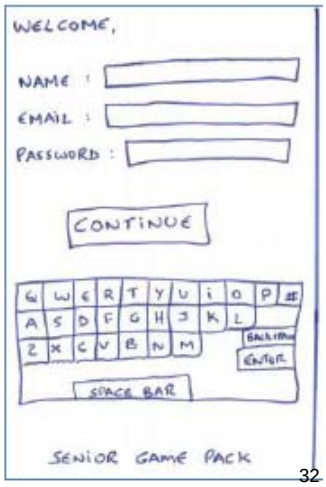


31

Low-fidelity Prototypes

- Sketching
- Screen Mockups
- Storyboards

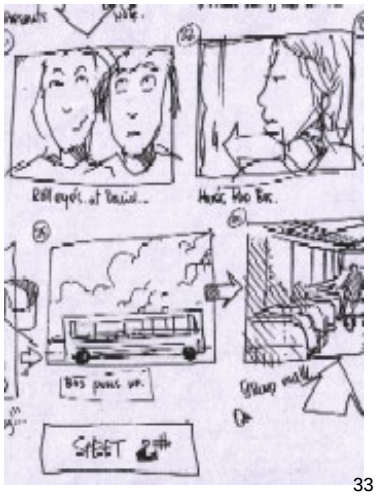
Why?



32

Low-fidelity Prototypes

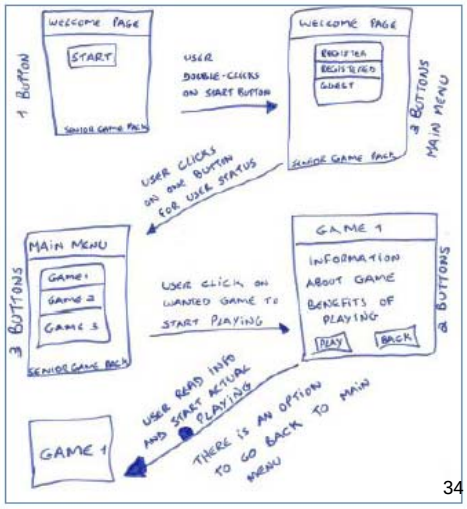
- Sketching
- Screen Mockups
- Storyboards



