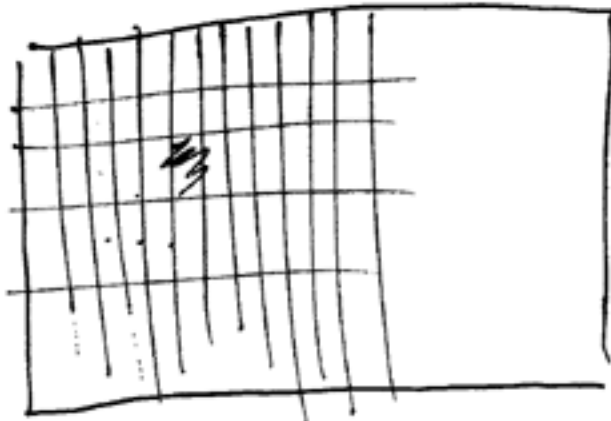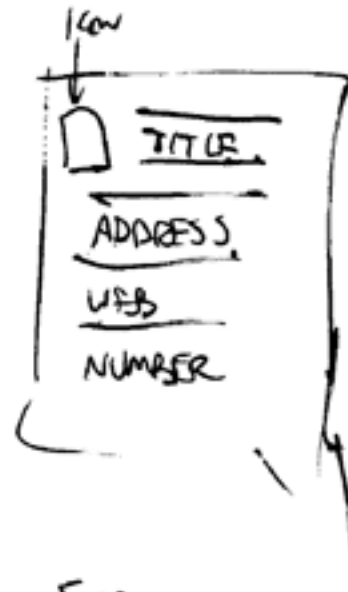Printer Linker - Redesign

USE A RELATIVE, NON SCALE MAP AS AN ALTERNATIVE.

" Everybody's looking at their phones when they're fucking dining" JW

RESOLVE OVERLAP ISSUE WITH ICONS

ICON

TITLE

ADDRESS

WEB

NUMBER

PRINT OUTS

WRITE EMAIL
90 ADDRESS AUDIENCE

Print Digital

Honours Exegesis

Domenico Mazza

Contents

Articulated Research

My Honours year research began with a three week task to update the look and feel of my service provider directory *Printer Linker*. The initial research question which initiated this task was "what can be done visually to make digital user interfaces more conducive to an intuitive and exciting experience"? I was mainly inspired by three things: Ted Nelson's dismissiveness of the, still modern idea of the *Graphical User Interface* developed by Xerox's PARC, Frank Chimero's philosophy that screens don't care what's on them, and an article by Mike Kruzeniski on how print design presents the future of digital design. In playing around with the visual elements of the then, version two, of *Printer Linker*, albeit, with some difficulty handling the mapping library software, I came to some conclusions as to how I could propose a better way of tackling this subject matter, by breaking some fundamental structures I had relied on. In engaging further with the literature I'd read, it'd become apparent the approach I'd stick with, is to ultimately take *Printer Linker* on a ground up journey, while also taking the opportunity to work on other web and application projects to build up my own technical and practical knowledge.

    The research question was updated to ask "in better understanding the context in which digital applications exist in relation to the user, how might a more exciting and intuitive visual experience for the user be derived"? This influenced a design methodology based on privileging what a user might want, instead of relying on established templates, or just putting a wrapper on things. The results are what I believe are better quality applications, influenced by what a visual designer has to offer, over a more technical thinker. Naturally, it all concludes with a proposition for more research.

    This chapter will cover the articulated research which guided this journey, and gave me a clearer idea of what this year's Honours research would produce, and the motivation behind it.

Literature Review

Many current day digital computer applications sit in an insular world that disregard the tried and tested experiences we're used to on printed surfaces, and don't wholly consider the relationship between the user and a software visual interface. This insularity perpetuates itself through tradition and exists in a misunderstanding of what should be achieved through digital media, and the role of the visual designer in the digital realm. Through my research I seek to ask: *In better understanding the context in which digital applications exist in relation to the user, how might a more exciting and intuitive visual experience for the user be derived?* This literature review serves to provide a more informed and critical stance to what I believe is the current situation, and what needs to be explored and done through design to create a more exciting and intuitive visual experience for users of digital computer applications.

A fundamental point to grasp is the interfaces we interact with on digital screens are a graphical abstraction of the underling set of instructions that are able to be performed by an application. Chimero (2013) suggests that interfaces act as visual metaphors for the user to grasp onto and understand, he utilises the familiar example of an icon to represent the trash bin. Most users are unbeknownst to the computer's file management system or directory structures, although are able to use the feature as its functionality and appearance matches the physical world's idea of a place to store and purge unwanted files. When we apply this idea across the board of digital applications we use day to day, we start to notice the knobs, buttons, switches, text boxes, folders and documents we see, frequently rely on a symbolic link to the physical world in order to translate and thereby understand information in the digital world. This notion of using the physical world to notate and explain the digital world, comes at a cost to the potential experience that can be gained via the screen.

The digital world is an infinite world, although we've defined and consequently limited it by the physical world—it provides an easy access point for users but at the cost of usability. Nelson (2007)
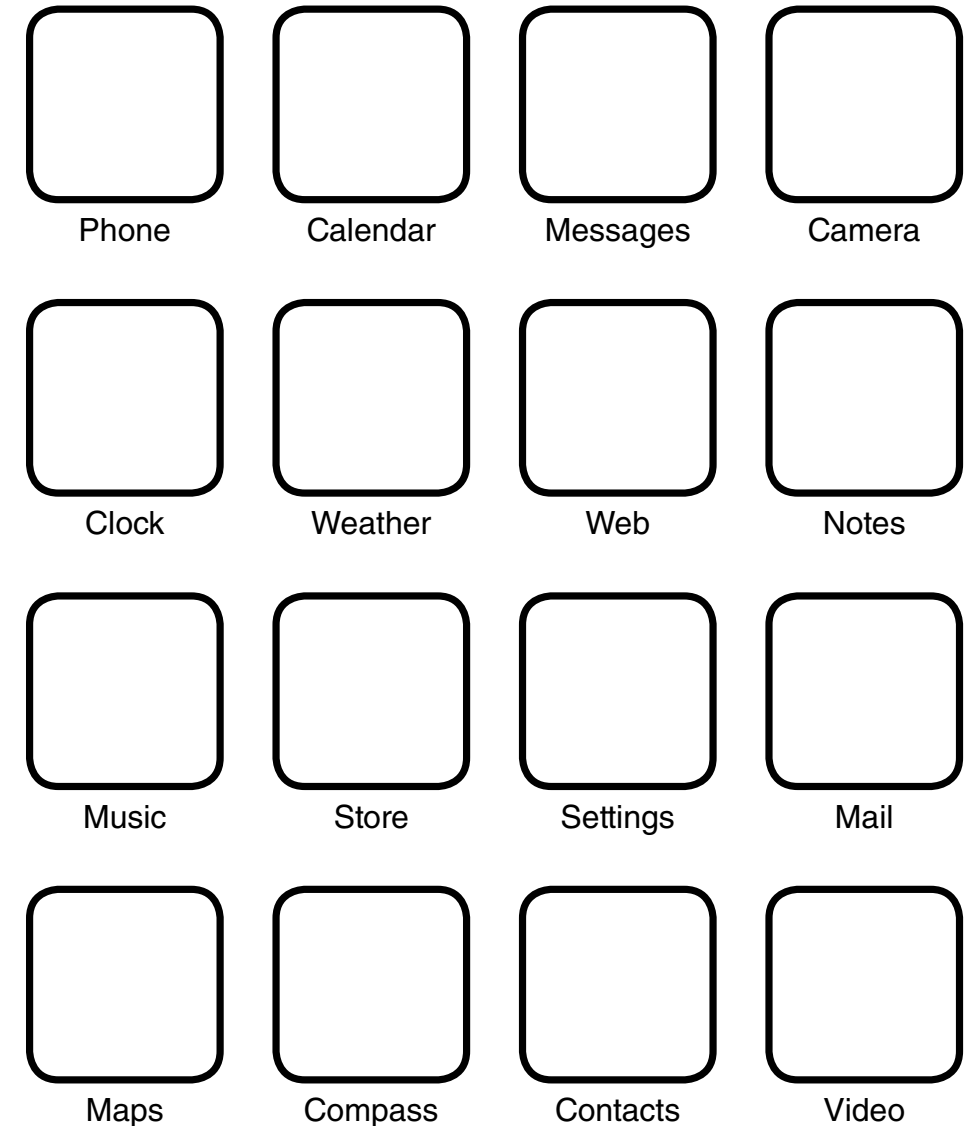

Fig.1: A typical *home screen* layout which presents a field of *apps*.

infers, the computer world has for a long time been fraught with misunderstandings of human thought and human life, where people behave as though everything is known through the imposition of inappropriate structures, through computer files and applications. He explains the hierarchal file structure we're used to today on computers, solidified by Unix in 1970 (the base operating system behind modern operating systems, Mac OS and Linux, and mobile derivatives iOS and Android), is directly derived from the past limitation of being only able to have sets of data and their filenames recorded into their own respective tape based storage mediums.[1] Adding, the *Graphical User Interface* (GUI) developed by Xerox's Palo Alto Research Centre which still lives on, in today's modern devices, is merely a wrapper over this antiquated system, locking us inside a paradigm.[2] While Nelson doesn't offer any direct solutions, he identifies the myopia inherent in continually aligning modern computer applications with old models of thought and suggests looking towards new and novel ways of displaying digital data. Furthermore, Nelson expressed these opinions before the boom of home screen centric interfaces, brought about by the rise of use in smartphone and tablet devices. While these modified interfaces don't allow interaction with a traditional filesystem, applications are folders and act as self-contained filesystems, see fig.1. This lends greater significance to Nelson's argument as it demonstrates how far ingrained this paradigm is. Perpetuating long standing system design traditions are enforcing a backward advancement for users.

Given our interaction with screen based interfaces is visual, the principles we apply, and sensitivities we have towards other visual media should inform the visual structure of the digital realm. Kruzeniski (2011) states in comparison to design on digital media, design for printed media has a rich history that's been shaped over several hundred years as both a functional and aesthetic discipline. More importantly he focuses on the adaption of print over time which has transitioned through advancements in technology, cultural movements and political shifts—in particular the *International Style* which rallied against the overuse of ornamentation, embellishment, illustrations, and decoration that was common prior to the 1950s,

adding it has taken a positive place in informing the design of modern minimal digital user interfaces.[3] While this describes print as a positive influence on the aesthetic of digital interfaces, there's also the functional side that needs to be translated over. Chimero argues to only lean on the aesthetics is a shallow answer to a deep question, and whether we choose to display flat and minimally or not, does not matter, as digital media, in a technical sense doesn't have a preference. The focus on how we present visuals is detracting from more important issues surrounding the design of digital structures. Attitudes towards print design fully understand the medium and what the user require from material to presentation.

Software visual interface design needs to be guided by understanding the problem space and context of the relationship between the user and the interface. Sharp et al. (2007) explain it can be tempting to initiate solving problems with interactive products by considering the interface before understanding the problem space. Understanding and conceptualising the current user experience on offer and how it can be improved or changed is imperative. In considering the dilemmas involved in following antiquated tradition and misunderstanding visual needs, with over preoccupation on visuality rather than what the screen is capable of, it becomes apparent the quality of user experience in this space is in dire need of refining. Fig.2 demonstrates an error screen on the latest version of Windows, Windows 8, it's a key example of misunderstanding the needs of the user involved in this scenario—it provides cumbersome ways out of the situation with the option of either clicking a relatively small back button or *try again* link, and is all together lost in a style that neither explains the situation the user is in, nor exploits the potential of the computer hardware it's on. If the experience on offer here were presented in print it would be subpar—excluding the links, this would be directly replicable in print. In situations of little appreciable difference, how does the digital medium meaningfully compete against print?

