



**Department of Computing
Te Horo Rorohiko**

CH3880 Bachelor of Information and Communications Technology

BCCE301 Cooperative Education Project

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Windows 10 Implementation Project Ara Institute of Canterbury

FINAL REPORT

**Michael English
12178187**



Windows 10 Implementation Project

Final Report

Michael English

3/27/16

BCCE301

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Background.

Ara Institute of Canterbury is the combination of both CPIT & Aoraki polytechnic, the leading tertiary education providers for the South Island of New Zealand. With this new entity, focus must be allocated to building name recognition and remaining relevant to new and existing students. This relevancy is built, in part, by the ICT systems available to students and staff to ensure the company provides work ready candidates capable of succeeding in the latest working environments. As with all companies, ICT systems must continue to improve and remain stable as a matter of course, and with the integration of an additional 5 physical site locations with the five original, current systems must provide maximum consistency for all computers. Currently the institute is running a 64x Windows 7 (with limited numbers of Windows 8) operating system image, managed from an SCCM2012 R2 environment, to deploy the patches, images, and updates to institutionally managed devices. It is Ara's expectation that this project will provide the opportunity for the completion of the ground work, to provide one standard end user operating system. Historically CPIT has utilized features including PXE boot and multicast of which Ara has expressed interest in returning some of this functionality if possible.

Summary

The Windows 10 implementation project went very well considering the size and changes to the scope that occurred midway through the project. The key lessons I've learned from this project being that requirements are fluid, and schedules are great as a guideline but flexibility is the best way to ensure success. I have learnt more about configuration manager than I ever expected and have gained tangible skills for implementing large change in a complex ecosystem. Lastly, I have learnt that with perseverance and enough time most outcomes will eventually be met with an acceptable degree of quality.

The project ran slowly at first while I spent many nights reading and learning about the server aspects of configuration manager and the level of integration it had with other systems. Additionally, delays in getting the required sign off by all parties added time to the project that, at the time, was not critical but after the scope changes impacted the time line considerably as this documentation required reworking. The product (1511) is in a relatively new stage in its life cycle and as such, changes are happening rapidly with new features and bug fixes rolled out sometimes weekly. Initially, the decision was made to perform a side by side clean install, and then carry out a migration. This was opted for to ensure maximum uptime of service, reduction of legacy settings and roles (endpoint protection and Software Update Point), and to allow more control over the new systems data. An in-place upgrade would have had considerably less complexity and cost but had a much higher level of risk. I believe if there had been time to fully test this in the "Develop, test, & restore (DTR) environment" this could have been a better option. This option would have provided more time to clean up the system, choose settings through team discussion, and study features we would have liked to implement.

As it currently stands, the majority of settings, deployments, and configurations are a direct port from the 2012 (which in its self is a port from the 2007 environment) system with minimal clean up or changes. The goal has been to get the system working to keep the business functioning so very few new features were fully investigated. Some of the settings changed have included an Increase to the collection update speed, the boundary group configuration, and the ability for automatically downloading updates.

Some of the key Issues I experienced include:

- Microsoft changed the process for encrypting drivers in the boot disk. This resulted in the hardware purchased for the 2016 ripple being unable to be imaged. This effected the project by changing the focus to upgrading the production environment as fast as possible.
- Due to time constraints some investigations were limited, WSUS, end point, MDM, PXE, Drivers deployment.
- Microsoft not supporting the co-hosting of AppV 4, 5, and SCCM, reducing our ability to manage the migration as planned. Additionally, it means we will be unable to save money through co-exsisting.
- Boundaries were being automatically populated based off the domain settings.
- Unable to test all the components in dev environments as there was a lack of physical connection.

Project parameters.

Initial project goals.

- Provide a management point to support an upgrade from the Windows 7 operating system (OS) to Windows 10 on the 3800 current computer, laptop, and tablet devices at CPIT-Aoraki.
- Upgrade the server side systems to support the deployment of applications, images, and patching to the Windows 10 computers at CPIT-Aoraki.
- Upgrade and Optimize utilization of Microsoft products to support the business's expansion with regards to remote site management.

Final project goals.

- Provide a management point to support an upgrade from the Windows 7 operating system (OS) to Windows 10 on the 3800 current computer, laptop, and tablet devices at Ara.
- Upgrade the server side systems to support the deployment of applications, images, and patching to the Windows 10 computers at Ara.
- Upgrade and Optimize utilization of Microsoft products to support the business's expansion with regards to remote site management.

Expected outcomes.

The project can attain a “satisfactorily completion” status once Mark Marshall has signed off on the technical achievement for the first 3 key outcomes. Additionally, the project can receive “full completion” once all outcomes of lower priority have been achieved and signed off by Mark Marshall. The following are ordered in priority to the customer:

1. A new Windows 2012R2 server running an SQL database migrated from the current 2008 system running in the live environment.
2. A new Windows 2012R2 server running SCCM build 1511 running in the live environment.
3. Each PC, laptop, and tablet deployed cross site with the 1511 client.

Important note 1: The deployment of the 1511 client on CPIT-Aoraki cellular phones will not be included in the scope of this project as the cost to the business is outside the allocated budget for the project.

Important note 2: The deployment of the 1511 client on CPIT-Aoraki iMac and Mac book pros will not be included in the scope of this project as the business has Mac specific deployment software already configured for this environment. This has potential to change based on the requirements gathering phase of the project.

