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Abstract

This article examines the development and ultimate demise of the Ultranet, a major ICT infrastructure project in the education system of the Australian State of Victoria. The case is interesting as it was a very large project, intended for 1500 schools and funded to $180m (Au). The study traces the design and implementation of the project as a socio-technical innovation in education. Although there are examples of how this project worked very well, its uptake was less than anticipated. The study found that potential benefits from a very large project like this can be nullified by a number of factors including: change in sponsorship of the project, an over emphasis on security concerns, failure to enrol crucial stakeholders and a naive assumption by technologists that technology with potential benefits will always be accepted. The study also found that technology projects must be delivered where a need exists and one that, most importantly, is recognised by the stakeholders. This will also be the case in other education systems around the world. If resources are not to be wasted the problem must be clearly identified and its need accepted before a solution is proposed. The Victorian Government finally abandoned the Ultranet in June 2013.

Keywords

Socio-technical studies, information technology, people, Education, schools, eGovernment, project management, adoption, actor-network theory, innovation translation, Ultranet, extranet, intranet, online learning, reporting to parents, sharing curriculum materials, benefits, problems

Introduction

Information systems project failure has been extensively researched, both longitudinally (Standish Group 2016) and through examinations of the human issues (Dwivedi , Wastell, Laumer, Henriksen, Myers, Bunker, Elbanna, Ravishankar and Srivastava 2015). In this longitudinal study of a single case of failed adoption an Actor-Network Theory (ANT) approach has been taken to allow examination of how the actions of both the technology and the various human and non-human actors lead to failure. The case allows us to examine the fine detail of interactions and provide an example of how interactions between actors can explain failure both when the technology is sound and significant support exists.

In 2004, the Victorian Government's Department of Education and Early Childhood Development (DEECD) commenced an exploration of the use of a Web-based online system to support the delivery of curriculum, online teaching and learning and the sharing of knowledge across all Victorian Government schools. The result was the Ultranet, a project rolled out to all Victorian Government

schools in September 2010 as "*a student centred electronic learning environment that supports high quality learning and teaching, connects students, teachers and parents and enables efficient knowledge transfer*". (Department of Education and Early Childhood Development 2011). The original budget for building the Ultranet was $60 million, but this later turned out to be a very optimistic under-estimate, increasing to almost three times that amount before completion. DEECD claimed that an early evaluation pointed to positive teacher attitudes in the use of such an online environment, but after that the adoption and use of the Ultranet was much less than expected. Although it seemed like a good idea at the time with lots of possibilities to do worthwhile things, by late 2012 it was not being used to any great extent in most schools and was abandoned by the Government in June 2013 when DEECD signed an agreement with NEC that would come into operation in January 2014. The agreement was for NEC to continue provision of the Ultranet, but only to schools that were prepared to use the service on an individual user-pays basis (Sharp 2013). This article addresses the socio-technical nature of the Ultranet, its development and the possibilities it offered, and examines why they did not fully eventuate.

Background – The Victorian Education Ultranet

All Victorian Government schools have broadband access (either via cable or wireless) to the Internet, so high speed access to the Ultranet was not a problem. The Ultranet was designed for three principle uses (Tatnall and Dakich 2011):

- To allow students to access personalised learning activities and to keep an on-going record of these activities.
- To allow teachers to monitor student progress and learn more about individual students through information collected by other teachers so as to provide accurate student assessment. Teachers would also be able to collaborate with other teachers, create curriculum plans and access professional development programs.
- So that parents would be able to directly see information that would help them keep up-to-date with their child's learning. This would include attendance records, test results, timetables, learning progress, homework activities and teacher feedback. Parents would also be able to easily provide relevant information back to teachers.

While the Ultranet had many of the features found in learning management systems, such as Blackboard or Moodle, it also had other important features intended to inform parents about their child's education and about the school they attended (Tatnall, Dakich and Davey 2011). This is how it differed significantly from these other systems.

The Ultranet also had many of the features of a business extranet in that it was closed to people outside the Victorian Government school community and required a username and password to gain access. One major difference to most business extranets, however, was the Ultranet's large size: its potential users including over half a million students (and their parents) in over 1,500 Government Schools along with their 40,000 teachers (Australian Bureau of Statistics 2010, DEECD 2010b). In 2011, DEECD's Ultranet website noted that specifically, the Ultranet was designed to achieve the following:

- *"Enable parents to become full partners in their child's education, giving them online access to their child's homework, attendance, assessment, curriculum, and teacher feedback at any time.*

- *Ensure that every child will have a complete record of achievement across all years of schooling.*
- *Give students their own online workspaces, personally tailored education programs, direct feedback from teachers and better access to curriculum.*
- *Enable students in remote schools to access specialised curriculum and podcast classes from schools that excel in various subject areas.*
- *Allow students to learn in an environment that will ensure that they have the cutting edge ICT skills they will need in the 21st century workforce.*
- *Reduce the administrative burden for teachers and schools by using the Ultranet for recording attendance, school reports, timetabling and school events, to pool schools' resources and give teachers access to a vast central database of classroom resources."*
(Department of Education and Early Childhood Development 2011)

Figure 1: The Ultranet – Login to the Future (DEECD 2011)

The Ultranet made use of something it called '**Spaces'**, which were really mini-websites, where each type of 'Space' was intended to allow different information to be accessed. Each Space was classified

by its accessibility as one of the following:
- Me Spaces were private spaces accessible only by the owner.
- We Spaces were shared spaces that could be seen by those with permission.
- See Spaces were public, open access spaces that could be seen by the whole world.

