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A/B Testing

A is better than B ... or is it?

ACADEMIC RESOURCES:

Muyllé, S., Moenaert, R., & Despontin, M. (2004, May). The Conceptualization and Empirical Validation of Web Site User Satisfaction. *Information and Management*, 41(5), 543-560.

Tullis, T., & Albert, B. (2013). Measuring the user experience: collecting, analyzing, and presenting usability metrics. Elsevier/Morgan Kaufmann (2nd ed., pp. 216-218).

A/B testing is an evaluation method that consists of parallel testing two different versions of the same product, to decide which one is more suitable for a specific user need or business goal. It can also be used to assess a new version of an existing product against its predecessor. It is best suited to testing small, incremental changes in a design solution. By restricting changes to a known variable, it is then possible to understand the effect of that variable.

Even though this method is most commonly used to compare alternative versions of user interface designs of websites, A/B testing can also be applied to tangible products or prototypes. It is important to clarify the intended design objective behind the changes or features before testing. In outlining what

you expect to happen, you have a point of measurement by which to test your hypothesis. So, for example when A/B testing a simple versus a complex search function you might predict that the simple one will be easier to use.

A/B testing is useful to offer a quick diagnosis on whether A or B works more effectively in a given scenario. For instance, when testing the location of a banner on a website, the metric of the time taken to complete a specific task can reveal some comparable information in terms of visibility or accessibility. However, this information is not enough to reveal the reason why one option is better over the other. The inclusion of post experience interviews and other qualitative methods can offer insights beyond this metrics-based evaluation.

EXERCISE

YOU WILL NEED

2+ people, stopwatch, pen, paper



In this exercise, you will perform A/B testing using a pair of low-fidelity prototypes. The prototypes should only differ by a single variable, such as the size or location of a button. Prepare your own low-fidelity prototypes, or use the resources on the companion website.

- 1** **Decide which variable to test** in your prototype. Write down a short statement summarising your hypothesis: what effect do you expect the variation to have?
E.g. A larger "Submit" button is quicker to find.
[5 minutes]
- 2** **Prepare two sets of user interface sketches** for your prototype. The two sketches (A and B) should only differ regarding the design choice that you want to explore.
E.g. Version A contains a large button. Version B contains a much smaller button.
[15 minutes]
- 3** **Choose the task that you want the user to perform** with your prototype.
E.g. Complete and submit the flight booking enquiry form.
[5 minutes]
- 4** **Select the evaluation metric** you will use to compare which version (A or B) is better. It should align with your hypothesis.
E.g. Using time as a metric: How long does it take the user to complete and submit the form?
[5 minutes]
- 5** Give your first participant written instructions for the task. Ask them to **perform the task using version A first, then version B**. For each version, record the information that is relevant for your evaluation metric.
E.g. Record the start and stop time of the task.
[20 minutes]
- 6** **Compare the results** of using version A and B, by comparing your evaluation metric.
E.g. the task time = stop time - start time.
- 7** Repeat with your second participant, but **give them the tasks in the opposite order** (first version B, and then version A). This counterbalances the effect that the testing order might have on the results. To make this method statistically significant, the test should be repeated with many users.
[20 minutes]

Cartographic Mapping

Generating rich depictions of settings and practices in a problem domain

ACADEMIC RESOURCES:

Elovaara, P., & Mörtberg, C. (2010). Cartographic mappings: participative methods. In Proceedings of the 11th Biennial Participatory Design Conference (pp. 171-174). ACM.

Finken, S., & Mörtberg, C. (2014). Performing Elderliness-Intra-actions with Digital Domestic Care Technologies. In IFIP International Conference on Human Choice and Computers (pp. 307-319). Springer, Berlin, Heidelberg.

Mapping and other methods involving making collages are frequently employed in participatory design workshops to capture and understand domain-specific user knowledge. Cartographic mapping is a mapping method with a particular focus on the mediating role of the map-making activity in mutual knowledge construction. In this method, the facilitator and participant are working together on creating a visualisation of the participant's daily routines, relationships and settings within a problem domain.