The work of specialised interaction designers shed some light on how we might go about using the digital medium to enforce more positive experiences in this space. Stanton (2013) through his PhD
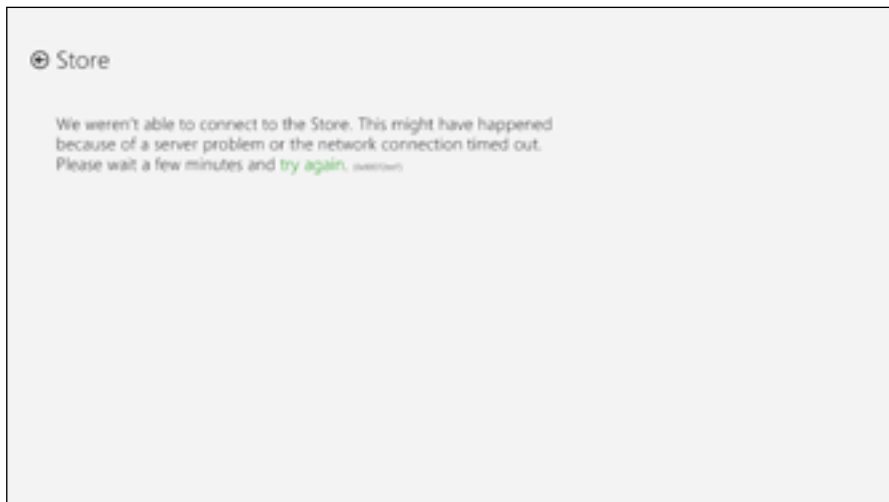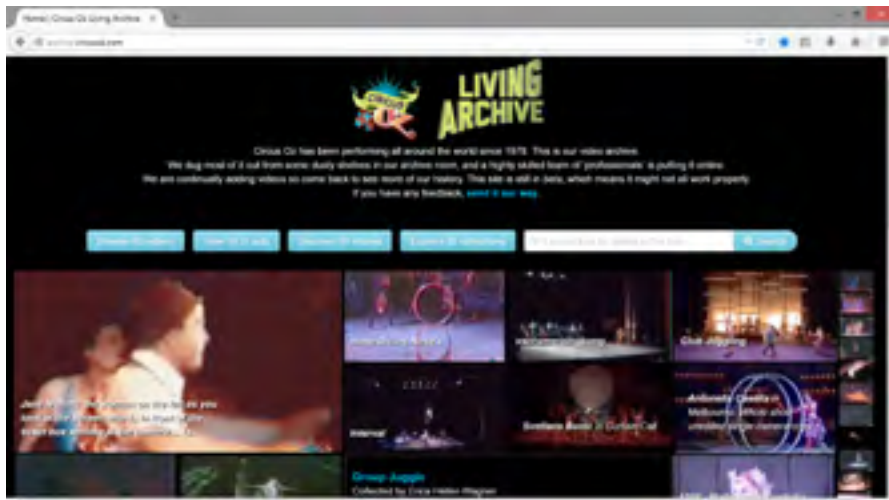
Fig.2: A Windows 8 store error screen.

Fig.3: A screenshot of the *Circus Oz Living Archive*.
View at http://archive.circusoz.com/

research is concerned about how the role of an interaction designer can play a part in presenting new, useful and engaging digital archives. *The Circus Oz Living Archive* website is one such product of his research, where he's pulled apart paradigms associated with contemporary performance archives by thinking about models of participatory technology.[4] The site, with home page shown in fig.3, is bespoke—its priority is to provide the content of a vast archive in a manner that's intuitive to work with for the user—alongside the search function, users instantly have a clearly defined set of options which allow for sorting of information to find a video, optionally, hovering over the thumbnails initiates a subtle sorting which highlights similar content such as other acts, performances or performers. This goes a long way in improving the user's intuitive experience by presenting data appropriate to the context and the dynamic medium it's on. Despite the greater amount of work required to make something bespoke, the reward of going against the grain of current paradigms is greater for the user.

A design oriented approach free of technical paradigms needs to reign in order to provide a better experience for the user. Hartson et al. (2012) describe a working situation where a group of interaction designers were stifled during initial development due to the unsupportive attitude of the software developer, citing there was no sense to develop ideas that could not be implemented. Hartson et al. suggest that while this may sound reasonable it is in fact not, as more iterations of an idea can be explored much more effectively and inexpensively than working on technical solutions first. This first-hand account of the dynamic within a development team lends to the thought that software out in the market suffers from proper creative exploration beneficial to end users. A greater awareness of the technical aspects behind applications on the visual designer's part seems a necessary skill to improve the quality of digital interfaces.

The visual designer needs to better connect with the digital medium to have greater influence in the space as is the case with other visual media. Lialina et al. (2009) suggest the domain of the digital should belong to the users rather than the inventors—rather than being relegated as content producers through social media and ad-click

generators. The derogatory relationship between the user and the interfaces termed as *user-friendly* or *user-oriented* consequently results in having a real lack of freedom in a space we creatively engage with. As our penmanship determines the level with which we interact with paper and the written word, our programming skills determine how we can interact with the screen and our interface with it.

The issues inherent with digital user interfaces today revolve around an idea of not fully understanding or tapping into the potential of what's available. Our only limit, is the limited ability to define the digital world conceptually and structurally beyond the physical. In seeking more intuitive and exciting experiences for users, we should find inspiration in creating applications in similar way to better established visual media we're confident in developing for audiences rather than relying on digital traditions.

Chimero, Frank, "What Screens Want", Frank Chimero, accessed 22 April 2014, http://frankchimero.com/talks/what-screens-want/transcript/.

Hartson, Rex and Pardha S. Pyla, *The UX Book: Process and guidelines for ensuring a quality user experience*, Massachusetts: Morgan Kaufmann, 2012.

Kruzeniski, Mike, "How Print Design is the Future of Interaction", Mike Kruzeniski, accessed 22 April 2014, http://kruzeniski.com/2011/how-print-design-is-the-future-of-interaction/.

Lialina, Olia and Dragan Espenschied, *Digital Folklore*, Stuttgart: Merz & Solitude, 2009.

photonhunter, "Ted Nelson on Pernicious Computer Traditions" (online video), accessed 22 April 2014, http://www.youtube.com/watch?v=zumdnl4EG14.

Sharp, Helen, Yvonne Rogers and Jenny Preece, *Interaction design: beyond human-computer interaction*, West Sussex: John Wiley & Sons Ltd, 2007.

Stanton, Reuben, "Research", Reuben Stanton's PhD, accessed 22 April 2014, http://phd.absentdesign.com/research.html.

1. photonhunter.
2. Ibid.
3. Kruzeniski.
4. Stanton.

Research Paper

Abstract

Through my research I seek to answer the question: *in better understanding the context in which digital applications exist in relation to the user, how might a more exciting and intuitive visual experience for the user be derived?* As a visual designer, this question positions me to look at a topic which is often handled by professionals that subscribe to less visual design ways of thinking, and attempt to shatter design patterns in this space which may result in overwhelming users. It's my contention that a digital application should be visually designed with the user in mind, first, over the capabilities of computer software, and attempt to present data in novel and relevant ways.

Given my own capabilities as a web developer and visual designer, my methodology revolves around re-developing my self-initiated service provider directory *Printer Linker* (fig.1), alongside developing website and application design projects commercially and academically. The projects encompass diverse digital interface models from the data driven, to the predominately visual, and tackle a variety of situations a user would face. The main outcome will be the third version of *Printer Linker (v3)*, fed by practical and technical experience gained from developing external projects.

The potential significance of this research would be to provide a portal as to how visual designers could tackle this medium in a more effective manner—similarly to how we confidently process and develop print media. For myself personally, it's my ambition the research will lead to a better understanding of the screen medium, and human interaction with these abstracted models.

Background

Research into this digital space began with an observation that long standing and proven print design traditions were not being carried over into the design of digital spaces. Kruzeniski (2011) highlights that
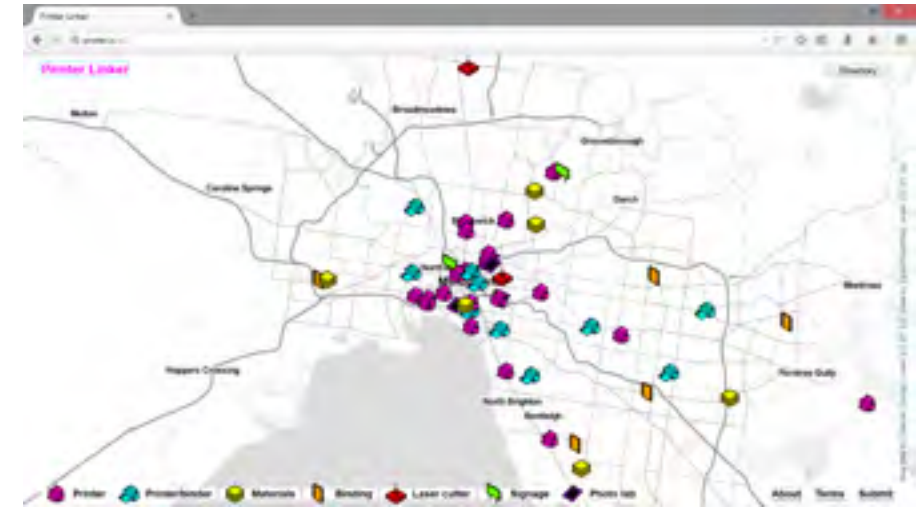

Fig.1: *Printer Linker v2.*
View at http://v2.printer.lc/

in our exploration of the differences between print and digital design, we've forgotten about the similarities across both realms for the requirement of clarity and simplicity in communication. Understanding the similarity formed the major part of my initial research question, focused entirely on tackling the visuality of digital space to improve its quality for the user. Further engagement with research material shifted my perspective and project ambitions, in turn reforming my research question to that of which I described in the abstract.

The formation of my literature review on this subject enhanced my research question by allowing me to clarify what the core design issues behind modern software visual interfaces are. These core issues are defined by an overemphasis on resolving trivial problems—such as the flattening of real life artefacts translated into digital space (skeuomorphs), perpetuation of long standing paradigms and traditions—in particular the foundational concept of the *Graphical User Interface* (GUI), and a drawing away of power from users forcibly positioned as content producers and revenue generators.

Fig.2.1: The operating system from the original 1984 Macintosh—Mac OS 1.
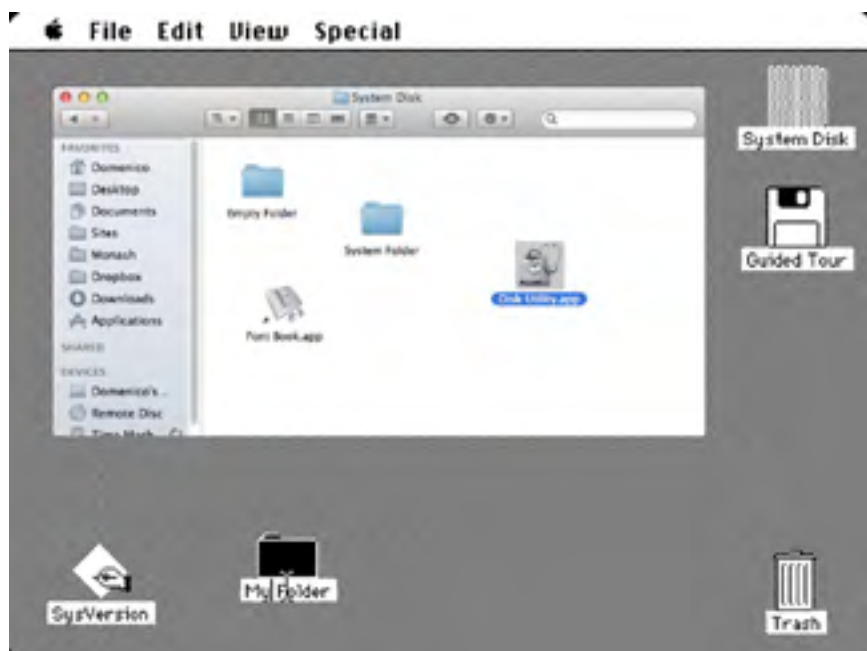

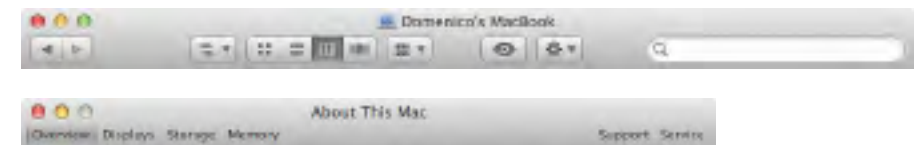Fig.2.2: Mac OS 10.7's Finder overlaid on Mac OS 1.

Fig.3.1: Mac OS 10.7's window interface elements.

Fig.3.2: Mac OS 10.10's window interface elements.

