Technology, Simplifying the User Experience

How do we make it easy to use?

Marc Dimmick - 2011 Churchill Fellow

This project explored how break-throughs in mobile technology that can help social workers in the field provide an improved child protection service. It will examine how to ease usability barriers imposed by the complexity of unwieldy applications and devices. It will try to eliminate, or moderate the impersonal use of technology in meetings, with clients, where a high degree of empathy and emotional intelligence is required. Working with experts in child protection, technology, usability and communications, this project will seek ways to record and process information captured in the field using a new generation of smart devices and innovative software applications. Key goals will be a reduction in staff workload, improved access to information for colleagues, and a rich interaction with clients, enhanced by the removal of technology barriers. A further substantial benefit will be a decreased need for computer training, due to a better understanding of usability and human interface into these devices, allowing staff more time to focus on relationships with clients.

The project included travelling to the USA, UK, Germany, Austria and Singapore meeting with institutions, manufacturers, government bodies, developers and usability experts in the field of Human Computer Interaction and Human Factor Engineering. Its main goal is to discover how we can make technology easier to use. In meeting and talking with the people around the world I hope to better understand how we can use the technology used by social works in Child Protection.

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Signed: ________________________________                    Date: September 2012
Executive Summary

The impact of the complexity of technology is a major factor in the delivery of services to the Department for Child Protection. Currently we have a large and complex client records management system which is served from the desktop computers within the department. With the advent of the iPad and many other forms of mobile technology, the department is considering the possibility of using these types of devices in the field of child protection. Due to the size of many of these devices, the current style of design of many applications is not conducive to mobile devices. The biggest issue is the amount of screen space or territory that these mobile devices offer.

The main theme behind this project is to better understand the issues associated with usability and the reduction of complexity in the technology we use. A good example is with the current Apple iPads. If you talk to an owner of an iPad they will talk about what they do and create. Any mention about technology and complexity of the programs does not form any part of their conversation. Based on the view that if Apple can reduce complexity, then how can this be achieved with other technology? Can we reduce that complexity in the technology that the Department for Child Protection uses? How do we make technology facilitate the outcomes of our social workers?

This project took the perspective of four groups in the delivery of this technology. The groups were Users, Developers, Manufacturer’s and Business. From a user perspective the project was aiming an understanding what the user wants to achieve with their technology. What are the challenges and frustrations that users face when using technology?

As a developer, how did they come to their decisions in the development and delivery of products. The manufacturer’s was it based around sound user analysis and understanding the user’s needs? How did they align themselves with both their customers’ needs and the needs of their business? The Business or Government perspective was understanding why many don’t believe they are able to direct the outcomes.

During my research around the world I met many different companies, dealing with software and hardware; I visited Stanford and Harvard to meet with business departments and Human Computer Interaction (HCI) or Computer Human Interaction (CHI) to obtain an understanding how people in the field of usability and Human Factor Engineering (HFE) address these area of usability and interaction with technology.

The following report covers my journey and the interactions I had with the people and organisations that I met. I needed to understand the questions as well as look for answers. What I did learn was that as I gain more knowledge and information the less I knew and the more I needed to learn. I came across some really good questions and some better insights.
This trip and report is just the start of my journey and further education on this field of study. The experience has been priceless and set me on a solid foundation to better inform organisations on the topic of usability and to simplify the technology that we use.

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Programme

11\textsuperscript{th} - 19\textsuperscript{th} May 2012 - Perth > Sydney > LA > San Francisco, CA

- Stanford University – HCI Department
- Fujitsu Research Laboratory
- SAP
- Oracle
- Google
- Apple

Figure 1 - The Golden Gate Bridge

19\textsuperscript{th} - 23\textsuperscript{rd} May 2012 - San Francisco > Seattle, WA

- Microsoft

Figure 2 - Seattle City and the Space Needle

23\textsuperscript{rd} – 25\textsuperscript{th} May – Seattle > Austin, TX

- Micro computing

Figure 3 - Austin, Texas
25th May – 1st June 2012 – Austin > New York, New York

- Mauro New Media
- New York University

Figure 4 - Flat Iron or The Wedge, First Skyscraper in New York

1st – 8th June – New York > Boston, MA

- Harvard, JFK School of Government
- Microsoft
- Bentley University

Figure 5 - Cheers – Where people know your name

9th – 15th June – Boston > London, UK

- Google
- Fujitsu European Laboratories
- London Web

Figure 6 - St Paul and the Millennium Bridge
15th – 22nd June – London > Heidelberg, Germany

- SAP

22nd – 29th June – Heidelberg > Salzburg, Austria

- Salzburg University – HCI Department

7th – 13th July – Vienna > Singapore, Singapore

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May 11th San Francisco - Heading to the birth place of computing

**Fujitsu Laboratories of America**

My first visit was to Fujitsu Laboratories of America. This was a contact that was arranged for me via Mr Tony Zach of Fujitsu, Australia. The visit was half a day understanding the role of the Laboratories and seeing some of their research in different areas of technology.

The meeting commenced with a presentation by Mr Yasunori Kimura, Ph.D. who is the President and CEO of the Laboratories. He shared the goals and aspirations of the laboratories and the areas in which they specialise. Fujitsu has a number of Laboratories around the world, two in the US, one in the UK, Singapore, Shanghai, Suzho and Beijing as well as Kawasaki, Atsugi, Yokusuka and Akashi. Each of these Laboratories specialise in a number of different areas; ranging from:

- Cloud computing,
- Sensing Solutions,
- Web Information Processing,
- Service and solutions,
- Human Centric Computing,
- Device and materials, and
- Trusted Knowledge Processing.

Mr Yasunori told the story of Fujitsu from 1954 through to present and into the future. Their work in the area of Peta-scale computing (very large and powerful computers) was very interesting and exciting.

The Fujitsu Laboratories employee over 1500 people in Japan and overseas, they established the Fujitsu Laboratories of America, Inc. (FLA) in 1993 and located in Sunnyvale and Richardson. Some of the research topics they are working on are:
Mr Ysunori, Hideaki Tanioka, Ph.D. a Senior Software Engineer gave a presentation of the work he has been involved with Fujitsu Human-Centric Mobile Technologies. The presentation demonstrated the phones that Fujitsu had been developing. Applying their algorithms to these devices has provided some special capabilities. Their phones had up to ten sensors ranging from:

- Touch,
- Accelerometer,
- Camera,
- Approximation,
- Microphone,
- GPS,
- Fingerprint,
- Humidity,
- Gyroscopes, and
- Temperature.

The combination of these multiple sensors and with Fujitsu’s algorithms provided some special capabilities. His demonstration utilised one of these phones. Their mission is around innovation creation, to realize Human Centric Intelligent Society. The main focuses of the laboratories are Hearing, Security, Touch Operation and Wellness. One of the examples was in the area of analysing movement using the accelerometer and the gyro-sensor. While holding a phone to the person’s chest and carrying out a series of movements the application was able to determine the flexibility of the person. Other examples included Golf Swing Form Advisor, Walking Advisor, Running Form Advisor and the Body Balance Advice. The applications of these phones or devices did not stop at humans. They also explained work they had been carrying out with pets in the area of monitoring levels of activity and other data to provide pet health management. In one of our discussions I suggested some ideas of using the phones with the elderly. Based on an algorithm of
types of actions i.e. a sudden fall or change in medical condition another person could be contacted automatically.

Mr Matthew DePetro demonstrated how social robots could become people-friendly terminals. He gave a demonstration of the newly released Robot Teddy. The social robot bear cub is designed to be a people-friendly terminal with life-like appearance and behaviours. It aims to comfort the elderly, keep children happy, and support families by providing care, education, healing and information relevant to users’ daily lives.

The bear cub interacts with its environment and responds to physical interaction with the use of twelve actuators or little motors, voice and touch sensors. It has a camera mounted inside its nose and can recognise faces and expressions. It has microphones and speakers internally so it can hear and respond to noise and voices. Grip sensors in both hands give it the ability to recognise when they are touched and squeezed. In the face there are three actuators, giving the eyes, mouth and ears independent movement and the ability to express emotion. In the demonstration it would yawn if no one interacted with it, its eye would blink and ears droop. Every so often it would make noises and even snore when it fell asleep. Then if you touched or tickled it, it would laugh. There was a further three more actuators in the head so that it could nod, shake and tilt the head to give further expression. In the body there were a further six actuators two in shoulder joins and in the hips. There were thirteen touch sensors over the body so physical interaction derived a response from the bear. This was a proto type and had cables hanging out the back, but the potential and future possibilities were very exciting. There are a number of videos online as the bear was shown at the 2012 Computer Electronics Show (CES) in March.

The bear is modelled on a 5 year old, so the bear would make comments and then fall asleep. We discussed the application of this device with the elderly as a companion and reminder for actions, like taking medications and other activities as well as for education and sociability. One area which I raised was the possibility for Child Protection and child interviewing situations. The device could be used to deliver conversations to a script; it could also have direct responses to a person controlling the device. Due to the camera and microphone, a physiologist could use it as an interview device with children, breaking down barriers between the adult and the child.
The next presentation was by Mr Ajay Chander, senior research in DDHC (Data Driven Health Care). A device was presented, not much bigger than a credit card and the thickness of some of the modern phones. Within this device was a fully capable small computer which captured, analysed and transmitted health data.

The device would be connected to a number of sensors worn by a client. They could record raw EC (heart data), heart rate, activity levels, heart rate variability, power spectrum and calculate stress levels. All this data would be collated and time stamped and then with the device which could be held in a pocket or on a belt and transmitted to a service provider. One of the experiments was to have this data transmitted to a small display or mobile phone so the end user could see when they were getting stressed and take immediate action. This display would show current stress levels in the last hour as well as heart, respiration and activity levels. In these experiments people were able to change their circumstances and environment to reduce such situations.

With the use of the bio-sensors, a computer and a smart phone, the capabilities of future service providers unlimited services. It could provide for crowd-sourcing of data to better understand individual behaviours and groups and ages. This could mean better support of the ageing, providing alternatives to nursing homes with a better quality of life. Providers would be able to manage and support the patients who were identified with needs. Treatments could be better provided due to more accurate and timely information. Health and safety could be improved with early detection. With all of this data then becoming available the knowledge and capabilities of our service providers can only improve. The information and devices and the possibilities were extensive.
Mr Jatin Thaker the Director of User Experience of Oracle Applications gave a presentation on the ideology in the development and creation of their software and tools. Upon completing that presentation he then proceeded to present “Innovations in the Applications User Experience: The New Standard for Work”

He presented the point that they had taken a centralised approach to their application user experience over their suite of applications. In respect to user interface vs. User Experience they are looking at the complete experience for a user accomplishing a task, including across traditional application boundaries. This is working to be useful for everyone, both the user and the administrator of the system, encouraging collaboration and adapting to personal work style. With the advent of mobile technology and the phone or an iPad or a slate/tablet, the experience needs to concentrate on these types of work styles.

