UNIVERSITY OF
WOLVERHAMPTON

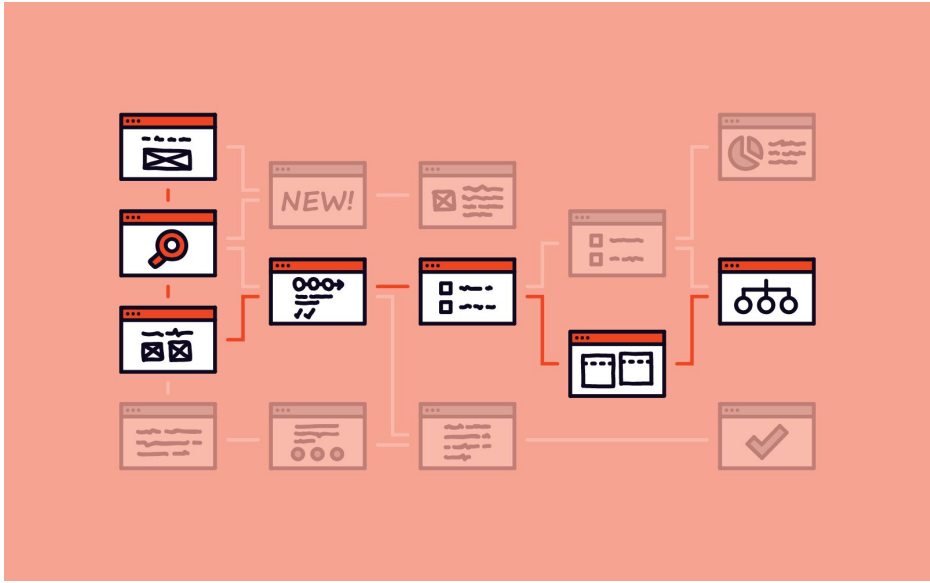
5CS020-HCI (Human Computer Interaction)
Week - 6

Navigation and its evaluation

April, 2024

Introduction

- Navigation (Predominantly websites, but applies to other areas)
- Evolution of navigation in UI
- Evaluation methods (If our navigation design works)



https://blog.optimalworkshop.com/10-examples-of-great-website-navigation-and-why-theyre-awesome-part-1/

Finding Stuff before

- Navigation means finding content (in the context of user interfaces)
- When google was established in 1998, there were 2.4 million websites
- Web navigation happened through
  - Search Engines (Word matching, ‘AltaVista’)
  - Web Pages (Text hyperlinks, sidebar)

UNIVERSITY OF WOLVERHAMPTON

Finding stuff now

- There are more than a billion websites
- Web navigation happens through
  - Search engines (Semantic/ Meaning based, Auto complete, Google, Bing, …)
  - Web pages (links, menu based on text, ...)
- Modern websites feature several navigation systems - all designed to make navigation easier

UNIVERSITY OF WOLVERHAMPTON

Navigation Mechanisms

That we will explore today

- Websites
- Touchscreens
- Gestures

UNIVERSITY OF WOLVERHAMPTON

Navigation Mechanisms in websites

- Paging
- Breadcrumbs
- Bars and tabs
- Vertical menus
- Site maps
- Trees
- A-Z Directories
- Dynamic and drop-down menus
- Visualization

UNIVERSITY OF WOLVERHAMPTON

Paging/ Pagination

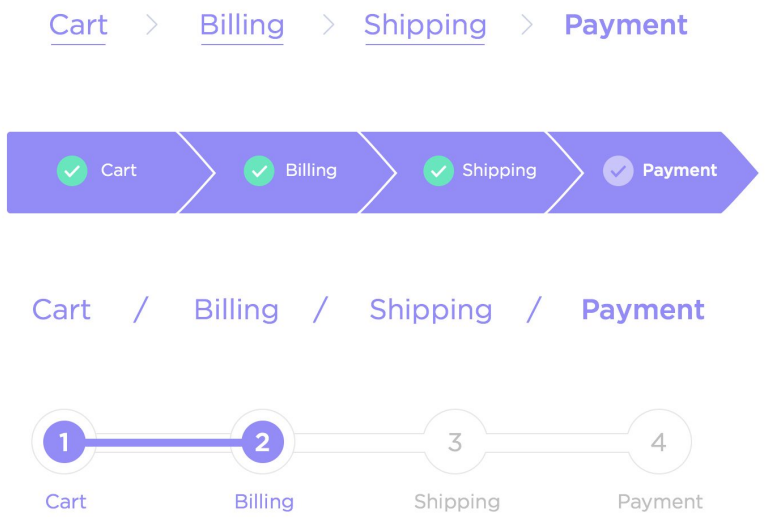
- Process of separating content into discrete pages
- Consecutive web pages are linked via textual links

https://www.vectorstock.com/royalty-free-vector/pagination-bar-page-navigation-web-buttons-vector-22654788

