

SCC 141 - Week 4: Understanding users, usability, and user experience

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Learning objectives

At the end of this lecture, you should:

- **Understand** why we need to think about users and what factors influence how users interact with a system
- **Identify** what usability is and its key indicators
- **Recognise** dark patterns in UI design



Part 1: Understanding users

Why do we need to think about users?

- Computing - used by many people (not just technical professionals)
- Problems if products/services can't be used effectively by intended user groups
- Need to consider people's capabilities, limitations, needs, desires
- Many different users with different abilities and needs → **cannot assume that everyone is the same**

“Technology may change rapidly, but people change very slowly. The principles of good design never change.”

Donald A. Norman, (2013). *The Design of Everyday Things: Revised and Expanded Edition*.

Examples of not thinking about the user



A brief history of user-centered computing research

- **Late 1960s:** Personal computing began to grow, leading to concerns about **usability**, meaning how easy and efficient it is for users to interact with computers.
- **1970s:** Software engineering shifted its focus towards **non-functional requirements** like **usability** and **maintainability**, considering aspects of software beyond just its core functionality.
- **1980s:** The discipline of **Human-Computer Interaction (HCI)** emerged, concentrating on how people interact with computers and designing systems to improve this interaction.

A Range of Disciplines in User-Centred Design

Lots of different disciplines and sub-disciplines involved in considering users. These include:

- **Interaction Design:** Creating intuitive and engaging user interfaces.
- **Human-Computer Interaction (HCI):** Studying how users interact with computers to improve usability.
- **User Experience (UX) Design:** Enhancing overall user satisfaction and ease of use.
- **Requirements Engineering:** Defining system functions and qualities, including usability and security (revise Week 3 Lecture functional vs non-functional requirements).

Understanding users

Need to consider human abilities and capabilities, as well as what they like/need.
This includes:

- **Physiological** aspects – e.g., senses, movement, strength, fatigue, etc.
- **Cognitive** aspects – e.g., attention, memory, learning, cognitive load, etc.
- **Affective** aspects - i.e., emotional responses (e.g., engagement, frustration, etc.)



PHYSIOLOGICAL: Is it readable for people with colour blindness?

COGNITIVE: How much mental effort does it take to use?



AFFECTIVE: Is it satisfying or frustrating to use?

Need to consider variety and change of abilities:

- Individuals' abilities vary
- A single individual's abilities may change over time – for example, as a result of ageing
- Some abilities remain fairly constant over time – for example, ability to cope with stress or cognitive load

Limitations to understanding users

- **Humans are complex – understanding is always partial:** We can't predict every need or behaviour.
- **We are all different:** Impossible to design for every possible user or use case.
- **Users may struggle to articulate needs:** They often can't clearly express what they want.
- **Users' actual use may be different from what they say:** What users say they will do doesn't always match their real behaviour.

Techniques for considering users: scenarios

- **What are they?**

Scenarios are stories that describe how users interact with a system.

- **Personas**

These are fictional characters representing typical users, helping designers understand different types of users.

- **Purpose**

Scenarios help designers imagine how users will use the system in various ways.

- **Collaboration**

Designers and users discuss the scenario together to identify potential problems and suggest improvements.

Techniques for considering users: personas

- **What are they?**
- Character "portraits" that represent typical users.
- **Based on real data**
- Personas should be created using actual data about real users.
- **Variety**
- Different personas represent different types of users with unique needs.
- **Example**
- Designers can ask, "What would Salma want?" to think from the user's perspective.



Personas example

Typical UX Persona #4: Kate, a Journalist

Fictional Name

Kate Robertson

Occupation

Journalist, works for two online news outlets, mostly from home



Demographics

- 26 years old;
- Single, no children;
- Lives in Los Angeles, California;
- Her parents live in another state, she supports them financially;

Has a middle-income level.



Justinmind
user persona templates ...



Justinmind
user persona templates ...



Amelia booking plugin
User Persona Template Examples...

Part 2: Usability

What is usability?

Some definitions:

- “Usability refers to ensuring that interactive products are easy to learn, effective to use, and enjoyable from a user’s perspective” (Rogers et al, Interaction Design)
- "The extent to which a product can be used by specified users to achieve specified goals with **effectiveness**, **efficiency** and **satisfaction** in a specified context of use” (ISO 9241-11)

What is usability?