Oracle builds the application user experience by observing end users where they actually work and analysing, finding patterns across both the customers and users. Taking this Oracle then sketch out what kind of experience they think end users need and re-define these sketches with customers. This is an important point which is demonstrated using Henry Ford as an example. If Henry Ford had asked what people wanted before he invented the Model T-Ford they would have told him they wanted a bigger and faster horse the need was for a more reliable means of transport that could carry more and travel further than before in comfort.

The next step is then to prototype. From this position, further refinement can be included to the design. The final step is to measure how well the product stacks up to the end user needs. If you cannot measure, you cannot manage. It is this constant review and measure which make the difference between good and great.

Mr Jatin Thaker then gave a demonstration of the eye tracking screen. This tool is capable of providing considerable information to designers and developers of software. It would track the user’s eye movement...
based on a number of exercises. One of the exercises was to location the name of the manager on the screen of a person’s record.

The system plots the movement and locations that you stop and builds a picture associated to the task requested. The results could then be displayed based on an individual or of a group of people. The results of the group would show up trends and anomalies. From the feedback developers and designers could then be better informed in how they design and place the information on the screen.

(\textit{NB: Source of images fig 14-15 Oracle Website Usability})

The other area of interest is the study of facial gesture analysis. Oracle is researching where people look for information and to understand the emotional interaction and seeing and understanding if there are factors with respect to frustration and happiness in the success of completing a task.

The interesting part was the recognition that the science of HCI/CHI (Human Computer Interaction / Computer Human Interaction) was starting to be a factor in software development. Oracle UX (User Experience) team are working with many different institutions around the world.

During my time with Mr Jatin Thaker we discussed approaches to software from the user perspective and how it has become more complex. Our discussion covered two areas; one of that of the developers, the other the end user.

Usability and how we design for the user of the end product is becoming more important. Oracle works to deliver a complete user experience which is customer-driven insight, designing with the next-generation of innovations, building with a complete tool set and driving change with user experience best-practices. One way that Oracle is addressing this area of their business is with the use of a Usability Advisory Board. This approach is bringing usability to a whole new level through industry, government and university
collaboration. This board includes 100 customers worldwide which meets quarterly rotating through geographic locations. They cover topics selected annually by customers and collect data a number of times over the year.

It was interesting to see the commitment that Oracle was putting into usability. They presented and discussed their commitment to the delivery and how they are working to enable people to complete tasks and not just collect data.

**Apple Computers**

Mr John DiTomasso, the Apple Federal Manager spoke about a number of the customers he has been working with and projects that they had developed. He explained the development programs for iOS development both for individuals and Enterprises. We discussed other developments and how the change in understanding that Apple brought to the table with respect to mobile development. During our discussions Mr John DiTomasso identified a number of organisations dealing with similar issues that we are facing at DCP.

Development of mobile applications is a totally new way of thinking. Applications need to be based more on user processes and business outcomes and less about functions and features. Again, like Oracle, Apple is working with engagement directly of the end user and understanding what they are doing, by getting an appreciation of the requirements to achieve their tasks. Apple has a number of case studies which explain this scenario quite well. One of these examples was the case study with Mount Sinai which Justin Stuckey, the Business Development Manager for iPhone & iPad in Business, Enterprise and Government presented while visiting earlier this year. It was how Apple had identified 25+ key processes which they then developed into an iPhone and iPad app.

The biggest disappointment was not being able to get a better appreciation of how Apple went about that process. John indicated that it was their secret source. There are a number of people that need to know and so no one talks, either in or outside the business.

Apple has shown us that technology can be created in such a way that it becomes transparent to the user. If you talk to an iPad user and they will usually talk about what they do and create, nothing about the
technology. The technology effectively has become transparent. I believe that we need to do this with all our technology.

There is an iTune preview site with a selection of videos about Customer Stories in the Enterprise. The second link was to the iOS Developers Library. The introduction starts with describing the guidelines and principles that help the user to design a superlative user interface and user experience for their iOS app with emphasis on the user experience and the principles and guidelines around developing that experience.

Designing for outcomes users can tell when an application follows their understanding and when it does not. Apple prides itself on the use of HI (Human Interaction) with their devices. The document outlines the principles and guidelines for the development of an application. The whole premise is the designing of great user interfaces that followed human interface design principles. These principles are based on the way people think and work and not about the technology that it is built on. With Apple products the technology takes a back seat and it is the experience of using the product and the ability of the user to achieve a satisfying beautiful, intuitive and compelling user experience which enhances applications functionality and inspires a positive emotional attachment in users.
Stanford University

I arrived at the William Gates Computer Science Block where I waiting to meet Mr. Terry Winograd with whom I had been corresponding over the last year. Terry Winograd is a professor of computer science at Stanford University and co-director of the Stanford Human-Computer Interaction Group. He is well known in the philosophy of mind and artificial intelligence field for his work on natural language using the SHRDLU program. The SHRDLU program was written as his PhD thesis while at MIT between 1968-70. Terry was an adviser to Mr. Larry Page the current CEO of Google who was a PhD student at Stanford at that time. Terry spent part of 2002 as a visiting researcher at Google. While at Google he studied the intersection of theory and practice of human-computer interaction. My visit to Stanford was to participate in a lunch time workshop with the PhD and Master students being supervised by Terry.

Members of his team as well as visiting PhD students arrived; and made enquiries as to my reasons for visiting. The meeting was held each week for the students and Terry to get together and discuss what they had been doing and some of their research and issues. The topic under discussion was their recent participation at the CHI (Computer Human Interactive) 2012 Conference held in Austin Texas.

Members of the team presented their views of presentations of major interest to them and the others. They were further discussed and explored with people around the table. The visiting researchers were then invited to explain their research and the reason for my visit.

One topic discussed was a presentation given by Oregon State University at the conference on “Tell me more the effects on mental model soundness on personalising intelligent agents”. This was based on an internet radio which had a number of dials. They were using a control group which received instruction and another that had none. The idea was understanding people’s views of complexity and how it would go over time. The control group improved and the uncontrolled group indicated that there was a high level of complexity. The interesting part was the analysis and understanding of control and...
measurement by, looking at how mental models can have an impact on people’s ability to adopt technology and gain benefits from it.

The next discussion was about building structures based on what other people do. In practice it was shown that as people use this more and more the results become better, but the next point raised was whether this limits how people build these structures. Will it reach a point where certain knowledge will not be shown due to previous choices? In some ways it would reduce people’s choices.

Another topic discussed was “Crowd sourcing and peer production”. Bjoern Hartmann and his students built a vending machine to correct computer science exams. Under-graduates were invited to mark the papers and as papers were graded they would receive payment in the form of candy. The machine had a screen which displayed both the question and the correct answer and then the exam result was displayed and the student had to grade the answer. The result of 10 assessors would then be used to determine the grade and reduce the difference from the hard markers and the easy markers.

The interesting part of this experience was to get the understanding how the science of HCI and HFE (Human Factor Engineering) has an impact on our use of technology and how we get to design products that are better understood and easier to use. In talking with a number of the students there were suggested references and reading which have been more enlighten. My next encounter at Stanford was with Bjoern Hartmann talking about his project and what he had achieved. A number of the students had seen the vending machine at the CHI conference in Austin Texas and so the presentation was more about the building and running of the machine at the conference and some of his discoveries. This was an experiment for me as I had some understanding of CHI and HFE but my appreciation of this area of study and its relationship to my project took some work. It is a major factor and it was the realization that during this time at Stanford that I started to realize that I have a whole lot more study and knowledge required for this topic.

SAP

I interviewed Ms Sabine Kabel-Eckes, the Director of UX (User Experience) about the role of User Experience within SAP.

In the UX area they are committed to three areas. They are user focus, field research, contextual enquiries and field observation. A major focus which is driven Mr. Jim Snabe the CEO of SAP in San Francisco is being focused on design thinking. The best example of design thinking comes from Wikipedia.

Figure 19 - SAP Office San Francisco
**Design Thinking** refers to the methods and processes for investigating ill-defined problems, acquiring information, analysing knowledge, and positing solutions in the design and planning fields. As a style of thinking, it is generally considered the ability to combine empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality to analyse and fit solutions to the context. While design thinking has become part of the popular lexicon in contemporary design and engineering practice, as well as business and management, its broader use in describing a particular style of creative thinking-in-action is having an increasing influence on twenty-first century education across disciplines. In this respect, it is similar to systems thinking in naming a particular approach to understanding and solving problems.

Currently, there is a momentum to create awareness about design thinking among designers and other professions by teaching design thinking in higher education. The premise is that by knowing about the process and the methods that designers use to ideate, and by understanding how designers approach problems to try to solve them, individuals and businesses will be better able to connect with and invigorate their ideation processes in order to take innovation to a higher level. The hope is to create a competitive advantage in today’s global economy. – [Wikipedia Website](https://en.wikipedia.org/wiki/Design_thinking)

Mr Jim Snabe is creating this momentum within SAP. Design thinking brings to the table of software development empathy with the end user. To do this requires first hand observation about how the user works and where their pain points are. This is very different from the traditional method of relying on the self-reported wants and needs of the user which was usually reported from an appointed proxy. The company is working towards this as an end goal.

In mobile development there has been much work done in the area of advance mobile patterns. Business wants the visualisation of their data which is different from forms and tables. One of the projects that Sabine is involved with is around GeoTime and transportation management. An example is of a delivery truck which required to pick-up and drop-off packages. Currently they get a list of appointments to carry out their deliveries and pick-ups, they then create the mental picture of where and how they are going to get to their locations. A mobile device is time and location aware. A calendar with times of the day will see locations on the map. Periods in time are indicated by a colour code. Grey being somewhere they visited in the past, green is where they need to go now, red is places in the future and gold or orange is where they are currently. As the task and the location are all time based and the work is location based, this data can be presented in a graphic format with the use of a map. This type of application reduces the work that the driver is required to do, as time and proximity presents the relevant data to the screen. The principle is around building for a delightful experience and value to the business.
Prototyping is important to the stakeholder and provides a language to better identify their wants and needs. Using a prototype gives a chance to carry out other testing and usability testing before sending out the full product. Prototyping is a dynamic orientation discipline. In working with a client they are able to re-assess what the client was doing and how they want to carry out their work. It was observed that a device with an accelerometer needed to determine the angle of the tablet and determine which hand the user was holding the device. From there they were able to then dynamically re-draw the screen layout to compensate the correct hand and enable it to better enter in the data required.

