Usability INFO30004 Assignment 1 – Cognitive Walkthrough

Transport Trevor

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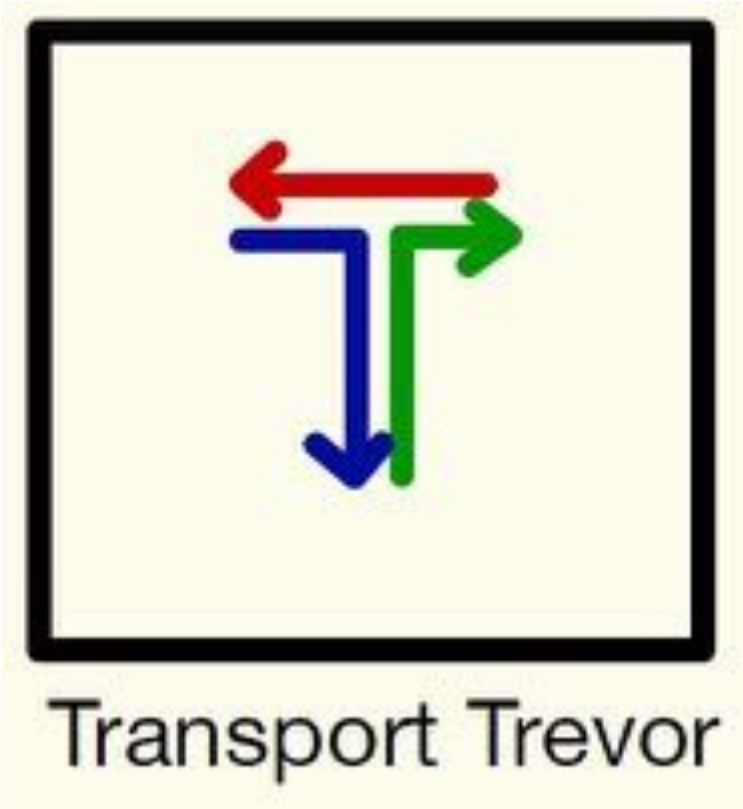


Contents

1. Executive Summary

The Cognitive Walkthrough assignment includes the whole process of the creation and refinement of an idea in Usability Engineering. The chosen topic of this report is a smartphone application that improves the user experience when organising public transport needs. It was observed that the current situation in the city of Melbourne is terrible and hence be improved in several different ways.

In the Statement of Problem section the prior applications and technology in this field are examined, followed by an explanation of the needs and wants of the user. To then support these issues and discover more about the user, several interviews were conducted. The interviewees chosen were from a range of different backgrounds to allow a greater perspective on the types of consumers of this technology. The Rich Picture was a brain storming technique designed to formulate and present the ways in which people interacted with the smartphone application and their surroundings during the process of public transport travel. Using the results from these previous components a synthetic Persona was created, mixing the answers from the interviews to create a description of a person that our team, and hopefully others, could relate to on a personal level. This achieved a better understanding of how these issues of the current technology affected people. To further understand the process in which these technologies were used a comic-strip style Picture Scenario was made. The Scenario walked through a simple story that highlighted all the problems of PTV, Myki and public transport as a whole.

The next step was to begin designing exactly what features this new application, Transport Trevor, would include. The tasks section contains three tasks which each analyse the main objectives of this application. These are basically planning a journey, adding money to your account and checking transport disruptions. The Paper prototype is a rough draft that allowed the team to visualise the application and how it would work screen by screen. It was designed to include everything that would benefit the user experience. This prototype was deeply analysed by a user in the Cognitive Walkthrough section to determine whether the application was indeed functional. In this process further problems and errors of the design were found. The report is completed with the Findings and Recommendations which summarises the analysis of current technology issues and includes a short prototype video, problems with the design of the new system and how to proceed from this stage.

2. Statement of Problem

Following a history of criticism, public transport apps that continue to frustrate Victorians in their daily commute need vast improvement. Being labelled as the 'worst app ever' and another user commented 'Whomever updated this app to such poor standards should reconsider their career path' (Levy, 2012). Such outrage has sparked the need for a new application that is appealing to a vast majority of the commuting population, so that it can address many of the bugs that have impacted the applications in the past. Currently widely used applications such as PTV, Tram Tracker and Train Trapper offer similar software solutions to navigating through Melbourne's public transport network. Whilst combinations of the apps serve as an effective way to plan commuting through the network, a proven issue is still finding an efficient method instead of using a mixture of all applications. All systems thus far have their advantages and disadvantages and ramifications of this include constant frustration from the users. The main issues identified include a simple journey planning function, which governs the route and mode of transport. This is primarily due the clarity of some of the functions.

