College Development Network | Leading Creating Sharing

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data-driven decision making

Marketing and Communications Conference

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analytical skills.co.uk

who are we?

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More than 20 years of experience providing UK organisations (public, private and third sector) with marketing and technology consultancy advice and support. Expertise across Marketing Strategy and Management, Customer Relationship Management and E-Marketing. Passionate about Data Driven Decision-Making.

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Over 30 years of experience as a digital business adviser, supporting SMEs, third sector organisations and corporates with strategic decision-making, innovation and investment / fund raising. Developer of a data analytics-driven programme to run 'behavioural science' experiments on digital channels and support growth and conversion targets.

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a better question...

why are we here?

agenda

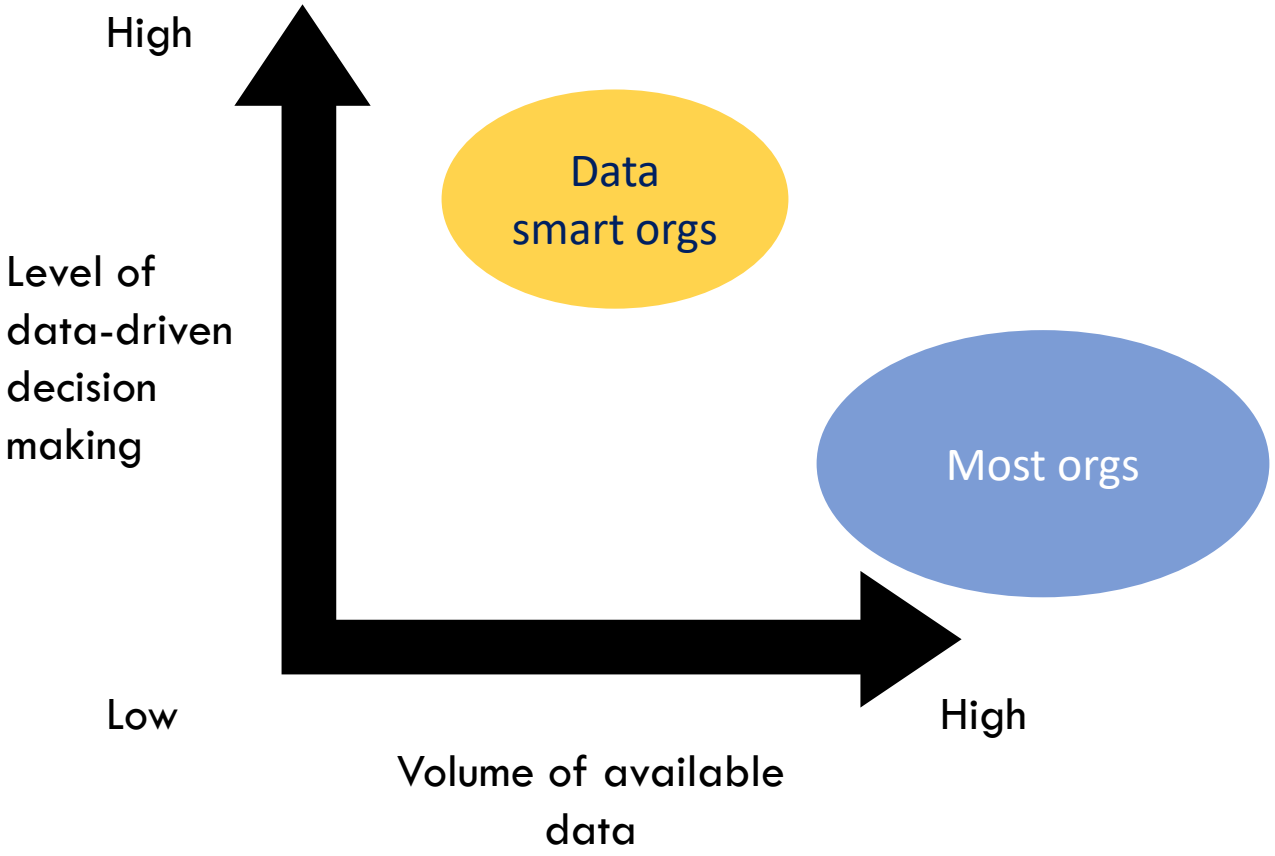
- the data paradox
- the data priority
- data-driven decision making

the data paradox

- there is a data proliferation - much of it is digital
- our digital data includes:
  - networked databases (CRM, Student application dbases etc)
  - local databases, spreadsheets etc. (GDPR has helped here)
  - ‘clickstream’ data (Google analytics, Facebook)
- many of us regularly use these resources in our ‘day-to-day’
- few use these resources to support key decision making

when I think about how we use data, I think of this...

our hypotheses



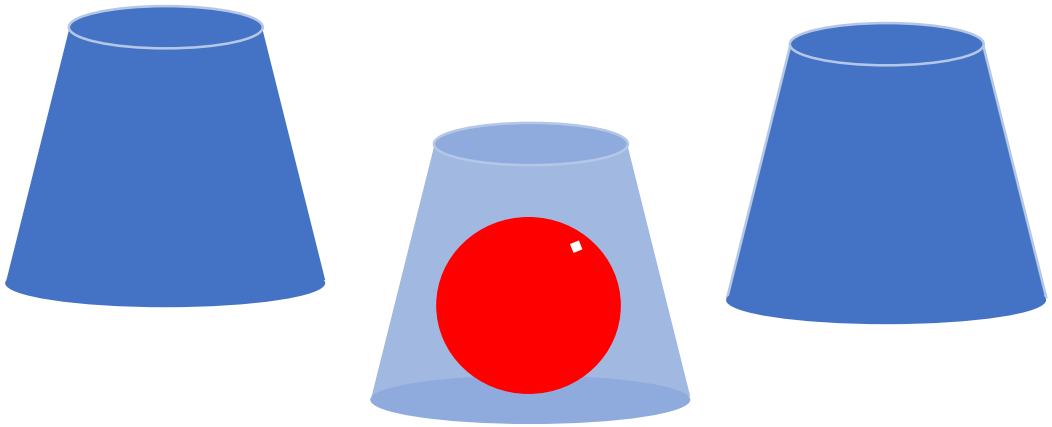
- H1 - we don't make smart data driven decisions
- H2 - we don't generate enough useful insights
- H3 - we don't have the right approach to data

the priority for every organisation...

the data priority

Every organisation must employ a **data-driven approach** to support their most important decisions

Data-driven smart decision making



Stop guessing!

stop guessing: data vs. gut

Human parole boards do much worse than simple formulas at determining which prisoners should be let back on the streets.

Highly trained pathologists don't do as good a job as image analysis software at diagnosing breast cancer.

Purchasing professionals do worse than a straightforward algorithm predicting which suppliers will perform well.

McAfee (2013)

stop guessing

- what are the important decisions you make?
- which of your decisions could be better informed by data?
- what questions would you ask of this data?

we might do more if not for...

- there is so much data, where do you start, how do you focus?
- it doesn't provide much value so we don't value it much
- closely related to 'we've always done it this way'
- we don't have skills, I don't know statistics or anyone that does
- i don't feel confident in making data decisions
- it's not my job. In fact, it's not *anyone's* job
- the main decision-makers don't really understand data

or your organisation may have these…

Hippos – highest paid person(s) opinions

"Once the highest paid person articulates their opinion, it's difficult, without data, for organizations to go against that opinion. The HiPPO will be weighted more than any other voice involved in the decision-making process." *(Forbes, 2017)*