The other challenge for UX (User Experience) is getting business to understand that it is more than design, more that the eye candy on a screen, that the UX team needs to be involved at the beginning of product development cycle and not at the end. Leaving it to the end, UX is not able to offer any improvement or major value to both the product and the business outcomes, other than the look and feel. UX is not just the look but largely how it works. There is a strong need to understand that involvement of UX at the start of a project can bring the final outcomes to a product and service. The earlier the involvement, the bigger the impact on the outcomes of the product. If UX is left to the end of a project there is usually little they can offer.

The other side of UX is the need to be involved with the real end user and observational data collection. Using a proxy will always lead to a misalignment of stakeholder expectations as little things which can have a big impact can be missed. That lack of the end user observation is a big part in the failings of the expectations. This is becoming more so in the mobile application space. Another is the practice of testing on a simulator and not the actual device and regression testing.

There is more work to be done in the area of end to end experience and the on boarding or ramping on of applications. This process needs to be far more automated. Currently to on-board an application requires 15 fields to be filled and these can be quite technical in the information required. This need to be simplified and transparent to the end users and their experience in obtaining applications within a business environment.

The UX is central to the organisations and has a senior vice president over-seeing it. The unit provides a central service within SAP with units around the world reporting into the San Francisco operations. The team is made up of 250+ people specializing in three key roles of user research, interaction designers and visual designers.

The design thinking is having an impact on innovation, by using design thinking to define the problem space so that teams are able to come up with better and more appropriate solutions.

Sabine gave an example of how design thinking has had an impact to innovation in the area of baby incubators for third world countries. This was a case at the Stanford d.school.
The students were given a challenge to develop a less expensive incubator for children in developing countries like Nepal. Where there were incubators but no children in them. When they asked where the babies were, they discovered they were in the country and that they never made it to the hospitals. So it did not matter how cheap the incubators were what they needed was a way to keep the babies warm. Over the last few years they are gone through a number of prototypes and iterations adding features such as a window; not because it was needed but it was a request by the mothers who felt uncomfortable seeing just the head of the baby.

With the observations, they keep learning and improving the solution to the point now it has become a not for profit organisation called Embrace. Through the use of design thinking they have developed a low cost infant warmer for vulnerable babies in developing countries. Over 20 million low birth-weight and premature babies are born every year around the world, and over 4 million die within their first month of life. Embrace has developed an infant warmer that costs a fraction of the price of existing solutions, and that functions without a continuous supply of electricity.

The solution that the students found would not have had the same results if they had not used the skill they had learnt in design thinking and observation; the part of looking for the problem space and producing an innovation that has saved many lives.

SAP has started to roll out this training to a large part of their organisations. The adoption of this methodology has the potential to lead to much innovation.

While the theory of design thinking is having an influence in the way SAP approaches their work it still has a way to go before it becomes ingrained into how and what they build. SAP are still working on the idea that developers are a good enough proxy for the end users. In the past this attitude has been accepted but we have reached the tipping point in the development of software. The advent of Steve Jobs and ‘Think Different’ is starting to create an impact and users are becoming more demanding. They have seen that their expectations can be reached and are now demanding it of software developers. Their personal experience with the use of mobile devices has shown it can be achieved automatically with little input from the user other than selecting what they want, the rest being done for them. They are now looking to get the same experience from their business applications.

This is a large part of what Sabine and her team are working towards addressing the issue of on boarding of application to devices. People are looking for the seamless experience they have become accustomed to in their private use to be reflected in their business use.
Ms Susan Etrick, US researcher and Ms Anya Kogan a UX Designer for Adwords, work in the section of Google that help users who wish to advertise their business, service or products to market themselves online. The UX developers work especially to design advertisements to create the biggest returns and assist in attracting more customers to the businesses.

It was highlighted that Google has now produced and published graphic design principles. The interesting part about having principles as opposed to standards is interpretation.

I was sent a link to the Android Design principles which had three overarching goals that Google applies to their core applications and the system at large.

The three goals are:

1. Enchant me
2. Simplify my life
3. Make me amazing

**ENCHANT ME**

This goal is to imply that beauty is more than skin deep and applications are to be sleek and aesthetically pleasing on multiple levels.

**SIMPLIFY MY LIFE**

Android applications are to make life easier to understand. The idea is to design applications that are intuitive to the user. Where tasks can be made as background tasks then the developer is encouraged to try and achieve this in their design. Reduce choice and don’t assume the age of your audience.

**MAKE ME AMAZING**

It is not a matter of just making applications easy to use but to empower the user to try new things. Applications should make the user feel that the application is theirs and personal.
Each of the three goals is then expanded into the full design principles, further elaborating and giving examples. The entire section of the website goes deeply into all the aspects involved in designing and building applications for the Android environment.
May 19th Seattle, Washington - Microsoft and the Space Needle

**Microsoft**

My visit to Microsoft was a full day, starting at 7:45am through to just on 6pm. What a day, thanks to my contact both at Microsoft Australia and Mr. Alan Merrihew. Below is the program we covered for the day.

- 7:45-8:00 – Breakfast
- 8:00-9:30 – Welcome and Technology Discussion
- 9:30-9:45 – Espresso Break
- 9:45-10:45 – Microsoft Research Overview
- 10:45-11:00 – Break
- 11:00-12:00 – Metro UI – New Windows 8 interface
- 12:00-13:00 – Microsoft Home of the Future (Tour)
- 13:00-13:30 – Lunch
- 13:30-14:30 – MSR Touch Develop Demo and Concept Behind the Design
- 14:30-15:00 – Espresso Break
- 15:00-16:00 – Productivity Future Vision (Microsoft Envisioning Lab)
- 16:00-16:30 - Microsoft Surface: The Possibilities and the Technology
- 16:30-16:45 – Shuttle to Global Security Operations Center
- 16:45-18:00 – Global Security Operations Center Tour

Mr Josh Rice, Sr. Director, Technical Sales Worldwide Public Sector and Alan Merrihew, Information Technology Strategy Government, Worldwide Public Sector. We discussed my research and objectives of my trip, the types of information I was looking for from Microsoft. I discussed some of my findings and outlined
my research topic. From there both Josh and Alan identified other sources of information which might be of interest and assistance to my project.

We discussed many things across a wide variety of issues and products. A number of them were very interesting especially the MAVIS (Microsoft Audio Visual Indexing Service) This service uses some software and a SQL database using Microsoft’s Azure services will take a video and capture and convert audio to text which is then indexed to positions within the video. This gave the user the ability to search the content of a video for a work or phrase and select that position within the video so you can review at that point. I saw the possibility within DCP to utilise that service and will be exploring that on my return.

Another area of discussion was with big data issues. I was surprise to find that Microsoft is working with an open source solution called Hadoop. They are committed to broadening the accessibility and usage of Hadoop to users, developers and IT professionals. Hadoop distribution for Windows offers ease of use by simplifying the acquisition, installation and configuration experience. Developers are able to install and deploy Hadoop in hours instead of days.

With the constant growth of data within DCP this tool has much to offer, with the types of complexity within our data and the types being unstructured data, Word, PDF files, images, videos and potentially geo-spatial data in future. Microsoft’s experience with their analysis of over 100 petabytes of data is in the delivery of their search results in Bing. They would be able to offer DCP some assistance as they do with many other companies and institutions.

The next issue with big data is the visualisation of that data. We spoke about ChronoZoom, a product developed by Microsoft Research. More details of this can be found at their website.

(http://www.chronozoomproject.org/#/t55 ) This site is an open source community project dedicated to visualising the history of everything to bridge the gap between the humanities and science by using the story of the Big History to easily understand all this information. Using a graphical interface the user navigates around data covering 13.5 billion years of cosmic and human history. In the top right of the screen you can drill through the data from the Cosmos level of 13.5 billion years and then down to the history of the earth. From there you can drill down to life on earth and more specifically Human Prehistory and then down into our Humanity time period. There is so much information within these screens that this would have to be one of the best ways to search across so much so easily.
Another area of discussion was the use of big data analysis of BOTs (derived from robots and automated process, in this case an automated virus program) and work in the area of virus and Trojan detection. This was work being done by the Microsoft Digital Crime Unit.

Another topic was the work being done with the Kinect and Autism. There is a good video of the work they are doing with Microsoft’s Kinect. More details can be seen at [http://vimeo.com/27257317](http://vimeo.com/27257317). This video is about the Lakeside Centre for Autism and how they are using Microsoft’s Kinect. Putting the children in front of the Kinect and interacting with the activities and games, the children are starting to gain far more confidence and ability to move in a more coordinated fashion, which in the long term will lead to a better life experience.

The next session was on Microsoft Research, and how the research program worked within the Microsoft corporate environment. This presentation was led by Mr Behrooz Chitsaz, Director IP Strategy. Behrooz has been with Microsoft for 20 years and his presentation was very interesting. Behrooz went over some of the points initially raised by Josh and Alan. One of those is work that has been done on contact lenses that work as a heads up display and can be used as a medical device to check on sugar levels in the systems.

Mr Jeff Fong, the Principal UX Design Lead and Creative Director for Windows Phone, presented the story of windows journey in design, from the start through to the work that went behind the new interface and designs incorporated in the new mobile phone interface and Windows 8. It was most enjoyable to be talking with someone with so much passion about their work. The new metro style was articulated in a set of principles and not a style guide on how to build the interfaces. These sets of principles are led by Jeff and being adopted across Microsoft. I have used the new Windows 8 Preview and enjoyed the user experience and looking forward to the release of Windows 8 sometime in October.

I went to see the Microsoft Future Home. Where I met Mr Jackie Giuliani who outlined what I was about to see. This room looked to be the front of a house. Bit by bit Jackie led me through the house explaining and showing me examples of some of the things we could expect within a house in the next 5-10 years. You can see a little of what I saw with the video on YouTube [http://www.youtube.com/watch?v=l6lf105vJM4](http://www.youtube.com/watch?v=l6lf105vJM4).

Mr Arjmand Samuel, SR Research PM presented a new toolset that will be used to develop phone applications on the phone. This is currently available for download and there is considerable amount of information at the Touch Develop Website [http://www.touchdevelop.com/](http://www.touchdevelop.com/).