Some applications have proven better than others in the past but in particular the PTV app has struggled to provide a user friendly solution. In addition there are other hardware issues that limit the performance of a journey planner such as network capabilities within the city loop. Other issues identified include using an application to track the Myki system. Currently no applications have recognized the upgrade in technology and a key issue that travellers identify is that they have no method of tracking their Myki balance and therefore topping up at stations can be a lengthy or hassling process. Finally isolating disruptions and providing communication to users is another focus for the revamped application as current software options have provided a substandard approach that seems confusing and impractical. The proposed Transport Trevor public transport application proposes to include new features including the Myki function in addition to improving the journey planner and disruptions feature. This is important to the users who need a user friendly option. In the past commuters of all ages and levels of technology literacy have struggled to comprehend with the challenging journey planners and as technology advances it should become easier for everyone as a whole to communicate with the network. In particular the new application will focus on targeting younger and elderly commuters, in addition with tourists who are not familiar with the current network. By trying to 'dumb down' some of the features it will allow a wide spectrum of use from all age groups and so the experience as a whole can be enhanced.

3. Interviews

Each group member was allocated to interview a person from the general public and ask a set of questions in relation to how they rate the public transport system in Melbourne. As A group we devised a set of questions that was used throughout the process so we could try and establish the key issues and hoped that the interviewee's thoughts were similar. We aimed to target users who commute to the city regularly and who seem technology literate so that they could have an opinion specifically on the current smartphone applications.

Interview 1: Megan

Megan is a 21 year old student who lives in Ivanhoe in Melbourne's North East. She commutes to university by train and tram four days a week and uses the Public Transport Victoria (PTV) application every time she travels. She likes how convenient the app is, and using this software is far easier than going online or looking up a timetable at the station. However, occasionally she finds the reception on train services is poor and she is unable to find connecting tram times, often when she is in the city loop. In addition Megan believes that for elderly people the software seems redundant as they may struggle to navigate through the application.

As a result of some of her concerns, she opts to drive to work, even though public transport is still available, but only because public transport is too unreliable. Furthermore she has some concerns about the Myki system that has been implemented recently. She believes that there should be infrastructure to allow her to top up on trams or an application that can automate the topping up process. In addition she suggests that enabling WIFI access at stations and on Public transport would increase societies use, as they would be able to plan adjoining transport to a higher accuracy than what's currently available. She thinks these implementations would improve the experience but would have any further impact on her using the network.

Interview 2: Alan

Alan is a 61 year old orthodontist who rarely uses public transport, only for occasional appointments, but never for work purposes. Alan has tried many different applications for transport services but doesn't like them because they are unreliable, and prefers to just turn up to the station and catch the next service. Alan dislikes that the current applications aren't very intuitive and it is complicated to navigate through the application. Living in Ivanhoe and working in Bundoora, Alan's only form of transport to and from work can be by car and prefers it this way. Alan quite likes the new Myki system, and appreciates that you can top up online, however thinks the machines at stations are slow and cause delays.

Alan thinks that is an issue that commuters are unable to view their balance, and also believes the zoning system is appropriate for those who live further out from the city. For Alan's needs there is not sufficient infrastructure to facilitate his travel needs however suggestions include safer night travel and better public transport applications to improve the overall experience.

Interview 3: Gracie

Gracie is a 17 year old student who commutes to school every day via trains and bus. She regularly uses the PTV application on her smartphone and likes the location feature

because she can use it to navigate places she's never visited, and the software provides the quickest and safest route. Since she can't drive yet, this is her primary mode of transport and dislikes the fact that her stop is the fist into zone 2, and finds it illogical that a station that is only a short walk away from her is in zone 1.

Attending school in Toorak means that Gracie has a number of options to commute around the city although she rarely uses public transport over the weekend. This is primarily because of the zoning system and the journey planning function on the PTV application. Having a yearly pass, Gracie isn't concerned with the top up process, but on occasions where she has had to use the Myki top up machines she has experienced delays and thinks that it shouldn't be so difficult for everyone to get around.

Interview 4: Rosi

Rosi is a 20 year old student who commutes daily between university and her boyfriend's house. She uses the Tram Tracker application on her smartphone for trams but for trains she uses the internet on her computer. She lives in Frankston, and commutes between University and her boyfriend's place in Brunswick, in addition with her work in Northcote. She is satisfied with the public transport apps as they satisfy her journey planning needs.