These Ultranet Spaces were:
- Home – a personalised page for students, parents and teachers to see school or community notices (Me Space).
- eXpress– a personal space for students and teachers to capture, share and reflect on their learning (We Space).

- Design – where teachers could plan, create and collaborate with colleagues within and across schools and design curriculum and student learning activities (We Space).
- Community– where students, parents and teachers could find information about school news and events (We Space).
- Collaborative Learning – where students could take part in online learning activities set up by their teachers (We Space).
- Learner Profile – where students, their parents and teachers could view a detailed profile of their individual learning progress with information built up over time (We Space).
- Learning Tasks – where teachers could plan, deliver and assess learning activities and students could view and submit learning tasks (We Space).
- My Content – where teachers and students could store and search for personal, school and quality-assured digital learning resources (We Space).
- Connect – allowed students to find reviewed websites and online activities (See Space).

Figure 2: 'Spaces' on the Ultranet (DEECD 2010a)

Methodology: Innovation Translation

Reviews of the literature of project failure show that many studies are of perceptions of people

involved and not of the projects themselves (Savolainen, Ahonen and Richardson 2012). Recent theoretical considerations have shown the need to include studies of cases of failure and that those studies include all the social actors and their interactions with the project (Stoica and Brouse 2013).

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Any investigation of the adoption of the Ultranet must consider both its technical and its human components and so this must necessarily involve a socio-technical research approach and methods. Actor-Network Theory (ANT), or the 'sociology of translations' (Callon 1986b, Law 1992) was designed to deal with socio-technical research in a way that would address the need to treat the contributions of both human and non-human actors fairly and in the same way (Callon 1986b) and was developed to analyse situations where separation of human and non-human elements is difficult (Latour 1993, Callon 1999, Tatnall and Gilding 1999, Tatnall 2000, Tatnall 2009). It was clear from the beginning that the failure of the Ultranet was not due to technology alone, and although other methodologies were considered we believe that ANT, and in particular Innovation Translation, handles this most effectively. Our research was qualitative and used an approach of interviewing the actors by speaking with the human actors and by the use of documents to 'interview' the non-humans.

It is useful to consider the Ultranet project as an example of technological innovation and to view it through the lens of technology adoption. Before beginning it is important though to distinguish between invention and innovation. While invention involves the discovery or creation of new ideas or technologies, innovation is the process of putting these ideas or technologies into commercial or organisational practice (Maguire, Kazlauskas and Weir 1994). The process of innovation involves getting new ideas accepted or new technologies adopted and used (Tatnall 2011). After the discovery of a new idea, or the invention and development of a new technology, it does not automatically follow that this will be adopted by its potential users, and even if it is adopted, there is no guarantee that it will be adopted as its designers intended. In this article we will make use of innovation translation (Callon 1986b), informed by actor-network theory (Latour 1988, Latour 1996), to examine the reasons why the Ultranet was not adopted to the extent intended. Innovation Translation sees the process of innovation in terms of translation from one state to another. Callon (1986b) suggests that the process of translation has four aspects or 'moments': Problematisation, Interessement, Enrolment and Mobilisation.

In the *problematisation* moment, one or more key actors attempts to define the nature of the problem and the roles of other actors so that these key actors are seen as having the answer, and being indispensable to the solution of the problem. This means that the problem is re-defined, or *translated*, in terms of solutions offered by these actors who then attempt to establish their views as an 'obligatory point of passage' (Callon 1986b) which must be negotiated as part of its solution.

It is unlikely that all the actors will see use of the Ultranet in the same way, and so some actors will try to persuade others that their view of its operation and use is the one that should be adopted by all. These key actors will then attempt *interessement*, which is a moment involving a series of processes that attempts to impose the identities and roles defined in the problematisation on the other actors. In this interessement each party then attempts to convince the others to make what they consider to be 'good use' of it.

The next moment is *enrolment* (or adoption) and if the interessement is successful enrolment will follow through a process of coercion, seduction, or consent (Grint and Woolgar 1997), leading to the establishment of a solid, stable network of alliances. Enrolment, however, involves more than just one set of actors imposing their will on others; it also requires these others to yield (Singleton and Michael 1993).

Finally *mobilisation* should follow, as the proposed solution gains wider acceptance (McMaster, Vidgen and Wastell 1997) and an even larger network of absent entities is created consent (Grint and
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Woolgar 1997) through some actors acting as spokespersons for others. Those enrolled would then praise the value of the Ultranet in an attempt to show its benefits to others.

Actors and Networks

A multitude of actors were involved in different parts of the Ultranet project. The human actors included: State Government policy makers, students (over 500,000), teachers (about 40,000), parents (about one million), Principals of Government Schools (about 1,500), School Councils, DEECD officials, teacher educators, pre-Service teachers and the Ultranet developers. There were many non-human actors as well: Broadband Connections, Web 2.0 technologies, Schools, School Computers, Home Computers, the Victorian Institute of Teaching and Learning, the emerging National Curriculum, policies, privacy laws, DEECD, the Victorian Government and the technology of the Ultranet itself (Tatnall, Dakich and Davey 2011).

