

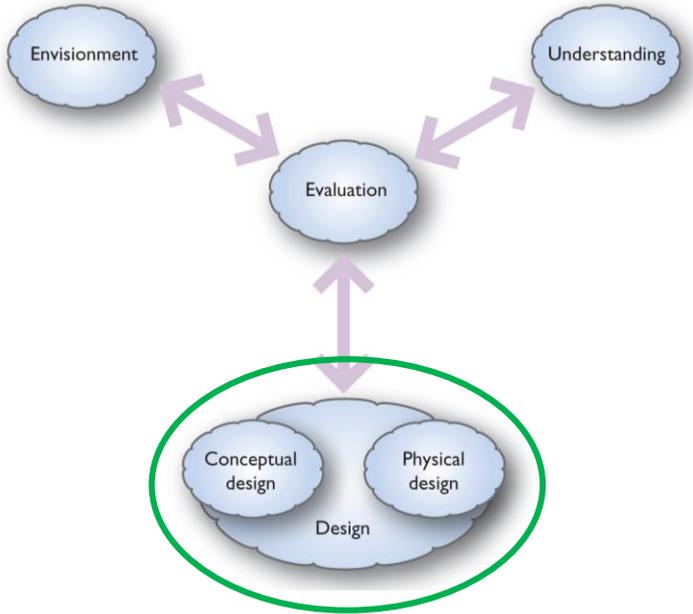
Digital Interaction Design IS-104

DESIGN PRINCIPLES FOR USABILITY

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Goals for today



Understanding design principles and modelling the system:
(Chapter 5 & 9)

- Elaborate on Benyon's 12 design principles (chapter 5)
- Designing user experiences (chapter 9)
- UX Design (Conceptual)
- UI Design (Physical)

Benyon's Principles

Learnability

1. Visibility
2. Consistency
3. Familiarity
4. Affordance

Effectiveness

5. Navigation
6. Control
7. Feedback
8. Recovery
9. Constraints

Accommodation

10. Flexibility
11. Style
12. Conviviality

A set of 12 principles grouped in 3 broader categories.

Benyon's Principles

Principles related to learnability:

1 **Visibility** – Try to ensure that things are visible so that people can see what functions are available and what the system is doing.

2 **Consistency** – Be consistent in the use of design features and be consistent with similar systems and standard ways of working.

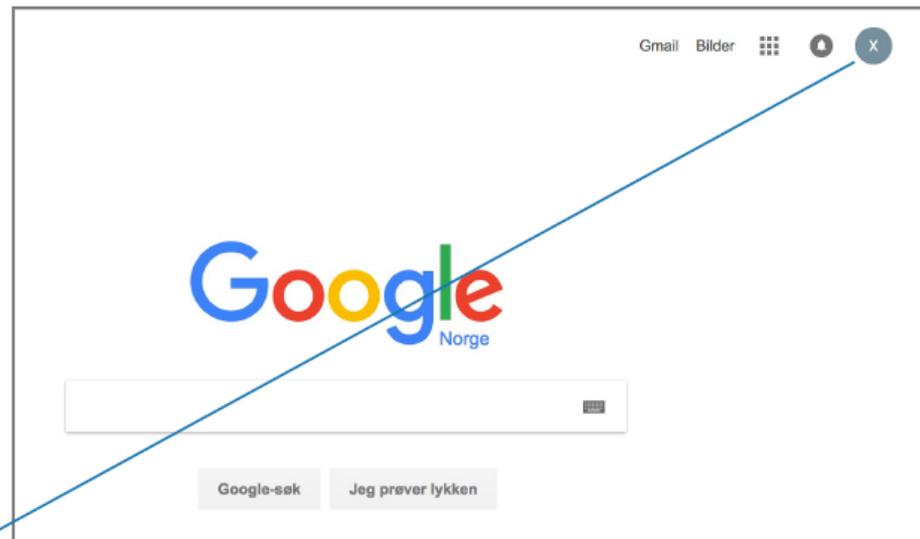
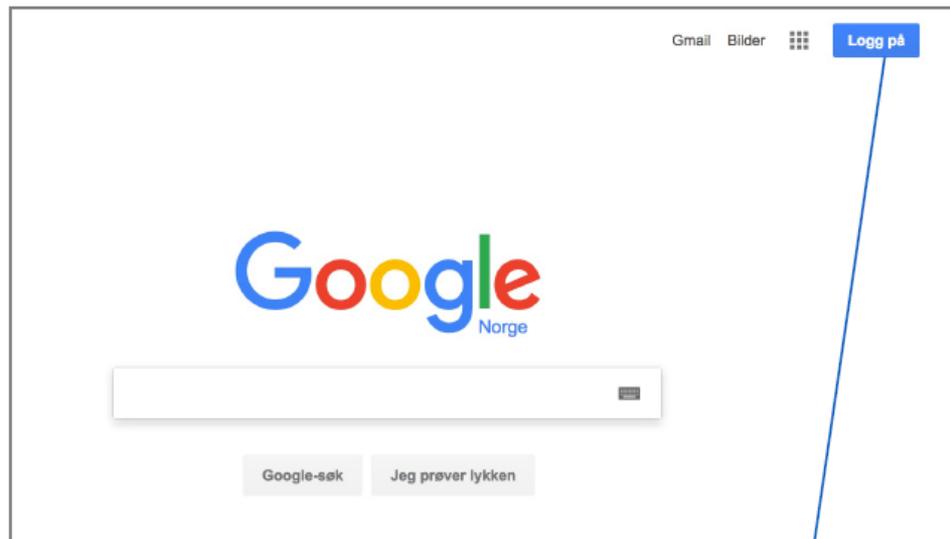
3 **Familiarity** – Use language and symbols that the intended audience will be familiar with.

4 **Affordance** – Design things so it is clear what they are for; for example, make buttons look like buttons so people will press them.