4. The inclusion of any additional features that arise from the requirements gathering phase.

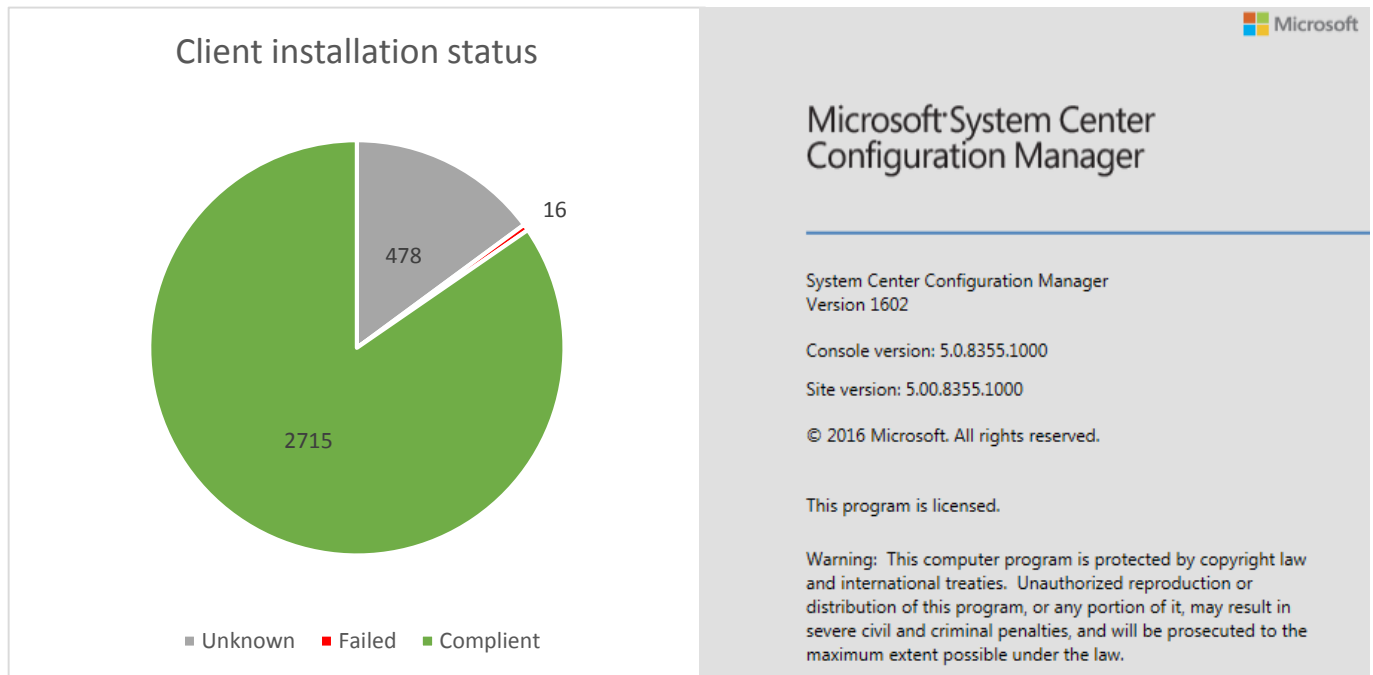
Important note 1: To reduce scope creep, any additional features must be decided, signed off, and budgeted, by the sponsor by the last Friday of the requirements gathering phase. Changes to additional features outside of this phase must be signed off by the sponsor, industry supervisor, Academic supervisor and the Academic lead.

5. A functioning Windows 10 image available to deploy across the site.

Important note 1: The deployment of the Windows 10 image will not be until at least December 2016 as the risk to the business of a midyear upgrade is too great and significant application testing will need to be completed before deployment which is outside the scope of this project.

Achieved outcomes.

1. A new Windows 2012R2 server running an SQL database migrated from the current 2008 system running in the live environment.
2. A Windows 2012R2 server running SCCM build 5.00.8355.100 running in the live environment.
3. 99% client compliancy of PC, laptop, and tablet deployments cross site (build 5.00.8355.1001)
4. A functioning Windows 10 image available to deploy across the site.



Key deliverables at the start of the project.

- A formal requirements document.
- A map of the current SCCM infrastructure.
- A new SQL 2014 version on a Windows Server 2012 r2 virtual machine.
- At least one new SCCM 1511 server.
- A Windows 10 image.
- A methodology report.
- A halfway (by time not completion) report.
- 1 A3 Poster.
- A final report.
- A panel presentation.

Key deliverables that changed during the project.

- A signed quality assurance strategy. - 22/03/16
- Lessons learned document created. - 18/03/16
- The decommissioning of any unrequired servers. - 26/03/16
- A map of the current SCCM infrastructure changed to technical breakdown. - 30/03/16

Final key deliverables met.

- A formal requirements document. - 31/03/16
- A technical breakdown conforming to Ara standards. - 08/04/16
- A halfway report. - 12/05/16
- A new server 2012 with the role of SQL 2014 & SCCM reporting services.
- A new server 2012 with the role of SCCM management point.
- A new server 2012 with the role of SCCM Distribution point.
- Migration of all:
 - Boundaries & boundary groups.
 - Applications.
 - Packages.
 - Collections.
 - Boot images, task sequences, driver packages.
 - Distribution points and groups.
 - Configuration settings where applicable.
- A Windows 10 boot disk with working drivers.

Initial scope.

Project start date: 14/03/2016

Phase one: Requirements gathering and documentation.

- The gathering of appropriate requirements from technical users and support staff.
- The creation of a formal risk analysis and register document.
- The creation of a formal quality assurance programme.
- Selection of the most appropriate methodology to the upgrade.

Phase two: Research and investigation phase.

- The investigation and mapping of the current environment.
- Document current SCCM features being utilized.
- Find legacy server dependencies.
- Investigate viability of features not utilized to meet requirements.
- Understanding the upgrade process through white papers and knowledge base articles.
- Investigate how domain changes will affect the upgrade.

Phase three: Utilizing an existing dev environment to test an in place upgrade and Greenfield install.

- Create snapshot of current system.
- Place 3-10 clients connected to the test environment.
- To simulate an in place upgrade.
 - Use the Windows 2008 server with an SQL2008 install to test an in place upgrade to SQL 2014.
 - Complete an SCCM2012 update on the current Windows 2012r2 virtual server.
 - Test compatibility and features.
- To simulate a fresh install.
 - Create an SQL2014 virtual server.
 - Create an SCCM 1511 virtual server.

Phase Four: Test the Dev environment as close to live as possible.

- Complete a testing plan to provide consistent test results.
- Add several small-medium sized applications to the virtual distribution points.
- Test deployments over different connections.

Phase Five: Roll out the “live” environment.

- Initiate the rollout of 1511 clients to the site, pushed out by the 2012 client.
- Live rollout of new/upgrade SQL server depending on dev testing outcomes.
- Live rollout of new/upgrade SCCM 1511 server depending on dev testing outcomes.

Phase six: Testing the live environment.

- Test the live environment against the same tests that the dev environment went through.

Phase seven: Decommissioning the old live environment.

- Decommission any equipment that is no longer required.

Final Phase: Project wrap up.

- A final report on the upgrade and project.
- A panel presentation explaining key decisions, outcomes, and changes over the project.
- The creation of a poster showcasing the work completed.

Changes to scope.

Successfully met, In Progress, ~~Cancelled/Changed~~ - (as of 12/05/16)

Phase one: Requirements gathering and documentation (1 week)

- The gathering of appropriate requirements from technical users and support staff.
- The creation of a formal risk analysis and register document.
- The creation of a formal quality assurance programme.
- Selection of the most appropriate methodology to the upgrade.

