
CONTEXTUAL DESIGN CONSOLIDATION

Consolidation



- ◆ Consolidation is inductive process of:
 - Inquiry
 - Bringing all the individual data together
 - Building one affinity diagram
 - Building one set of models
- ◆ Variation across customers exists within a structure
- ◆ Advantages for designers
 - Takes part of the design conversation
 - Design is owned not just by one person
 - Gives fresh perspective to designers

Things to Look for in Consolidation

- ◆ How Much Do Users Vary?
 - Are These ‘Surface’ Differences?
 - Are These ‘Fundamental’ Differences?
- ◆ Is There a Common Pattern of Work?
 - A Common Mechanism?
 - A Common Artifact?
 - A Common Problem?

The affinity diagram

- ◆ The first consolidation step
- ◆ Shows the scope of the customer problem
- ◆ Organizes the individual notes captured during interpretation session
 - Intended to Show Common Issues and Themes
 - Starts ‘Bottom-Up’ From Data
 - Don’t start from predefined structure
- ◆ Finish in a single day
- ◆ Can Be Huge!
 - Starts at 200 Notes, Up To 1500 and More!

The affinity diagram

- ◆ Structure

- Green post-its - whole area
- Pink labels – specific issues
- Blue labels – each aspect of the issue
- Individual notes – instances illustrating the blue label

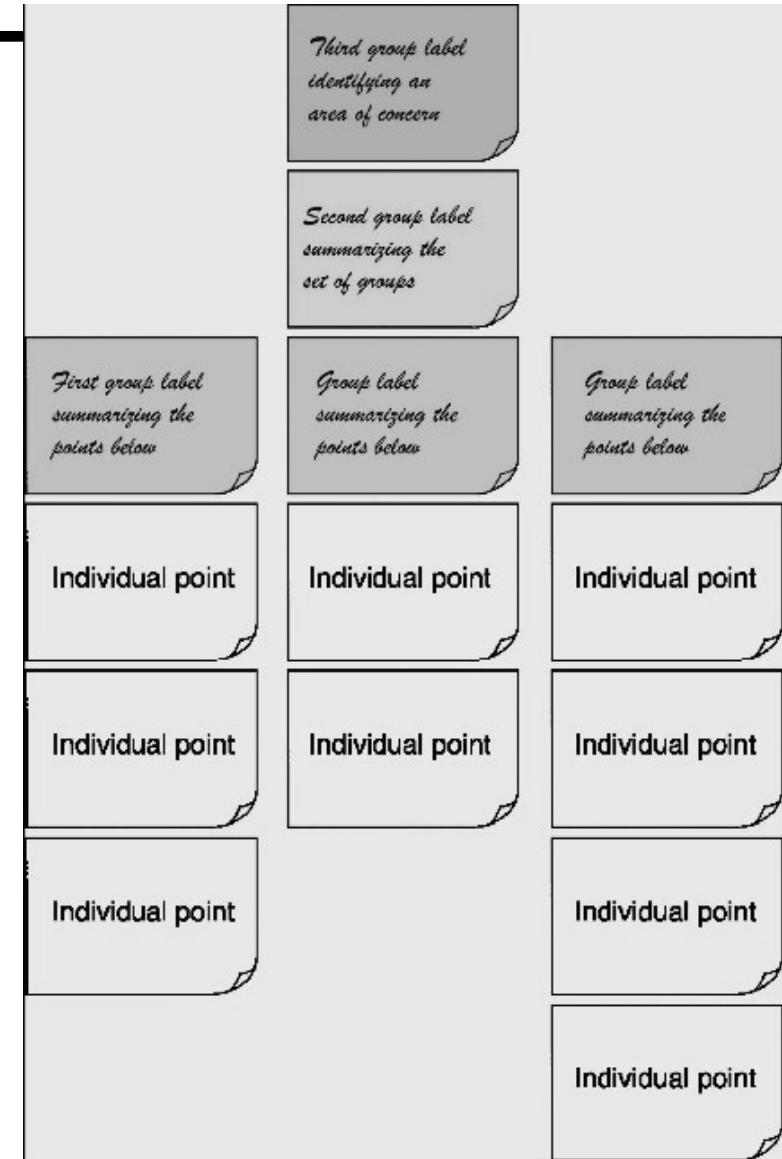
- ◆ Method:

