ROYAL NORTHUMBERLAND FUSILIERS WW2

INTERACTIVE EXHIBIT

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CONTENTS

BRIEF

Students will create two deliverables, a prototype and a design document. You are required to create (or finalise) your prototype into a completed project and to write a document critically justifying your approch and methodology taken.

The exact subject material for the project is self determined but the module content will embrace; visual and verbal preperation of design proposals, research and ivestigation; assesment of goals, audience, content and design requirements; prototype development and evaluation.

For this project it is a very open brief what this enables me to do is to create an innovative project that streches my skills in both design and technology.

As well with the brief being very open I am also able to explore into a theme and topic that I am passionate about and will enjoy researching and creating a new idea or product.. Choosing the theme as well will help me show as well what I am as a person with the possibility to make the project very personal.

The fianl deliverables include a design document and a prototype. The design document covers the research and development stage of the project and gives me a chance as well to be creative and innovative.

The research stage as well gives me a chance to see what is avaliable or existing now as well as conducting research into the theme and topic of the project. Research will be categorised into groups sch as technology research, existing products/exhibits, theme and inspiration. The research into technology in particular will help me with the creation of the exhibit or product .

The other deliverable for the projects is the creation of a working prototype. This is the most difficult part of the project and will strech my skills in terms of knowledge in technology in particular coding.

As well the prototype is difficult in terms of the creation of a physical product which is another test of my skills.

INITIAL IDEAS

The mind map below shows initial ideas that I came up with for personal project 2. The ideas are split into varying groups which are projection mapping, touch interface, digital floor, tablet mirror, interactive homes, tablet table and augmented reality.

These groups vary in terms of whether an idea for an object or the use of a particular software. These groups help me narrow down my final idea for the project. One particular group that attracts my attention for example is the use of touch interfaces.

Artistic Historical Dresses

Virtual World in Your Bedroom

Nature Taking Over Urban Areas

Fantasy Creatures

Museum interactive exhibit

Projection Mapping

Touch Interface

Interactive reatil experience

Find the Borrowers Game

Augmented Reality

Idea Generation

Digital Floor

Fantasy Portal Game

Check In Desk For Airports

Furniture Layout In Stores like Ikea

Tablet Table

Tablet Mirror

Restaurant Self-Service

Fitting Room Interactive Mirrors

Interactive Homes

Contactless Paying and Browsing

Personal Security System

Interactive Windows

Your Homes Carbon Footprint

Hairdresser Interactive Mirrors

CONCEPT

After evaluating the the initial ideas generated I started narrowing down the final concept for the project. The creation of a touch interface was the idea that I eventually choose to focus on. I choose touch interface becaue of the growing increase of touch interface devices avaliable on the market as well as the push forward for large scale touch interfaces (e.g. Google glass) for tables, work surfaces and possibly even walls.

Confirming what technology I wanted to explore was the first part of the concept.

Next it was also decided that the project will be an exhibit for a museum or gallery. This will also give me an oppurtunity to explore a theme which I am passionate about.

The summary of my concept is written below and sums up my first concept for the project .

1925 - 2013

https://www.flickr.com/photos/mrsultan/9342212170/in/album-72157626149118210/

An interactive piece within a museum or gallery inviting people to use touch interface to interact with the past through videos, images and sound.

RESEARCH

After coming up with an initial concept I am able to move on with developing my concept befor this though I have to conduct research into my concept. The research I will do include...

Touch Interfaces
The research into touch interfaces will include existing touch systems in varies environments. The research will highlight how they are used, what environment they are used in and the main user for the interface and how they interact with the interface.

Technology
Technology research will include a look into possible technology that could be used to create the touch interface. Part of the technology research as well will look heavily at Arduino UNO and its possible usage.

Inspiration
Inspiration for the project can stem from a variety of souces including similar products, art exhbits and general products that are not even related. Inspiration could also be taken from past projects within the course.

Theme
Whie this project is very much toward the creation of a working prototype the theme of the project is very important as well. Throuh research I will narrower down the theme for the project and what will be presented whether it is artistic or informative.

Visual Research
Visual research will be taken around the possible themes and also artistic inspiration. The visual research will consist mostly of a moodboard and analyses of images.

User Experience
Part of the research that will be undertaking is into a user experience based around my concept and exisitng products. As well there will be research into how an experience is created and what people react to best.

Target Audience/Location
The Target audience is very wide for my concept so a more detailed look at possible users will be undertaking. As well the concept could possibly be used in a particular location so research into where this location could be will be undertaking as well.

Scenarios
A final part of the research would be to create scenarios based around the concept. These scenarios would be created in a few different ways including written, drawn and explored scenarios.

TOUCH INTERFACES

The concept that I have decided on is a touch interface. With this decision part of my research will be into exisiting touch interface products, how they work and there usage. what products I choose to look at will be simlilar to my concept of an exhinit either in a museum or a gallery.

As well a look into how they work will help me determine the technology I may use to create the final prototype. The comparision of products finally will also help me in possibly determining a theme for my touch interface. The topics that will be covered when looking at touch interfaces will be...

• Everyday touch interfaces

• Interactive Exhibits

• Retail and interactivity

• Future interactive interfaces

All these topics above are relevant in the research needed to help with the final design and creation of this project.

Innovation Icon
http://fashions-cloud.com/pages/i/innovation-icon/

Innovation and Creativity
http://cdi.hw.ac.uk/seed-corn/files/2011/04/wordle.jpg

Everyday Touch Interfaces

With easy access to smart phones, tablets, kindles and computers we live in a digital age where increasinly touch interfaces are becoming more common.

When researching touch interfaces one of the first touch screens that I researched was the everyday touch interfaces we use on our smart phones and tablets. The technology for a touch screen is made using three possible systems which are...

• Resistive
• Capacitive
• Surface acoustic wave

The resistive system consists of a normal glass panel that is covered with a conductive and resistive metallic layer. These two layers are held apart by spaf=cers, and a scratch-resistant layer is placed on top of the whole setup. An electrial current runs through the two layers while the monitor is operational. When a user touches the screen, the two layers make contact in that exact spot. the change in the electrical field is noted and the coordinates are known, a special driver translates the touch into something that the operating system can understand, much as a computer mouse driver translates a mouse's movement into a click or a drag.

In the capacitive system, a layer that stores

Mobile Phones in the Classroom
http://www.webanywhere.co.uk/blog/wp-content/uploads/2011/11/Smartphone.jpg

XPeria
http://api.sonymobile.com/files/xperia-tablet-s-hero-black-1240x840-f445cbd142ea0f-

electrical charge is placed on the glass panel of the monitor. When a user touches the monitor with there finger, some of the charge is transferred to the user, so the charge on the capacitive layer decreases. This decrease is measured in circuits located at each corner of the monitor. the computer calculates, from the relative differnces in charge at each corner, exactly where the touch event took place and then relays that information to the touch-screen driver software. One advantage that the capacitive system has over the resistive system is that it transmits almost 90 percent of the light from the monitor, whereas the resistive system only transmits about 75 percent.

On the monitor of a surface acoustic wave system, two transducers(one receiving and one sending) are placed along the x and y axes of the monitor's glass plate. Also placed on the glass are reflectors - they reflect an electrical signal sent from one transducer to the other. The receiving transducer is able to tell if the wave has been disturbed by a touch event at any instant, and can locate it accordingly. The wave setup has no metallic layers on the screen, allowing for 100 percent light throughput and perfect image clarity.

While there are three systems price plays a part as well and the resistive system overall is the cheapest but the layers it has can be damaged easily. This reserach helps me determine what touch system will be best to use within this project.

Interactive Exhibits

May musueams nowday are becoming more and more interactive with digital exhibits taking the forefront. There are many examples of interactive exhibits all over the world within this research examples are taken from various themes including historical, modern/science and artistic installations.

The first theme that interactive exhbits can fall into are historical more and more in museums and historical landmarks are adopting interactivity to attract younger visitors and modernise the way they present information. An example can be found at the Great North Museum in Newcastle the exhibit is about Hadrians Wall and includes a scale model of the wall with interactive screens which can be seen in **Figure 1**. As well there is a large projection which visitors to the museum can see a section of the wall and on a particular interactive screen visitors can interact with this projection to add bricks to the wall. This exhibit is very popular and is a focal point of the museum.

Another example of an historical exhibit is the Virtual Autopy shown in **Figure 2 and 3**it was an exhbit at the British Museum during the Spring of 2013. The Virtual Autopsy allows users to explore the different layers to an Egyptian mummy from the casket to the unwrapped body. This information rich exhibit could be confusing but interactive visuals make it usable for nearly everyone.

Figure 1
http://www.wide-sky.co.uk/wideskydesign/wp-content/uploads/2012/02/Great-North-Muse-um-HW.jpg wordle.jpg

Figure 2
http://d.ibtimes.co.uk/en/full/1369773/museum-visitors-can-now-explore-ancient-egyp-tian-mummy-wrappings-using-virtual-autopsy-table.jpg

Figure 3
https://britishmuseumblog.files.wordpress.com/2012/11/gm_demo_544.jp-g?w=544&h=325

The next theme an interactive exhibit could fall under is Science echibit and in terms of interactive exhibits having a science theme seems to producing more new and exciting exhibits.

The Discovery Museum in Newcastle has a top floor whch they call the Science maze within this maze there is many interactive and immersive exhibits all to do with science. An example of an exhibit which is seen in **Figure 4** this exhibit is all to do with electricity and encourages visitors to go round and explore how connections are made. The design and setup of the exhibit is quite simple but pulls on the human need to touch and feel something by making the visitor touch panels to cmplete circuits and tun lights on.

Another science exhibit which is shown in **Figure 5** is called the Science of Survival this is a touring exhibit which teaches visitors exactly what the name suggest. One part of the exhibit is an interactive table which many people can interact with at once. The design is colourful and inviting and having a round table makes the exhibit a group activity. The style of the exhibit looks to be mainly aimed towards a younger audience and as a touring exhibit might visit schools. The interactive exhibit as well uses simple recognisable visuals.

There are many examples of science exhibits but the two I have chosen represnt my idea of create touch interfaces.

As musums up there game by creating exciting new interactive exhibits to attract visitors galleries have started to fall on the wayside. Recntly though more interactive art installations are starting to be created.

An example of an art exhibit which while not interactive but motorised which has stood the test of time is the Silver Swan at Bowes museum the swan is an elaborate meatl structure which is motorised so that on the hour it comes to live and eats jumping fish from the silver water. The swan is shown in Figure 6 and is a focal point in the museum.

Another example of an artist installation is Rain Room. Rain room is literally a downpour in a room but when you go to step into where the water is falling the ware shuts off around that point keepign the person interacting with the room dry. Such a simple concept creates a stunning view with many points cut off and responding even to just a leg or arm. This art installiantion uses complicated sytems to create a unique experience. The addition of danceers as well show the beauty of the piece.

Art instillation that are interactive can be quite ambiguous and the interactivity sometimes just being a novelty for a while and not an actual use.

Retail and Interactivity

As technology improves and becomes more avaliable and affordable the next stage of interactivity is within a retail environment.

A basic example is how most large shopping centres are the interactive maps that are now avaliable to help customers naviagte. An example of these can be seen in the Metro Centre based in Gateshead.

Another example is a combination of scanning and visual information. An example of this is a new in store display where the customers can scan a product to discover its full story which is displayed on a screen.

A final example is Tescos new large screen interactive display which is a game. This novelty display in store is simply to attract customes in and does not serve no further purpose then as a novelty. The display is a large game which appeals mainly to children.