Living in Frankston, ideally Rosi would prefer to get lifts everywhere because of the expensive nature of the second zone every day. She would also like to have air-conditioning on all services so the overall experience is better. However her biggest concern is the amount of Myki top of machines around tram stops, and has occasionally been caught out with a low Myki balance which has proven to be inconvenient. She strongly recommends that all trams should have a topping up system on board, so her mind can be at ease whilst travelling.

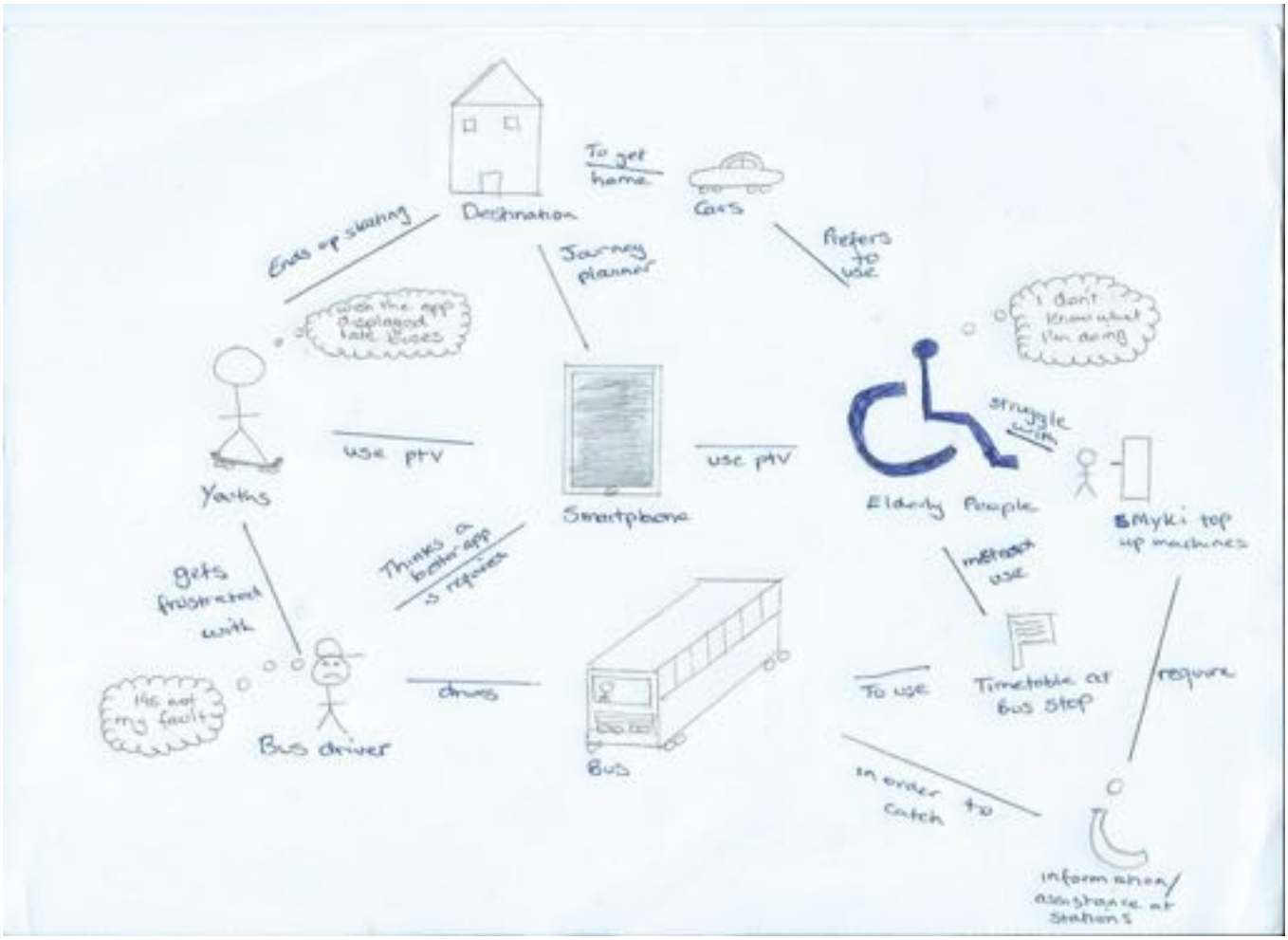
Common themes and observations

Most of our participants were students so they all use public transport regularly and have knowledge regarding transport smartphone applications. However they all have mixed opinions of its functionality. Some concerns included that there is no incorporation of the Myki card service on the application, and that an opportunity has been wasted to save commuters time with substandard topping up options currently available. Other issues with the transport applications include the ease of use, and some are worried about the ease of navigation, especially for older citizens. Resultantly some people refer to other avenues to plan their journeys, including not having a plan or resorting to drive alternatively.