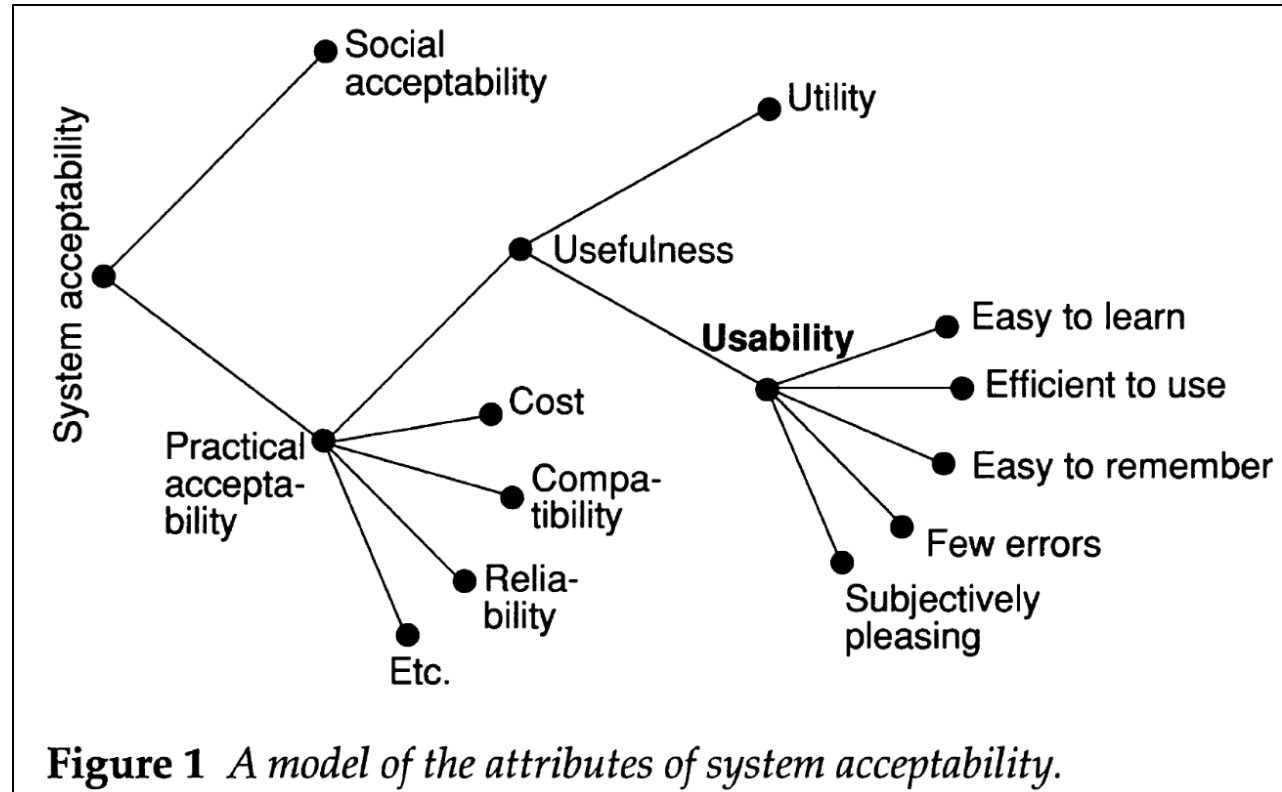


Jakob Nielsen's Usability Engineering (1993)

- He suggested using "usability" instead of "user friendly."
- Usability is made up of different factors, not just one thing.
- Usability is part of **usefulness**, which has two key parts:
 - **Utility**: Does the system do what users need?
 - **Usability**: Can users easily use the system's features?

Nielsen's model of system acceptability

system acceptability relies on a combination of social and practical factors, with **usefulness** (which includes utility and usability) being a key driver of whether a system is considered acceptable by its users.