Phase two: Research and investigation phase. (3 weeks)

- The investigation and mapping of the current environment.
- Document current SCCM features being utilized.
- Find legacy server dependencies.
- Investigate viability of features not utilized to meet requirements.
- Understanding the upgrade process through white papers and knowledge bases.
- Investigate how domain changes will affect the upgrade.

Phase three: Utilizing an existing dev environment to test an in place upgrade & Greenfield install (1 week)

- Create snapshot of current system
- ~~Connect 3-10 clients to the test environment (11-4-16)~~
- Place 2 clients connected to the test environment.
- ~~To simulate an in place upgrade (11-4-16)~~
 - ~~Use a snapshot of the current Windows 2008 server with an SQL2008 install to test an in place upgrade to SQL 2014.~~
 - ~~Complete an SCCM2012 update on the current Windows 2012r2 virtual server.~~
 - ~~Test compatibility and features~~

- To simulate a fresh install.
 - Create an SQL2014 virtual server.
 - Create an SCCM 1511 virtual server.
 - Create a boot disk.
 - Create an application.
 - Complete a testing plan to provide consistent test results.
 - Add several small-medium sized applications to the virtual distribution points.
 - Test deployments of boot disk and applications.

(12-3-16) the below is not need due to the virtual infrastructure already being mostly available.

Phase three: Developing a “dev” environment in a virtual environment.

- Create a virtual domain controller mimicking our current environment.
- Create 3-4 virtual machines to act as clients.
- To simulate an in place upgrade
 - Create an SQL2008 virtual server.
 - Create an SCCM2012 virtual server.
 - Perform an in place upgrade of the SQL and SCCM servers.
- To simulate a fresh install
 - Create an SQL2014 virtual server
 - Create an SCCM 1511 virtual server

Phase Four: Test the Dev environment as close to live as possible. (3 weeks)

- Complete a testing plan to provide consistent test results.
- Add several small-medium sized applications to the virtual distribution points.
- Test deployments over different connections.

Phase Five: Deployment of the “live” environment.

- Initiate the rollout of 1511 clients to the site, pushed out by the 2012 client.
- Live rollout of new/upgraded SQL server depending on dev testing outcomes.
- Live rollout of new/upgraded SCCM 1511 server depending on dev testing outcomes.

Phase six: Testing the live environment.

- Test the live environment against the same tests that the dev environment was subjected to.

Phase seven: Decommissioning the old live environment.

- Decommission any equipment that is no longer required.

Final Phase: Project wrap up.

- A final report on the upgrade and project
- A panel presentation explaining key decisions, outcomes, and changes over the project.
- The creation of a poster showcasing the work completed.

Time management

Initial time budget.

A project of this size and scope will require a large amount of time invested on research and planning. It is expected that before the server is commissioned, roughly 3 hours per night and a weekend day per week will be needed to research, plan, and prepare for the upgrade. Once the server is commissioned, much more time will need to be invested in larger blocks, particularly in the first weeks. The goal will be to have the time between cut over of servers as limited as possible. To do this, we will break the tasks into smaller phases.

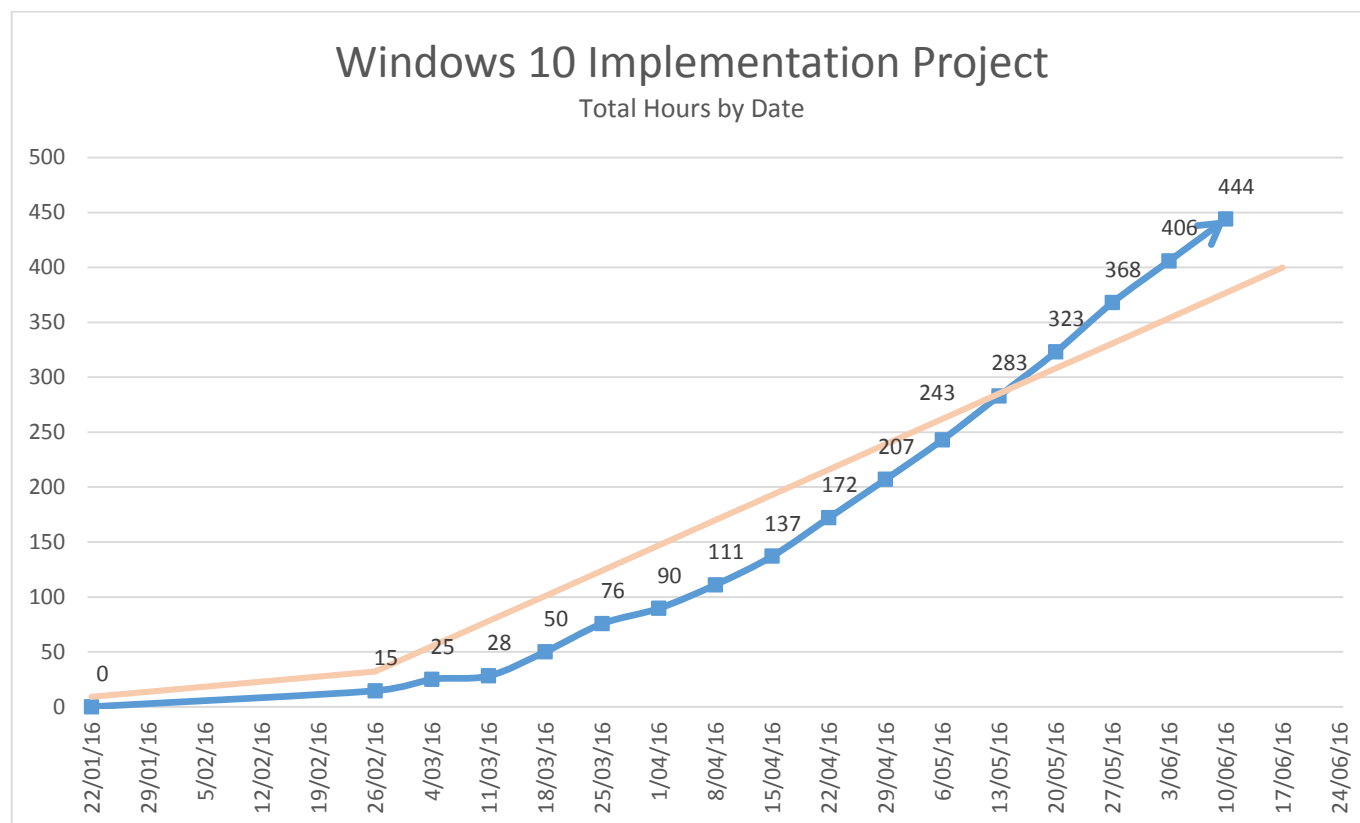
- Requirements gathering and documentation.
- A research and investigation phase.
- Developing a “dev” environment in a virtual environment.
- Test the Dev environment as close to live as possible.
- Roll out the “live” environment.
 - Live rollout of clients
 - Live rollout of SQL server
 - Live rollout of SCCM 1511
- Testing the live environment.
- Decommissioning the old live environment
- Project wrap up.

