

FIT5032 - Internet Applications Development

The Front End, Usability and Accessibility

Prepared by - Jian Liew

Last Updated - 30th May 2018

Monash University (Caulfield Campus)



Outline

- Front End & Back End
- The Front End
- Google Philosophy
- Foundations of a Delightful Web
- What is responsiveness?
- Achieving responsiveness
- Responsive Frameworks (Bootstrap, Foundation and others)
- WAI-ARIA
- Image License

There is actually an entire unit dedicated to the concepts of usability.

FIT5152 - User Interface Design & Usability

What we attempt to cover here is the basics on how usability and accessibility matters for the front end web development.

We will teach you the important tools, that is needed to achieve it in terms of web development.

Front End & Back End

Two terms are often used in the web industry

- Front End
- Back End

Front end is

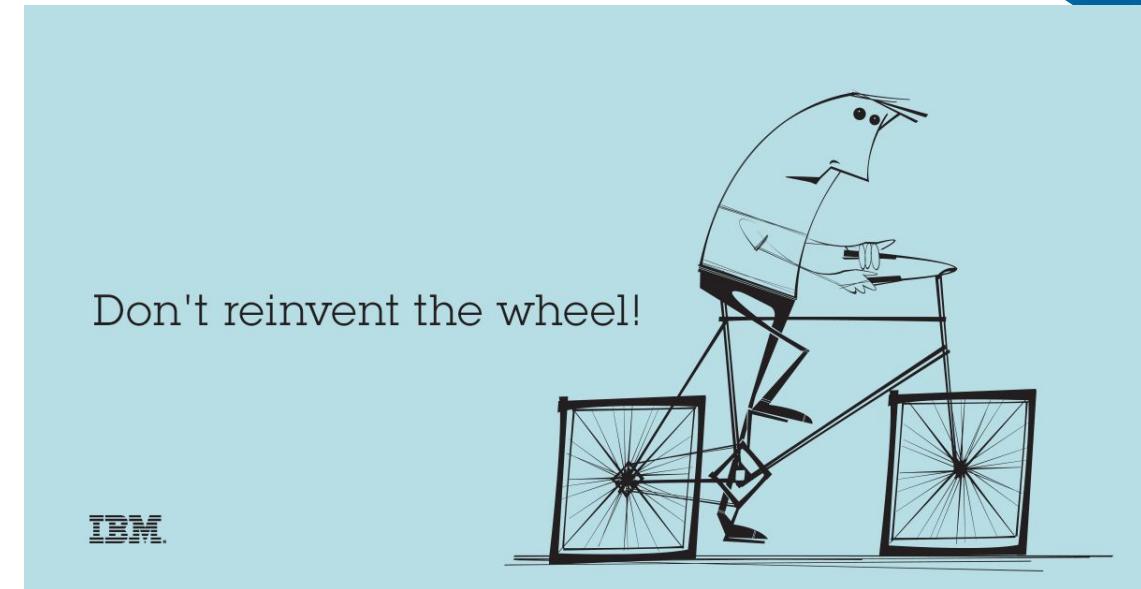
- often referred to as the client side
- sometimes considered to be web-design.
- everything involved with what the user sees, this
- includes HTML and CSS.

Back-end is often referred to as

- server-side.
- Most large-scale websites use server-side code to dynamically display different data.
- This data is often from a database.

Amount of programming needed

- The amount of programming needed for this subject is actually **considerably smaller in comparison to other subjects.**
- In this subject, we will be using tools which are ready made for us to simplify the development process, but it is still important for us to understand how to properly utilise the tools.
- In other words, we will **try “not reinvent the wheel”.**
- However, at the end of the day everything depends on the context. This subject is designed so that we try to avoid “reinventing the wheel”. In real life, however often times there are times when reinventing the wheel is needed.
- That being said, it is important to understand the basics of what we will be using.



Slides

Due to the nature of this materials, it is highly recommended to use the links provided instead.

The PDF version of these slides will not have certain animations.

There links that will be used are

1. <https://99designs.com.au/blog/trends/web-design-trends-2018/> (Trends of 2018 Web Design)
2. <https://www.youtube.com/watch?v=q9Qff0b-lHk> (Explanation of WAI-ARIA)
3. <https://www.darkhorseanalytics.com/portfolio/2016/1/7/data-looks-better-naked-clear-off-the-table> (Presenting Tables)

The Front End

(Design Principles)

“Good design is actually a lot harder to notice than poor design, in part because good design fit our needs so well the design is invisible”

- Donald A. Norman, The Design of Everyday Things

The 6 Principles Of Design (Donald Norman)

- These principles carry over to the design of web as well.



Visibility

- Users need to know what all the options are, and know straight away how to access them.
- For example, on Moodle, the minute you login, it is immediately obvious what the possible options are.

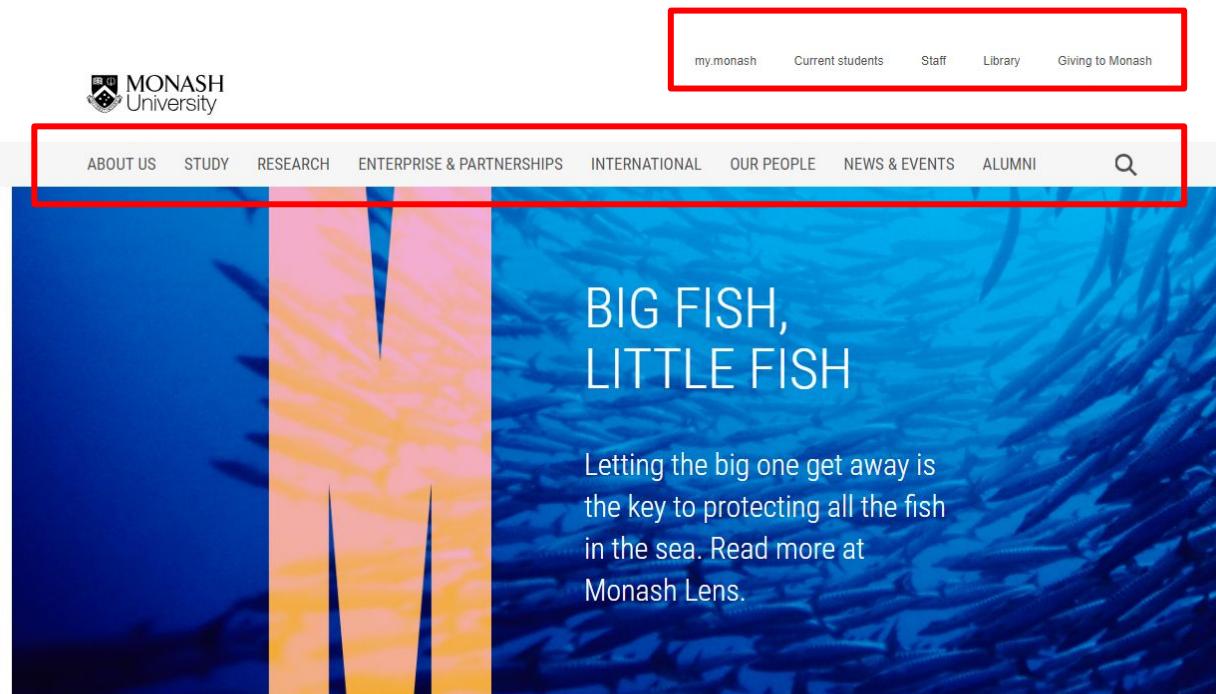
The screenshot shows a Moodle dashboard for Monash University. At the top, there's a navigation bar with links like Home, BTBL @ Monash, Library, Report a Moodle Fault, SETU - Unit Evaluation, All Unit Guides, Your Responsibilities, Need Help?, and a user profile for Jian Liew. Below the navigation is a 'Dashboard' section. On the left, a 'Navigation' sidebar has a single item: 'Dashboard'. The main content area starts with a 'COPRIGHT WARNING' box about the Commonwealth of Australia Copyright Act 1968. To the right of this is a 'CALENDAR' for May 2018, showing dates from 1 to 31. Below these are three course units listed in a box with a red border:

- FIT5136 Software engineering S1 2018**: Includes a note: "You have quizzes that are due".
- FIT9134 Computer architecture and operating systems S1 2018**
- FIT9131 Programming foundations in Java S1 2018**

To the right of the course units is a sidebar with a message about accessing Panopto video/livestreams and another message about Turnitin errors.

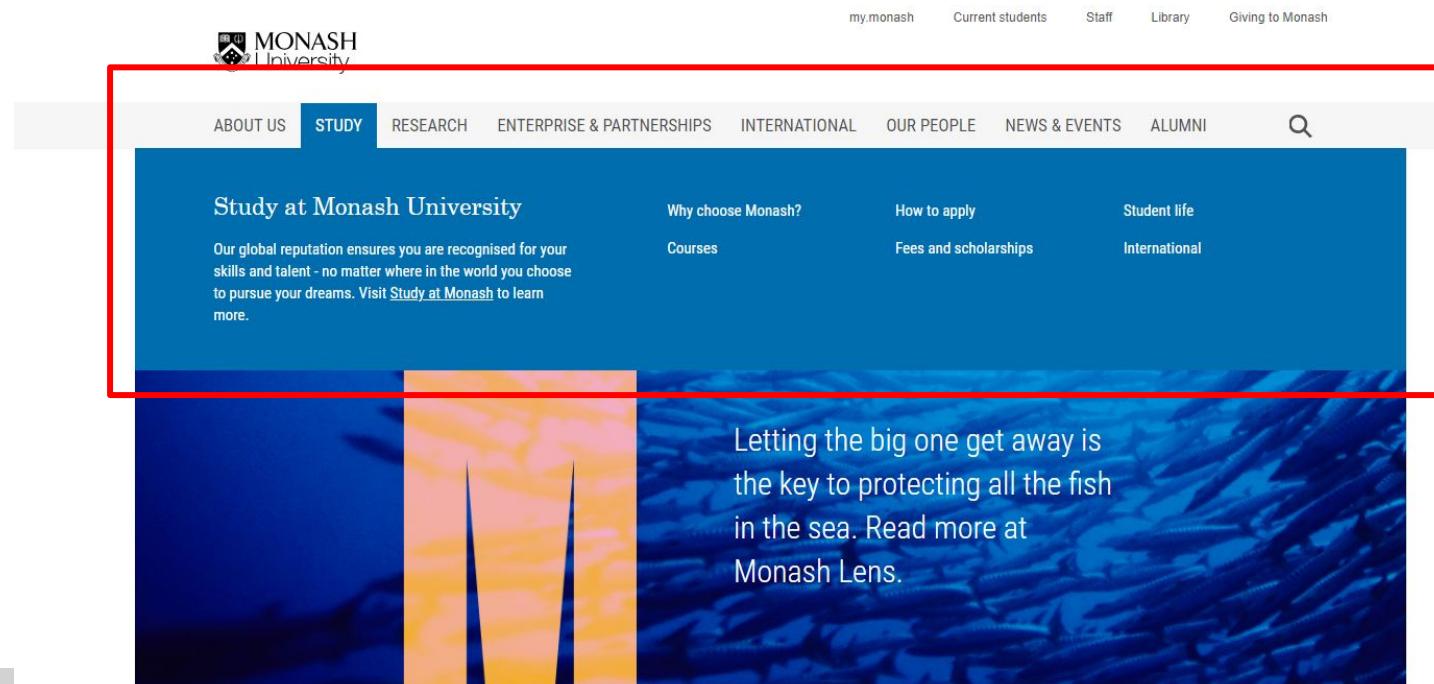
Visibility continued..

- Another example would be the Monash home page, upon arrival it is immediately obvious that the user can use the navigation menu to navigate around.



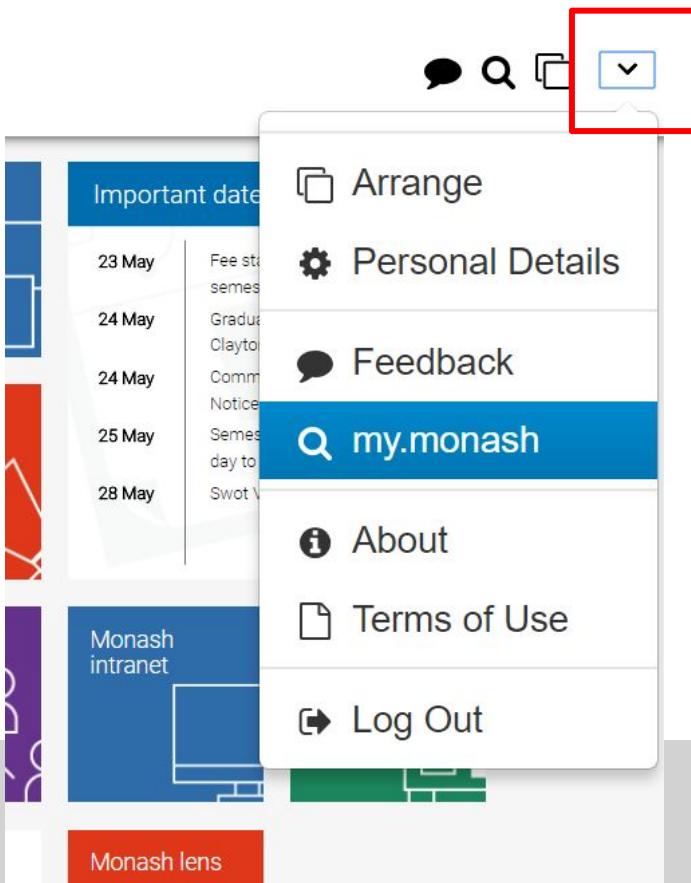
Feedback

- Feedback is when a system provides users with information about what has been completed or accomplished.
- One example, is that on the Monash Home page, when the user uses the mouse to hover over the “Study” option, a drop down menu appears giving feedback to the users’ action.