Callon (1986a) argues that an actor can also be considered, at times, as a black box, as we do not always need to see the details of the network of interactions that is inside it. The complexity is not just lost however, as it is always possible to open the black box to investigate its contents: the complexity is punctualised (Law 1992), but not lost. The Victorian Institute of Teaching and Learning, DEECD and the Victorian Government are all black boxed non-human actors, but in each case inside the black boxes can be found a multitude of human actors.

In actor-network theory it is not so much the actors themselves that are all important but rather their interactions with each other to form networks. In ANT terms a network is an interconnection of actors (both human and non-human) and these can certainly change over time. In this case, one significant change was the part played by teachers, students and parents. As time went on these should have become significant actors but this did not happen.

Research Methods

This was qualitative research and so the research technique primarily used was that of case study (Yin 2014) and historical research (Howell and Prevenier 2001, Mahoney and Rueschemeyer 2003) making use of interviews, documents, archival records, direct observation and examination of physical artefacts. Ongoing legal issues associated with the demise of the Ultranet restricted the degree to which we could conduct some interviews and view some documents, but nevertheless we visited six schools and interviewed six school principals, five School Council members, twelve classroom teachers, eight parents, three teacher educators and two State Government policy makers over a period of two years. It was, unfortunately, not possible to interview the Ultranet developers. (Under Education Department regulations it was also not possible to interview students.) Although this was quite a small sample, we believe that it covered the range of backgrounds and views of the actors, particularly when supported by documentary evidence. We also investigated as many documents and archival records on the creation and implementation of the Ultranet as were available. In terms of physical artefacts we observed school hardware and Internet connections, and of course looked at the Ultranet itself. The data, including documents, reports and interview transcripts, were analysed using ANT as a lens. Repeated iterations were performed independently by two researchers in order to identify actors, the interactions between them and evidence pointing to specific moments of translation, or the points at which those moments broke down. The research outcome is the 'story' of the failure of adoption of a technological innovation seen through the lens of ANT.

Information Systems Project Success and Failure

There is a great deal of literature relating to information systems (IS) project success and failure. Over the last twenty years the Standish Group has produced a Chaos Report (Standish Group 1995, Standish Group 2016) indicating that a large number of all projects result in failure, so in this respect the Ultranet is no exception. In this article we will not dwell on this literature except to mention just a few examples. Srivastava (2011) looks at the impact of e-Government projects and Goldfinch (2007) discusses pessimism and computer failure in the public sector. Dwivedi et al. (2015) discuss a range of issues including viewing problems from multiple different perspectives and looking at human and organisational issues rather than just considering the artefact itself, arguing that user resistance is also closely related to IS failure. They note research by Bhattacherjee and Hikmet (2007), Hirschheim and Newman (1988) and Laumer and Eckhardt (2012) who focus on the sources of resistance in technology end-users and on how this is shown through non-compliance or non-usage. This research has relevance to human issues involved in the failure of the Ultranet.

The Development, Use and Death of the Ultranet

Birth and Development of the Ultranet

In the mid-1990s Victoria set up a number of 'Navigator Schools' whose purpose was to develop the use of ICT to improve both teaching and learning and school administration. In the early 2000s Glen Waverley Secondary College, as a Navigator School, developed an effective school intranet that transformed the way the students and staff gained access to each other and to curriculum resources (Toomey, EkinSmyth, Warner and Fraser 2000). This was a joint venture between the school and Impaq Educational Services.

The Education Department was impressed that Glen Waverley Secondary College had provided: "*an intuitive interface that seamlessly brings together various aspects of classroom 'business' (teaching and learning plus other associated administrative functions) into a single, central, logical environment that has a profound impact upon the way teachers, students, parents and other key staff share information and cooperate*" (EduWeb 2006). One school blogger (Doncaster Secondary College 2008) noted that this intranet was both powerful and informative, allowed the community to know exactly what was going on in the school, and that it was used by everyone.

In 2005 the Education Department commenced a joint R&D initiative with Oracle Corporation to produce "*the prototype for a student centric system that supports teaching and learning, curriculum delivery and the management of knowledge in Victorian schools*" (DEECD 2005). The prototype was to be known as the Ultranet and be based on Oracle's L360 design. The aim was to provide the functionality of Glen Waverley Secondary College's intranet system and to provide parents of school children virtual access to their child's classroom. In 2006 to test the feasibility of these ideas a 'proof of concept' system was developed by the University of Melbourne and trialled in 22 schools over 18 months using a version of the software provided by a commercial supplier (Griffin and Woods 2006, Tatnall, Davey, Dakich and Wickramasinghe 2013). The trial aimed to establish whether such a project was viable, to determine functional requirements, to identify any possible user and technical issues and to investigate development and implementation costs. It was reported as a "*proof of concept student-centric ICT system, called Students@Centre, to support online teaching and learning, curriculum delivery and knowledge management in Victorian government schools*" (Department of Education and Early Childhood Development 2010a).

In 2006 the Victorian Labor Government made an election commitment for $60 million to build the Ultranet (EduWeb 2006, Tatnall, Davey, Dakich and Wickramasinghe 2013) and have it operational before the 2010 election. In 2007 the Education Department attempted to develop a business case for the Ultranet but this was rejected by the Government, requiring a revised version to be submitted later that year (Victorian Auditor-General's Office 2012). It was acknowledged in this second business case that schools already had a choice of several different ICT solutions and that many were already using these (Tatnall, Davey, Dakich and Wickramasinghe 2013). It emphasised, however, "*that no single solution could provide the full level of scalability, security, interoperability and functionality that is needed to meet the identified business needs and objectives of the Ultranet*" (Victorian Auditor-General's Office 2012 :4).