Initial work breakdown schedule.

11/04/2016

Task Name	Days	Start	Finish	Predecessor
Phase 1 - Requirements gathering and documentation	6	14/03/16	Mon 21/03/16	
Gather appropriate requirements from technical users and support staff.	4	14/03/16	Thu 17/03/16	
The creation of a formal risk analysis and register document.	1	14/03/16	Mon 14/03/16	
The creation of a formal quality assurance programme.	2	18/03/16	Mon 21/03/16	2
Selection of the most appropriate methodology	1	18/03/16	Fri 18/03/16	2
Phase two: Research and investigation phase	7	22/03/16	Tue 5/04/16	1
Read the planning and Migration plan chapters from SCCM book	3	22/03/16	Thu 24/03/16	
Polyview functionality documented.	1	22/03/16	Tue 22/03/16	
Software downloaded from Microsoft.	1	22/03/16	Tue 22/03/16	
Server hardware and software requirements gathered from Microsoft.	1	22/03/16	Tue 22/03/16	
Boundary document created.	2	22/03/16	Thu 24/03/16	10
Server diagram created.	3	23/03/16	Thu 31/03/16	10
Intune feasibility investigated and documented.	3	1/04/16	Tue 5/04/16	12
Phase three: Utilizing an existing dev environment to test an in place upgrade and Greenfield install.	16	6/04/16	Wed 27/04/16	6
Produce a functioning SCCM 1511 server running in green field.	16	6/04/16	Wed 27/04/16	
PXE boot feasibility document created.	2	6/04/16	Thu 7/04/16	
Configure SQL Database	4	6/04/16	Mon 11/04/16	
Update SCCMDB02 OS to 2012R2	2	6/04/16	Thu 7/04/16	
Update DB02 to SQL2014	2	8/04/16	Mon 11/04/16	18
Configure SCCM03	2	12/04/16	Wed 13/04/16	17
liven CCNEWB03 to act as a DP	1	12/04/16	Tue 12/04/16	
configure and clean up boundary and boundary groups	1	12/04/16	Tue 12/04/16	
Create a windows 7 VM with 2012r2 client installed	1	13/04/16	Wed 13/04/16	22
Configure SCCM04	6	14/04/16	Thu 21/04/16	20
Install 1511 on SCCM04	2	14/04/16	Fri 15/04/16	
SCCM04 to be DP01 and setup to talk to File Server	1	18/04/16	Mon 18/04/16	25
Import configuration from SCCM03	1	19/04/16	Tue 19/04/16	26
Build a Win 10 boot image	3	19/04/16	Thu 21/04/16	26
Create driver package of Intel I219	1	19/04/16	Tue 19/04/16	26
Create a small Application and deploy to 2012	1	14/04/16	Thu 14/04/16	
Document Windows 10 WIM build for enterprise.	1	22/04/16	Fri 22/04/16	28
Windows 10 settings configuration for enterprise documented.	3	25/04/16	Wed 27/04/16	31
Testing Dev environment	4	22/04/16	Wed 27/04/16	24
Create a test plan.	4	22/04/16	Wed 27/04/16	
Confirm SCCM 1511 Client on 98% of test machines.	1	22/04/16	Fri 22/04/16	
Test the Computers can successfully image in the test environment.	1	25/04/16	Mon 25/04/16	35
Test several applications can deploy from test environment.	1	26/04/16	Tue 26/04/16	36
The environment successfully meets the criteria of the test plan.	1	27/04/16	Wed 27/04/16	37
Sign off of test plan by third party.	1	27/04/16	Wed 27/04/16	37
Phase Five: Rollout the "live" environment.	9	28/04/16	Tue 10/05/16	33
Migration plan created.	4	28/04/16	Tue 3/05/16	16
SCCM is deployed by the best method found in testing.	5	28/04/16	Wed 4/05/16	
SCCM 1511 Client on 95% of test machines.	4	5/05/16	Tue 10/05/16	42
All current applications successfully deploy to live environment.	1	5/05/16	Thu 5/05/16	42
Test the Computers can successfully image.	1	5/05/16	Thu 5/05/16	42
Phase six: Testing the live environment.	11	6/05/16	Fri 20/05/16	45
The environment successfully meets the criteria of the test plan.	10	6/05/16	Thu 19/05/16	
A Methodology Essay completed.	10	6/05/16	Thu 19/05/16	
Sign off of test plan by third party.	1	20/05/16	Fri 20/05/16	47
Phase seven: Decommissioning the old live environment	4	23/05/16	Thu 26/05/16	
Unused servers that can be decommissioned are.	3	23/05/16	Wed 25/05/16	49
Documentation organized in a logical way conforming to CPIT standards.	1	26/05/16	Thu 26/05/16	51
Final Phase: Project wrap up.	4	26/05/16	Tue 31/05/16	51
Lessons learned documented.	3	26/05/16	Mon 30/05/16	
Poster created.	1	26/05/16	Thu 26/05/16	49
Final report completed.	3	26/05/16	Mon 30/05/16	2
Presentation to stakeholders completed.	2	27/05/16	Mon 30/05/16	55
Files are stored for later use by CPIT staff.	1	31/05/16	Tue 31/05/16	57

How the project tracked.