Metro Center
http://i3.thejournal.co.uk/incoming/article4341905.ece/ALTERNATES/s615/the-metrocentre-467461532.jpg

In Store Interactive Display
http://new.edpllc-usa.com/wp-content/uploads/2014/07/new-balance-store-in-boston-rfid-480x318.jpg

Tesco
http://fluxx.uk.com/cms/wp-content/uploads/2012/08/Tesco-Virtual-Store.png
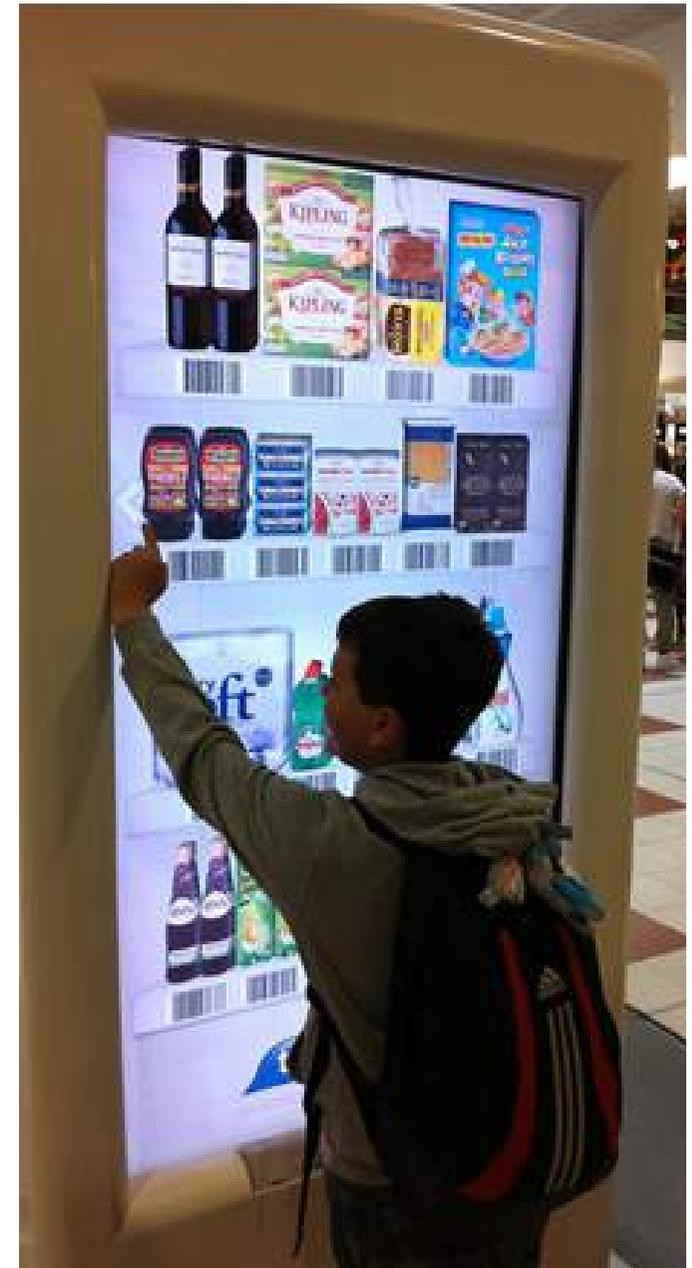
Future Interactive Interfaces

As technoly advances so with interactive displays the vision for the future right now is the ability to create large scale touch screens to work in a variety of situations whether it is home, work or retail. The technology is advancing now but it will be another few years before practical uses can be used. This youtube video illustrates the future of interfaces perfectly https://www.youtube.com/watch?v=X-GXO_urMow

Monolithic Interactive Display
http://cdn.psfk.com/wp-content/uploads/2009/03/snowbird_heroshot2.png

TECHNOLOGY

To create the final prototype I have done research into what technology I could use to create an interactive touch interface.

The first piece of research I did was the possibility of creating a touch interface myself. I researched using instructables for a step by step guide. While it is possible I concluded that in the time frame that I have that it would be impossible to complete in time ecspecially if I encountered problems. As well the cost of the project would increase significantly.

The next piece of research I did was into Arduino which is a system I am familiar with. With the Arduino I found countless resources online I could go to for help. The problem with Arduino is that I would not create a touch screen but a console with buttons and sensors. Through research I found the different sensors I could use included....

• Capacitive Sensors
• Piezi Sensors
• RFID Tags
• Potentiometers
• Infra Red sensors
• Motion Sensors

With the extensive possibilities of Arduino and a more realistic goal to get a prototype working I decided that Arduino would be the technology I would use to create my prototype.

Multi Touch Table DIY
http://www.instructables.com/file/FJF3IKDHOG8V2L5

Arduino Logo
http://www.talent-lab.it/arduino-lab/wp-content/uploads/sites/13/2015/04/stickers_logo_text.png

INSPIRATION

Through the previous research pages I have highlighted examples of exhibits that interactive and specifically touch exhibits.

When thinking about the inspiration behind the project though I was reminded of a visit to a nuclear Bunker Museum in Shropshire where the exhibits are very old fashioned but the way they have isolated some old consoles allows for visitors to play with the dials and buttons.

This simple interactivity of buttons and dials and the joy of just wanting to find out what the button will do is what is my main inspiration behind this project. The aim for me then is to create an exhibit that people would want to approch and interact with by just using simple buttons and sensors.

Hack Green Nuclear Bunker
http://s0.geograph.org.uk/geophotos/02/77/39/2773991_45b291e3.jpg

THEME

For the interactive interface one of the most important aspects is to decide on what theme the exhibit will be. A decision was made early on that the theme would be something historical this is because when it comes to makign new exciting interactive echibits somethimes all to often Science and Art is the themes that people turn to. Listed below are some ideas for themes.

• Suffragete Movement - With 2015 being an election year creating an interactive exhibit about the Suffragete movement would be very relevant. The exhibit could either tell the story of the suffragetes ir concentrate on one aspect of the movement.

• Leonardo Da Vinci - A famous historical figure who gives great scope and visuals to the possibility of an interactive exhibit. The exhibit could focus on him as a person or tell the story of one of his projects.

• Historic Location - This theme would include choosing an historic monument or place (e.g. Alnwick Castle) and create the exhibit around the place.

• WW2 - WHile this is quite a broad theme I could narrow it down to concentrate on one particular part for example a location, a person or a regiment. A WW2 exhibit would also allow me great visuals with old newsreels and images.

• Jane Austen - Exploring her as a person the time period and of course her famous books. This exhibit could help Jane Austen and her books to a new generation.

• Christopher Colombus - This theme would explore the specific person and who they were. The exhibit would focus on specifically Columbus' discovery of the New World.

• Life of a viking - Using a combat group in Newcastle create visuals showing the life of a viking warrior. This theme could work well in terms of visuals but the specific of interactivity I am not sure about.

• Darwin - While this does go down the route of a science exhibit again the theme would explore more Darwins journey of discovery.

• Hadrians Wall - The exhibit would focus on the wall and how they built it and why. The visuals could include animations.

• Battle of trafalgar. A virtual map showing the strategic points that Napolean took which won him the battle of Trafalgar.

All these theme have the potential of creating a good interactive exhibit but after thought I decided to go with the WW2 theme and narrow it down by researching abouth the Northumberland Fusiliers.

All refrences for the visual research images are highlighted in red in the bibliography.

TARGET AUDIENCE/LOCATION

The target audience for the interactive exhibit is very flexible with the potential of being used by any one who visit the museum or gallery. A general target audience though would men and women ages bewteen 18 - 50 who have an interest in museums and like to interact with exhibits.

In terms of target audience though I have also considered the idea that the target is possible locations for the exhibit this is a very broad spectrum to start with but with the final theme narrowed down to the Royal Nortumberland Fusiliers several possible locations can be named including...

• Alnwick Castle - Alnwick Castle currently houses the existing exhibit about the Royal Northumberland Fusiliers so my interactive exhibit could be a perfect addition

• Discovery Museum Newcastle - The Discovery museum is a great advocate for interactive echibits

• Woodhorm Museum - Woodhorm museum while a mining museum has several area where exhibits are changed continously.

Royal Northumberland Fusiliers Museum ALnwick
http://ichef.bbci.co.uk/arts/yourpaintings/images/collections/main/FUMN_collection_im

Discovery Museum Newcastle
http://www.twmuseums.org.uk/geisha/inc/img/geisha/assets/images/Disco-exterior.
jpg/661/431/fill.jpg

Woodhorn Museum
http://images.visitnorthumberland.com/Woodhorn-Museum-and-Northumberland-Ar-
chives/vn-medium-Welcome-to-Woodhorn-Museum.jpg

Scenario 1

Winston Churchill is a history teacher at a high school in Newcastle. His favourite part of history is WW2 and he wants to know more about regiments from Northumberland.

Winston has visited the Royal Northumberland Fusiliers museum in Alnwick before but found it outdated and boring. On returning though he finds a new interactive echibit. Winston loves the simple controls allowing him to explore the history of 2 of the batallions.

He is inspired as well by the use of the news reel footage cobined with text to create simple to the point information in a more fun way. He loves the exhibit so much that he encourages his students to visit.

Scenario 2

Vera Lynn is a young writer who is trying to get published. As part of a competion she is asked to write about a person in WW2.

After reaecrhing Vera is fascinated with the massive journey batallions completed during the course of WW2 so decided to focus her writing on that. Part of her research includes a visit to a new exhibit in the Discovery museum which has information about the Royal Northumberland Fusiliers during WW2.

Vera loves the radar map and how you work it with a dial. The information as well is very helpful for her to complete her writing so that her story can be as accurate as possible.

Winston Churchill
https://drhurd.com/wp-content/uploads/2015/05/winston-churchill.jpg

Vera Lynn
http://static.guim.co.uk/sys-images/Guardian/Pix/pictures/2009/4/10/1239361342172/Vera-Lynn-001.jpg

DEVELOPED CONCEPT

The concept for the project has not developed much over time and has only changed to reflect how the final prototype is a museum piece which primary function is to gove information but in a new and exciting way. The sentence summing up the developed concept can be seen below.

An interactive piece within a museum or gallery using video, images and sound to convey infromation about a theme and a new exciting way.

FINAL THEME

The final theme I decided on for the inter-active museum piece was to use the Royal Northumberland Fusiliers and their journey during WW2.

With the theme decided the next stage was to do the research I needed in order to obtain the information for my interactive exhibit. After researching on the internet I kept being referd by to the same book which is called 'The History of the Royal Northumberland Fusiliers during the second World War' I did some searching in the local libraries and managed to obtain a copy.

The turned out to be a vital source of knowledge and is my primary source for research into the Fusiliers. The book provides detailed maps as well as information which would be crucial later on for the project.

After delving deeper into the source I was also able to refine the theme even more to the 1st and 2nd battalion where I would discover the journey they took during WW2.

The image on the right show top right the cover for the book and bottom right an example of the notes I took whch were extensive and allowed me to make sure the information I was collecting was as accuarate as possible.
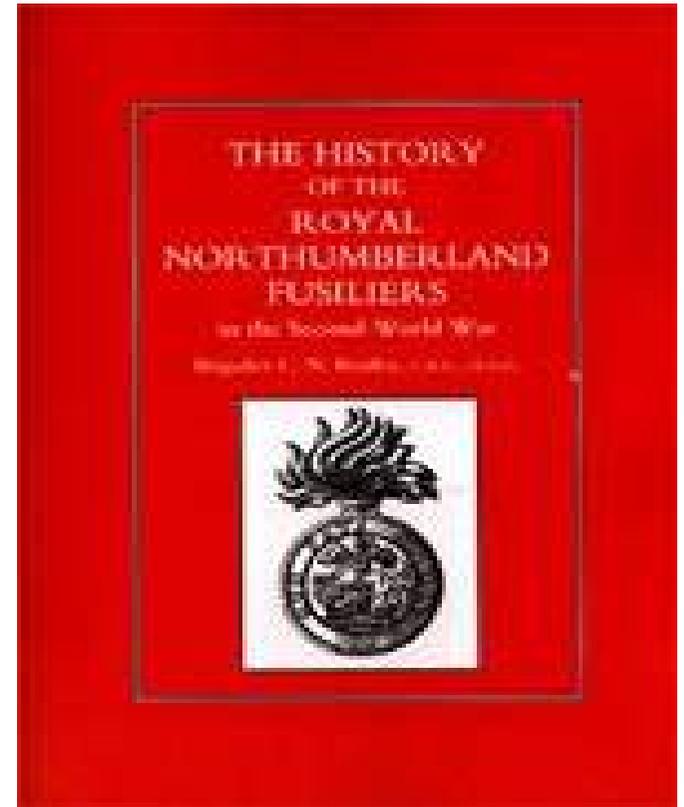
The Hisory of the Royal Northumberland Fusiliers during the second Waorls War
http://www.naval-military-press.com/images/T/7419.jpg
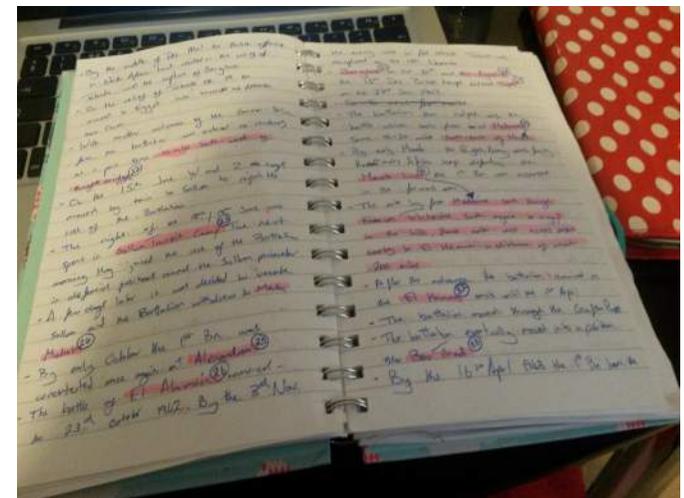
The **1st Battalion** of the Northumberland Fusiliers was based in Cairo, Egypt at the start of the war and the timeline below indcates through my notes how using place names I was able to draw on the map later to create a