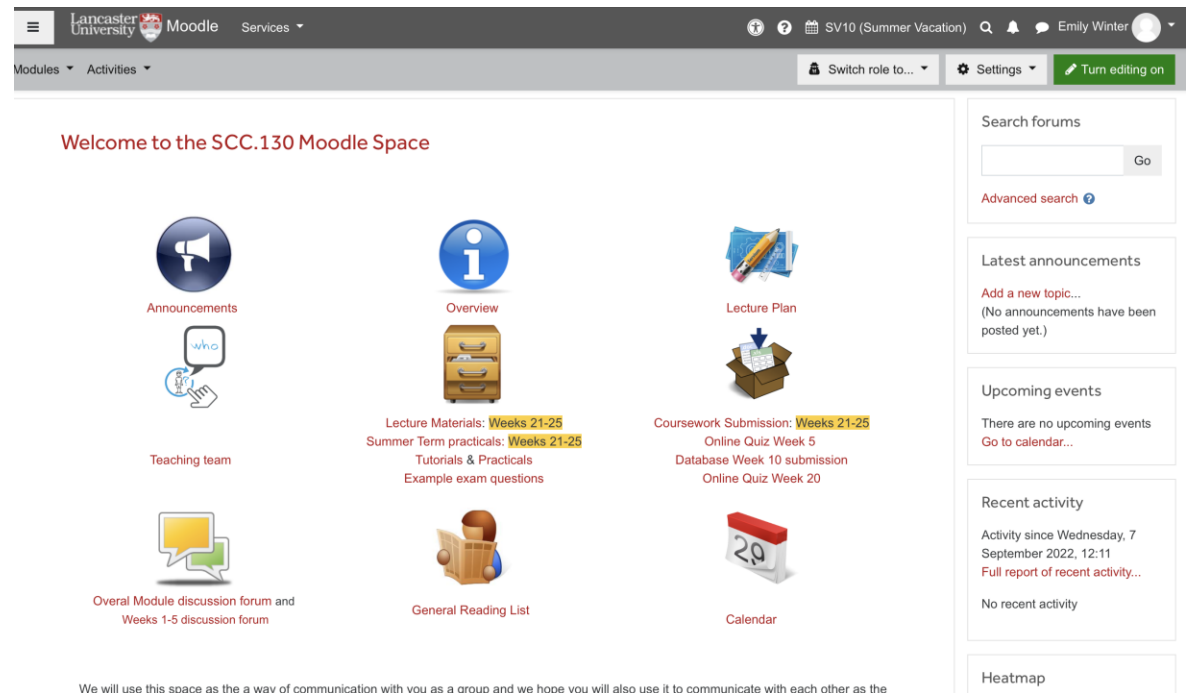


Nielsen's usability characteristics

- Learnability – the system should be easy to learn
- Efficiency – the system should be efficient to use
- Memorability – the system should be easy to remember
- Errors - the system should have a low error rate
- Satisfaction – the system should be satisfying to use

Learnability

- Is the system easy to learn?
- What is the learning curve like?

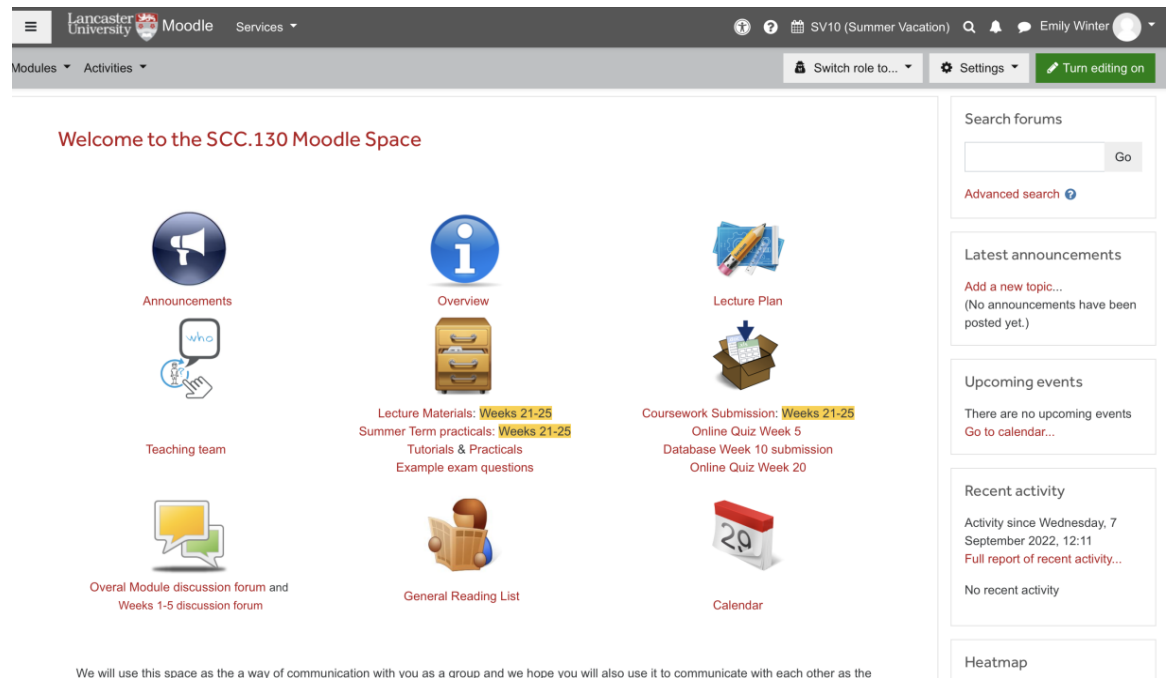


The screenshot shows the Moodle interface for the SCC.130 course. The top navigation bar includes the Lancaster University logo, 'Moodle', and 'Services'. The user is logged in as 'Emily Winter' on 'SV10 (Summer Vacation)'. The main content area is titled 'Welcome to the SCC.130 Moodle Space' and features a grid of icons for various course activities: Announcements, Overview, Lecture Plan, Teaching team, Coursework Submission, Overall Module discussion forum, General Reading List, and Calendar. The right sidebar contains sections for 'Search forums', 'Latest announcements', 'Upcoming events', 'Recent activity', and 'Heatmap'.

When you first started to use Moodle, how did you experience it? Did it feel intuitive? Did you need to spend some time 'getting to know it'?

Efficiency

- Once over the learning curve, is using the system efficient?
- Does using the system make the user productive?