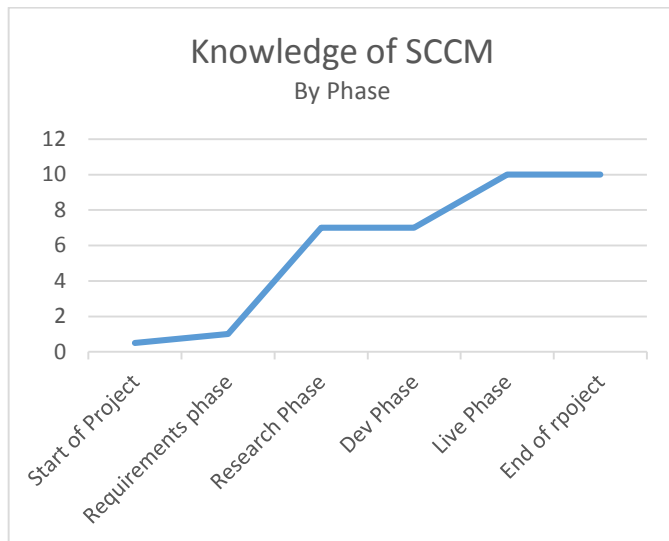
As the above graph shows, during the initial half of the project I was consistently under the baseline in hours logged. However, this graph is not necessarily an accurate reflection on the amount of completed work versus yet to be completed. In this example, the projects first phases took less billable hours but more time to organise meetings, gather materials, get servers provisioned, access/rights to the DTR, reworking documentation, etc. Had I been over the baseline early on it would have made no change to the completion cost or date to the project.

There are several factors that have affected the hours spent on the project and the trends this graph shows. The project started slowly while learning about the systems, gathering requirements and sign off from the ICT department and academic division. This took much longer to get than anticipated even though the initial proposal was the one accepted by the academic and industry signatories. After sign off. At the end of March the project started to gain momentum while research was being carried out and QA, Risk, and reviews were being completed. At the end of the second phase, on the 25/03/16, a fault in the current system, restricting the purchase of new hardware was found and the business requested an increase to the priority of the project. Because of this, some objectives were dropped, timelines shifted, and the amount of allocated hours increased by 40% to an average of 35 hours per week to ensure we met the projects objectives in a timely manner.

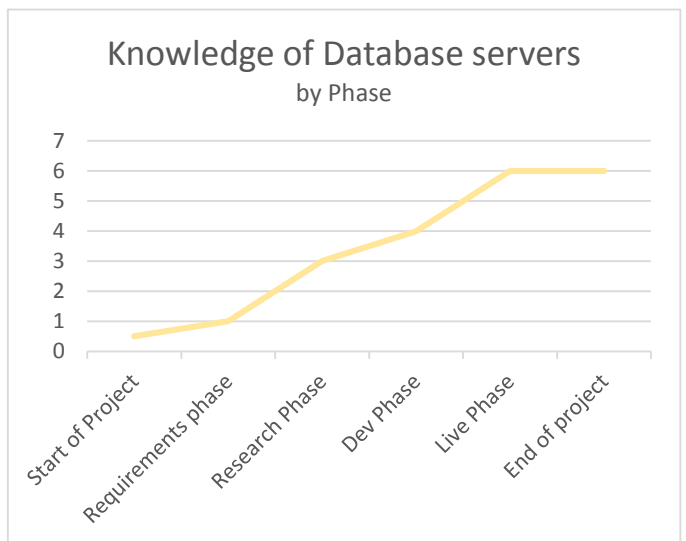
This resulted in the third phase being completed in under 3 weeks, shown by the steep incline over April. Unfortunately, due to an external party provisioning the server, phase 4 was unable to start until the 20/05/16. Once begun the live roll out took about 5-7 working days

From this project I have experienced several substantial changes to the schedule created before the scope was defined. While this has been discussed in several courses I have undertaken, this is the first project that has gone from a key constraint of quality to time. The business decision to accelerate the delivery, of the product, effected the schedule far more than the misunderstanding of milestones and objectives that usually impacts projects. Therefore schedule management was far more critical to this project, and using the skills gained from previous CPIT courses, I was able to adapt and rapidly determine the scope was too large to be delivered in the timeframe requested. I used tools and skills, like Gantt charts and top-down estimation, developed in project management papers, to illustrate this and justify the changes to scope and additional resources. This project has provided valuable insight into the changing nature of live projects and constraint management.

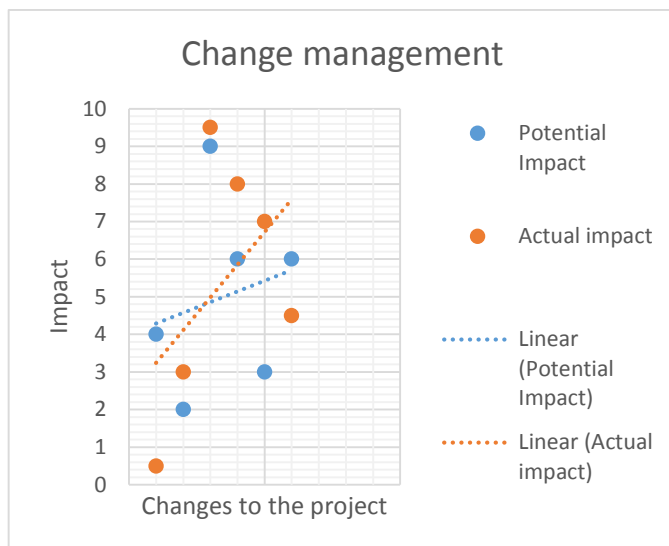
Learning Outcomes



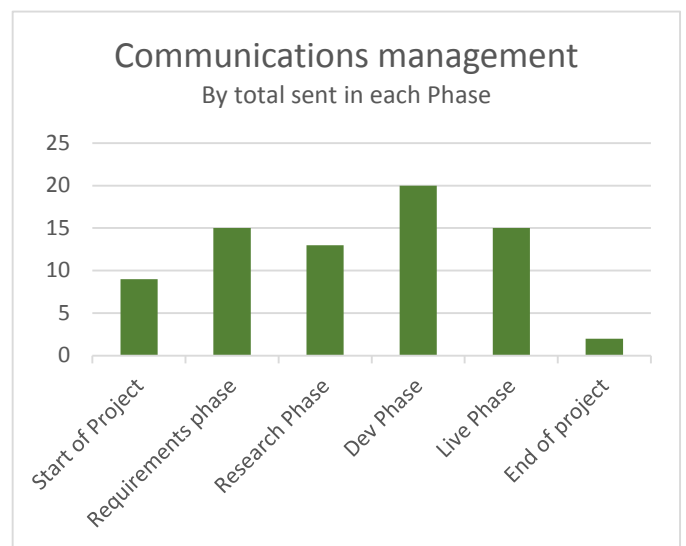
I started the project with a basic understanding of collections and application management and over the project have gained an in-depth understanding of boot images, task sequence, server components, configurations and migrations. This knowledge will help me in both my current job and any job in the future that involves software being deployed across a corporate environment.