To address many of the issues it would be suitable to design a new application that incorporated many of the current functions with a Myki design aspect. This would entice users to properly plan their journeys and improve the overall experience of using public transport.

4. Rich Picture

A Rich picture is a representation of ideas and issues around a centralised idea. Rich pictures are used to identify all of the components of a complex issue. They classify the key stakeholders, conflicts and common thoughts that they may share. In addition they help 'elicit and represent an understanding of problematic situations' (Ploderer, 2014). From the initial surveys, a picture to describe the users key issues with public transport has been devised and their associated issues and common themes that they experience on a day to day basis whilst using the public transport network.



The rich picture identifies the key stakeholders from the interview process which are the youths and a significant concern coming out of that stage was how elderly people cope with the advancements in technology. The rich picture demonstrates that it is impossible for elderly people to use public transport applications to plan their journey and they still require looking up timetables at stations and bus stops or having assistance. To suit an ageing populations needs, either more money needs to be spent on infrastructure to facilitate their needs or a more user friendly app is required that can be used by everyone. For younger people however they have a basic knowledge of how to navigate around applications but still have constant issues with some of the bugs that haunt the current system. To further encourage younger commuters to use the public transport system the application needs to provide a more efficient system with advanced options to improve the quality of the experience. If nothing is done a further reliance on other modes of transport will be enforced.

5. Persona

Steve

20 years old
Male
High School finished,
And currently studying first degree at Uni

CONTEXT

Steve lives with his family in Rosanna, a suburb that is approximately 12 km from the CBD of Melbourne. He has a part time job near his home and also attends University in the city during the week. Whilst on university holidays he tends to either work more or go on travel adventures.

To commute to and from university, and also to get to other activities in/around the city, he mainly uses public transport. An average trip to University will consist of a train from Rosanna to flinders street station and then a tram up Swanston. He does not own or have access to a car so this is really his only option. The Rosanna railway station is just on the border of zone 2, meaning he has to pay a higher ticket fee to use the train. He likes to plan his journey using his smartphone before getting to the train station, however after attempting to use the PTV application for a while and simply getting very frustrated with the interface he has started to just have a train timetable on hand to look at and then take his chances with the tram. Although this mostly works, there are occasionally problems such as timetable change, disruptions in service due to construction or trams being cancelled for parades. Steve is then often late for class, making him frustrated with public transport and stressed because his tutor might think he is lazy. He also never knows how much he is being charged for each trip because the only way to find out is during the 1 second touch off.