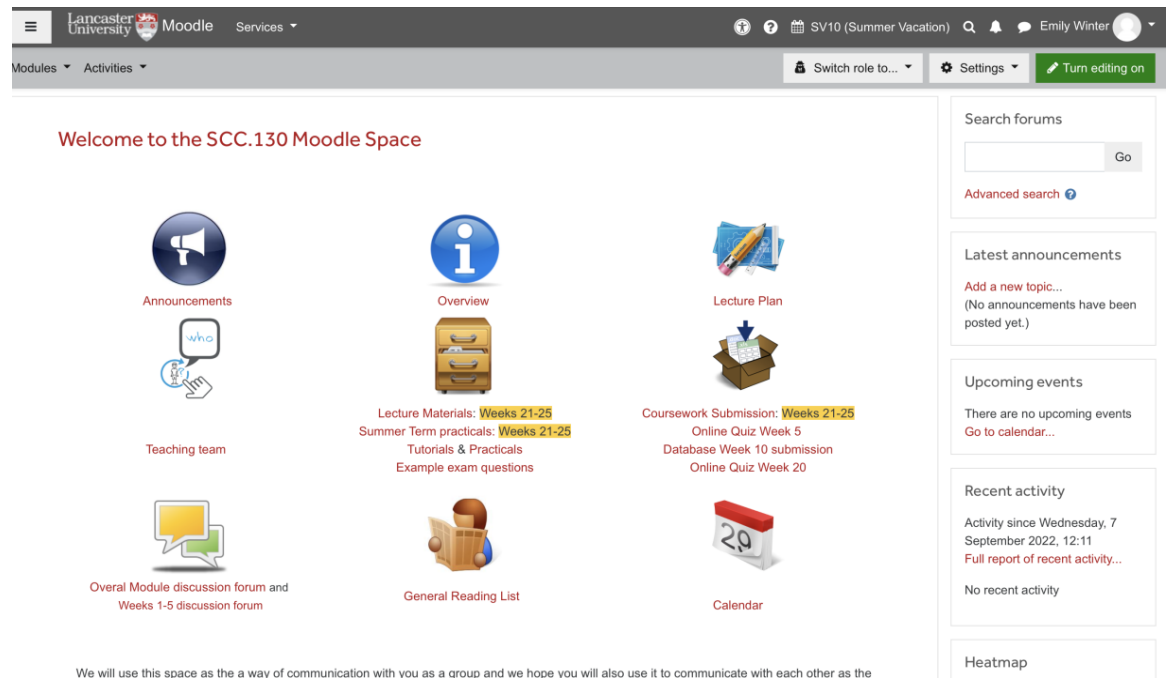


The screenshot shows the Moodle interface for the SCC.130 Moodle Space. The header includes the Lancaster University logo, the word 'Moodle', and a 'Services' dropdown. The user is logged in as 'Emily Winter'. The main content area is titled 'Welcome to the SCC.130 Moodle Space' and features a grid of icons for various functions: Announcements, Overview, Lecture Plan, Teaching team, Coursework Submission, Overall Module discussion forum, General Reading List, and Calendar. The right sidebar contains sections for Search forums, Latest announcements, Upcoming events, Recent activity, and a Heatmap. The footer states: 'We will use this space as the a way of communication with you as a group and we hope you will also use it to communicate with each other as the'.

Now you have learnt how to use Moodle, are you efficient at using it? Can you get what you want to get done quickly?

Memorability

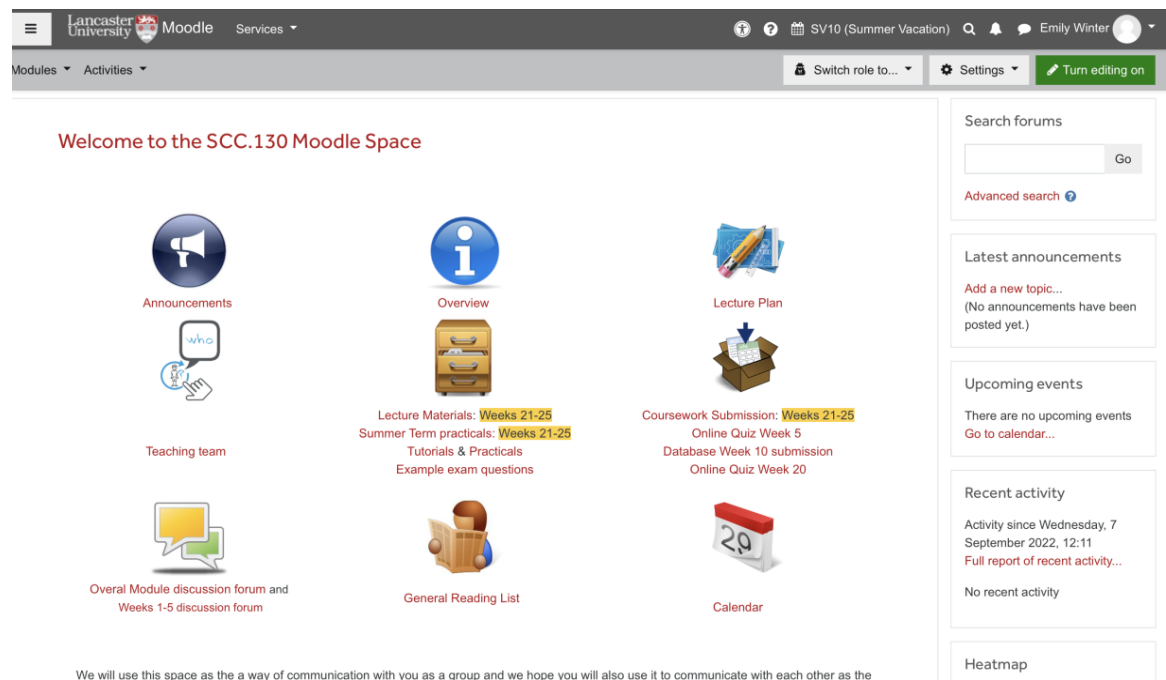
- Is it easy to remember how to use the system?