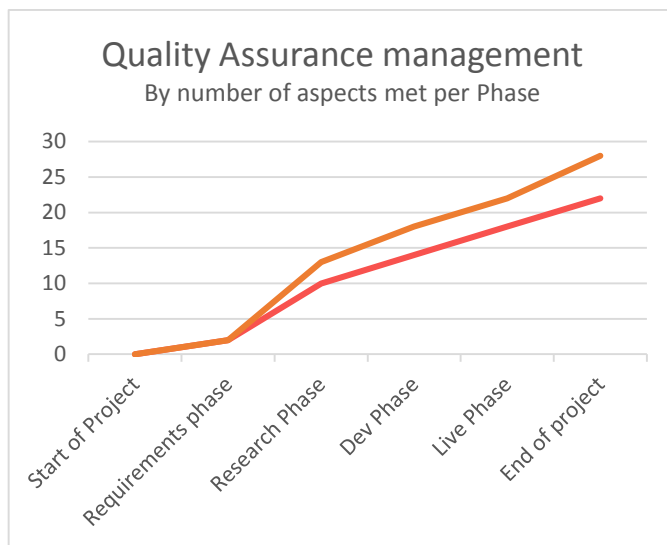
I started this project with an understanding of writing SQL queries but had never experienced using both an SQL client or database server. Throughout this project I have gained an in-depth understanding of installation and configuration SQL2014 as well as changing instance through PowerShell, allocating user rights, and communication protocols between servers.



Over the project I faced many changes of varying impact which are graphed above. Items graphed show My Industry super visor being away for an extended period of time, Sign off being delayed, Changes to scope, Hardware requiring testing, Operating system drivers changing , Pushing Live Phase scaled to Pre-test- ALPHA- BETA - Live



I feel my communications management was quite well implemented and provided a real understanding of my progress (warts and all) however I believe I could have provided more information at the end of the project to non-essential stake holders. I felt this is the lowest area of my learning but did notice a marked improvement over time.



I felt I had a strong understanding of quality assurance prior to starting this project, however, the time spent working in a real project management environment reinforced my understanding that not all quality expectations can be met and that quality aspects created before fully understanding the project can be misleading. Throughout the requirements phase of the project, key stakeholders insisted that quality was the key constraint, only to change to a time critical project halfway through.

The main thing I have learnt about risk management is that it is completed daily on a micro scale even if the documentation is not. The majority of Ara projects I have completed, where risk management is required, have been very academic based giving the false sense that risk management is a one off process, where you document every risk up front, and that you revisit on occasion but barely use. Completing a "real world" project has illustrated that the documentation for risk management is useful in large teams but when ran in teams of one to three somewhat gets in the way. Instead of writing every risk down in the register, I tended to weigh each action I did against a probability * impact matrix in my head. If this had a significant result on the project, I would then add it to the register. This worked very well, particularly in the dev phase, but would not work if the project had been team based.

Expected academic outcome

With the learnings I have gained from the project. The quality of the final product delivered. The numerous changes that the business have required, that were successfully managed throughout. Including risk, communications and quality assurance. To produce a working production environment, I feel an acceptable grade would fit easily into to the A to A+ bracket. All of the course requirements have been surpassed including the learning outcomes stated in the course descriptor exceeding the expectations of the level 7 graduate profile.

I appreciate all of the assistance both my academic and industrial supervisors have provided and am proud of the product that has been delivered, with minimal disruption to the business as usual of Ara.

Communications Management.

Weekly email.

Please see appendix 3 for full PDF of weekly communications.



Fri 20/05/16 9:50 p.m.

Mehdi Asgarkhani

RE: SCCM1511 update - Week 20/05/16

To Michael English; Bruce Blank

Cc Mark Cooper; Raymond Wallace

Subject: RE: SCCM1511 update - Week 20/05/16

Afternoon Team,

This is the eighth progress update to the SCCM1511 update for Ara.

Over the last two weeks I have:

- Updated the risk register
- Documented the boot disk creation process.
- Created and delivered a PowerPoint to the SE301 class on my project
- Tested the WOL features in the DTR environment whilst waiting for the server to be ready. This did not go well.
- Created some documentation on the process I will go through to install the SCCM current branch
- Decided that we will allow configMgr to be kept up-to-date through the MS cloud services to allow us to upgrade to 1602. This reduces our control but allows for feature and critical/security updates to be installed on the primary server with more ease.
- Had a team discussion on expected timeframes and if we are on track. Consensus is even with the delay in the DB server we should still meet our June 1st deadline for our ability to image the new equipment that has already been delivered.

On the 19/05/16 the DB server was passed to me to start the move to production.

During the install process I discovered the collation was incorrect for our install and therefore a rebuild was required. Once the server was back to full functionality, I continued the install successfully getting the migration to take place over the weekend. Due to several permission issues (not having local admin rights, SCCM Action accounts not having rights to the DB, Sql management accounts not having rights to the SCCM server) I finally achieved production install 20/05/16 at 15:35

I began the migration process by recording our 2012 environment over the weekend with the intention to end the capture Monday afternoon.

The plan for the next two weeks.

Monday – Wednesday:	Work with Bruce to Ensure settings and configuration Items have successfully migrated. Create a boot disk and test imaging. Update SCCM 1511 to 1602.
Wednesday – Friday:	Create a new client package and push out to T105/6 (pre-test). Test application deployment. Test package deployment. Test updates.
Monday – Tuesday	Create a boot disk with drivers for the new hardware. Depending on previous week testing results push to T block (Alpha).
Wednesday – Thursday Thursday – Onwards	Again depending on testing image some of the new hardware for driver testing hitting our June 1 st deadline. Test, test, decommission, test, documentation, breath.

Some of the QA challenges/potential risks

- Unused inventory out the back is a cost to the business.
- Not getting the information regarding instance collation to the IS team was a failure in my QA management.
 - To resolve this I have created better documentation provided by my installation notes. This will resolve this happening in future and illuminate changes to the DTR environment needed in production.
- Getting the server but not having rights to work with it was a security decision made at the time.
 - Under normal circumstances a staff member in the SC team would not have these rights to the DB server an exception has been made for a small duration during the project.
- A very rushed production phase is a risk as there will be a significant reduction in testing. Usually an upgrade like this can be rolled out over months. This will happen in days.