MOTIVATION

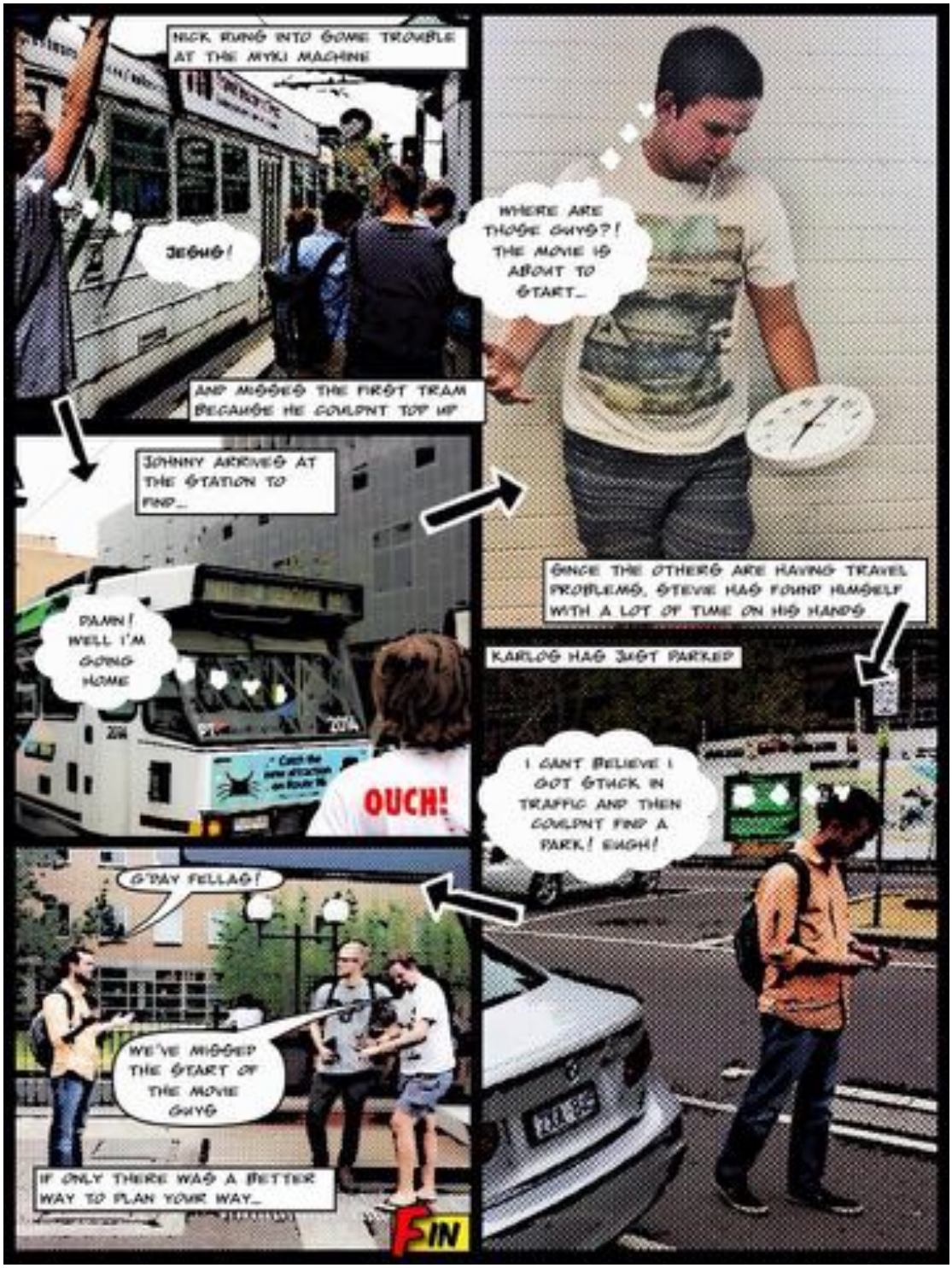
He expects to get to University on time when using public transport. He still gets quite frustrated with the current smartphone application. He desires a more functional/usable/ satisfying app to plan his journeys. Also would like to have an easy way of telling him how much each trip is going to cost whilst planning.

ATTITUDE

- Frustrated
- Treated Unfairly
- Cautious

6. Picture Scenario

Below is the picture scenario that was designed to outline the main issues that the smartphone application will address. The point of this exercise is to visualize the everyday activities that are encountered whilst using public transport and how problems arise in current circumstances. The group of friends wish to meet up for a movie and all use different transport processes.


NICK RUNS INTO SOME TROUBLE AT THE MYKI MACHINE
JESUS!
AND MISSES THE FIRST TRAM BECAUSE HE COULDN'T TOP UP
WHERE ARE THOSE GUYS?! THE MOVIE IS ABOUT TO START...
JOHNNY ARRIVES AT THE STATION TO FIND...
DAMN! WELL I'M GOING HOME
OUCH!
SINCE THE OTHERS ARE HAVING TRAVEL PROBLEMS, STEVE HAS FOUND HIMSELF WITH A LOT OF TIME ON HIS HANDS
KARLOS HAS JUST PARKED
I CANT BELIEVE I GOT STUCK IN TRAFFIC AND THEN COULDN'T FIND A PARK! UGH!
G'DAY FELLAS!
WE'VE MISSED THE START OF THE MOVIE GUYS
IF ONLY THERE WAS A BETTER WAY TO PLAN YOUR WAY...
FIN

7. Tasks

The following three tasks are acted out in the picture scenario, and are the three main features Transport Trevor will address.