UNIVERSITY OF WOLVERHAMPTON

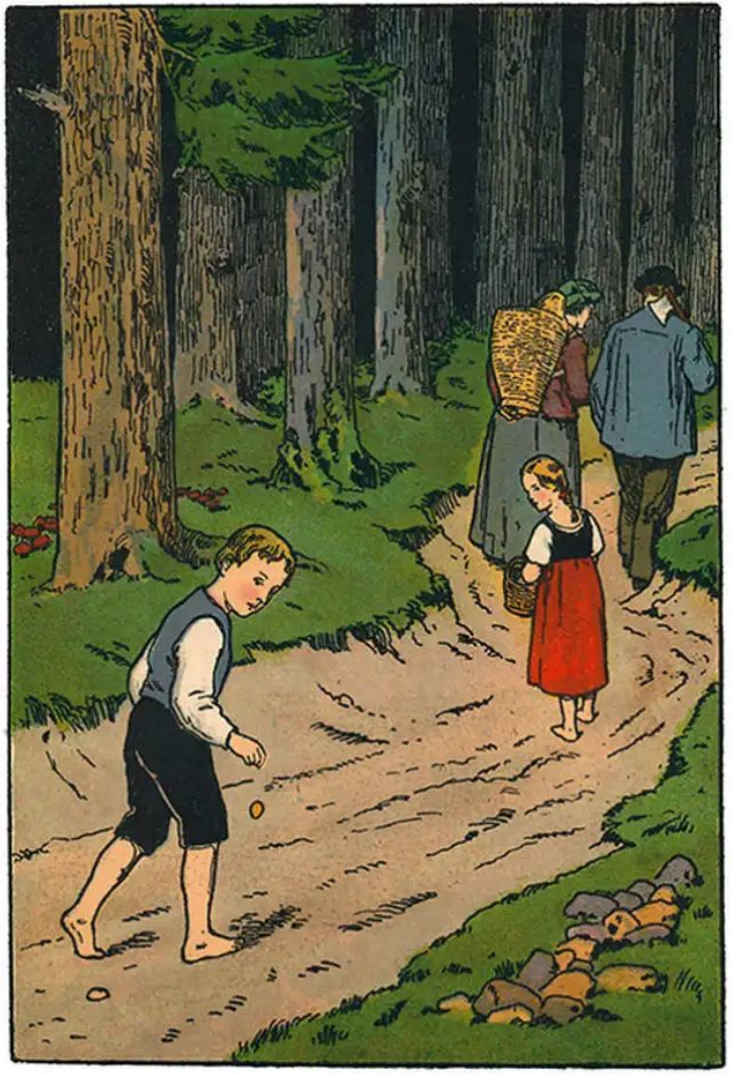
Breadcrumbs

- Indicates the path that the user is on and the current location
- Research suggests, breadcrumbs not frequently used