Affordance

- A situation where an object's sensory characteristics intuitively imply its functionality and use.
- When a control behaves as its appearance suggests.



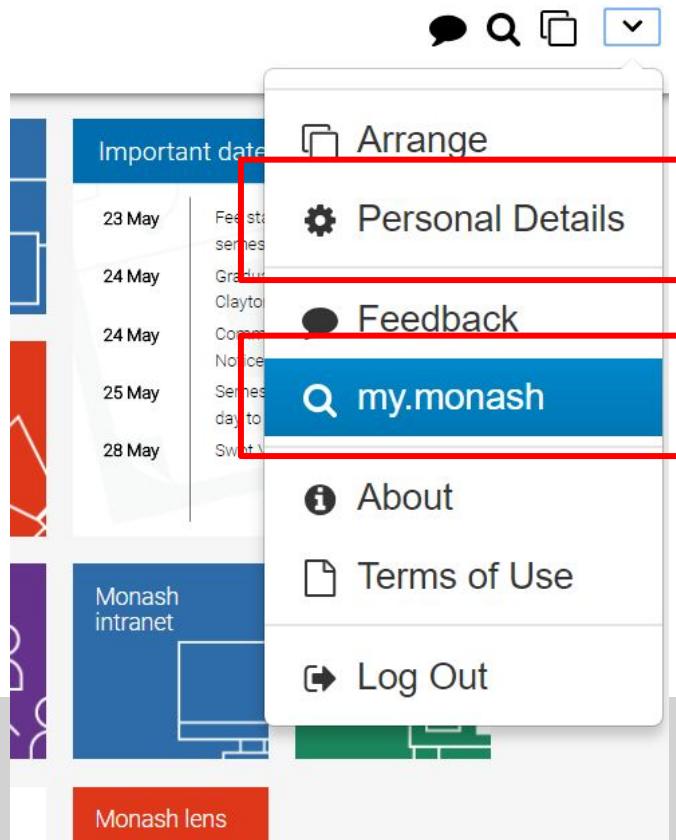
An example of this would be the My Monash portal.

In this example, notice that the “caret down” icon invites the user to click on it implying that there will be more contents.

A more obvious example, would be the “button” which looks like a button is a good example of affordance as it invites the user to click on it.

Mapping

Mapping is the relationship between control and effect. The idea is that with good design, the controls to something will closely resemble what they affect.



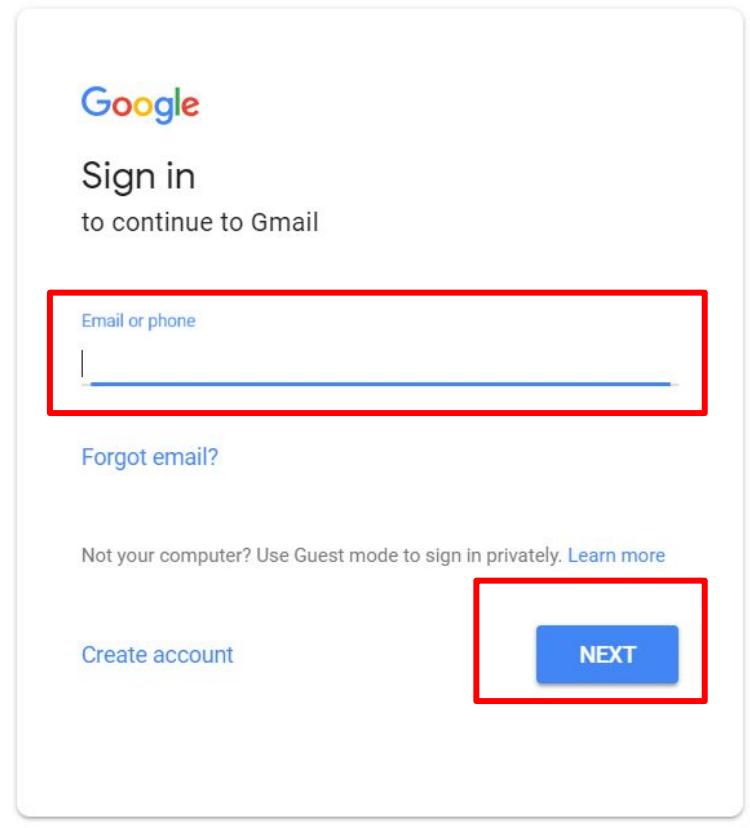
Once again, let's look at the My Monash portal.

Here, the usage of icons creates the mapping. For example, notice that the “cogwheels” icon will lead to the “Personal Details or Settings”.

A good example here is the usage of the “magnifying glass” icon which indicates the ability to search.

Constraints

Constraints is about limiting the range of interaction possibilities for the user to simplify the interface and guide the user to the appropriate next action.



A good example of this is the Gmail sign in.

Notice that here, I only have a few possible options.

In a way, I am limited to selecting those options, thus it not only simplifies the interface, it will also guide me to the next action.

Consistency

Consistency refers to having similar operations and similar elements for achieving similar tasks. By leveraging consistent elements throughout your entire experience, you make your experience far easier to use.



A good example of this is the My Monash portal.

Notice that, all of the “tile”s elements are of the same size as they represent similar operations and similar elements.



Focus on the user and all else will follow.

One of the ten philosophies of Google.

Foundations of a Delightful Web

Google's opinionated reference for building amazing web experiences.

The core foundations are:

- Fast - It [responds quickly](#) to user interactions with silky smooth animations and no janky scrolling.
- Integrated - The user doesn't have to reach through the browser, it uses the full capabilities of the device to [create an experience true to the device](#).
- Reliable - [Loads instantly and reliably](#), never slowing the downasaur, even in uncertain network conditions.
- Engaging - [Keeps the user coming back](#) to the app with beautifully designed experiences that look and feel natural.

More information can be found [here](#).

Fast

Users do not expect janky scrolling or slow load performance.

Making your site fast is a process that starts with an understanding how RAIL effects the performance of your site and how to use that to measure and improve performance.

Critical Rendering Path - Delivering a fast web experience requires a lot of work by browsers.

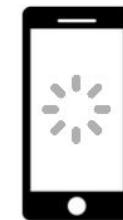
Optimising for performance is all about understanding what happens in these intermediate steps between receiving HTML, CSS and JavaScript bytes and the required processing to turn them into rendered pixels.



RAIL

Response, Animation, Idle and Load

RAIL is a **user-centric performance model** that breaks down the user's experience into key actions.



