HCI in the Development Cycle

CSCU9N5 – Multimedia & HCI

HCI in the Development Cycle

Motivation for good design
Goals for the designer
How design fits into the software life cycle

Case study: Microsoft Windows 95 (mainly)
Case study: the NN group web page

Preece et al, Chapters 9, 11, 12
https://www.nngroup.com/articles/case-study-iterative-design-prototyping/

Motivation for Good Design

It is easier to point to what happens when the design is poor:

- Under-use of expensive computer technology
  - People use alternative (unofficial?) systems
- Inefficient use of systems
- Irritated/frustrated users
- Physical danger (safety-critical systems)

Motivation for Good Design

Concentrating on the benefits of good HCI:

Customer satisfaction (customers often prefer usability to functionality) and hence £££

Good reputation

Reliability (users don't make as many errors)

Allows users to focus on their work, not the interface

- Better turnover
- Greater flexibility
- Better use of staff

Goals for the Developer

The big picture:

- Adequate functionality
- System reliability
- Good interface design

Also other features such as standardization, portability, consistency, integration

Shneiderman Section 1.2

Specific Goals for the Designer

General aims:

- Improving quality of work produced
  - Discouraging errors, for example
- Increasing throughput
  - Making it easy to do things quickly
- Minimization of training time
  - Making it easy to learn

…but we need measures in order to see whether the goals are achieved!

(SMART: Specific, Measurable, Achievable, Realistic, Timebound)

Shneiderman, Section 1.3

Preece, Section 1.3, also chapter 10

Goals for the Designer

Specific measurable goals:

- Subjective satisfaction (use surveys with satisfaction scales, e.g. like feedback questionnaires for lectures)
- Rate of errors (how many, what kind?)
- Speed of performance (use benchmark tests)
- Time to learn (measure for a specific set of tasks)
- Retention over time (how easy is it to remember how to use?)

There are certain trade-offs that might have to be made.

Testing - Crucial for good design

Feedback post-release is not enough.

Testing after all development is not enough.

Good design requires early (and frequent) feedback

The Software Life Cycle

Different models all include these main areas of activity to a greater/lesser degree:

- Specification
- Analysis
- Design
- Implementation
- Testing
- Maintenance

Where should the designer be considering good design?