How did you find using Moodle after the holidays? How do you think it will be after the summer break?

Errors and safety

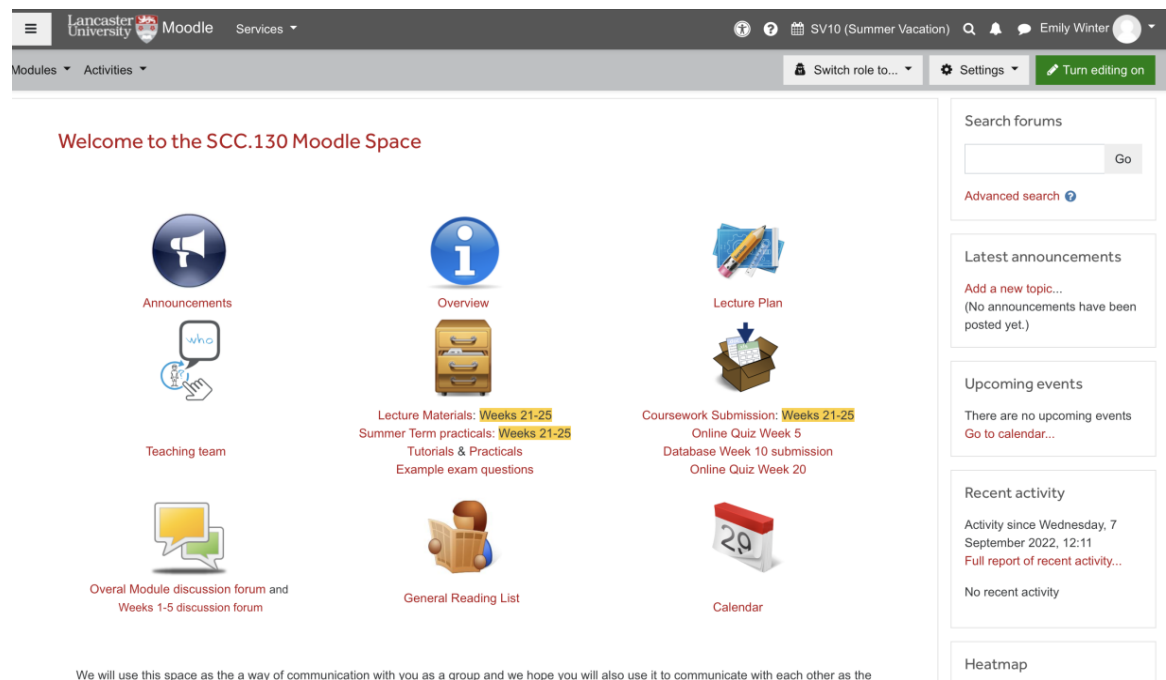
- Users should make few errors using the system
- If users do make an error, can they recover easily from them?



What happens if you make a mistake using Moodle? Would it be easy to recover? What consequences would there be to, for example, submitting the wrong coursework, or pressing the wrong button by mistake in an online test?

Satisfaction

- Is the system pleasant to use?



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Welcome to the SCC.130 Moodle Space

Announcements

Overview

Lecture Plan

Teaching team

Coursework Submission

Overall Module discussion forum and Weeks 1-5 discussion forum

General Reading List

Calendar

Search forums

Latest announcements

Upcoming events

Recent activity

Heatmap

Is it enjoyable or satisfying to use Moodle?

Nielsen's usability mottos (contradictions highlight complexity)

- **Your best guess is not good enough**

Design based on user data, not assumptions.

- **The user is always right**

User feedback reflects real experiences.

- **The user is not always right**

Users may not know the best design solutions.

- **Users are not designers**

Users understand their needs, but not design.

- **Designers are not users**

Designers can't assume their preferences match users'.

- **Less is more**

Simplicity improves usability.

- **Details matter**

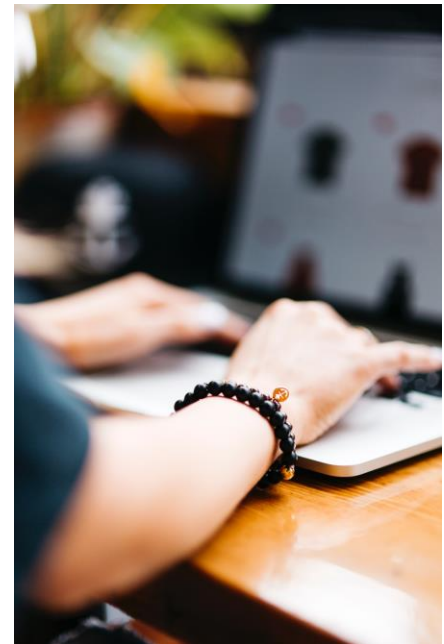
Small design details greatly impact the experience.