At the Envisioning Laboratories I met Ms Karla Clark. Karla took me through the labs to see some of the possibilities for the future. First there was a very large screen with which the user could interact. Information was presented, and based on body movement, you could engage with the information that was being presented. The envisioning labs are where Microsoft shares their long-term vision for productivity, where
ideas are shared with feedback then looked to incorporate into future products. They had a 28 foot touch enabled wall which was using laser technology so the user could interact with the information. This was used to set the context to the displays being presented around the room. One area was a desktop with a three part screen and desk surface where you could interact with the information on all surfaces.

Another item was a device which was a representation of tickets in the future. These tickets would be information devices that could be navigated by touch sensors that were placed on the back of the device. It would be a ticket with information and details about where you are going and staying and being dynamic and providing the details applicable to the context in which you are using it.

There is a great video online which shows Joshua Topolshy taking a tour of the Microsoft Envisioning Labs in Redmond.

(http://www.youtube.com/watch?v=yiV9_98IrAI&feature=player_detailpage#t=247s

Mr Ken Malit, Systems Solutions Specialist presented the Microsoft Surface Version 2 technology. This technology name has now changed to Microsoft PixelSense. This tablet takes some of the learning’s from what has been experienced in the previous surface technology and brings the best of both small tablet and surface experience into their new offering, which will be launched sometime late October.

The unit used in the presentation was a 40 inch surface that is aimed at large collaborative environments. Ken went through a presentation about the work that Microsoft has been involved with since 1997. This was a major improvement since.

When Ken began his presentation he demonstrated the table’s ability to recognise different objects and devices. The idea being that in future when you put your phone on to one of these tables you will be able to interact dynamically with its content. Ie, the contact list, photos and share them on the surface. You will also have the ability to pass them across the table for someone else to interact with the image and then copy it onto their own phone. This type of interface provides more engagement over the content you are using. By making the experience more engaging and immersive it will assist companies to solicit interaction with their customers.

At the Microsoft’s Global Security Operations Centre (GSOC’s) Mr David Vey of Global Security Operations demonstrated the services that they provide Microsoft and their employees. The information presented was
about the GSOC’s around the world and how their use of “out of the box software” to manager and communicate with all people and locations, their property and people but also their continuity of business. In referring to “Out of the Box Software” this means these were products that Microsoft develop and are not bespoke developed systems or applications.

During the demonstration he made calls to check on communications in London and India. Within seconds he had both verbal responses and video conferencing over the network and via Lync. Behind him was a wall which looked to be a white board work area. He then proceeded to flick a switch and the glass area became transparent showing the GSOC there in Redmond. We covered a number of areas and topics with respect to security which was informative and offered a great deal of insights to the security challenges that Microsoft faces in their every day running of their business.

May 23rd Austin Texas – Motion Computing and the Texas Rangers

Quote from their website: www.motioncomputing.com

"Motion Computing is Head quartered in Austin, Texas.
Motion Computing is a leading global provider of tablet PCs and supporting mobility solutions for vertical markets, including healthcare, construction, field service and retail. Rugged, lightweight and highly mobile, Motion Tablet PCs are designed for mobile professionals who require real-time computing at the point of service. Users can gather, access, analyse and transmit the critical information they need in order to be productive in today’s de-centralized work environments.

Motion offers the broadest line of Windows-based tablet PCs available, and when coupled with an array of tailored accessories and services, provides mobile professionals with high levels of power, security, portability and manageability. Customers report improved efficiency, accuracy and overall performance while saving time and reducing costs. Integrated features, peripherals, software, wireless and services come together to provide a complete mobile computing solution for vertical business environments.

I met Mr Mike Stinson, VP Marketing and Mr Michael D. Johnson SVP. Product Development. My discussions with Motion Computing was to get their perspective in the mobile discussion space and to understand how they address their customers’ need.

It was interesting to see from their perspective, issues and challenges that they face in the development and delivery of mobile devices. Motion Computing has been building and selling Slate computers for over 10 years. In that time they have seen the industry go through big changes.
They have developed slates/tables for the Health and Life Sciences, Field Services, Retail and Distribution and Construction. Over the years they have seen a major shift and change in both the style of devices and the proliferation of these devices. The biggest challenge for them is that applications need to be specifically designed for these devices. The user experience when trying to deliver desktop solutions on to a small factor tablet computer does not work and adoption is low. But when software is designed for this form factor and the user experience in mind then adoption is very high.

Being a manufacturer of these devices makes it harder to get a presence in new areas of the market. Motion Computers has a well-established niche with their 5 year support in their technology. The power supply used in their older models will also work in their newer models. They have kept a proven product size and format but as new updates come, they pack in more capable technology. One of the productivity items they have in their J3500 is able to swap batteries while it is working. This is due to having two batteries, while battery is removed the other keeps powering the device. This gives a field worker the ability to carry out their tasks without fear of power loss and the ability to swap a battery without having to power the device down. Then the user can charge the old battery while continuing their work. The alignment of user experience to the adoption of the table device was agreed as a key factor.

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May 25th New York, New York - The big Apple, here I come

In New York, I had a number of interviews, starting with the founder and President of Mauro New Media, Mr Charles Mauro. Following Mr Mauro I then meet with the following:

- Ms Katherine Dillon a designer and professor at ITP who teaches our usability and user experience course.
- Mr Clay Shirky an American writer, consultant and teacher on the social and economic effects of Internet technologies and faculty at ITP.
- Ms Zoe Fraade-Blanar is an interaction Designer, Data Artist and Accidental Entrepreneur. An adviser to journalism and media companies she helps experiment with concepts of digital presence and new uses for data visualization. Email contact only.

1st Interview

My first interview was with Mr Charles Mauro of Mauro New Media. Charles Mauro holds a Masters in Ergonomics from New York University (NYU) and is a certified Human Factors Engineering (HFE) professional. At NYU he was at the National Institute of Occupational Safety and Health. A research fellow at the Rusk
Institute of Rehabilitation Medicine. He has received grants and fellowships at the Ford Foundation, the National Institute of Occupational Safety and Health and the National Endowments for the Arts.

Since 1975 he has been the President of Mauro New Media, a leading provider of professional usability engineering and high performance user interface design, consulting services for many leading corporations, government agencies, non-profit and start-ups. Mauro New Media was the first non-military consulting firm to create a formal usability-testing lab in 1976; the first to create a highly structured and repeatable research methodology in 1977 and the first to employ web based usability testing methods in 1995.

My first question was, “how if technology was supposed to make our lives easier but it has become more complex?” Apple has shown though their designs it is possible to simplify, but their view is to tell the end user how to interact with technology not ask them. Charles then discussed his perspectives with the options of closed and open systems giving the plus and negative aspects.

We discussed UX (User Experience) and how the name is starting to be a bit over used. His specialty is more from the HFE (Human Factor Engineering) and many of the proponents of UX do not have the full appreciation of this field. Using UX, good designers aim to build on prior experience with their systems or other systems. This helps in creating a compelling user experience. Using the concept of transfer of learning has a huge impact on the user acceptance. A lot of the work in UX is based in the area of HFE and has led to better product design, but many UX designers are not aware or trained in this field.

As I get to talk with more people in this field is seems that a lot of the talk around UX and usability has been in the area of what is sometime referred to as eye candy, more the look and feel and not the users experience in achieving a task.

2nd Interview

Ms Katherine Dillon is a Professor at NY and digital media consultant. Katherine teaches at NYU in the ITP Program.

We discussed issues of User Experience and User Interface design and I gained another perspective as her students were working with their Masters projects focusing around the area of user centric design and use. We had a fruitful discussion on a variety of topics and ideas.
Technology simplifying the User Experience

3rd Interview
Mr Clay Shirky is an adjunct Professor, interactive Telecommunications Program, NYU part of the ITP faculty. Clay also consults on social and economic effects of Internet technologies.

Clay talked on a number of topics an interesting projects was RapidFDR. This is a project that his students became involved with and worked with UNICEF. They have deployed this application which assist the children who are displaced within African Nations. It is an on and off line solution which utilises mobile technology and has been used in Haiti.

Another area we discussed is the work of Mr John Halamka and the Electronic Heath Records that are used at the Harvard Hospital. Some of the development work has processes built into the system call "Break the Glass". When a doctor needs to get access to a particular piece of data or information about a patient, he would then invoke the breaking of the glass. The situation with breaking the glass is that all work is logged and monitored and then reviewed within 24hrs. The beauty of this process is that, after a while if a pattern emerges, then the application is adjusted to incorporate that pattern, thus there is a rapid change as circumstances dictate. In this way the system is updated as processes change and change is dictated by overriding process change with in the work environment. The application thus has a way to evolve and not stay static because of out-dated processes.

We then discussed a number of issues with the display and management of data analysis and how the likes of Four Square and Kick Starter are using dashboards in presenting user specific data based on behaviour. Another area was two books which Clay had written called "Here Come Everybody" and "Cognitive Surplus".

June 1st – Boston, Massachusetts – Harvard, Bentley and Microsoft

My meeting with Mr Zackary Tumin at the JFK School of Government. My meeting with Zackary was really short but quiet informative. Our discussions covered a number topic and the work that I was hoping to do while in the US and travelling around the world. From our discussions, a number of organisations were highlighted which could have some bearing on what I was doing, as well as point of interest to see what people were doing in the areas of technology and their approaches.

Zackary recommended that I should consider looking at some of the work being carried out by Anne Casey foundation and their work with social workers and handheld devices. The US army had been doing a lot of work in the areas of telemedicine as well as the work being carried out by the Division of Social Services of Boston and NASIA Group and a program called Code Yellow for lost kids.

One of the other areas that Zackary was involved in is a book he recently published in conjunction with the former police chief of New York. The book Collaborate or Perish. One of the chapters is within the book was
on Child Welfare. Zackery develops programs in the area of research information communications technology and public politics projects at Harvard. He also leads the Harvard component on Cyber security with MIT working with Government, industry and Harvard.

**Bentley University**

I meet with Mr Bill Albert, Executive Director of the Design and Usability Centre, Bentley University.

We started in Bill’s office where he started by giving me some background into his work in the area of Human Factor Engineering and User Experience. Initially working in Geography he gain an interest in the intersection of Geography and cognitive psychology and came across the field of *spacial* cognition.

Bill spent time working in this area of research which led him to work in navigation systems. System that required minimal attention, as in car systems. Designing systems that a driver can obtain the necessary details without being distracted. After completing his work in this area he stumbled upon the area of usability and found that it aligned quite well to what he had been doing in cognitive psychology and human factors. This led to his interest in perception, cognition and behaviour and the relationship that goes on in these areas. As the web came about, he then moved into this area and learnt a lot in the area of usability and design.