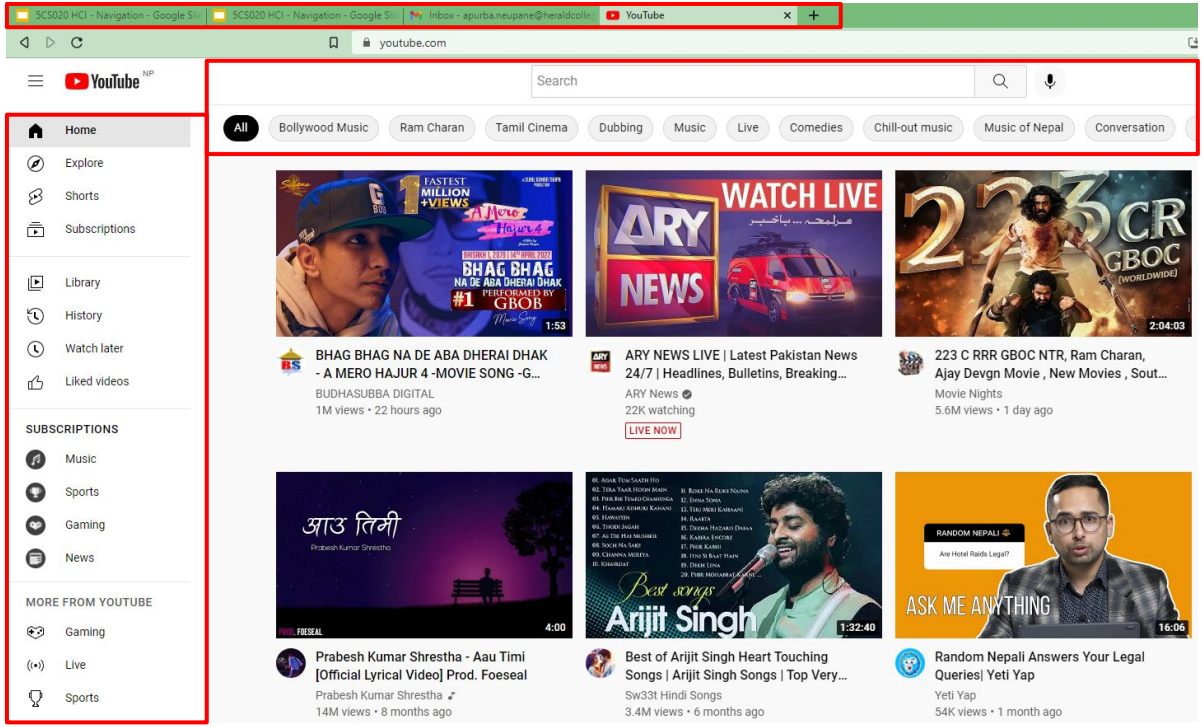


https://www.justinmind.com/blog/breadcrumb-website-navigation/

UNIVERSITY OF WOLVERHAMPTON

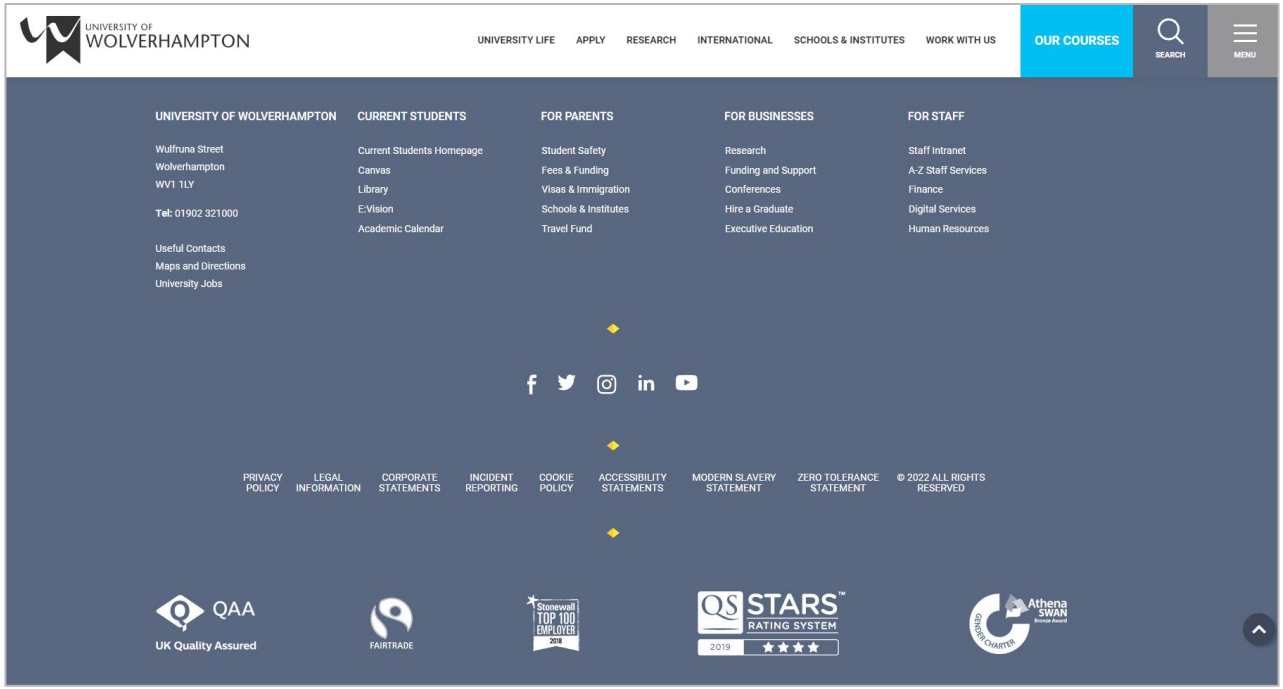


Bars, Tabs, and Vertical Menus

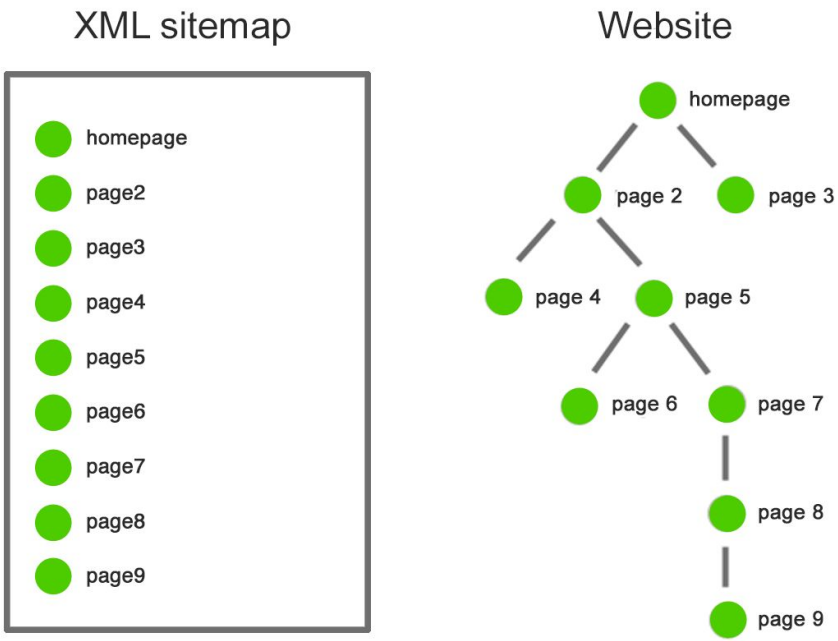


UNIVERSITY OF WOLVERHAMPTON

Sitemaps, Trees, A-Z Directories



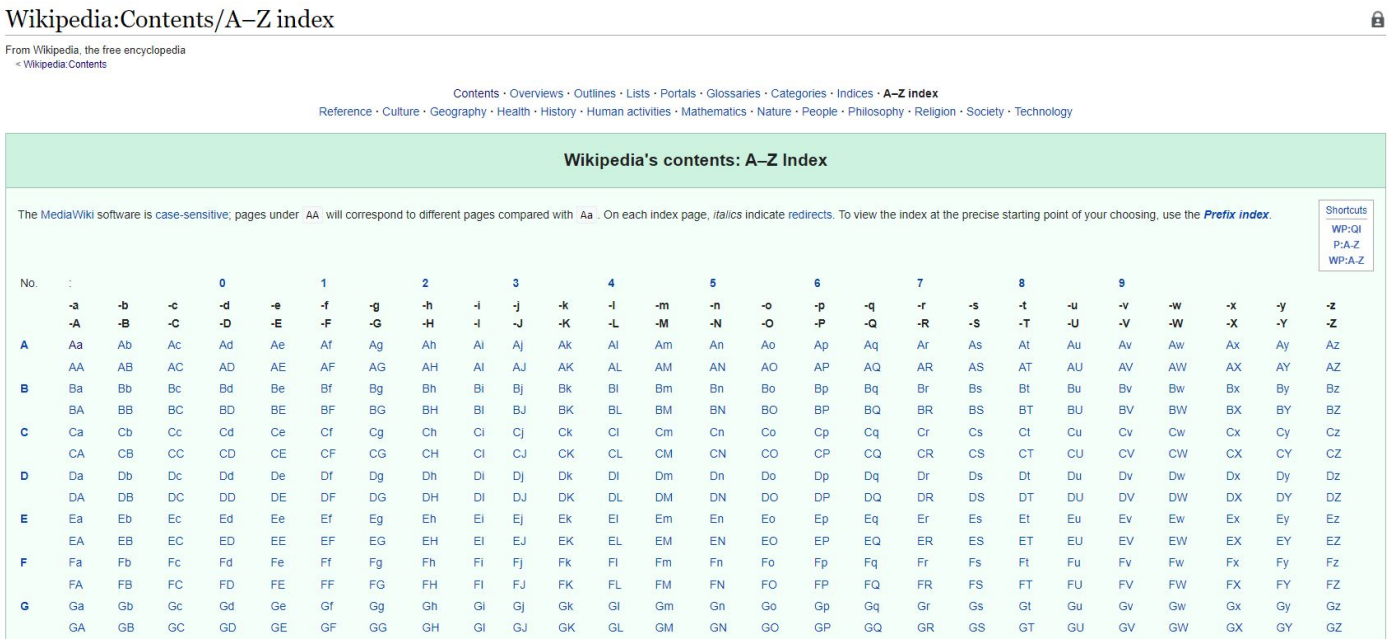
Sitemaps, Trees, A-Z Directories



https://www.searchenginejournal.com/technical-seo/xml-sitemaps/

UNIVERSITY OF WOLVERHAMPTON

Sitemaps, Trees, A-Z Directories



Wikipedia:Contents/A–Z index

From Wikipedia, the free encyclopedia
< Wikipedia:Contents

Contents · Overviews · Outlines · Lists · Portals · Glossaries · Categories · Indices · **A–Z index**
Reference · Culture · Geography · Health · History · Human activities · Mathematics · Nature · People · Philosophy · Religion · Society · Technology

Wikipedia's contents: A–Z Index

The MediaWiki software is case-sensitive; pages under `AA` will correspond to different pages compared with `Aa`. On each index page, *italics* indicate redirects. To view the index at the precise starting point of your choosing, use the ***Prefix index***.

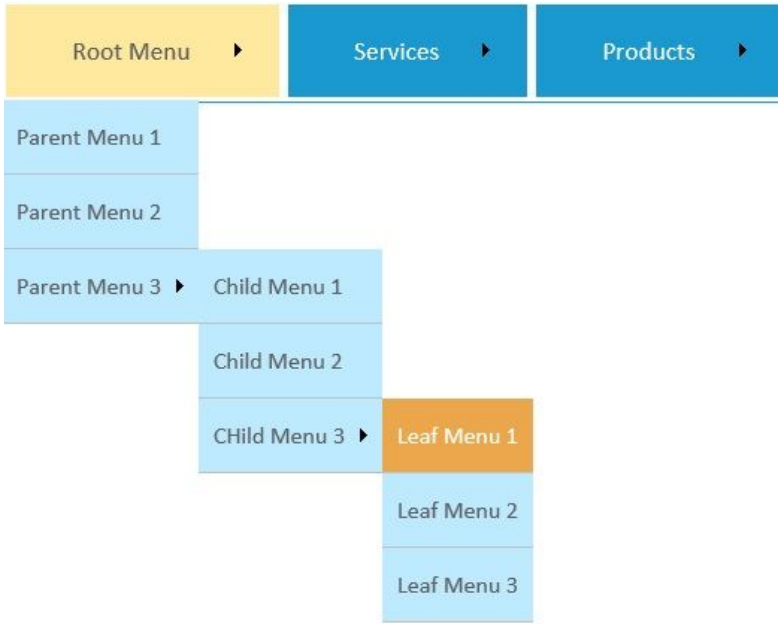
Shortcuts