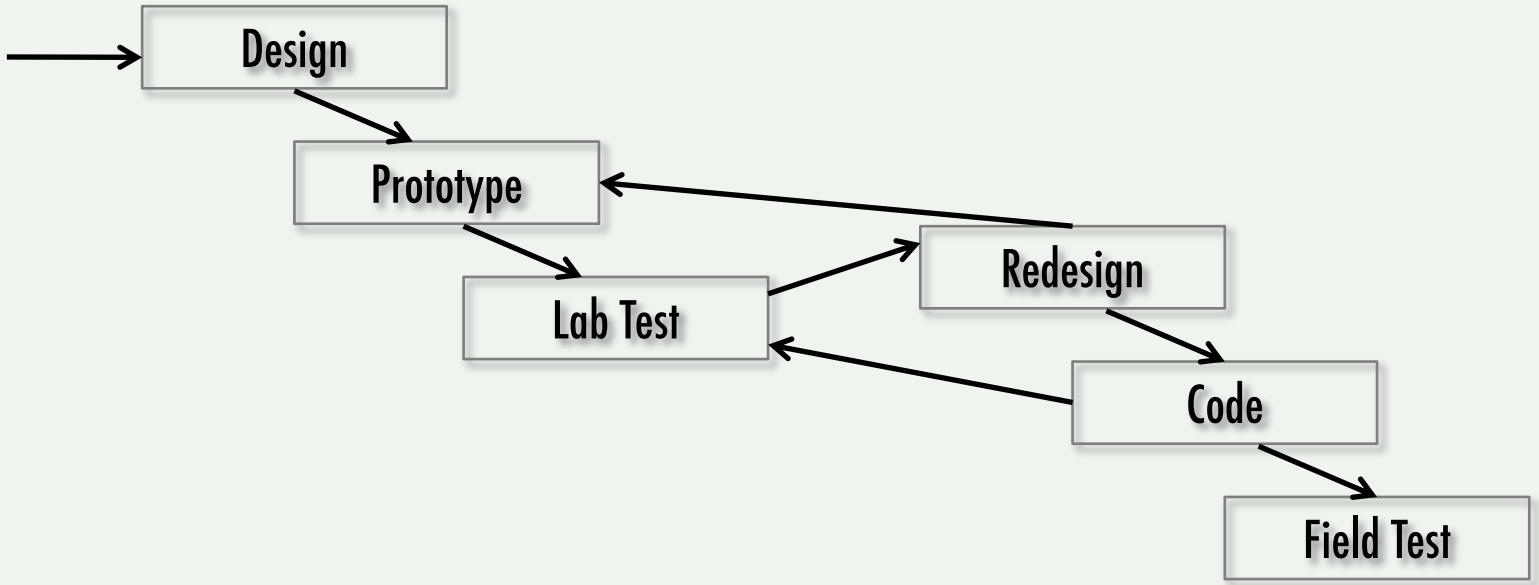
Shneiderman, Section 3.4

Usability Engineering Model

It is possible to test from very early on. Possible places to test during the development are:

- Early design testing (of previous versions or competitors' products)
  - **provides goals for the designers**
- Middle stages design testing
  - **validates designers' choices, provides feedback for improvement**
- Later stages
  - **ensures that product meets the design objectives**

Rapid Iterative Design



Involves a lot of prototypes and testing
Gives fast feedback about design flaws

Case Study: Microsoft Windows 95

Scenario:

- To produce a user interface for Windows 95 (an upgrade to Windows 3.1 and Windows for Workgroups 3.1), in just *18 months* for the design *and* coding
- See http://acm.org/sigchi/chi96/proceedings/desbrief/Sullivan/kds_txt.htm

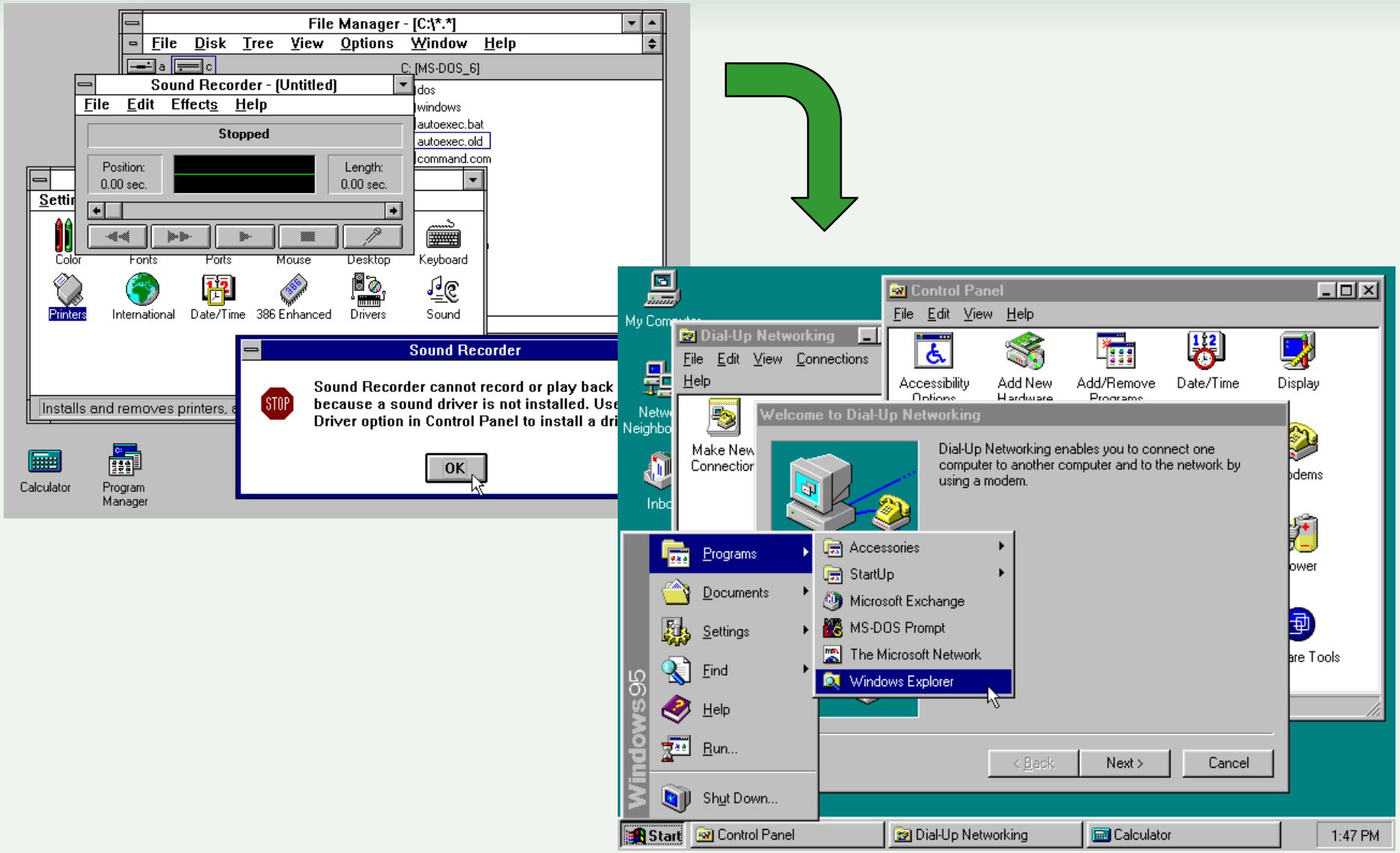
Goals:

- To make Windows easier to learn for beginners
- To make Windows easier to use for computer users

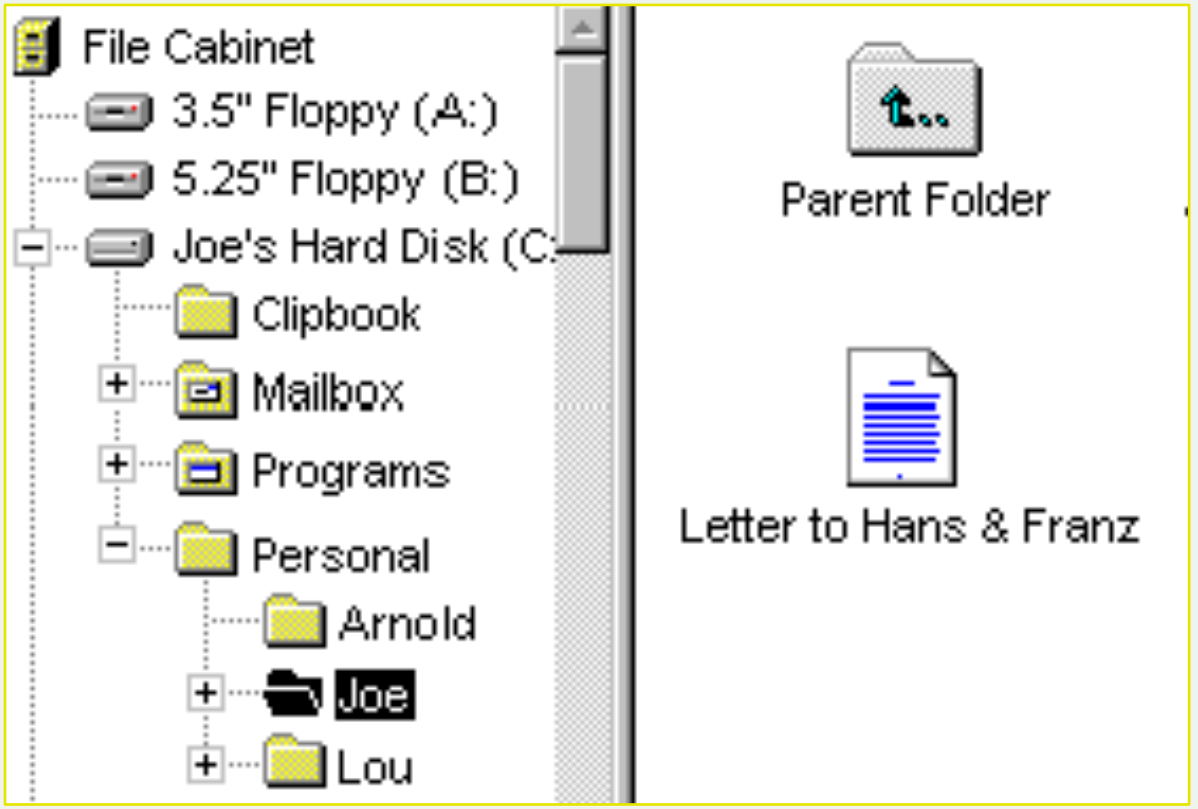
Implementers (12), Design team (12):

Interdisciplinary, including product designers, graphic designers, usability testers and computer scientists

Windows 3.1 and 95



A First Attempt: complete specification and prototype



Early Results

- Early results from iterative design showed that a baseline from Windows 3.1 was required
- User testing provided data on frequently repeated tasks in Windows 3.1
- Comparisons of Windows 3.1 showed that the early Windows 95 prototypes were different, not better
- Consistency with Windows 3.1 was over-focused on and the team needed to adopt a whole different approach