His research later moved on to focus on the data but looking at the research methods for usability and being able to show true business value through demonstrable details. Usability in the past has been focused on the qualitative aspects. Bill worked with Tom Tullis in the research area of quantitative research, writing a book called Measuring the User Experience.

Bill teaches with Tom in his work at Bentley and is building revenue to the university in the capacity of a consultancy business, providing services mostly to the fortune 500 companies on all sorts of matters of usability, user experience research and helping to advise them on building technology to be easy and intuitive to use.
The other goal is to train graduate students; he is responsible for running one of the largest UX (User Experience) graduate programs in the US and has more than 100 graduate students. A small percentage of those students work in the centre with real clients gaining both experience with real world clients, products and services.

A question I raised was the difference in designing for tablets to desktop. From the UX perspective there is no real difference in the approach and the way that UX specialists work. The difference is more in the use of UX, and the developers who design systems, are not necessarily knowledgeable about UX and the supporting fields of study. Many developers make the assumptions based on their experience which does not reflect any understanding of UX and the requirements to delivery on that experience.

Poor information architecture and navigation will always create the same problems no matter what format the system is delivered to. Bill pointed out that the emergence of mobile technology for the delivery of these systems has forced the issue and need for proper UX work. The Apple/Google effect has raised the bar and there is less tolerance for bad design. Now that people are experiencing better design products it has raised the expectations we will accept.

An example that Bill highlighted was with some work he was involved with Fidelity, a usability lab in the mid 90's. They quickly realised and made a connection between usability issues and support costs. They found that people were calling up for various reasons that they might not have called up if they were able to locate the information they required. They realised that every word counts and that there were savings if they designed their site better and made it easier for the client. They found it resulted in savings in phone calls.

Bill indicated that for sometime UX was used more to get a product signed off for market. That companies neither saw the value or understood the benefits of UX and its involvement in the development of products for the start. With the work of Steve Jobs and Apple computers companies are starting to realise the value of go design and user experience. The situation now has improved and more clients are started to realise the value on involving UX design at the start of the product development lifecycle.

The point from the usability aspect is that if the customer can't buy or use your service which can be demonstrated both quantitatively and qualitatively then there is a problem. Usability is no longer a service that needs selling and businesses are starting to understand the value and benefits it can bring.

After the discussion Bill then took me on a quick tour of the usability labs that they had. One was a one person arrangement with a computer and screen and a number of cameras around the room, with a second room behind a mirror for the staff carrying out the assessment. The second lab was similar in style but designed for multiple users and mobile devices with a digital camera in the ceiling that can focus on the screen in high fidelity quality.
Microsoft

I met with the SharePoint Product Team at the Microsoft New England Research and Development Center, 1 Memorial Drive, Cambridge across the river from the City. I met Mr Richard Sgro who is one of the product managers associated with the SharePoint Team.

Initially I had a round table discussion with members of the SharePoint Development Team.

Much of my time was talking about and understanding what Microsoft was doing with SharePoint and some of the features coming in the new product that is to be released in the near future. One area of interest was the ability to upgrade to the new version once it was released. Experiences in the past have been of a very long process. One of the engineers was working to make this a process that would be easier than before, reducing from one or two days to a couple of hours.

June 9th – London, United Kingdom – Returning to familiar ground

Google

Upon meeting Mr Miles Rochford at the 5th Floor reception. We discussed a variety of ideas from Apple to Microsoft and Google in the area of usability and how each company has approached this topic within their product line.

Our discussions were about how companies came to the realisation that User Experience is a consideration which can potentially save money. Miles gave an example of a company that had to reset password for their clients. They calculated that each interaction cost approximately twenty pounds in time, effort and resources. Not much when looking at one or two interactions, but when you start to look at hundreds of thousands this can become very expensive. Providing better user experience in being able to retrieve their own passwords and resetting them saved thousands of pounds.

The discussions covered many aspects of what Google is doing to improve their situation for developers and assisting them to produce applications. They provided Software Development Kits and principles for developing in this space and a many different examples to demonstrate the application of these design principles.

One piece of information that I did take away from this meeting was the discussion we had about legacy issues faced by all companies and how they handle it. Even Apple, who own the total user experience is now
having to face this, as does Microsoft and other companies. Google, too has to handle the situation where the manufacturers are trying to create a difference also create issues for developers having to develop for multiple versions. This is similar to the situation with the browser wars in the past.

Hopefully with the new standard of HTML5 this may finally start to settle, but we have to wait and see if Microsoft comes out with a Microsoft HTML5 which will put them back into the same situation as Google with their multiple versions of Android. The issue with Legacy is in trying to be innovative, that innovation has to be held back due to design and constraints of past designs. The other aspect is backwards compatibility. Microsoft has started to address that and have indicated the IE10 will not be backward compatible. The other part is the user has a set-up of learning experiences and to change totally meaning that you are creating a new learning curve. With some users that will just frustrate their efforts to carry out their work. Consideration need to be made with the user in mind and the learning experience needs to offer a benefit and savings and not just for the sake of being different or new.

This is where User Experience really comes to the fore, by applying the knowledge of the user process required to carry out a task, we take advantage of that knowledge and reduce the training. That is based on the interface being intuitive to that process. In discussing this it highlighted some of the examples I have been seeing around the world being used by small business. I saw an example with a food truck. Who remembers everyone crowding around the truck to get your order in and waiting for the food. For one or two people that's fine but what happens when there are 20, 30 or 50.

At Microsoft in Boston, we went around to a local food truck that produced vegetarian food. The interesting part was there were many people around but they were all waiting away from the truck. There were two women taking orders and money but they were entering the order on an iPhone. Your name and order were entered on the phone and money was handed over. I then noticed two more phones hanging up in the truck where the orders were received, in order. The food was prepared and the name called out. This was a very simple application using four iPhones and they were serving up to 40 people.

Another example which was in New York. A couple of years ago there were some mates who wanted to go to dinner. When they got to their favourite restaurant they had to put their name on a list. They were informed of a wait of 45-60min and to call back or hang around until they were called. They asked if they could be notified via their mobile, but this was too hard. At that point they came up with the idea of an Open Table. This is an app which take requests at the door and then sms you when your table is ready. Now they have an app where you can look up your favourite restaurant, look for a vacancy at the time you want, book the table and then turn up. The responsibility is being put on the patron but giving them the flexibility to utilise their time.
This is the new paradigm, which Clay Shirky discusses in his book "Cognitive Surplus: Creativity and Generosity in a Connected Age". Using social media and the generosity of users to supply the service and information to a task that would have cost businesses someone to do this task. Now the customer manages their time and flexibility and books their own table, relieving business of that task, thus freeing them to provide more and better services.

So in taking a situation which was frustrating for both the patrons and the business, this application now give the user the ability to manage their table bookings and the business to better serve the customer just by looking at the user experience as well as taking advantage of the Connected Age.

**Kent – Adult and Child Services**

I arrived at Session House, the offices of the Kent City Council where I was greeted by Jacky Scobell the Business Solutions Manager.

The meeting was setup to cover a number of topics. Initially I gave an introduction of my programme of works and the reason for my visit.

Next Linda Harris who worked in the area of Adult Social Services talked about some of the experiences in the area of mobility. About 3 years or more ago there was an extensive marketing campaign about the use of mobile technology in the delivery of adult services. This was commenced in a limited fashion but did not progress to much past the marketing. The initial foray into this area of mobility was with assessments of clients but it was not a success. There were issues with respect to roles and responsibility and the skills and capabilities of the social workers and their experience in using the technology.

Another issue with the laptops was with clients, proving to be both confronting, and a challenge for the social worker. Being experienced with pen and paper, this did not work out as an effective tool. It created a barrier between the social worker, the clients and did not prove to be of any benefit. The demographics of the workforce and skill levels in the use of technology also proved to be a challenge as much of the workforce were not accustomed to using technology, let alone mobile technology. It was believed to be a generational issue as the support desk was run with a younger generation who found it challenging to communicate to an older audience.

The biggest issues with the technology are that lack of sustained investment. Like many government bodies working in the area of social work, focus is on the social worker and not the technology. Kent is like a number of Australian government departments still working with Windows XP. There is not an appetite for the cost to upgrade and manage the fallout from stability issues.
The systems do not meet the current needs and this is being addressed but in a phased approach due to the lack of funds and support. The department is aware of the issues but not prepared to put the necessary funds or resources to address the issue so it can only be done in parts. There are issues of legacy and the new software requirements and need to update underpinning systems and infrastructure. The SWIFT system will be ran to a point and then transitioned across. Due to the lack of resources and equipment, this will be a phased transition. The new system will be introduced using a blended method of training. It is hoped that this should address some of the issues of the past and assist in the uptake of the new system.

There will be issues around adoption due to the length of time the old system has been around. The mental models formed of the old system will be hard to unlearn. Another issue is the design of the new system has been based on the policies of the department. These policies do not reflect how the field actually work and will create issues in its implementation and adoption. The older members of staff will struggle and this will have an impact on new staff. Even though they will learn the new model there will be the continuation of the older members and their struggles could potentially effect adoption by newer members to the department. A problem which has been faced by the Department for Child Protection in Western Australia is the definition of roles and the responsibilities. The technology introduces many new types of responsibility and work. In the past computer work was the domain of administration staff now the field is being asked to do this work as well. As in Australia the older members of staff in Kent are have similar issues.

Adult services have been an area isolated from Child services. This was proving to be very challenging as children who needed the services usually still need them when they became adults. The problem was while they were under 18 they came under the area of child services. The moment they turn 18 they came under adult services. The communication technical was not there and this transition proved to be very challenging. Adult services then moved in with child services and this situation is being better addressed. There is talk to have adult services move to Health Department and so there is a need for a system in Health Department to take this on. The services department is now working to form a partnership and assist with this system as Health does not have such a system.

Kent has had some limited exposure to BYOD (Bring Your Own Device). This has been brought about with management introducing iPhones and iPads. This has not been done in a considered manner and there has been no work done in preparation. There is a research group working on the adoption of mobile devices and is moving quickly and looking into the area of Mobile Device Management (MDM). Cloud technology is not being considered but the ICT staff are aware of the impact and that they need to be involved with understanding the offerings. Being prepared and able to offer alternatives is the idea they are working towards, so that they can be part of the technology conversation when it comes.
The Government structure in Kent is quite extensive. The ICT section forms part of the top tier of county councils. There are a number of levels and Burroughs and councils to work with and stakeholder management is a precarious situation.