A typical cartographic mapping process involves two stages taking place in a workshop setting: 1) making an initial map, and 2) enhancing the map through a participant-performed ethnographic study. In the first stage, workshop participants are asked to create a map of their relationships with other people, devices, and other material objects in their problem domain. A large blank paper, various cut-out pictures, post-it notes, and colourful markers are provided for the

activity. The participants place a picture representing themselves on the paper and then start to map relations with other entities around it. During this process, the workshop facilitator asks questions about the participants' particular choices of images and the relationships being mapped. In the second stage, the participants are asked to take photographs of the setting relating to the problem domain to capture the details of their work or everyday routines. In a subsequent workshop, the participants add these photographs onto the maps they created in the first workshop to develop a better understanding of the problem domain.

In addition to the creation of thick and rich visual representations of people's daily routines, relationships and settings, the activity of map-making facilitates an informal conversation about the various problems and matters of concern supported by relevant visuals.

EXERCISE

YOU WILL NEED

1-3 people, A0 and A4 paper, coloured markers, pen, scissors, glue, sticky tape



In this exercise, you will employ cartographic mapping to understand the practices of one or more participants, and identify opportunities for design solutions. Choose your own design problem, or focus on the Supermarket of the Future brief (p.143) and use the resources on the companion website.

- 1** **Arrange a workshop** with one or more participants. Every participant should have recent experience of the problem domain.
e.g. shopping for groceries in the supermarket
- 2** **Ask the participant(s) to use the provided images and materials** on the companion website to express their experiences. They can glue these onto the A0 paper, arranged in such a way that they represent the participant's routines and relationships.
- 3** **Your participant(s) can also use lines, annotations and sketches** to accompany the pictures they have selected.
E.g. A line connecting two pictures could represent a relationship
E.g. Annotations can be used to clarify the choice of a picture.
[25 minutes]
- 4** **Use the resulting map to interview your participant(s).** Ask them questions about their activities, the people they interact with, the technologies they use, and the problems they face. Follow up any interesting points that you observed during the map-making. Take notes and/or record the conversation.
- 5** **Get your participant(s) to take photographs** of the environment, objects and technologies they encounter in the problem domain, in the week after the workshop. Print these photos.
[1 week]
- 6** **Conduct a second workshop** where you ask the same participant(s) to augment their existing map with the photos they took. This will help to improve the representation and understanding of the problem domain.
[20 minutes]



Hero Stories

Envisioning ideas through speculative storytelling

ACADEMIC RESOURCES:

Hinyard, L. J. & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education & Behavior*, 34(5), 777-792.

Dickey, M. D. (2006). Game design narrative for learning: Appropriating adventure game design narrative devices and techniques for the design of interactive learning environments. *Educational Technology Research and Development*, 54(3), 245-263.

The hero stories method involves the creation and evaluation of speculative stories around key experiences that people might have with an envisioned product or service. Typically, a hero story focuses on a single user's experience, for example, based on a previously developed persona (p.100). Different to persona-based walkthroughs (p.98), which focus on common tasks or scenarios, hero stories explore extreme scenarios.

Using storytelling techniques, a hero story is developed starting from an ordinary person facing a significant challenge. As the story unfolds, the person finds ways to overcome this challenge. Hero stories are developed using a structured framework consisting of a current state, an inciting incident, transformation and return. The current state describes the experience the user is in, introducing the user's values and concerns and the conditions that allow a relatable problem to emerge. The inciting incident describes the event

where a problem emerges for the user. Following this, a proposition for a solution is introduced. The solution is described as transformation, showing the inciting incident being solved for the user. This is where the hero encounters or makes use of the envisioned product or service. The final component brings the story back to the starting point, with their initial challenge remedied.

Once the hero story is developed, it can be tested with prospective users or other stakeholders. After reading the story to participants while recording their comments, open-ended questions should be asked to probe why participants are reacting in a certain way to the hero story.

The method is particularly valuable for the design of services that don't involve any physical or digital products that can be prototyped and tested. It can be used as a collaborative ideation method as well as for the evaluation of design concepts.

EXERCISE

YOU WILL NEED
Pen, paper, 2-4 people



In this exercise, you will develop a hero story, and use it to explore your design problem and generate feedback. Focus on your own design problem or choose a design brief (p.138) and use the hero story template from the companion website.