A new approach

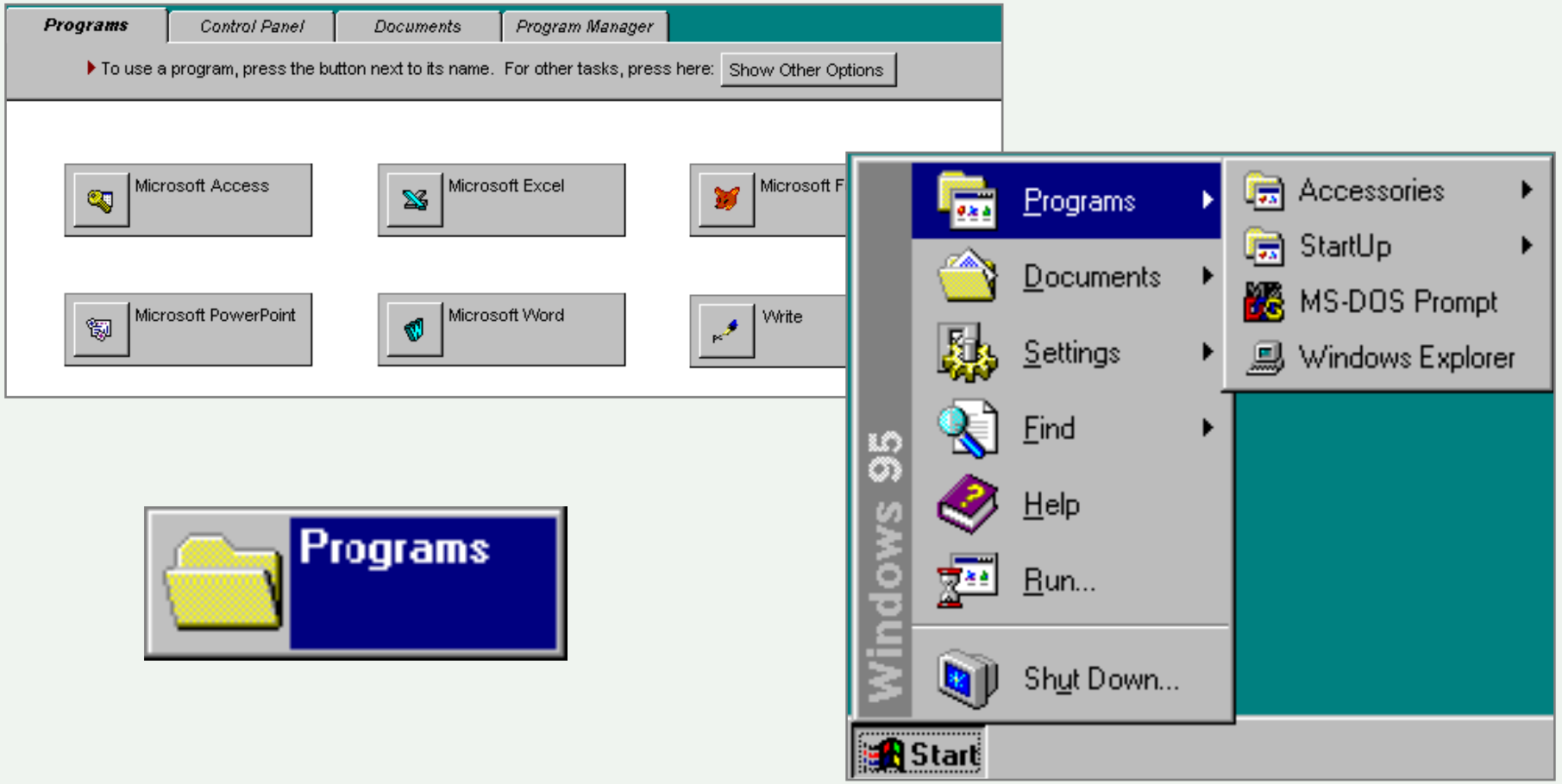
Too many results and improvements to keep updating the specification.

Therefore, let the prototypes serve as the spec.