Response

Animation

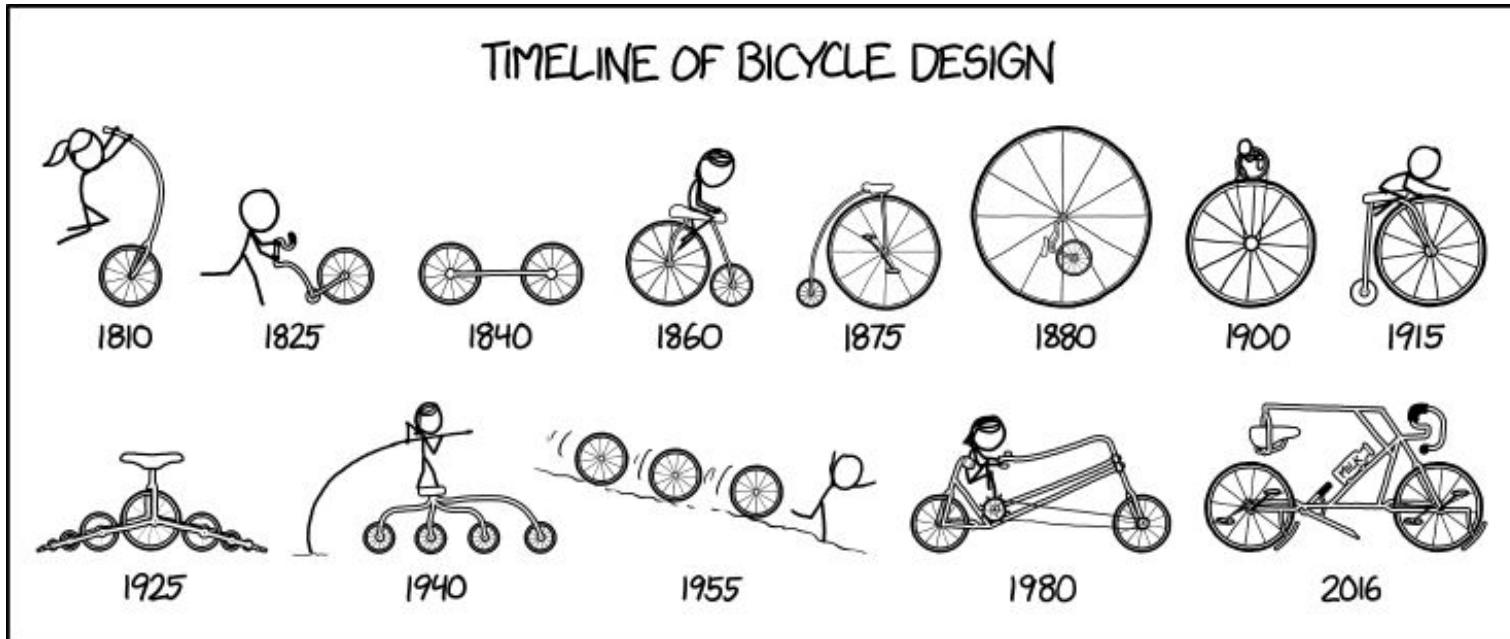
Idle

Load



MONASH
University

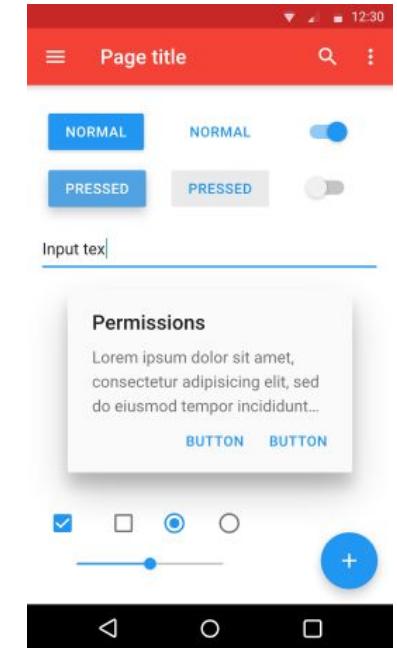
Relevant XKCD



This XKCD comic strip is a mockery of how the design of the bicycle evolves over time.

It can be seen that the perception of what a good design is might evolve and change over time.

This is evident when you browse on the internet a lot and you notice that some sites have not adapted over time.



Material Design (Google)

Material Design is a design language developed by Google in 2014.

Material design uses

- tactile surfaces
- bold graphic design
- fluid motion

In order to create beautiful, intuitive experiences.

Surface and shadow establish a physical structure to explain what can be touched and what can be moved.

As of 2015, most of Google's application which includes Google Drive, Docs, Sheets, Slides and Inbox have incorporated it as well.

More information can be found [here](#).

Metro Design

- Metro (officially known as Microsoft design language or MDL) is a design language created by Microsoft.
- This design language is focused on typography and simplified icons, absence of clutter, increased content to ratio ("content before chrome"), and basic geometric shapes
- In September 2012, "Microsoft design language" was adopted as the official name for the design style.
- Monash has something very similar to a "metro" like design.





Fluent Design (Microsoft)

- The Fluent Design System is a set of innovative UWP features combined with best practices for creating apps that perform beautifully.
- **Adaptive** - Natural on each device
- **Fluent experiences listen and adapt**. They feel natural on the device people use, from tablets to laptops, from PCs to television. They travel from the office to the living room to virtual worlds.
- **Empathetic** - Intuitive and powerful
- **Fluent experiences adjust to behavior and intent** - they understand and anticipate what's needed.
- **Beautiful** - Engaging and Immersive

Flat Design

- Is a style of interface design emphasizing minimum use of stylistic elements that give the illusion of three dimensions (such as the use of drop shadows, gradients or textures)
- It is focused on a minimalist use of simple elements, typography and flat colors.
- Flat design is great for users who are highly attuned to digital interaction, while material has more of a reactive response to a user's action.