data driven decision-making

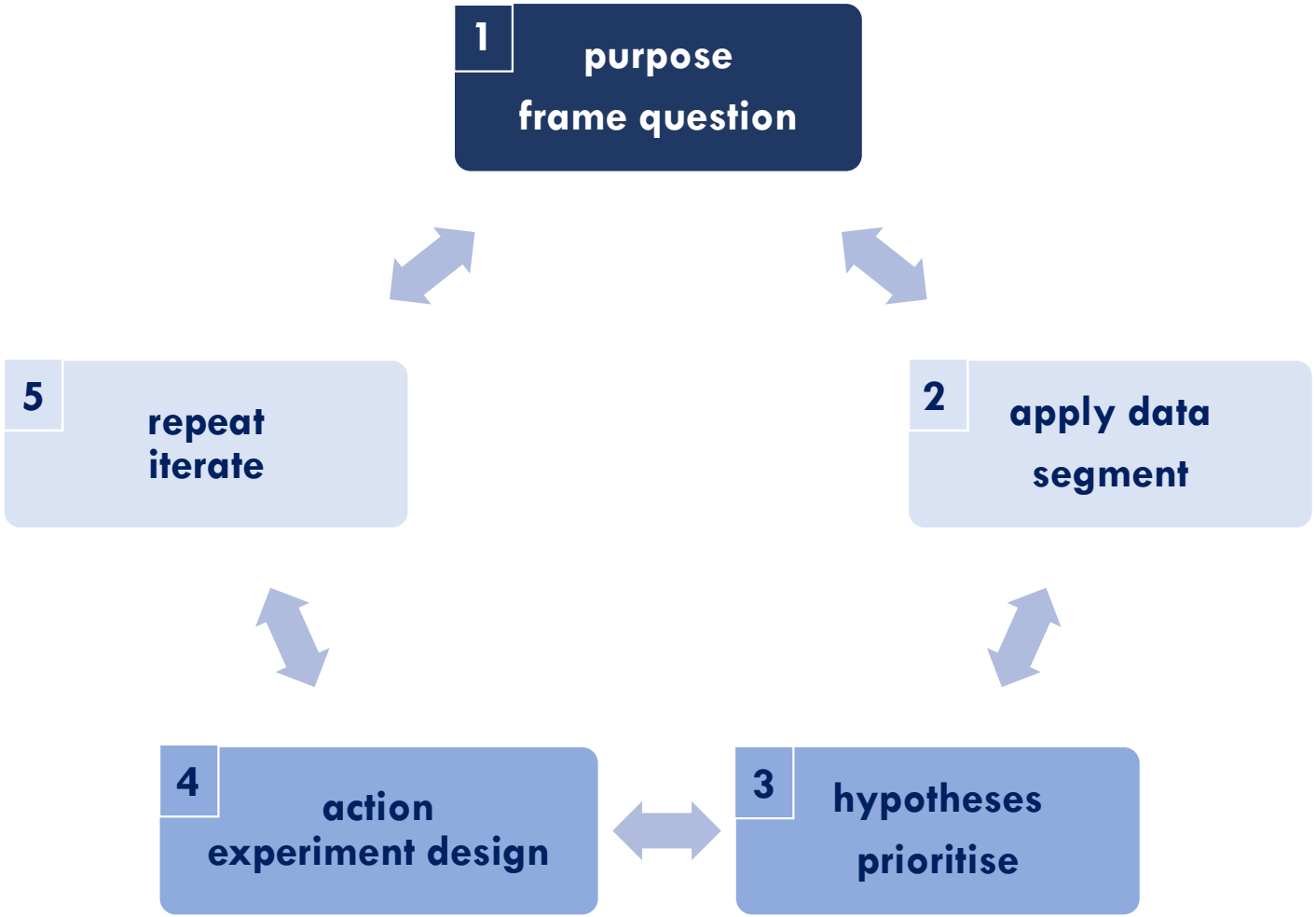
being ‘data-driven’ will:

- provide a focus (by design)
- reinforce the value of your data
- demonstrate to others that this is not difficult
  - (and is in fact often simple) to deploy
- provide a ‘source of truth’
  – to counter (or even support) opinion before it becomes **the** decision

data driven decision-making

5 key steps:

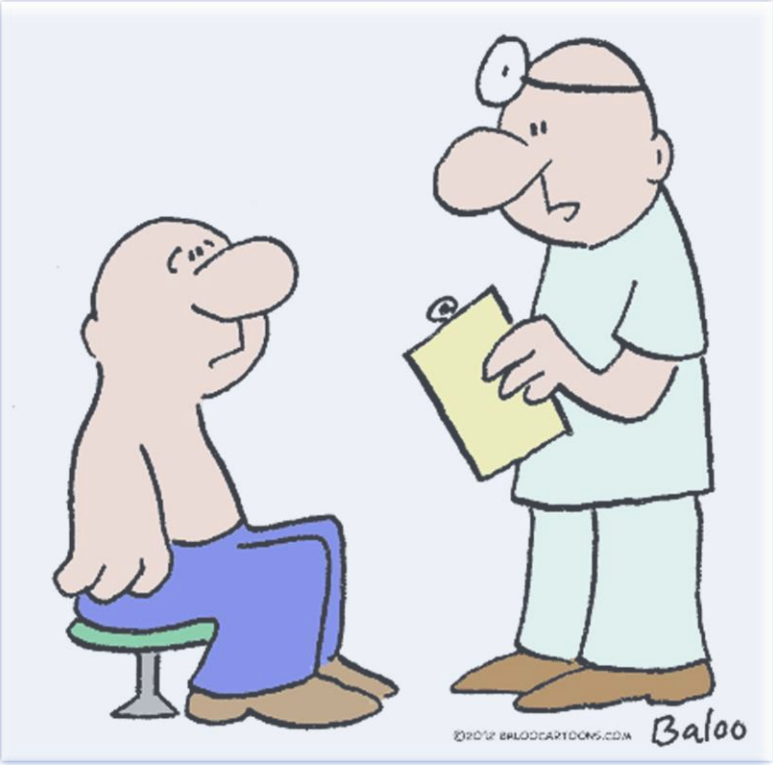
1. **the question?**
2. **examine**
3. **hypotheses**
4. **design**
5. **feedback**



or put another way...

5 key steps:

1. **'what seems to be the matter?'**
2. **examination**
3. **diagnosis**
4. **prescription**
5. **'come back and see me'**



1. the **question?**

1 the question?

- agree the challenge - the purpose for assembling our target measures
- this is the lens through which we prioritise the data likely to be important
- if unsure where to start, think about your high level aims as these are likely to be most important

*A tag cloud of the aggregated **vision and mission statements** of Scottish colleges*

how can we enhance the learning experience?

how can we increase our levels of access and inclusion?

how can we increase our local economic impact?

1 the question?

- as marketers we should be thinking more about:
  - customer engagement — ***how to increase the level of interest amongst school leavers?***
  - marketing effectiveness — ***which marketing initiatives are most effective?***
  - customer satisfaction — ***how to improve the levels of student satisfaction?***
  - brand loyalty — ***how to increase brand loyalty and positive wom?***
  - customer insight — ***what do we know about our students that we can act on?***
  - market knowledge — ***what do we know about local demand that will influence our approach?***

- while your questions may vary and even overlap, it's important to focus on **just one question**

1 the question?

- with our broad question decided we then think about making it sharper

which marketing initiatives are most effective?

- what constitutes an initiative?
  - should we consider everything we do? Or just digital or just traditional
  - performance all year round or at a particular time e.g. about a campaign we're running?
- what constitutes effectiveness?
  - is this largely about volume e.g. finding enough students to fill courses? Or is it also about quality of intake, access to opportunities (inclusion) etc?

which digital marketing initiatives are most effective?

2. examine

2 examine

- when applying data to **the question** there's never just one measure
  - we can measure some things now (lead measures) while others take longer to measure (lag measures)
  - there's a positive relationship *which can be tested* between lead and lag

Lead Measures

diet: eat healthier

- eat fruit daily
- eat vegetables 4 times per week
- drink fruit juice, less fizzy juice

exercise: do more

- walk 5,000 steps per day
- swim once per week

Lag Measures

- Lose weight
- Lower cholesterol
- Fewer sick days

Am I getting healthier?

2 examine

- If we apply lead and lag measures to **our question** we could view it as follows:

Lead Measures

For each initiative

- Number of unique visits (to the site and key pages)
- Level of engagement (number of pages, posts, replies, comments)
- 'Buy' actions (enquiries, application forms started / completed)

Lag Measures

For each initiative

- Successful applications
- Successful applications around access / inclusion
- Course starts
- Course completions

which digital marketing initiatives are most effective?

2 the trap

Some KPIs are popular – because they are easy to measure

- many online activity measures fit this mould
- easy-to-collect metrics are not always appropriate ones

Drunk man: "I dropped them in front of my house, back there!"

Policeman, "If you dropped your keys in front of your house, half a mile down the street, why are you looking for them here?"

Drunk man: "Well, the light is better here!"

2 examine

- If these appear to be good measures for **our question** - where can we find this data?

Lead Measures

For each initiative

- Number of unique visits
- Level of engagement
- 'Buy' actions

Google analytics
Channel statistics

Lag Measures

For each initiative

- Successful applications
- Success around access
- Course starts / completes

Student data statistics
Student surveys

which digital marketing initiatives are most effective?