Task 1	
Name: Journey planning	
Frequency: Every trip	
Significance: Journey planning determines route and form of transport, will determine whether you get to your destination on time	
Issues: Which form of transport to take? Are there bus/train/tram stations nearby? How much will the trip cost? What is the fastest route? When should I leave in order to arrive on time?	
Technology: Smartphone apps (e.g. PTV, train trapper), websites,	
User Actions	***Interface Feedback***
Step 1:Consult smartphone app/website in order to find a way to get to the desired destination	App will provide a way to plan a journey from point A to point B, will allow user to choose best train or tram to take in order to arrive at his/her destination on time, and with minimal fuss.
Step 2: Make a decision on the best route for the current situation. (E.g. Take the train leaving in 10 mins or drive because the smartphone app you have is simply too frustrating to use.	App will allow you to sort based on journey time, number of zones, etc.

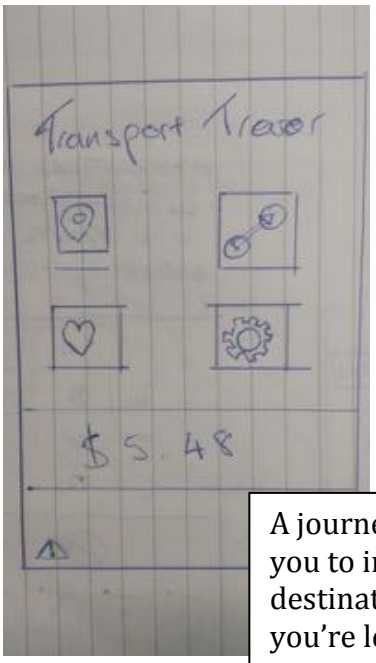
Task 2	
Name: Myki Account Management	
Frequency: Whenever Myki money/pass runs out to ensure valid ticket	
Significance: Payment must be made in order to travel	
Issues: Expensive, zone system frustrating to some, time-consuming process, confusing to less tech savvy people, pricing system confusing to some (i.e some people unsure what they are/should be charged)	
Technology: Myki ticket machine, located at all train stations, some tram stops	
User Actions	***Interface Feedback***
Step 1:Place card in machine	
Step 2: Navigate menu to either top up money or day passes	Myki Machines located at station often provide cause for confusion, many people are unsure how to top up properly, and as a result take a very long time, meaning other people often cannot top up in time
Step 3: Pay	App can feature myki top up system, allowing you to sync your myki and your debit card to the app, and allow quick and easy top ups on the go

Task 3	
Name: Dealing with disruptions	
Frequency: During trip/if transport is cancelled	
Significance: A cancelled tram or train can mean arriving to your destination on time, or possibly not at all, knowing ahead of time or being provided a way to get around disruptions is very important for people using public transport	
Issues: Does the app require internet connection? Wi-Fi support on trains? Data limits from phone carrier, how to alert user before disruption effects them, and provide a way around it.	
Technology: Smartphone app	
User Actions	***Interface Feedback***
Step 1: User runs into trouble while undertaking the journey, needs to replan a different route for whatever reason	N/A
Step 2: User consults smartphone app and re-reads steps or replans journey	User will be provided alerts and notifications about relevant disruptions to the journey already planned, or to "favourite"/most frequently used stations/routes.

8. Paper Prototype

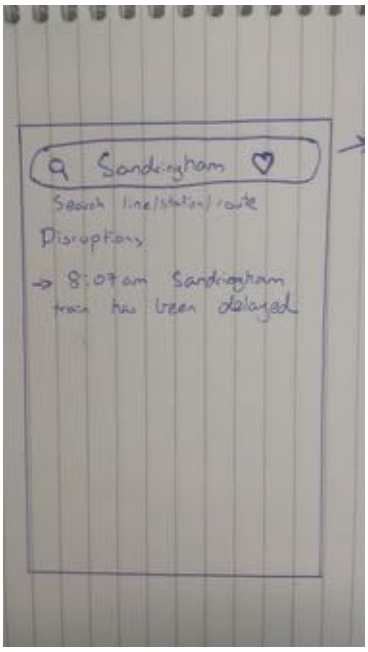
A Paper prototype allows the designer to put together a very rough draft of what the application may look like, and to analyze the tasks that the application will accomplish, to get a better understanding of the applications shortcomings, and provide recommendations to solve these shortcomings.