Chimero (2013) establishes that "a screen doesn't care what it shows any more than a sheet of paper cares what's printed on it". From the inception of interfaces on the screen, metaphors, such as the folder, files and trash bin have played a vital role in initiating new computer users to the data functions possible on a computer by relating them to familiar analogues—this is the basis of the GUI devised by Xerox's Palo Alto Research Centre in 1973.[1] The metaphors over time have morphed and expanded in number, based on technological trends and the increase in device functions available to users. As highlighted by Nelson (2007), the underlying structure remains the same to this day. Effectively, the focus for a sizeable amount of time has been placed on the wrapper. When we compare the old and new (fig.2.1 and 2.2) the lack of fundamental difference is abundantly clear, and perhaps most shockingly, modern interfaces have introduced further complexity through the addition of more icons and second level file structures through sidebars (fig.2.2). If we look at modern and upcoming operating systems, efforts are consistently based on visually flattening metaphors (fig.3.1 and 3.2), and avoiding the crux of the dilemma embedded in the concept of the GUI. To compound this, Lialina et al. (2009) suggest computer users are relegated as content producers through social media, and ad-click generators across the web. A focus on content and clicks encourages a negative digital culture which is visible through essential tools such as online maps

(fig.4.1) and search engines (fig.4.2). The overwhelming data removes power from, and doesn't care about the user—it encourages them to click on content that stands out for the purpose of generating revenue. The limitless potential of the screen is downplayed—seemingly there is no importance placed on reworking data structures to allow users to navigate fluidly and democratically.

Outcome

The outcomes of my research are website and application designs culminating towards the development of *Printer Linker v3*, a map based web application designed to help users find service providers related to the graphic design industry (fig.1). Website design allows an entry point into software visual interface design— as a considered web design calls for consideration of navigation, file handing and interoperability across different devices, similar to software applications outside the web. Sharp et al. (2007) explain, it can be tempting to initiate solving problems with interactive products by considering the interface before understanding the problem space. In response, the web designs produced will consider the users' interaction with the application, by understanding users' context and requirements.

   The design brief for the *Negative Press* website (fig.5) came with the requirement for a horizontally scrolling website. Typically documents within operating systems scroll vertically and web browsers follow suit. These conventions are easily forgotten and result in lacklustre results when attempting to break this grain. The *Negative Press* website contains two important, although easily missing features from typical horizontal scrolling websites—the website will accept vertical scrolling and translate it to horizontal scrolling, and on pages where there are multiple background images, the first and second images are scaled relative to the viewport (browser window) such that the first image covers the majority of the screen, and the second image peeks through. When users confront a horizontal scrolling website without these features, there's the strong possibility further content will not be accessed, as the
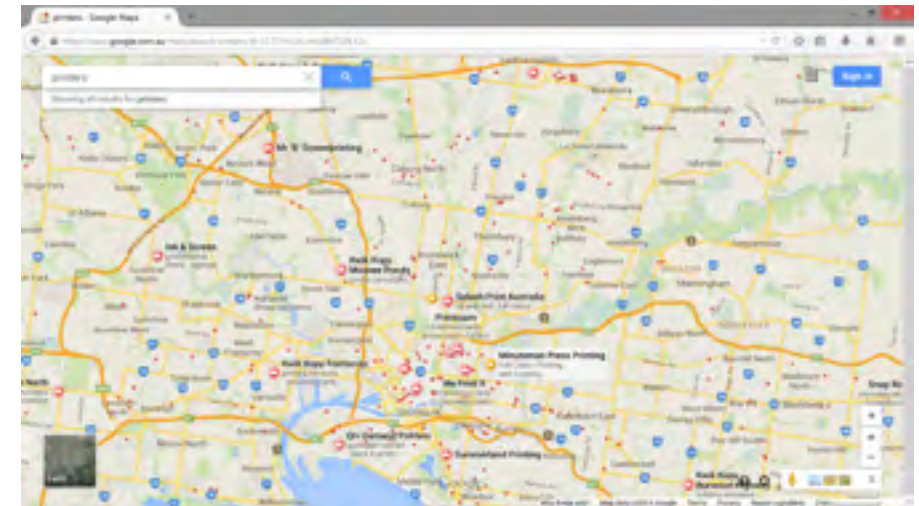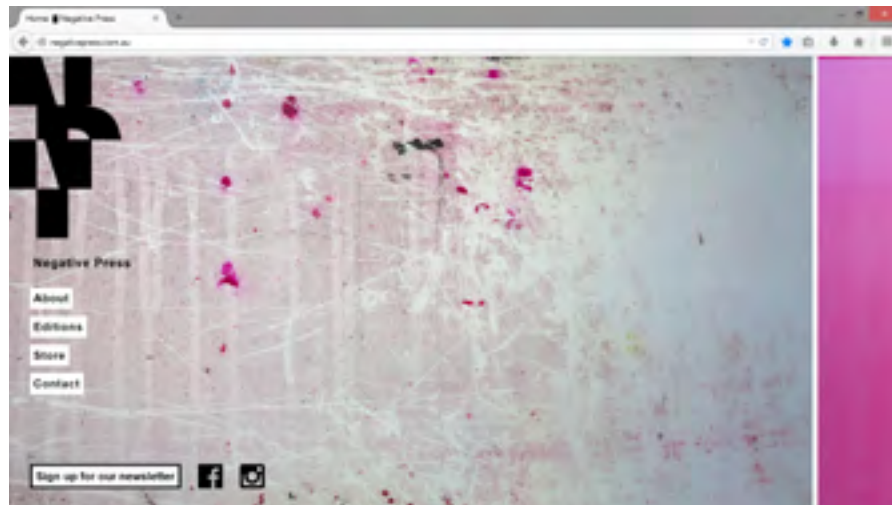

Fig.4.1: *Google Maps*.

Fig.4.2: *Google Search*.

Fig.5: The *Negative Press* website. View at http://negativepress.com.au

user may conclude scrolling is broken, or there is nothing more to scroll to. These design considerations fall on par with how a visual designer would intuitively not make text very small or very big for a given context such that an audience couldn't decipher the information presented.

The wireframe for *Printing the Archive* (fig.6) a proposed online screenprinting archive, in a similar fashion to the *Negative Press* website thoroughly considers navigation, although with emphasis on how a narrative can be intertwined to improve users' experience. To build a narrative, navigation elements are adapted contextually through colour and shape depending on the user's location within the site, for an intuitive sense of orientation. This begins at the first level (home page) where colour coding establishes individual screenprinting projects, clicking onto a project at this level expands the coloured project to the second level (project page), as if the user were engaging with a poster analogue to help solidify the experience in reality. Hovering on the sides reveals coloured bars that act as forward and back buttons between the projects, referencing the order on the home page projects and their individual colours. The system carries over to the third and final level (project work page) to navigate works. Simultaneously, the navigation at the topmost area of the site is dynamic, working as page titling on one side and *breadcrumb* navigation to the right.

The common thread between these supporting web designs for *Printer Linker* is a thought for what the user would require, and better suited novel models of navigation for data visualisation. In this way, these exercises are explorative models for considering and creating the intended final outcome.

Limitations

The limiting aspect of the design research conducted here rely on technical skill level. As a visual designer, my training has been focused on producing visual outcomes, with self-taught knowledge on web programming (HTML, CSS and basic JavaScript), reinforced through personal and professional practice in web design and development.

Printing the Archive   About

About   Printing the Archive

Project

OR

Project Work   Project
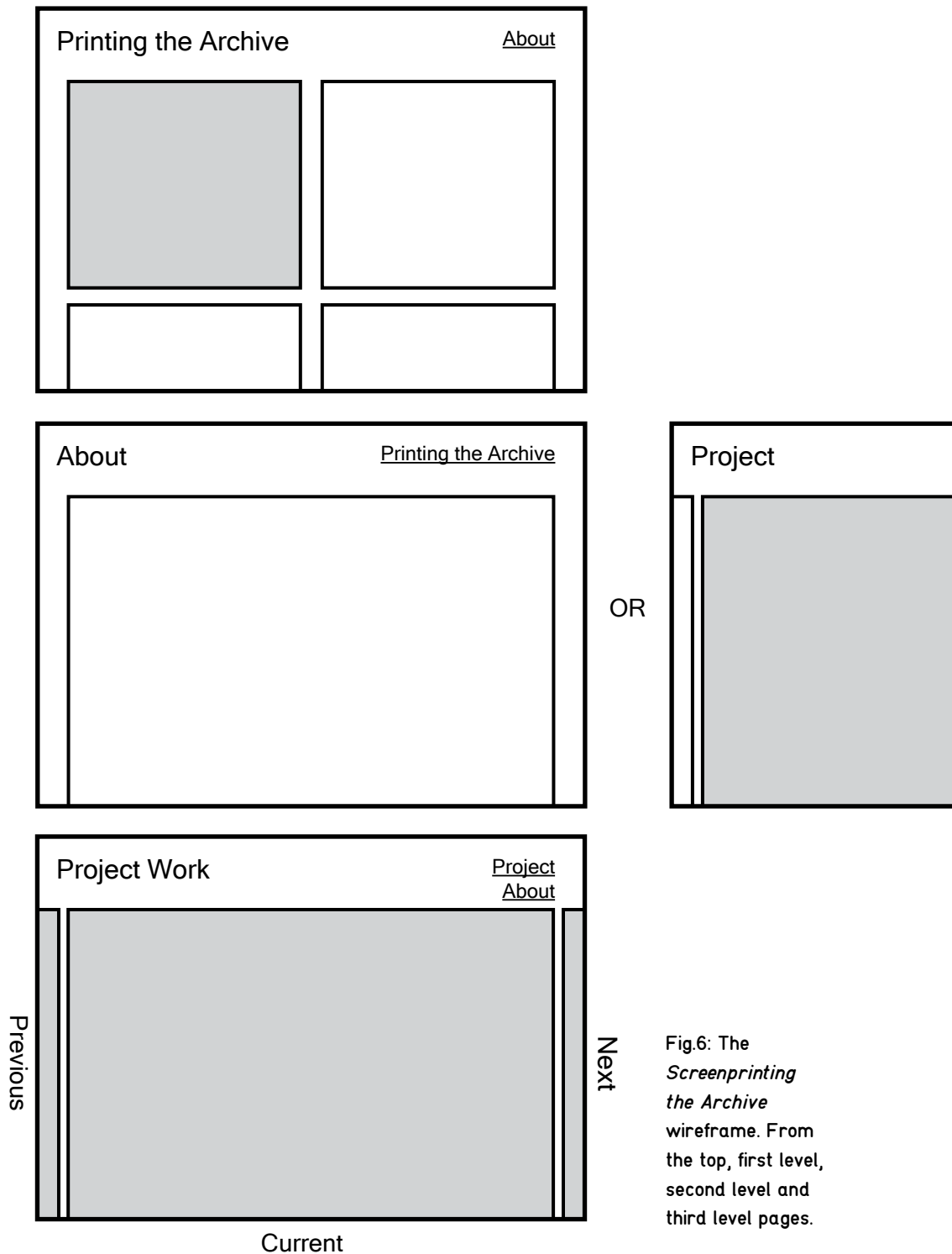About

Previous

Next

Current

Fig.6: The
*Screenprinting
the Archive*
wireframe. From
the top, first level,
second level and
third level pages.

This knowledge represents a maximum in regards to technical experience in constructing a software application. In spite of this, the difference today between web and software applications are marginal, and based more on software applications having more direct access to system resources than web applications sandboxed in web browsers.

In a research context, the limitation of being restricted to web design isn't necessarily limiting, in that by tradition the web is an open platform—most content is freely accessible and updates can be pushed out without intervention from the user. It's these qualities that make *Printer Linker* an ideal incubator to trial concepts on an already established audience, primarily Communication Design students at Monash University who have been introduced to the service by tutors since its inception in mid–2013. Already, observations from a tutor in regards to how students responded to *Printer Linker v2's* zooming function has directed the design for *Printer Linker v3* to negate the need to zoom or pan the map.

Furthermore, technical limitations in customising elements of the *OpenLayers* mapping library software which *Printer Linker v2* is built on, has encouraged investigating a customised method of laying out cartographic data. Investigation into mapping without a library reliant on GPS co-ordinates has, as a by–product, generated ideas resolving clarity issues. A wireframe of the intended layout system for *Printer Linker v3* (fig.7) supplants *OpenLayers'* rendition with a cleaner non–scaled layout which contains all the necessary data points positioned relative to the edges of the viewport using percentage co-ordinates. This pure HTML method, eliminates overlaps and data from being excluded from initial view, while still retaining scalability and the information relevant to the user.