2 examine

- Google is a key data source for analysing 'lead measures' and creating a test and learn platform:
  - There is a huge amount of rich data available through Google (and it's free)
  - Google Analytics is well used but consider it as part of a suite of integrated "must use" products, that includes Google Tag Manager and Google Optimize

Google analytics

- Widely adopted
- Auto populates
- Easy interface
- Sophisticated analysis tools
- Goal tracking, segmentation and custom reports

Google Tag Manager

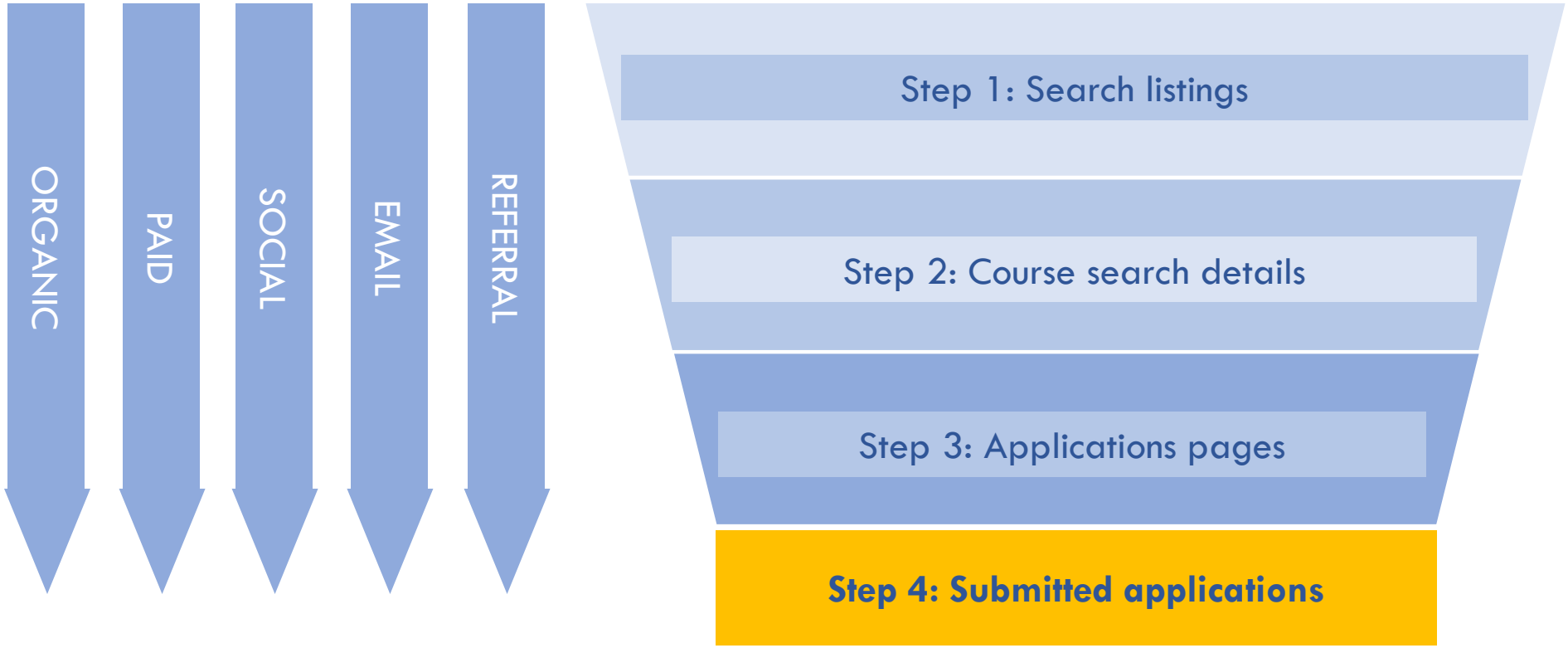
- Less well used
- Powerful level of click / event tracking
- Applies to social media and websites
- Tracks scrolls, clicks, video plays, form fills etc.

Google optimize

- Under utilised
- Wysiwyg interface for creating test versions of pages and journeys – drag / drop html
- A/B and multivariate tests

2 examine

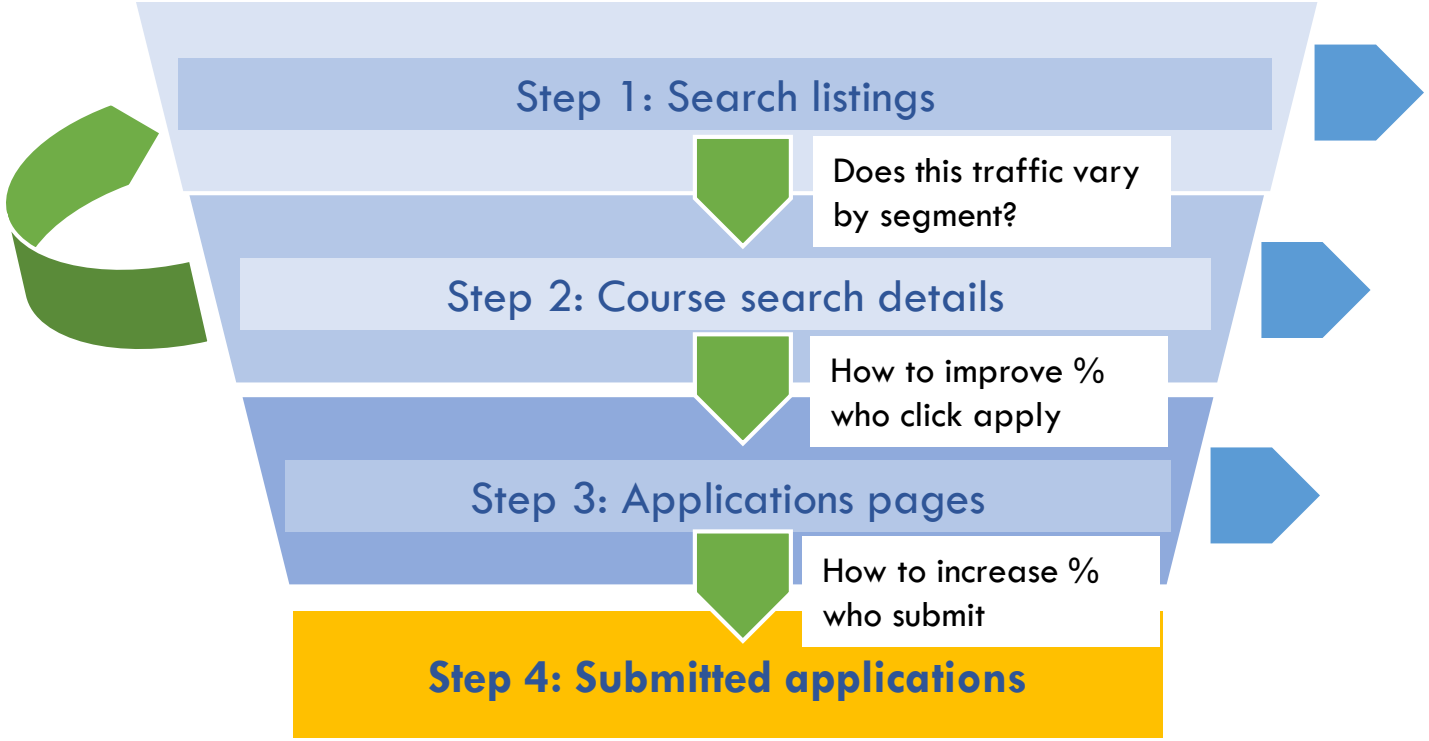
- a derived, more powerful way to view each measure is in terms of a funnel
- we can then compare segments (e.g. marketing initiatives) across the steps in the funnel



2 examine

- when we look at our data in terms of a funnel we can more clearly see how users flow between steps in the funnel and where they drop off

It's not unusual for traffic to loop back between details and listings pages – a behavior individuals may be doing several times in a visit



Why is traffic dropping off here (review significant differences by segment)?

This is of most concern as these are individuals ready to apply but don't – why not?

- this helps us to develop hypotheses and provides a basis for experimentation

2 examine

- our analysis could be even more sophisticated through introducing some or all of the following:
  - **demographic data**; age, gender, location etc.
  - **technographic data**; device, browser, OS etc.
  - **behavioural data**; hour of day, day of week, number of visits etc.
- all of this data can be viewed within the context of our marketing initiative
- and to help describe ‘target audiences’ and ‘typical’ converts

3. hypotheses

3 hypotheses

- while our data may provide potential issues, it won't tell us what's going on
- before we can create an hypothesis statement:
  - be prepared to capture more detailed data (if relevant and it exists)
  - consult other sources of best practice advice and information, such as online marketing, web usability, web design, web copywriting, even behavioral science "nudging" etc.
- remember each hypothesis is about **what can simply make a difference** (marginal gains)
- don't look for the ultimate explanation for everything - focus on what might move the needle
- If all of this seems hard work, try something rather than do nothing (if your hypothesis doesn't play out – well, we've learnt something!)

3 hypotheses

- discuss your data with colleagues and create some hypothesis statements…

We believe that **simplifying the language used on course details pages** *will result in* increasing course applications. *We'll have succeeded* when we see a significant increase in students who submit course applications

We believe that **reducing the number of form fields on the application page** *will result in* increasing course applications. *We'll have succeeded* when we see a significant increase in students who submit course applications

We believe that **linking course details pages directly from video case studies** *will result in* increasing course applications. *We'll have succeeded* when we see a significant increase in students who submit course applications having viewed a video

We believe that **showing the number of people who've viewed a course details page** *will result in* increasing course applications. *We'll have succeeded* when we see a significant increase in students who submit course applications

3 hypotheses

- you should have more than a few hypothesis statements or “cards”
- don’t worry if there’s a lot there, you’re in this for the long haul!
- it’s impossible to address everything at the same time
  - some of your experiments will compete for the same pages and audiences
  - if we’re relying on actions that only a small proportion of our visitors undertake, it’ll take longer to achieve a minimum sample for our experiment
- this is about planning and prioritization
  - what’s most important and what can we do now
  - what requires more data or what can wait for later
- with our shortlist in hand we can start to design our experiments

4. design

4 digital screen design variants

- behavioural science insights help us design information to 'go with the grain' of how citizens actually interact with our digital channels
- people are not rational 'economic agents' – but nor are they simply irrational: they are systematically and (often) predictably irrational
- we can experiment with alternative layouts, content and screen-sequences to take these *cognitive biases* into account
- by objectively measuring the effect of alternatives on our conversion goals, we progressively move closer to optimising channel design for user preferences AND our own objectives

4 going with the grain?