33

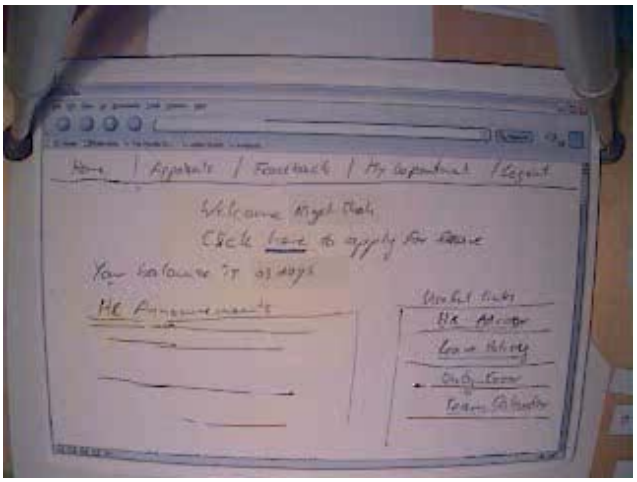
Low-fidelity Prototypes

- Sketching
- Screen Mockups
- Storyboards



34

Paper Prototyping Example

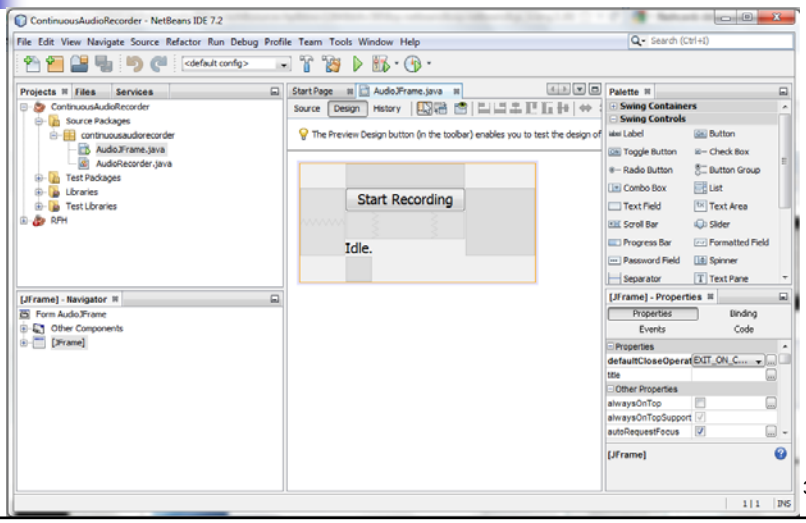


35

GUI Prototyping Tools

36

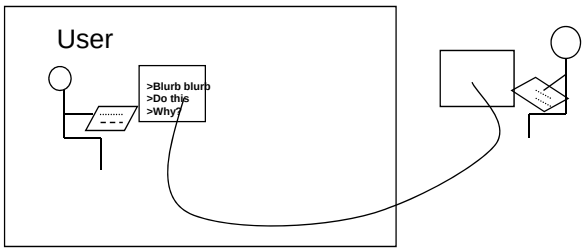
High-Fidelity Prototypes: Using Software Tools to Try Out Your Ideas



37

'Wizard-of-Oz' prototyping

- The user thinks they are interacting with a computer, but a developer is responding to output rather than the system.
- Usually done early in design to understand users' expectations



38

Example: AlwaysOn Project

39

Stone Ch 7

Case study on requirements: Tokairo, part 1

Methods?

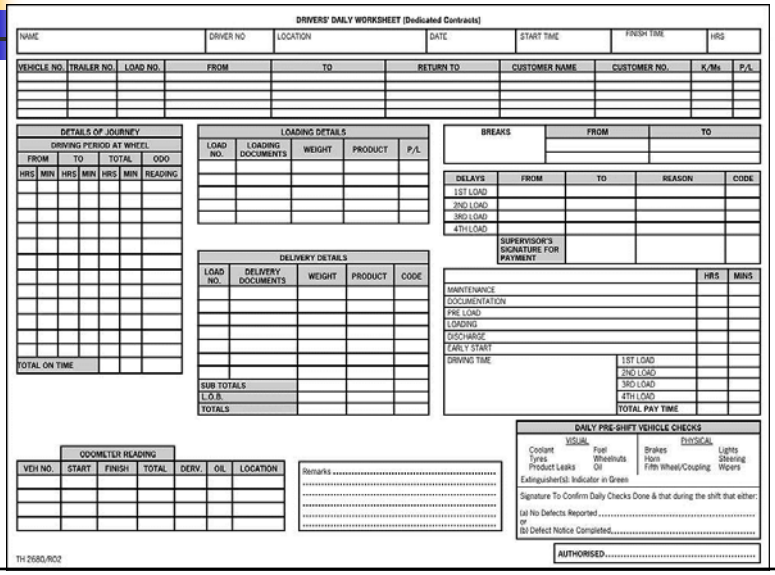
40

Redesign of Delivery Records

- Original
  - Paper worksheet drivers completed.
  - Worksheet passed to administrative staff
  - Staff processed worksheet

41

Original Delivery Record



DRIVERS' DAILY WORKSHEET (Dedicated Contracts)

NAME | DRIVER NO | LOCATION | DATE | START TIME | FINISH TIME | HRS

VEHICLE NO. | TRAILER NO. | LOAD NO. | FROM | TO | RETURN TO | CUSTOMER NAME | CUSTOMER NO. | K/Ms | P/L

DETAILS OF JOURNEY — DRIVING PERIOD AT WHEEL: FROM (HRS, MIN) | TO (HRS, MIN) | TOTAL (HRS, MIN) | ODO READING; TOTAL ON TIME