The limitations outlined here do not inhibit the development of fundamental concepts—perhaps only their technical translation into digital space. Unlike a site which is limited to presentation of only images and text, the concept, utility and user base of *Printer Linker* provides an ideal playground for data visualisation concepts. Data visualisation could be considered the base of visual user interface design—data visualisation requires data to be translated
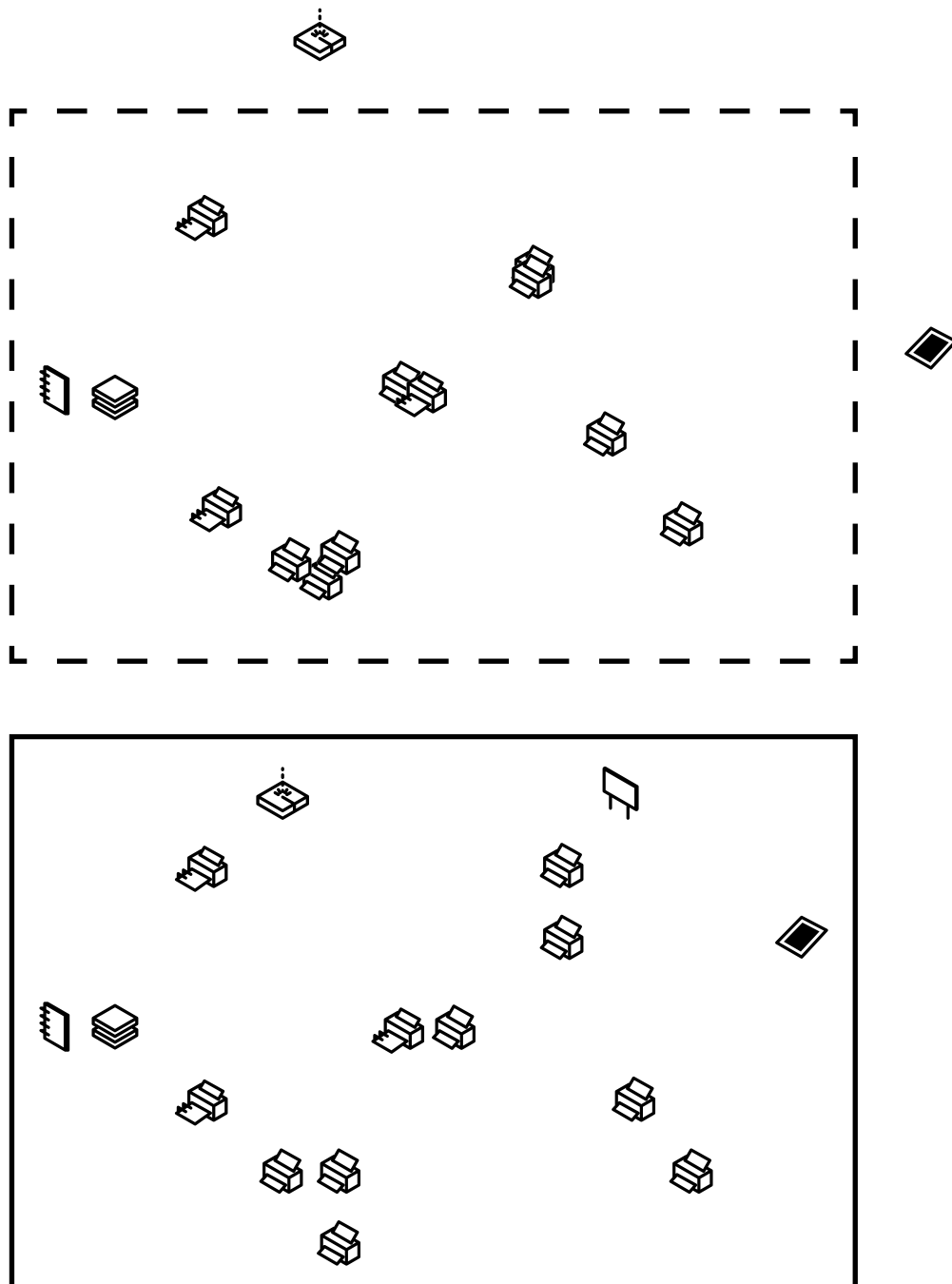
Fig.7: *Printer Linker v2* vs. *v3* layout system.
Compare http://v2.printer.lc/ and http://printer.lc

into considered visual forms, through visual interfaces, to allow humans to manipulate and interact with said data. *Printer Linker* provides metaphors in the form of colour coded icons to more easily locate data, this data is expandable and filterable through captions, alternate modes of view, and sorting, to allow for exploration and segmentation of data. In considering this capability, it can be confidently said that exploration in this space is as valid and worthy as exploration elsewhere within the digital realm.

Significance

The significance of this research relies on demonstrating how the skills we put into application as visual designers can be applied in the digital realm, for outcomes driven less by pushing overwhelming amounts of information. Visual designers work in a space where refined intuition and the parameters we learn about applying design elements—revolving around colour, shape and typography, and design principles—revolving around harmony and hierarchy, dictate considered and successful outcomes. In the digital realm, visual design is the slave to data, and consequently interfaces suffer at the lack of intuitive navigation around this information. Where screens should be taken advantage of, they're not—this is evidenced by traditions of small typography and graphic elements, such that we see in typical menu navigation, or places where almost every function available is shown.

Visual designers primarily create work which is processed by audiences quite quickly, whether it's on a supermarket shelf or a billboard, these contexts require particular consideration in clarity of communication to drive a point to an audience, either limited by attention span, physical distance, or time. The digital space can be somewhat luxurious—given the screen can be a more intimate and personal place, users more often than not will interact with a digital application for a prolonged period of time. This allows more time for a user to learn their digital space. Detrimentally, this is taken advantage of when clarity is sacrificed in pushing data or functions, and it rests on the user to spend more time to process what they're

looking at. It's my contention that where visual designers succeed at clear communication, these problems can be solved.

In developing *Printer Linker* and the exercises which support its development, I aim to demonstrate how a visual designer working in the digital realm could produce better solutions, simply by applying existent skills from training and considering what a user would want from an application. This research attempts to be unique in that it challenges traditional methods of interaction by challenging frameworks, for instance, consideration of non-scaled maps and contextual navigation driven by narrative. At the core of *Printer Linker* are ideas surrounding data visualisation, and how it can potentially be extrapolated out into other interesting and relevant regions. With this food for thought, it's the ambition of the research to generate a discourse about looking at application design from a data visualisation perspective, and potentially invite more practitioners to inquire into the space and contribute their own ideas without trepidation.

Qualitative analysis of peoples' interaction between using *Printer Linker v2* and *Printer Linker v3* could provide further insights into the effects of the new design considerations, and shine light on the validity of the methods conducted and outcomes presented through this research.

Statement on Method

This research encapsulates research for, through and about software application design. The research question, alongside the chosen methodology simultaneously questions how we should go about creating a better digital application, by creating more considered outcomes, and all through tackling current design issues, or paradigms existent in the digital realm. By questioning and investigating different models for navigating and displaying information through web design projects, and pairing this with qualitative analysis, we can gain a better understanding of what is most effective for the rendition and function of digital screen based interfaces. This is all conducted through a variety of projects leading towards the ultimate

re-design of *Printer Linker*. The impetus, is formal and observational research based on how and why current software applications are lacking, and how visual designers could resolve this.

The importance of undertaking various projects and questioning different models relies on gaining a cross section of resolvable areas in digital screen based user interface design, and thusly a greater understanding of the problem space, rather than working on one specific area—for instance, the effectivity of non-scaled map data point positioning. In consultation with clients and/or supervising tutors, each project receives feedback before reaching the public. In a research context this grounds the work in the reality of professional briefs, and also in the realm of experimentation and dynamic briefs. This results in outcomes striking an ideal balance—not necessarily relegating work conducted to that of the conceptual or of the real world, but both. In the context of aiming to generate discourse, this is imperative.

Qualitative analysis will play an important part in gaining precise information about what works and doesn't work, for instance teacher feedback from students unable to instantly engage with the zoom function of *Printer Linker v2*. A formalised process of qualitative analysis, for instance, on *Printer Linker v3* pertaining to the speed of finding a particular provider on the map in comparison to *Printer Linker v2* from problem zones (involving overlap and out of viewport data points), would provide definitive answers to the success or failure of revised or new features. Qualitative analysis is also practical within the time frame of the research project and will provide a greater return on investment than quantitative data which will require a substantial amount of time to accumulate and process, to ultimately provide very specific insights about the user base, which are of relatively insignificant research value.

Crucially, research is predominately self-guided. Observation about the current state of design in the digital realm in regards to the objectives defined in the research question, inform the outcomes. By identifying issues empirically (through observation), the process of making and testing is fluid, experimental, and importantly original—a reflective approach that is a true extension of my creative process. A

comparative explanation would be best defined by Microsoft's revision and re-introduction of the start menu. Windows 8 was best defined by its removal of the well-established expandable start menu. The old pop-up start menu epitomises the GUI paradigm, and its removal was refreshing in that it supplanted trawling through a list, for instead navigating a screen filled with squares in a user customisable layout. Whilst being a better solution from a design perspective, it suffered at the backlash of users who'd grown accustomed to the older start menu system. At the detriment of losing revenue from its original design decision, Microsoft has reverted to implementing a hybrid new/old start menu in its next major Windows update (fig.8). Considering this, *Printer Linker*, the container for the overall research project, a live real world outcome, is owned and operated by myself, allowing complete control over all aspects of design, implementation and management.

Within this research, generating outcomes begins by analysing the problem space. The planning of a web design begins with understanding the content which needs to be shown, and the expectation with which the user should deal or interact with the content. Following one of the main directives from the research question, thinking from the users' perspective is placed first. In the case of the *Negative Press* website (fig.5) navigation is unobtrusive while maintaining a certain clarity in communicating the main areas of the site which are navigable. Simultaneously consideration is placed on how visual and textual content co-operates with the navigation that sits statically on top. Alternately, in the case of the *Printing the Archive* wireframe (fig.6) the content structure is a rigid and consistent series of projects which will increase in number over time, followed by works within those projects, so navigation relies on establishing a narrative of looking at posters with as many links as possible between projects and works. The bespoke nature of these outcomes directly tackles the breaking down of paradigms, such as standard dropdown or horizontal bar menus.

Considering designs and contexts outside of those directly related to *Printer Linker* inhibits the myopia inherent with focusing directly on one project. By being able to explore the successes and failures
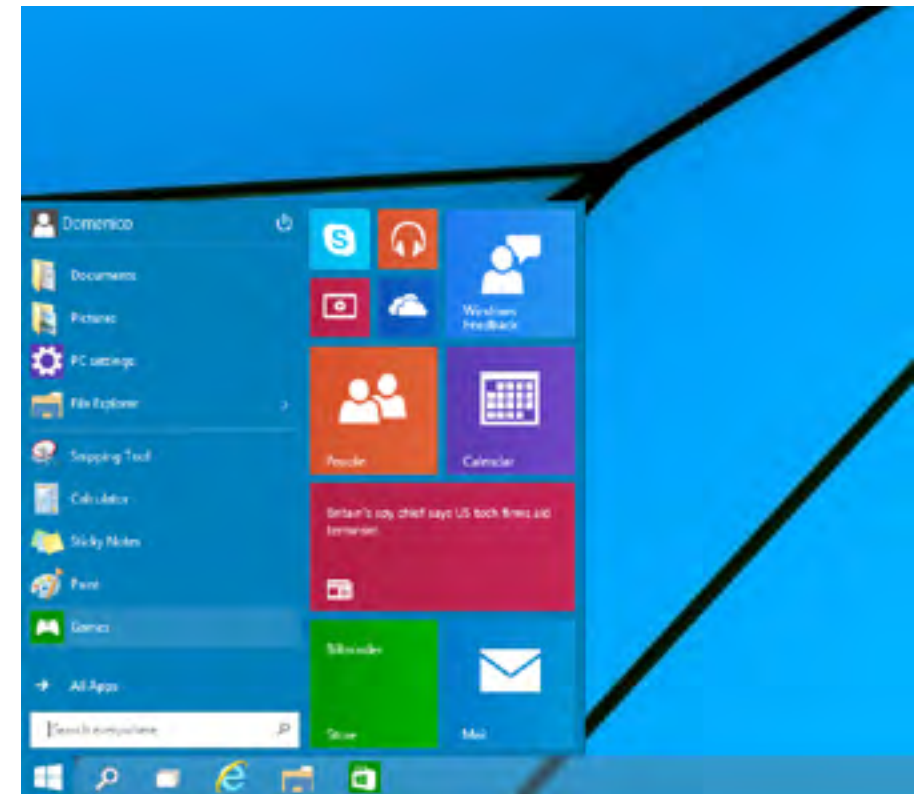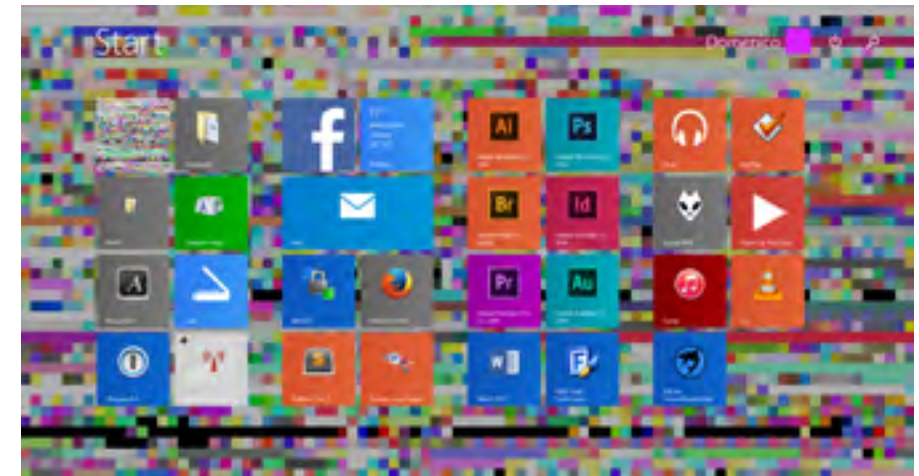

Fig.8: The Windows 8 start menu (top) and Windows 10 hybrid start menu (bottom).

of other web outcomes, and dealing within different contexts, fine tunes the process of designing and building websites, where it'd be otherwise required to constantly re-design *Printer Linker* to gain the same experience. The thought processes in these other spaces also contributes to generating new ideas for *Printer Linker*, in particular thoughts about contextual navigation devised in the *Printing the Archive* wireframe (fig.6) inspire ways in which caption information for data points could expand outside of the conventional pop-up bubble.

