



Software Product Management

Principles of UX design

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- Dimensions of Usability (Jakob Nielsen)
 - Steps for UI design
 - Different aspects of UX design
 - Evaluating UX – Nielsen's heuristics
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Introduction



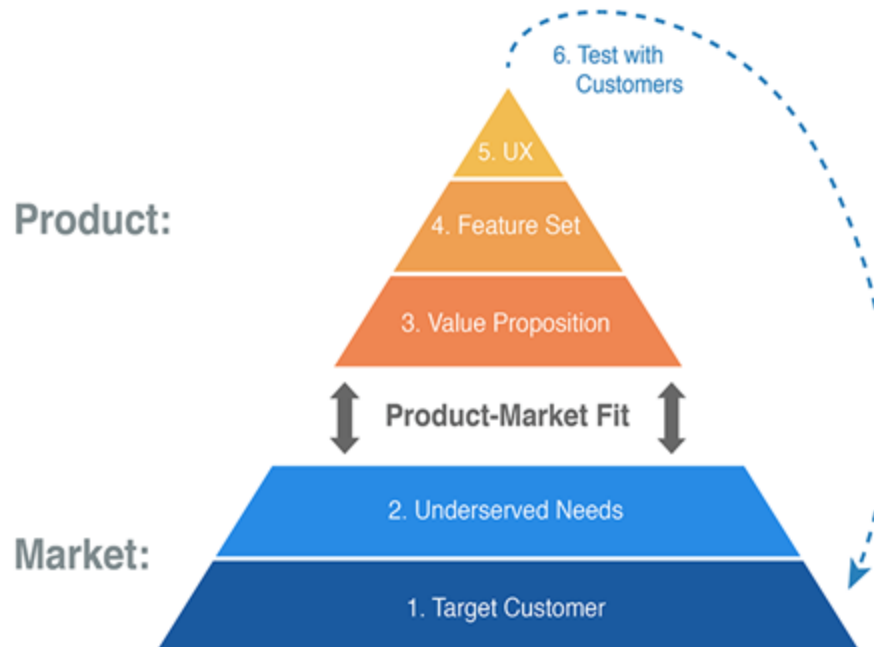
Have you come across User interfaces that exhibit the following:

- Unintuitive and hard to use.
 - You can't find what you're looking for
 - You're not clear what to do next.
-

Introduction



One way to evaluate UX is to consider how much it helps or hinders the functionality / features in realizing the value proposition (the desired customer benefits) (Product – Market fit pyramid)



Dimensions of Usability



- **Learnability:** How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency:** Once users have learned the design, how quickly can they perform tasks?
- **Memorability:** When users return to the design after a period of not using it, how easily can they re-establish proficiency?
- **Errors:** How many [errors](#) do users make, how severe are these errors, and how easily can they recover from the errors?
- **Satisfaction:** How pleasant is it to use the design?

Dimensions of Usability



Consider the following:

- Learnability: How quickly can you learn to use these - washing machine, Gmail, online banking
- Efficiency: How efficiently can you accomplish your task using these – MS Word, 50 process templates to choose from in Kissflow
- Memorability: How long does it take to use these when you return again to use them - Airport kiosk to print boarding pass, Movie theatre kiosk to print ticket
- Errors: How many errors do you make while buying a product on Flipkart?
- Satisfaction: How pleasant was your experience using MakeMyTrip.com?

Exercise: Give examples



Dimension	Good product example
Learnability	
Efficiency	
Memorability	
Error	
Satisfaction	

Exercise



Comment on the “Efficiency” dimension of booking an flight ticket in MakeMyTrip.com

The screenshot displays the MakeMyTrip website interface for searching flights. The search parameters are set to: Trip Type: One Way; From: Delhi, India; To: Bengaluru, India; Depart: Thu, Feb 25, 2021; Passengers & Class: 1 Adult, Economy / Premi. The search results are titled "Flights from New Delhi to Bengaluru".