- 1 Choose your hero**, the user that this story will focus on. Who are they? Describe their character and state before embarking on their journey. What are their values and concerns? This should be based on user research, e.g. captured in a persona (p.100) or inspired by a specific observation. **[10 minutes]**
- 2 Start at the beginning**. What is your hero doing just before their problem emerges? Pair visuals with simple phrases to set the scene. Use sketches or photos to accompany each stage of the story. **[10 minutes]**
- 3 Write the inciting incident**. Something changes – the hero encounters an unexpected difficulty or learns something new that affects their view of the world. An action is required. **[10 minutes]**
- 4 Introduce the transformative solution**, describing how your hero takes action to solve the problem and what products or services support him. The solution does not have to be feasible; this is primarily used to test your understanding of the user's problem as represented by your hero. **[10 minutes]**
- 5 Conclude with the hero's return**. The final part of the story will wrap up the narrative, with the hero returning to an improved version of the situation where they started. **[10 minutes]**
- 6 Test the hero story with participants** by asking them to read the story out loud. While reading they can ask questions or express their opinions. Follow up with an open-ended interview and record their feedback. **[10 minutes per participant]**
- 7 Iterate and test again**. Based on your participants' feedback, what changes do you need to make? If your story didn't resonate with your participants go back and iterate the story based on their feedback, or change the envisioned solution.

Service Blueprints

Documenting the visible and the invisible

ACADEMIC RESOURCES:

Stickdom, M., Schneider, J., Andrews, K., & Lawrence, A. (2011). This is service design thinking: Basics, tools, cases. Hoboken, NJ: Wiley.

Shostack, G. L. (1982) How to Design a Service. *European Journal of Marketing*, Vol. 16 Issue: 1, pp.49-63

Whenever we take part in a service, we only see the part that is happening 'on stage'. Entering a cafe, we might choose a muffin, pay the cashier and enjoy our food while reading the paper. But even a service as simple as this consists of both visible and invisible components. Much needs to happen 'backstage' - muffins get baked and delivered, the electronic payment system transmits payment information, and the cafe gets stocked with newspapers each day.

Service blueprinting plots out all these different elements in order to form a picture of the overall system. This helps to make it more comprehensible, and identify strengths and weaknesses. The service blueprint resembles a flowchart in which the horizontal dimension shows progress through time, and connections between steps are represented by arrows. A line in the middle of the page called the 'line of visibility' helps to indicate what is apparent to the user and what is hidden.

Everything above the line is 'on-stage' and everything below the line is 'backstage'.

Revealing this complexity allows us to understand an experience in detail, which can help us to make improvements or design new services. The technique can be used for developing ideas in the early phases or for testing current and proposed solutions. By charting the user's role within a wider system, designers can describe and understand how each individual component is connected. In advanced versions of service blueprinting different shape codes are used for each element of the system to help indicate different kinds of activities.

EXERCISE

YOU WILL NEED
Pen, paper, a partner



In this exercise, you will plot all the steps of a system onto a service blueprint. Use the template from the companion website to support you.

- 1 Choose a service to plot out**, or focus on the experience of taking a train. **[3 minutes]**
- 2 Write down five key steps of the service** as experienced by the user. Write these in the five numbered boxes across the template. E.g. The first stage of train travel might be "planning the journey". **[10 minutes]**
- 3 For every step, try to identify at least one corresponding step** that takes place behind the scenes. These actions are required, but the user won't see them. Write these in the boxes below the 'line of visibility'. E.g. For the user to plan their journey, they need to retrieve up-to-date timetable information from a database **[10 minutes]**
- 4 Identify additional corresponding steps.** Sometimes multiple things may happen below the line of visibility to facilitate a single user action. Add as many boxes as you need to represent these. E.g. The correct train platform is indicated by a board and by a PA announcement **[5 minutes]**
- 5 Connect the steps in chronological order**, to show the flow of information through the system. Arrows can pass across the line of visibility and back again. **[5 minutes]**
- 6 Add failure points**, indicated by an F in a circle, and use these to lead into an alternative version of the experience. Try to think of different logical ways the system might fail. **[5 minutes]**
- 7 Re-design the service using a new blueprint.** Discuss your blueprint with a partner. Where can the system fail easily? What parts seem convoluted with many arrows? Is there a lot going on behind the scenes while the user is left waiting? Take these factors into account as you design a new improved service. **[30 minutes]**

-  **Design.**
-  **Think.**
-  **Make.**
-  **Break.**
-  **Repeat.**

Design Briefs



Museum Visitor Experience

While some people can spend the entire day exploring museums, others would not mind if they never set foot inside one again. This is a potential problem for an institution that relies on public interest for funding: museums need to be interesting and relevant for everyone. The most critical issue facing many museums today is how to remain relevant, and engage broader audiences in new ways.