Choosing web design as a means to explore concepts and outcomes towards improved digital screen based user interfaces, provides a space for explorative play and rapid prototyping. The Stacey flat file web content management system (CMS) behind the sites generated for this project has a small technical footprint by substituting the conventional need for a backend database setup with text files instead, and is easily customisable allowing for unlimited data variables and tying variables to media. Uninhibited by the technical aspects of adding data and content to a website results in the focus going towards generating, developing and playing with a variety of application concepts. Choosing this wed design as a means for exploration also allows me to leverage the audience and design freedom that's possible by utilising *Printer Linker* as a research platform.

Conclusion

In summation, delving into the realm of digital screen based user interface design from the perspective of a visual designer looking to generate outcomes which consider the context between user and application is a refreshing outlook, in a realm better defined by abiding by antiquated structures and implementing banal wrappers. In relation to other visual communication design research, the research conducted here applies experimental design and research led methods in a specialist digital realm to demonstrate how thinking as a visual designer could incite change in this far removed, although closely related space. The outcomes of this research should demonstrate the close link in thinking which exists between traditional visual design, and working on fundamental interface elements which make up applications. Perhaps this could lead to demonstrating this as a more successful approach to design in this space, than that offered by specialists focused on building backend functions. Hopefully paving a way for a greater symbiosis between visual and technical thinkers, in producing outcomes in the digital realm.

1. Mike Kruzeniski, "How Print Design is the Future of Interaction", Mike Kruzeniski, accessed 22 April 2014, http://kruzeniski.com/2011/how-print-design-is-the-future-of-interaction/

Chimero, Frank, "What Screens Want", Frank Chimero, accessed 22 April 2014,
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Lialina, Olia and Dragan Espenschied, *Digital Folklore*,
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photonhunter, "Ted Nelson on Pernicious Computer Traditions" (online video),
accessed 22 April 2014, http://www.youtube.com/watch?v=zumdnl4EG14.

Sharp, Helen, Yvonne Rogers and Jenny Preece, *Interaction design: beyond human–
computer interaction*, West Sussex: John Wiley & Sons Ltd, 2007.

Printer Linker Poster (2014)
Screenprint on Strathmore Premium Super Smooth 176gsm
50.8 × 66 cm

Practical Research

Reflecting on the outcomes I've worked on and produced this year, I wouldn't believe someone if they told me I could have made *Printer Linker* without the backing of external projects. Not to mention, I wouldn't have the ability to tackle issues in the digital realm without first working on a <u>relatively</u> simple data visualisation outcome like *Printer Linker v3*. This works in contrast to my initial view that I could use Printer Linker as a warm up, and work from there— *Printer Linker v3* took a year. Working in digital space presents more variables and considerations to deal with in producing outcomes— mainly to do with the nature of producing an interactive and scalable product as opposed to a static and fixed product.

    The projects I'll document in this chapter will provide insight into how *Printer Linker* was part of a loop fed by, and also feeding other projects, technically and conceptually. Concluding with a guide through *Printer Linker v3*.

Negative Press Website
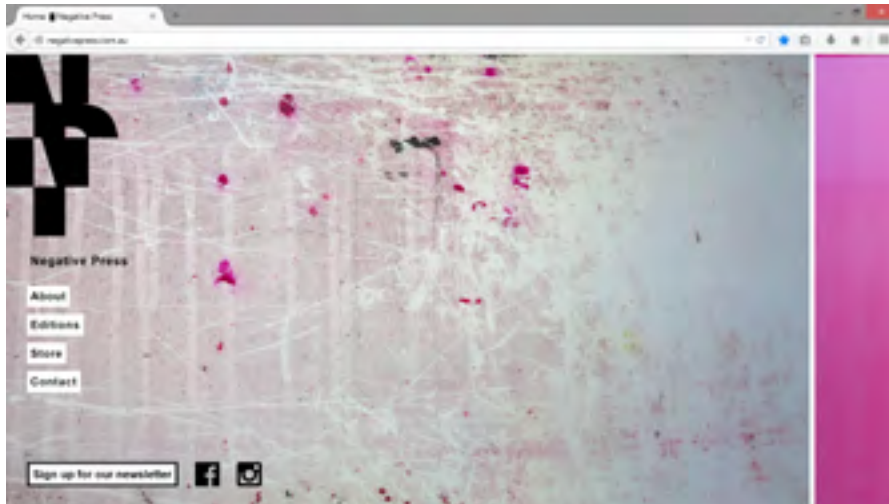
The *Negative Press* website build was quite unique in the need for it to scroll sideways—defying, traditional horizontal scrolling. This project presented an opportunity to explore what a good user experience should consist of—it would have been quite simple to do the reverse in this situation.

A fair amount of consideration went into the presentation of, and interaction with the side scrolling interface—where images fill the whole screen, and where there is more content to show, it was essential to let part of the next image show, to encourage scrolling (shown top left). Additionally both vertical and horizontal scrolling actions register as horizontal scrolling actions, to avoid users having false ideas about scrolling not functioning.

There was also the opprtunity to devise a non-obtrusive social media menu (shown above) which responded, based on the user's interaction with the menu.

While the design brief was straightforward, design considerations in this space inspired some of the ways *Printer Linker* deals with ensuring users interact (continuity) and page content scaling (fluidity).
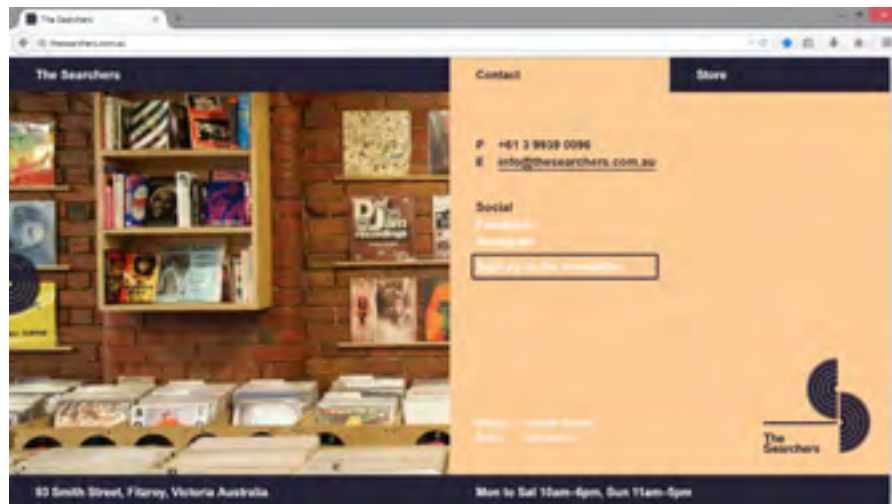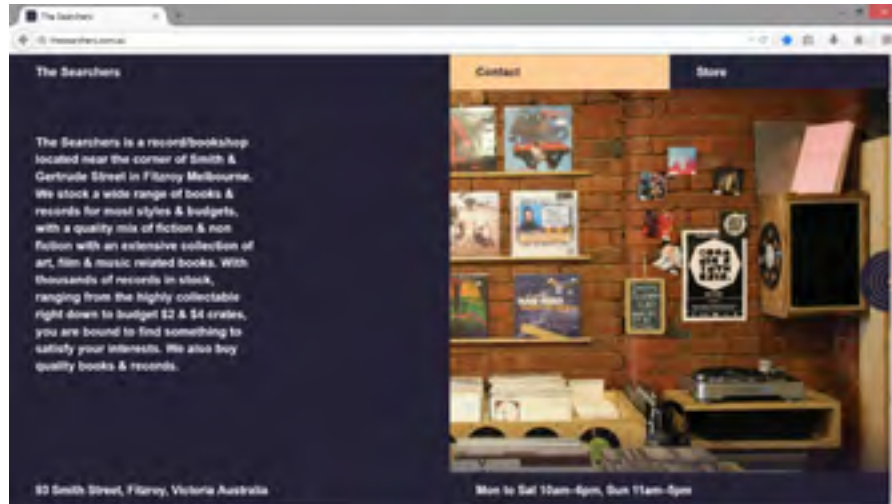
The Searchers Website

Where the *Negative Press* website was a focal point for interaction design, and ensuring it wasn't hampered by the unusual scrolling, *The Searchers* website, designed by Hayden Daniel, provided the opportunity to delve into more technical aspects of web design.

The Searchers website design features minimal graphics and was a ripe opportunity to explore the use of Scalable Vector Graphics (SVG) graphics instead of traditional raster graphics (JPG, PNG, GIF, etc.). Having used SVG in the past on a larger scale with little success, use of SVG for navigation buttons and a brand mark (shown left) proved fruitful. Success here, guided the experimentation of, and use of SVG for all the icons rendered on *Printer Linker v3*. Vector graphics are considerably faster to load, although importantly, with the rise of use in high pixel density displays, vectors will scale and render sharply on any display.

Also the code used to expand and contract the 'about' box (shown top left) and 'contact' box (shown bottom left) is lighter than the similar code used on *Printer Linker v2*.

Amongst the technical knowledge gained, there was the opportunity to implement a newsletter signup form similar to the *Negative Press* website. This implementation better guides the user on what to do, by asking users to enter an email address when the field is focused on.

Accordion
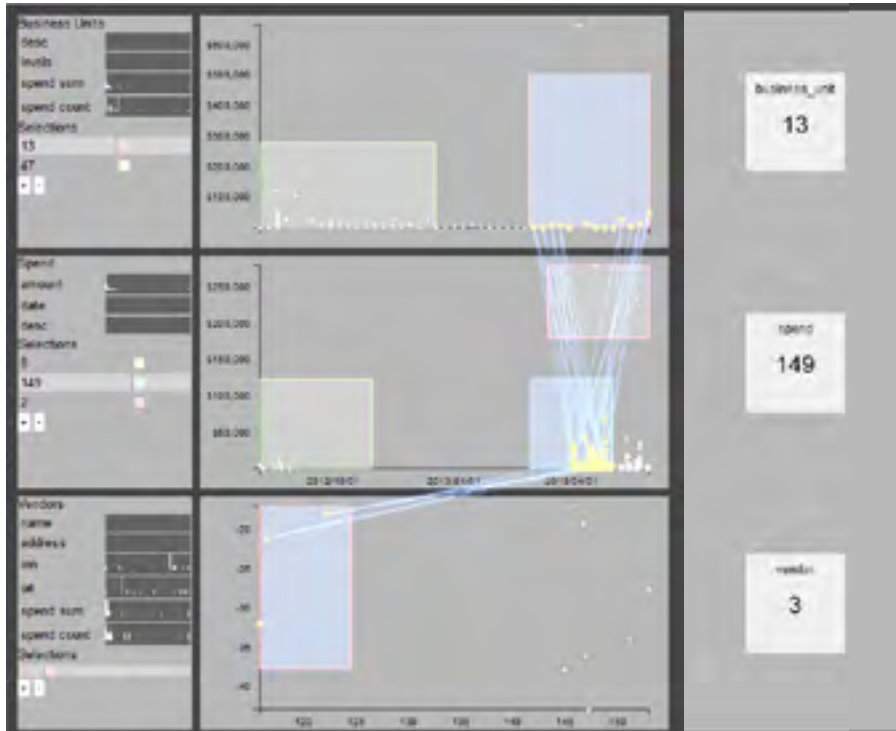
Accordion, under development by Tim Dwyer and James Manley as part of the *Monash Immersive Analytics* initiative, provided the opportunity to imagine a software interface for a complex, large touchscreen targeted, data visualisation application.