Things I must keep on the agenda but have a lower priority

- Creation of a poster for the 9th of June
- Touching up the report to more align with academic context
- A methodology essay (at least a summary for report)

As always, Thank you all for your support and confidence throughout this project & if you have any feedback or suggestions please let me know.

Regards,



Michael English
System Administrator – Desktop Environment
+64 3 940 8769
City Campus, Madras St
PO Box 450, Christchurch
New Zealand
ara.ac.nz

Level 200 & 300 courses.

- BCSE206 - Professional practice. This course provided basic expectations of standards in the workplace and working within a team. It covered methods of operations and sustainability focusing on compliance with legislation, licensing and professional bodies. The learnings from this course were applied throughout all interactions and communications within the team. I would recommend the content of this course focuses on team based interactions and culture building activities.
- DICT540 - Introduction to scripting. The SCCM environment relies on PowerShell, bat, bash, and SQL Scripting for a large portion of application support, deployment and monitoring. PowerShell was used to structure the directories of the new environment, where SQL was used for communication between the site database and active directory. This course has been invaluable to this project and I would recommend it spends more time using PowerShell to teach communicate with more systems (AD) and remote sessions.
- DICT610 - Software installation and testing. This course provided a foundation to designing and implementing challenging, multi-faceted systems. This was quiet beneficial to the project as there was not only 6 Distribution points, but a database server, file server, management point, reporting service, and many fall back points. The fundamentals in this course gave a strong ground work but unfortunately had a low expectation of students. This led to students finding the quickest, dirtiest way to implement and not cover configuration and integration with existing systems one of the key struggles with this project.
- BCIS202 - System design and implementation & BCIS201 - Alternative modelling were important for selecting a methodology. These course taught the fundamental elements of project management planning & methodologies available. It introduced methods of Project management, QA, Testing strategies, and implementation plans at a very low level. All aspects were used in this project making it of some value to students but as the concepts of this course are built upon by multiple other courses (specifically in the IS stream) It could be quiet easily merged together and taught at a faster pace.
- AMPA and BCIS390 - Business analysis. These level two and three courses were of fantastic value throughout the project. Initially, the business was clear on their key requirements for this project, their quality expectations, and the cost/risks they were willing to manage. Over time these changed and managing these requirements and expectations was handled through the sills I learnt in these courses. Unfortunately, a large amount of the courses shared very similar content and one level 3 course would be for more beneficial for students to take.

- **AMPM600 - Project management.** This business elective was very well rounded. I carried this out in a busy time in my life as a new father, in a just purchased house, whilst working full time and studying 2 papers. This gave me perspective on requirements that had to be met versus would like to be met and where my work was required or where delegation and resource manipulation could provide a better result for the project. The course was taught very much to the recommended text and after reading the text book, the time in class would be perhaps better managed by providing an outlet for students to discuss the finding and recommendations as opposed to teaching the content of the book.
- **BCIS301 - Management of ICT.** This course was an in-depth analysis into developing and scoping a business plan and risk analysis. This course was quiet beneficial to this project as a well-defined business plan and monitored “real” risk management plan were critical to the success of the project. This course is a big jump for most students to remove their student hat and put on an employee hat but is incredibly valuable. Instead of recommending changes to this course, I would suggest that other courses are brought in line to be in a comparative methodology reducing the shock to students from such a quick transition.

Quality assurance

Quality assurance review.

Over the duration of the project there were several changes to the Quality Assurance program. Firstly, and most importantly, the testing phases merged with live phases as the scope of testing required dropped and the complexity of installation increased. Quality assurance documentation was reviewed at the end of each phase and when changes were made. Fortunately, the changes to scope were generally time focused (at a cost to quality and testing) and therefore the quality expectations actually became less stringent throughout. With that, the majority of key quality metrics, of the initial quality management document, were met by the completion of the project (illustrated below in green). This project taught me that changes are to be expected from a project and that, providing they are managed, are to be embraced and can even be beneficial to aspects of the project. The quality assurance programme helped me maintain a grasp on what was expected from each phase and help shape some key decisions throughout the project (deciding which sites required a distribution point and what our boundaries should look like). More detail can be read in appendix 4.

Quality Assurance statement

The primary factors of Quality assurance that must be monitored and managed are:

- The risk management being based off a strong assessment to ensure none of the improvements break the current environment or pose a future risk to business operations.
- How does the upgrade impact our ability for self-evaluation & continuous improvement through better services and self-assessment?
- Compliance with Microsoft upgrade path and SaaS goals to ensure future support.
- The downtime of the live environment while roll out is occurring,
 - Downtime of more than 4 work days will result in a rollback option to analyse and fix issues.
- The servers are commissioned to the same consistency of every other 2012R2 server on site.
- The integrity of the existing SQL server is maintained
 - Managed by maintaining multiple backups over the “Live” phase

The primary means of quality control will be Failure testing of the dev and live environments and risk mitigation plans.

Key Quality Metrics

(Were met, ~~Changed or cancelled~~, in progress.)

Phase one: Requirements gathering and documentation

- Requirements document will be created in conjunction with key stakeholders.
- The requirements document will be signed off by key stakeholders of the project.

Phase two: Research and investigation phase.

- Time allocated to read the Planning and Migration plan chapters from SCCM book.
- Server hardware and software requirements saved to one drive in separate document.
- Industry sponsor and infrastructure to assist with boundary investigation.
- ~~Server diagram created in accordance with similar documentation already kept by Ara.~~
- Migration plan based off internet research.
- Software downloaded from Microsoft verified to be error free.
- Intune feasibility developed with assistance from industry sponsor and third party.
- Polyview functionality documented with assistance of Polyview creator.
- Industry supervisor to co-build Windows 10 WIM which will be documented throughout.
- ~~Windows 10 settings configuration for enterprise documented during build process.~~
- A Methodology Essay completed.
- The quality Assurance document will be signed off by industry supervisor and academic supervisor.

Phase three: Utilizing an existing dev environment to test an in place upgrade and Greenfield install

- SCCM 1511 server can utilize snapshots to provide dynamic scenarios when errors/misconfigurations are injected for the in place and green field upgrade.
- ~~Analysis documentation will be a gap analysis and basic SWOT analysis.~~
- Ensuring SCCM 1511 Client deploys on 100% of test machines is meeting the quality requirements.
- Applications of varying size successfully deploy from test environment.
- Computers successfully images from test environment.

Phase Four: Test the Dev environment as close to live as possible.