Popular Filters:

- ☐ IndiGo (72) ₹ 6,867
- ☐ Morning Departures (58) ₹ 6,867
- ☐ AirAsia (31) ₹ 6,868
- ☐ Non Stop (27) ₹ 5,608
- + 5 more

One Way Price:

₹ 5,608 to ₹ 21,000

Stops From New Delhi:

- ☐ Non Stop (27) ₹ 5,608
- ☐ 1 Stop (105) ₹ 6,868
- ☐ 1+ Stop (18) ₹ 8,774

Departure From New Delhi:

Flights from New Delhi to Bengaluru:

	Thu, Feb 25	Fri, Feb 26	Sat, Feb 27	Sun, Feb 28	Mon, Mar 01	Tue, Mar 02	Wed, Mar 03	Thu, Mar 04
	₹ 5,608	₹ 6,867	₹ 6,867	₹ 6,867	₹ 6,867	₹ 6,867	₹ 5,608	₹ 4,569

Sorted By: Departure | Duration | Arrival | Price

Airline	Departure	Duration	Arrival	Price	View Prices
IndiGo	05:00 New Delhi	06 h 35 m 1 stop via Ahmedabad	11:35 Bengaluru	₹ 6,920	VIEW PRICES
AirAsia	05:05 New Delhi	10 h 40 m 1 stop via Kochi	15:45 Bengaluru	₹ 6,868	VIEW PRICES
IndiGo	05:05 New Delhi	05 h 05 m 1 stop via Mumbai	10:10 Bengaluru	₹ 6,920	VIEW PRICES

Basic steps



1. Design the overall structure
 2. Consider the different scenarios (use cases)
 3. Design navigation & screens for each scenario
-

Example: Overall structure



Online Shopping site in Inc X MakeMyTrip - #1 Travel W X +

https://www.makemytrip.com 150% ...

make **my** trip My Trips 24x7 support Biz Introducing myBiz MakeMyTrip for Business Login or Create Account IN

Flights Hotels Villas & Apts Holidays +Cruise Trains Buses Visa Cabs Charter Flights NEW

ONEWAY ROUND TRIP MULTI CITY

FROM **Delhi** DEL, Delhi Airport India

TO **Bangalore** BLR, Kempegowda International Airp...

DEPARTURE 25 Feb'21 Thursday

RETURN Tap to add a return date for bigger discounts

STUDENT FARE Trending Searches: Chennai → Hyderabad Bangalore → Singapore Delhi → Kolkata