Over a four week period I developed a series of wireframes which picked apart and reconstructed an early version of the application (shown above). The application, in this instance contains transaction data from a large corporation, documenting relationships between particular units of the company in terms of their expenditure with external businesses. It's able to pinpoint patterns which would be useful for a company to know. Streamlining the design and improving the ability to manipulate data selections was paramount. The wireframes (section, shown above) achieved this by considering from the ground up, the purpose of the application and the types of scenarios involved in interacting with the application. In the section shown, we can already see clear seperations between data sets, and inefficiencies such as clusters of small lines transformed into more useful representations able to be interacted with in their own right.
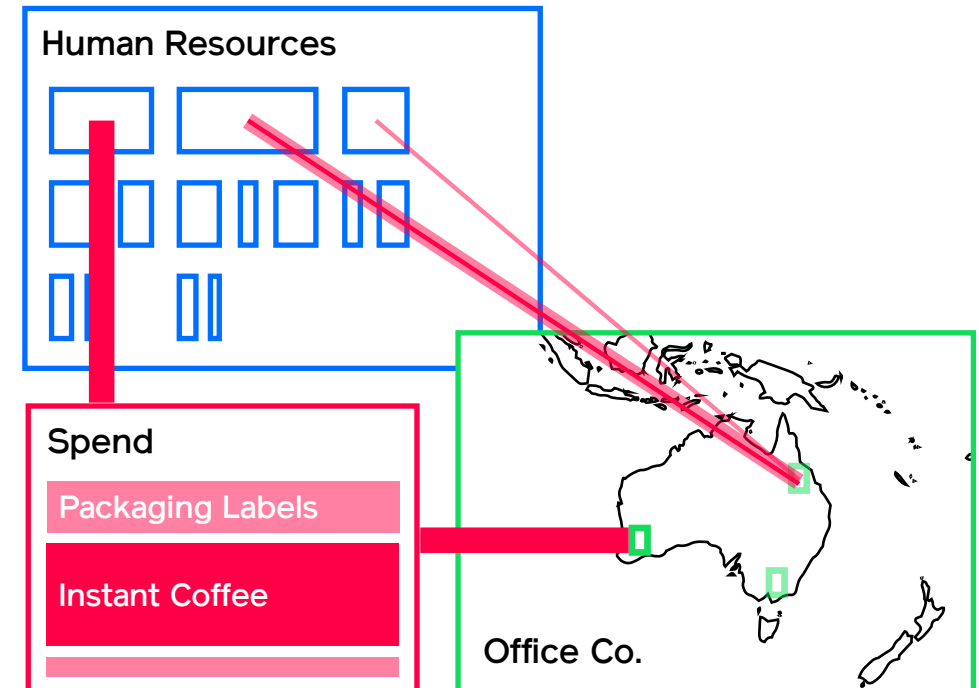
Vendor Map

Map Overlay

Longitude

Vendor List

Heat Map Overlay

Spend Sum

Spend Count

Latitude

Vendor 1

Vendor 2

Vendor 3

Spend Amount

HR Helpdesk

Business Units

Spend

Spend Count

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

Time (weeks)
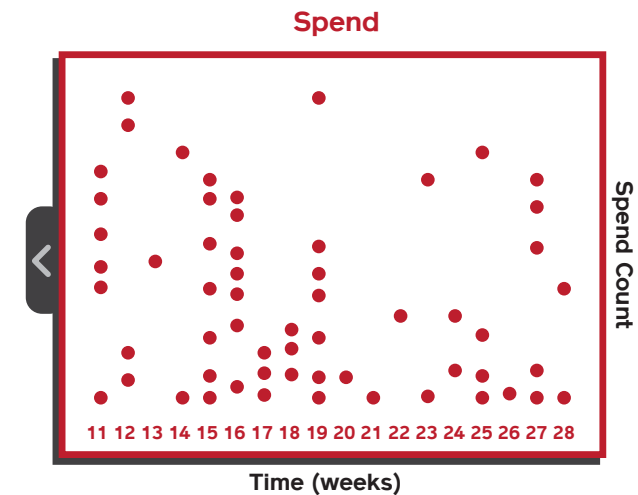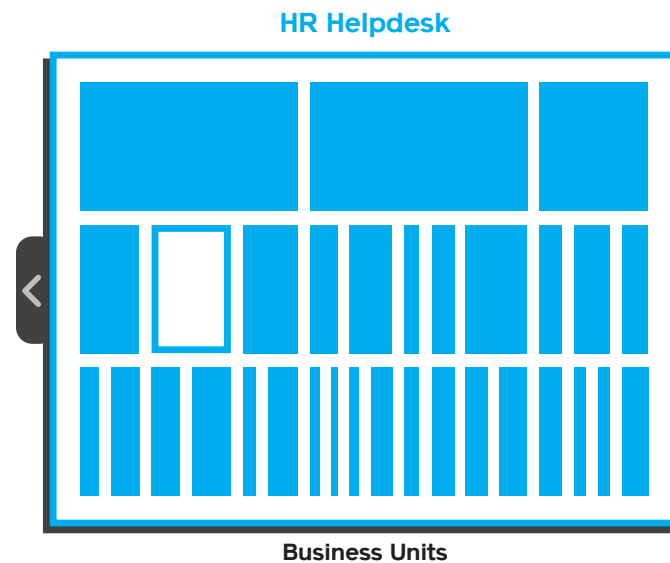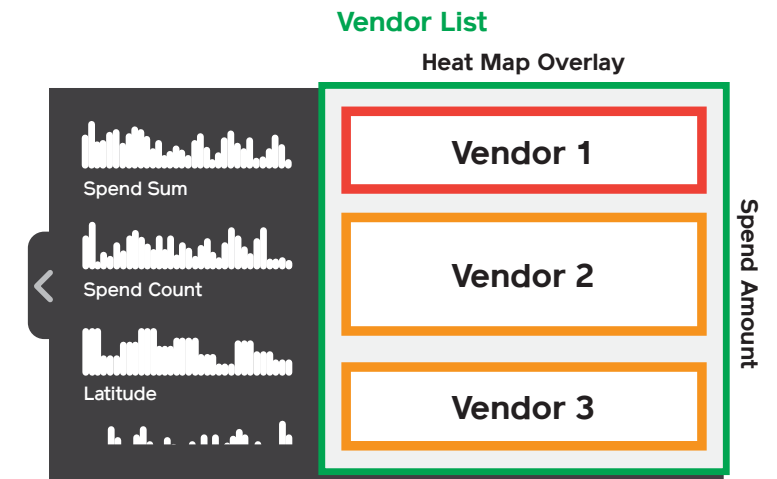
A finalised presentation of the complete wireframe (shown here) compared with the original program (shown on p.42) is a flexible layout, where windows can be brought up via a search function (shown bottom right). A slide out menu (shown top right) acts as an extra data view and options panel for adjusting the data shown in the window.

| HR Helpdesk | Spend | Vendor Map |
| Vendor List |
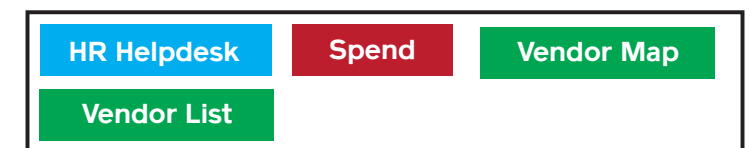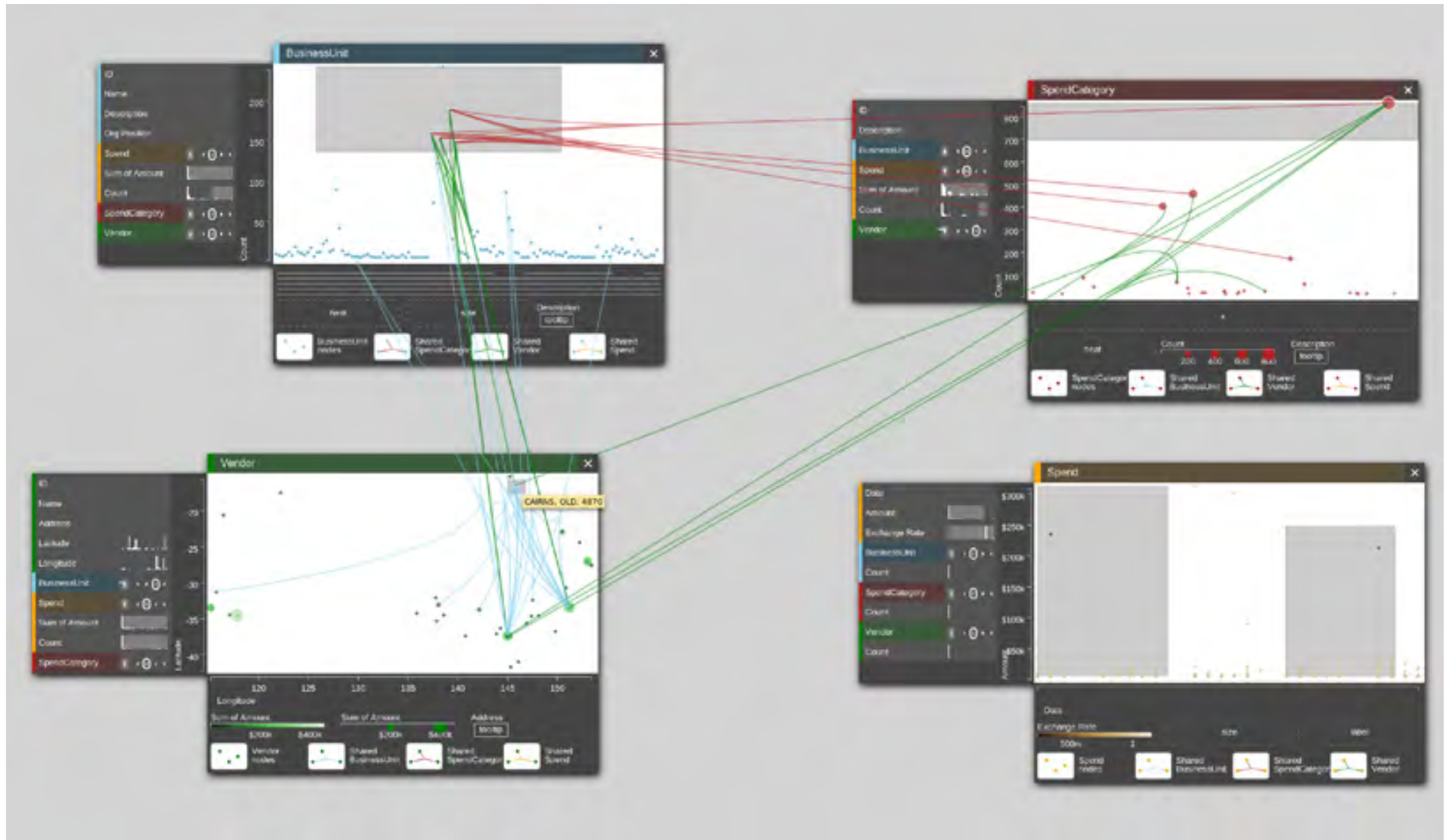
This development screenshot shows part of the wireframe implemented on the application. The flexible design would allow the application to parse other datasets in the future.
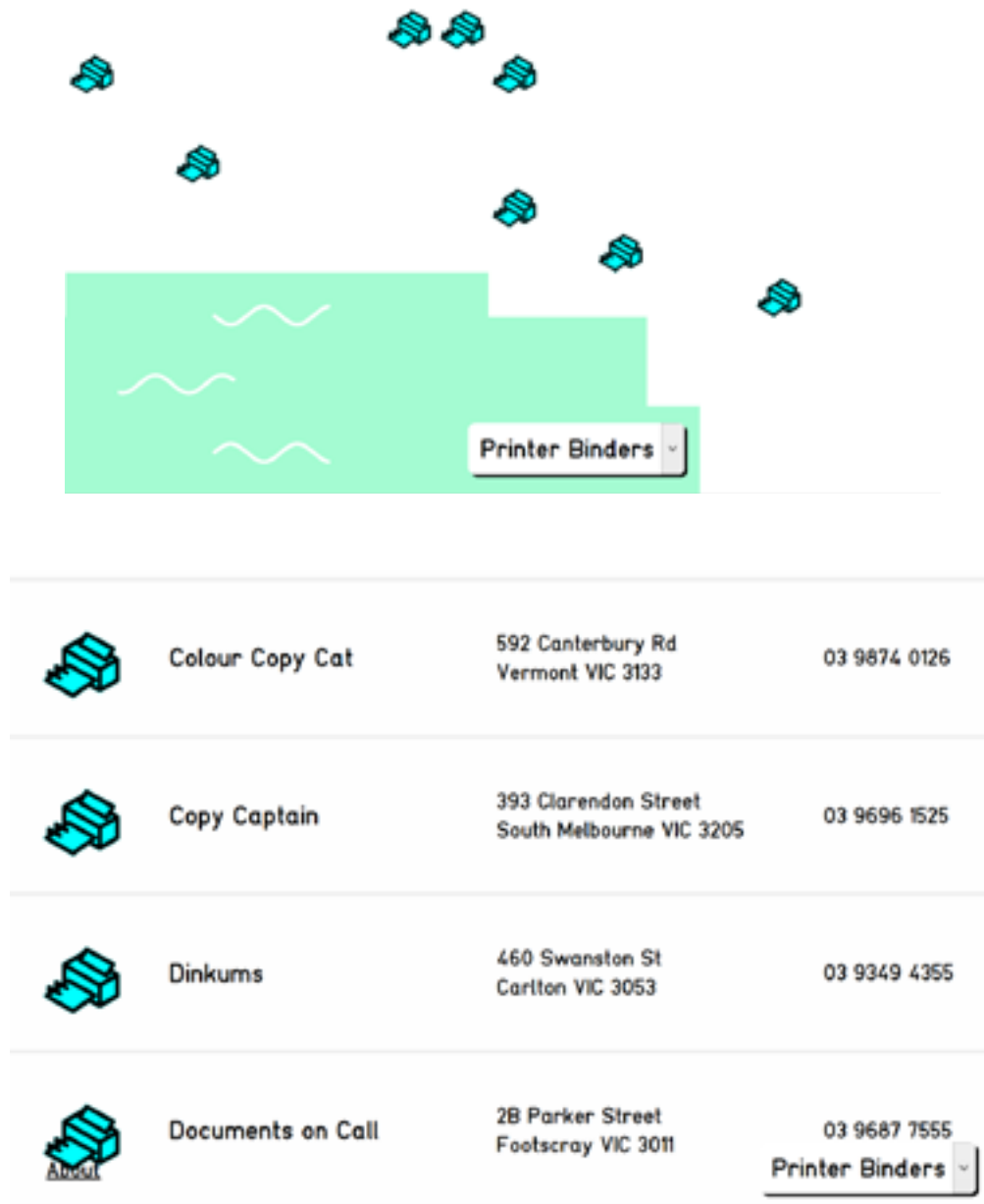
Printer Linker