WP:QI
P:A-Z
WP:A-Z

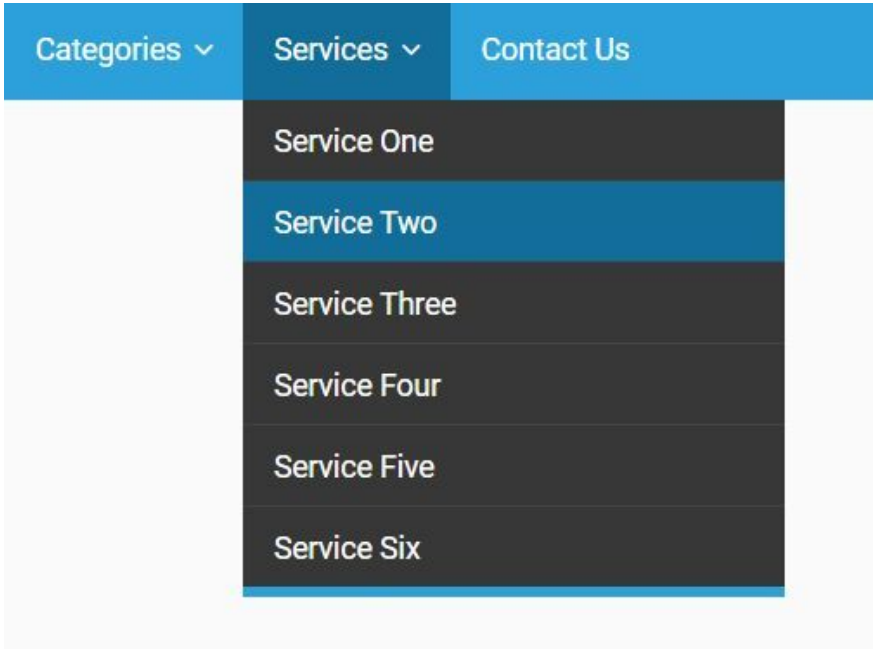
No.	:			0		1		2		3		4		5		6		7		8		9				
	-a	-b	-c	-d	-e	-f	-g	-h	-i	-j	-k	-l	-m	-n	-o	-p	-q	-r	-s	-t	-u	-v	-w	-x	-y	-z
	-A	-B	-C	-D	-E	-F	-G	-H	-I	-J	-K	-L	-M	-N	-O	-P	-Q	-R	-S	-T	-U	-V	-W	-X	-Y	-Z
A	Aa	Ab	Ac	Ad	Ae	Af	Ag	Ah	Ai	Aj	Ak	Al	Am	An	Ao	Ap	Aq	Ar	As	At	Au	Av	Aw	Ax	Ay	Az
	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
B	Ba	Bb	Bc	Bd	Be	Bf	Bg	Bh	Bi	Bj	Bk	Bl	Bm	Bn	Bo	Bp	Bq	Br	Bs	Bt	Bu	Bv	Bw	Bx	By	Bz
	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ
C	Ca	Cb	Cc	Cd	Ce	Cf	Cg	Ch	Ci	Cj	Ck	Cl	Cm	Cn	Co	Cp	Cq	Cr	Cs	Ct	Cu	Cv	Cw	Cx	Cy	Cz
	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ
D	Da	Db	Dc	Dd	De	Df	Dg	Dh	Di	Dj	Dk	Dl	Dm	Dn	Do	Dp	Dq	Dr	Ds	Dt	Du	Dv	Dw	Dx	Dy	Dz
	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ
E	Ea	Eb	Ec	Ed	Ee	Ef	Eg	Eh	Ei	Ej	Ek	El	Em	En	Eo	Ep	Eq	Er	Es	Et	Eu	Ev	Ew	Ex	Ey	Ez
	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ
F	Fa	Fb	Fc	Fd	Fe	Ff	Fg	Fh	Fi	Fj	Fk	Fl	Fm	Fn	Fo	Fp	Fq	Fr	Fs	Ft	Fu	Fv	Fw	Fx	Fy	Fz
	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ
G	Ga	Gb	Gc	Gd	Ge	Gf	Gg	Gh	Gi	Gj	Gk	Gl	Gm	Gn	Go	Gp	Gq	Gr	Gs	Gt	Gu	Gv	Gw	Gx	Gy	Gz
	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ

https://en.wikipedia.org/wiki/Wikipedia:Contents/A%E2%80%93Z_index

UNIVERSITY OF WOLVERHAMPTON

Dynamic and Drop-down menus





UNIVERSITY OF WOLVERHAMPTON

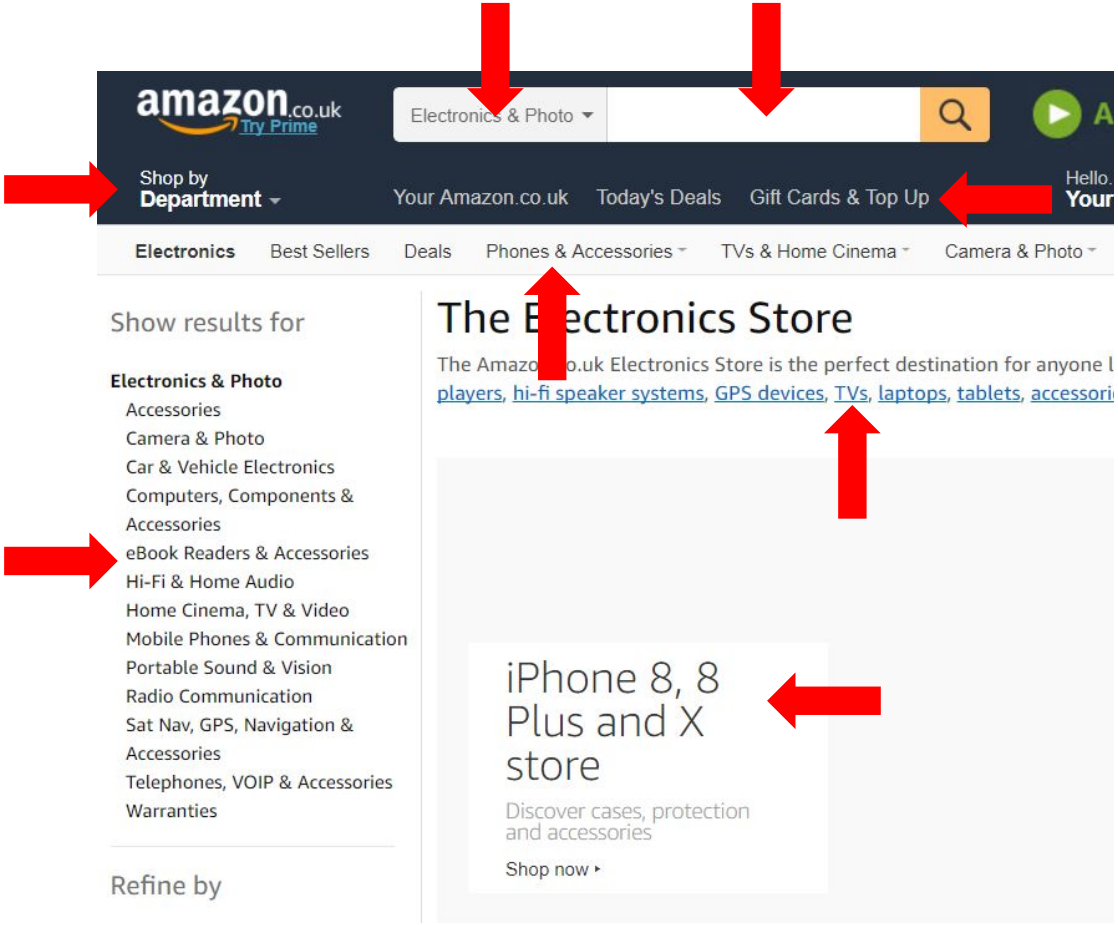
Visualization

UNIVERSITY OF WOLVERHAMPTON

No need to use all of them at once

Multiple options improve choice but also increase complexity and clutter

UNIVERSITY OF WOLVERHAMPTON



UNIVERSITY OF WOLVERHAMPTON

Daraz has actually done a better job

UNIVERSITY OF WOLVERHAMPTON

UNIVERSITY OF WOLVERHAMPTON

I live inside my car leasing website all day Monday to Friday 9am-6pm. I lease the cheapest PCP and contract hire cars in the UK! - I am Ling, accept no substitutes

LINGsCARS.com

Leader of the Pack - Guardian. UK fav car leasing co from Newcastle!