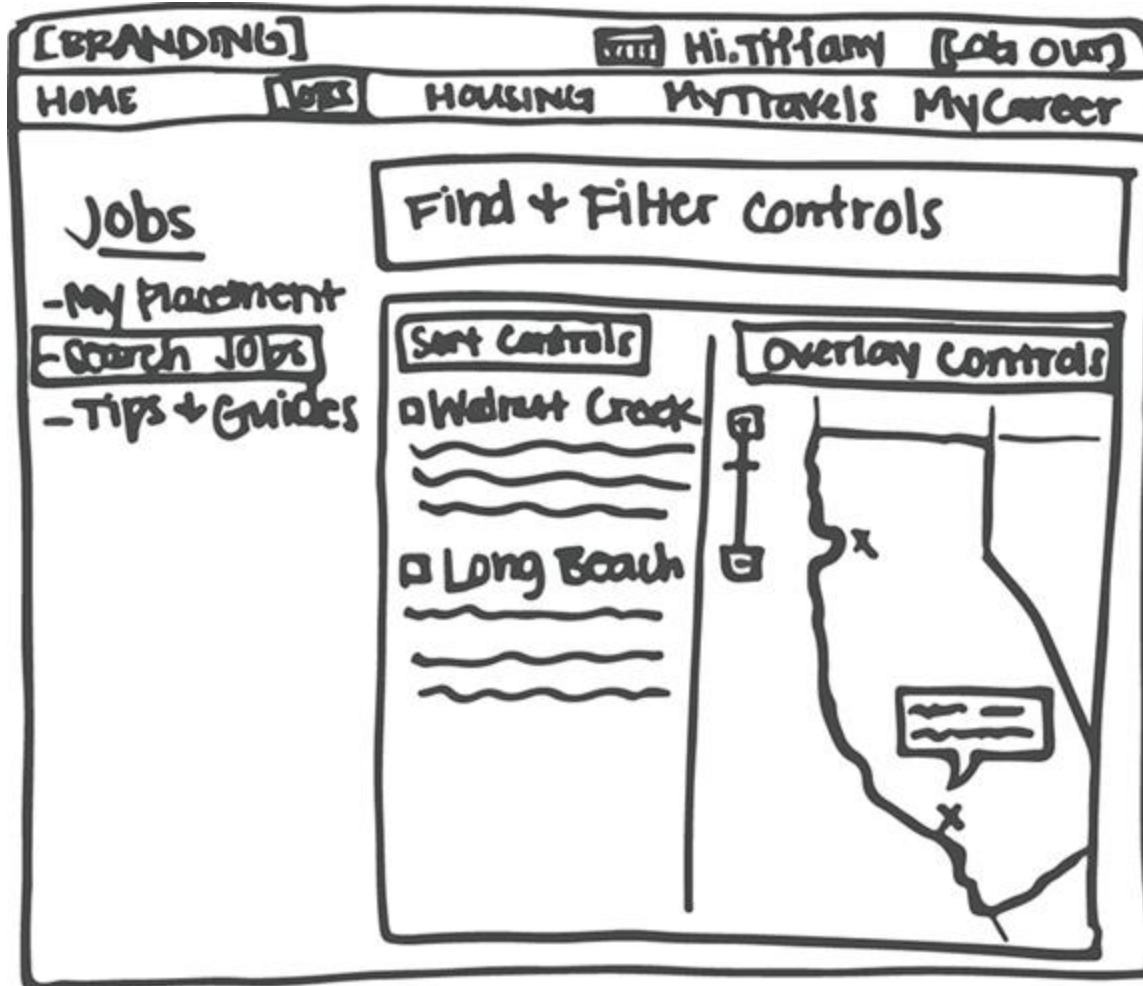
WE ARE HERE TO HELP. airlines & hoteliers to make inform date changes →