4 behavioural insights that matter

principle #1: other people's behaviour matters

principle #2: habits are important

principle #3: people are motivated to 'do the right thing'

principle #4: people's self-expectations influence how they behave

principle #5: people are loss-averse

principle #6: people are bad at computation

principle #7: people need to feel involved and effective to make a change

Source: "Behavioural economics: seven principles for policy-makers' published by the new economics foundation, July 2005

4 digital experiment design

we consider 3 'flavours' of test & learn experiment design:

I. **Information architecture** – helping users find 'important' information

II. **Choice architecture** – making it easier for users to make better choices

III. **Thinking architecture** – helping users 'think smarter' about choices

4 design | information architecture

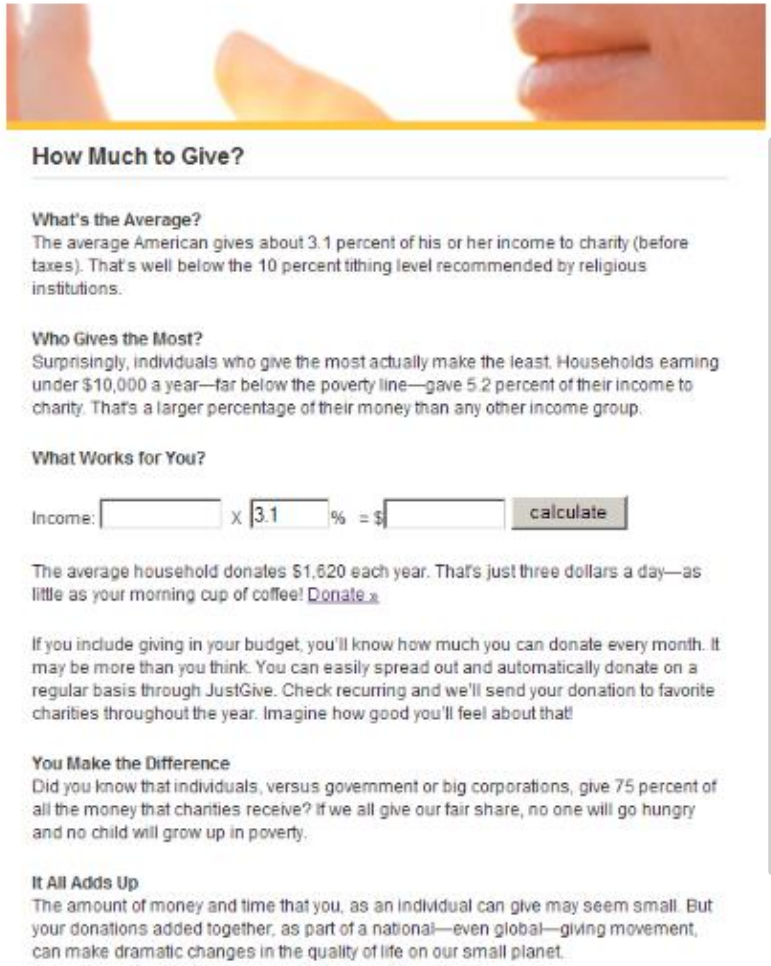
- the amount of information flowing into our brain exceeds our ability to process it

HELP!

  - **Salience** is designing for decision-making through novelty, convenience, simplicity to make information more relatable and relevant
  - **Visual appeal** means trust: though subjective, there may be useful segment variations to test e.g. age, gender, location,
  - **Position on screen** – information presented horizontally tends to have greater salience i.e. is more likely to be noticed

*Sources: 'The Smarter Screen' (Benartzi and Lehrer, 2015); 'The Choice Factory' (Shotton, 2018); 'Mindscape: influencing behavior through public policy' (UK Government Cabinet Office, 2010)

salience



How Much to Give?

What's the Average?
The average American gives about 3.1 percent of his or her income to charity (before taxes). That's well below the 10 percent tithing level recommended by religious institutions.

Who Gives the Most?
Surprisingly, individuals who give the most actually make the least. Households earning under $10,000 a year—far below the poverty line—gave 5.2 percent of their income to charity. That's a larger percentage of their money than any other income group.

What Works for You?

Income: X 3.1 % = $ calculate

The average household donates $1,620 each year. That's just three dollars a day—as little as your morning cup of coffee! Donate »

If you include giving in your budget, you'll know how much you can donate every month. It may be more than you think. You can easily spread out and automatically donate on a regular basis through JustGive. Check recurring and we'll send your donation to favorite charities throughout the year. Imagine how good you'll feel about that!

You Make the Difference
Did you know that individuals, versus government or big corporations, give 75 percent of all the money that charities receive? If we all give our fair share, no one will go hungry and no child will grow up in poverty.

It All Adds Up
The amount of money and time that you, as an individual can give may seem small. But your donations added together, as part of a national—even global—giving movement, can make dramatic changes in the quality of life on our small planet.

Option A?

words = effort

text density = a barrier

content = descriptive, generic

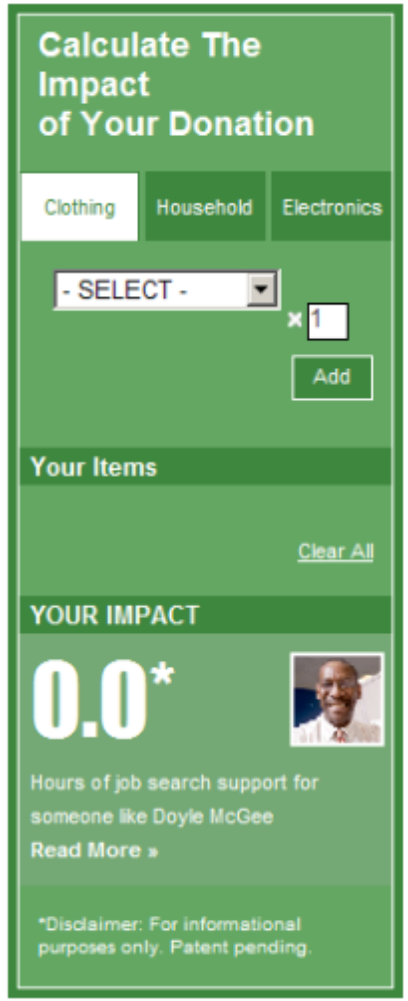
or

Option B?

invites interaction

answers a question on potential donors minds:
'what effect will my donation have?'

use link/image to a personalised narrative



Calculate The Impact of Your Donation

Clothing | Household | Electronics

- SELECT - ×1 Add

Your Items

Clear All

YOUR IMPACT

0.0*

Hours of job search support for someone like Doyle McGee

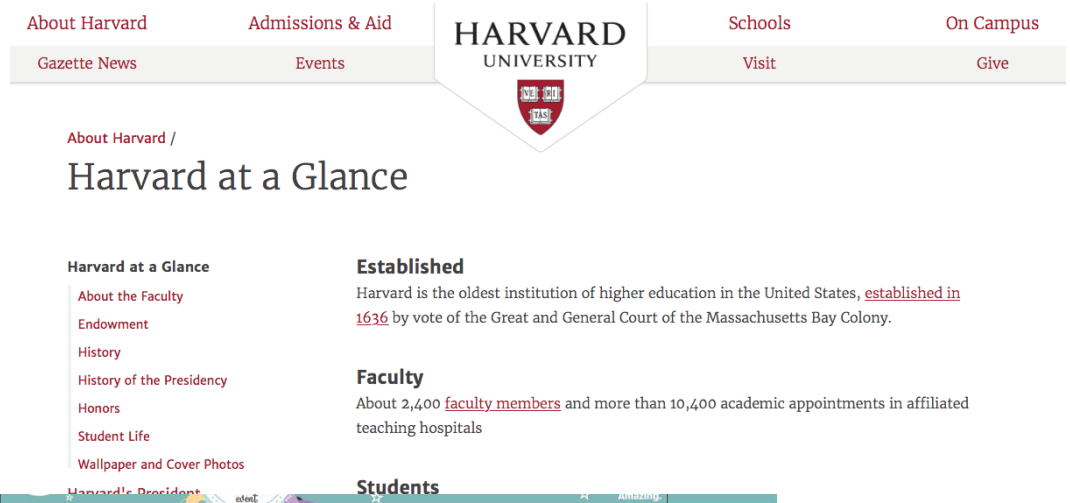
Read More »