- As a ‘Group’ of Notes Is Identified, Make a ‘Blue’ Label Summarizing Its Points
- As Diagram Increases, Group the Groups -‘Pink’ and ‘Green’ Labels...

The affinity diagram

◆ Steps

- Put notes up on the all one at a time, add notes that seem to go with it
- Label them with blue post-its
- Break down groups so there are no more than four notes in a group
- Add pink-level notes
- Add green-level notes



The affinity diagram

Example

- ◆ Grouping of notes
 - 110,214 – legal case
 - 110,360 – search strategy
- ◆ Choose pairing
 - search strategy
- ◆ Combined with other notes
- ◆ Choose group name

110. U2
The more recent a legal case, the more persuasive it is

214. U2
Legal case precedents are searched by paralegal staff

360. U4
At milk case, buys 1 gallon or 2 quarts depending on expiration date

Recent stuff is best

110. U2
The more recent a legal case, the more persuasive it is

360. U4
At milk case, buys 1 gallon or 2 quarts depending on expiration date

720. U8
The most recent house listings are the most desirable; good houses sell quickly

The affinity diagram

Example

- ◆ Describing delegation
- ◆ Part of story about why people communicate in doing their job
- ◆ Shows different ways

We delegate our work

Why we delegate

I don't want to deal with it

I have too much work

How I choose who to delegate to

Whoever is available does it

The person with the job does it

How I go about delegating

I gave it away, but I'm still responsible

I gave it away at a meeting

I pass it on informally

Consolidating flow models

- ◆ Reveals the communication patterns that underlie the way customers do business
- ◆ Shows
 - Who the customers are
 - What they do
 - How they interact to each other
- ◆ Identify the roles
- ◆ Keep track of how roles map to individuals