SEARCH

Type here to search

05:57 24-02-2021

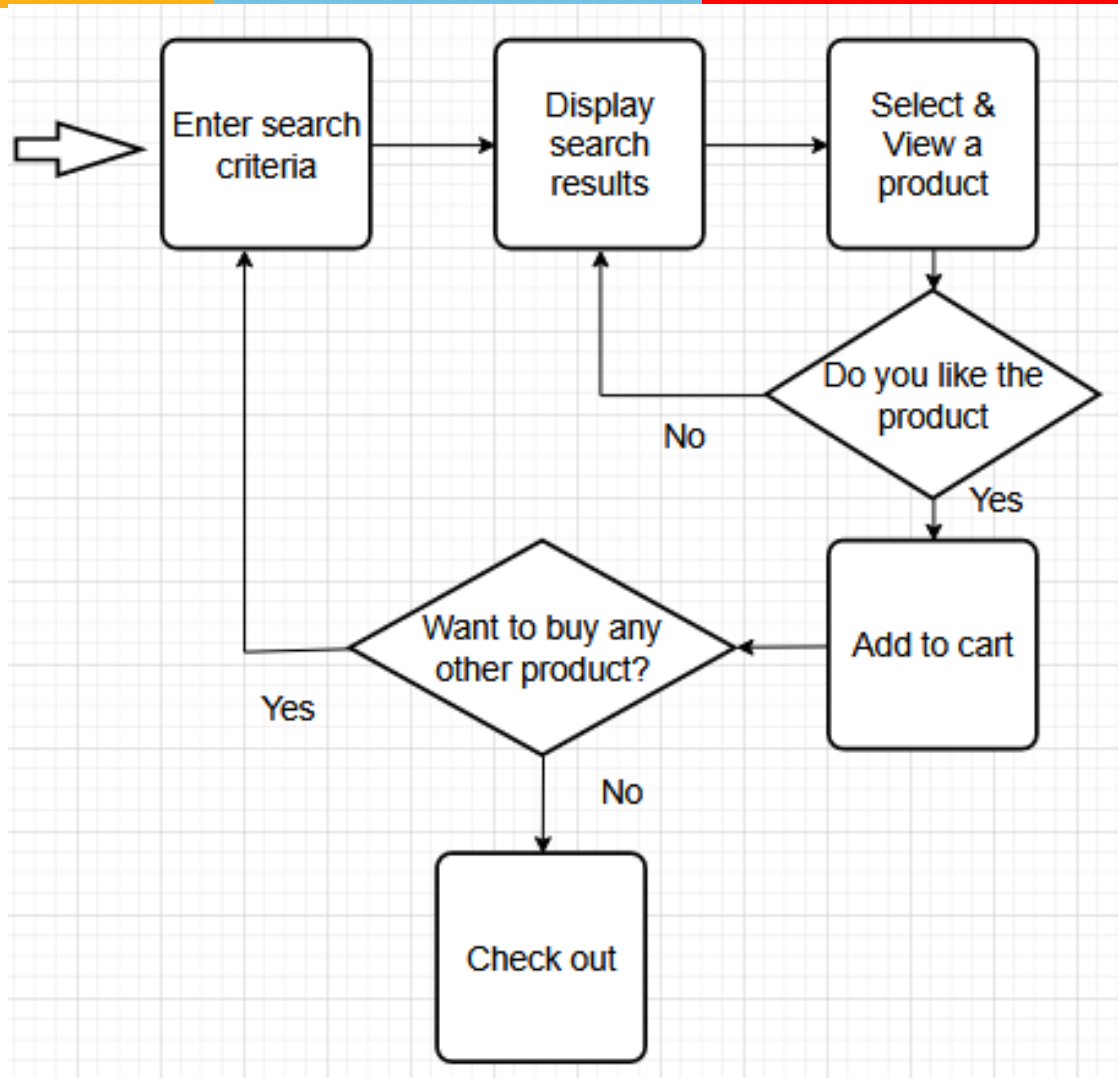
Example: Sketch of overall structure



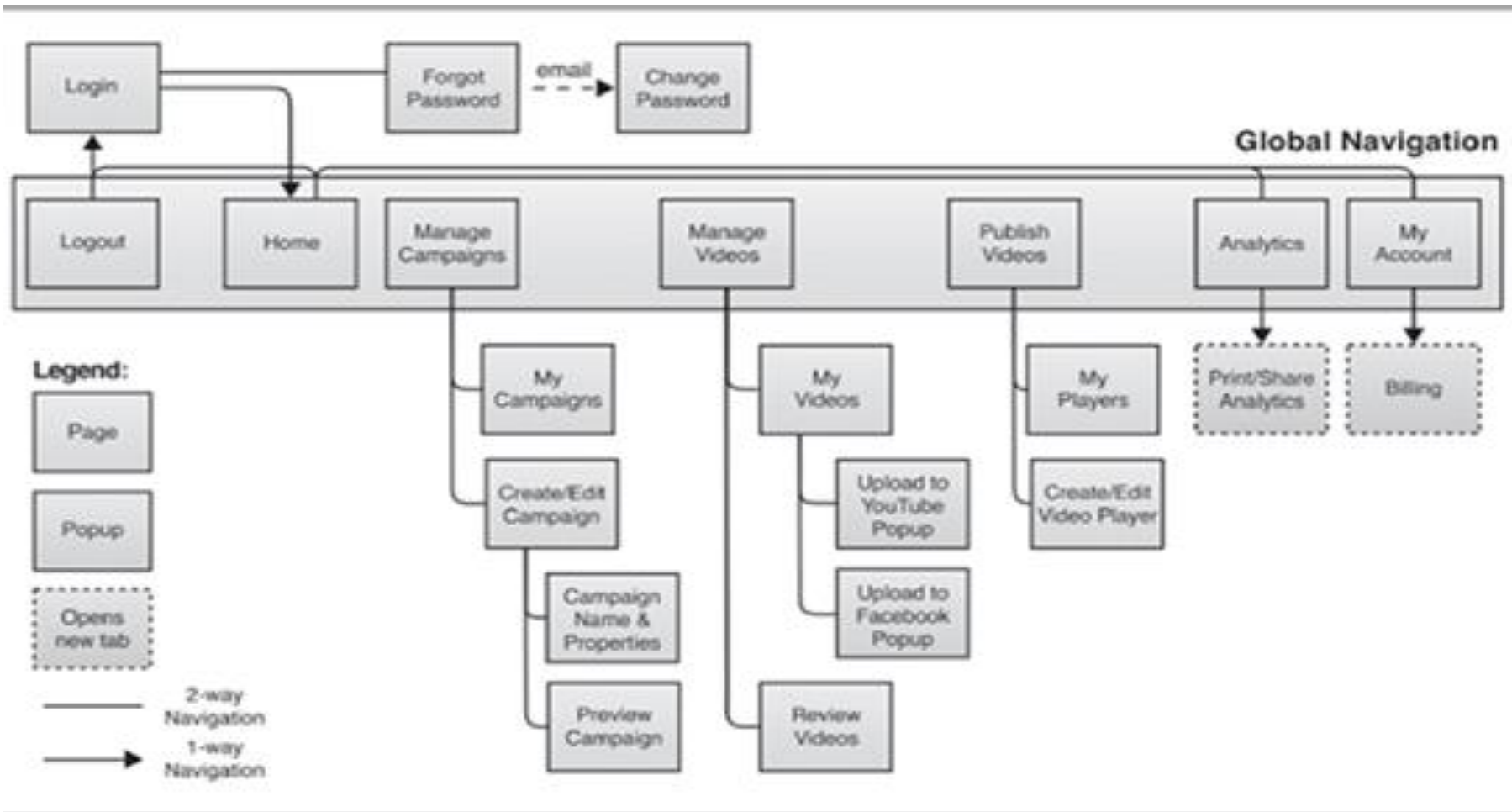
Portal for travelling nurses

- Show different areas using rectangles
- This is an iterative process

Example: Scenario: Searching & selecting products to buy



Example: Navigation



Example: Screen design



Calculation		Notification	
Period	<div>Jan ▼</div>	Scenario	<div>Actual ▼</div>
		Year	<div>2017 ▼</div>
<input type="checkbox"/> Run All Rules		<input type="checkbox"/> Allocation Rule2 is 58% complete.....	
<input type="checkbox"/> Specify Rule Set Range		<input checked="" type="checkbox"/> Today at 11:30 AM: Database Deploy Co	
Select First Rule set	<div></div>	<input checked="" type="checkbox"/> Today at 10:54 AM: Allocation Rule1 Cor	
Select Last Rule set	<div></div>		
<input type="checkbox"/> Stop After Rule			
Rule Set Name	<div></div> ▼		
Rule Name	<div></div> ▼		
<input type="checkbox"/> Run a single Rule from a RuleSet			
Select RuleSet	<div></div> ▼		
Select Rule	<div></div> ▼		

Example: Screen design



Calculation

Select the required POV and click on the 'Refresh' button.