Communication is key:

- Regular staff meetings for the design team, to keep informed
- Usability test schedules/results regularly broadcasted
- Regular design presentations for outsiders
- Formal tracking of all usability issues, using a database

Ideas that came (and some that went)



Testing and Problem Tracking

64 phases of lab testing, using 560 subjects

699 different comments on usability, 148 positive

Identification

- Level 1: Unable to continue with task (15%)
- Level 2: Considerable difficulty completing task (43%)
- Level 3: Minor difficulty completing task (42%)

Problem Resolution

1. Addressed (fixed and tested successfully)
2. Planned (fix designed, implementation awaits)
3. Undecided (not sure if fix desirable/feasible)
4. Somewhat (fix designed, tested, issues remain)
5. Not addressed (fix not going to happen)

81% of problems were addressed (most not addressed were due to technical or schedule limitations)

Review

Iterative Design:

- No detail of the initial design survived in the final product
- The scope and volume of changes were not envisaged at the start of the project
- Iterative design and constant testing allowed many different solutions to problems to be explored rapidly
- Designers felt rushed towards the end and would have liked to keep iterating and testing and improving

Specification Process

- The "prototype/code is the spec" approach worked well
- Practical organizational details refined

Review

Usability Testing

- This was crucial in "making the pieces fit"
- Good changes to wording in the interface and the Help documents were suggested by testers

Problem Tracking

- The tracking database was crucial to make sure issues didn't get pushed aside
- It was important that the team believed they weren't going to get it right first time and indeed not getting it right was very useful
- Unaddressed issues were rolled over into a new database for the next version of Windows

Windows 8-10

Microsoft believe in Usability

- they have a Usability in Software Design section in their Developer Center
- they launched the Windows Customer Experience Improvement Program

Useful tips include

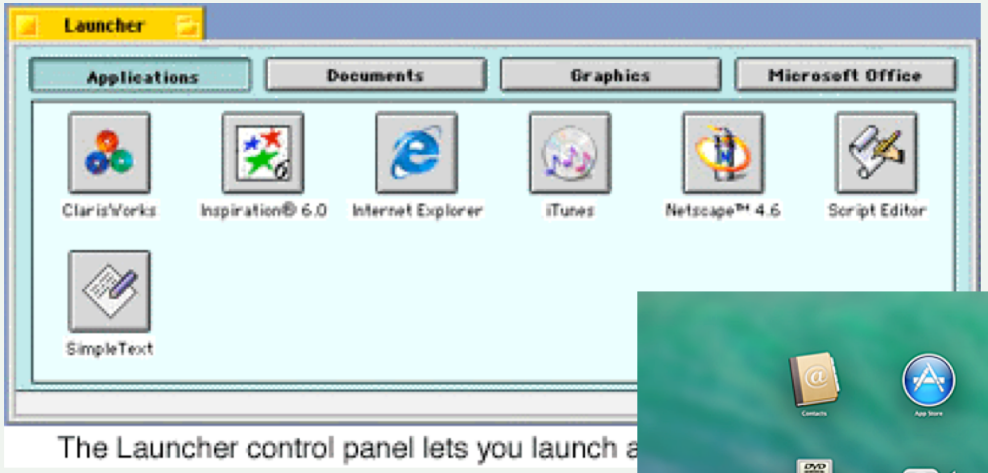
- usability vs utility
- liking it vs using it
- discovery vs learning vs efficiency

They also stress usability testing, to

- reduce the number of support calls
- reduce training costs
- improve user acceptance
- differentiate your offering from those of your competitors

So what do you think?

Another evolution: MacOS 7.1 Launcher to Launchpad



The Launcher control panel lets you launch a

NNGroup web pages

Requirements analysis: qualitative surveys to gain feedback on customer reactions and expectations.

3 main design objectives:

- **Demonstrate credibility**: (by showing examples of research)
- **Create an appealing, minimalist aesthetic**: (modern design, enhancing credibility, supporting usability)
- **Maintain access to primary offerings**: (what's important here? Don't break navigation to existing services and information).

Approach

Rapid iterative prototyping

Wireframes (using Moqups)