For an industry that has traditionally defined itself in being an authority on cultural matters and the wardens of historical collections, the rise of the information age has changed the game. Museums are no longer the gatekeepers of knowledge that they once were, and much of their content can be accessed from the comfort of your sofa. Even artworks have become digital goods. If you want, you can view the Mona Lisa from the comfort of your home, download it, print it and hang it on the wall. Museums are in the midst of a digital disruption and are constantly challenged to reinvent themselves.

Spurred on by this relevance crisis, many museums have been busy adapting their practices. To maintain their unique position in the community, they need to offer unique, immersive and astounding visitor experiences that bring people to the building. And you can help them do it!

For this design brief, your task will be to select a museum of your choice and to design an experience that builds upon the collection that the museum offers. It should improve visitor engagement, fulfil educational goals of the institution, and help the museum to attract new audiences (or affirm their relationship with existing ones). The experience should be interwoven with the building itself; it could not exist without the collection and the environment of the museum. The experience is as broad or as narrow as you decide – it could begin at the door of the museum or focus on a particular gallery.

Using the methods and templates in this book, you should explore a variety of different aspects:

- **Tangible:** making use of the physical qualities of the artefacts and collection
- **Spatial:** using the building itself and its spatial qualities as a setting for the experience
- **Narrative:** telling a story using the collection of the museum
- **Digital:** using technology to support new ways of engaging and teaching visitors

Design an experience that the visitors will never forget..



Supermarket of the Future

Almost everyone has, at one point in time, experienced the act of grocery shopping. Some may even describe this activity as a weekly chore. This design brief is set within the context of grocery stores and the broader experience of and around shopping, both from a customer as well as provider perspective.

Grocery stores exist in various sizes and locations, and serve a diverse range of customers and their needs. They can reach from small 'box stop' grocery stores at a petrol station to massive supermarket halls inside shopping centres, each with their own unique context, challenges and opportunities.

Your task is to develop a vision for future shopping environments (both digitally and physically) that improve the experience of customers and staff. To achieve this, you will need to first understand the context, define your problem area, and understand the various stakeholders involved. Solutions should consider the interests and perspectives of different stakeholder and user groups, which can be of conflicting nature. Think, for example, about the shopping requirements for an elderly, retired person versus a young full-time professional on the way to work, and the social and behavioural implications of these scenarios.

You should use the methods and templates from within this book to scaffold your design process. It will be your task to first identify a problem area to work on, understand this problem space, explore pain points of current experiences – either of customers, staff (such as shop assistants) and any other stakeholder contributing to the shopping experience.

Based on your specific problem context and stakeholder group, you will then ideate solutions that address all or some of the identified pain points of this problem.

You should then employ various prototyping techniques, with the aim to produce as many prototypes as quickly as possible. By prototyping ideas as tangible manifestations that can be experienced you can identify and refine solutions that best meet the needs of the stakeholder.

This brief challenges you to develop solutions that address the problem from a human-centric perspective, not in a technology or materials-driven approach

Designing Space Travel

This response to the Designing Space Travel brief involves data collection through online ethnography and interviews, synthesised through affinity diagramming and turned into a prototype for usability testing.

Online Ethnography

	Webjet iOS	Flight Center Android	Expedia iOS	Skyscanner iOS
Total Reviews	683	14	1838	33586 (just only 10,000 reviews analysed)
Topics	3.5	3.3 Most	3.3 Most	3.3 Most
Over				
Sentiment (out of 10)	0	7.6	7	7
% of total reviews	36.7%	7.6	8.5%	7.7%
Trending	increasing steadily	not enough data	not enough data	increasing steadily
Comments				
Design & UX				
Sentiment (out of 10)	9	10	9	7.3
% of total reviews	38.1	28.6	19.7	18.8%
Trending	decreasing steadily	not enough data	decreasing steadily	decreasing steadily
Comments	"Great" and "Easy" appeared in 56% and 68% of overall reviews respectively	See summary below	Many comments praising ease of use, and speed of use "easy" - 40% of reviews "book" however had medium sentiment (7.6) and appeared 36.7% of reviews.	"Easy" and "Simple" dominated this category appearing 40% of reviews
Satisfied Users				
Sentiment (out of 10)	8.5	10	8.5	8
% of total reviews	44.2	14.3	25.7%	31.3%
Trending	increasing steadily	not enough data	decreasing steadily	decreasing steadily
Comments		See summary below		

UX sentiment was mixed, 50% of users reviewing UX were positive
 • Since June 2014, UX sentiment has trended positive - "Great" and "Easy" appeared in 36% and 68% of overall reviews respectively

of all 4001 UX related reviews, around 70% had positive sentiment.