Period Scenario Year Version Refresh 

Calculation Parameters

Job Comment

Processing Range

☐ Run All Rules

☐ Specify Rule Set Range

Select First Rule set

Select Last Rule set

☐ Stop After Rule

Rule Set Name

Rule Name

☐ Run a single Rule from a RuleSet

RuleSet Name

Rule Name

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Ideal sequence for design

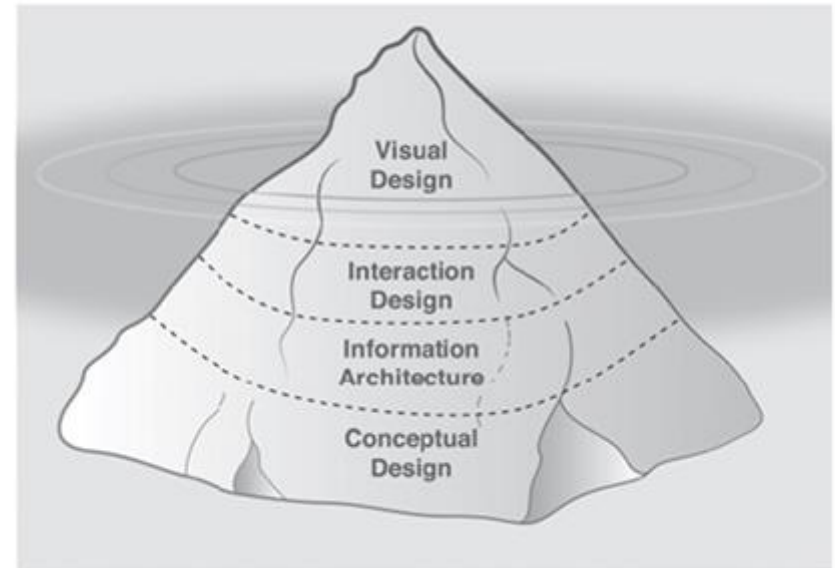


Sketch => Wireframe => Lo-fi Prototype => Hi-fi Prototype => Code

Different aspects of creating UX



- Conceptual design
- Information architecture
- Interaction design
- Visual design



Conceptual design



Should resonate with how the users think (Mental model)

Examples:

- Quicken used checkbook as a metaphor, which customers found very intuitive.
- Uber's conceptual design was to show users the location of nearby cars in real time:
- Tally: User's language not Accountant's language
- MakeMyTrip: Steps to book ticket match users expectations

Need to understand users and their goals (personas)

- How tech savvy is the customer?
- What is the age?
- What is the environment in which he will be using the product (in a car while driving, in a noisy factory)

Exercise: Conceptual design



- Comment on the conceptual design of the “Funds transfer” feature of your bank’s online banking software
-

Information architecture



- Deals with how you organize information on the screen
 - Findability is a key measure
 - Organize features, label them in a way that is easy to understand
 - Organize in sections and screens within sections (Site map)
 - Global navigation pattern
-

Information architecture: Example of bad design



How you like this screen design?

Form Title -- (appears above URL in most browsers and is used by \www\ search		Background Color:
Q&D Software Development Order Desk		FFFBF0
Form Heading -- (appears at top of \web page in bold type)		Text Color:
Q&D Software Development Order Desk <input checked="" type="checkbox"/> Center		000080
E-Mail responses to (will not appear on	Alternate (for mailto forms only)	Background Graphic
dversch@q-d.com		
Text to appear in Submit button	Text to appear in Reset button	<input type="radio"/> Mailto
Send Order	Clear Form	<input checked="" type="radio"/> CGI
Scrolling Status Bar Message (max length = 200 characters)		
WebMania 1.5b with Image Map Wizard is here!		
<< Prev Tab		Next Tab >>

Exercise: Info architecture



Comment on the “Findability” aspect of your bank’s online banking software

How easy or difficult it is to find the following features:

- a) Order cheque book
 - b) Block debit card
 - c) Access Form 16
-

Interaction design



Deals with:

- What actions can the user take at each step, and how will the product respond?
- How will the user interact: click, hover, drag, type, tap, swipe, etc.
- What navigations needs to be provided?
- Depicting the state, such as - Product selected, checkout, payment
- How does the product provide feedback?
 - Error messages,
 - confirmation,
 - acknowledgement for pressing a button,
 - wait indicators (hour glass),
 - progress bar,
 - 'you are here' indicator in a multi step process
- Which product you have used that gives good feedback?