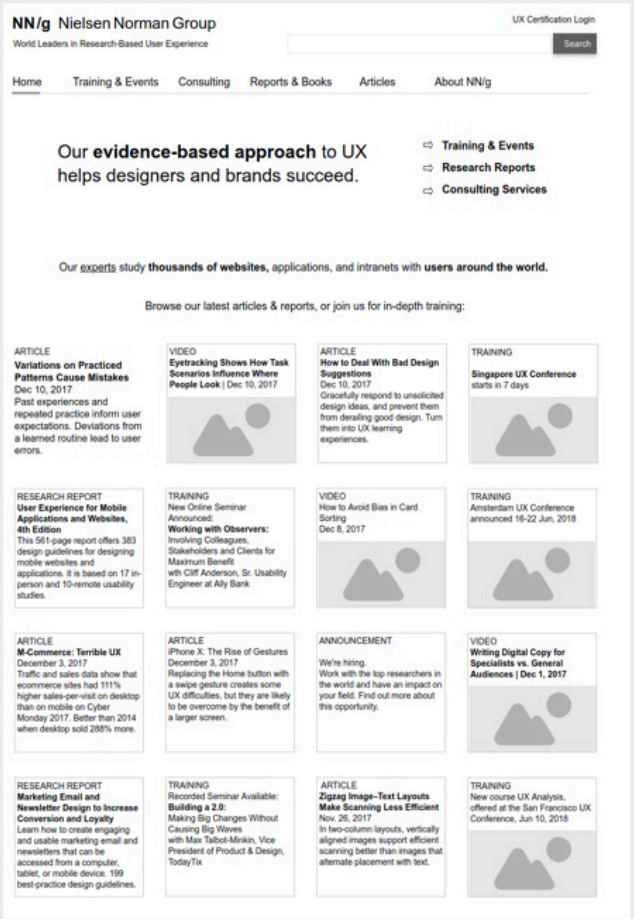
Task tracking and to-do lists (using Basecamp)

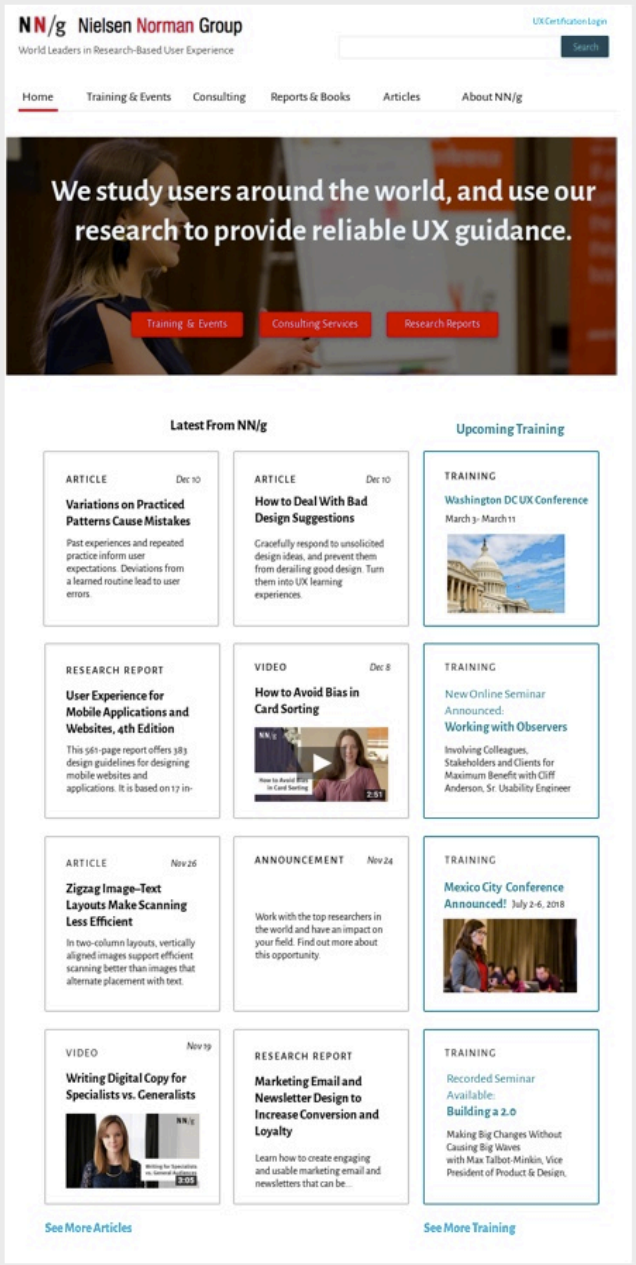
collaborative tools, easy to share changes, low cost, web-accessible.