Journey Planning



A journey planner, allowing you to input your destination, the location you're leaving from, and options section allowing you to filter by transport type and certain features (e.g. wheelchair access)

Disruptions

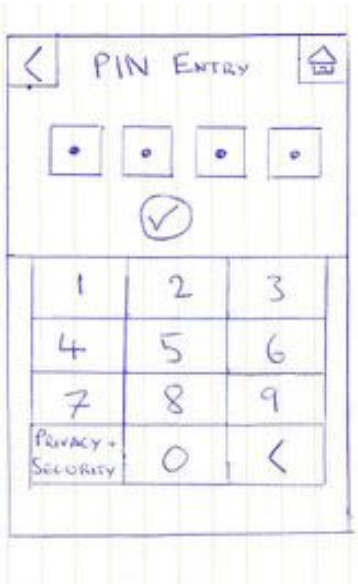


A disruptions section, which allows you to search the train station/bus route you plan on taking, and providing you with a list of cancellations/delays. Also providing the ability to 'favourite' certain stations for quick access in the future

Myki Account Management

Finally the Myki account management screen, which allows you to check your current balance, check you touch on/off history, and of course top up your myki.

Myki Continued



9. Cognitive Walkthrough

A cognitive walkthrough was performed using the paper prototype that was made, in which the three tasks journey planning, myki management and dealing with disruptions was acted out, in order to find errors and possible problems relating to using the application

Task name:	Myki Account Management			
Task Description:	Being able to view account balance and then top up myki money on phone (assuming credit card information is already saved)			
	Steps	*Will users know what to do?*	*Will the user see how to do it?*	*Will users understand from feedback whether the action was correct or not?*
step 1	Click on myki balance button	Yes, but possibly not the very first time. So slight learning curve.	The user knows what to do, because the access is right on the home screen. May need a prompt to make it more obvious	Yes, it leads directly to the myki page.
step 2	Navigate to topping up	Yes there's an obvious button	Yes.	Yes
step 3	Select either preset or custom amount	Yes, it is designed to be very similar to the ways of a myki machine so the user knew what to do. The amount was highlighted and then 'add' was pressed.	The user wanted to type in a preset $5 so this was quite easy due to there being a $5 button.	Yes
step 4	Enter pin for credit card information and confirm	Yes, the pin is similar to a banking app. If successful it asks "confirm now" which is an obvious option.	yes	Possibly not, it then directs you to the myki home page which displays the updated balance. May not be obvious if it worked.

Overview of Problems

	Problem *description of problem*	*Cause* *assumption about what causes problem*	*Severity*			*Response to problem* *What changes to `the design could be made to address the problem?*
			Scope *How many people are likely to experience the problem?*	*Frequency* *In how many tasks would the problem occur?*	*Impact* *Would the problem prevent critical tasks being completed?*	
1	Myki button on home page	Not obvious that the myki balance is in fact a button, that will lead to further features	Most (>50%)	One	If the user cannot identify the button, then the task would not be completed	Interactive walkthrough when first downloaded, and/or information icon in bottom of home page, which leads to a guide of the functions
2	Myki top up feedback	No direct confirmation that myki payment has been successful	Most (>50%)	One	No it would not prevent the task being completed; however it would lead to confusion.	Pop-up message confirming payment after returning to myki page

Task name:	Journey Planning			
Task Description:	The journey planner determines the route and mode of transport and will determine whether you get to your destination on time			
	Steps	*Will users know what to do?*	*Will the user see how to do it?*	*Will users understand from feedback whether the action was correct or not?*
step 1	Click on Journey Planner button on home page	Yes	Yes	Yes, it leads directly to the journey planner
step 2	Click the from link on the journey planner page	Yes, seems pretty self-explanatory	Yes, very clear	Yes, leads to a page where details are inputted and then leads back to the journey planner.
step 3	Click the to link on the journey planner page	Yes, seems pretty self-explanatory	Yes, very clear	Yes, leads to a page where details are inputted and then leads back to the journey planner.
Step 4	Click on the option link (optional) to select preferences for travel	Yes	Yes, however the user may not identify that this is an advanced option for those with other needs for travel	Yes, once the form is complete users will identify that the services they require are listed.
step 5	Input departure/arrival time	Seems pretty intuitive	Yes	Yes, the user will see the time displayed as the correct time that they wish to travel.
Step 6	Finalise the form by pressing the 'Go' button	Yes	Yes	Yes, pressing this leads to a page with services available

Overview of Problems						
	Problem *description of problem*	*Cause* *assumption about what causes problem*	*Severity*			*Response to problem* *What changes to `the design could be made to address the problem?*
			Scope *How many people are likely to experience the problem?*	*Frequency* *In how many tasks would the problem occur?*	*Impact* *Would the problem prevent critical tasks being completed?*	
1	Unclear identification of use for the option button	Not intuitive and not enough description	Most, unless they click the link	One	It can because people with special needs require specific services	Information icon at bottom of page to identify the functions of the option link