- **Help doesn't**

If users need help, the design isn't intuitive enough.

Evaluating usability

- **Analytic approaches:** assessing a system using guidelines or heuristics (expert evaluation)
- **Empirical approaches:** observations, surveys, etc. (user evaluation)



Methods to evaluate usability

1. Inspection Methods (Expert Evaluation)

- **Heuristic Evaluation:** Experts check against usability principles.
- **Walkthroughs:** Experts simulate user interactions.
- **Standards/Guideline Checklists:** Review compliance with standards or guidelines.

2. Inquiry Methods (User Evaluation)

- **Observations:** Watch users interact with the system.
- **Interviews/Focus Groups:** Gather feedback through discussions.
- **Questionnaires:** Collect structured user feedback.

3. Testing Methods (User Evaluation)

- **Usability Testing:** Users complete tasks while being observed to identify issues.

Nielsen's usability heuristics

First things first, what is a heuristic?

- A **heuristic** is a practical approach to problem-solving.
- It relies on **guidelines, shortcuts, or rules of thumb** to find a solution.
- Heuristics aim for a **sufficient** solution rather than a perfect one.
- They are **useful** for making quick decisions, but there's no guarantee the solution will always be completely accurate or optimal.

Nielsen's usability heuristics part I

1- Simple and natural dialogue

Interfaces should be easy to use and feel intuitive.

2- Speak the users' language

Use terms and concepts familiar to the user.

3- Minimise memory load

Users shouldn't need to remember too many rules to use the system.

4- Consistency

Actions should always have the same effect.

5- Feedback

The system should always inform users about its actions and their input.

Nielsen's usability heuristics part II

6- Clearly marked exits

Make it easy to cancel or undo actions to recover from mistakes.

7- Shortcuts

Provide shortcuts for experienced users to speed up tasks.

8- Good error messages

Error messages should be clear, helpful, and polite.

9- Prevent errors

Design the system to avoid mistakes before they happen.

10- Help and documentation

Provide easy-to-find, well-structured help, but keep it simple, as most users avoid reading it.



Pros and cons of heuristic evaluation

Pros

- **Quick and inexpensive**
- Provides fast feedback without needing large user groups, saving time and money.
- **Fewer ethical/logistical concerns**
- No need to recruit users or worry about privacy and consent, as experts handle the evaluation.

Cons

- **Requires expertise**
- Needs trained usability experts to be effective.
- **Hard to find experts**
- Qualified usability experts may be difficult to source.
- **May miss bigger issues**
- Often identifies minor problems but can overlook larger usability concerns

Survey measures for usability

System Usability Scale (SUS)

The **System Usability Scale (SUS)** is often used **after usability evaluations** (such as heuristic evaluations or user testing) to get quantitative feedback from real users on how they perceive the usability of a system. It consists of 10 statements where users rate their agreement, giving a sense of how intuitive, consistent, and easy-to-use the system is.

System Usability Scale Questionnaire	Strongly Disagree				Strongly Agree
1. I think that I would like to use this product frequently.	1	2	3	4	5
2. I found the product unnecessarily complex.	1	2	3	4	5
3. I thought the product was easy to use.	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this product.	1	2	3	4	5
5. I found the various functions in the product were well integrated.	1	2	3	4	5
6. I thought there was too much inconsistency in this product.	1	2	3	4	5
7. I imagine that most people would learn to use this product very quickly.	1	2	3	4	5
8. I found the product very awkward to use.	1	2	3	4	5
9. I felt very confident using the product.	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this product.	1	2	3	4	5

Survey measures for usability

System Usability Scale

1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to use
4. I think that I would need the support of a technical person to be able to use this system
5. I found the various functions in this system were well integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use this system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

Usability testing

After the **System Usability Scale (SUS)**, **usability testing** is often conducted to observe how users interact with the system in real time.

Usability Testing Process:

- **Users are assigned tasks:** Real users perform specific tasks, such as finding and purchasing an item, to simulate actual use of the system.
- **Performance measures are recorded:** Key metrics like task completion time, number of errors, and success rates are tracked to assess how efficiently and effectively users interact with the system.

Usability metrics

- **Usability Metrics** are key measurements used to evaluate system usability, focusing on how well and how efficiently users can complete tasks.
- **Effectiveness:** Measured as the percentage of tasks successfully completed. It's calculated by dividing the number of tasks completed by the total tasks, then multiplying by 100 to get the completion rate as a percentage.
- **Efficiency:** Measured by the time taken for users to complete a task. Faster task completion generally indicates higher efficiency.



Part 3: User experience

Origins of UX (User Experience)

- The term **User Experience (UX)** was coined in the 1990s by designer **Don Norman**.
- UX refers to the **overall experience and feelings** a user has when interacting with a system, device, or product, including the context of its use. This definition, from **Hartson and Pyla's UX Book (2012)**, emphasises how users experience technology on a deeper, more emotional level.
- UX recognises that technology is no longer just about improving **productivity** in the workplace but also about creating a **satisfying and seamless experience** for users.
- This shift highlights the need to focus on **quality** in a broader sense, considering both **functional** and **emotional** aspects of user interaction.