In mid-2007 a request for tender to develop and manage the Ultranet was released but a report in The Age newspaper indicated that many of Oracle's rival software suppliers were concerned that owing to Oracle's early involvement they would not have much chance in the tender process (Baker, McKenzie and Preiss 2014b). "*There was no question about it. It was always going to be Oracle's software, everything was skewed towards it*" an executive from an IT company involved in the Ultranet tender was quoted as saying (Baker, McKenzie and Preiss 2014b). Several months of evaluation and negotiation, however proved unsuccessful with most tenders over $100 million and so unable to meet the Government's budget. The tender process was aborted and consultants hired to help re-scope the project, drastically reducing its functionality. In 2008 a second request for tender was issued with a requirement that the project be completed by September 2010, and the Australian IT firm CSG Limited (in partnership with Oracle) was selected (Tatnall, Davey, Dakich and Wickramasinghe 2013). This was followed in 2009 by a third variation of the business case dropping the need for the Ultranet developer to provide administrative support to schools. By this time the functionality of the revised Ultranet had become a good deal less than that originally proposed.

The Ultranet was launched in August 2010 when Victoria's 1,500 State Schools were closed for an extraordinary student-free day for teacher professional development (Department of Education and Early Childhood Development 2010b). All 3,500 State Schools Principals and Assistant Principals were called to Melbourne to attend Ultranet's 'Big Day Out' at the Melbourne Exhibition and Convention Centre to learn about the state's new online learning network. Teachers across the state were asked to familiarise themselves with the Ultranet from their own school location, but unfortunately the launch turned into a disaster when the Ultranet crashed disastrously at 9am (Tatnall, Davey, Dakich and Wickramasinghe 2013). Later when the system was running again many teachers and principals experienced problems when they attempted to log on and reported it as running extremely slowly (Holden 2010, Levy 2010, Topsfield 2010).

One important definition of project failure is the inability to deliver on time. Emails from the Ultranet General Manager in the days immediately before the launch show that significant downtime was then being experienced and that the training day should have been rethought (Peck 2010).

Our research suggests that the intention, or problematisation, of the State Labor Government was to create an online system to both offer access to learning materials and to inform parents of their child's progress. In 2010 the Labor Government was defeated in the state election and the new State Liberal Government saw the Ultranet as an expensive product of the former government, that while it could not remove, it did not want to facilitate further. The new Education Minister was quoted in The Age as slamming the Ultranet as an "*appalling Labor failure*" and indicating that he had "*strong reservations*"

about its "*woeful*" up-take (Topsfield 2012c). Teachers problematised it differently. Most saw some value in the aspects of the Ultranet that provided access to learning materials, but many did not agree with using it to provide information to parents, seeing this as a challenge to their position and influence, and so as a threat. Most parents did not problematise the Ultranet at all, but those who did concentrated on the benefits of its use to inform them of their children's progress.

The Ultranet in Use

A major goal of the Ultranet Project was to improve communication between the school and its teachers with parents. The Education Department's website announced that:

> *"As a parent, the Ultranet will give you more detailed and timely access to information so you can monitor and support your child's learning. Information about your child and their school will build over time as schools progressively implement and use the Ultranet's many functions. In just a few clicks, you will be able to see your child's latest: attendance records, learning progress information, teacher feedback, in-class or at-home tasks and timetable." (DEECD 2012)*

Following the disastrous introduction day, however, the Ultranet was made more stable and started to deliver. Each Education Department region appointed a number of 'Ultranet Coaches' (a total of 50 in all), each given six days of professional training and then based at a school. Their task was to service a small group of local schools with the goal of supporting teachers to prepare for the Ultranet and to build ICT capacity in the classroom so working towards "*improving student outcomes enabled by ICT*" (DEECD 2009b). As well as these coaches, each school was asked to appoint an Ultranet Champion known as a 'Lead User' who was provided with two days of professional training by the local Ultranet Coach and given support materials including: Ultranet School Readiness Guide, Ultranet Functionality, Ultranet Implementation Planning, Data Advice for Schools and eLearning Planning Showcase, and whose role was to offer ideas for school-based professional learning strategies and to promote use of the Ultranet (DEECD 2009a). These support structures had been used to good effect with previous educational innovations and were well researched.

Although by 2012 the Ultranet was not widely accepted around the State it was well used by a select group of schools, centred mainly on a couple of country regions, both as a tool for student collaboration and as a means of communicating with parents (Victorian Auditor-General's Office 2012). The Age newspaper (Topsfield 2012b) reported on the case of a country school near Mildura (500km from Melbourne) in which parents were given a fortnightly update report on their child's school progress. A teacher at the school pointed out that *"… a student might be reading well but skipping over full stops or have a weakness with the four times table. This fortnightly reporting meant parents received feedback instantly and could work immediately with their children at pausing at full stops when reading aloud or practicing their multiplication tables, instead of waiting for six-monthly reports*." (Topsfield 2012b). The school indicated that it had "*nothing but glowing feedback*" on how the Ultranet had allowed parents to find out more about their children's learning.