Printer Linker v3 is a fully scalable, single screen, data visualisation web application—it's been designed to be compatible with a vast array of screen sizes and adapts itself based on screen orientation to show particular visualisations at their best. The site's data footprint is minimal, through the complete use of vector graphics, CSS effects and JavaScript animation. The result is an adaptive, quick to respond and clearly laid out application.

The desktop version's map mode (shown top right) presents all data points on a non-scaled map. The points are oriented relative to a large geographic marker, in this case, *Port Phillip Bay*, to roughly identify Melbourne's west, city, north and east. In this instance the user doesn't need to navigate a to scale map to find points, but instead has all options presented to make the job of finding a particular type and location of a provider a matter of just clicking.

The desktop version's list mode (shown bottom right) presents all crucial data in the form of a list, with the ability to hover over rows to highlight and enlarge information. To allow for continuity, clicking on an icon in list mode will close the list and highlight the icon in map mode by opening its tooltip window (shown below).

| | Colour Copy Cat | 592 Canterbury Rd
Vermont VIC 3133 | 03 9874 0126 |
	Copy Captain	393 Clarendon Street South Melbourne VIC 3205	03 9696 1525
	Dinkums	460 Swanston St Carlton VIC 3053	03 9349 4355
	Documents on Call	2B Parker Street Footscray VIC 3011	03 9687 7555

Printer Binders

Printer Linker offers basic data–segmentation in the form of a dropdown box filter which works across all modes, to sort by provider type (shown left).

On tablet devices, *Printer Linker* functions similarly to the desktop version (shown above).
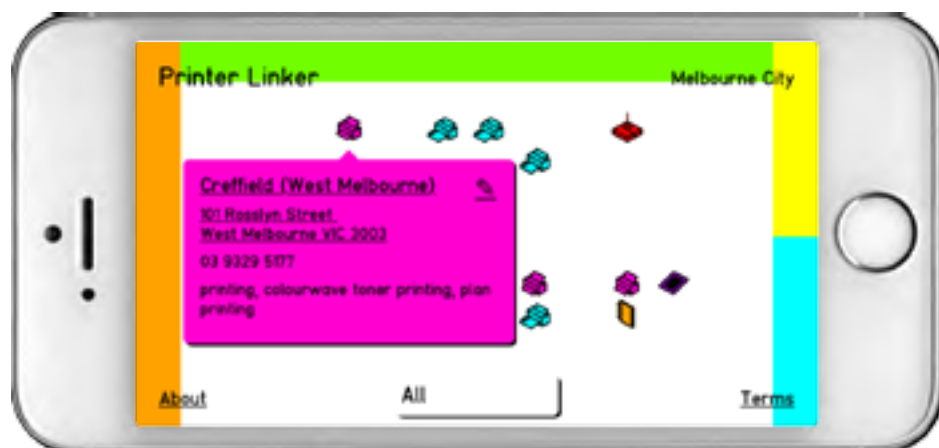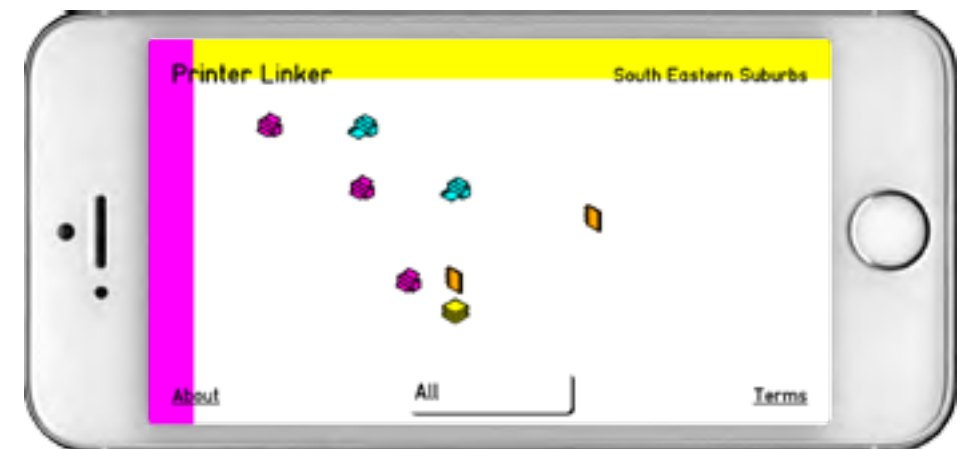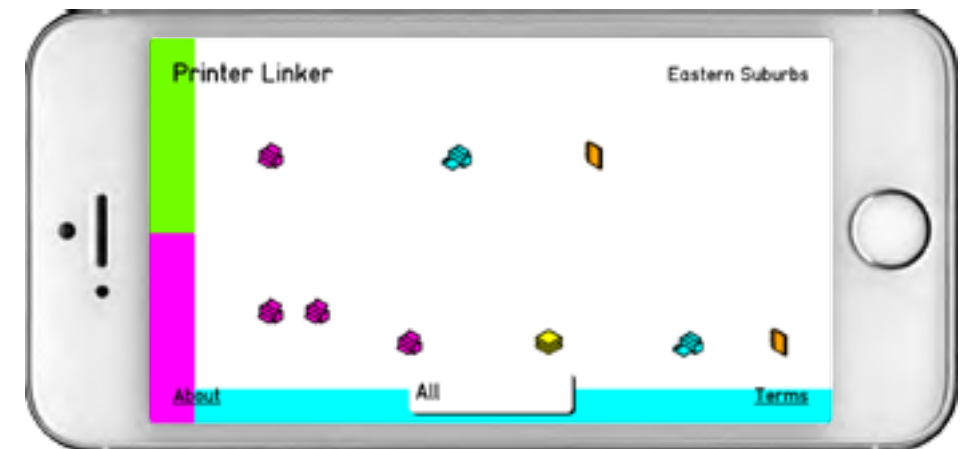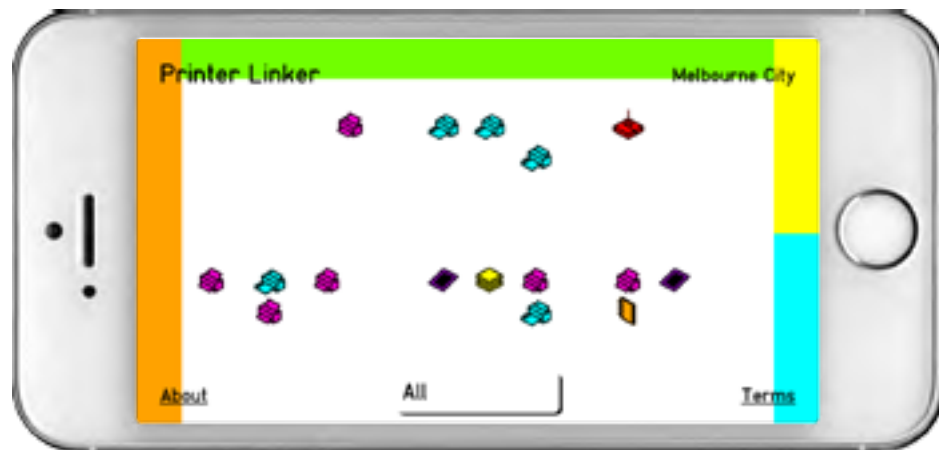
Printer Linker
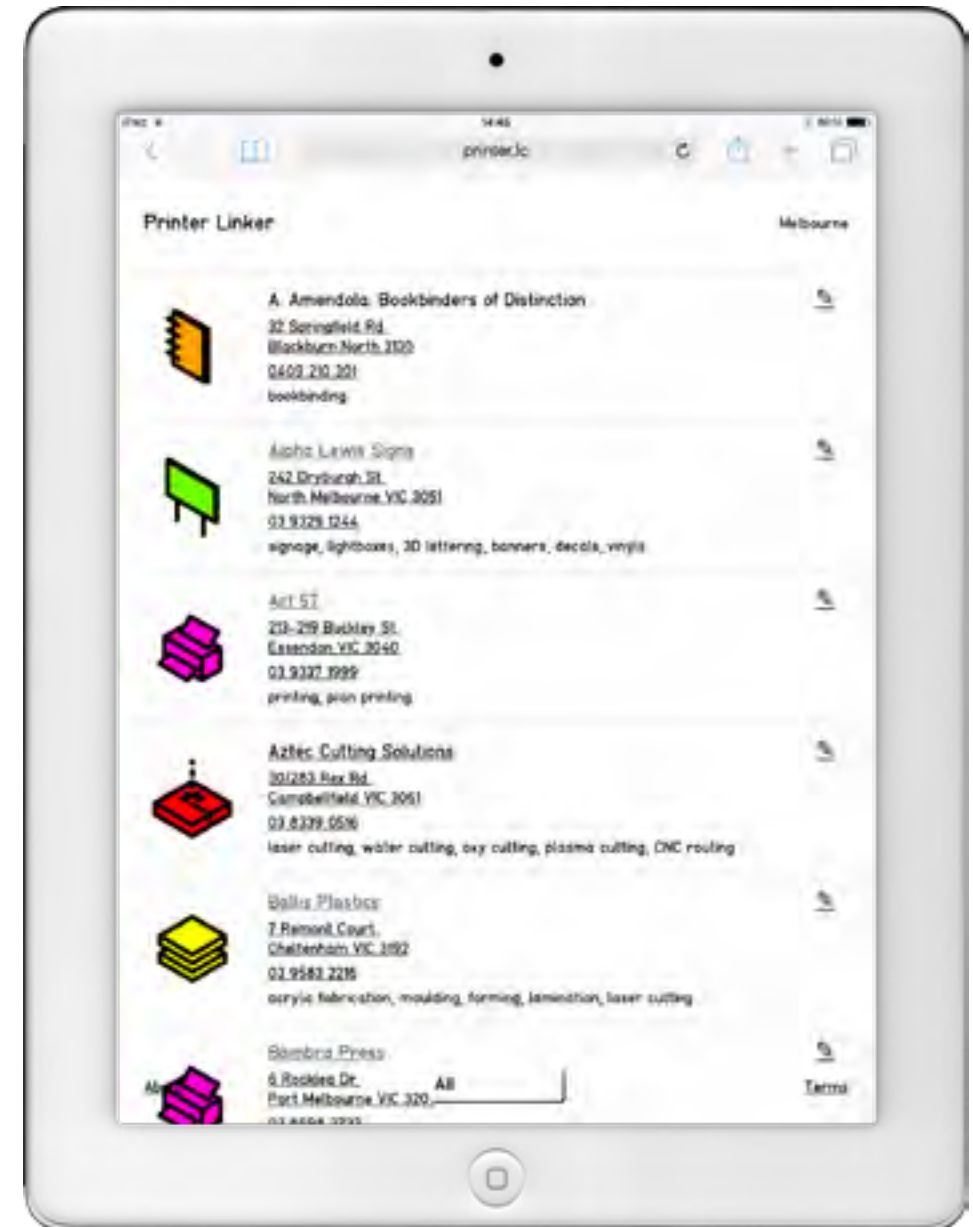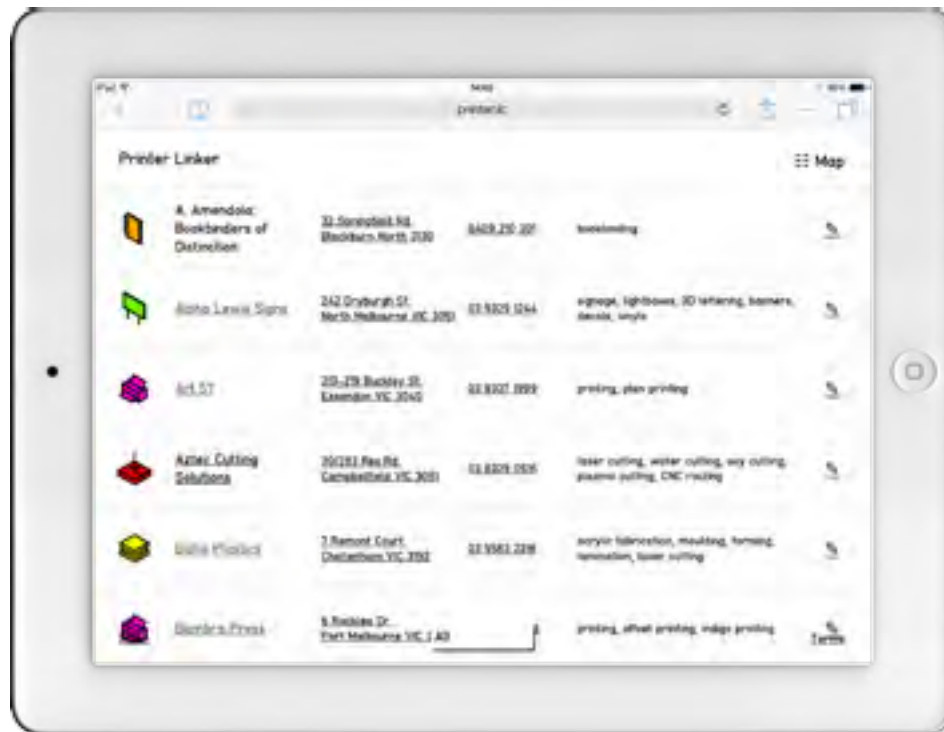
On a tablet device, the list mode is accessible through the conventional method (shown above), as well as by tilting the device into portrait mode (shown right). This resolves issues around map scaling, but also provides another way to see the list.
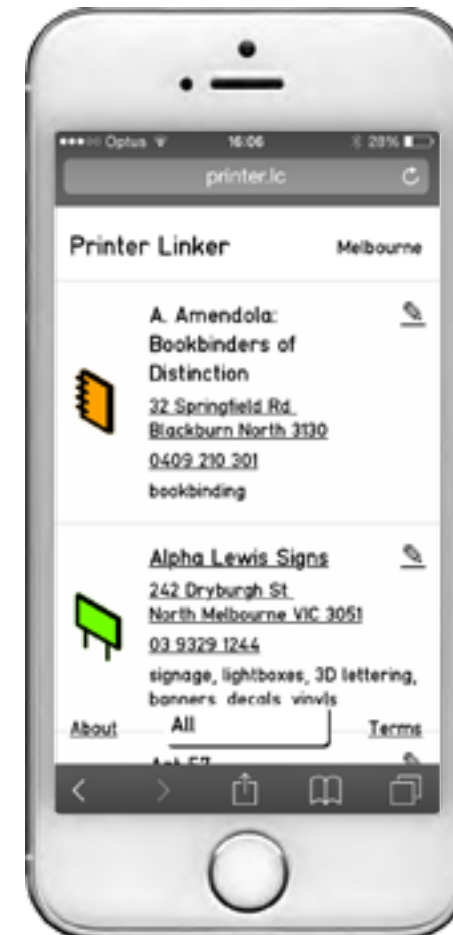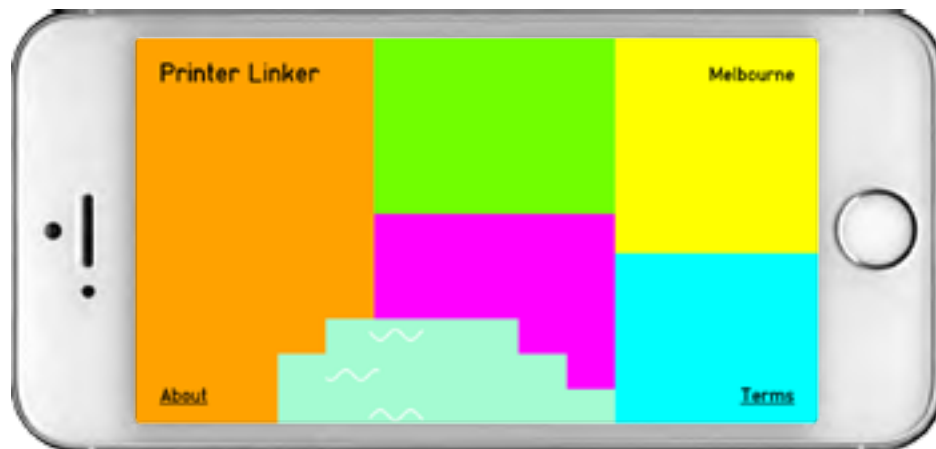
On mobile devices, the data points are split into colour-coded zones (shown above). This is to allow data points to be shown clearly and not all clumped together on one screen. The list mode on mobile devices is only accessible by tilting the device into portrait mode (shown right).