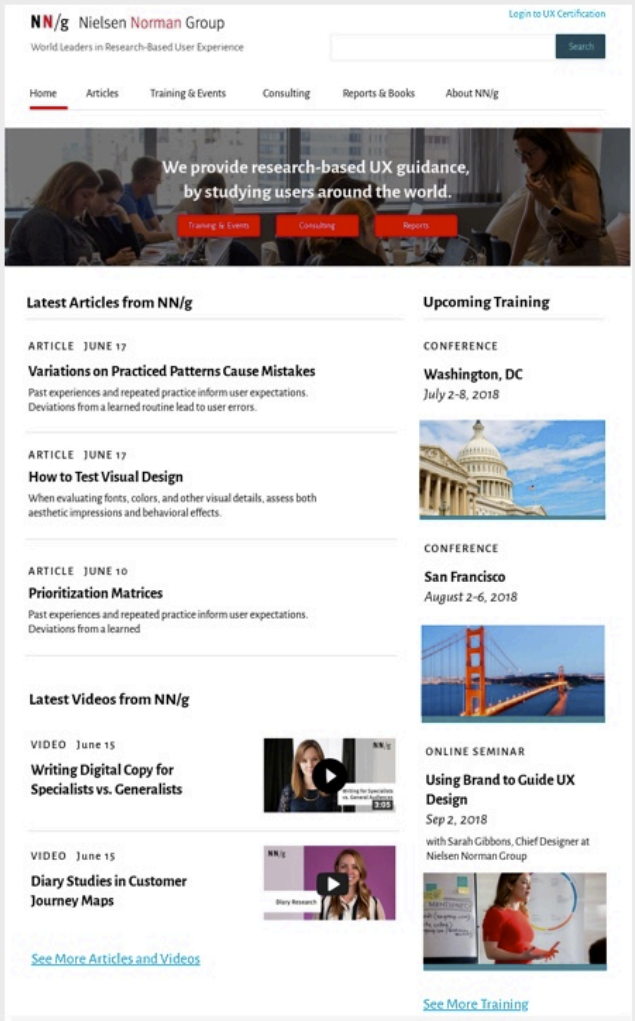
Start simple: low-fidelity, black–and–white wireframes for content planning,

high-fidelity visual prototypes for testing

A/B testing (comparing visual designs for aesthetic appeal). Repeated versions, adding polish and fidelity.


NN/g Nielsen Norman Group
World Leaders in Research-Based User Experience
UX Certification Login
Search
Home
Training & Events
Consulting
Reports & Books
Articles
About NN/g
Our evidence-based approach to UX helps designers and brands succeed.
Training & Events
Research Reports
Consulting Services
Our experts study thousands of websites, applications, and intranets with users around the world.
Browse our latest articles & reports, or join us for in-depth training:
ARTICLE
Variations on Practiced Patterns Cause Mistakes
Dec 10, 2017
Past experiences and repeated practice inform user expectations. Deviations from a learned routine lead to user errors.
VIDEO
Eyetracking Shows How Task Scenarios Influence Where People Look | Dec 10, 2017
ARTICLE
How to Deal With Bad Design Suggestions
Dec 10, 2017
Gracefully respond to unsolicited design ideas, and prevent them from derailing good design. Turn them into UX learning experiences.
TRAINING
Singapore UX Conference
starts in 7 days
RESEARCH REPORT
User Experience for Mobile Applications and Websites, 4th Edition
This 561-page report offers 383 design guidelines for designing mobile websites and applications. It is based on 17 in-person and 10-remote usability studies.
TRAINING
New Online Seminar Announced:
Working with Observers:
Involving Colleagues, Stakeholders and Clients for Maximum Benefit
with Cliff Anderson, Sr. Usability Engineer at Ally Bank
VIDEO
How to Avoid Bias in Card Sorting
Dec 8, 2017
TRAINING
Amsterdam UX Conference announced 16-22 Jun, 2018
ARTICLE
M-Commerce: Terrible UX
December 3, 2017
Traffic and sales data show that ecommerce sites had 111% higher sales-per-visit on desktop than on mobile on Cyber Monday 2017. Better than 2014 when desktop sold 288% more.
ARTICLE
iPhone X: The Rise of Gestures
December 3, 2017
Replacing the Home button with a swipe gesture creates some UX difficulties, but they are likely to be overcome by the benefit of a larger screen.
ANNOUNCEMENT
We're hiring.
Work with the top researchers in the world and have an impact on your field. Find out more about this opportunity.
VIDEO
Writing Digital Copy for Specialists vs. General Audiences | Dec 1, 2017
RESEARCH REPORT
Marketing Email and Newsletter Design to Increase Conversion and Loyalty
Learn how to create engaging and usable marketing email and newsletters that can be accessed from a computer, tablet, or mobile device. 199 best-practice design guidelines.
TRAINING
Recorded Seminar Available:
Building a 2.0:
Making Big Changes Without Causing Big Waves
with Max Talbot-Minkin, Vice President of Product & Design, TodayTix
ARTICLE
Zigzag Image–Text Layouts Make Scanning Less Efficient
Nov. 26, 2017
In two-column layouts, vertically aligned images support efficient scanning better than images that alternate placement with text.
TRAINING
New course UX Analysis, offered at the San Francisco UX Conference, Jun 10, 2018