Typical positive UX reviews include mention of being quick, easy and logical to navigate, some users reporting clarity provided by colour coding

1-2 Star reviews
 Significant insight: Some users don't care exactly where or when they go, they just want the cheapest of flights

ETHNOGRAPHY RESULTS (summary)

For full details on ethnography and sentiment analysis please see appendix section.

aggregation and filtering are popular

Unclear fee structure

"Very simple and efficient to use." - Collinsyashri

"Very easy to use and handy to book flights quickly" - Baeange

"Pretty easy to navigate through site" - Sah! Steve

"I found this app extremely useful when I was in a hurry for work and couldn't remember my flight details - simply logged in and there they were!" - Paul Richards

"Comparisons are simple and it takes away the stress of going into individual apps for plane carriers. Convenient, reliable and simple to use." - J192567

Affinity Diagramming

Peace of mind for medical issues

Personal items are important on long trips

An easy booking process

Personalised Experience is important

I want to easily match my insurance cover to my travel itinerary

I want to know what I can bring with me

I want my cabin to feel like home away from home

I want to book tours easily

I want to be able to easily choose my room

I want a trip of a lifetime

I want an experience based on my preferences

I want to be inspired with recommended experiences

Lifestyle Interests

Health and Medication

I took 3 large cases and a backpack on my 34 day Queen Victoria cruise this year. The backpack had my drug supply and electronics that I didn't want out of my sight. I also came in handy on shore trips.

Photography

I have a 500mm lens plus if needed by a couple of cameras but what will be, will be. I'm happy to see these photos from the ship. We didn't get out of our room for the night. We didn't get out of our room for the night. We didn't get out of our room for the night.

Souvenir

pick up is money from the island. I prefer paper money, but often pick up coins as well. It is a great addition to your scrapbook.

Fashion

besides, the ship itself is always a destination to me and we love sea days.

Friendships

I use Kayak to monitor airfares and price for hotels.

Technology

I use Trip-It on my iPod Touch and on the computer.

Social Status

Towards the end of the cruise the women talked to me about their husbands and you probably had a good time at the end of the cruise. I had a good time at the end of the cruise. I had a good time at the end of the cruise.

Supermarket of the Future

This response to the Supermarket of the Future brief involves a competitor analysis and a spatial analysis of existing supermarkets. The envisioned solution is presented through mockups and visualisations.

Competitor Analysis

METHODS

CONTEXTUAL MAPPING

Conducted at mid-day in Wynyard Station
Coles Express
Monday at 12:30pm - 12:45pm

CONTEXTUAL OBSERVATION

Conducted at mid-day in Wynyard Station
Coles Express
Monday at 12:45pm - 1:00pm.

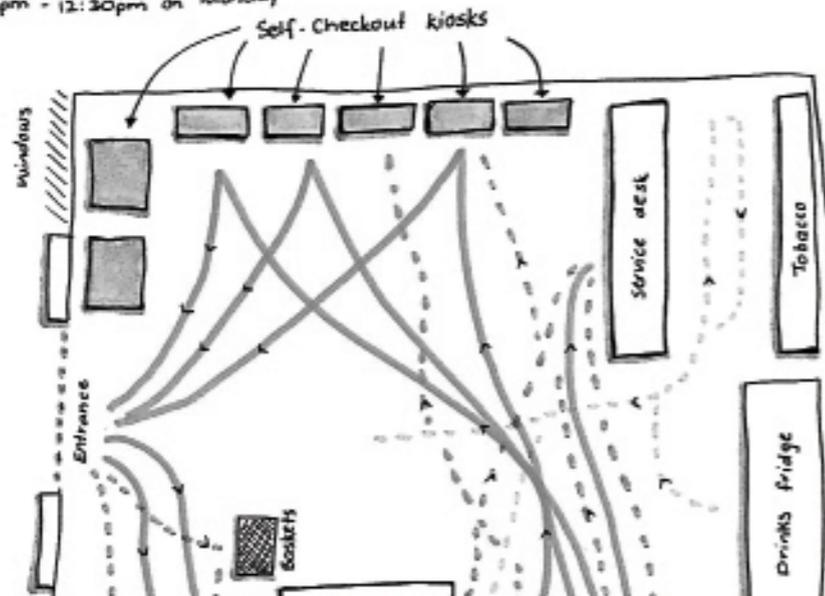
Observations

- More customers were in groups of 2 than in Woolworths Metro, possibly as a result of the location inside a train station.
- There were less office workers than in Woolworths, this was probably as it was during office hours and most workers would not be travelling on public transport.