Around the rest of the State, there was much less use of the system. This was partially, but not only due to a 2012 ban on the system by the Teachers Union in an enterprise bargaining dispute (Australian Education Union - Victoria 2012). Blogs such as ReflectiveTeacher suggested that it was not only industrial action that precluded open and wide acceptance of the Ultranet but also disenchantment with the proposed value of the system compared with other tools that were more easily adaptable and

usable. "*My experiences of the Ultranet so far have given me the impression that it is restricted and basic. While I can definitely see the value in what they are trying to achieve, it saddens me that so much funding and resources are being pumped into a clunky system in its infancy.*" (ReflectiveTeacher 2012). Another indication of the stagnation of the system was the lack of apparent interest shown in official 2010 Government webpages – the 2010 DEECD Schools' Page for parents making no mention of the Ultranet (Department of Education and Early Childhood Development 2010a).

An Auditor General's Report (Victorian Auditor-General's Office 2012, Australian PolicyOnline 2016)[1] noted that the Ultranet had not as yet achieved the expected benefits for students, parents and schools. The report indicated that the project was significantly late, more than 80% over budget had a very low uptake by users and had not achieved the functionality originally intended.

> "*DEECD has not fully considered the demand the Ultranet would have on teachers' time and workload, particularly in terms of teachers' roles in supporting and guiding parents on how to use the Ultranet … System problems have also discouraged uptake … These include the Ultranet's technical unreliability and poor performance, the lack of appropriate support to develop Principals' and Teachers' ICT competency and confidence, and ageing ICT infrastructure and devices (which can affect online access to the Ultranet).*" (Victorian Auditor-General's Office 2012 :30)

The project management of the Ultranet obviously left a lot to be desired, and the Victorian Auditor-General's Office Report indicated that: "*The Ultranet project was poorly planned and implemented.*" (Victorian Auditor-General's Office 2012 :ix). The report went on to add:

> "*There is little confidence that the financial management practices relating to the Ultranet were sound and that full costs have been adequately recorded. … DEECD has advised that it is currently investigating the financial practices in relation to this major ICT project.*"

> "*Use of the Ultranet is low, and declining. On average, only 10 per cent of students and 27 per cent of teachers logged in on a monthly basis from July 2011 to May 2012. An underlying factor which has limited the effective implementation of the Ultranet is the significant discrepancy between the original scope of the project and expected benefits and what has actually been implemented and delivered.*" (Victorian Auditor-General's Office 2012 :ix)

Several other major relevant issues emerge here on why the Ultranet had not (so far) been a success: a change of Government in late 2010, poor publicity and training for the Ultranet and the need for many teachers and parents to see something useful on the Ultranet before committing themselves to its full adoption. The immediately most important of these issues is perhaps the first. When asked whether the change of government had made a difference to adoption of the Ultranet, the Principal at one Primary School remarked that: "*it made all the difference*" as the new government had shown little commitment to the project.

DEECD had the power to insist that all Government schools made use of the Ultranet, but making this happen would not have been as straightforward as it might now seem. The old saying: '*You can lead a*

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[1] The Auditor-General is an independent officer of the Victorian Parliament, appointed to examine the management of resources within the public sector on behalf of Parliament and Victorians (Australian PolicyOnline 2016).

horse to water but you can't make it drink' is relevant here. While DEECD could have insisted that schools use the Ultranet it could not have made them achieve something worthwhile with it (Tatnall, Dakich and Davey 2011).

A significant issue was that as the Ultranet had been the product of a Government that had been in power for over 10 years, many teachers thought that the new Government might scrap it. Another issue was poor publicity and training for use of the Ultranet. Many teachers and parents wanted to see something useful before committing themselves to its full adoption. Although there had been teacher training on *how* they could access and *use* the Ultranet there had been very little discussion of *why* it would be worth using (Victorian Auditor-General's Office 2012).

Furthermore, in an informal conversation one primary school principal indicated that the Ultranet Coach who had visited them did not seem to understand the human issues involved in convincing teachers and parents to use the Ultranet. The Coach was of the view that as DEECD had decreed that it be used, that was the end of it (Tatnall, Dakich and Davey 2011). This primary school had decided not to introduce the Ultranet to parents until such time as there was something worthwhile on it for them to see – until it had some data about their own children. The Coach did not seem to understand this. In May 2011 as an economy measure the Ultranet Coaches were advised by the Government that they would no longer be required after the end of the year.

A parent of secondary school children whom we interviewed indicated that he had not been able to find out much about the Ultranet and that as far as he was aware his children's school was not using it. Clearly there should have been a good deal more done to convince principals, teachers and parents of the Ultranet's value. Until the Ultranet had some useful content that was relevant to a given school, its teachers, students and their parents, it was unlikely that the school would want to use it. On a positive note however, one blogger indicated that: "*Overall, I am disappointed with the Government's spending on this project and the poor usability thus far, but I do like the idea of it and the potential that it holds*" (ReflectiveTeacher 2012).

A 2010 survey reported by the Victorian Ombudsman (Victorian Ombudsman's Office 2011)[2] indicated that 65% of School Principals thought that the Ultranet could have positive effects on student learning (Tatnall, Davey, Dakich and Wickramasinghe 2013). They thought that the Ultranet could enhance teaching practices, support school culture and improve the school's ability to communicate with parents, but only 37% said that they considered the implementation of the Ultranet at their school to have been successful.