Contract hire cars from Ling Valentine, LINGsCARS is the UK's favourite car leasing website - On 2016 I leased over £85 million in cars! (RRP)

I'M ALIVE IN MY WEBSITE

Menu

- Home
- Cars
- Customers
- About Ling
- Fun stuff
- Free stuff
- Live staff

CARS A-Z

- About Ling
- Mantra
- Dragons' Den
- My location
- Movies
- Youtube
- Ling speaking

Facebook Twitter

MY BEST SELLING CAR LEASING DEALS!

CZECH MATE!

£131/mth including VAT

3 year cheap car leasing

3+35

- Petrol engine
- Manual gearbox
- Flat paint

Drive 10,000 miles per year

(Other mileages available)

MEGA-HATCH!

£167/mth including VAT

18 mth cheap car leasing

3+17

- Petrol engine
- Manual gearbox
- Metallic paint

Drive 10,000 miles per year

(Other mileages available)

GROOVY CAR!

Citroen C4 Cactus

1.2 PureTech 12v (82bhp) Flair Hatchback 5dr 1199cc

RENT NEW £178/mth including VAT

1 year cheap car leasing

3+11

- Petrol engine
- Manual gearbox
- Metallic paint

Drive 10,000 miles per year

(Other mileages available)

SPANISH JUKE!

MADE IN UK!

GREAT IMAGE!

Navigation has evolved

It is not just desktop based anymore

- Small Screens (Mobiles, Tablets)
- Touch Screens
- Gesture Based Control

UNIVERSITY OF WOLVERHAMPTON

UI evolution after small screens

- Remove clutter
- 4-8 items in a navbar
- Prioritize functionality in the start screen
- Keep navigation consistent
- High contrast

UNIVERSITY OF WOLVERHAMPTON

UI evolution after touch screens

- Touch target sizes
- Adequate margins
- Feedback mechanism
- Card layouts

UNIVERSITY OF WOLVERHAMPTON

Gesture Based Control

Gesture based

- Mobile Navigation
- Desktop/ Laptop Navigation
- VR Navigation

UNIVERSITY OF WOLVERHAMPTON

Evolution of Gesture Based Control

- Overlaps with ‘traditional’ touch screen control
- Influenced by Steven Spielberg movie ‘Minority Report’ (2002)
- Credited with influencing gesture control and more modern tech
- [9 touchless technology inspired by Minority Report]

https://www.cnet.com/culture/entertainment/the-minority-report-future-15-years-later-podcast/

Generic Gesture Based Control

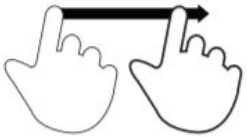
Tap

Briefly touch surface with fingertip

Double tap

Rapidly touch surface twice with fingertip

Drag



Move fingertip over surface without losing contact

Flick

Quickly brush surface with fingertip

TILT

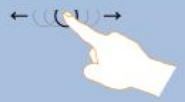
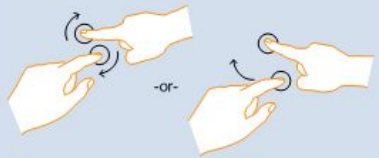
SHAKE

MULTI TOUCH

[Touch Gesture Reference Guide]

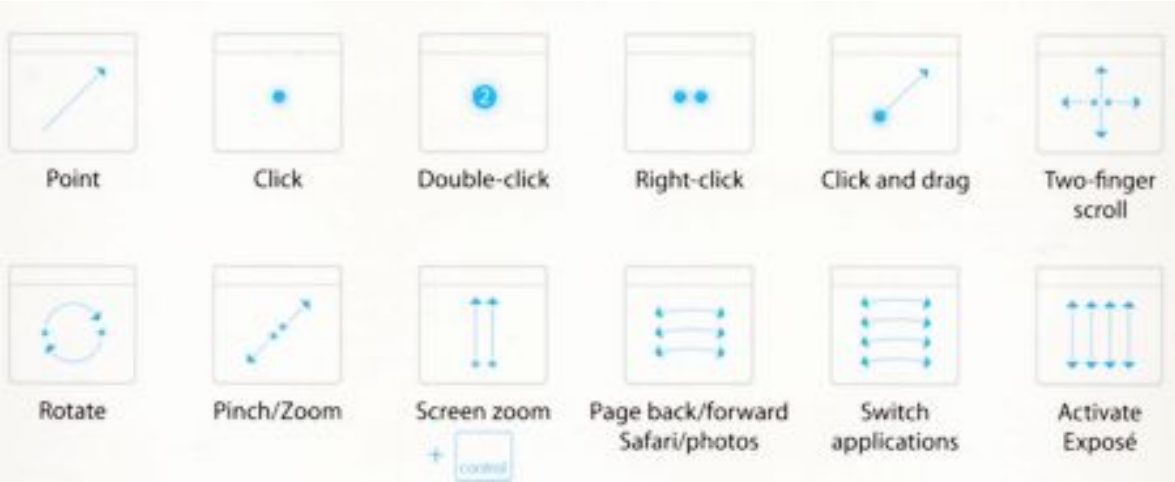
UNIVERSITY OF WOLVERHAMPTON

Gestures in microsoft windows (7 onwards)