Customer journey mapping (different touch points)



A **customer journey** is the end-to-end process that a customer goes through in order to complete a task over time

Customers interact with an application using multiple devices – laptop, smart phone, kiosk – and in multiple ways – email, browser, sms. (touch points)

Example: Airline travel

- Book ticket using laptop
 - On day of journey, the airline sends me a notification to check in
 - I show my phone boarding pass at gate
 - I print boarding pass on kiosk
 - If there's a flight delay, I'm updated immediately by text message or email.
-

Exercise: Customer journey mapping



Can you give example of customer journey mapping for
Customer complaint of lost credit card?

Visual design (Graphic design)



Deals with:

- Colour (highlight, borders, title)
 - Hierarchies (Heading, sections, ...)
 - Brand personality (Company logo)
 - Fonts
 - Images (AirBnB)
 - Icons (Save, Edit, ...)
 - Style guide for consistent design
-

Visual design: Hierarchy



(A) Create a Clear Visual Hierarchy

Organize and prioritize the contents of a page by using size, prominence, and content relationships. Let's look at these relationships more closely. The more important a headline is, the larger its font size should be. Big bold headlines help to grab the user's attention as they scan the Web page. The more important the headline or content, the higher up the page it should be placed. The most important or popular content should always be positioned prominently near the top of the page, so users can view it without having to scroll too far. Group similar content types by displaying the content in a similar visual style, or in a clearly defined area.

(B) Create a Clear Visual Hierarchy

Organize and prioritize the contents of a page by using size, prominence, and content relationships.

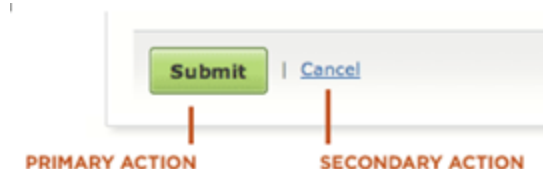
Let's look at these relationships more closely:

- **Size.** The more important a headline is, the larger its font size should be. Big bold headlines help to grab the user's attention as they scan the Web page.
- **Prominence.** The more important the headline or content, the higher up the page it should be placed. The most important or popular content should always be positioned prominently near the top of the page, so users can view it without having to scroll too far.
- **Content Relationships.** Group similar content types by displaying the content in a similar visual style, or in a clearly defined area.

Evaluating design: Nielsen's heuristics



- Simple & Natural dialogue – minimize concepts, match user's mental model
- Speak user's language – avoid codes such as 44 for UK, 1 for US, avoid technical terms such as memory overflow
- Minimize user memory load - Use menus and drop downs
- Consistency – Example menu items across Word, Excel, Powerpoint
- Feedback – Confirmation of action, Progress indicator
- User control & freedom – Example Home, Back, Undo, Redo
- Clearly marked exits – Cancel, Logout
- Shortcuts – Ex. Word shows last files opened, prefill preferences, default values
- Good error messages – Precise and helpful: Can not open file Chapter 5 because it is not on disk". It is possible that the file has been moved to new directory or might have been renamed"
- Prevent errors – Example Drop down values, Calendar to select date, Describe the format ex. dd-mmm-yyyy 2-Oct-2048, Make primary action prominent
- Help & Documentation – Task oriented search



Summary



We looked at:

- 5 dimensions of Usability: Learnability, Efficiency, Memorability, errors & Satisfaction
- 4 aspects of design: Conceptual, Information architecture, Interaction design, Visual design
- Evaluation heuristics of Nielsen

Question



What are the key learnings from this session?

Appendix



Information architecture: Example of poor organization



Al Gore from the Democratic Party, lost many thousands of votes, which instead went to the Reform Party.

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OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000

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lead



20: The network diagram for the London Underground reflects a problem-oriented refinement of the area's physical geography. By radically compressing the distances between outlying stations, this diagram became the first "fisheye" view. Design by Henry C. Beck, 1935. (See also color plate 2).

Balance



Balance



Imbalance

Source: <https://www.interaction-design.org/literature/topics/visual-design>