How does user experience differ from usability?

- **User Experience (UX)** focuses on how a system **feels** to the user, including emotional responses and satisfaction. It's about the **subjective experience** of interacting with a product, covering aspects like enjoyment, ease, and engagement.
- **Usability**, on the other hand, is more **objective**, measuring how efficient, effective, and easy it is for users to complete tasks using the system. It's about **practical functionality** and productivity.
- As described by **Sharp, Rogers, and Preece**, UX is concerned with the user's personal experience, while usability focuses on how well the system performs from a functional standpoint.

Designing a good user experience

- User experience (UX) design is the intentional creation of experiences through technology, focusing on how users feel and interact with a product.
- **WHY:** Start by understanding the user's needs, emotions, and motivations behind the activity.
- **HOW:** Design the interaction—how users achieve their goals (e.g., pressing a button to complete a task).
- **WHAT:** Determine what activities the product enables users to perform.

Dark patterns

What is a Dark Pattern?

- **Definition:** Dark patterns are deceptive UI design features (**tricks**) that mislead users into making choices not in their best interest.
- **Purpose:** They exploit human weaknesses and behaviours for the benefit of the service provider.
- **Impact:** Users often end up taking actions they didn't intend, such as signing up for unwanted services or sharing personal information.



Sign Up + Save!

Sign Up for our newsletters and get an **exclusive** coupon for **30% off** your next order!

SIGN UP + GET COUPON

Nah, I like paying full price

The continuum from honest interfaces to dark patterns.

Honest Interfaces

Dark Patterns



Users are put first, even at the expense of short-term revenue and conversion rate gains.

Steps are taken by the business that are unarguably deceptive to users, though carefully placed on the right side of the law.

Steps are taken to boost conversion rates that are not in users' interests, but arguably necessary to make the business viable.

Inverting Nielsen's heuristics

- **Nielsen: Simple and natural dialogue**
 - **Dark Pattern:** Conceal key information.
- **Nielsen: Speak the users' language**
 - **Dark Pattern:** Use ambiguous or misleading language (weasel wording).
- **Nielsen: Prevent errors**
 - **Dark Pattern:** Exploit user errors by not offering confirmation options before actions are finalised.


Capitalising on human behaviours

- **Behaviour:** Users scan rather than read thoroughly
 - **Dark Pattern:** Hide key information within dense text.
- **Behaviour:** Users tend to stick with default options
 - **Dark Pattern:** Set defaults that favour the business over the user.
- **Behaviour:** Users are influenced by others
 - **Dark Pattern:** Prominently display positive feedback while obscuring negative reviews.