Web Design Trends in 2018

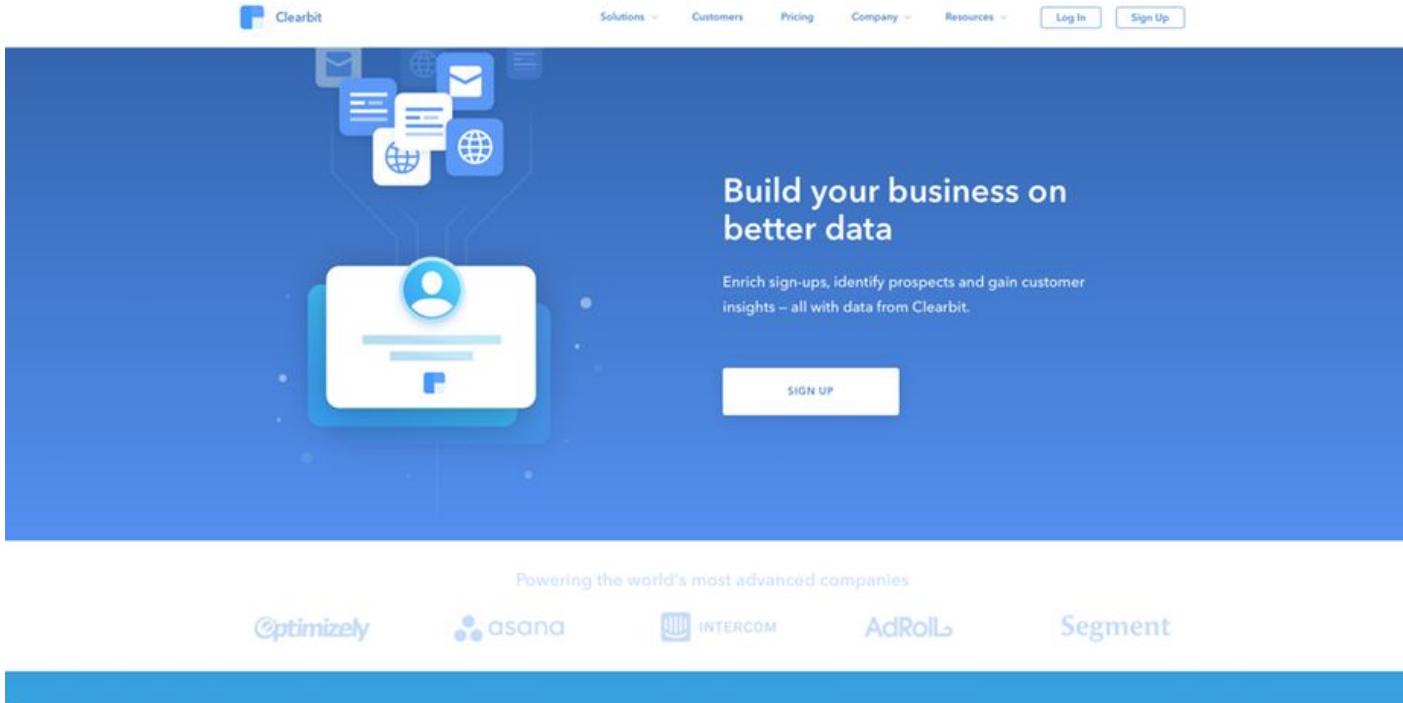
Let's take a look at some notable web design trends coming poised to take over in 2018.

Here are some design trends for 2018 (99designs.com.au)

- Drop shadows & depth
- Color schemes
- Particle backgrounds
- Mobile first
- Custom illustrations
- Big, bold typography
- Grid layouts
- Integrated animations
- Dynamic gradients

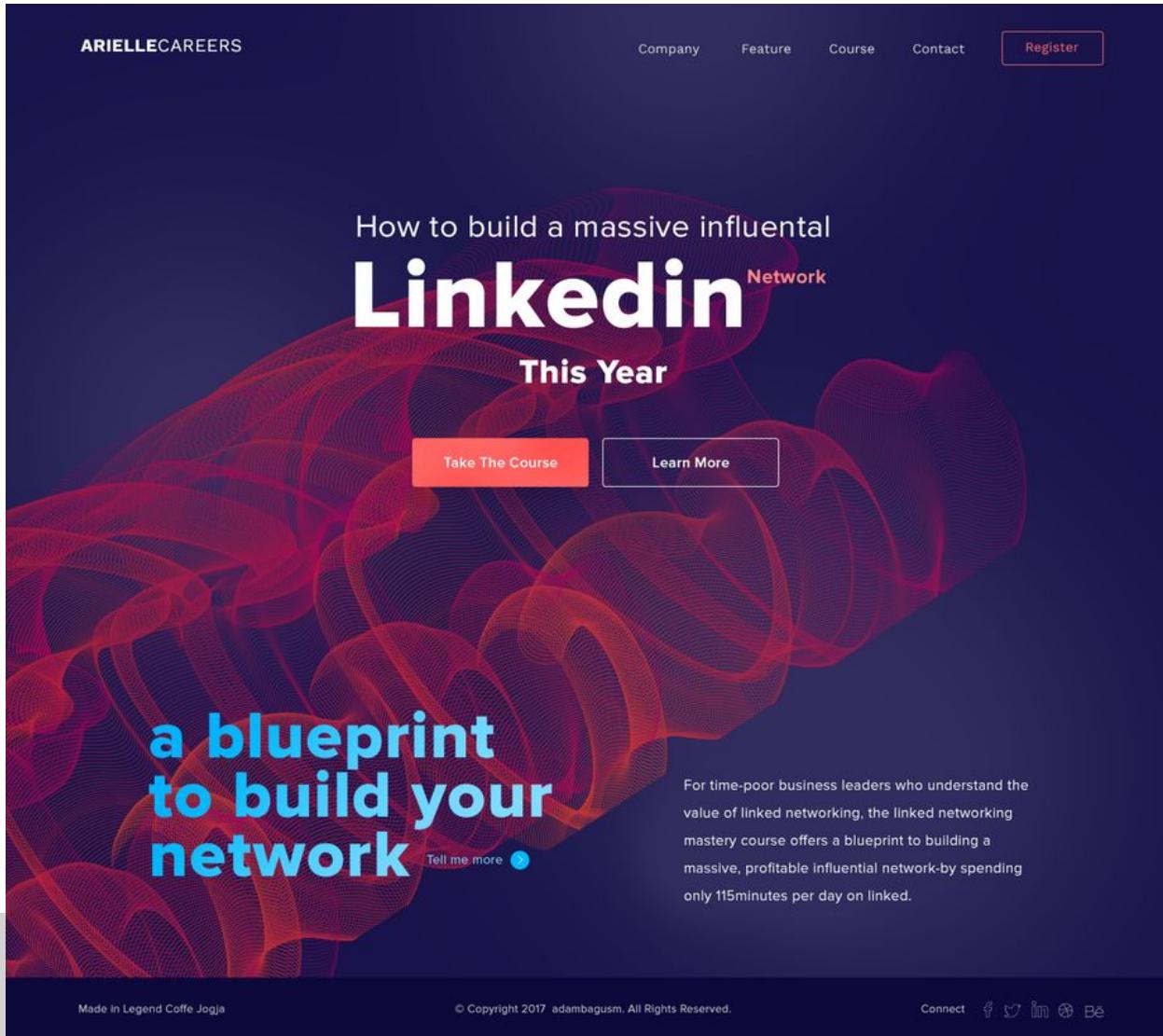
Please refer to <https://99designs.com.au/blog/trends/web-design-trends-2018/>