Benyon's Principles

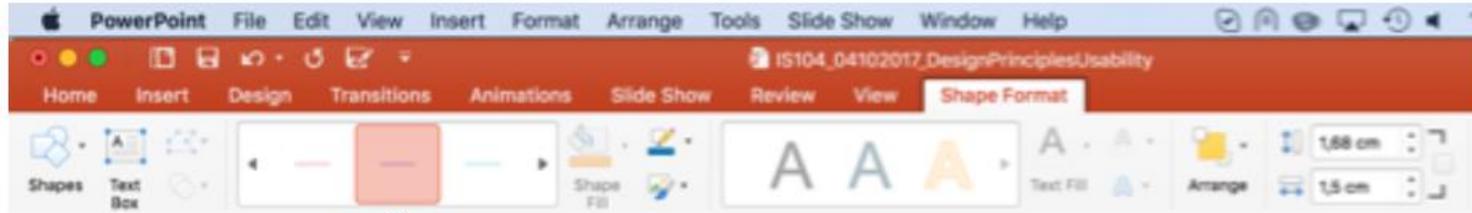
Visibility example



Am I logged in?

Benyon's Principles

Visibility example



What did I select?

Benyon's Principles

Visibility example



What is the system doing?

Benyon's Principles

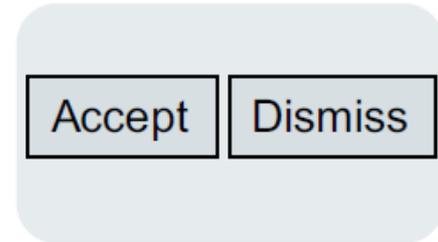
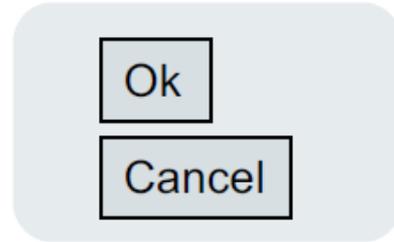
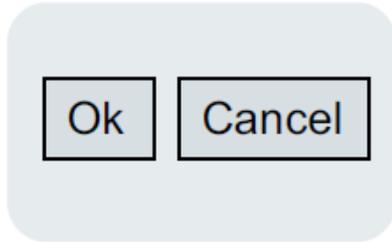
Consistency example

- Consistent sequence of actions for similar situations
- Identical Terminology (prompts, menus, help)
- Consistent visual layout (fonts, color, etc.)



Benyon's Principles

Inconsistency example



Benyon's Principles

Familiarity example

- Follow real world conventions.



Benyon's Principles

Familiarity example

- Speak the users' language.

Maximum withdrawal of \$50
at this time

X.25 connection discarded
due to network congestion.
Local limits now in effect

Benyon's Principles

Affordance example

- Buttons should look like buttons.

Submit

Submit

Submit

Benyon's Principles

Affordance example

- But “non-buttons” should not look like buttons.

These are labels with a raised appearance.
Is it a surprise that people click on them?

The image shows a web form with a grey background and a torn-paper edge effect. At the top, there is a header box labeled "Subscriber". Below it are two input fields: "Name:" and "Account #:". To the right of these fields are labels "Tech. Re" and "Status:". Below the "Account #" field is another header box labeled "Contact". Underneath are three input fields: "Telephone:", "Address:", and "E-Mail:". To the right of the "E-Mail:" field is a label "St". At the bottom of the form are two buttons: "Save" (with a dashed border) and "Cancel". A line from the text box on the left points to the "Subscriber" and "Contact" header boxes.

Benyon's Principles

Principles related to effectiveness:

Three effectiveness principles are about ease of use.

5 **Navigation** – Provide support to enable people to move around the parts of the system.

6 **Control** – Make clear what can be controlled and allow people to take control.

7 **Feedback** – Rapidly feed back information from the system to people so that they know what effect their actions had.



Benyon's Principles

Navigation examples

- Users should always know where they are.

Navigation Bar



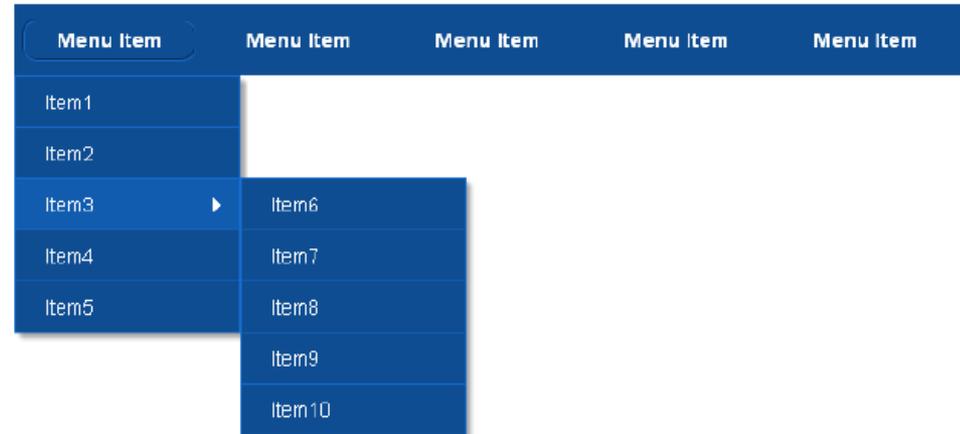
Page Control



Benyon's Principles

Navigation examples

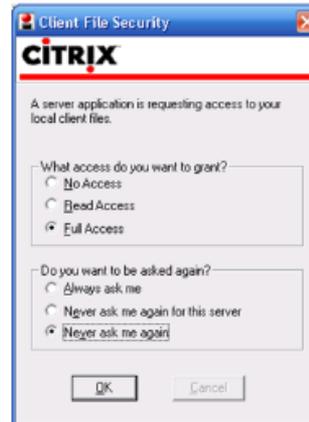
- Users should be able to move around by making selections.