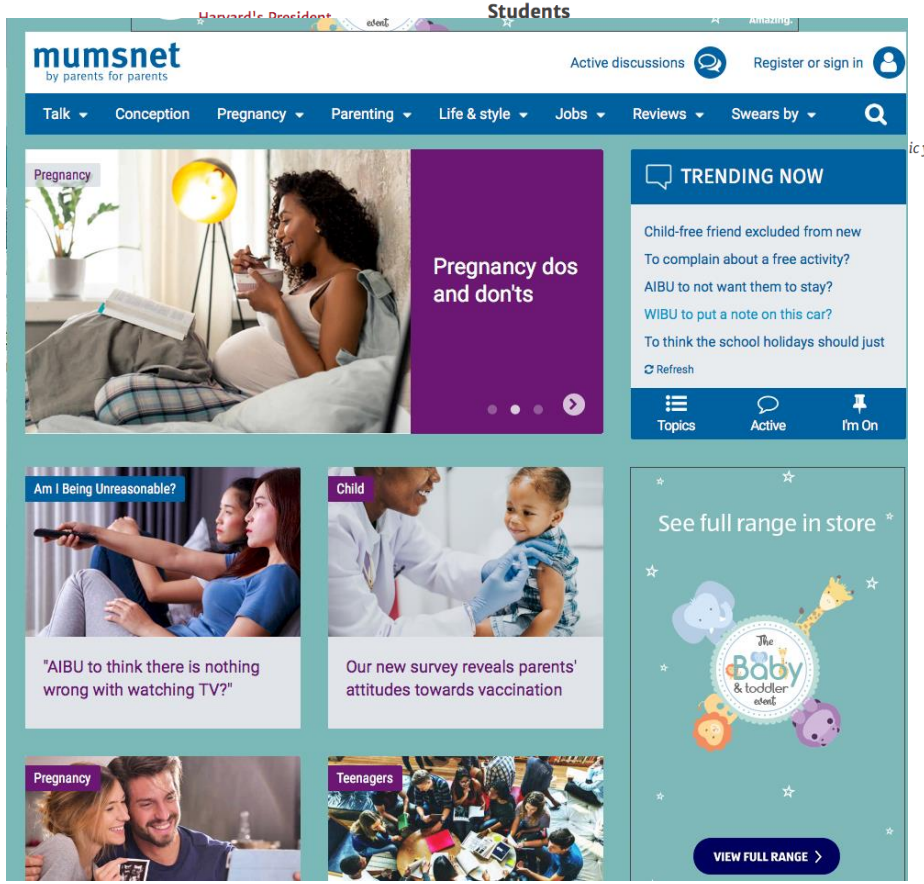
*Disclaimer: For informational purposes only. Patent pending.

https://uxmag.com/articles/using-salience-to-guide-user-decision-making

visual appeal

- the way we behave online magnifies the biases of our visual system
- we can control what we present to users – BUT how users perceive it depends on the schemas and mental models in their heads
- 'appeal' is a subjective perception – but some useful segment variations can be tested
  - these segments can be estimated (and prioritized) from clickstream/ Google Analytics data
  - reactions and impact can be measured through experiments





ic year.

RGB	HEX
R= 165 G= 28 B= 48	A51C30

position on screen

consumers process information in the form it is given – they have a strong built-in preference for moving from side to side, in a sweeping horizontal motion

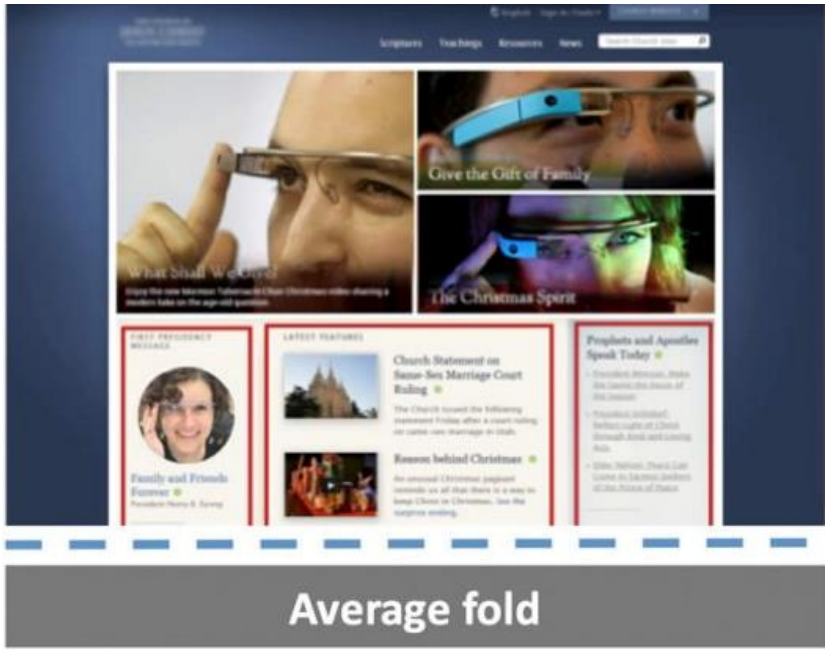
- **middle bias -** we are naturally attracted to things in the middle (and, to a lesser extent, on the left-hand side – although cultural differences exist)
- **top-left bias - i**n situations where a middle choice doesn't exist, say 2-by-2 matrix, our eyes gravitate toward the top-left cell.
- **horizontal bias - i**nformation that appears in a horizontal context tends to have higher saliency — we're more likely to notice it

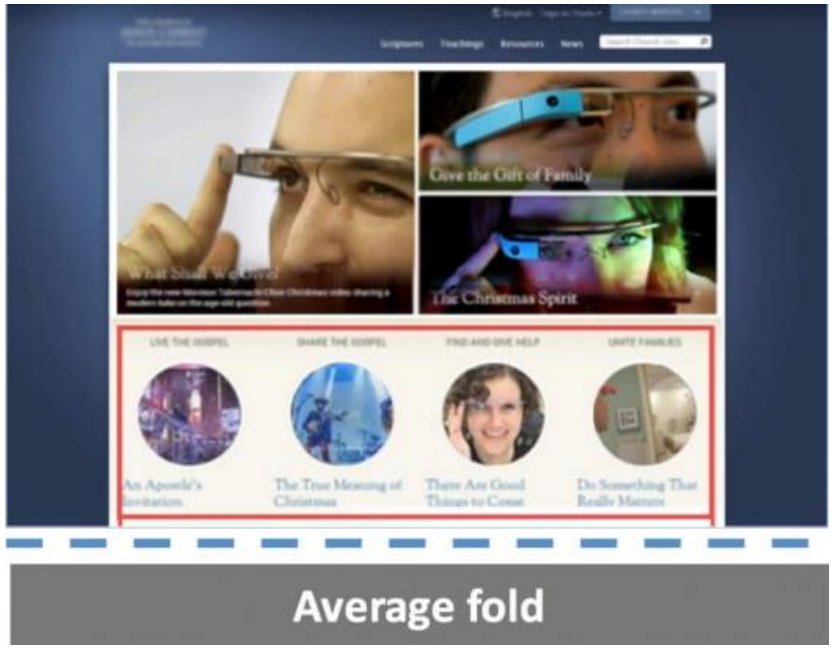
- these biases produce hot spots and in effect, also cold spots – the significance of variations can be tested

Source: https://medium.com/@WilliamStefan/ux-design-display-biases-a6e6aafab37

position on screen = CAUTION!

- depending on the users device (desktop vs mobile) a horizontal layout may not trigger scrolling
- unless there is an indication that more content lies below (left image), visitors may assume the page ends and leave important content hidden and unexplored.