In spite of great promise, the adoption of the Ultranet by schools and teachers had been disappointing (Tatnall, Dakich and Davey 2011). In a November 2011 report, the Victorian Ombudsman noted that: "*Despite its early problems, Ultranet has been delivered and is working in schools and there is widespread support for the concept.*" (Victorian Ombudsman's Office 2011 :96).

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[2]   The Ombudsman's role is to investigate the decisions and actions of Victorian government bodies. The Ombudsman is independent and impartial and provides a free service. The Ombudsman also tables reports in Parliament, produces a range of fact sheets and delivers community education (Victorian Ombudsman's Office 2016).

> *"Users' resistance and reluctance to change are the biggest potential barriers to Ultranet, and uptake and ongoing usage will have to be monitored carefully. Ultimately, Ultranet's success will be dependent on whether students, teachers and parents are able to access and use the system and whether they feel that it is having a positive impact on teaching and learning." (Victorian Ombudsman's Office 2011 :97)*

By the following year however, in December 2012 an Auditor-General's report indicated that: "*Use of the Ultranet is low, and declining*" (Victorian Auditor-General's Office 2012 :ix).

The problematisation of the Ultranet by the Labor Government as a system to offer access to learning materials and to inform parents of the child's progress seemed worthwhile to many when it was first proposed. What should have happened next, we suggest, was that considerable effort should have been put into convincing teachers and parents to accept this problematisation and so become enrolled. This, however, did not happen – there was a major failure of interessement!

The first attempt to convince teachers of the value of the Ultranet was at the 'Big Day Out' and student-free day for professional development. This attempted interessement was a disaster that, far from convincing teachers of the Ultranet's worth, did exactly the opposite. The initial problematisation of the Ultranet was partially inspired by existing systems in which teachers had found value (Tatnall, Davey, Dakich and Wickramasinghe 2013), but even these systems were not universally used and insufficient effort was put into showing teachers the need for a new monolithic system. A typical blog from the time of the training day disaster (Fraudster 2010) showed that teachers were already using a number of different tools that were more easily adaptable and usable for many of the purposes offered by the Ultranet. There were also alternatives to the Ultranet as a blog by a secondary school teacher explains: *"Google Apps for Education gives teachers and students at my school everything we could ask for in an online environment: flexibility, ease of use, customisability, practicality, efficiency, effectiveness, collaboration, availability on multiple devices etc. … for FREE!"* (ReflectiveTeacher 2012). This raised the question: why should I adopt and use the Ultranet? It would have been sensible to identify those aspects of the original business case of most utility to teachers and to ensure that these were stressed, so making teachers more interested in using the new system.

Another attempt at interessement was the appointment of Ultranet Coaches, but as in the case of the primary school mentioned earlier, their efforts were not always successful. The idea of a Lead User in each school was a good one, but the Education Department did not put enough effort into persuading them of the Ultranet's value to their schools. The Auditor-General's Report (2012) noted that even after the initial stage of coming to grips with the Ultranet, teachers would need to spend extra time in professional development. Communication with parents was proposed as a key benefit, but the affect that this might have had on teachers' perceptions of their role and of their workloads was not taken into account. They would also need to spend time assisting and training parents to use the Ultranet. This does not appear to have been considered. Our research has shown teachers stressing the online learning aspects of the Ultranet, while downplaying those aspects of informing parents, as many teachers were concerned with parents gaining too much influence in their school. The human aspect of promoting the Ultranet was not given sufficient consideration.

Efforts to convince schools and teachers to make good use of the Ultranet was a critical factor to its adoption and one way that this could have been achieved was through a series of well thought out professional development activities. Another possibility would have been the provision of useful and convincing case studies of schools and the setting up of a number of 'Lighthouse Schools' well equipped

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with ICT and with teachers well versed in its possibilities to demonstrate a variety of uses that could be made of the Ultranet. The Australian Commonwealth Government provided funds for an approach like this in the 1980s when computers were just beginning to be introduced into schools and its computer education program was in full swing (Tatnall, Davey, Dakich and Wickramasinghe 2013). After the election in 2010 the new government made very little effort at interessement at all, and most parents just waited for more information from the schools or the government. The Auditor-General's Report also recommended that DEECD "*expedite the provision of guidance to schools on the current status of the Ultranet as the department's key learning technology investment, and clarify the policy context of schools' autonomy in purchasing non-Ultranet learning technologies*" (Victorian Auditor-General's Office 2012 :31).

Given this failure of interessement, very few schools became enrolled and embraced the Ultranet. An even smaller number became mobilised and attempted to convince others.

Death of the Ultranet

In December 2012 The Age newspaper (Topsfield 2012c) reported that the Victorian Government would seek advice on whether the Ultranet, now noted to have cost $180 million, could be salvaged. In another article the Secretary of the Department of Education and Early Childhood Development was quoted as announcing that the government was "*looking at the Ultranet in its entirety... It's a fact, and a well-known fact I think, that the level of take-up of the Ultranet has been nothing like what was intended.*" (Topsfield 2012a).

Ultimately, in June 2013 the Government announced that it had decided to abandon the Ultranet. DEECD then signed an agreement with NEC to take it over, rebadged it under the name of GenED and announced that from January 2014, only schools that were prepared to pay for the service would then have access (Sharp 2013).