On mobile devices, *Printer Linker* presents all the same functions offered on desktop and tablet devices. To assist in navigating the zones, colour-coded side panels provide quick access to neighbouring zones.

Findings &
Future Research
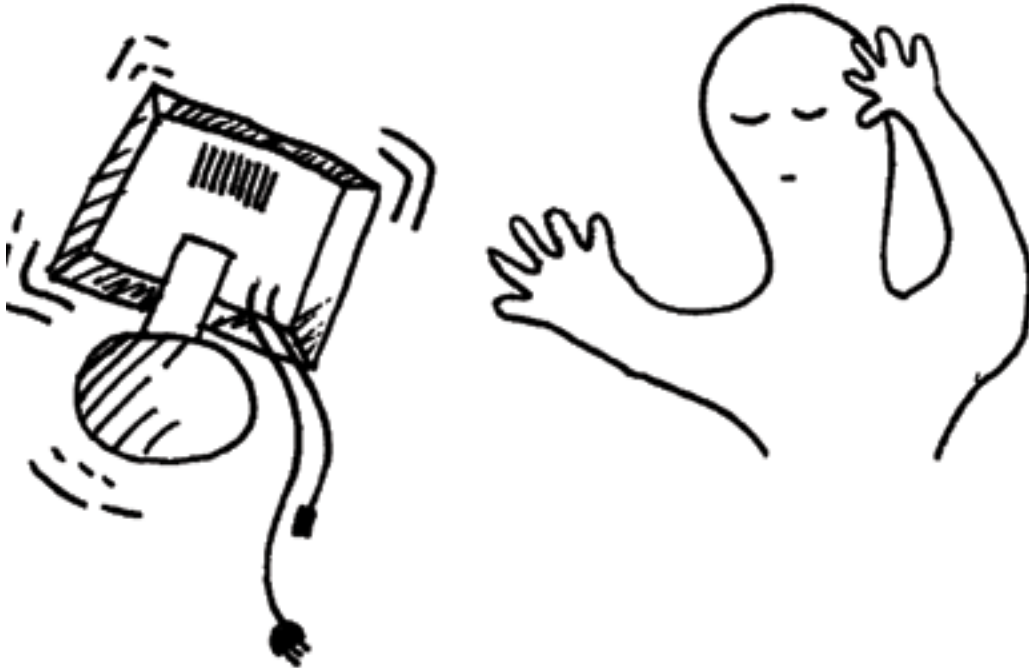
Curiously, the greatest outcome of my Honours research is the inspiration to keep prodding and poking in this digital space. This is not to say, outcomes produced through the methodology presented were not fruitful. Rather, the research conducted has helped me contextualise my work in a broader light, that of data visualisation— and how the effectiveness of data visualisation is essentially the measure for any outcomes in this space, from simple website, to a system application on your desktop computer.

While I did not permit time to put *Printer Linker* to a rigorous qualitative test to prove right and wrong, from an observational standpoint, it's quite clear to see that the outcomes produced, especially when placed against pervious or early versions, are better outcomes—they're cleaner, but most importantly, all the features are included.

Upon reflection, the main result of this research for me, is a theory that design in digital space guided by principles of (what I'll define as) "lossless compression", will yield the best results. It seems at least, for as long as we have to deal with computer systems that rely on a screen/s, touchscreen/s and/or input device/s (i.e. sans mind—control), there will be a level of abstraction humans will have to deal with to perform a task—thinking about how we can reduce the amount of information a user has to process to the most reasonable minimum will surely make experiences better. As to, whether we're close to that point or far from it, is the job of research to answer.

Following this section is a research proposal. I believe that it will answer the research question I developed this year: *In better understanding the context in which digital applications exist in relation to the user, how might a more exciting and intuitive visual experience for the user be derived?*

Research Proposal:
Lossless Compression of Software Visual Interface Design

The main objective of research carried out under *Lossless Compression of Software Visual Interface Design* is to employ a design methodology towards the construction of software visual user interface design concerned with, and privileging, the needs of the user in partnership with the application before demonstrating the functionality of a software application. The question this presents is "whether success in this field is a matter of perspective and taking a designerly approach over a technical one"?

Building upon research carried out under my Honours Degree of Bachelor of Visual Communication, as well as work carried out professionally in the digital realm, it's become apparent that a versatile and effective approach to designing software visual interfaces is to compress the apparent abilities of applications without functional compromise. Carefully considering the way an application presents itself initially, and in exploring feature sets. Quite simply, the methodology proposed stems from basic design principles derived from print media—where it's commonplace through composition to strive for an appropriate visual harmony and clear communication of data and narrative. This serves not as a point of emulation, but as a set of rules to consider in the breaking up of ugly structures imposed by tradition and privileging of underlying programs' functionality.

Of particular interest and inspiration is the work and research of information technology pioneer Ted Nelson and notable contemporary designer Frank Chimero. Nelson's text data visualisation application Project Xanadu, descriptions of zig-zag data structures and overall attitude towards established traditions in digitally designed space, will in a substantial part form the basis of my investigation into novel ways of constructing interfaces in the context of data visualisation design. Furthermore, Chimero's eloquence in describing the triviality of focusing on transitioning from skeuomorphic or life-like textures to flattened textures over understanding digital screens as a style-agnostic medium will guide my design reasoning.

The entry point for the proposed methodology will be to work across a board of data visualisation projects and if required, on a self-initiated basis to test novel ideas. It's intended that this run in parallel to testing, backed by theoretical research in human-computer interaction (HCI) and other relevant topics as they become apparent. My intention is this should form my contribution to the field and better establish my own knowledge and abilities.

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accessed 30 October 2014, http://www.youtube.com/watch?v=WEj9vqVvHPc.

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