Dark pattern example: confusing permission

brandon_L@gmail.com

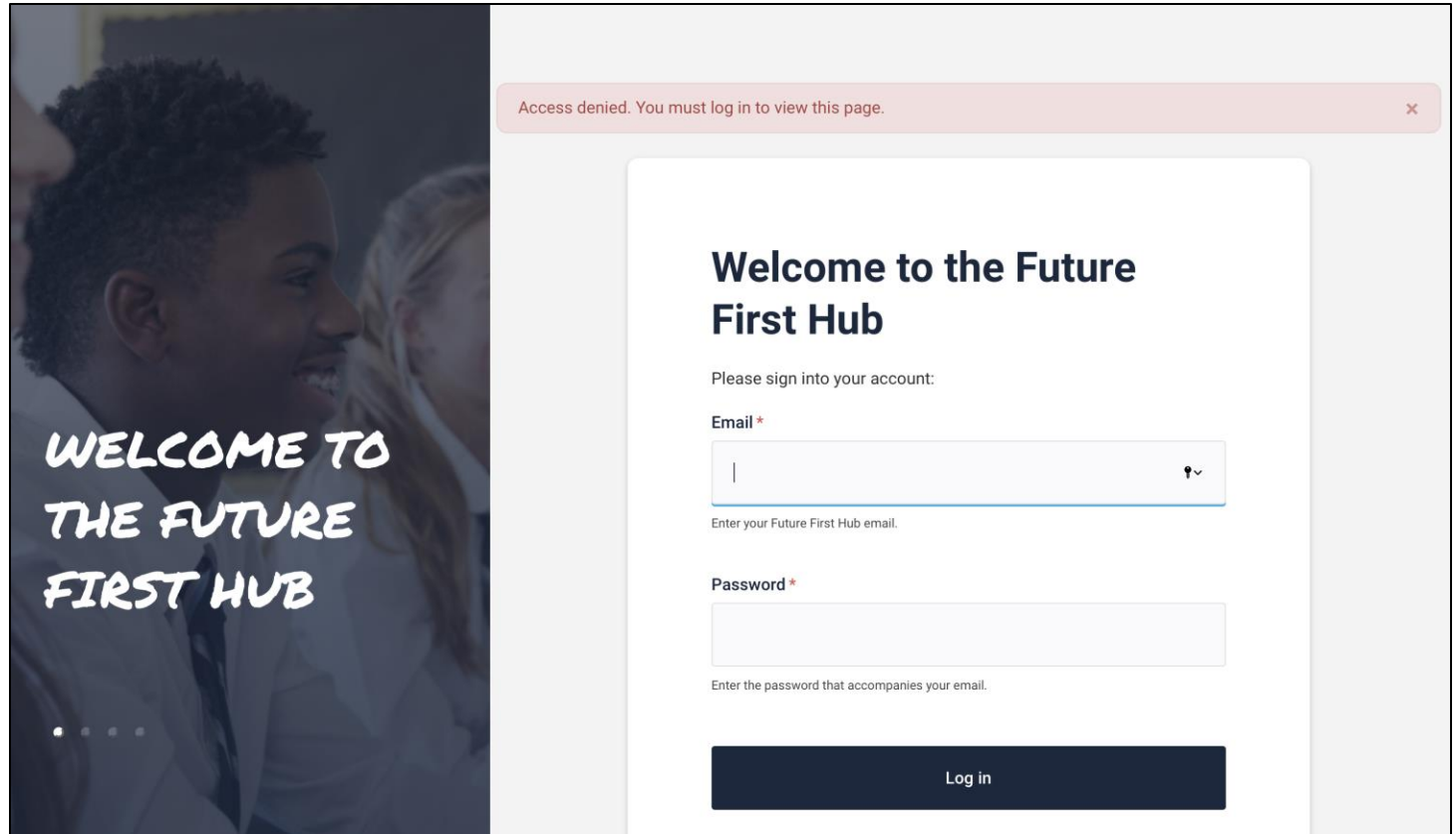
Password

***** 

☐ We'd love to send you emails with offers and new products, but if you don't wish to receive these updates, please tick this box.

Sign Up

-
- The **Roach Motel** is a type of dark pattern in user interface design where it is **very easy for users to enter a situation** (like subscribing to a service) but **difficult to exit** it (such as unsubscribing).
 - **Example:** Signing up for an email newsletter is typically straightforward, while finding and completing the process to unsubscribe can be complicated.



nextdoor

Search Nextdoor

Unsubscribe successful

You will no longer receive the following email:

General posts



A few weeks or so later...

nextdoor

Search Nextdoor

Unsubscribe successful

You will no longer receive the following email:

Digests



Dark patterns: Forced continuity

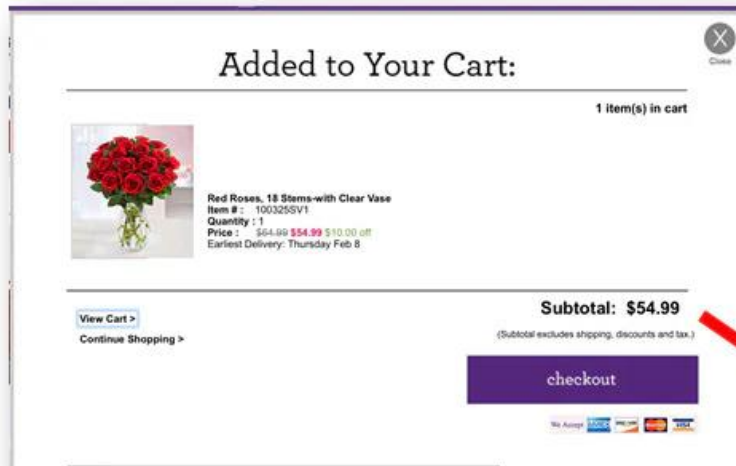
- **Forced continuity** is a dark pattern where users are required to provide their credit card information to sign up for a **free trial**.
- Once the trial period ends, users are **automatically billed** without prior notice.
- Often, there are **no reminders** sent to inform users that their trial is ending.
- Cancelling the automatic renewal is typically **difficult**, trapping users into continued payments they may not want.
- This tactic exploits users' tendency to forget about the trial and leads to unexpected charges.


Dark patterns: bait and switch

- **Bait and switch** is a dark pattern where users intend to complete one action, but an **undesirable action** occurs instead.
- This tactic is one of the oldest tricks in marketing.
- **Example:** A user may see one price for a product, but after clicking, they are presented with a **higher price**.
- This method misleads users, taking advantage of their initial interest to push them towards an unexpected outcome.

1-800-Flowers' website example

Lancaster
University



Merchandise:	\$54.99
Surcharge:	\$7.99
 Shipping Charge:	\$14.99
Total Before Tax:	\$77.97
Estimated Tax:	\$5.97
Order Total:	\$83.94

[place order](#)

By clicking the "Place Order" button I agree to be bound by the [Terms of Use](#) and [Privacy Policy](#).

Dark patterns: privacy Zuckering

- **Privacy Zuckering** refers to the practice of designing confusing jargon and user interfaces that deceive users into sharing more personal information than they intend to.
- This term is named after **Mark Zuckerberg**, CEO of Facebook, highlighting the platform's history of privacy issues.
- Users are often misled by complex language and layout choices, resulting in unintentional sharing of their data.
- This tactic exploits users' lack of understanding, compromising their privacy in the process.