On the outbreak of war in 1939 the battallion was based in Cairo Egypt

From Cairo the battalion moved to posistions of the Western Desert at Mersa Matruh

Early March 1940 the batallion left the Western Desert for Moascar on the Suez Canal

The battalillion was then widely dispersed bewteen Amyria and Daba

Orders were then received to concentrate on Sidi Bishr

By autumn 1940 the 1st Bn were located at Naghamish

The next movement was the investment of Bardu

After Bardu had fallen the Bn moved on for a similar operation against Tobruk

The Bn then moved to Derna

The Bnthen continued on to Soluch

After a few days in Soluch the Bn moved into the new barracks at Benghazi

The next task was to hold a defensive posistion near the village of Mersa Brega

The next posistion was on the high ground North of Agedabia

Part of the Bn then moved to Antelat

At Scaledeima a halt was called

Part of the Bn eventually rejoined the rest of the Bn at El Abiar

At this point the main body of the Bn was located in and around Benghazi

The Bn then took up posistiions from Er Regima eastwards

The Bn then withdrew to the next encampment east of Barce

The Bn then withdrew into Tobruk

By 3rd December 1941 Tobruk was won and the Bn moved back to Cairo

With another advance of the enemy the Bn was orderes to rendevous at a point near Knightsbridge

The night of the 18th/19th June was spent in Sollum Transit Camp

The Bn then withdrew to Mersa Matruh

By early Octover the 1st Bn was concentrated once again at Alexandria

The Bn then took part in the battle of El Alamein

Benghazi

El Aghelia

Tripoli

The Bn then helped with the battle that took place at Medenine

By early March the Bn was facing the enemy on the Mareth Line

After the advance the Bn reamined in El Hamma

The Bn eventually moved into a posistion near Bou Thadi

Soon after midnight on the 16th/17th April the Bn moved off in column bound for Northern Tunisia

On the 18th the Bn arrived at its first destination El Aroussa

On the 21st April the unit moved to Bou Arada

By early May allied forces were at the gates of Bizerta and Tunis

On first light the Bn moved to the village of La Cebela Du Mornay

By midday they had moved again to Grombalia and Soliman

On the 21st May the Bn commenced a move back to Tobruk

On the 25th July the Bn embarked on two ships back to Egypt

On the 31st July the Bn arrived at Alexandria and promptly moved to Sidi Bishr

In the middle of September the Bn moved to Syria there destination Qatana

In Decmeber the Bn moved to Gaza

The Bn then moved to Port Said where they embarked on a ship

The ship took the Bn to Taronto Italy

By mid April the Bn had moved to Ortana

The Bn helped capture Cassino on the 18th May

On the 14th June the allies occupied Rome

The Bn then moved to Venafro

On the 5th July Monte Acuto was captured

On the 6th the Bn H.Q. moved to Umbertide

The Bn was then advancing on Anghiari late July

7th August was the attack on Monte Castello

The 28th September saw the Bn moving into concentrated areas around the village of Coriano

The Bn spent the period 4th to 18th Novemeber in the barracks at Cesena

Meanwhile the Bn H.Q. had taken residence in Forlimpopoli

With hostilities ending in Italy on the 2nd May 1945 the Bn was at rest in the village of Vigarono

Soon after celebrating victory day in Europe the Bn moved to Venezia Giolia

The **2nd Battalion** of the Northumberland Fusiliers was based in Shorncliffe, England at the start of the war and the timeline below indcates through my notes how using place names I was able to draw on the map later to create a route guide.

On the outvreak of war in 1939 the 2nd Bn was moved into a camp near Shorncliffe

The 10th September saw the Bn moved to Connaught Barracks Dover

The Bn then moved again for a camp at Dibgate Near Folkestone

The Bn then embarked at Southhampton on the 1st October

Disembarktation took place at Cherbourg on the 2nd October

After short halts they arrived in the small town of Dourges

Two day later they moved to the nearby villgae of Attiches

They then moved to Bill Montigny a suburb of Lens

The Bn then made a move to the frontier town of Tourcoing

Two weeks were then spent at Dannes

On the 10th May the Bn moved to a pre-arranged rendevous at Templemers

On the 11th May the Bn crossed the Franco-Belgium frontier and arrived at there allotted sector from Borstoeve to Vilvarde

The Bn though then with drew to Kirxken

On the 18th May the Bn recieved orders to move behind the River Escaut

A last minute change then saw the Bn move late at night to Ooteghan

During the 22nd/ 23rd May the Bn withdrew back to the Franco-Belgium frontier

After many orders the Bn arrived on a line near the Ypres Canal

By the early morning on the 29th the Bn had arrived at Moeres

With the order to withdraw to the French Coast the 2nd Bn next destination was the Bray Dunes

Next the Bn moved to the Mole at Dunkirk

The party arrived at Dunkirk and embarked ships straight away

Meanwhile part of the Bn was still at Bray Dunes and were given order to take up posistion at Zuydecoute

The remaining parts of the Bn then marched to Malo-Les-Bairns

The rest of the Bn was eventually conveyed in a destroyer from the Mole

By the 3rd of June the survivors of the Bn arrived at various ports in the South of England

The Bn assembled again and moved to Willsworthy Camp in Devon

The Bn then moved to Storminster Newton Stalbridge-Marholl, in Dorset

On the 21st June the Bn then moved to the Isle of Wight

The Bn spent a few days at Calbourne

They then took up coastal defense posistions bewteen St Catherines Point and Bembridge

In September the Bn moved to a camp in Ashurst Wood

ABout a month later another move was made to the Lymington area

November 1941 the Bn moved to Mindora barracks, Aldershot

In October 1942 the Bn returned to the Selkirk area

In Febraury 1943 the Bn moved to the west of Scotland to Kirkmichael house

There was then a move to Bake Camp near St Germans in Cornwall

On the 17th June embarkment happened at Avenmouth

Disembarkation took place at Algiers on the 27th June

After a week in Algiers the Bn moved to a tented camp in the Forte de St Ferdinand

The 2nd Bn then embarked at Algiers again and landed at Salerno on the 9th September

On the 20th the Bn moved to Vietri Sol Mare

On the 6th October the Bn moved to an area north-west of Literno

On the 25th the Bn moved to an area of Francolise

On the 28th the Bn H.Q. moved to Pizzone

By the 3rd November the Bn had been withdrawn to rest at San Croce

Bn H.Q. then moved to Naples and then to a camp at Cardito

The capture of Monte Cammino

At this point the Bn was split up into several area which were Vezzarola, Monte Cedro and the River Garigliano

The 15th March saw the attack on Cassino which the Bn took part in

Again the Bn was then spread out over several places including River Volturno, Venafro, Alvigano, Ailano and Venafro-Isernia

The next move to posistions was to the Belvedere area

By the 21st the whole Bn was concentrated at rest in Piedimonte d'Alife

The next move was to Arce and Ceprano

The advance continued to Velmontone

On the night of the 11th/12th another move was made to the River Tiber

On the 15th a move was made to the forward concentration north of Viterbo

On the 25th the Bn moved to Citta Della Pieve

The Bn H.Q. moved to Lake Chiusi near Strada

On the 5th Bn H.Q. moved forward up the Val Di Chiana

A move was made to Cauriglion

The 5th August found the Bn only 4 1/2 miles from Florence

The Bn then moved to an olive grove near Foligno

The Bn continued on to there next destination of Sengallia

The next move was to the vicinity of Tombo Di Pesaro

8th/9th September saw the B move to the village of Dieve

The Bn took part in the Cesano and River Savio battle

The Bn then took part in the attack on Forli

The Bn then moved to Atri

The next destination was Taronto Bay where they embarked on a ship to Piraeus, Athens

The task of the Bn was to defend the air base Kalmaki

The next move was to Khalkis

The final move was to Volos where the Bn celebrated Victory in Europe
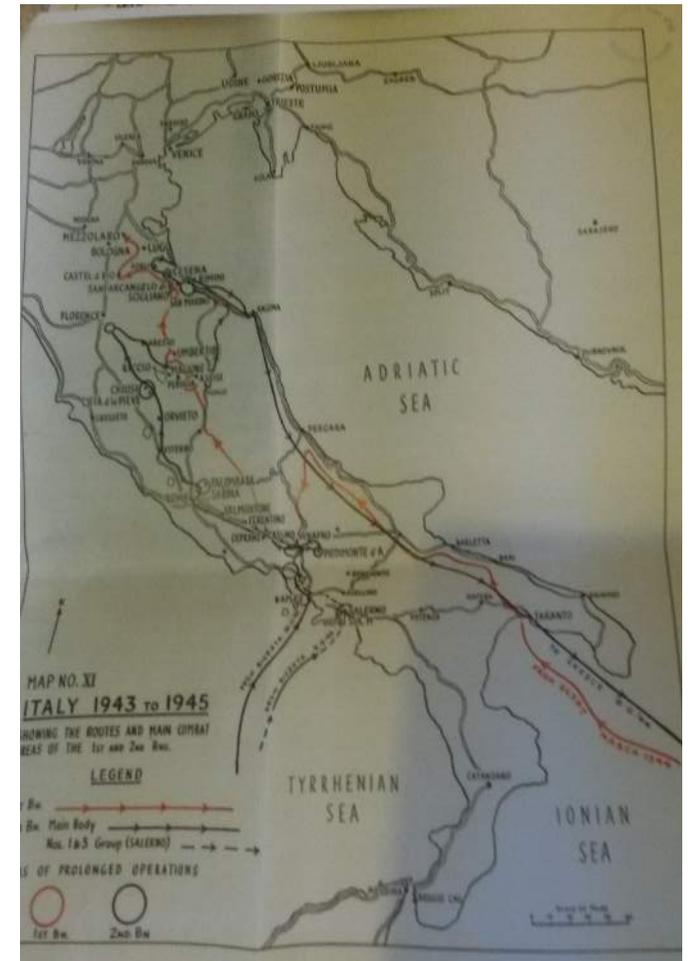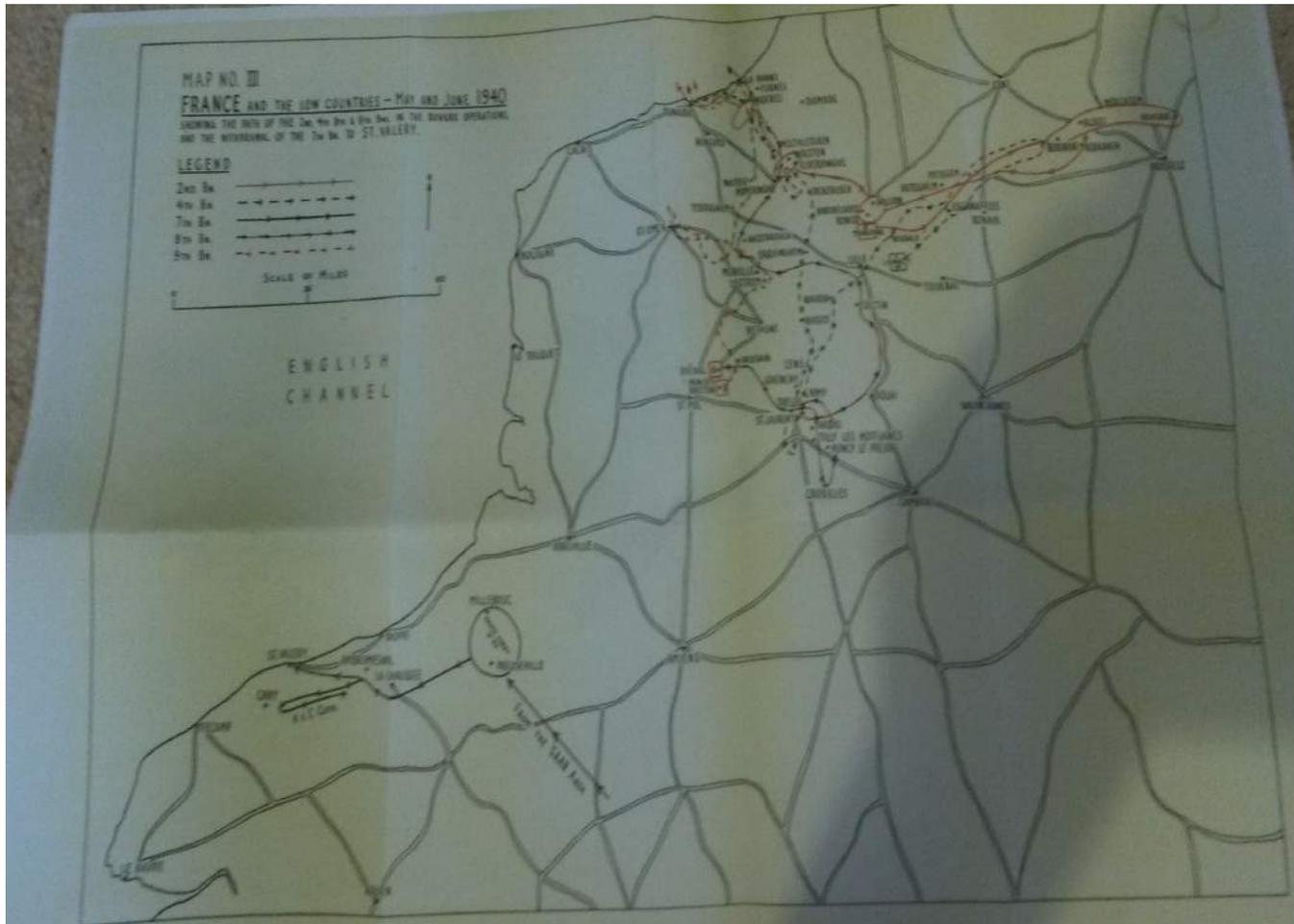
The maps above are two scans taking from an original version of the book found in the archive section of Newcastle library. The maps folded out and were a clear starting point for tracking the Battalions.