Consolidating flow models

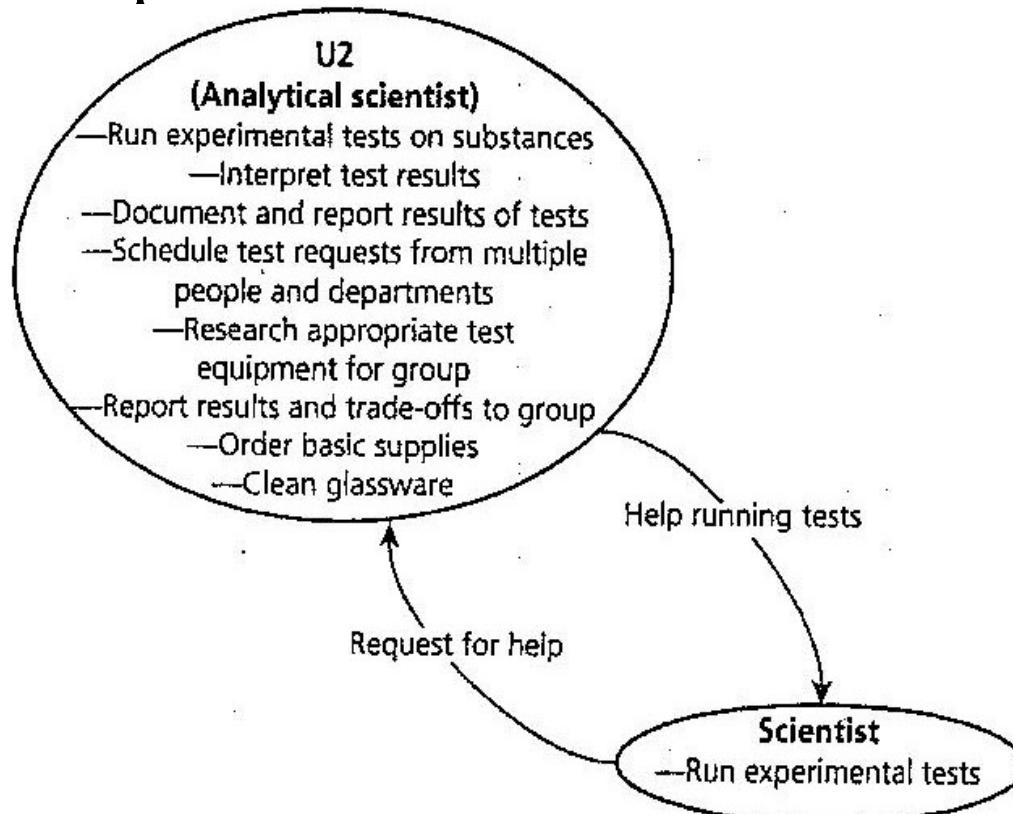
- ◆ Steps

- Select 6-9 complex flow models
- List responsibilities and identify roles
- Name roles
- Collect similar roles from all models
- Rewrite responsibilities
- Collect artifacts and communications
- Transfer any breakdowns
- Add any responsibilities, and roles from the remaining models that are not represented

Consolidating flow models

Example

- ◆ List of responsibilities for Scientist



Consolidating flow models

Example

- ◆ Identify roles

- What's the primary contribution of the responsibility to the work?
- What other responsibilities go with it?

| | |
|---------------------------------------|-----------------------|
| EXPERIMENTER | LAB MAINTAINER |
| —run experimental tests on substances | —clean glassware |
| —interpret test results | —order basic supplies |
| —document and report results of tests | |
| —help other scientists run tests | |

| | |
|--|--|
| EQUIPMENT RESEARCHER | |
| —research appropriate test equipment for group | |
| —report results and trade-offs to group | |

| | |
|--|--|
| LAB SCHEDULER | |
| —schedule test requests from multiple people and departments | |

Consolidating flow models

Example

- ◆ Compare with roles of another scientist

TESTER

- run a test on samples
- convert raw data into meaning
- report results of tests to requester
- describe what's needed of new equipment

METHOD DEVELOPER

- develop a new test procedure through experimentation
- document the new test procedure in standard form
- assist other scientists in using the new procedure

Consolidating flow models

Example

- ◆ Recognize similar roles
 - Tester
 - Experimenter
- ◆ Group their responsibilities into one role

| EXPERIMENTER |
|--|
| —run experimental tests on substances |
| —interpret test results |
| —document and report results of tests |
| —help other scientists run tests |
| —describe what's needed of new equipment |

Consolidating sequence models

- ◆ Brings together many instances of many individuals accomplishing the same work
- ◆ Shows
 - Strategies
 - Common structure of a task
 - Intents

Consolidating sequence models

- ◆ Steps

- Select 3 or 4 sequences addressing the same task
- Identified the activities
- Match the triggers
- Match the steps
- Write an abstract step
- Write intents