Drop shadows and depth



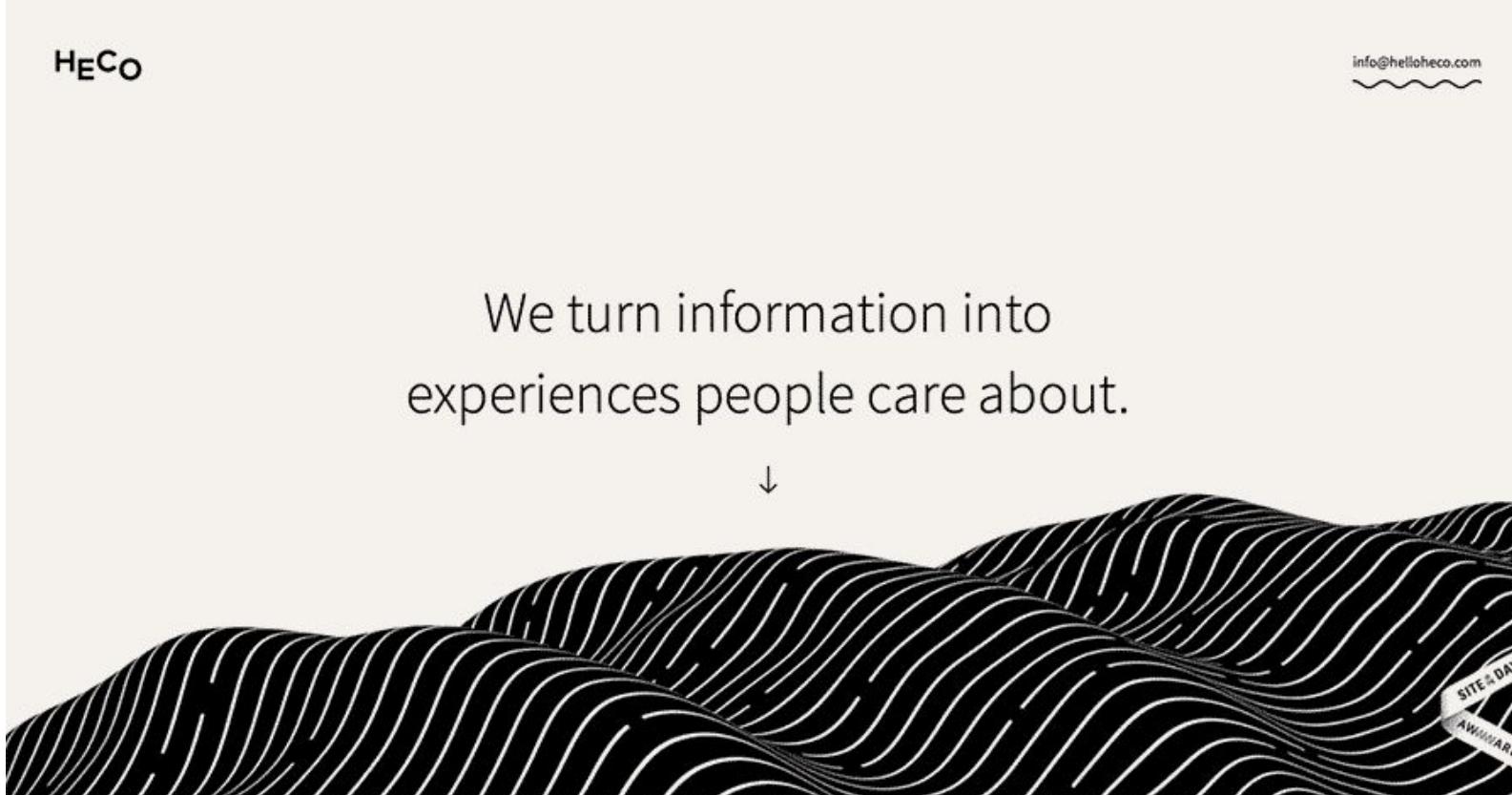
Playing with shadows more than ever to create depth and the illusion of a world beyond the screen.

Vibrant, saturated color schemes



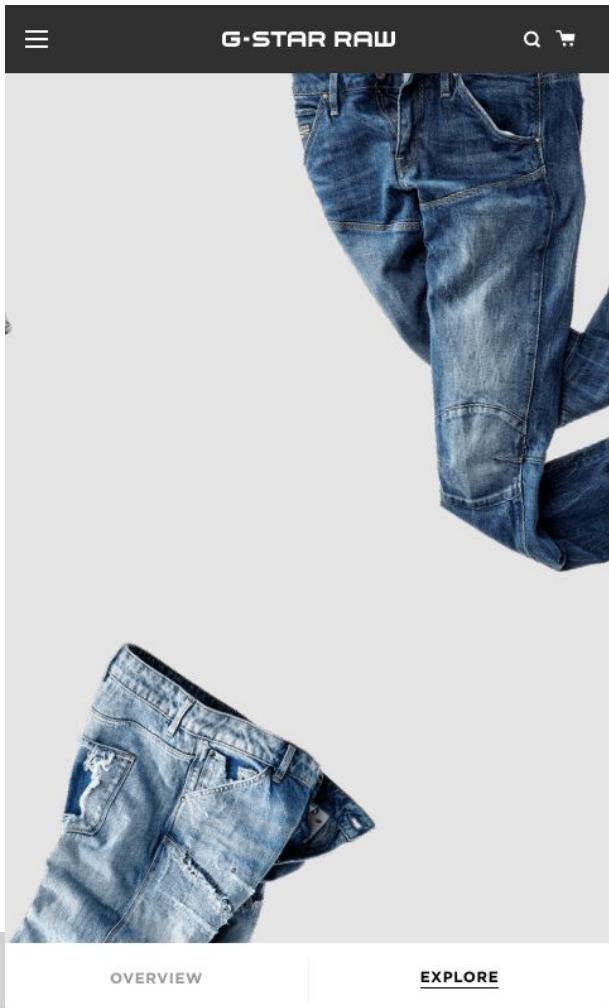
Supersaturation and vibrant shades combined with headers that are no longer just horizontal but reimagined with slashes and hard angles.