The map below is what I created before the final digital version. Using my notes I highlighted points in the text which gave me a place name and numbered it in order. With this I was then able to mark the route on the map that you see below keeping the number system to help me see later on where they started and ended.
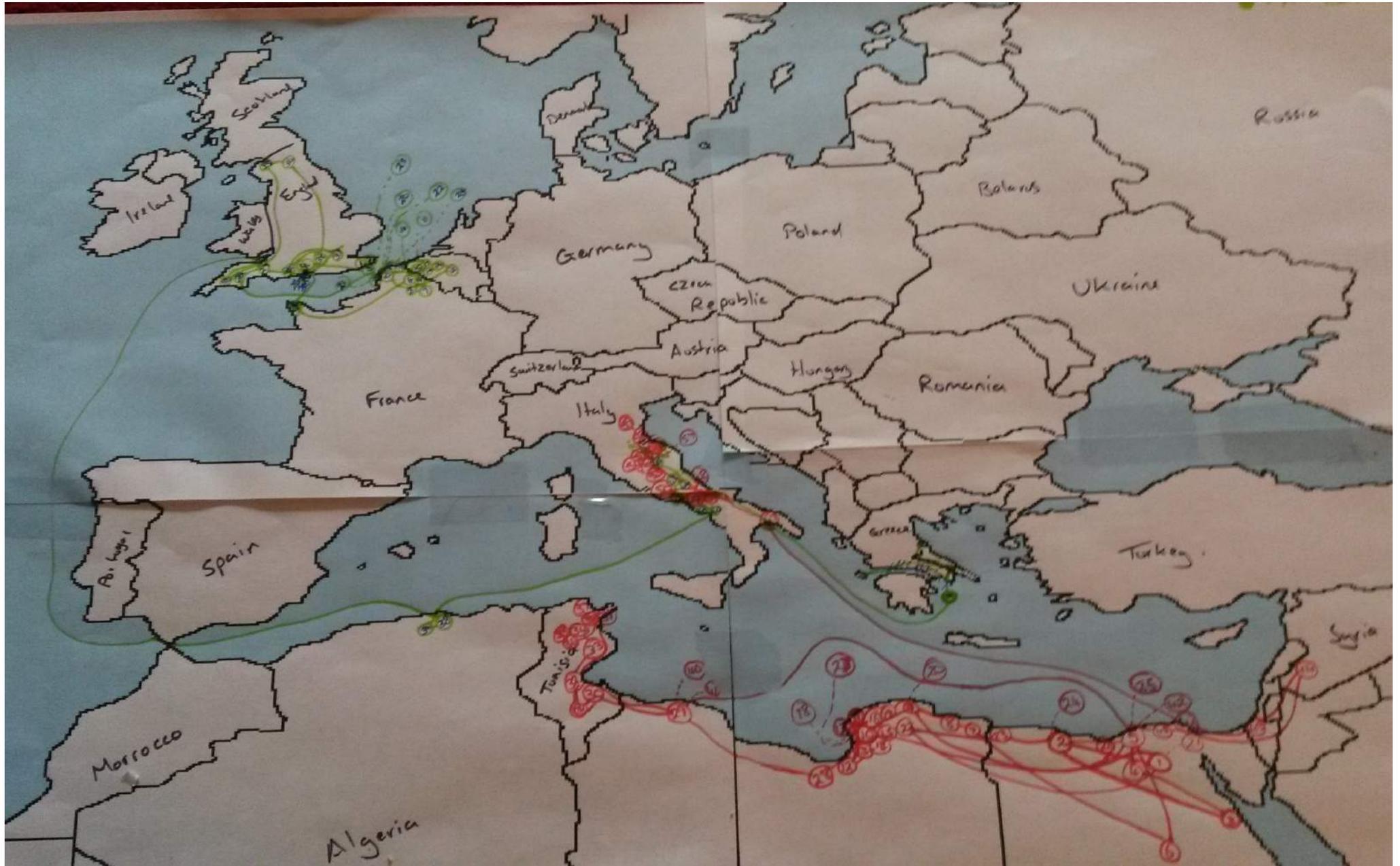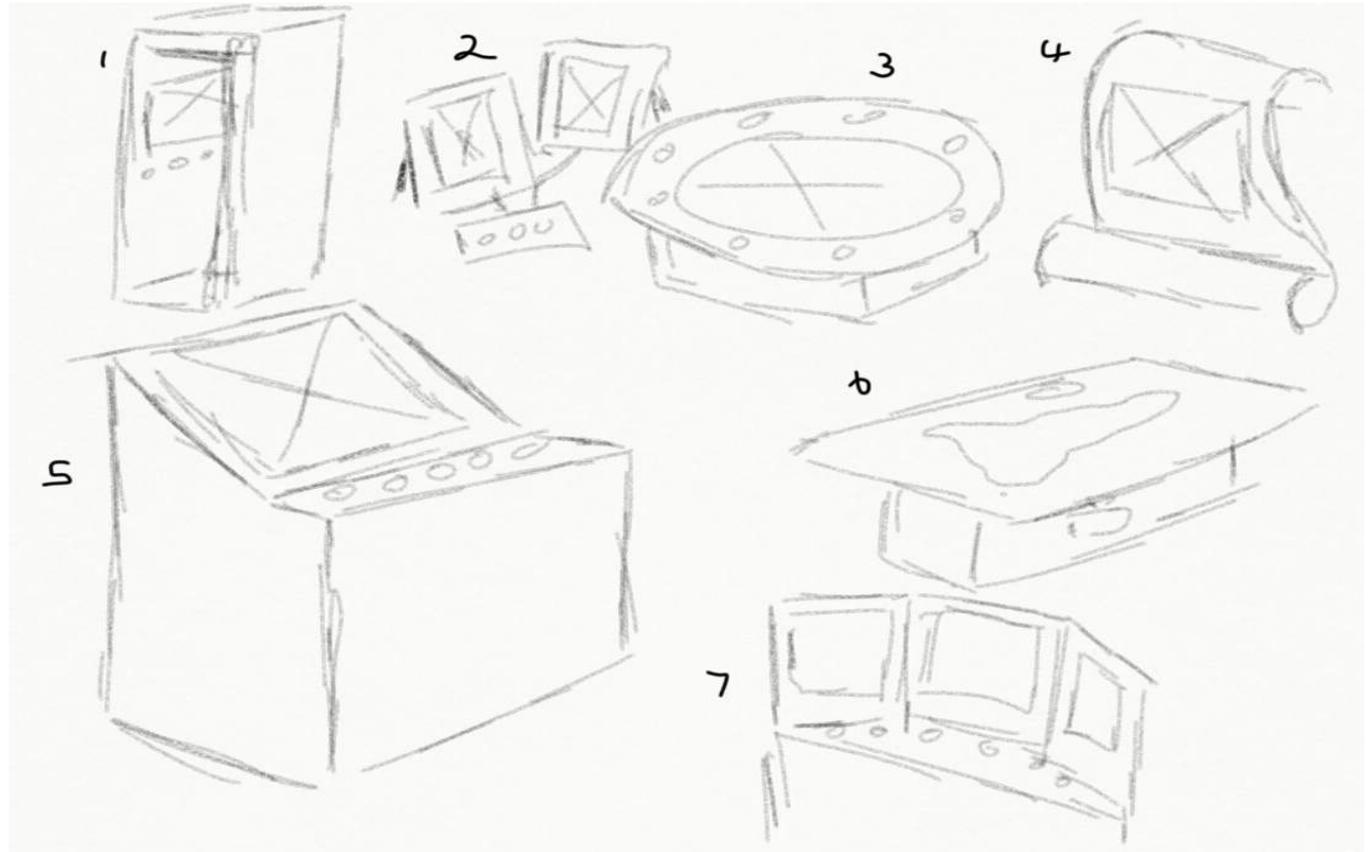
The image above shows a quick sketch compilation of the initial ideas that I cam up with for the design of the prototype.

1- A photobooth style with the projector projecting from the instead down on a tilt.

2- A selection of photoframes with a screen in each and all attached to a box containing the interactive buttons.

3- Around flat table with buttons and sensors all the way round for group interactivity.

4- a scroll like shape large piece for a gallery with the projection on the scroll (using madmapper possibly)

5- A console with a tilted screen like a radra console from WW1 and WW2. A flat panel on the front would hold the buttons and sensors.