LOADING DETAILS: LOAD NO. | LOADING DOCUMENTS | WEIGHT | PRODUCT | P/L

BREAKS: FROM | TO

DELAYS: | FROM | TO | REASON | CODE; 1ST LOAD; 2ND LOAD; 3RD LOAD; 4TH LOAD; SUPERVISOR'S SIGNATURE FOR PAYMENT

DELIVERY DETAILS: LOAD NO. | DELIVERY DOCUMENTS | WEIGHT | PRODUCT | CODE; SUB TOTALS; L.O.B.; TOTALS

	HRS	MINS
MAINTENANCE		
DOCUMENTATION		
PRE LOAD		
LOADING		
DISCHARGE		
EARLY START		
DRIVING TIME — 1ST LOAD		
2ND LOAD		
3RD LOAD		
4TH LOAD		
TOTAL PAY TIME		

ODOMETER READING: VEH NO. | START | FINISH | TOTAL | DERV. | OIL | LOCATION

Remarks .....

DAILY PRE-SHIFT VEHICLE CHECKS

VISUAL: Coolant, Tyres, Product Leaks; Fuel, Wheelnuts, Oil

PHYSICAL: Brakes, Horn, Fifth Wheel/Coupling; Lights, Steering, Wipers

Extinguisher(s): Indicator in Green

Signature To Confirm Daily Checks Done & that during the shift that either:

(a) No Defects Reported .....

OR

(b) Defect Notice Completed .....

AUTHORISED .....

TH 2680/R02

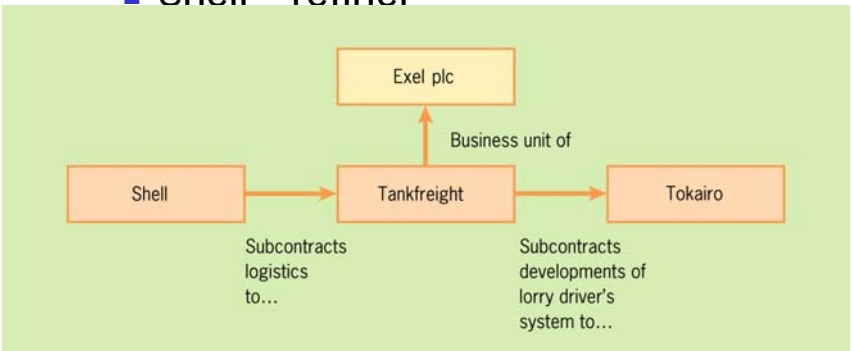
42

Environment

43

Players

- Tokairo – software house
- Tankfreight – transport of goods
- Shell - refiner



44

User Requirements Gathering

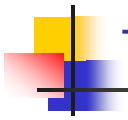
- Characteristics of Users, Tasks, Environment
  - Domain analysis: logistics for oil industry
  - Drivers: male, large hands, nonacademic, well-motivated, payment linked to deliveries, union members
  - Tasks: safety checks, loading, driving, complete worksheets, 12-hour shifts, variable time to complete worksheet
  - Environment: truck cab, reception area

46

Tokario Gathered User Requirements

- Personel: Sales and marketing director, technical director, senior software engineer.
- Process:
  - Knew drivers and tasks
  - Site and System Audit- links documents to functions within the organization.
  - Stakeholders from each organization

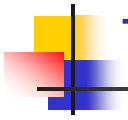
47



Tokario Gathered User Requirements

- Communicating with Programmers:
  - Informal and “open plan”
- Conscientious requirements gathering
  - Some methods
    - Direct observation
    - Interviewing
    - Questionnaires

48



To Do

- Read
  - Conceptual Design (Stone Ch 8)
  - Interaction design (Stone Ch 10-11)
  - Introducing Swing Tutorial & Demo, Swing Features (10 pages, up to Questions and Exercises)
- Project
  - T2 – Task analysis – due next class
- Homework
  - I3 – Ethnography – due next class

49