Benyon's Principles

Control examples

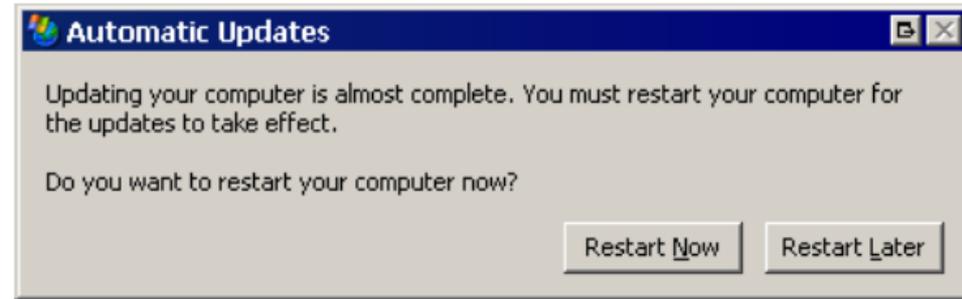
Many interfaces interrupt users with questions. Many of these dialogs offer the option “Never ask me again”.



Benyon's Principles

Control examples

Many systems perform automatic operations that might interrupt users. It is important to allow users to control such interruptions.

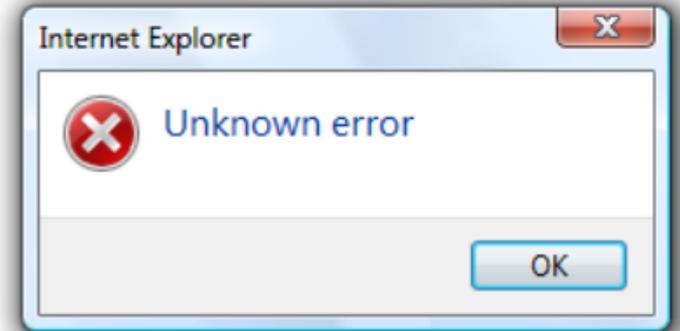


Benyon's Principles

Feedback examples

Error messages are good examples of feedback. They need to:

- Be written in plain language
- Indicate the problem
- Suggest a solution



Benyon's Principles

Feedback examples

Email address: (You will use this email to sign in.)

⚠ **This email address is invalid. Please try a different one.**

Password: **Confirm password:**
(Between 6 and 15 characters with no spaces.)
⚠ **Please enter a valid password.**

Member name: (Displayed to other members, not unique.)

⚠ **Please enter a display name.**

Benyon's Principles

Principles related to effectiveness:

Two effectiveness principles are about safety.

8 **Recovery** – Enable recovery from actions, particularly mistakes and errors, quickly and effectively.

9 **Constraints** – Provide constraints so that people do not try to do things that are inappropriate. In particular, people should be prevented from making serious errors through properly constraining allowable actions and seeking confirmation of dangerous operations.

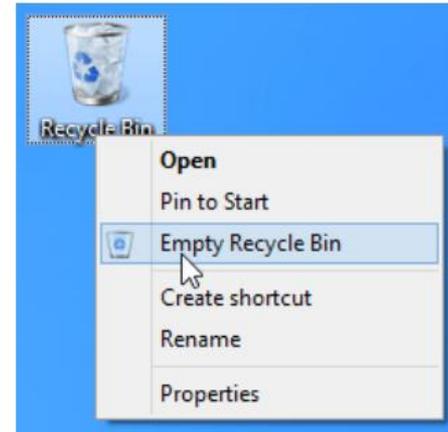


Oh no!

Benyon's Principles

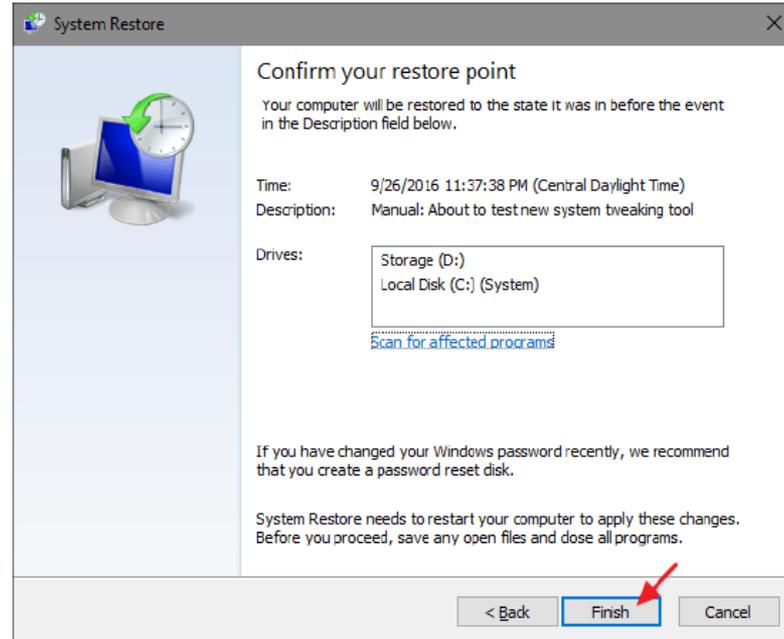
Recovery examples

- As much as possible, actions should be reversible.



Benyon's Principles

Recovery example



Benyon's Principles

Constraints examples

Prevent errors:

- Try to make errors impossible.
E.g. can only enter legal data.
- Gray out menu items that don't apply.

RDU

Leave
Sep ▼ 22 ▼ 
Anytime ▼

Return
Sep ▼ 29 ▼ 
Anytime ▼

OPTIONAL (U.S. & CANADA ONLY)
 Search one day before and after

JANUARY 2005

JANUARY 2005						
MON	TUE	WED	THU	FRI	SAT	SUN
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Benyon's Principles

Principles related to accomodation:

10 **Flexibility** – Allow multiple ways of doing things so as to accommodate people with different levels of experience and interest in the system. Provide people with the opportunity to change the way things look or behave so that they can personalize the system.

11 **Style** – Designs should be stylish and attractive.