Kent City Council is embracing Broadband usage in quite a big way. Linden Gurr, a broadband specialist with the ICT section spoke about the adoption and the investment that both the central government and Unity authorities and County Councils are becoming involved and investing in a big way. The idea is to have a minimum of 2 Meg fibre to the cabinet for up to 90% of Kent. The rest is being supported with other technologies such as wireless, satellite and white space on the TV band.
Fujitsu

I was greeted by Dr David Snelling, Senior Research Fellow in the Research and Transformation & Innovation Unit of FLE (Fujitsu Laboratories of Europe). I was introduced to Ms Makiko Hisatomi Ph.D. who is Principal Researcher a member of Dr Snelling’s team.

Our initial discussion was around my research; from there Dr Snelling then gave me some background into FLE and their work.

Fujitsu over the years have transitioned their thinking from thinking about computers, to thinking about networks and to thinking about society. Fujitsu worked to build technology with a different perspective, building services right to the end user and working with partners in a collaborative approach.

Fujitsu is involved in building smart cities and agriculture. This is all based around Human Centric Intelligent Societies. They are very good with their sensors and taking that information, and making use of it. The way that Fujitsu approaches its R&D strategy is on three frameworks.

The first is their core strategic themes. These topic areas are selected by the Fujitsu corporate collectively with the labs, and sponsored by the corporation as a whole. All the business units pay a tax to the corporate that is fed into the laboratories. These themes have a medium to long-term focus where the aim is within a couple of years to have something new into the market place around these core themes which are more directed by the business.

The second core strategic theme is business driven from six months to two years to work closely with business unit. They are funded by the business units outside of the main funds. FLE works with the business in a consultative basis on such projects as green data systems. The labs then make proposals and come back with some answers with specific targets and outputs all directly funding by the businesses.

The third core strategic these is their exploratory work which is their Blue Sky’s category. These are longer term and again funded by the central tax model that everyone pays into. These are topics selected by the laboratories. Any member of any laboratory can propose ideas but they need to convince the lab’s board that it is worth the effort. They do not need a business unit attached to such projects and they don’t need to be a part of the core strategic theme. These projects do need good business proposals and ideas in place; they are not a free for all. There would be an expectation to see some sort of product within five to six years. The balance of the framework usually works on a 40% - 40% - 20% split of the funds.
In the core, strategic theme, the overarching principle is the Human Intelligence Society with specific areas that the labs are looking at in terms of Human Centric Computing. This is about the devices and getting the devices connected to the cloud. The intelligence Society is looking at the ways you implement these verticals. Work is being done in the medical information systems deals with an Intelligence Society to the medical information space. The cloud is not a new idea and cloud fusion is enabling local infrastructure to better integration into the cloud. This is based on earlier experiences of the work that Fujitsu did on the early incarnation of cloud, which is Grid Computing.

A lot of effort has been centred on green data centres and the reduction of power consumption and IT efficiencies. Some ideas are around the topic of “How to cool the servers more effectively”. Seed research may come into the core and working with the business or it can become a spinout to a new business or spin out company. The laboratories have a great amount of flexibility to get innovation either out to Fujitsu directly or in spinoff companies and into the community which is the target.

FLE (Fujitsu Laboratories Europe) was established in 2001 and has 40 employees and turns over about $5mil a year. Their focus is based on three areas, they are:

1. **Future Networks** – traditionally the team has been hugely involved in the development of the mobile infrastructure offering from Fujitsu. Large numbers of Patterns that form part of the mobile infrastructure come from Fujitsu and many come from FLE. Such as 3GPP and LTE long term evolution. Then 5 generation mobile will be born of their remits over the next couple of years.

2. **Intelligence Society Research Platform** – is our cloud computing research group. They are looking at more sophisticated ways of managing information in the cloud. By having a cloud data centre you have the opportunity to temporarily expand large amounts of data then collapse it again. They are looking at techniques in the area of benefit fraud and specific use cases to test the technology.

3. **Technical Computing Research Division** - This support our HPC (High Performance Computing) Area. They have a large collaboration arrangement with the HPC system that FLE has put in Wales. It was supposed to be a super computer for Wales but due to the political situation it had to be disbursed system. The situation was no one had the ability to provide enough power to run the computer in one location, that is one the main reason the system wass disbursed around Wales.
Dr Snelling, Ms Makiko Hisatomi Ph. D and college have started a new activity in FLE called Technology Transformation Innovation. One area they have found challenging over the year is to get R&D done in Japan into businesses outside of Japan. The typical process works very well to get the technology into the business units in Japan, but if we have come up with an idea needed by the new emerging markets, waiting for a product cycle in Japan to be internationalised is overly lengthy. They are looking to accelerate that process and possibly bring the research straight into business development outside of Japan. That is one side of innovation transformation.

Another aspect of the Technology Transformation Innovation Business Unit is to host visits like mine, being a part of the technology cognisor. Which is to grab technology trends, requirement trends from outside of Japan and feed that back into the laboratories. This assists with the steering and direction of the laboratories in a more focused on the needs of groups outside of Japan. This is more likely to mean when it goes into product, even if it goes into product in Japan, it is already seen as a potential market outside and it doesn’t have to be done at the last minute.

Another area of work is Technology Innovation Funnel. This is done in collaboration with other laboratories around the world to build a technology catalogue. Some of the demonstrations that I saw formed part of that catalogue. It is designed so that the labs can demonstrate to customers and business units in a safe sandbox environment. This gives a better appreciation of the stage that the technology has reached. Items within this catalogue have indicators of the technology level to give it a clear indication of where the technology is. That then gives the labs the ability to understand that the technology might be at a mature stage technically but it does not have the commercial understanding of the issues associated with it. They can then determine to do a trial with a friendly customer, or a not so friendly customer, depending on how challenging they want to be and then go from there. Most of the work has been done at FLE but is now being developed further in Japan.

FLE (Fujitsu Laboratories of Europe) was a centre in Hayes, Middlesex and in the laboratories they had an area where they were able to demonstrate a number of the projects that they are involved with around the world. Those areas cover:

- Technical Computing
- Green Data Centre Solutions
- Virtual Desktop Acceleration – RVEC (Remote Virtual Environment Computing)
- Social Event Visualisation
- Advanced Extraction Techniques for Distributed Data
- Inter-Cloud Data Security
• Network Engineering Services Platform (NESP
• I-House (Smart Sensing Platform- SSPF)
• Health Sensor Management
• Video Data Integrity

The demonstration area was setup with a number of workstations from which the members of the lab demonstrated each area. The demonstrations encompassed all the technologies being worked on at that time. The technologies were demonstrated via a presentation form on large LCD screens and each demonstration was presented by the technology lead or manager. They were presented partly in a technical and non-technical fashion, assisting me with my understanding of what was being presented.

**London Web**

I met Mr Jamie Easterman we spent a few hours going over a number of products and services which Jamie provides via London Web. These were solutions to reduce computers and run up to 8 terminals off one computer. The demonstration and information for doing this was quite detailed and I believe there is quite a bit of potential. This was all centred on a product called Softxpand.

The next product was a Mobile Device Management solution called Notifylink. Jamie and Londonweb has been doing quite a bit of work with this solutions and the NHS. This solution is sorely needed by many organisation that are moving into the mobile space. It gives the ability to manage multiple devices and how they are used.

The other solutions was on paper forms. This solution was very elegant is called PaperIQ. This solution is based on a digital pen technology, which captures the data in a form, is then connected by blue tooth to a mobile phone where it then transmits the data back to the server. This keeps a hand written copy as it was initially written but also an Optical Character Recognition (OCR) version into a database.
June 15th – Heidelberg, Germany – SAP leaders enterprise mobile adoption

SAP

Well I met Mr Oliver Pink who is the project manager for the internal SAP knowledge management system. Oliver has been working in the area involved in designing and development of a central knowledge management portal for SAP.

We started by discussing the work that he has been involved with at SAP; touching on a number of points on Usability and UX (User Experience) and the current ideas to which SAP aspires. All of their applications and developments are controlled by a set of Style Guides, both corporate and design. These guides are specific to each of their major application streams.

I met Mr Nils Obermiller, a Development Architect, in the Business Suite Architecture Unit. Our discussion covered quite a number of areas, including the philosophy to develop applications for mobile devices. That development for these types of devices requires a different approach.

Our discussions were about the products that SAP had taken on recently with the purchase of the Sybase. Afaria which is a powerful, flexible mobile device management and security solution for the enterprise. Afaria provides a single administrative console to centrally manage, secure, and deploy mobile data, applications and devices. Afaria powers a wide array of features for device management for both handheld and laptop devices.

The other product that we discussed was SUP - Sybase Unwired Platform. This is a mobile enterprise application platform that enables enterprise developers to simply and quickly develop applications that connect business data to mobile workers on any device. It has been built on proven, industry-leading technology. The Sybase Unwired Platform addresses the difficult mobile challenge of creating and managing multiple mobile applications that securely connect a variety of heterogeneous back-end data sources to all major device types.

As the enterprise landscape becomes increasingly complex, Sybase Unwired Platform enables enterprises to embrace mobility across the entire organisation through the use of a consistent, but highly adaptable, development platform. These two products offer a lot for the development, distribution of mobile...
applications as well as the management of these devices. My time with Nils was very interesting and quite valuable in the knowledge and details I was able to ascertain. SAP which was started in 1972 has a long history both within the computer industry.

At the moment there is an exhibit covering the past, present and future of SAP. It was interesting to see some of the items. The items ranged from punch cards, floppy disks and one of the first mobile phones through to the present with surface technology and wall displays that were interactive.

June 22nd – Salzburg, Austria – Mozart and Human Computer Interaction

Salzburg University

My interview was with Professor Astrid Wiess who started in sociology, then entered the field of Human Computer Interaction (HCI) with an internship at the Salzburg University. That internship covered a novel interaction paradigm for the home. How can we interact with technology like the universal remote controls in the home? What do people want? What were their expectations? How could it change interactions face to face in the home, and usage in the home? During this project, they used a large ethnographic study with 40 households, diaries and photos to record their activities. Working more in the sociological side of the research, she looked at how it changes the use of technology. How do they share technology, the use of the car radio with its classification as a mobile device because it was in the car.

After completing this internship Astrid was offered a new project on human social interactions with robots. Only humans can interact socially, not even humans and animals are classed as social interaction. Humans are the only animals that have the capacity to interact socially. This is from the aspect of a traditional sociologist. This project was where Astrid came across usability and user experience and the whole area of society and the social impact of technology.

Her Ph. D thesis was on a small study with humanoid robots and how they should directly cooperate with humans. The requirement was to assess what makes a robot usable. What provides a positive user experience, and makes a robot socially acceptable? What are the society implications? The theses covered off four aspects that turned out to be much bigger than she expected in the beginning. Initially what she thought seemed easy at the start of the thesis overtime grow in complexity and presented many challenges.