6- 3 screens like a vanity mirror which splits into 3 screens and plays diferent movie aspects to do with the theme.
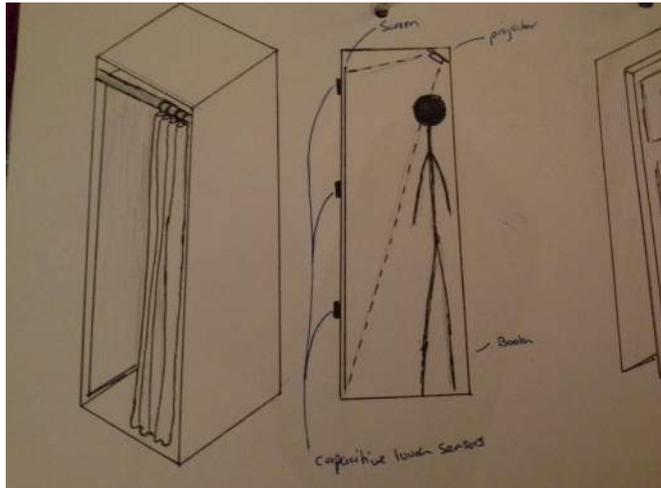
My first favourtie design is the photobooth idea creating a complete immerse environment for the user of the exhibit. Also gives an oppurtunity to have the buttons and sensors in various places so the user has to move.
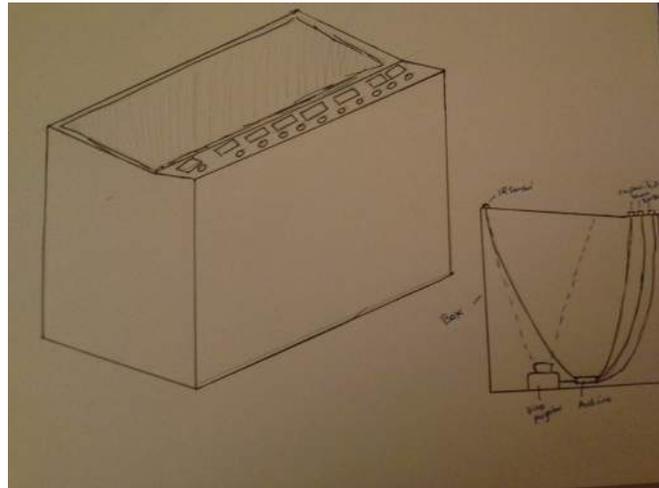
My second favourute design is the console inspired by old radar consoles. This is a very contained unit which can hold all the equipment needed. As well it reflect the theme I have chosen very well.
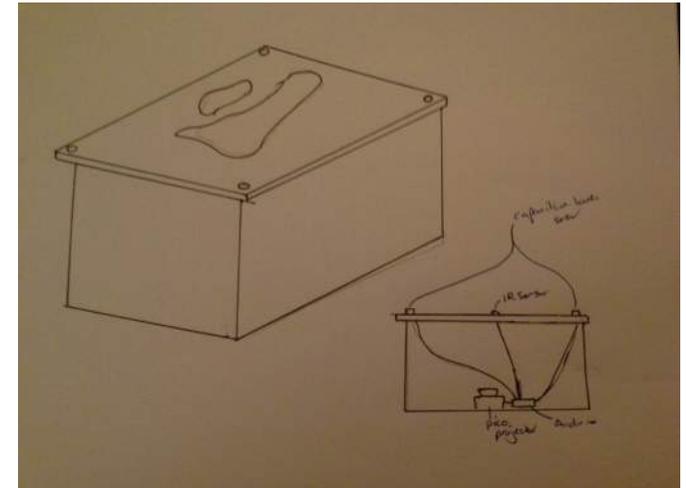
My last favourite design like the radar screen embraces the theme that I have choosen with an old fashioned map table but with a projection nside going up. The sensors as well can be placed around the table.

Photo Booth
http://aastudiosinc.com/wp-content/uploads/2012/08/001-ONE80-HOSTEL-Photo-booth-For-Berlin.jpg

Radar Concole
https://c1.staticflickr.com/3/2419/2216276029_6cf87e5760.jpg


WW2 Map Table
http://www.liverpoolwarmuseum.co.uk/images/toppics/maproom.jpg
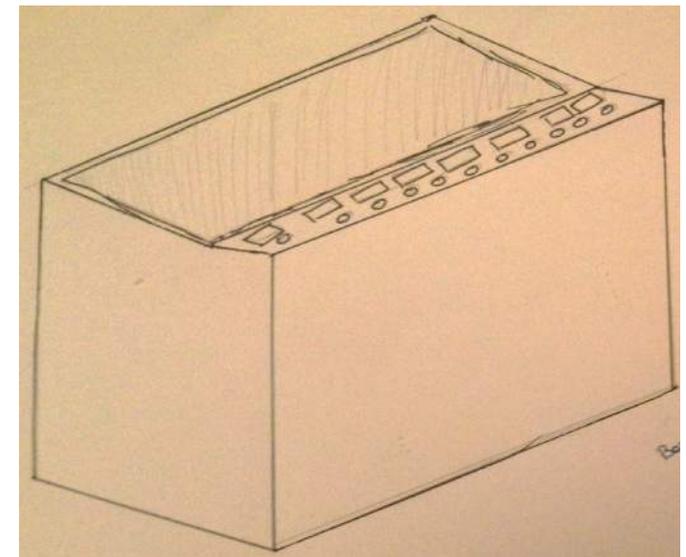
From the initial designs of the prototype with various setups I have decided to go forward with the radar screen inspired design . The initial sketch with a sloping screen and a console holding the buttons has not changed much . The cardboard prototype I created though made me reevaluate the size of the prototype and it has now decreased in lengh. From this I was able to take forward the final design to start building the prototype.

FINAL DESIGN

The final desing for the prototype can be sen below. The box desing has not changed that much but after prototyping with cardboard the box is thinner and with less touch points. I also made a final decision to create the visuals in the old radar style instead of a futuristic interface to keep the theme very accurate and tie the whole project together.
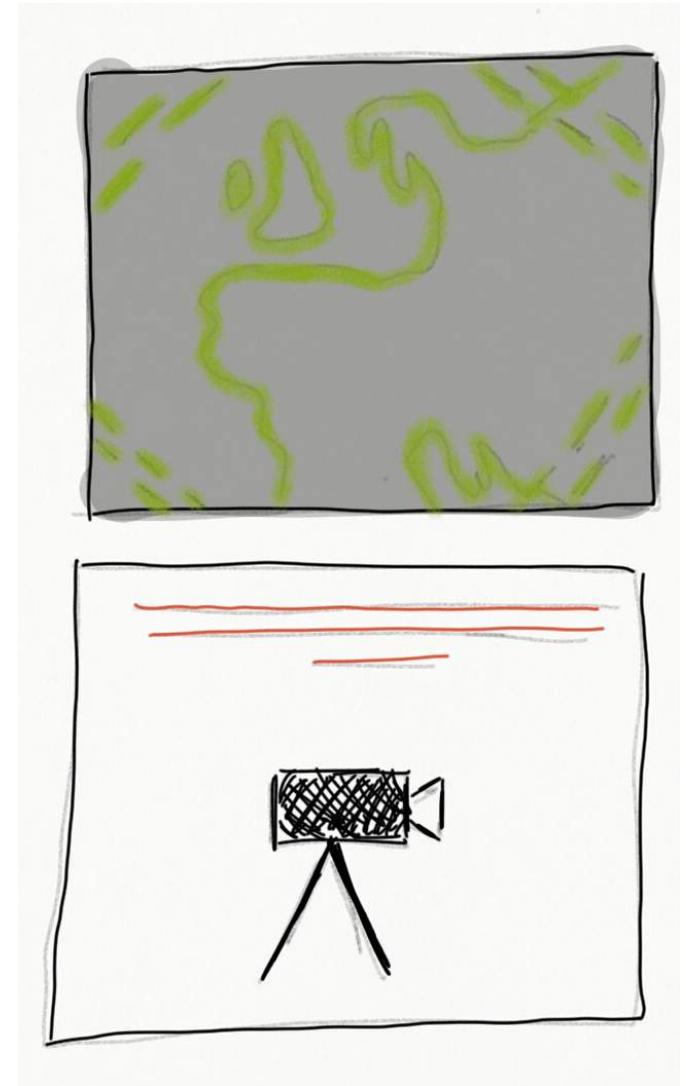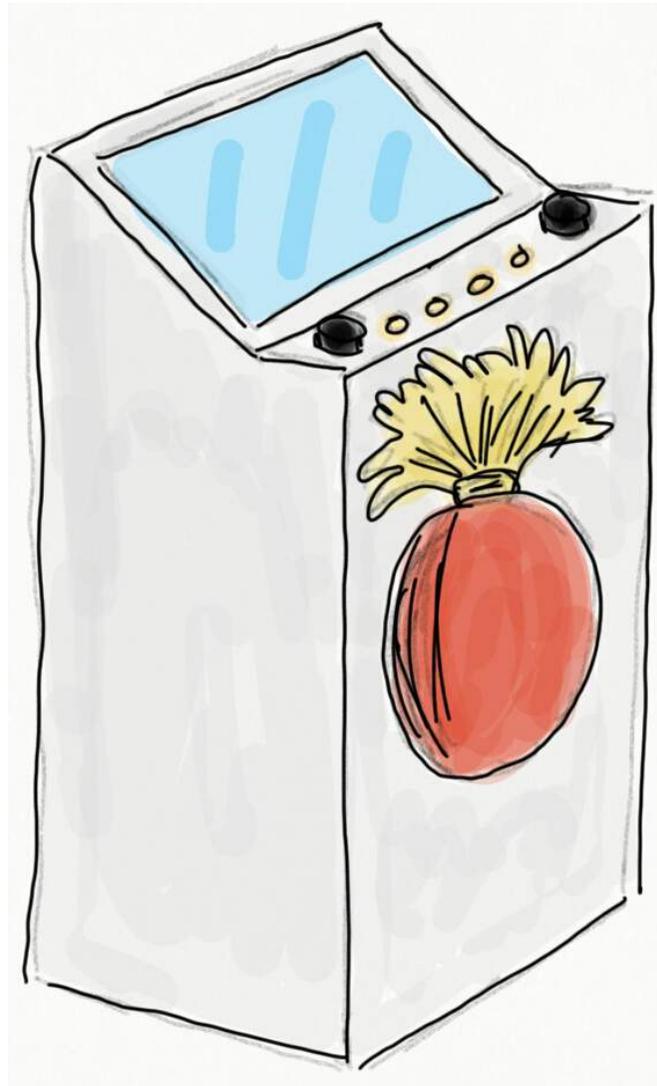
BRANDING

For this project I have created a mu-suem exhbit so from the start brand-ing was not a very important aspect..

The main reason for the branding is relat-ing to the theme which is the Royal Nor-thumberland Fusiliers. With this theme I have taken the battalions badge and var-ious medallions and for the final design of the box the badge will be on the front.

To create the sticker for the badge though I had to research into what the badge looked like and create a digital copy that was compatible for large printing.

The images below are visual research into the badge and various medallions of the Northumberland Fusiliers. The image on the next page then shows the digital version of the badge that I have created ready for print.

Cloth Badge
http://www.badge-of-pride.com/images/Royal-Northumberland-Fusili.jpg

Pipers Badge
http://www.britishbadgeforum.com/pipers_badges/northumberland_fusiliers_pipers_badge.jpg

TECH DEVELOPMENT

To create the interactive exhibit that I have designed I did research into possible ways to create the interactivity. The final decision in the end was to use Arduino, Processing and a pico projector.

I decided to use Arduino because it is technology that I am familiar with and already know the basic skills to use.

The main problem I had was decided what sensors to use for the interactivity. The first sensor I decided on was to use capacitive touch sensors I decided on these because I have used these before and therefore I was confident enough to create them again.

For the other sensor I eventually decided on using potentiometers this was mainly a design decision with the console reflecting the console of a radar machine.

Potentimeters though were a sensor I had never encountered before so before I even started to work with Arduino I did some research into Pontentiometers.

The next pages show a detailed diagram of how the Arduino and sensors are wired together as well as the connections to the computer and projector. The 4 pages proceeding outline the code for both Arduino and Processing that is used for the prototype. Parts of the code is explained.

Arduino Logo
http://www.talent-lab.it/arduino-lab/wp-content/uploads/sites/13/2015/04/stickers_logo_text.png

Processing Logo
http://www.donkersct.nl/wordpress/wp-content/uploads/2014/07/processing2-logo.jpg