Key Insights

- The placement of the store changed the customer based significantly, with Coles having less office workers and more small groups than Woolworths
- Having large shelving made navigation for customers difficult as signage and visual paths were obscured. This caused shopping to take longer as customers walked a lot slower

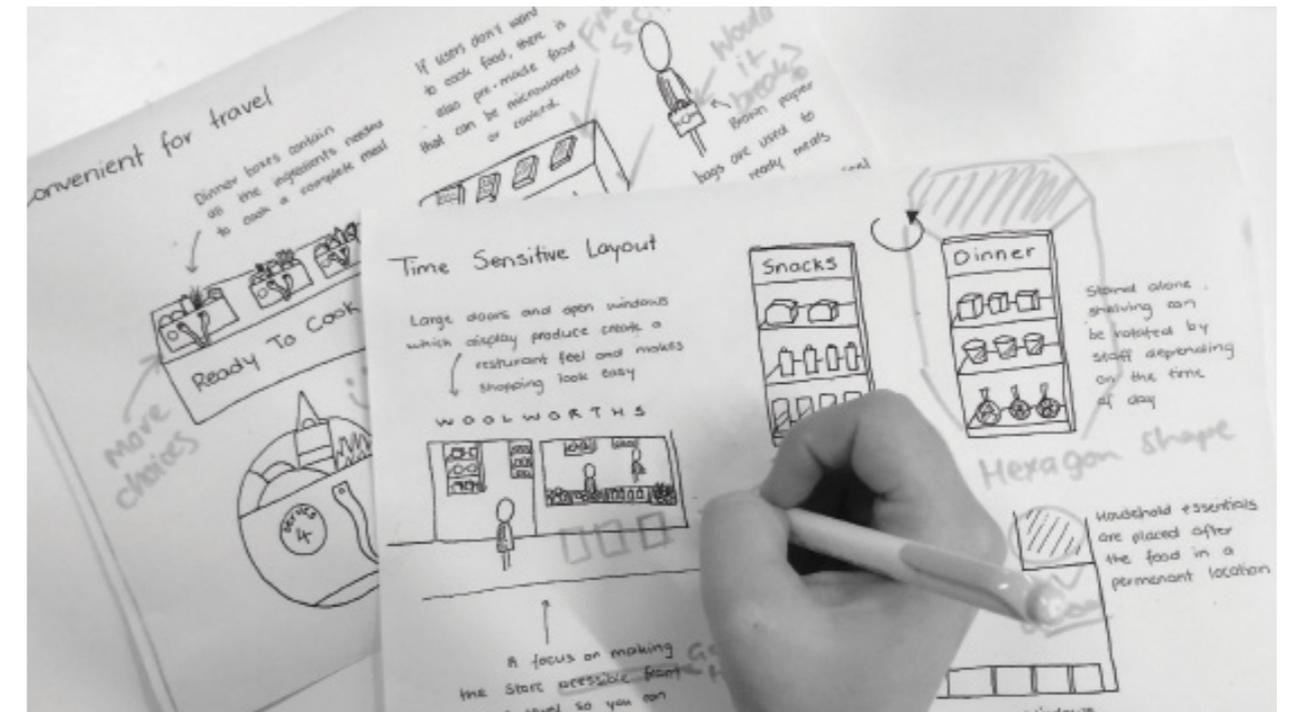
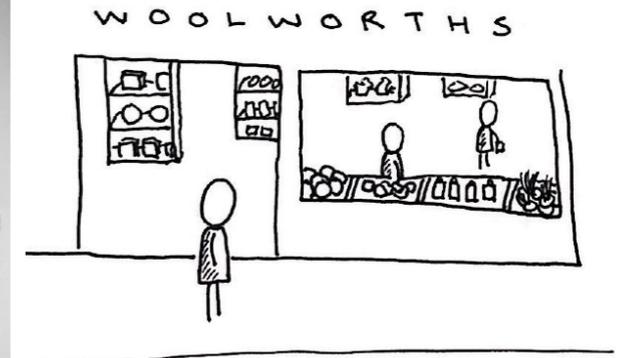
Woolworths Metro, York St NSW
12:00pm - 12:30pm on Monday