She worked in a way which is typically in sociology based on social empirical research. What is usability? Which indicators are relevant with good usability with humanoid robots. At the start there was not much in the way of literature in this domain.

Astrid’s research starting in 2007 only a year after the first Human Robotic Interaction Conference. This had its benefits and disadvantages. Benefits include being one of the first in this area there was little comparison,
but the disadvantage being a leader in the field, there was not much in the way of research materials. What was clear was the big interplay between all these things. How much expectations pre-assumption made by media, movies and how much they play in the role in human robot interaction. The culture difference between western participants and the Japanese participants. In Tsukuba, Japan 60 km Northeast of Tokyo is a university and enterprise research centres. Studying at the intelligent robot laboratories, which was in cooperation between France and Japan. It was interesting to see how the Japanese interacted with the robots. In the surveys, their answers were very different to the way western participants had answered them. The interviews did not work because the Japanese did not want to freely talk about their experience; this was the opposite of my western participants.

Astrid being a sociologist, this was most interesting data besides the performance data. The interesting part was the cultural differences and the history that Japan has had with the robot both historically and culturally. They had a very different way of handling the cooperation with the robot. They were much more willing to adapt to the pace of the robot, the capabilities and the interaction with the robots. They were driven to success in one run and not to make too many mistakes, whereas the western participants were more trial and error. Trying to find out what the machine is capable of doing, and not willing to adapt. If the robot did not get it the first time, they would try a second time and that was the test over. The research in Tsukuba was an interesting experience.

At the completion of her Ph. D she was offered another project with a robots that had to determine their way from one location to another. The cool part was the robot had to find its way by just asking questions of humans. The robot had no map knowledge or GPS data. It had to retrieve information from humans using a basic artificial intelligence (AI) engine. In asking for the way, retrieving landmark information and interpreting the landmarks. Weighing up in information and making determinations. This was required when receiving two different descriptions, which would happen quite often. Working out how to get the understanding. When a human indicate right which right.

All the things we take for granted are a far great challenge for robots. The nice part of this project was that the robot needed to be built from scratch. Astrid and her team gathered the requirements from users and with an engineering company; the robot was built as a joint effort between the project team and the engineers. The requirements covered expectations, what it should look like as well as how do we deal with user requirements. Size is an issue with robots, they cannot be too big and yet they cannot be too small as they have to be able to communicate naturally and navigation. Robotics has been my main area of research.

With aspects of usability Astrid used qualitative methods combining different measures to get an overall impression of what the person perceives is usability. Having actual usability data on performance is
preferred but if people still have a perception that the system is not usable it has nothing to do with the aesthetics user experience or hedonistic qualities. It is more about am I capable of handling the system, if people are not feeling in control they will never accept the system or be willing to use it. A lot of pre-experience and other things fall into this issue. Recently when we were working with an industry partner where the employees were very use to the systems. The system needed to be used before IT had it fully functioning. Having the users starting early in the pilot phase creates a situation where they obtain prior knowledge of the system and what did not work. If this experience is too painful than those memories will follow when they get to use the system in full. The issue is that the pre-experience of the system not working colours their views and attitude. This makes it difficult when coming to testing, as there are pre-conceived ideas and attitude, which colour the testing and does not make life easy to deliver a working system.

Another aspect of usability is the big urban myth around Apple. Apple does not focus on real usability they just focus on this wonderful experience. If the experience is so cool, they take into account usability issues. With the first iPhone and iPad, there were definite issues with usability. For instance, multi-tasking was not supported in the beginning. Probably at one point, this experience could be true, that the experience is so good that you do not consider the usability aspects. The thing was at the launch of the iPhone an iPad they introduce a completely new paradigm in the way we interacted with this type of technology. Users had never seen this before and touch is very intuitive. What made it succeed was that they put it into the market before it was completed. They were the first and with the heavy marketing, it got the adoption. The big thing they have been the leaders in this innovation space and making things easier. They focus on things that people have struggled with in the past, like synchronising calendars. Then there was mobile-me which was not that easy and then came the iCloud which is very easy and self-managing.

Personalisation of devices has been made easy but the users are still struggling with this concept and they do not know where to start and where to end. Many people do not know that they can personalise their devices. Many have the technology as a statement and do not really understand the capabilities and being able to take advantage of that capability.

The section that Astrid works in is Interactive Communications and Technology and Society. Originally a research cluster and has now been reduced to a research centre combining two departments’ computer science department and communication science department. The centre has to be self-sustaining to 90% of its own income. The centre will exist as long as they find income and they have funded research. They teach at the university in the computer science department in HCI (Human Computer Interaction) and part of the syllabus. People in the Communication Science department can voluntarily take HCI classes but they do not really need to, to fulfil their studies. The research centre has been going since its inception in 2004. Post-Doctoral student write the proposals for research and then seek the research funding. The centre has
become more inter-disciplinary, where in the past, they only had computer science and communication science students they now get sociology, psychology and interaction designers. This has continued to expand the more they teach HCI.

Initially they would approach the market to see if companies would be interested in engaging with the centre. Looking into researching different aspects of usability. They would offered to do something interesting for them. Enquiring if they knew what their users wanted? Do they know how their next product should look like?

Now they are finding with many Austrian companies they are calling them based on their successes with other companies. Enquiring if they would like to have their help. Most of their industry related projects are usually based around normal usability testing. They would offer to do a little more around their research so it becomes a give and take situation. The clients usually were wanting the centre to do the testing, then inform the client as to what was wrong with their product. Followed by informing them as to how to improve their product or service. Most of their work usually starts at the half way point when the products were already there. They would be asked to review and let them know what is wrong and what can they do to fix it. Rarely are we involved at the beginning.

There are projects that are funded by the Austrian Research Fund in these cases they have been involved right at the start of requirements gathering. Working together with the industry partner for an outcome beneficial to all parties. They work to look at usability in a bigger context and not just from a computer science aspect. In many cases, it is more than usability and sometime it is structural problems that have to be addressed first before we can get into the usability aspect of a project. So with this area of research becoming a more cross discipline topic, usability has a larger impact on many thing and many things have an impact on usability.

Another project that we were involved a partner who produced specific remote controls. However, their end customers were using then in many different fields. It took the centre 6 months to convince the industry partner that the centre could only do some reasonable work if they could work directly with the end customers of their product. Otherwise our researcher did not understand exactly how the devices were being used. We posed the questions to the partner, do you know how your customers are using this product? The response was “no, but we know they are not satisfied with all situations” that was good but they did not know all those situations. The partner then said “Can’t you just test it in your lab?” Yes we could but what exactly should we test for?

We finally got to work with the end customers and did a large amount of user studies, with performance studies, eye tracking and qualitative data and now they realised how valuable the data could be. The
outcome from that exercise was the partner then wanted us to be involved with a new project from the beginning. That was from the requirement phase on; they now understood the value of the data we could obtain from their end user customers.

On the big projects, they get involved in observational design. While working for a partner for a year we looked into the working in a factory setting, understanding exactly how it worked. On the findings we made we asked the stakeholders if they knew how many work around they had in their company. Did they understand how many levels their works used to get around their systems just to achieve the company goals? In addition, it was noted that their systems did not support their company goals. They were frustrated and could not understand how that could happen. They did not even realise that they had 15 different tool for reporting and that the data these tools used did not transfer between each of the tools. The client had no idea, as they had not understood their own systems. Due to the log data giving no indication as to any problem, they believed that everything was working correctly.

June 29th – Vienna, Austria – Strauss, Wiener schnitzel and C.U.R.E.

I arrived at CURE where I was met by Dr. Ernst Kruijff a Research Coordinator at CURE. Dr Kruijff then outlined what and who CURE and USECON are and what services they provide. CURE is in the research area providing Services, Laboratories, Usability and Project working International, National, Publications and Project Partners.

USECON was a consultancy service in the area of usability, user experience (UX) and user interface design. Their work centred around the users, the way they interact with applications, software, websites or systems, working closely with the end user and aligning their expectations with the outcomes of the application, software or systems. This is carried out in close association with their research are CURE.

The next day I gave a small presentation to both the CURE and USECON team. At the completion we discussed a number of points. I met the team and heard about their work. While I was at CURE I had the privilege to use some of their resources. I came across an interesting book in their library on Usability. The book was titled Selling Usability by John S. Rhodes. It highlighted for me that one of the perspectives that I am applying to my research is correct; The alignment between the practitioners of usability and business.

The book gave a great example which outlines two ways to communicate the message needed to get the job done, by techie talk and business talk. The usability exponents usability focus on the techie talk. An example of Techie Talk is:
"Based on the recent test it showed a statistically significant number of users don’t understand how to enter a discount code. That number was 17%. They indicated the field was too short. We are confident that based on the experiment design the results can demonstrate this point”

An example of the same conversation but from a business take or Business Talk

"Customers are finding it difficult to enter the discount code into our website. After reviewing this with our sales team we have discovered that we are losing about $24k per month. Potentially we are at risk of losing 10% of our customers permanently. After speaking with the design team we can fix this issue for about $80k”

As you can see the second example does not focus on UX jargon. It talks about loss, risk and a solution. It has indicated that the ROI would be relatively cost effective with a longer term benefit which the business can understand and realise within 3-5 months. The important part is the understanding that these topics and expertise needs to be shown to a business in such a way to show the business the value proposition. If business can see and realise the loss and risk and understand the cost and ROI of the proposed solution. It has a better understanding of how that response is given.

One of the interesting items was in some of the questions that were asked during my time with CURE. "Where do I feel the adoption of UX is with other organisations and companies?" was one, but the question that I felt was most interesting was after a presentation of one of the team members on her methodology in assessment of usability was "What is usability or user experience?" This created some discussion as there are many definitions. It raised a further question; unless you know what it is you are assessing then how do, you measure it? How do you quantify usability and or user experience? There was some discussion and some views but I could see that this is quite a large question and provided food for thought and further research to be carried out.

In another meeting I met with two members of the CURE team. We discussed a number of different items about my work and theirs at CURE. The next meeting was with Mr Michael Bechinie, Senior Consultant / Team Lead and Mr Peter Strassl, Senior Consultant. In our discussion we covered many and varied topics but the interesting one was our discussion on methodology of approach to work in UX.