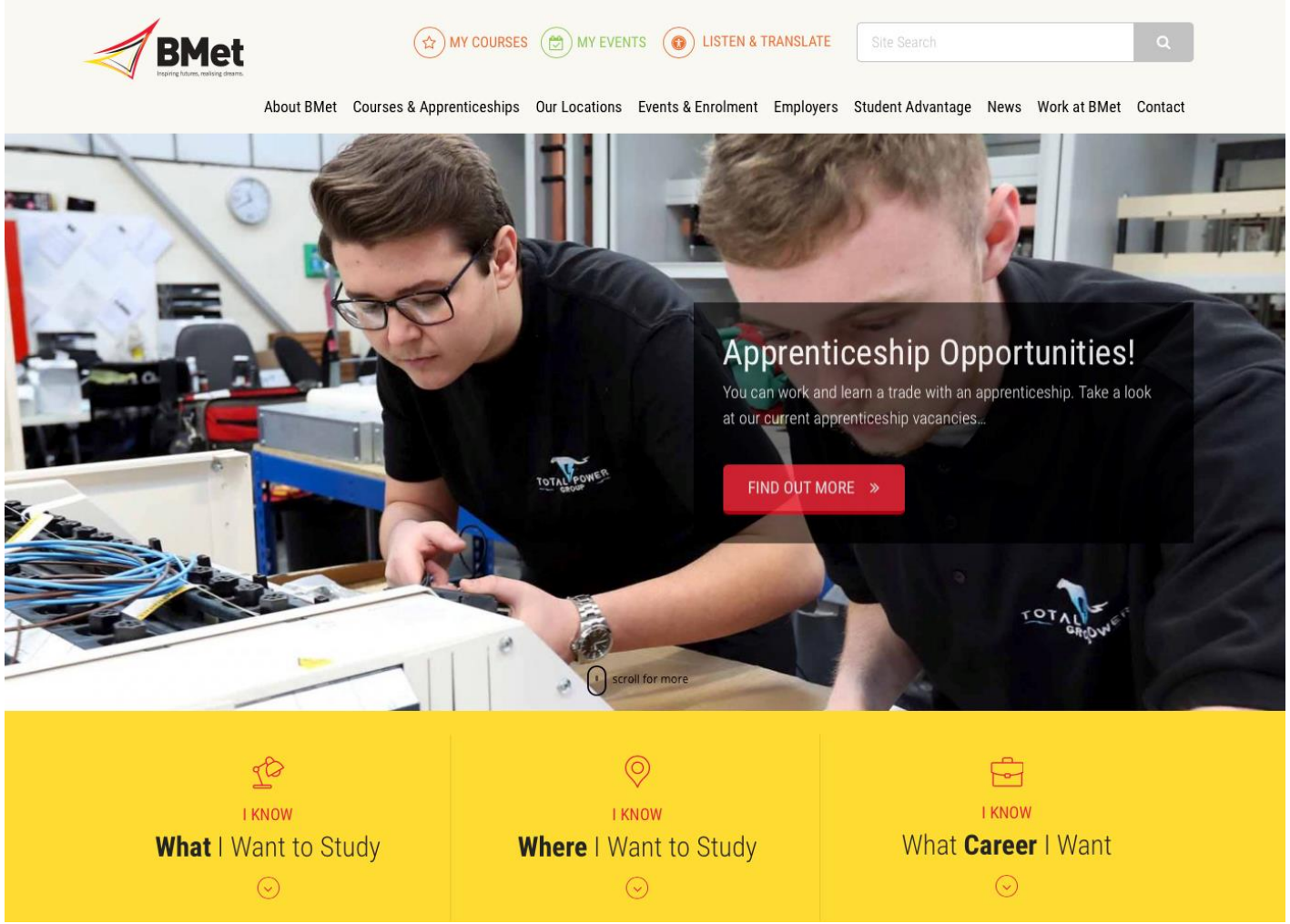
Source: https://www.neurosciencemarketing.com/blog/articles/horizontal-website-layouts.htm

4 design II choice architecture

- **more choice can be paralyzing** – we pick (or fear picking) badly and give up
  - as choices become more numerous, their structure will affect outcomes
  - people are only able to consider a few options at a time; give them the right ones
- **social proof -** can be used to 'nudge' users towards awareness of options
  - demonstrate the relative popularity of options you are already considering
  - we are strongly influenced by what others do
- **relativity** – changing the comparison 'set' can influence attractiveness
  - valuable when seeking to encourage applicants towards one set of options over another
  - BUT care: choosing the wrong categories can be worse

* 'The Smarter Screen' (Benartzi and Lehrer, 2015); 'The Choice Factory' (Shotton, 2018); 'Mindscape: influencing behavior through public policy' (UK Government Cabinet Office, 2010)

simplified shortcuts



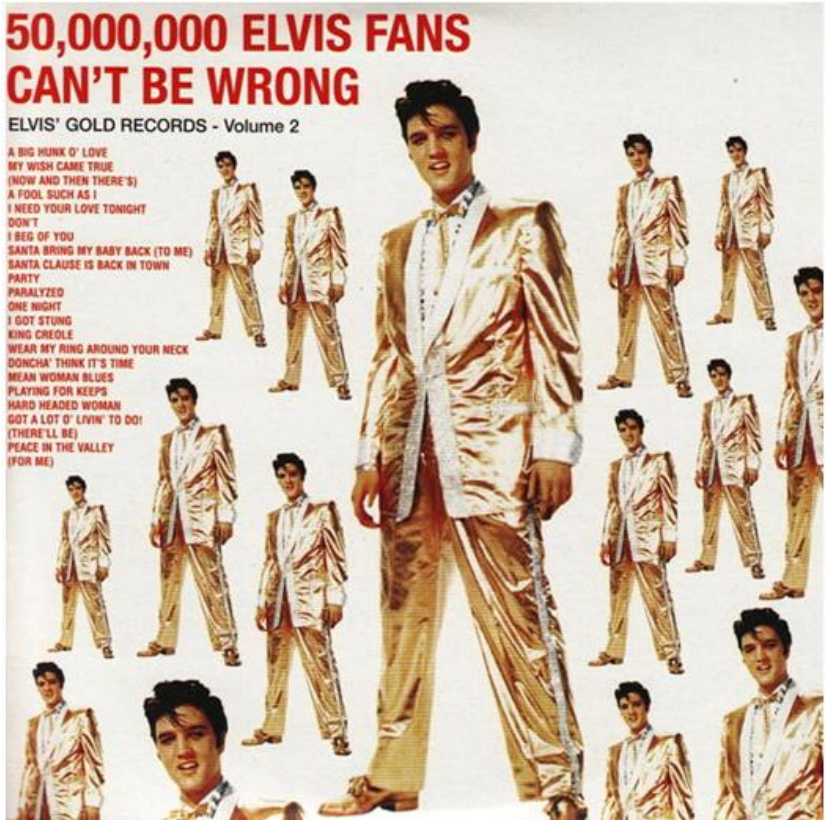
- Birmingham Metropolitan College homepage includes three BIG yellow boxes offering potential students a 'shortcut' to 3 choice criteria:
  - subject
  - location
  - outcome

- these are simplified categories that can help users eliminate less-likely options and reduce the number of possible choices presented – quickly, easily

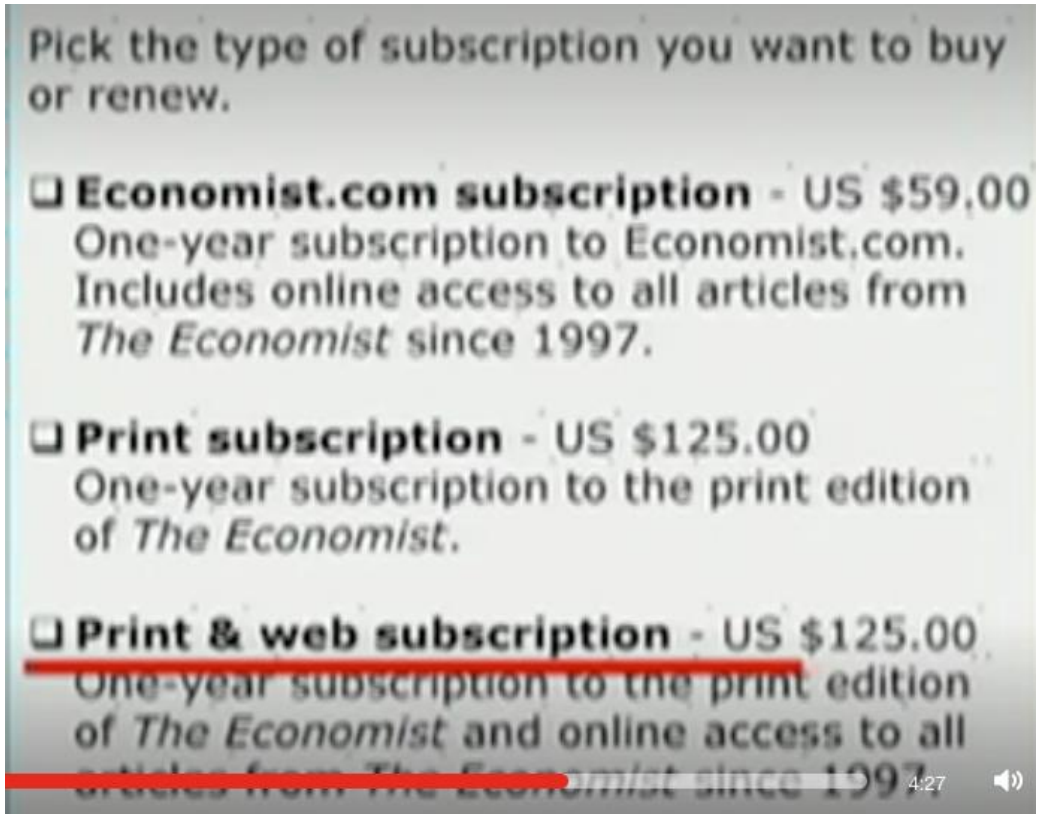
https://www.bmet.ac.uk

social proof

- **peers** – user testimonials (e.g. Twitter and Facebook quotes) or (more formally) case studies from existing/former clients 'like you'
  - Social media 'share' counts can also communicate popularity (if not too low……)
  - Users ''like you' also viewed these…..'
- **experts & influencers** – testimonials from credible and prominent third party or alumni who may exhibit the same behaviours or achievements that you want new customers to aspire to
- **crowds** – large numbers (e.g. # of users looking at this site or page now (real-time)/in the last week/last month, etc.)
  - This can also be linked to scarcity – implying limited availability and a risk of 'missing out' (loss aversion)



‘useless’ comparisons?