NN/g Nielsen Norman Group
World Leaders in Research-Based User Experience
UX Certification Login
Search
Home
Training & Events
Consulting
Reports & Books
Articles
About NN/g
We study users around the world, and use our research to provide reliable UX guidance.
Training & Events
Consulting Services
Research Reports
Latest From NN/g
Upcoming Training
ARTICLE Dec 10
Variations on Practiced Patterns Cause Mistakes
Past experiences and repeated practice inform user expectations. Deviations from a learned routine lead to user errors.
ARTICLE Dec 10
How to Deal With Bad Design Suggestions
Gracefully respond to unsolicited design ideas, and prevent them from derailing good design. Turn them into UX learning experiences.
TRAINING
Washington DC UX Conference
March 3- March 11
RESEARCH REPORT
User Experience for Mobile Applications and Websites, 4th Edition
This 561-page report offers 383 design guidelines for designing mobile websites and applications. It is based on 17 in-
VIDEO Dec 8
How to Avoid Bias in Card Sorting
2:51
TRAINING
New Online Seminar Announced:
Working with Observers
Involving Colleagues, Stakeholders and Clients for Maximum Benefit with Cliff Anderson, Sr. Usability Engineer
ARTICLE Nov 26
Zigzag Image–Text Layouts Make Scanning Less Efficient
In two-column layouts, vertically aligned images support efficient scanning better than images that alternate placement with text.
ANNOUNCEMENT Nov 24
Work with the top researchers in the world and have an impact on your field. Find out more about this opportunity.
TRAINING
Mexico City Conference Announced! July 2-6, 2018
VIDEO Nov 19
Writing Digital Copy for Specialists vs. Generalists
2:05
RESEARCH REPORT
Marketing Email and Newsletter Design to Increase Conversion and Loyalty
Learn how to create engaging and usable marketing email and newsletters that can be...
TRAINING
Recorded Seminar Available:
Building a 2.0
Making Big Changes Without Causing Big Waves
with Max Talbot-Minkin, Vice President of Product & Design,
See More Articles
See More Training


NN/g Nielsen Norman Group
World Leaders in Research-Based User Experience
Login to UX Certification
Search
Home
Articles
Training & Events
Consulting
Reports & Books
About NN/g
We provide research-based UX guidance, by studying users around the world.
Training & Events
Consulting
Reports
Latest Articles from NN/g
ARTICLE JUNE 17
Variations on Practiced Patterns Cause Mistakes
Past experiences and repeated practice inform user expectations. Deviations from a learned routine lead to user errors.
ARTICLE JUNE 17
How to Test Visual Design
When evaluating fonts, colors, and other visual details, assess both aesthetic impressions and behavioral effects.
ARTICLE JUNE 10
Prioritization Matrices
Past experiences and repeated practice inform user expectations. Deviations from a learned
Latest Videos from NN/g
VIDEO June 15
Writing Digital Copy for Specialists vs. Generalists
2:05
VIDEO June 15
Diary Studies in Customer Journey Maps
See More Articles and Videos
Upcoming Training
CONFERENCE
Washington, DC
July 2-8, 2018
CONFERENCE
San Francisco
August 2-6, 2018
ONLINE SEMINAR
Using Brand to Guide UX Design
Sep 2, 2018
with Sarah Gibbons, Chief Designer at Nielsen Norman Group
See More Training

Testing

New and repeat users

3 rounds of testing with interactive prototypes and the legacy design on a combination of both desktop and mobile devices

Categorised feedback:

- copy,
- architecture,
- layout,
- visual style.

Next version revised based on this.

Feedback

Imagery: none, some lots, different styles.

- background image added visual appeal (but don't put text across faces)

Layout:

- grid of squares (articles, videos, and training events)
- List layout

People said they wanted the grid but they actually used the list.

(What people say may not be what they do)

- Do people ignore a column on the right? (No)

Lessons from NN group

Explore many design options without pressure to design the perfect layouts and visuals up front.

Make live improvements during usability testing to maximize user feedback.

End of Lecture