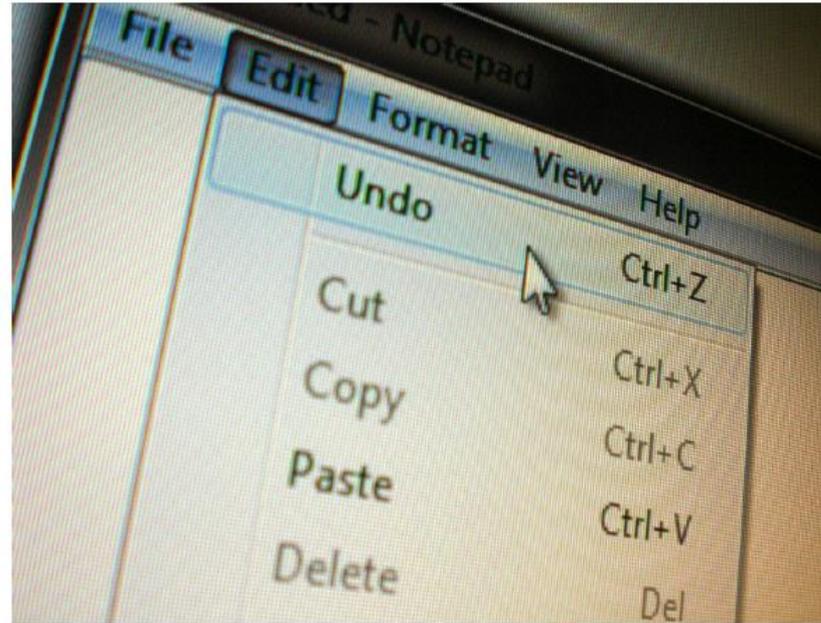
12 **Conviviality** – Interactive systems should be polite, friendly, and generally pleasant. Design for politeness.



Benyon's Principles

Flexibility examples

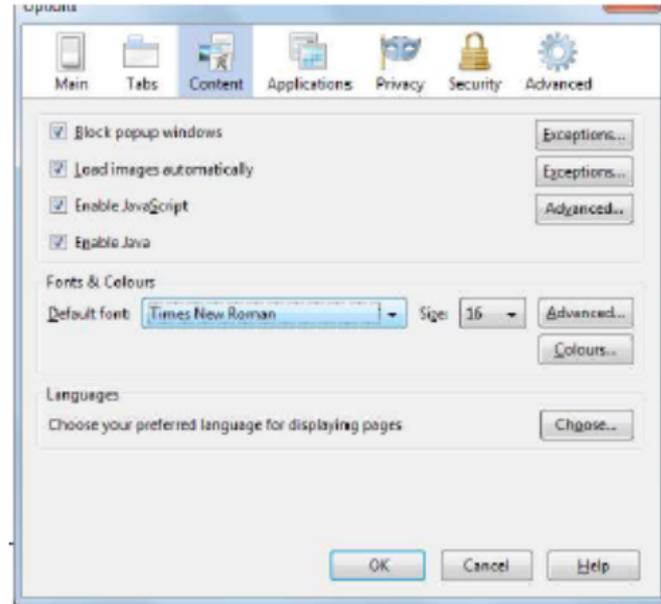
Accelerators for experts
e.g., keyboard shortcuts



Benyon's Principles

Flexibility examples

Give to users the ability to modify the user interface.



Benyon's Principles

Style examples

Style relates to design trends



Benyon's Principles

Style examples

1996



- Arts -- Illustration, Photography, JobPostings ...
- Business and Economics [Kiva] -- Directory, Investment, Classifieds ...
- Computers and Internet [Kiva] -- Internet, HOW, Software, Malicious ...
- Education -- Directory, E-az, Classes ...
- Entertainment [Kiva] -- TV, Movies, Music, Musicals ...
- Government -- Public Affairs, Agencies, Law, Military ...
- Health [Kiva] -- Medicine, Drugs, Diseases, Fitness ...
- News [Kiva] -- World Affairs, Daily, Current Events ...
- Recreation and Sports [Kiva] -- Sports, Games, Travel, Auto, Outdoors ...
- Reference -- Encyclopaedia, Encyclopaedia ...
- Regional -- Countries, Regions, US States ...
- Science -- Chemistry, Astronomy, Paleontology ...
- Social Science -- Anthropology, Sociology, Economics ...
- Society and Culture -- People, Environment, Religion ...

Yahoo! News - Yahoo! Shopping - Yahoo! Finance
 Yahoo! Japan - Yahoo! Internet Life - Yahoo! San Francisco

2002



Yahoo! Games - Play online Lucha, Diamond Mine, Pool, Chess, Spades, Hearts and more...
 Yahoo! Auctions - Auctions, Classifieds, Real Estate, Shopping, Travel, Yahoo! Pay - Maps, Media Finance - News - Sports - Weather
 Contact Us - Feedback - Site Map - Privacy - Terms - Help - Site Map - Privacy - Terms - Help - Site Map - Privacy - Terms - Help

Resources to do your taxes

- Preparation & filing
- Federal forms
- State forms

Less than 2 weeks left

File online today!

Powered by TurboTax for the Web™

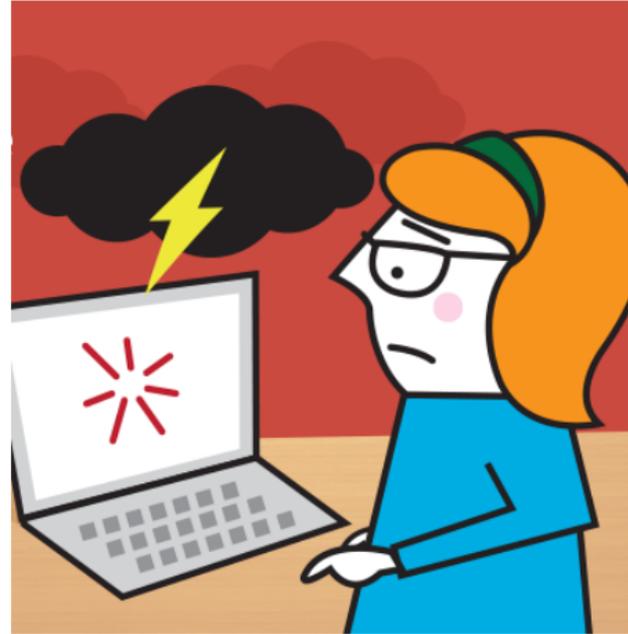
In the News

- Intel prepares calling Arctic
- Medical software giant, falls to agree on settlement of bid to acquire
- Footballing, U.S. Fed. Reserve, Cuban
- Obama picks to oversee reform
- Edna to begin for family's coasts
- record of 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 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Benyon's Principles