Consolidating sequence models

Example

- ◆ Two ways of diagnose the problems

| us | u4 |
|---|--|
| Fix All-In-1 <ul style="list-style-type: none">• Trigger: Watcher sends mail that the All-In-1 (A1) mail system isn't working• Log onto failing system to search for problem• Discover the A1 mail process has crashed (ACCVIO)• Look at the time of the crash: only this morning• Try to restart the process by hand• Process won't restart• Look at the process log; can't tell why it won't start• Call expert backup group for help | Fix router problem <ul style="list-style-type: none">• Trigger: Person walks into office to report problem—can't access files on another machine• Go into lab to look at equipment• Flick switches to do loop-back tests, isolating wire, MUX, router• Determine problem—bad router• Call AT&T people in second organization• Do something else while waiting for AT&T to show up• AT&T comes to look at problem• Look in book to tell which wire is which; show which nodes are on which wires and which wire goes to which router; paper for easy access• Tell AT&T people which router is at fault and which wire it's on• AT&T people fix problem• Log problem and fix• Done |
| Fix disk problem <ul style="list-style-type: none">• Ask them to log into the system and look at problem• Keep looking for problem in parallel• Search for problem• Discover that process can't create a needed directory• Try to create needed directory by hand<ul style="list-style-type: none">• [Look to see if directory created]• Can't create directory; disk is too fragmented• Call expert backup to explain problem; type and talk on speaker phone at the same time• Discuss problem; agree on the exact procedure to follow• Implement fix• Write mail to users describing changes that affect them• Done | |

Consolidating sequence models

Example

- ◆ Main activities

- Notify
- Diagnose
- Get help

| U5 | U4 |
|--|---|
| Notify <ul style="list-style-type: none">• Trigger: Watcher sends mail that the All-In-1 (A1) mail system isn't working | <ul style="list-style-type: none">• Trigger: Person walks into office to report problem; can't access files on another machine |
| Diagnose <ul style="list-style-type: none">• Log onto failing system to search for problem• Discover the A1 mail process has crashed (ACCVIO)• Look at the time of the crash: only this morning• Try to restart the process by hand• Process won't restart• Look at the process log; can't tell why it won't start | <ul style="list-style-type: none">• Go into lab to look at equipment• Flick switches to do loop-back tests, isolating wire, MUX, router• Determine problem—bad router |
| Get help <ul style="list-style-type: none">• Call expert backup group for help | <ul style="list-style-type: none">• Call AT&T people in second organization |

Consolidating sequence models

Example

- ◆ define abstract step to represent the triggers

| ABSTRACT STEP | US | U4 |
|---|--|--|
| <ul style="list-style-type: none">• Trigger: Find out about problem—Automated procedure—Someone reports problem | <ul style="list-style-type: none">• Trigger: Watcher sends mail that the All-In-1 (A1) mail system isn't working | <ul style="list-style-type: none">• Trigger: Person walks into office to report problem; can't access files on another machine |

Consolidating sequence models

Example

- ◆ Match up steps accomplishing the same thing
 - Watch for different strategies to do the same thing
 - Identify intents of the step
 - Define abstract steps
 - Going to deal with a problem

| ABSTRACT STEP | U5 | U4 |
|---|---|--|
| <ul style="list-style-type: none">• Go to the place where the problem can be solved (physically or logically) | <ul style="list-style-type: none">• Log onto failing system to search for problem | <ul style="list-style-type: none">• Go into lab to look at equipment |

- Identify a problem
- Diagnose problem
- Get help

Consolidating sequence models

Example

◆ Consolidated sequence model

| ACTIVITY | INTENT | ABSTRACT STEP |
|------------------------|---|---|
| Find out about problem | <ul style="list-style-type: none">• Learn about problems quickly• Discover problems before users do• Provide quick response | <ul style="list-style-type: none">• Trigger: Find out about problem<ul style="list-style-type: none">—Automated procedure—Someone reports problem |
| Go to problem location | <ul style="list-style-type: none">• Make it possible to do diagnosis and take action | <ul style="list-style-type: none">• Go to the place where the problem can be solved |
| Diagnose problem | <ul style="list-style-type: none">• Find cause of problem | <ul style="list-style-type: none">• Execute commands and tests on suspect system to identify anomalous behavior• Determine cause of symptoms• Estimate impact of problem |
| Fix problem | <ul style="list-style-type: none">• Decide who's been affected• Decide if any additional action should be taken to notify people of status• Make sure I don't do things I'm not supposed to• Fix the problem at once | <ul style="list-style-type: none">• Decide whether I can fix the problem |
| Call on help | <ul style="list-style-type: none">• Get the people involved who have the authority or the knowledge to fix the problem• Ensure problem gets fixed, even if not my job | <ul style="list-style-type: none">• If I decide I can fix it:<ul style="list-style-type: none">• Attempt fix• See if fix worked• Try to figure out why it didn't work• Decide I can't fix it; call on help |