Potentiometers

Arduino UNO

Computer

Pico Projector

Capacitive Sensors

© www.petervis.com
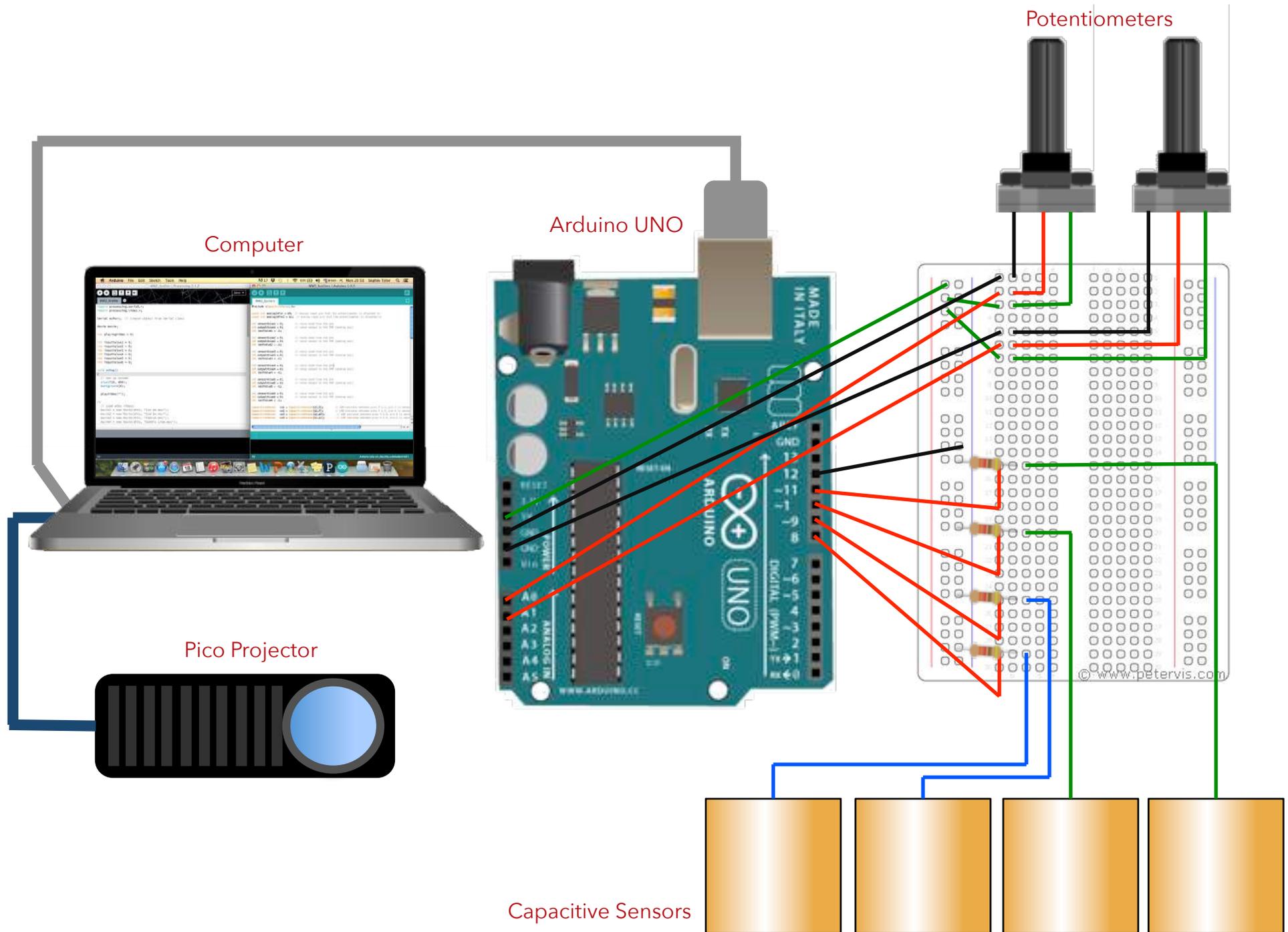
```
#include <CapacitiveSensor.h>

const int analogInPin = A0;  // Analog input pin that the potentiometer is attached to
const int analogInPin2 = A1;  // Analog input pin that the potentiometer is attached to

int sensorValue1 = 0;       // value read from the pot
int outputValue1 = 0;       // value output to the PWM (analog out)
int lastValue1 = -1;

int sensorValue2 = 0;       // value read from the pot
int outputValue2 = 0;       // value output to the PWM (analog out)
int lastValue2 = -1;

int sensorValue3 = 0;       // value read from the pot
int outputValue3 = 0;       // value output to the PWM (analog out)
int lastValue3 = -1;

int sensorValue4 = 0;       // value read from the pot
int outputValue4 = 0;       // value output to the PWM (analog out)
int lastValue4 = -1;

int sensorValue5 = 0;       // value read from the pot
int outputValue5 = 0;       // value output to the PWM (analog out)
int lastValue5 = -1;

int sensorValue6 = 0;       // value read from the pot
int outputValue6 = 0;       // value output to the PWM (analog out)
int lastValue6 = -1;

CapacitiveSensor   cs1 = CapacitiveSensor(12,8);      // 10M resistor between pins 4 & 2, pin 2 is sensor
pin, add a wire and or foil if desired
CapacitiveSensor   cs2 = CapacitiveSensor(12,9);      // 10M resistor between pins 4 & 6, pin 6 is sensor
pin, add a wire and or foil
CapacitiveSensor   cs3 = CapacitiveSensor(12,10);      // 10M resistor between pins 4 & 8, pin 8 is sensor
pin, add a wire and or foil
CapacitiveSensor   cs4 = CapacitiveSensor(12,11);      // 10M resistor between pins 4 & 8, pin 8 is sensor
```

The code you can see on the left is the start of the Arduino code for the prototype of the interactive exhibit.

The first part of the code is to set up the sensors inputvalues which is read from the port. This basic set-up is done 6 times for the 6 sensors on the prototype.

Even though 4 of the sensors ar capacitive and 2 are potentiometers for this part of the code   the set-up is the same.

The final code on the left shows thesetup for the capacitive sensors. This is done very simply with the inclusion of the Capacitive sensor library which is downloaded from Arduino and each sensor is set up with digital pin 12 as the ground for all and then digital pins 9 - 11 are connected to create the capacitive sensors.

```
void setup() {
 // initialize serial communications at 9600 bps:
 Serial.begin(115200);

 cs1.set_CS_AutocaL_Millis(0x80);
 cs2.set_CS_AutocaL_Millis(0x80);
 cs3.set_CS_AutocaL_Millis(0x80);
 cs4.set_CS_AutocaL_Millis(0x80);
}

void loop() {
 // read the analog in value:
 sensorValue1 = analogRead(analogInPin);

 // map it to the range of the analog out:
 outputValue1 = map(sensorValue1, 0, 920, 0, 1);

 if (outputValue1!=lastValue1) {
   Serial.println(100+outputValue1);
   lastValue1 = outputValue1;
 }


 sensorValue2 = analogRead(analogInPin2);

 // map it to the range of the analog out:
 outputValue2 = map(sensorValue2, 0, 920, 0, 1);

 if (outputValue2!=lastValue2) {
   Serial.println(200+outputValue2);
   lastValue2 = outputValue2;
 }


 sensorValue3 = cs1.capacitiveSensor(30);
```

The code continues on the right where a void setup is created and serial communications with the port are created. What this means is that any code afterwards actually talks to the Arduino through the serial port.

The main part of the code is then the most important setting up the sensors to read the values which will then be used within processing to trigger the right videos.

The code for each sensor is the same to read the outputvalues. At first the code was reading bewteen only two numbers (e.g. sensor 1 was breteen value 100 and 101) this was changed though because the capacitive sensors were very unstable and did not work all the time. So the code was changed to just trigger when it was just an output value.

The sensors all have the same code and a delay of 500 was added at the end to stabilize the sensor changes more.

```
   outputValue3 = (sensorValue3>600);

 if (outputValue3!=lastValue3) {
   Serial.println(300+outputValue3);
   lastValue3 = outputValue3;
 }

   sensorValue4 = cs2.capacitiveSensor(30);

 outputValue4 = (sensorValue4>600);

 if (outputValue4!=lastValue4) {
   Serial.println(400+outputValue4);
   lastValue4 = outputValue4;
 }

   sensorValue5 = cs3.capacitiveSensor(30);

 outputValue5 = (sensorValue5>600);

 if (outputValue5!=lastValue5) {
   Serial.println(500+outputValue5);
   lastValue5 = outputValue5;
 }

   sensorValue6 = cs4.capacitiveSensor(30);

 outputValue6 = (sensorValue6>600);

 if (outputValue6!=lastValue6) {
   Serial.println(600+outputValue6);
   lastValue6 = outputValue6;
 }

 delay(500);
}
```

```
import processing.serial.*;
import processing.video.*;

Serial myPort;  // Create object from Serial class

Movie movie;

int playingVideo = 0;

int inputValue1 = 0;
int inputValue2 = 0;
int inputValue3 = 0;
int inputValue4 = 0;
int inputValue5 = 0;
int inputValue6 = 0;

void setup()
{
  // Set up screen
  size(710, 460);
  background(0);

  playVideo("");

/*
  // Load athe videos
  movie1 = new Movie(this, "1st bn.mov");
  movie2 = new Movie(this, "2nd bn.mov");
  movie3 = new Movie(this, "Tobruk.mov");
  movie4 = new Movie(this, "Gothic Line.mov");
  movie5 = new Movie(this, "Dunkirk.mov");
  movie6 = new Movie(this, "Salerno.mov");
*/

  // Open the serial port
  String portName = Serial.list()[9];
```

Along with the Arduino code there is also Processing. Processing allows for communicating with files on a computer.

The first part of the code is the simple setup to make sure processing is taking to Arduino without this setup nothing else would work. Next like Arduino all the inputvalues are setup which is this case is 6.

The void setup is followed by the setting of the screen size for the videos when processing is played. Another vital part of the code is to define the port that the processing should talk to which is the same as the Arduino

Very much like Arduino the code continues with the same setup for each sensor which is to input a buffer. What this buffer does is read what is coming from the Arduino and if inputbuffer=100 for example on sensor one playing video=0/false. If the input buffer changes though to equal 101 sensor 1 is triggered and processing knows to then play video 1.

```
  myPort = new Serial(this, portName, 115200);
}

void movieEvent(Movie m) {
  m.read();
}

void playVideo(String filename) {
  movie = new Movie(this, filename);
  movie.jump(0);
  movie.loop();
}

void draw()
{
  String inputBuffer = "";
  String[] inputBufferItems;

  if ( myPort.available() > 0) {  // If data is available,
    inputBuffer = trim(myPort.readStringUntil(10));
    if (inputBuffer != null) {
      // Write debugging info
      println(inputBuffer);

      if (inputBuffer.equals("100")) {
        playVideo("");
        playingVideo = 0;
      }
      else if (inputBuffer.equals("101")) {
        playVideo("1st bn.mov");
        playingVideo = 1;
      }
      else if (inputBuffer.equals("200")) {
        playVideo("");
        playingVideo = 0;
      }
```

```
else if (inputBuffer.equals("201")) {
  playVideo("2nd bn.mov");
  playingVideo = 1;
}
else if (inputBuffer.equals("301")) {
  playVideo("Tobruk.mov");
  playingVideo = 1;
}
else if (inputBuffer.equals("401")) {
  playVideo("Gothic Line.mov");
  playingVideo = 1;
}
else if (inputBuffer.equals("501")) {
  playVideo("Dunkirk.mov");
  playingVideo = 1;
}
else if (inputBuffer.equals("601")) {
  playVideo("Salerno.mov");
  playingVideo = 1;
}
}
}

// Update the screen
// if (playingVideo>0) {
  image(movie, 0, 0, width, height);
// }
// else {
//   background(0);
// }

}
```

This input buffer code continues in the same style for all of the sensor with only the numbers changing.

The final part of the code which you can see on the left is a simple piece of code to make sure the sensors trigger one after the other. For example if you are playing video 1 and press sensor 4 video 4 plays straight away but if you were to go back to video 1 by pressing sensor 1 video 1 goes back to the beggining.