Apart from problems with user acceptance, the Ultranet project appears to have been flawed from the beginning. In November 2011 the Victorian State Ombudsman reported on a number of Government 'ICT-Enabled Projects' (including the Ultranet (Tatnall, Davey, Wickramasinghe and Dakich 2013)) that had not gone as well as they should.

> *"The Ultranet project suffered from inadequate upfront planning and a general disregard for industry and Gateway advice, which indicated the project could not be delivered within the budget and timelines. Ignoring this advice resulted in a failed tender that cost around $5 million. It also set the project back by a year and damaged the reputation of Ultranet." (Victorian Ombudsman's Office 2011 :25)*

A year later, the 2012 Auditor-General's Report on the Ultranet was quite scathing, indicating that there were a number of serious process issues and apparent probity breaches in relation to the Ultranet.

> *"The Ultranet project was poorly planned and implemented. None of its three business cases had a well thought out needs analysis or gave considered options to deliver the project. The various business cases did not answer the 'Why invest?' question for the Ultranet, nor did they provide a sound basis for the project's approval." (Victorian Auditor-General's Office 2012 :ix)*

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The Auditor-General (2012) further noted that in addition to cost overruns the project scope had also been considerably reduced with its business requirements reduced by 90% from the 1,260 functions stated in the 2007 business case to 131 functions contained in the 2008 RFT specifications. The concurrent user requirement was also reduced from 250,000 users to 78,000 and the Ultranet's total storage from 330TB to 160TB.

> *"Some six years since its announcement as a government priority, the Ultranet has not delivered any of the main objectives that were expected when the project was funded. The Ultranet is significantly late and over budget – and with limited functionality – when compared with what was originally announced." (Victorian Auditor-General's Office 2012 :20)*

Issues of Lack of Probity

In the Victorian Auditor-General's 2012 report: *Learning Technologies in Government Schools* a number of serious probity, procurement and financial management issues surrounding the Ultranet project were identified. The audit found that DEECD's tender process lacked rigour, was seriously flawed, and that there was little confidence in the costing and financial management practices around the Ultranet project (Victorian Auditor-General's Office 2015). Since then, accusations of corruption and fraud against a number of those involved in the Ultranet project have been made. Whether these accusations are justified, and indeed whether any of this relates to the life and death of the Ultranet remains unclear and merits further investigation.

In the early 2000s, when Glen Waverley Secondary College was developing its intranet (the forerunner of the Ultranet), the School Principal was Darrell Fraser and Dianne Peck was Deputy Principal (Toomey, EkinSmyth, Warner and Fraser 2000). Fraser was described by his colleagues as a gregarious, but tunnel-visioned man (Baker, McKenzie and Preiss 2014b). In 2004 he left the school to take up the position of Deputy Secretary for the Office of School Education. At the same time, Glen Waverley Secondary College was chosen by the then Labor Government as the site for what would become the Ultranet. Oracle was to become an initial development partner, and Fraser was made responsible for the project. Dianne Peck left the school and was also given a senior position in the Education Department. After the tender process CSG Limited was appointed to undertake the project (Baker and McKenzie 2014a). In June 2011 Fraser resigned from his executive position in the Education Department to take up a senior role with CSG (after they had won the Ultranet project contract), and was soon followed by Dianne Peck (Baker and McKenzie 2014a).

In early 2016 the Victorian Independent Broad-Based Anti-Corruption Commission (IBAC 2016a) commenced an investigation into 'alleged serious corruption at the Department of Education and Training'. Operation Dunham was set up to investigate:

- *"How contracts around the online learning portal were tendered for and awarded*
- *The personal and business connections between department employees and businesses involved in the Ultranet project*
- *Whether current or former department employees released confidential information, or used their position to influence procurement processes*
- *Whether department employees received payments, gifts, travel, employment opportunities or other benefits because they were involved in the Ultranet tender or procurement processes*

- *Department procurement and conflict of interest processes, and organisational culture."* (IBAC 2016c)

In a statement to the IBAC, Departmental Secretary Gill Callister said an atmosphere of "fear and bullying" had prevented people from speaking out. She said a group of senior staff breached procurement rules for their own benefit. "*In the Ultranet tender, a series of red flags were raised which should have resulted in the termination of the project, or, at least, a change in direction.*" (Cook 2016)

In a statement to the IBAC inquiry in relation to his involvement with CSG and providing Julie-Ann Kerin, Chief Executive Officer and Managing Director of CSG, with a million dollars when CSG were working on the Ultranet, Fraser said that:

> "I met with Julie-Ann Kerin prior to the Big Day Out where she was saying that the pressure being put on this project by the shortened timeline, with the failed tender, with the expectation we still deliver by September 2010, it was placing a lot of pressure on their resources having to get their contractors works longer, harder, etcetera. With the very pubic failure of the Ultranet at the Big Day Out, subsequent to that, I met with her and I also met with Denis Mackenzie and new issues had emerged because of that. I mean, obviously, the performance testing hadn't been done adequately and that required them to get even more resources." (IBAC 2016b)

Further to this, the IBAC found that four Education Department senior officials, including its General Manager, had bought shares in CSG *before* it was awarded the contract in 2009 (Baker and McKenzie 2014b). In 2010 the Education Department held a secret internal inquiry into this, and it has been reported (Baker and McKenzie 2015) that its former acting secretary, Jeff Rosewarne, received the findings of the internal inquiry in early 2011, but did not act on them. He is now a director of the Catholic Education Office.