Consolidating artifact models

- ◆ Shows
 - How people organize and structure their work
 - How they think
 - Hidden intents
- ◆ Similar usage of artifacts
- ◆ Level of details

Consolidating artifact models

- ◆ Steps

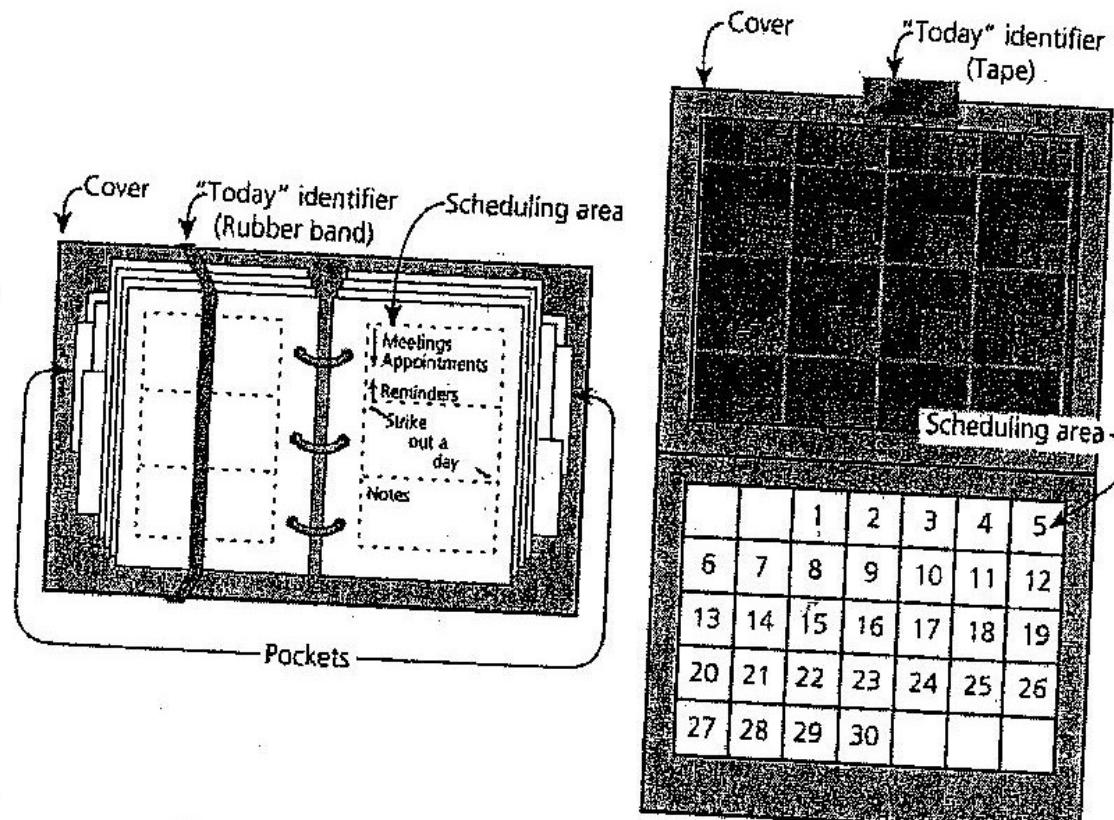
- Group artifact models
- Identify the common parts, intent and usage
- Identify the common structure
- Identify the breakdowns
- Build a consolidated artifact

Consolidating artifact models

Example

- ◆ Two kinds of calendars

- Common parts
- Structure
- Intent
- Usage



Consolidating artifact models

Example

◆ Consolidated artifact model