Particle backgrounds



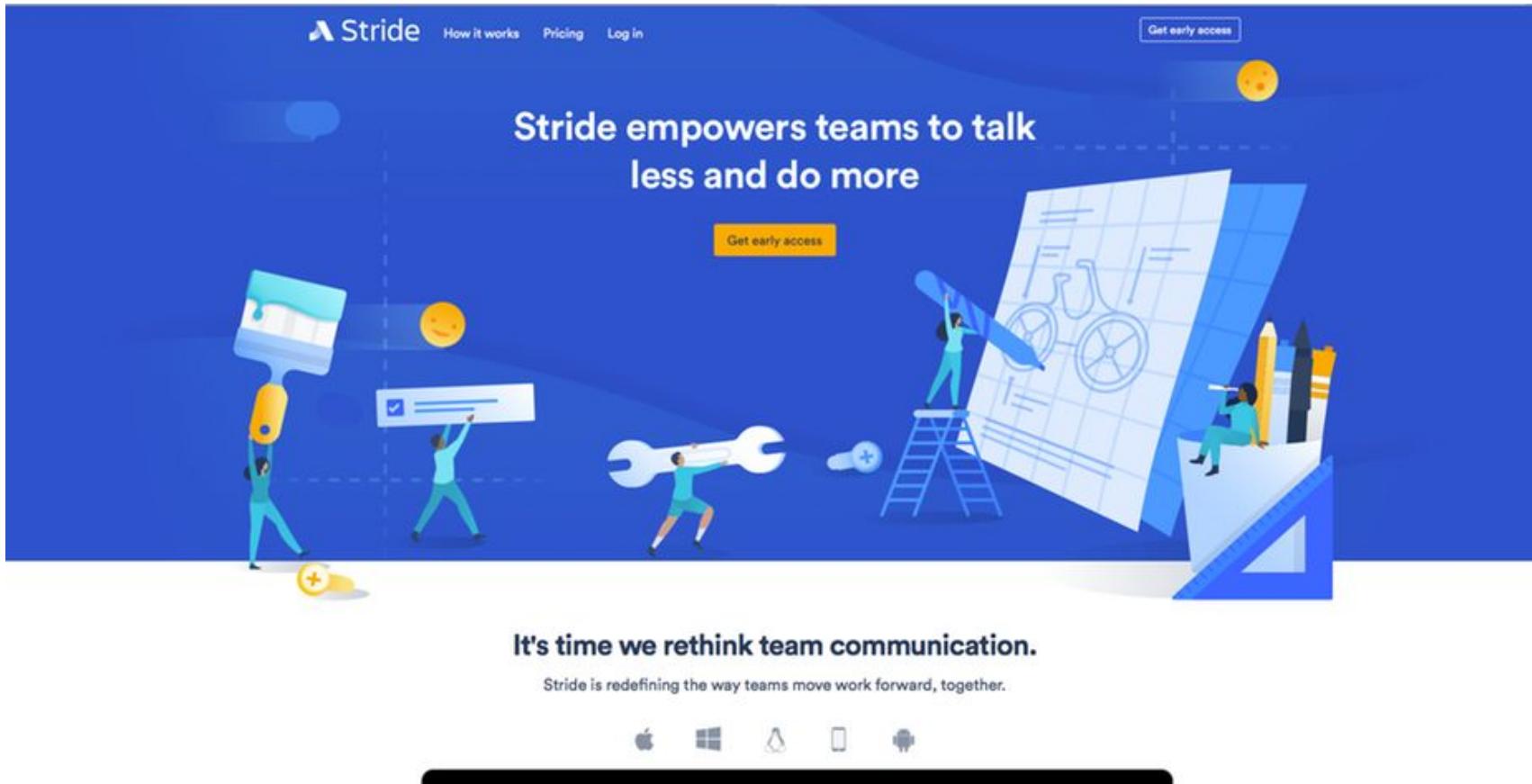
Particle backgrounds immediately attract the user's attention, so brands can create a memorable impression of themselves in only a few seconds.

Mobile first



Mobile browsing has now officially surpassed desktop. Almost everyone these days shops and orders on their smartphone.

Custom illustrations



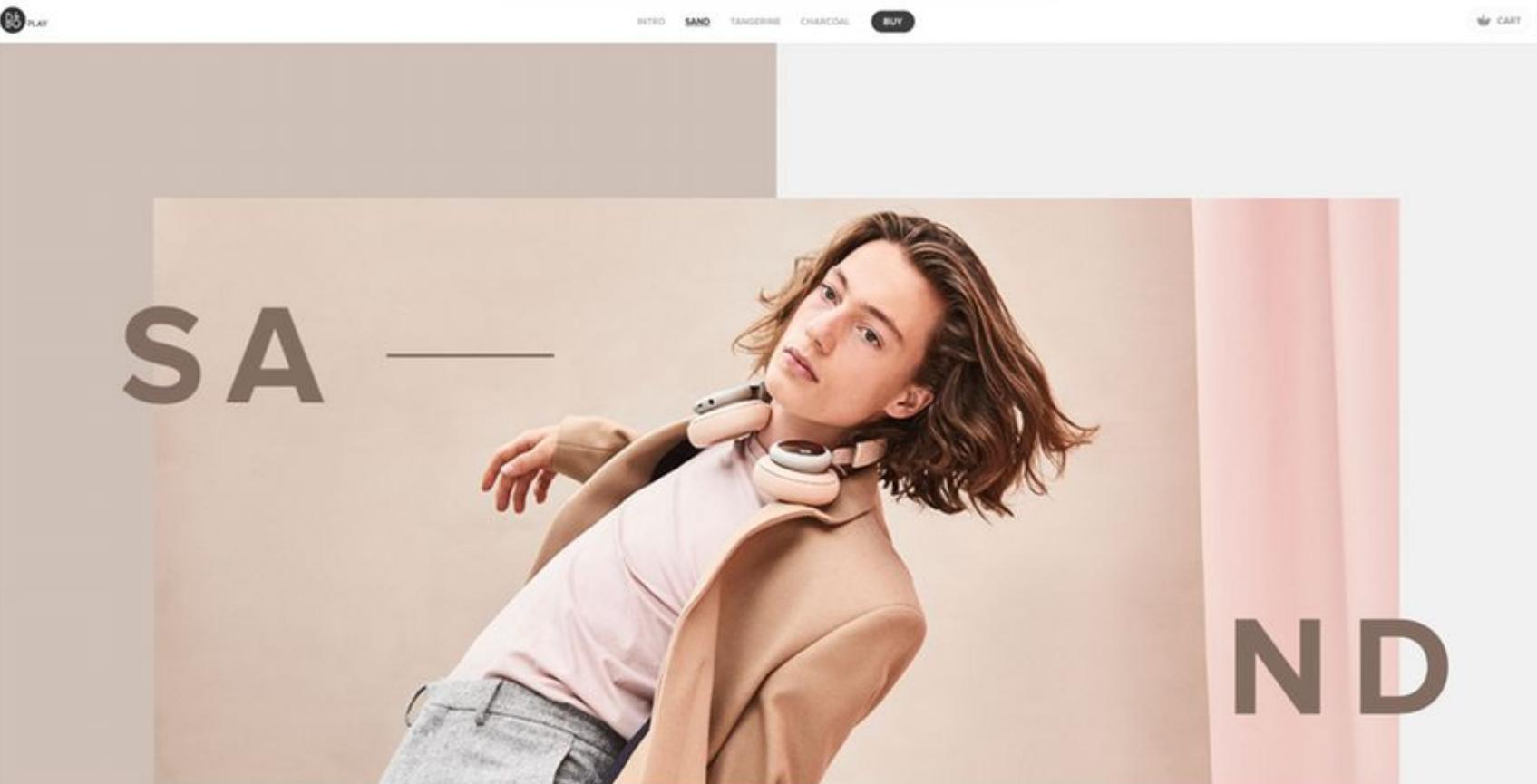
Illustrations are great, versatile media for creating images that are playful, friendly and add an element of fun to a site.