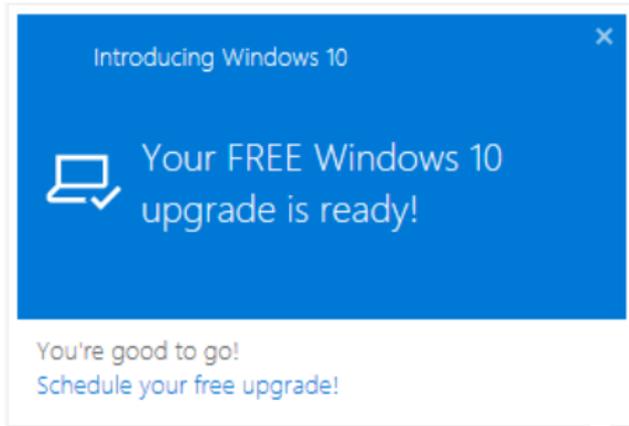
Conviviality examples

Nothing ruins the experience of using an interactive system more than an aggressive message or an abrupt interruption.



Benyon's Principles

Conviviality: example of impolite software

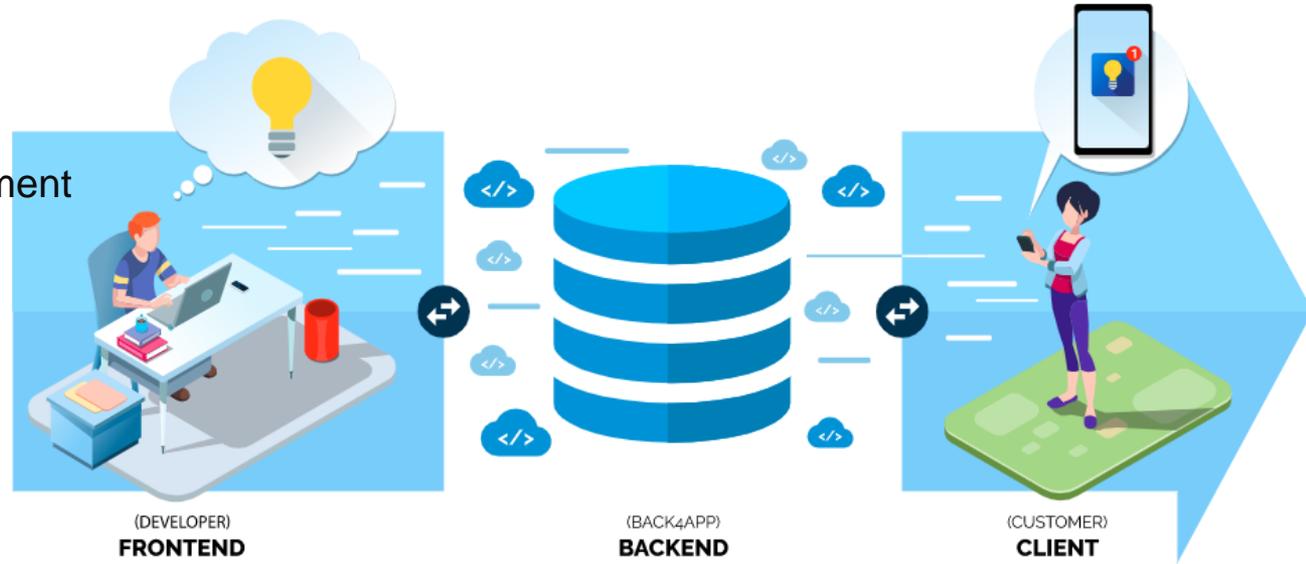


nagware

presents the user with one or more pop-up windows or alerts when an application is launched or closed (sometimes both), reminding the user to register, purchase, or take some other action which is not related to the task at hand.

Software Systems Development

- UX design
 - Research
 - Analysis
 - Concept development
- Frontend design
 - UI design
 - Programmability
 - Functionality
- Backend design
 - Database design
 - Data management
 - Data storage