The image top right shows the early stages of getting the Capacitive sensors to work with Arduino . The image middle on the right shows Arduino again combining the code for the potentiometers and the capacitive sensors. The final image on the bottom right show the Arduino and Processing code working next to each other this is the final setup for when the prototype is working.
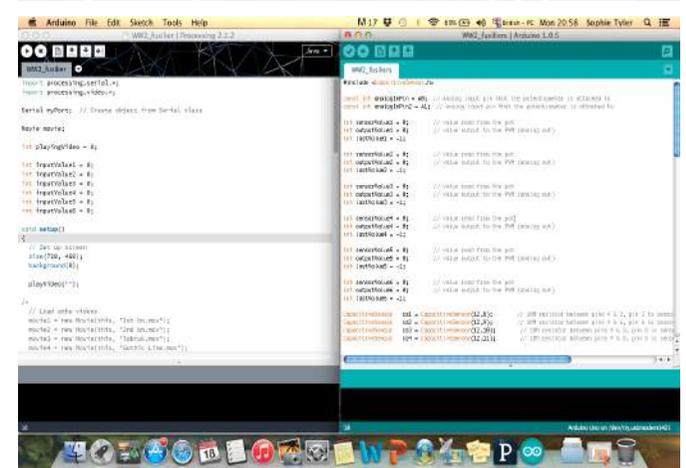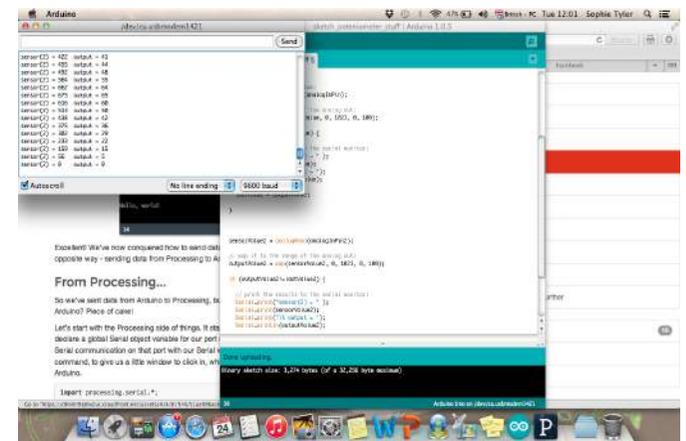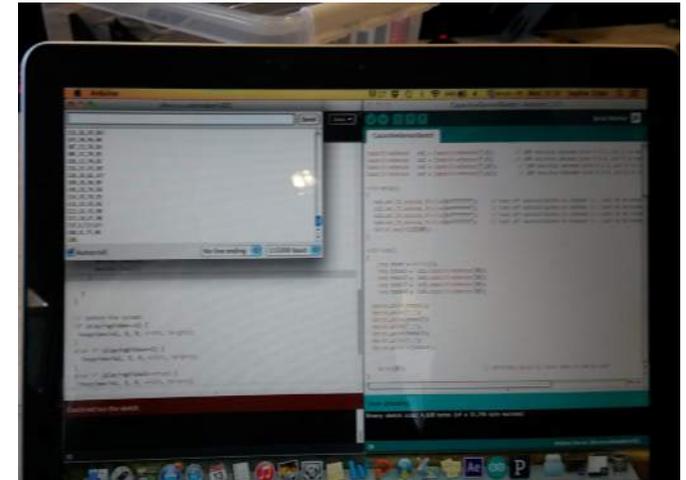
To work out the size of the box I would need for the project I created a full scale prototype out of cardboard. The projection by itself was originally too small so I used a mirror to reflect up onto the screen surface.
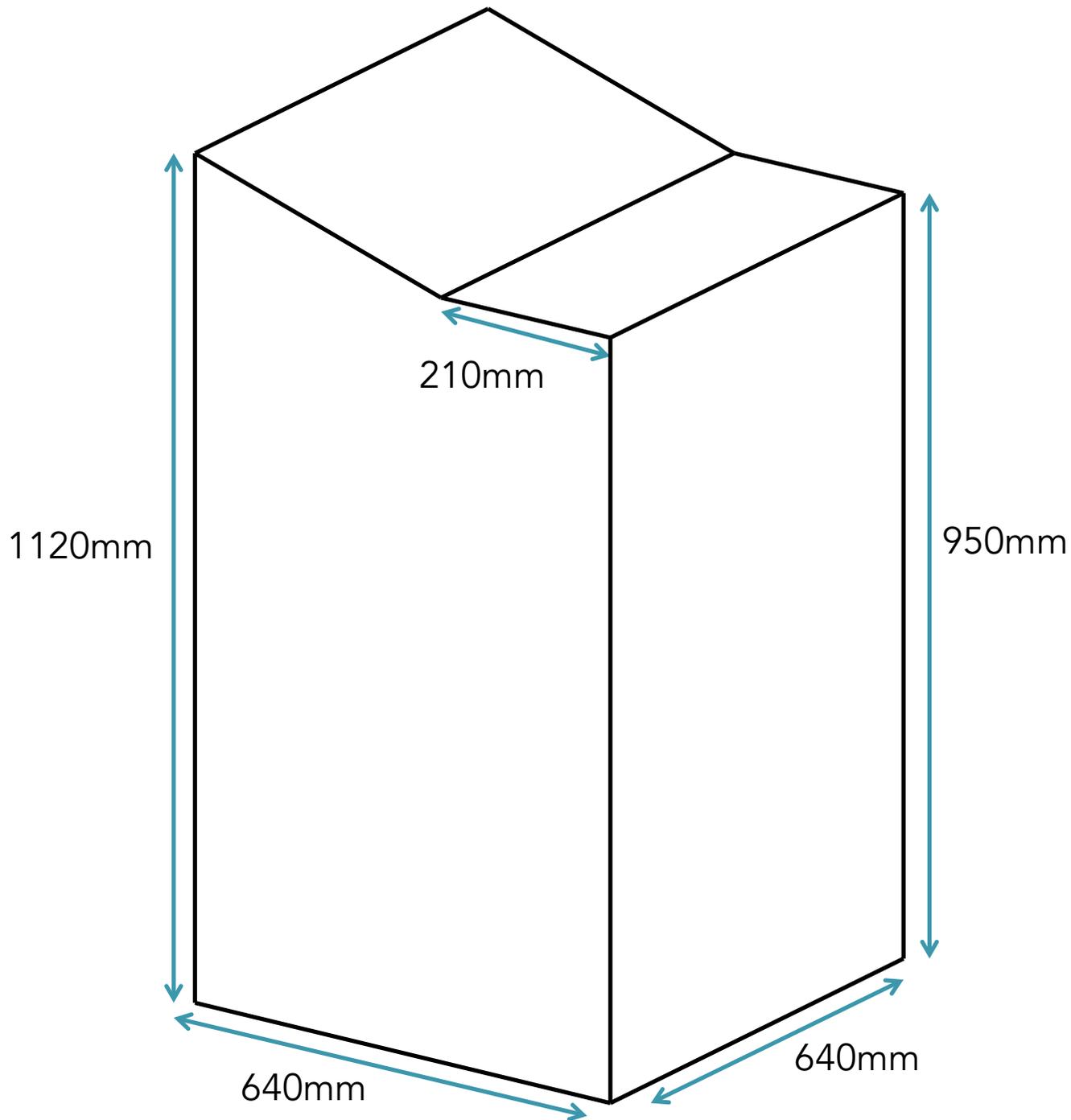
The cardboard prototype was a great tool that helped me define the size of the final box more accuratly by trimming it down until it had reached the desired size.

The size also makes it very compatible for transport with the ablity to fit in any large car or small van. The box as well has a foot size of 2ft by 2ft making it a nice square that can fit into any corner. The image on the left shows a diagram of the box with the measurements in.

The materials that were used to create the final prototype was...

- Timber beams
- Panels of MDF
- Screws
- Perspex sheets
- Arduino Uno
- Cooper Foil
- Wires
- Mirror

Step 1: The first step was to buy the material to create the box. The material included timber beams for the frame and sheets of MDF.

Step 2: The next step was to create the frame this was done using the timber beams which were screwed together.

Step 3: With the frame in place the MDF panels were cut down to the right size and screwed onto the sides.

Step 4: Inside the box two more lenghs of timber were put into place to indicate the place the console will rest on.
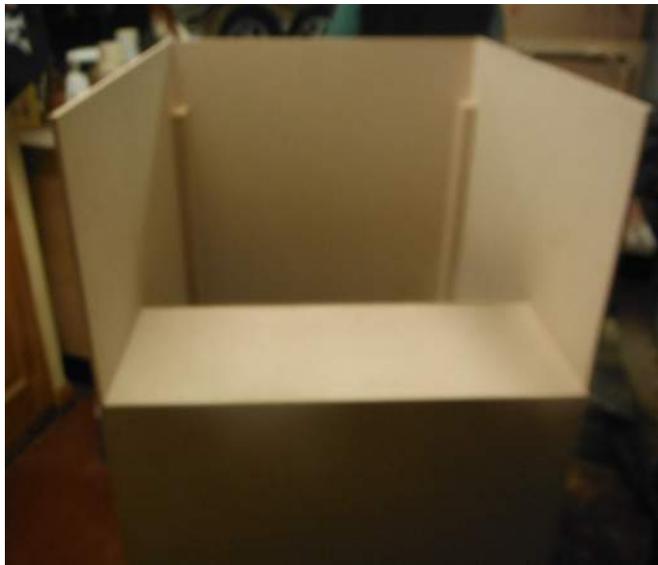
Step 5: The wood for the concole was then cut to the right shape and minor adjustments made to give it a tight fit .

Step 6: The angle for the screen was then measured and timber beams were cut and screwed into place at the right angle.

Step 7: The image above shows the box at this point of the creation.

Step 8: A floor was then put in easily by slipping into place on the inside giving it a tight fit.

Step 9: A door was then cut into the back of the box for acess later on.

Step 10: The square cut for the door opening was then used as the door using timber to reinforce and hinges.

Step 11: With the main structure of the box in place tests with the projector and mirror were carried out.

Step 12: The next step was to create the screen by cutting the perspex and wooden frame into posistion.

Step 13: The projection was accomplished using a projection material called Rear Projection sandwitched bewteen the perspex.


Step 14: The box was edited again by cutting down the top to create a sloping pane and then sanded to create smooth edges.


Step 15: The wooden frame with the perspex and projector material were clamped into place and screwed into place.

Step 16: The image above shows the box completed before the console is edited.
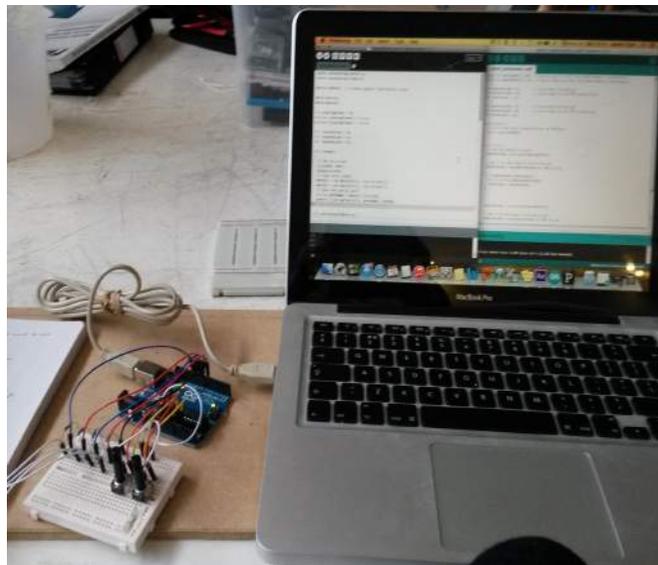
Step 17: With the box completed the next step was to take the Arduino and edit the wire connections ready for the transfer into the box.
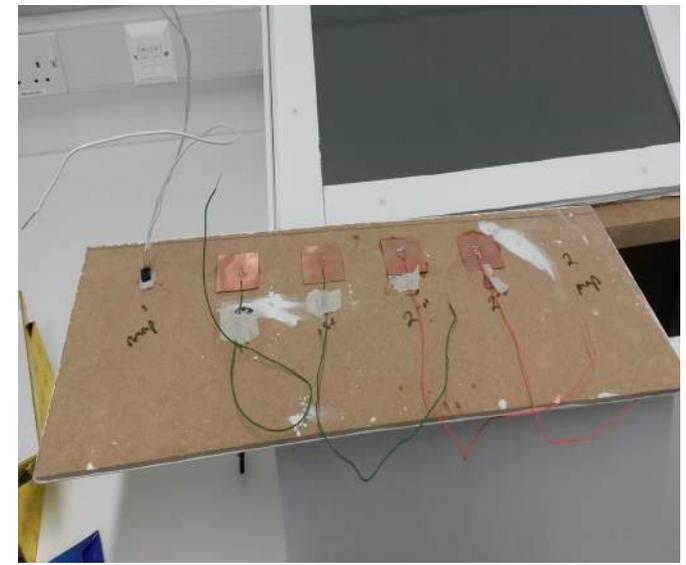
Step 18: The console was then drilled to create the holes for the sensors and the sensors were put in place.

Step 19: The console was then put back in place in the box with the Arduino resting on a shelf underneath.

Step 20: With the box in place the projector was put back in for more test with the laptop as well. The test went well.