- a (real) subscription offer from The Economist magazine
- MIT ran a test with 100 students, who chose:
  - Online only offer– 16%
  - Print only offer – 0% (!)
  - Online + Print offer – 84%
- a second test was run with the middle ‘useless’ option discarded: this changed the outcome:
  - Online only offer – 68%
  - Online + Print offer – 32%

https://www.ted.com/talks/dan_ariely_asks_are_we_in_control_of_our_own_decisions/up-next

relativity

Vs

NESPRESSO

Vs

- the 'mode of delivery' for Nespresso makes it relatable to the cost of a daily on-the-go drink
  - 35-40p vs. £2.50 per cup feels like good value
- but if Nestle had simply launched another 'at home' coffee, the price comparison would be to @£12-15 per 500g
- Nespresso costs @7p per gram – would customers pay (an equivalent) £35 for a 500g tub?

4 design III thinking architecture

- **device-specific variants;** the two-system mind is widely acknowledged*
  - smartphone users (lean-forward mode) anticipate using 'automatic' System 1 thinking
  - tablet, desktop users (lean-back mode) are more likely to use 'reflective' System 2 thinking
- **context** – easy-to-consume video or images can encourage users think more broadly about the stakes in a decision (increase salience)
- **screen-reading leads to lower comprehension than paper-reading** - so:
  - test alternative sequences of information (primacy)
  - encourage System 2 thinking to help overcome a nagging fear of 'missing out' (loss aversion)
  - easier information consumption can = lower comprehension: so add a degree of 'desirable difficulty' to force more reflective behaviour

* 'Thinking Fast and Slow' (Kahneman, 2011); 'The Smarter Screen' (Benartzi and Lehrer, 2015); 'The Choice Factory' (Shotton, 2018); 'Mindscape: influencing behavior through public policy' (UK Government Cabinet Office, 2010)

fast and slow thinking

- **fast = System 1**: it operates automatically and quickly, with little or no effort and no sense of voluntary control - fast, intuitive and emotional
- **slow = System 2**: it allocates attention to the effortful mental activities that demand it, including complex computations - slower, more deliberative and logical
- most of the time System 1 runs automatically and System 2 is in a comfortable low-effort mode in the background - when the two agree, impressions get turned into beliefs
- this can matter when users use different devices:
  - smartphone usage lends itself to 'scanning-mode' use – System 1 is in charge
  - desktop computer usage may imply greater concentration – System 2 comes into play

https://greenbookblog.org/2012/03/15/lessons-from-thinking-fast-slow-system-1-and-system-2/

providing context

- provide easy-to-navigate access (links) to background information
  - adding video, audio, images can work well
- complement this content with
  - strong narratives that tell personal, relatable stories
  - case study illustrations
  - an emphasis on reinforcing positive social norms

Benefits of volunteering

Volunteering is one of the most rewarding things you can do.

And thinking about how you want to benefit from volunteering is a good start to finding an opportunity that's right for you.

- **Gain confidence**. Volunteering can help you gain confidence by giving you the chance to try something new and build a real sense of achievement.
- **Make a difference**. Volunteering can have a real and valuable positive affect on people, communities and society in general.
- **Meet people**.Volunteering can help you meet different kinds of people and make new friends.
- **Be part of a community**. Volunteering can help you feel part of something outside your friends and family.
- **Learn new skills**. Volunteering can help you learn new skills, gain experience and sometimes even qualifications.
- **Take on a challenge**. Through volunteering you can challenge yourself to try something different, achieve personal goals, practice using your skills and discover hidden talents.
- **Have fun!** Most volunteers have a great time, regardless of why they do it.

Still need more information. Check out our frequently asked questions on volunteering.

https://www.volunteerscotland.net/for-volunteers/why-volunteer/benefits-of-volunteering/

desirable difficulty

Bodoni Italic **13PT/18PT**	Arial Regular 13PT/18PT
But I must explain to you how all this mistaken idea of denouncing pleasure and praising pain was born and I will give you a complete account of the system, and expound the actual teachings of the great explorer of the truth, the master-builder of human happiness.	But I must explain to you how all this mistaken idea of denouncing pleasure and praising pain was born and I will give you a complete account of the system, and expound the actual teachings of the great explorer of the truth, the master-builder of human happiness.

- recall is improved when the reader is forced to slow down to decipher the words.
- *harder to read text is also harder to skim over.*
- *ALTHOUGH* in UX design, removing unnecessary strain on users is usually paramount – and online, we are often in 'scan' mode (particularly on smartphone screens, less so on desktop computers) - *SO*
- *CARE!* – Disfluent fonts can act as an inhibitor when the reader's attention or motivation is weak to begin with
- *BUT* even the switch from regular to *italic* is a slight enough interruption that signals to the reader a heightened importance on a word or phrase.

Sourte: article by Steph Sabo, Senior Art Director at Bigwidesky published in https://medium.com/@bigwidesky/by-steph-sabo-senior-art-director-at-bigwidesky-b9b8863d9a5c - referencing http://web.princeton.edu/sites/opplab/papers/Diemand-Yauman_Oppenheimer_2010.pdf: research by Daniel Oppenheimer, published in 'Cognition'

4 design variants into action

although we're discussing the Google suite of tools... other solutions are available

Adobe Target

Google Optimize

Optimizely

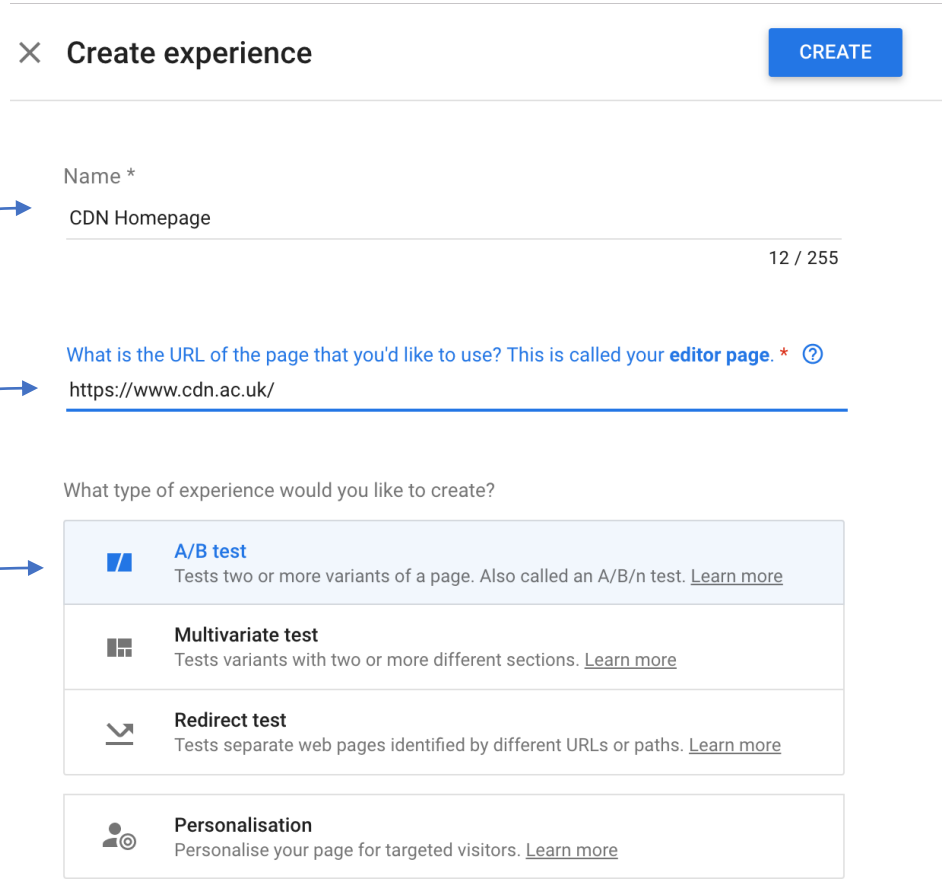
4 action: google optimize

- set up Google Optimize tag (use Google Tag Manager)

once done...