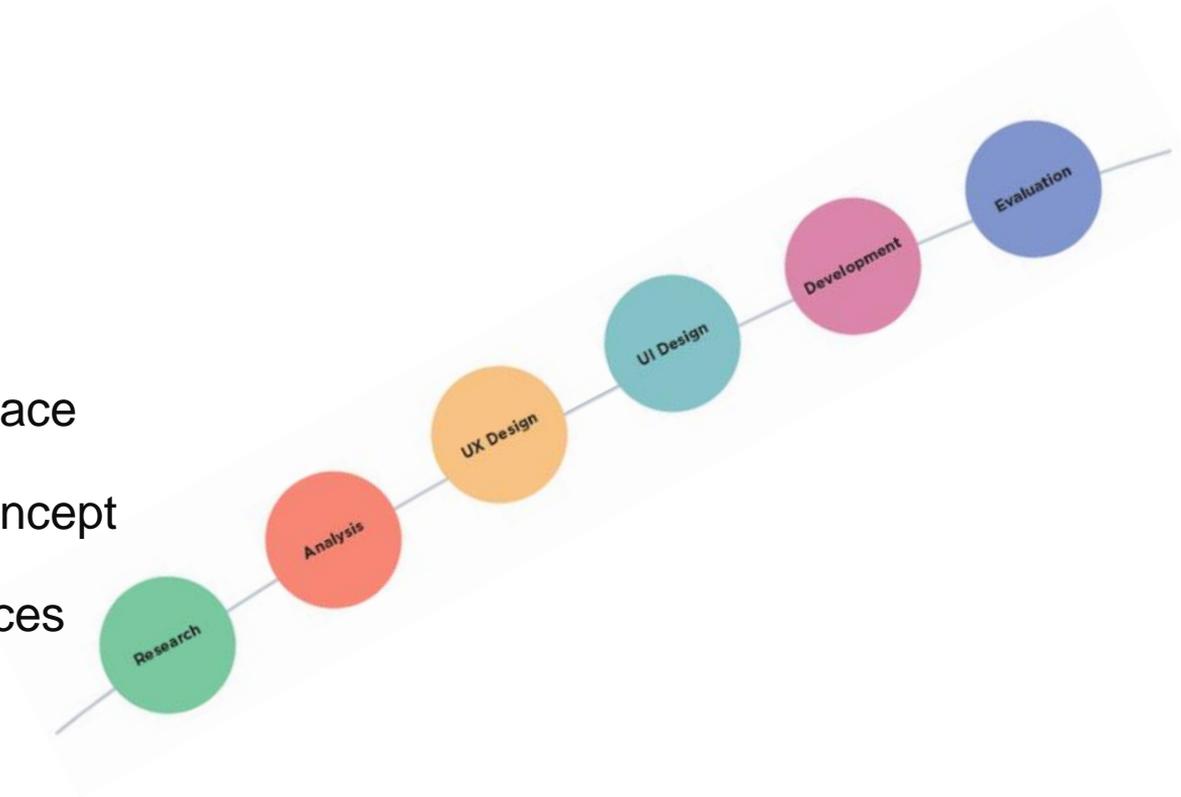
Designing User Experiences

- UX Design
- Metaphors
- Conceptual design
- Physical design
- Designing interactions



UX Design

- UX Design
 - Exploring design space
 - Exploring design concept
 - Places for experiences



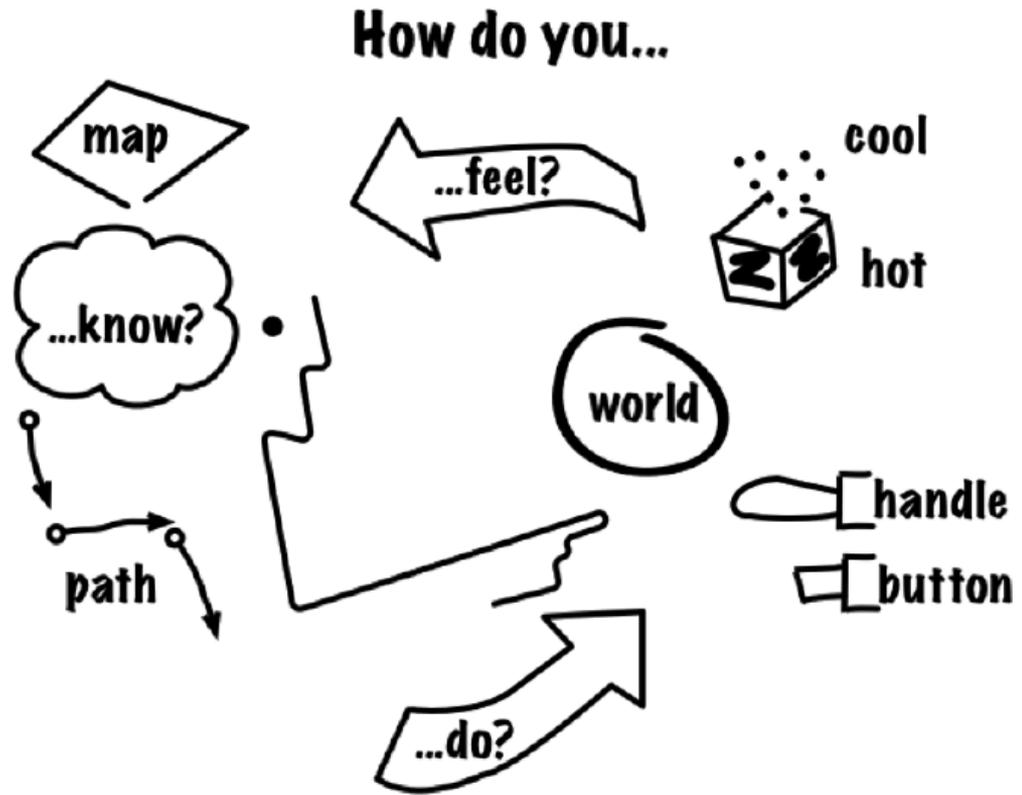
UX Design

- Exploring design space
 - design dimensions
 - exploring alternatives
 - design fixation
- open to radical solutions: service blueprints, customer journey mappings, wireframes and navigation maps
- brainstorming, envisionment, sketching, information architecture