At hearings in early 2016 IBAC was advised that the Department of Education was warned that the company behind the Ultranet project did not have the experience needed to deliver it, was over-charging for the work and so was not fit for the job (Jacks 2016). This certainly brings into question how they won the contract and the quality of the product created. The inquiry was told that the managing director of consulting firm Landell, Lexton Gebert, had told the Education Department Ultranet project manager that the tender bid was "*the closest thing he had seen to corrupt in 20 years of working in the Victorian Government*" (Jacks 2016).

Upsetting as all this is, whether it directly affected the design or death of the Ultranet is not completely clear at this stage. It is clear however, that there were various 'unofficial and potentially criminal' interactions between a number of the human actors involved that may have led to the production of a product not up to the standard it could have been. It may be that these 'hidden' interactions in the network were as powerful at destroying the innovation as any of the 'visible' interactions.

Conclusion

A summary by Eveleens and Verhoef (2010) of the first five Standish surveys indicates that outright success of information systems projects is rare. The persistence of IS project failure is remarkable as significant work has been done in addressing failure and it would be expected that this work would impact professional practice and hence performance. Stoica and Brouse capture this apparent anomaly as an issue in saying:

"In the field of Information Technology (IT) there is an observable trend toward project failure. Although multiple actions have attempted to address this failure trend, they have not impacted the extent of the trend." (Stoica and Brouse 2013)

Common methods to study IS project failure include large surveys, such as those underlying the Chaos reports, studies of human factors, such as those based on UTAUT (Venkatesh, Morris, Davis and Davis 2003) and similar theories, and extensions of Diffusion Theory (Rogers 2003) centred on the characteristics of the innovation. In this study a single case of failure has been studied and both human and non-human actors were 'listened to' in an equal way. The understandings here apply only to this case, but the method of coming to an understanding of the failure in this case is presented as a powerful method of approaching the continuing problem of IS project failure. Projects fail for both human and non-human reasons and innovation translation, informed by ANT, offers a useful way to study this, as it did on this occasion.

It is likely that similar difficulties would be found with the implementation of innovative new technologies in other education systems around the world. New technologies are not adopted just because they exist, but because people see a need for and some value in them. This was not the case with the Ultranet.

The possibilities offered by the Victorian Education Ultranet were considerable, but its up-take by schools was not. The solutions offered by the Ultranet had value, but they were not solutions to any existing problems that had been identified by schools or by teachers. More could have been done before introduction of the Ultranet to convince teachers of its value as it had numerous critics from the beginning who doubted this (Preiss 2014). If parents had been fully convinced about features intended to inform them about their child's education and about the school they attended perhaps they would have made a greater effort to convince their local school to adopt the Ultranet so affecting the outcome. The Ultranet really was a solution in search of a problem.

The Ultranet concept had many valuable features, arising from a system that had served one High School well. A test prototype worked well and was independently assessed, and one can conclude that this innovation would have been a worthwhile addition to the systems available to schools. The initial round of tenders for building the Ultranet indicated, however, that its proposed features were more expensive than the amount allocated by the government, and so the original proposal was scaled back. It is clear that the product finally produced did not meet all the intentions of its creators.

There is considerable evidence that those charged with managing the Ultranet project made a number of mistakes in this process. It also appears that a number of unseen interactions involving some of these actors were taking place in the commercial side of the project. The IBAC study of the Ultranet project has suggested that a number of these were at least unethical and probably illegal. What is more important for this study though is that it is likely that these unseen commercial interactions led to the production of an inferior product, as those charged with its development did not have the necessary experience to deliver it. It is also likely that they contributed to its failure.

Political problems continued to be associated with the system despite it providing some schools that found the system to be very useful, with its intended benefits. Apart from its technical and human problems, introduction of the Ultranet had a strong political agenda especially with the need to have it operational before a state election.

> *"The Ultranet fiasco is a tale of what happens when good ideas and intentions clash with political pressure to meet unrealistic budgets and timelines, and of what happens when zealous senior bureaucrats refuse to listen to advice."* (Baker, McKenzie and Preiss 2014a)

An innovation is of little value unless it is adopted, and it will only be adopted if it can be adapted in such a way as to fill a need – unless it can be translated. In this case the Ultranet failed to establish such a need. The problematisation of the Ultranet as "*a student-centred electronic learning environment that supports high quality learning and teaching, connects students, teachers and parents and enables efficient knowledge transfer*" (Department of Education and Early Childhood Development 2011) was generally accepted, but teachers, however, were not entirely happy with all aspects of it connecting with parents and some saw this as a threat.

It may be that the sheer size of the project and the diversity of the stakeholders made success very difficult to achieve. A better attempt at interessement in convincing teachers of the value of involving parents could, however, have helped in this situation. Overall, interessement to encourage Ultranet adoption was not performed well at all. The failure of the 'Big Day Out' was a disaster that showed teachers some of the Ultranet's problems. Appointment of the Ultranet Coaches was not always successful. Further possibilities such as targeted professional development activities and setting up exemplar schools to show how the Ultranet could be used to advantage were not followed through as much as they could have been. Although a number of factors were involved, the failure of the Ultranet was principally a failure in convincing teachers to make good use of it: a failure of interessement.

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