GESTURE	WINDOWS USAGE	GESTURE ACTION	ACTION (◯= finger down | ◌= finger up)	Single Contact	Multi Contact
Selection / Drag (left to right with one finger)	Mouse Drag / Selection	Drag one finger left / right		✦	✦
Zoom	Zoom (defaults to CTRL key + Scroll wheel)	Move two fingers apart / toward each other			✦
Rotate	No system default unless handled by Application (using WM_GESTURE API)	Move two fingers in opposing directions -or- Use one finger to pivot around another			✦

UNIVERSITY OF WOLVERHAMPTON

Gestures in Apple Trackpad

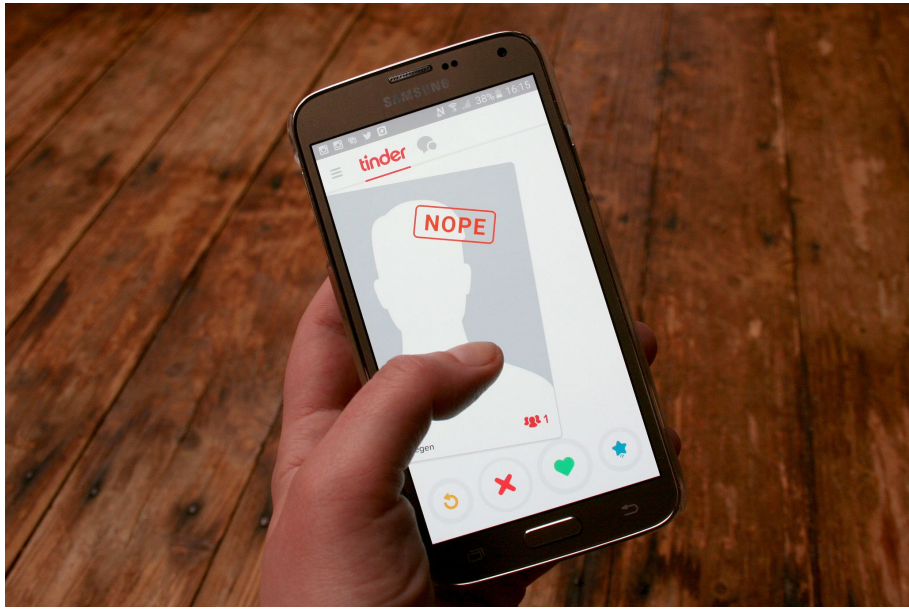


https://www.maciverse.com/magic-trackpad-gestures.html

UNIVERSITY OF WOLVERHAMPTON

Current issues in Gesture Control

- Touch targets are forgotten
- Relying strictly on icons
- Higher error rates
    - Swips can be too quick/ slow or too short/ long



https://haileyjaderyan.com/2016/03/25/10-things-that-will-make-me-swipe-left-on-tinder/

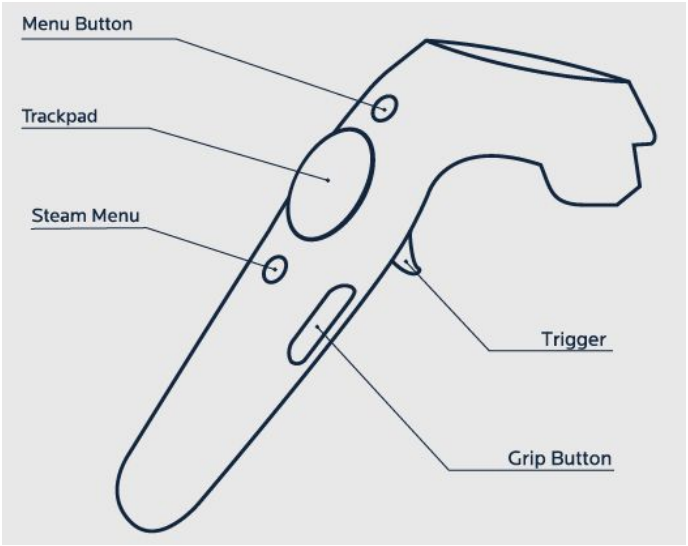
New gesture controllers

HTC Vibe

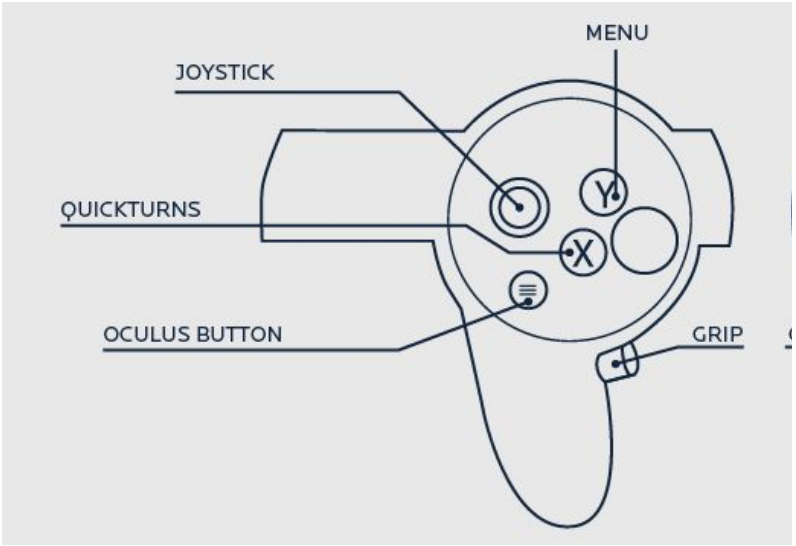
Oculus Rift

UNIVERSITY OF WOLVERHAMPTON

Gesture Controllers



HTC Vibe



Oculus Rift

UNIVERSITY OF WOLVERHAMPTON

Navigation is bound to evolve

Navigation has to be tested

Navigation Evaluation

- Navigation also needs to tested like usability
- There are several ways to evaluate navigation
  - Heuristic Evaluation (already discussed)
  - Stress Testing
  - User Observation
  - Surveys/ Questionnaires
  - Metric Analysis

UNIVERSITY OF WOLVERHAMPTON

Stress Testing Navigation

- Not to be confused with stress testing in load balancing
- During navigation testing, asking a series of questions
- If the questions can’t be answered, the navigation doesn’t ‘work’
- Some generic questions
  - Where am I?
  - What’s here?
  - Where can I go?