UX Design

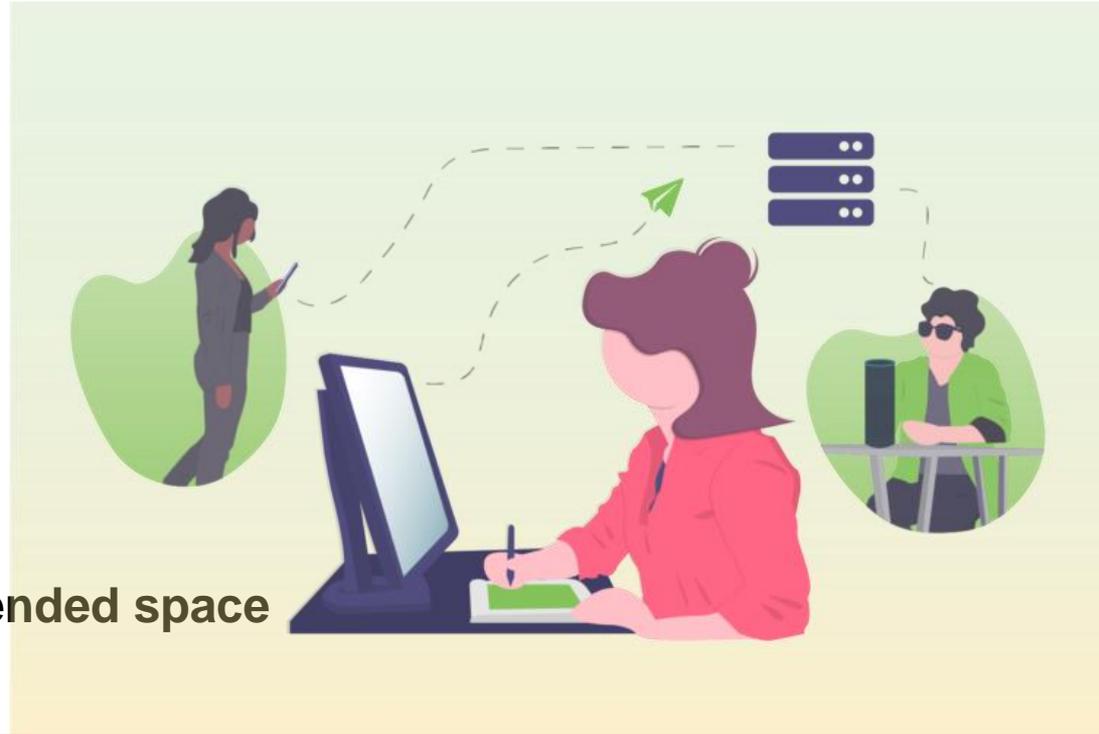
- Exploring design space
 - How do you do?
 - How do you feel
 - How do you know



UX Design

- Places for experiences
 - Physical space
 - Digital space
 - Information space
 - Social space

Blended space



Design Metaphors

- What is it?
 - “The way we think, what we experience and what we do every day”
 - Taking concepts from one domain (source) and applying them to another (target)
 - Use metaphor to describe new domain in terms of familiar ones
 - Not just a simple mapping from one domain to another: computer window & window in a house



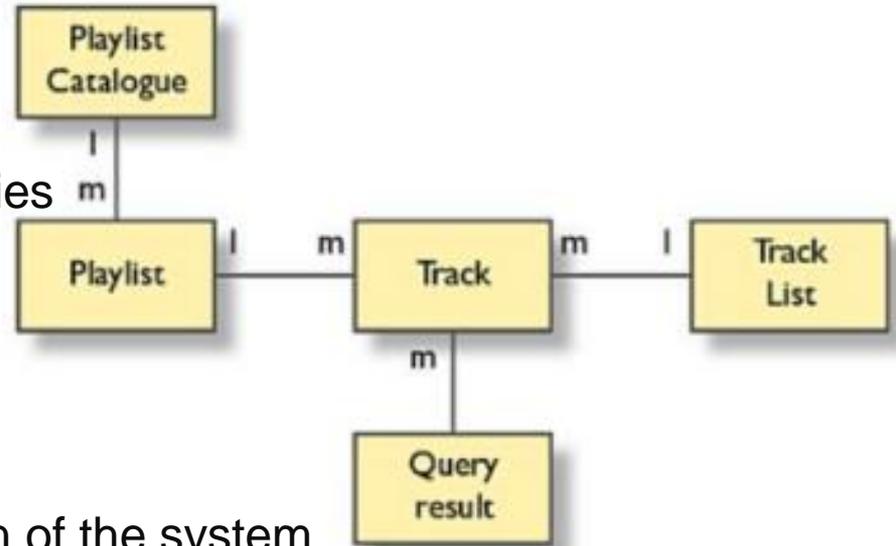
Design Metaphors

- Metaphors help users to
 - understand abstract content,
 - create a sense of familiarity
 - trigger emotions & draw attention
 - motivate actions
- Dos: make the unfamiliar familiar, awake positive associations and persuade people
- Don'ts: simplistically literal metaphor and blindly mimic a real-world precedent,



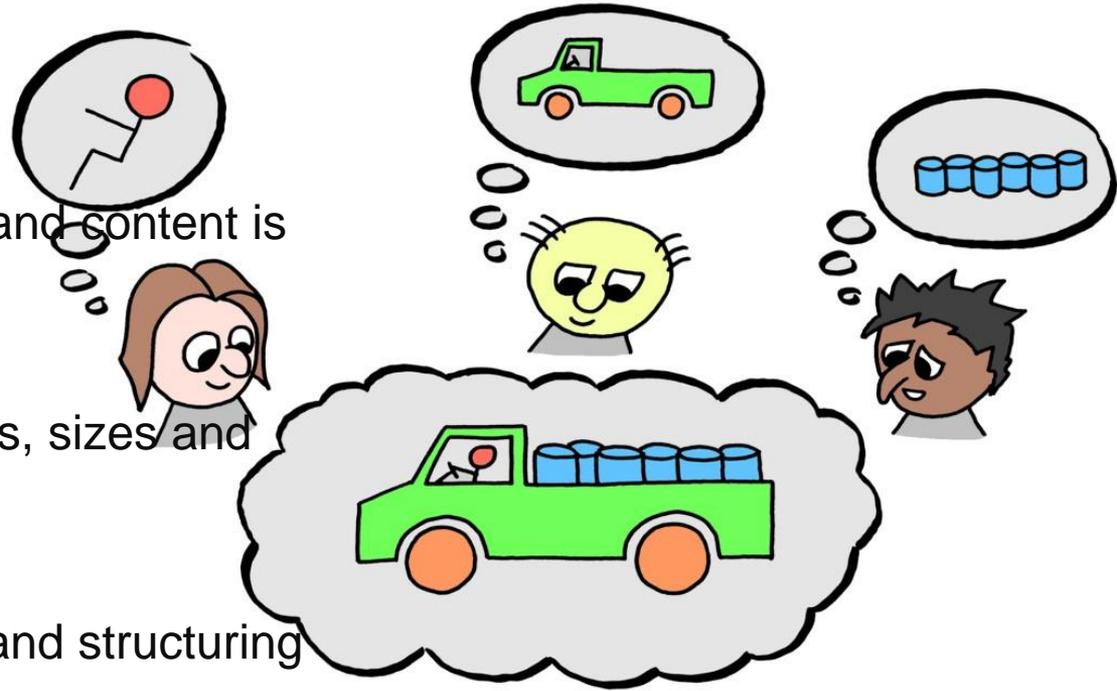
Conceptual Design

- Scenarios and conceptual design
 - Individual version of scenario
 - Covers major uses and functionalities
- Object-action analysis
 - Object: noun/noun phrases
 - Actions/activities: verbs
- Diagrammatic technique: representation of the system