Step 21: The final image above shows the box after being painted with the projector working on the screen.
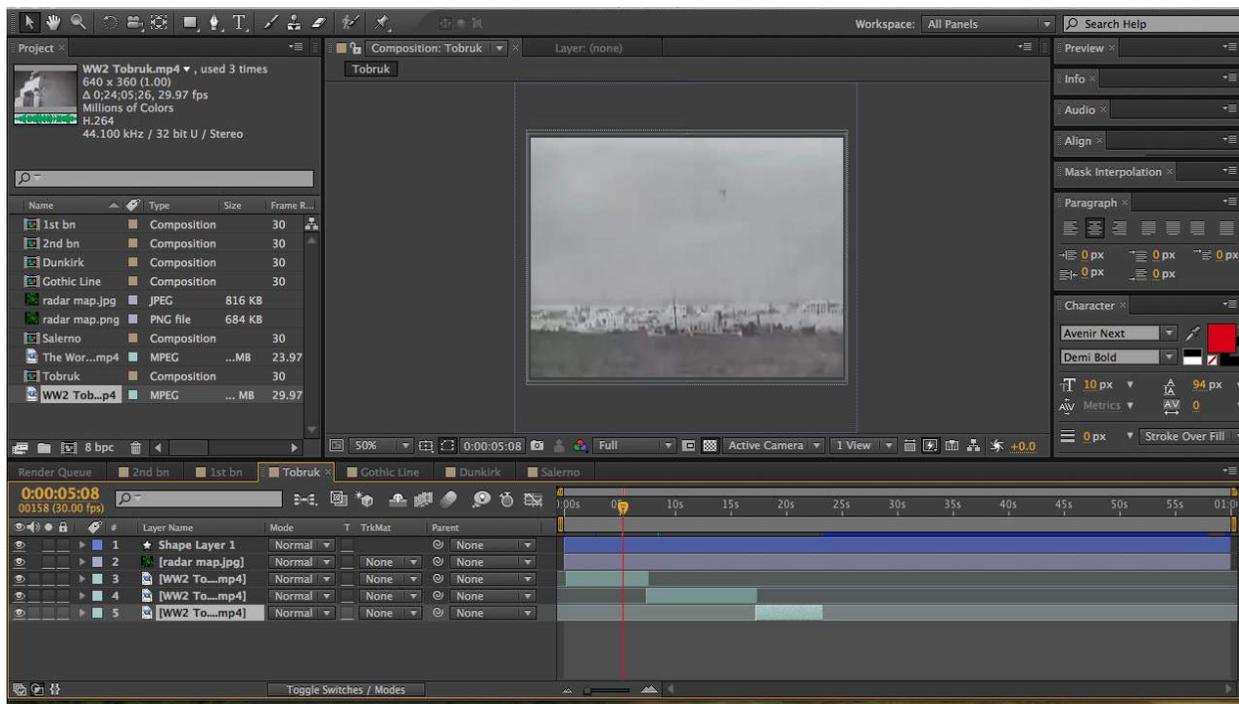
A final part of the prototype was the creation of the visual these were all done in after effects. Intotal there is 6 videos 2 are the map tracking of the radar map and 4 are the battle videos which use old newsreels.

The image on the left is a screenshot of one of the battle videos while it is being edited in After Effects.

PROTOTYPE VIDEO
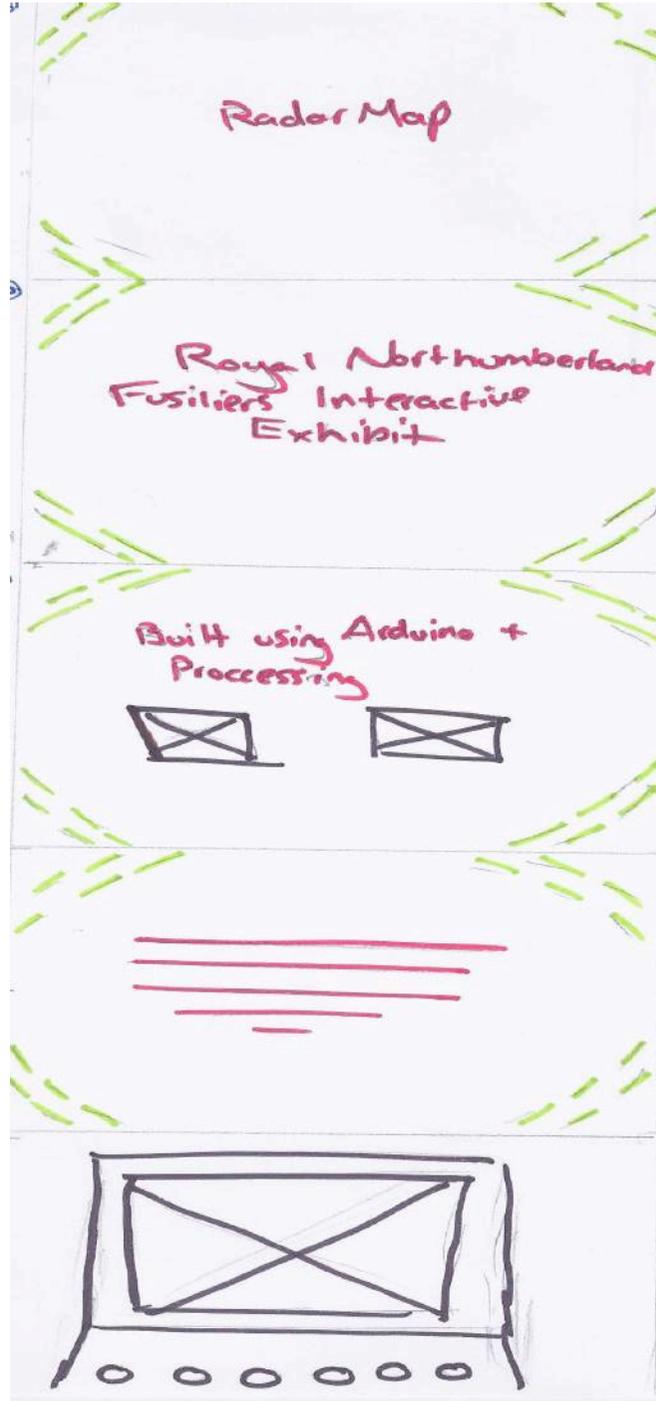
Screen 1: The radr map appears before fading out   leaving the spinning circles in lace.

Screen 2: A typewriter effect is applied to @Royal Northumberlan Fusiliers - an interactive exhibit" the text is in red and against the black with a green grid background.

Screen 3: The first text fades out and the typewriter effect again makes the text "Built using Aduino and Processing" appears along with the Arduino and Processing logo.

Screen 4: More text appears in the same way as before this text explains what the exhibit is.

Screen 5: The circles and grid background fae out and a few of the exhibit is showing from the front with the user interacting with the interface.
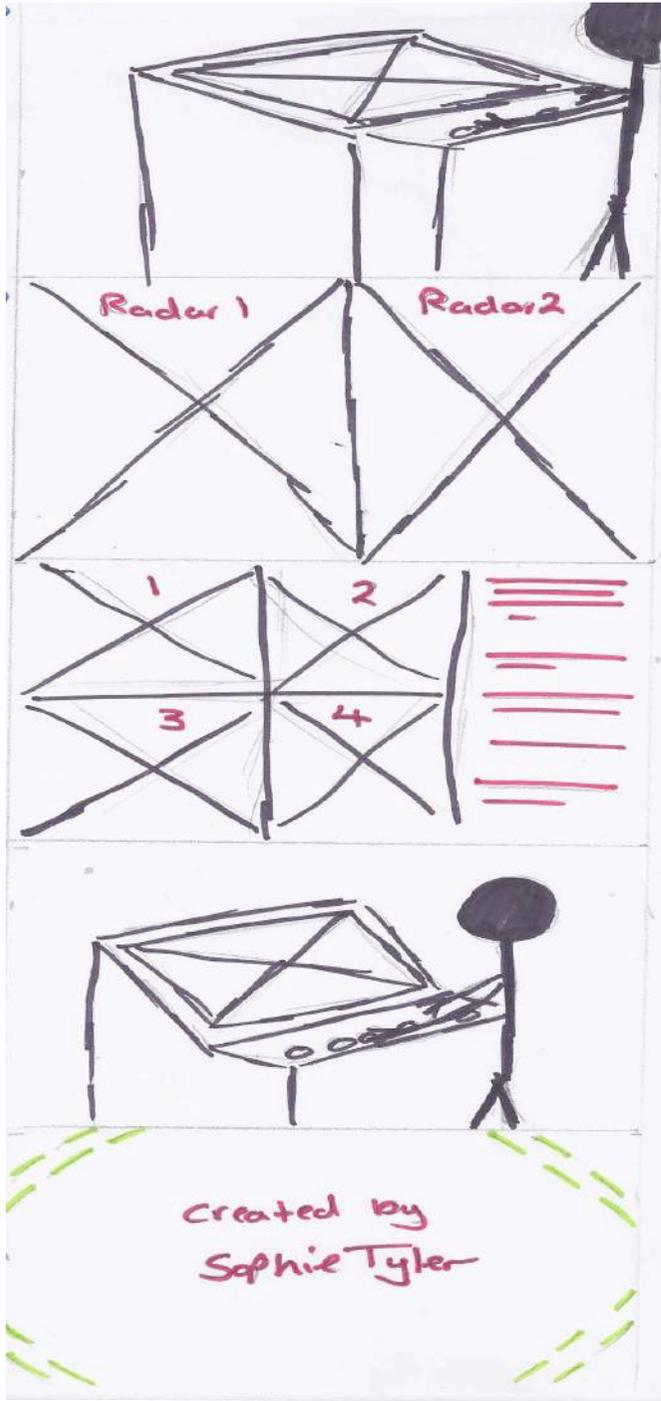
Screen 6: The video then fades to another view of the box and another user interacting with the exhibit.

Screen 7: The video fades and a double screen view shows the radra maps thar are triggered on the exhibit.

In the Mood by Glen Miller is the music I finally decided on for the final prototype video. I decided on this music because it is an instrumental piece which is quite upbeat but reflects the era that my theme is in very well.

Screen 8: The maps fade and the screen splits into four and shows the four videos that you can view through the exhibit. The text explaining the video also appears using the typewriter effect.

Screen 9: A short final video appears with a user using the interactive exhibit again.

Scren 10: The video fades out and the grid background and circles fade in again the text "Created by SOphie Tyler" then appears using the typewriter effect.

The final video was created using After Effect CS6 by pulling the images and files into the right part of the timeline and creating the layers to make the video. As well text layers were added and a typewriter effect added. After Effects also allows for easy addition of a sound layer with the ability to fade the sound in and out.

EVALUATION

The concept for thei sproject was to create an interactive piece within a museum or gallery using video, images and sound to convey infromation about a theme and a new exciting way. What I have created in a fully contained interactive experience inspired by old radr consoles. The box is designed with a tilted screen and a flat concole on the front the console containf 6 sensors 4 Capacitive sensors and 2 potentiometers these when operated trigger visuals on the screen which are projected from inside the box. The visuals shown on the prototype depict information about the 1st and 2nd batallion of the Royal Northumberland Fusiliers during WW2.

Overall I think my performance on this project has been very good ecspecially with the extensive research I carried out into my theme. As well I have been able to expand my Arduino skills and I feel I can now go on and do more DIY electronic projects. The challenge of creating a built prototype has made me evaluate my practical skills as well as my ability to plan and make decision quickly when there is a very tight deadline.

The combination of a solid idea from the beginning of what I wanted to create and extensive research into my theme means that the final prototype that has been created is of a high quality. As well the help with Arduino I received has taught me more about the system and giving me the confidence to work with it alone now.

The main strengh of this project I believe is the detailed and accurate research that has went into making the theme work with the prototype. Another strengh was my ability to make a decision quickly on the design of the box so that the building could move forward and not hinder me later on.

A weakness I would mark is that I did not spend as much time on the visuals as al did building the prototype and getting the Arduino to work.

How the project could progress in the future is if the box design stayed the same it has the potential of representing any theme with just the need to change the visuals easily through processing. For example instead of a WW2 theme visuals could be produced to show the history of animation. If the box design did develop though I would make it larger and add more sensors. As well I would adjust how people use the box to make it a pair or group activity instead of just one person viewing the information at one time.

Overall this project has went very well for me and I am happy with the prototype I have been able to create. The success of this DIY electronic project has given me the confidence to do more electronic projects in the future.

BIBLIOGRAPHY

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• Author: The British Museum Date: March 2013 WebAddress: http://www.britishmuseum.org/channel/exhibitions/2012/virtual_autopsy_gebelein_man.aspx

• Title: The History of the Royal Northumberland Fusiliers in the second World War Author: Brigiadier C.N. Barclay Date: first published 1952

• Author: Jamaal_7lna Date: 20 May 2015 WebAddress: http://www.instructables.com/id/Creating-your-First-Multi-touch-Table/

Images

• Title: Innovation Icon Date: 16 May 2015 WebAddress: http://fashions-cloud.com/pages/i/innovation-icon/

• Title: 1925-2013 Date: 18 May 2015 WebAddress: https://www.flickr.com/photos/mrsultan/9342212170/in/album-72157626149118210/

• Title: Innovation and Creativity Date: 20 May 2015 WebAddress: http://cdi.hw.ac.uk/seed-corn/files/2011/04/wordle.jpg

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