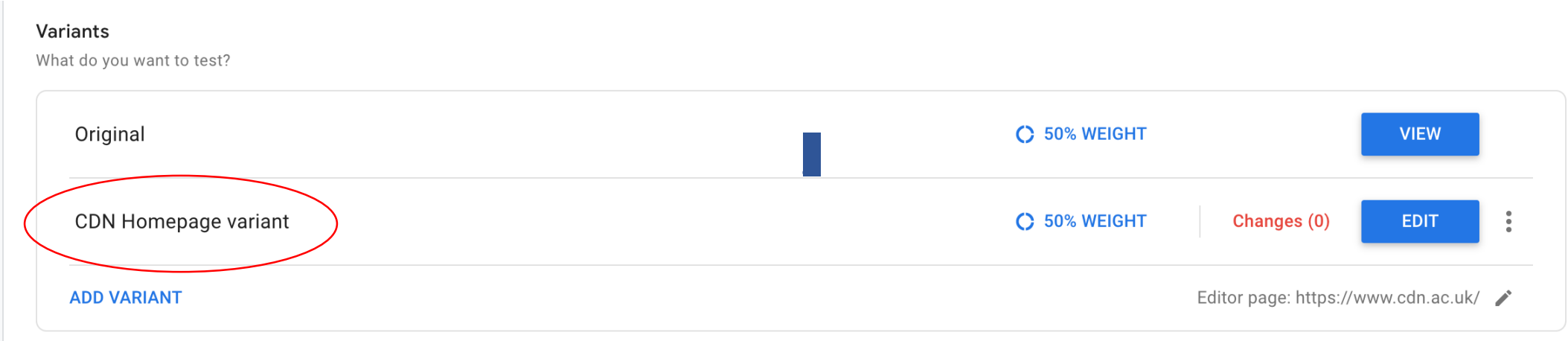
- name your experiment
- enter url of page
- choose experiment type

create



4 action: google optimize

- add a variant

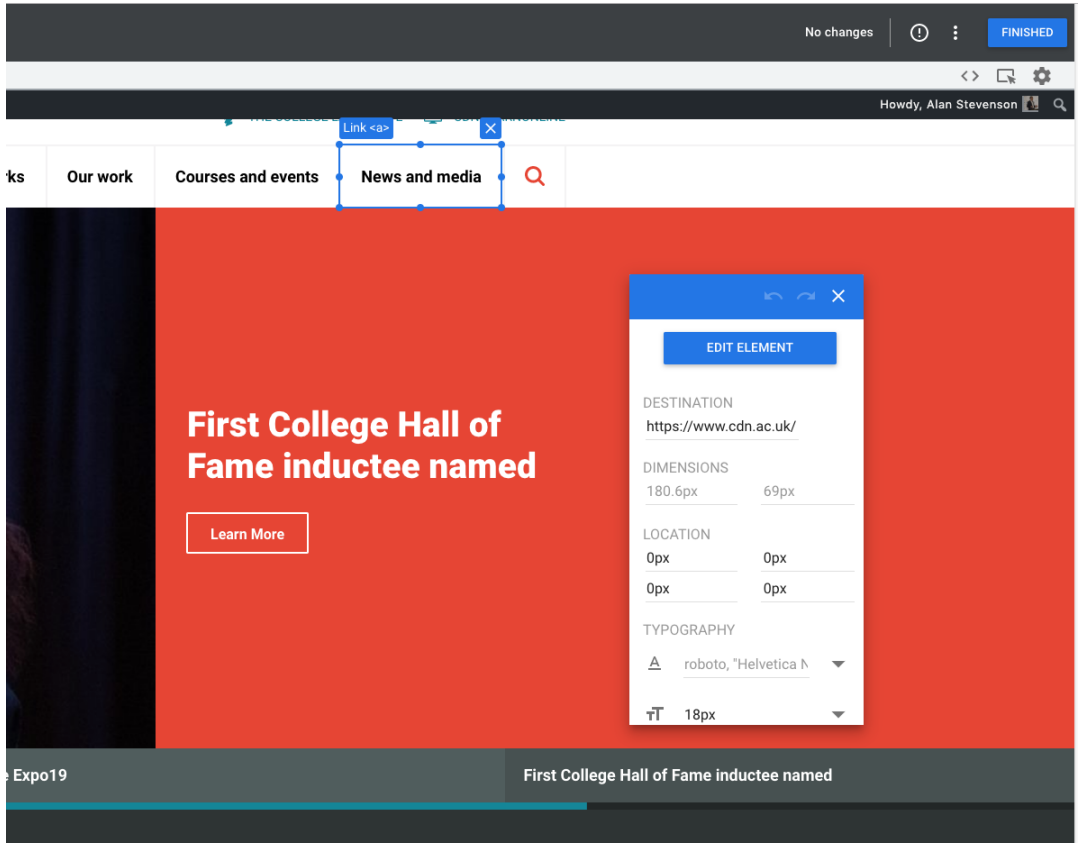


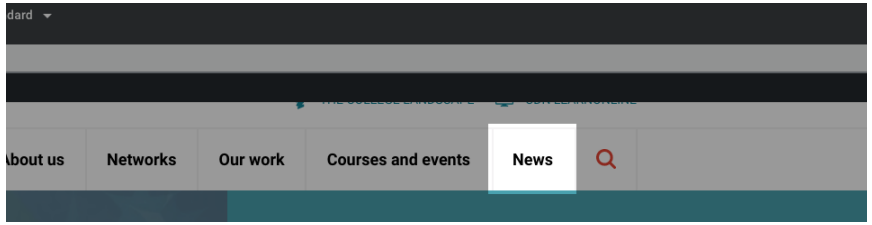
- you can also adjust the split of audience for Original and variant

edit

4 action: google optimize

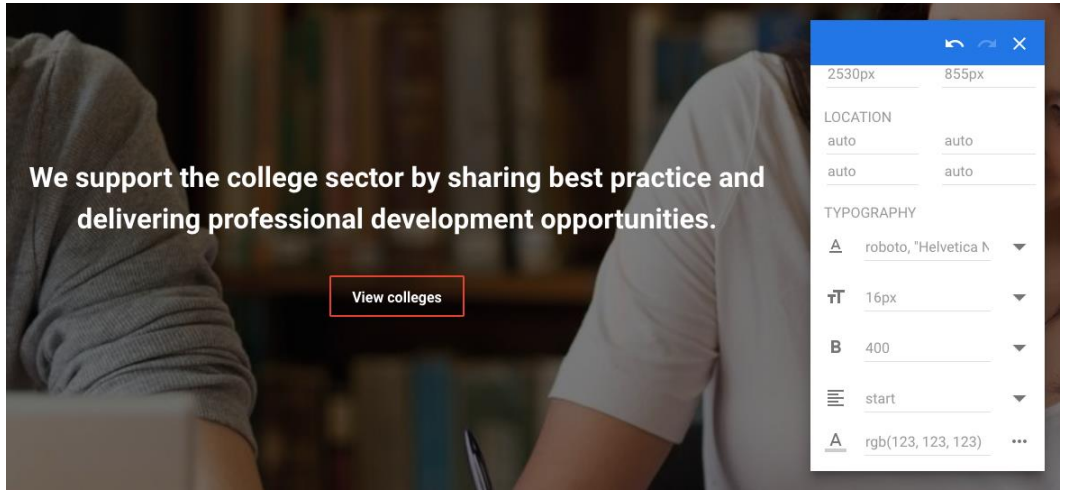
- edit your variant; change text, size, font, position or order





4 action: google optimize

- edit your variant



start

4 action: set up your experiment

- this example has started with an A/B test
  - for more complex redesign you may need another experiment type – **redirect test**
  - for more than one substantial change you may need a **multivariate test**
- add objective, description text (include hypothesis text)
- the experiment to run for a while (dependent upon traffic)
- you can check on progress in Google Analytics

5. feedback

5 feedback

- the experiment cycle is a process
  - evaluate, iterate and repeat (the faster, the better)
- experiments are specific – but could still have knock-on consequences
- 3 options for responding to measurement feedback
  1. scale-up/accelerate the 'winners' (but keep measuring)
  2. stop variants with negative impacts (risk-management)
  3. re-assess the inconclusives/promisings-but-not-provens – iteration actions:
     - do additional data analysis/, testing for potential 'supporting' clues
     - change the experiment design
     - reconfigure 'clickstream' data (gather new evidence) and/or CMS (alternative design)

final thoughts

- data is ubiquitous - but typically under-used
- we must ask it important questions to yield useful insight
  - if we decide what 'wheat' looks like, we can ignore the 'chaff'
- free analysis tools + behaviour science can be combined to turn data into actionable insight
- our 'test and learn' approach brings:
  - focus – prioritising a specific question
  - structure – 'line of sight' between particular data and 'the question'
  - objectivity – a disciplined cycle of quantitative measurement and reaction and explicit prioritisation criteria
  - marginal gains – a progressive accumulation of incremental benefits

Questions now

Questions later

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data-driven ≠ ‘machine learning’

more — **human insight and oversight** — *less*

	data-free reasoning	data-driven decision-making	machine learning
data requirements	• n/a	• smaller data volumes	• large data volumes
approach	• HiPPO	• hypothesis-driven test & learn	• brute-force computing
tools	• Gut-feel/ • ‘we’ve always done it this way’	• free desktop tools encoded by humans	• sophisticated algorithms ‘trained’ with data

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data-driven decision making

Marketing and Communications Conference

Stirling, 12th September, 2019