Task name:	Dealing with Disruptions			
Task Description:	Identifies disruptions so it can allow users to plan around potential issues.			
	Steps	*Will users know what to do?*	*Will the user see how to do it?*	*Will users understand from feedback whether the action was correct or not?*
step 1	Press the disruption/alert button on the homepage	Yes, most people can identify a hazard button	Yes	Yes, it leads to an adjoining page
step 2	Enter in the line/route/station of your choice to filter the disruptions accordingly	Yes, there's an obvious search button at the top of the page	Yes	Yes, if there is disruptions the filtered list will appear
step 3	Favourite list search to quickly identify disruptions	Yes, but may need to be prompted about whether to select a favourite or not	Yes	Yes, if the favourite is entered correctly it will appear in the disruptions page the next time it is entered.

Overview of Problems

	Problem *description of problem*	*Cause* *assumption about what causes problem*	*Severity*			*Response to problem* *What changes to `the design could be made to address the problem?*
			Scope *How many people are likely to experience the problem?*	*Frequency* *In how many tasks would the problem occur?*	*Impact* *Would the problem prevent critical tasks being completed?*	
1	Identifying the disruption link	Small, no description of the link and relies completely on the link	Less than 50%	Only when you're trying to identify disruptions	Yes, if you are unable to identify the icon as the disruption link	Information icon at bottom of homepage which identifies the function
2	'Favouriting'	Users can't identify that the heart will result in a favourite being generated	>80%	One	No impact, however its less convenient	Possible redesigning of favourite system

10. Findings and Recommendations

The interviews (found in section 3) revealed to us a glaring hole in the productivity in current popular public transport smartphone applications. This missing piece was the lack of Myki account management, via your smartphone, allowing you to check your balance and top up from your phone before you get to the station, and possibly miss a train because you don't have sufficient money on your Myki. Designing an application that could allow the management of the Myki, as well as allow you to plan your journey and check incoming transport timetables, became the goal.

The three tasks 'Transport Trevor' was designed to address was journey planning, Myki account management and dealing with disruptions. The cognitive walkthrough that was undertaken went through these three tasks using a paper prototype (Found in section 8) in order to establish the pros and cons of the current draft of the application.

In section 9 the cognitive walkthrough has been outlined in full detail and the problems arising from it can also be found in this section. The common theme regarding the issues related to the application involves unclear identification of the links and possible confusing arising from this. Some links to certain critical tasks such as the Myki management page and the disruption page, are unclear and have no prompt, instead relying on the intuition of the user in order to navigate the application successfully. Possible recommendations to fix this problem include the introduction of an information button located in the bottom corner of the page, which when pressed, would highlight the buttons on the current page, and describe their uses, or a quick walkthrough done when first using the application, in order to outline all the possible features.

Another problem that occurred during the cognitive walkthrough was the lack of feedback in order to confirm your Myki payment has been successful. The current form of the prototype simply returns you to the Myki management page, showing you an updated Myki balance; however it is possible that a more direct form of feedback is needed. A possible way to rectify this problem is once the payment is made and you have been returned to the Myki management page, the updated Myki balance will include a message, notifying you that your payment was indeed successful.

The last major problem encountered during the paper prototype was the 'favouriting' feature, utilized by the disruption page. In theory you would search your train line/bus route/tram line and a list of disruptions (If any) would appear, after searching this particular line you would then be able to favourite it by selecting the heart icon next to the line's name. The problem encountered with this was that the heart icon was not an intuitive step to take in order to select the line as a favourite line, the icon was simply confusing and the result from selecting the icon was unclear. In order to solve this problem the entire 'favouriting' system may need to be redesigned.

https://www.youtube.com/watch?v=8EWkt4w7qgU
- Link to video of cognitive walkthrough, focusing on the Myki management system.

11. References

1. Ploderer, B 2014, INFO30004 Usability Engineering, 2.2: Scenarios and tasks, lecture powerpoint slides, viewed April 4 2014,

2. Levy, M, 2012. Transport app rage sparks agency rethink. The Age, [Online]. May 3, Available at:http://www.theage.com.au/digital-life/smartphone-apps/transport-app-rage-sparks-agency-rethink-20120503-1y0rf.html (Accessed 06 May 2014).