My last day at CURE I has some discussions with Dr Ernst Kruijff. We discussed some of my findings and questions that had been raised over the last couple of days. I believe that we are at the verge or a tipping point. I strongly believe this in no small part to what Steve Jobs has done with the Apple products. Not to claim that they have the only technology that addresses this issue but the fact that Apple has raised the profile of user experience. Its pervasive entry into the market has given people a taste of what can be done. It has raised the questions with people “So why can’t we do this with all our technology?”.
Many people are trying to shoehorn the Apple solution to fix all, but its more that we should understand the fundamentals of what Steve Jobs and Apple have achieved. Looking to design for outcomes, understanding how to approach the issue from a different perspective, as Steve would say Think Different.

Yes, Apple has a big lead but I believe that the work of Google and Microsoft over the last couple of years are starting to level the playing field. Other companies and manufacturers are also looking at how we interact with physical products and addressing design and function at that level. I believe we are just starting to cross the tipping point, things are starting to take on what was professed in making life easier. My trip here to Vienna and my time with CURE and USECON has been of great value to the questions that were raised and the perspectives.

A couple of other good questions were “What is Usability or User Experience (UX)?” There are many interpretations of this science. The other is “How do you quantify UX?”, unless you understand what it is trying to define a measure is also difficult. The other areas are understanding the approaches in how to approach a piece of work and derive the value proposition for the business to engage in this type of work. I believe it is an alignment of those perspectives which will give the answer to these questions. Better understanding of business and their outcomes and then communicating the message of the value to business without the jargon is the main part.

So to Dr Ernst Kruijff and his team thank you for your time and having this opportunity to discuss my research.

July 7th Singapore, Singapore – City of the future

I had an interview with Dr Leong Mun Kew who is the Deputy Director, Institute of Systems Science, National University of Singapore and Dr Mahendran Maliapen, Director, Academic Informatics Officer and Associate Professor (Adj), School of Public Health and School of Computing, National University of Singapore.

I met with Dr Leong Mun Kew We discussed technology, to Enterprise Architecture and the challenges and tribulations, within government and government institutions. Many of our experiences were very similar and it was interesting to discuss many of these topics with a kindred spirit. We had many similar ideas and approaches in the way we both had worked and addressed issues within our own respective jobs and career.

I was fascinated in a lot of the research that Dr Leong Mun Kew had done in the area of hand writing recognition and voice recognition. Some very interesting and funny anecdotes he recounted, especially with working on a certain project and at the crunch point finding out one point had not been considered. Many lessons were learnt especially in the area of usability and testing for all eventualities.
Next I then meet Dr Mahendran Maliapen the Director, Academic Information Officer and Associate Professor (Adj), School of Public Health and School of Computing at the National University of Singapore. I was shown through a number of systems which had been designed to be delivered on mobile devices and the work that he had done to secure the devices. I learnt how he had addressed the responsibility of managing the data in the control of the user. The biggest issue with mobile applications, especially with the data is who is responsible for the security of the data. Many times this falls back onto the organisations and where there is a breach, the organisation that is left to manage the fall-out. In the model Dr Mahendran developed, they saw it as a service that people wanted, but that if they wanted the convenience then they had to take on the responsibility of managing the data. Before anyone can access the data they have to agree to a number of terms, but especially the responsibility of the device and data. I understood how powerful this was. It gave the practitioners the flexibility but also the responsibility of the management and access to the data and the device. If, in the situation a device was lost they were responsible to notify IT of that loss within 24 hrs.
Conclusion

In conclusion, I have found that the more I learn the less I know and the more I need to learn. The experience has given me a greater appreciation and insight into the area of usability, especially making technology easier to use. The use of anything new being it phone, TV or computer is one factor that is common to all and that is design. Design of the actual device and the design in how we use it to get the outcome we are looking to achieve.

I have met people in the areas of software development, manufacturing, business, educational institutions and usability instructors and consultants as well as authors who write on the topic and other areas that are influenced with and by usability. From these interactions, I have discovered that the issue of usability and addressing it is not new. The topic of Usability and Human Factor Engineering has been around for well over 60+ year and is a doctoral subject. However, many factors have led us to this point in time with our use of technology. The speed of the change in our technology has a big impact to its usability.

Steve Job’s at Apple saw this more than most, and the work that he has done in taking Apple from the brink of bankruptcy has been to his efforts in challenging the norm. He has done this by thinking differently to what has gone in the past. Using one of his famously quoted statement “Think Different” he looked at what people were wanting to achieve and doing that as simply as possible. This is designing for outcomes rather than just capturing data.

Computers started in the laboratories but then moved to the domestic market. From there, the technology grew organically and it was the realm of the nerds and geeks. Software was looked upon as magic by many in the domestic market. It was a toy for the geeks and nerds; and due to that fact it had a major influence as to how software and the applications were developed. Much of the learning in this space did not have too much structure and was the realm of trial and error. Skills were shared and learnt quickly but from the perspective of the geeks and nerds. They understood what could be done and had some idea of how they were going to deliver the outcomes. Those outcomes were usually grounded in sound computer skills or programming structure and design.

The approach of developers was to capture the information or data, manipulate that data to produce the results that were being sought. This was usually by a set of business rules and algorithms. The resulting information was then reported to the screen and or printer. In the early days of application and the web everyone had their view on what worked. Over time standards were developed but they were from the perspective of the developers.
There were early attempts to address usability and standards started to appear. Many of the early attempts at this area of computer use were based on the visual aesthetics and design elements. People like Jakob Nielsen based a lot of this work in conjunction with Don Norman on Human Computer Interaction science in which Jacob held a Ph.D. and Donald Norman who worked in the field of cognitive science, design and usability engineering. The Nielsen Group led much of the discussion and debate about website usability and the standards around building these sites.

Every so often, there would be software or hardware that came along that changed how we interacted with computers and software systems. The biggest of these was the introduction of the Apple MAC. Before then many worked at the command line with strange commands and sequences of letters, numbers and names. Windows came along making access to this technology a little easier but it was still not mainstream. In the early 90’s came the internet and from there grows daily our interactions and fascination of the technology. It was not until Steve Jobs had returned to Apple in 1996 that things started to really change in design and interfaces within technology. When the iPad was released in January 2010, people started to see that the use of technology could be made easier. That influence of the iPad and iPhone has changed our understanding of the use of complex technology. These innovations have led to the raising of the expectations of users and the technology they use.

What Steve Jobs brought about was the consideration of outcomes based design. As Apple designed its products, the market started to understand that technology can be easy and intuitive to use, by designing products to function the way people think and work and not on the capabilities of the device. Interfaces of the past were more about the functions and features, while not much effort was place in the aesthetics. The issue was that unattractive, convoluted, or illogical interfaces would feel like a chore when using the application even if it was a great product. Use of these systems became the realm of the geek and nerds. With the advent of the iPad and iPhone, beautiful, intuitive, compelling user interfaces enhance the application’s functionality. It inspired a positive emotional attachment in users. This has increased to such an extent that these devices have now become personal; people place a large amount of emotional attachment to these devices. The devices are taken everywhere in their daily lives and events People cannot go to bed at night unless it is nearby.

My project was to get a better appreciation on the how’s and why’s of technology usability. In better understanding, this topic I could potentially apply this knowledge to how we go about developing products and services for our field staff. The experience of this trip has led me to discoveries that there is nothing special, there is no silver bullet or solution in getting this right other than our approach. We have the ability,
the technology, the understanding and have always been aware of the issues. But I believe it is in our approach to development of devices and solutions that we need to consider.

In the past, we have concentrated on the capturing and the data. We have been worried that if we miss the data, we will not be able to carry out the task. In many systems and devices, this has been to the detriment of the user and their experience in working with these systems. As time went by we started to address usability but it has been treated as an afterthought. Most of the work in this area has been based around the aesthetics of the interface, system and or device. The problem was that by the end of the project when usability people were involved with the project, much of the work needed to be carried out could not as the product was about to leave the building. So usability was more based on aesthetic look and feel.

Steve Jobs turned that concept on its head by changing the focus and the point of engagement of the designer and engineers getting together at the start of the project and having a far greater involvement overall and on the outcomes of the product and services. The first Apple Computer led this. Where Steve Wosniak wanted to release the computer as a kit, Steve insisted that it be developed as a completed computer. By the time the first MAC computer came to market this concept had been developed to a far great level. The problem was a new company and not having the financial backing. Steve Jobs ended up being removed from the company. On his return, he was face with a company that was close to bankruptcy. He redefined what the company would develop. It was taken from a line of some 20 or 30 lines of products to four. Laptops for home and business and desktops for home and business. Company moral was raised over 100% and focus was towards building the best product.

What had changed was the perspective that was taken when developing both products and services. They asked simple questions as they were developing and designing. Was what was the end user trying to achieve? They gathered all the things that were believed to be needed. Then they concentrated on reducing elements until only the elements needed to achieve the outcome were left. Everything was centred on the end user experience and how the user was empowered to use the device.

In my meetings and visits, I was researching how companies are starting to address the issue of outcomes based design. How are they implementing those perspectives and practices in to the production of their products and services? Is there something that was a mystery in what they are doing or how they are doing it? To what level are they embracing this approach and is it based on a solid foundation? Could I learn from their work and apply it to our work in Child Protection or any agency that dealt with the public? I was aiming to achieve an understand how technology and its solutions could become better enablers to the field of social work and not a barrier to carrying out their tasks.
What I had started to discover was that companies are starting to take this seriously and it was due to the financial survival, that the end users were becoming more vocal. Comments such as “make it like the iPad”, it is easy to use and “you don’t need much training” is having an impact on the adoption of the different technologies, software and services. The users have a taste of technology that is enabling them to do what they have not been able to carry out in the past; they are feeling more in control. My experience to date has shown that the approach that Apple had started is having an effect on what people are looking to achieve with their technology. In addition, they are asking the question “why can’t they work like the iPad?” This raised the question. Why all technology can’t be designed in the same manner as the Apple products.

I now know that I need to address this issue of technology complexity. It was in a single line in a recent TED (Technology, Entertainment and Design) conference video. Reduce the complexity and simplify and....

“Design for Outcomes and the Experience”
Recommendations

My recommendations are to continue the conversation. Discuss with developers and departments when designing software to understand the outcomes that are wanting to be achieved. We don’t have to design because that was the way it was done in the past. We need to challenge and questions all our decisions in the designing and development of our software and the technology. We need to understand why we are doing something and it relevance to the outcomes.

What I would like to do:

- Present on the topic of reduction complexity in design
- Do further study on Design Thinking (@Stanford d.school).
- Encourage the adoption of Design Thinking when approaching new projects.
- Review and address our current implementation of technology and see how we can improve it based on my discoveries.
- Commence a project to deliver mobile technology to field workers that is intuitive to them.
- Discuss my findings and understanding to other departments and software development teams.