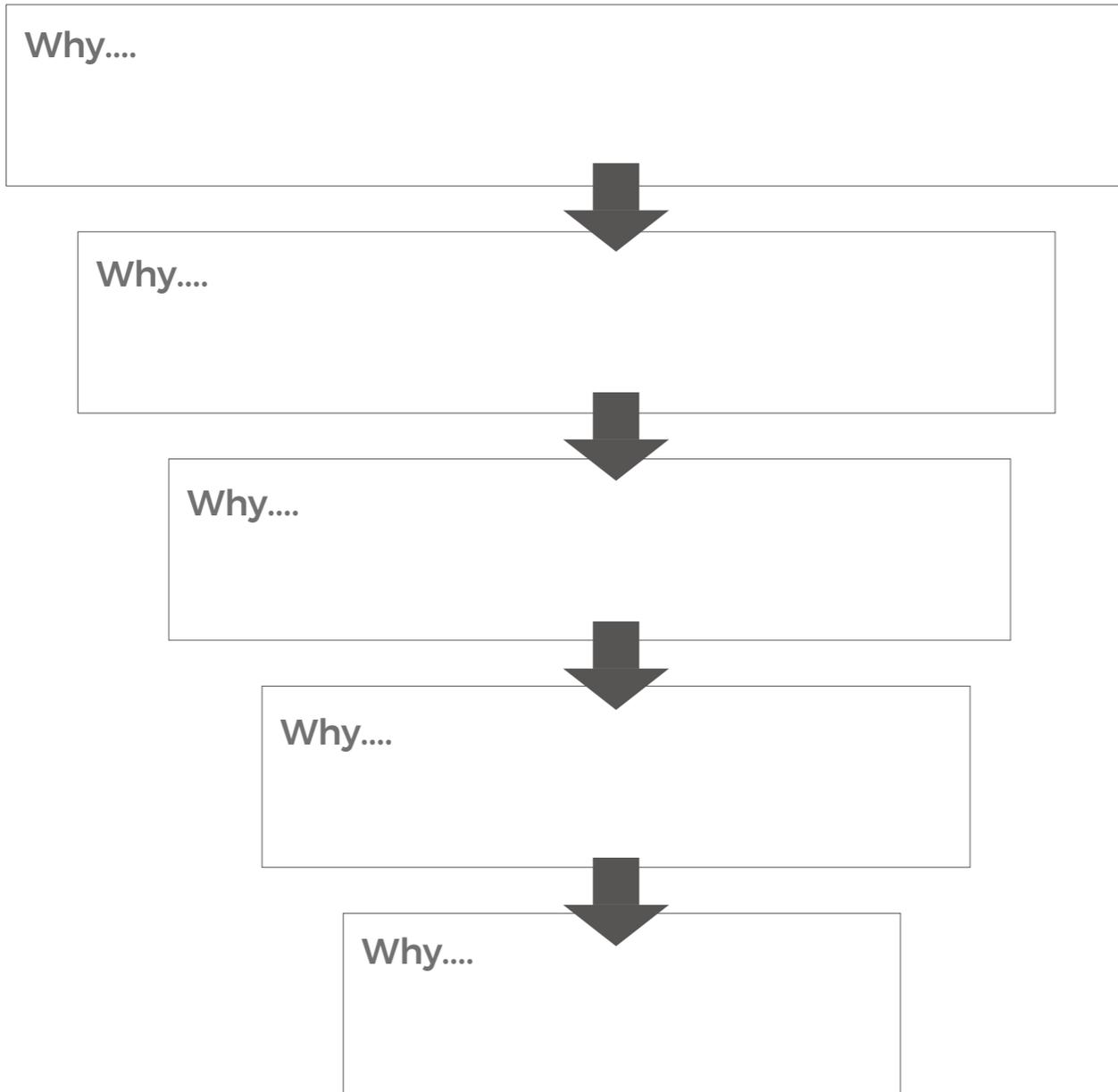
Legend

- Business people ———
- Parents & children ———
- Staff ———
- Wandering - - - - -
- Walking directly ———
- Self Checkout ●

Ideation Sketching



Problem:



Question/problem:

Round 6			
Round 5			
Round 4			
Round 3			
Round 2			
Round 1			
	Idea 1	Idea 2	Idea 3