Big, bold typography



The trend of large letters, contrasting sans serif and serif headings help create dynamic parallels, improve UX and best of all, keep the visitor reading your website.

Asymmetry and broken grid layouts



The appeal of the asymmetrical layout is that it is unique, distinctive and sometimes experimental.

Integrated animations

The screenshot shows the INTURN website. At the top, there's a navigation bar with links: FEATURES, ABOUT, RESOURCES, CAREERS, BLOG, LOGIN, and a red 'GET STARTED' button. Below the navigation, there's a large, light blue background area containing two illustrations. On the left, a woman in a pink dress stands next to a blue shelving unit. In front of her is a large, open red box filled with smaller boxes, each marked with a question mark. To the right, a man in a blue shirt and dark pants carries a large stack of three red boxes on his back. Above the man, text reads: "Buying and selling excess inventory can be hard." The overall design is clean and modern.

As browser technology advances, more websites are moving from static images and finding new ways, like animations, to engage users in their communication approach

Dynamic gradients



Over the last few years, flat design has been a much preferred web design trend over dimensional colors, but gradients are making a big comeback in 2018.

Presenting Tables

Remove
to improve
the **data tables** edition

[https://www.darkhorseanalytics.com/portfolio/2016/1/7/
data-looks-better-naked-clear-off-the-table](https://www.darkhorseanalytics.com/portfolio/2016/1/7/data-looks-better-naked-clear-off-the-table)

Food for thought

What kind of computer keyboard do you think people who are legally blind or have vision impairment use?



An example of a braille keyboard.

Normally users who are legally blind or have vision impairment can use the computer keyboard without major issues.

The keyboard is in actual fact, the same with what we use. (QWERTY layout)

WAI-ARIA

Web Accessibility Initiative - Accessible Rich Internet Applications

- ARIA is a set of attributes that define ways to make Web content and Web applications more accessible to people **with disabilities**.
- According to Vision Australia (2016), it is estimated that 384,000 people in Australia are legally blind or have low vision.
- ARIA is supported in the latest versions of all major browsers, including Firefox, Safari, Opera, Chrome and Internet Explorer.
- We can use ARIA by adding it to our HTML.
- In combination with HTML5 semantic elements, ARIA elements will provide more accessibility to people with disabilities.
- In short, WAI-ARIA is a technology that **adds in further semantics** that **browsers and assistive technologies can recognise** and use to let users know what is going on.



Introducing

ARIA

Please refer to - <https://www.youtube.com/watch?v=g9Qff0b-lHk>

Examples of ARIA compliant sites

The screenshot shows the myGov login page. At the top, there's a dark green header with the Australian Government logo and the myGov logo. Below the header, there's a form for entering a username or email and a password. There are links for 'Forgot username' and 'Forgot password'. A 'Sign in' button is at the bottom of the form, followed by a horizontal line and the text 'or'. Below this, there's a 'Create an account' button. On the right side of the page, there's a section titled 'What is myGov?' which describes it as a simple and secure way to access government online services. It lists several services such as Australian JobSearch, Australian Taxation Office, Centrelink, Child Support, Department of Veterans' Affairs, Medicare, My Aged Care, My Health Record, National Disability Insurance Scheme, and Victorian Housing Register Application.

The screenshot shows the australia.gov.au homepage. At the top, there's a dark blue header with the Australian Government logo and the 'australia.gov.au' domain name. There's a search bar with a magnifying glass icon. Below the header, there are navigation links for Home, Information and Services, About Government, News and Social Media, About Australia, and myGov. The main content area has a teal background with the text 'Helping you find government information and services'. Below this, there are several sections with icons and titles: 'Benefits and Payments' (with a hand icon), 'Business and Industry' (with a gear icon), 'Culture and Arts' (with a book icon), 'Education and Training' (with a graduation cap icon), 'Environment' (with a leaf icon), 'Family and' (with a family icon), 'Health' (with a heart icon), and 'Immigration and Visas' (with a passport icon).

www.mygov.com.au

Do you think My Monash is an ARIA compliant site?

Responsive Web Design

- The use of mobile devices to surf the web is astronomical, but unfortunately much of the web isn't optimized for those mobile devices.
- Mobile devices are often constrained by display size and require a different approach to how content is laid out on the screen.
- Responsive web design, originally defined by Ethan Marcotte in A List Apart, **responds to the needs of the users and the devices they're using.**
- Companies can choose make a completely different website (.mobi) just for mobile users. However these days, it is more common to have 1 website that could support various mobile browsers with their lower display sizes. There are benefits and drawbacks to both approaches.
- Responsive Web Design (RWD) is a Web development concept **focusing on making sites look and behave optimally on all personal computing devices, from desktop to mobile.**

iPad Pro ▾ 1024 x 1366 47% ▾ Online ▾

MONASH University

Notices

Explore your learning and training opportunities with myDevelopment

Lens: your window into the world of Monash
Compelling story-telling and expert commentary framed by current affairs

In other news

Favourites & subscriptions

Add your favourite links
Did you know you can now add up to four favourite links? Add now and access your most used links even faster!

OHS

Monash intranet

Staff directory

Timetabling

Tools

Campus life

my.monash tile personalisation

Maps & locations

M-Safe

Shuttle bus

Travel & parking

Monash lens

my.monash blog

Respect. Now. Always.

How to personalise your tiles in my.monash

47% ▾ Online ▾

iPhone 6/7/... ▾ 414 x 736 88% ▾ Online ▾

MONASH University

Notices

Explore your learning and training opportunities with myDevelopment

Lens: your window into the world of Monash
Compelling story-telling and expert commentary framed by current affairs

In other news

Favourites & subscriptions

Add your favourite links
Did you know you can now add up to four favourite links? Add now and access your most used links even faster!

Email

Calendar

Library

Moodle

ESS

Research

Teaching & learning

My Monash as seen on the iPad Pro

My Monash as seen on the iPhone 7

Bootstrap

Bootstrap is an open source toolkit for developing with HTML, CSS and JS.

With Bootstrap, we are able to build **responsive, mobile-first projects on the web.**



In the labs.....

1. You will get to play around with Bootstrap.
2. You will see how Bootstrap simplifies development by making it easier to create responsive UIs.
3. You will also learn how to use the developer tools, so that you can understand how various websites look like on various resolutions.

Summary

- The Front End is normally of very subjective nature. It is very easy for someone to say when something looks out of place or not so "beautiful".
- However, there is actually both qualitative and quantitative methods which can be used to determine this. (The other subject would explain this further)
- What we aim to teach you is tools that you will use to achieve certain features. (This is mainly the responsive web design using Bootstrap and how to use web developer tools)
- It is also important to understand the role WAI-ARIA markups.