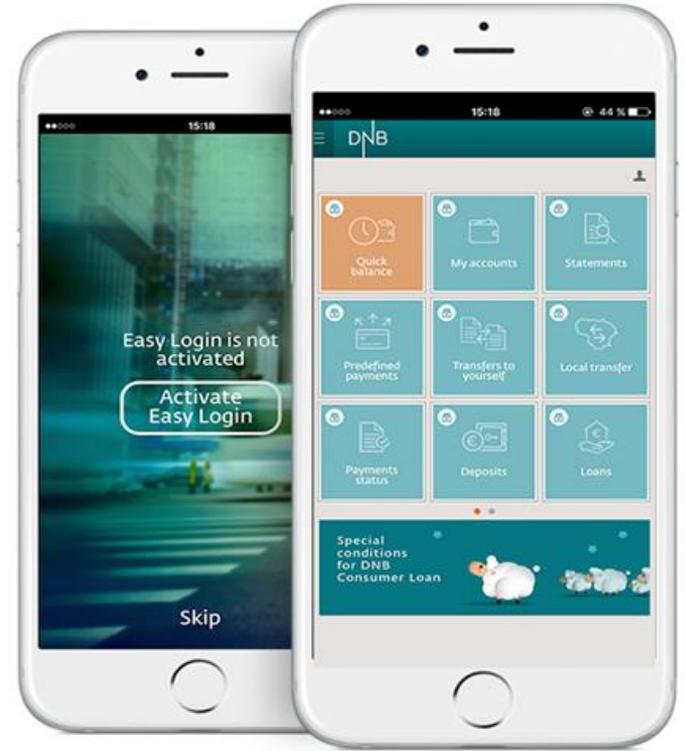
Physical Design

- Components of physical design
 - Operational design
 - How everything works and content is structured and stored
 - Representational design
 - Fixing on colors, shapes, sizes and information layout
 - Interaction design
 - Allocation of functions and structuring and sequencing of the interactions



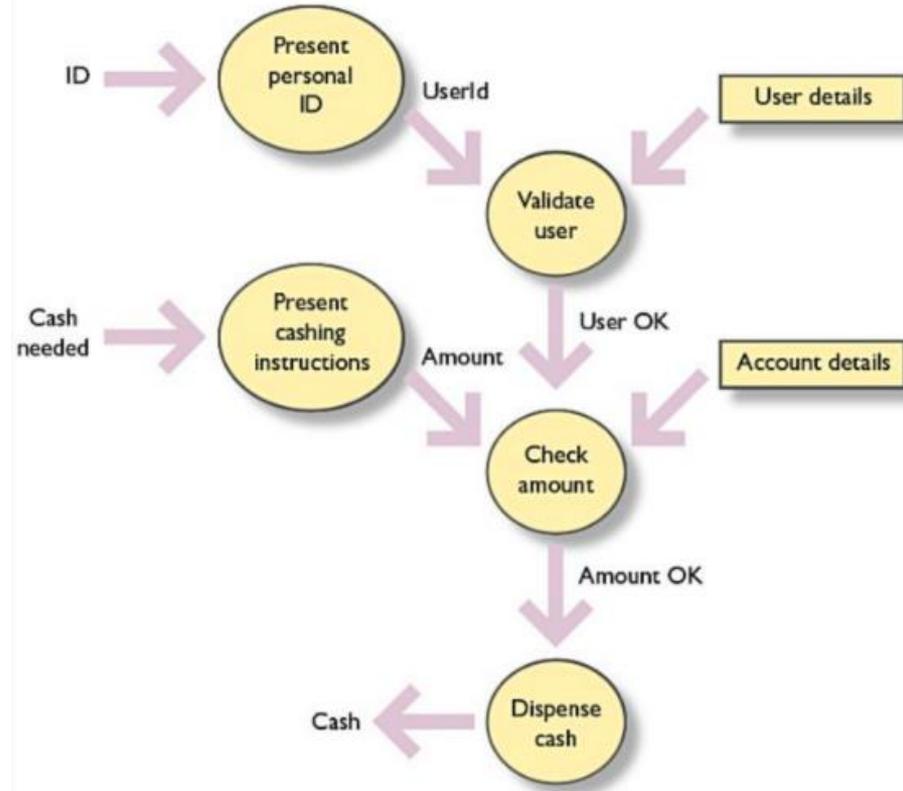
Physical Design

- Design Language
 - Building meanings into objects
 - What things to do
 - Distinctions between types of objects
 - Consists of:
 - design elements
 - principles of composition
 - qualifying situations



Designing interactions

- Allocate functions and knowledge to persons or devices
- Consider capabilities of people and the constraints on what they can do
- The interaction should be engaging, enjoyable and fulfilling
- Interaction patterns are built up with complex interactions of menus and mice/multi-touch display.



- Diagrammatic techniques: representing the process (dataflow diagram or sequence diagram or state transition network)

Tips for UX Design

- Usability: purposeful and functional
- User profiling: who are users & what do they want to achieve
- Asking for permission: only when it is needed
- Form vs function: always go for function over form
- Consistency: inconsistency in design creates confusion and unhappy users
- Simplicity: app is grandma-proof
- Don't make me think: beautiful, clear and easily understandable interface and functions

(source: <https://www.freecodecamp.org/news/whats-the-difference-between-ux-and-ui-design-2ca8d107de14/>)

Thank you! Questions?