UNIVERSITY OF WOLVERHAMPTON

Stress Testing Navigation

- A checklist of questions can be prepared
  - What is “up” 1 level from here?
  - How do I get to the top of the section of the site?
  - How do I get to the homepage of the site?
  - What major section is this page in?
- These questions can be asked at any point in the flow testing

UNIVERSITY OF WOLVERHAMPTON

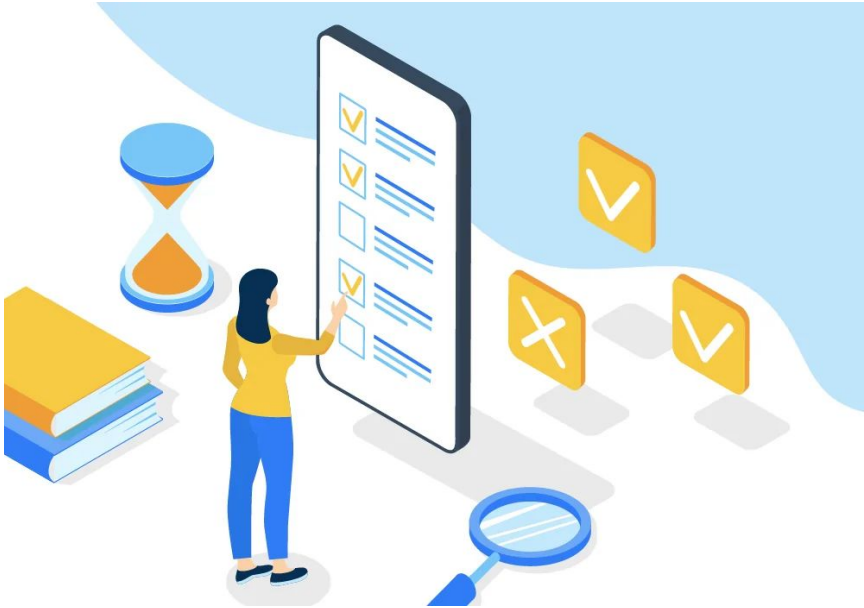
User Observation

- Literally observing users using the software/ hardware and noting their feedback
- Ideally done after a heuristic evaluation
- Sometimes it might also include a walkthrough in the early stages of the design process

https://www.keepitusable.com/blog/5-benefits-of-observing-ux-research-in-person/

Surveys/ Questionnaires

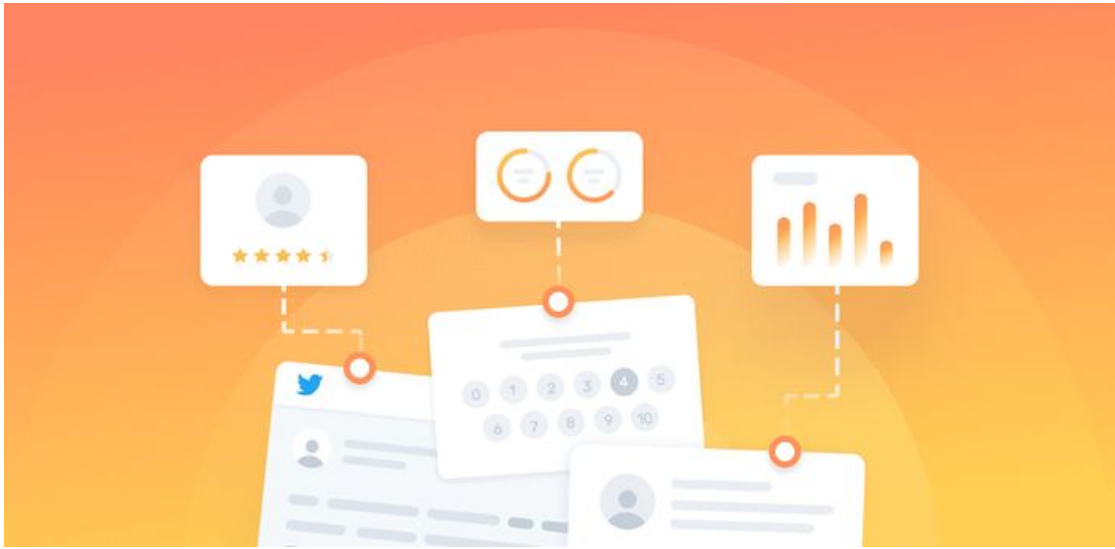
- More ‘traditional’ data collection method
- Poor return rate if not administered remotely (postal/ online)
- Important to make data quantitative rather than qualitative



https://www.surveylegend.com/research/survey-testing/

Metric Analysis

- Page Hits
- Site Hits
- Log file analysis
- Forum posts/ comments



https://monkeylearn.com/blog/data-analysis-examples/

Regardless of evaluation, feedback needs to be reviewed before incorporation

UNIVERSITY OF WOLVERHAMPTON

Any questions?

UNIVERSITY OF WOLVERHAMPTON