- ~~The test plan created is based off research and SCCM 2012 book.~~
- ~~Test plan created and tested in conjunction with third party (Leonie Harris).~~

Phase Five: Deployment to the “live” environment.

- SCCM is deployed by the best method found in testing.
- SCCM 1511 Client being packaged and deployed with existing SCCM 2012 infrastructure.
- Monitor the deployments of existing applications and packages once deployment has been completed.
- Successfully complete multiple re-images in live environment.

Phase six: Testing the live environment.

- ~~The environment successfully meets the criteria of the test plan.~~
- ~~Testing carried out in conjunction with previous third party based of plan created & tested in phase four~~

Phase seven: Decommissioning the old live environment

- Documentation is organized in a detailed and logical way conforming to Ara standards.

Final Phase: Project wrap up.

- Lessons learned document created for future upgrades.
- Poster created with assistance of graphic designer.
- Final report completed conforms to marking schedule.
- Presentation to stakeholders completed with confidence and conforms to marking schedule.
- Files are stored for later use by Ara staff.

Measuring Quality Assurance

Quality assurance measurement will start with the evaluation of the current performance levels and client compliance from the production 2012 environment. This will require identifying and documenting key performance indicators in the requirements phase of the project. This will be ran simultaneously with the investigation into new features and fixes provided by the 1511 deployment, followed by a gap analysis into what metrics can be compared suitably. The measurement of quality is linked with the quality definitions in this report and each metric must be measurable or at least confirmable passed or failed. The defining, monitoring, and management of these metrics is vital to the success of this project ensuring the end product meets the business needs.

Risk Management

Over the duration of the project there were several changes to the Risk management program. Firstly, the initial risk analysis was created at a very high level without a full understanding of exactly what the project required. This top heavy analysis involved things like “industry supervisor being away” and “Not understanding the product enough.” While these risks did actually eventuate, their impact was obviously very low. Overtime, these risk analysis sessions brought more relevant potential risks (like the deployment of a product that automatically updates and how to manage this) and allowed a medium to communicate my concerns with the business and discuss options. The change to scope also had an effect on the risks discussed in the risk analysis but none on the management programme used. At the beginning of each phase another analysis was completed and weekly (fortnightly when no change) the highest priority risk on the register had a mitigation plan created/inspected to help maintain a handle on the project. This had a positive relationship to the quality assurance program as it allowed adjustment to the QA where the risk warranted it. This project taught me that before starting a project, it is incredibly hard to understand the complexity and scope to the risks faced and unless you have experience with the product/environment risk analysis should be done by people with experience and technical understanding of the scope these changes will make. More detail can be read in appendix 5.

Initial high level risks analysis.

A formal risk analysis will be created as part of the project management plan. At a high level investigation, the primary risk is the confusion and added workload of the rebrand and domain change. There is also the risk of running out of budget to keep the servers functioning if the migration does not go smoothly. As with all projects, there is the risk of people leaving during/unable to complete the project due to sickness, promotion, or more likely (in this circumstance) other priority work being assigned to staff. Historically there have been issues between “features” Microsoft have included and our environment. We will be using historic documentation and experience to mitigate the negative impact of these to the project.

<div> <div>Risk Register</div> <div>Windows 10 Implementation Project</div> <div>Michael English</div> </div>						
14/03/2016					Version	1.0
Risk ID	Description	Date Added	Expected Phase	Probability (%)	Impact 1-100	Risk P*I
1.0	Faults in product that affect CPIT-Aoraki systems	11-Mar	3,4,5	0.7	50	35
2.0	Microsoft updating systems during implementation	11-Mar	4,5	0.8	35	28
3.0	Lack of technical knowledge to complete the project	11-Mar	3,4,5	0.35	75	26.25
4.0	Unintentional change to live system	11-Mar	5	0.6	43	25.8
5.0	Industry supervisor unavailable	11-Mar	All	0.8	25	20
6.0	Features required do not work in CPIT-Aoraki systems	11-Mar	4,5	0.4	35	14
7.0	Project goes over time	11-Mar	5,6	0.25	55	13.75
8.0	Resources redistributed due to domain change	11-Mar	All	0.15	80	12
9.0	Data corruption during migration	11-Mar	5	0.35	20	7
10.0	Unexpected project changes from the company merger	11-Mar	All	0.33	20	6.6

Risk mitigation strategies.

<div> <div>Michael English</div> <div>Risk Management Plan</div> </div>		Last updated: 27/05/16
Risk Management Plan for 10.2 "Unexpected project changes from the company merger"		
Why?	Support centre staff discovered a security feature that has not affected Ara up till now due to the way they have used the task sequence to deploy drivers. This feature introduced by Microsoft, changed the process of encrypting drivers. We are now facing an inability to load the latest network drivers to the win meaning new hardware purchased cannot be imaged. Because of this, an escalation of the priority of this project has been requested by the business to ensure supportability of future hardware and to allow procurement staff to continue their work with the June "ripple."	
How?	The business has requested the acceleration of the projects deliverable	
What?	<p>We have to proposed two options for the business to select:</p> <p>Use the patches provided by Microsoft to allow our old infrastructure to support the driver encryption. This carries some risk as it states this product is not to be used in production environments, and we will no longer be provided premier support for this product.</p> <p>Utilize more resources to rapidly produce a functioning prototype (with less functionality) focusing on the imaging process and deployment of the drivers. Rushing the time scale will reduce feature investigation, implementation and testing though we will still be able to meet the 3 key outcomes.</p> <p>There is a marginal risk to the business if I inject errors to the system through the lack of vigorous testing. This is mitigated by the concurrent running of the 2012 environment resulting in no downtime but potential of having additional servers provisioned while I work on a resolution. We'll upgrade the impact on this risk to a higher level if any of the following conditions become true:</p>	
Who?	<p>The Project lead is responsible for accelerating the time frame.</p> <p>The industry supervisor is responsible for helping ensure the project can still meet the objectives.</p> <p>The academic supervisor is responsible for ensuring the project stays within academic bondries.</p>	
When?	This Risk will be with us throughout the entire project.	
How much?	Providing I manage this correctly, there will be little additional cost to the project but the risk is large.	

<div> <div>Michael English</div> <div>Risk Management Plan</div> </div>		Last updated: 27/05/16
Risk Management Plan for 7.1 "Project goes over time"		
Why?	Current analysis shows I am behind schedule. The schedule was unclear but is becoming more fleshed out as the scope has been defined more clearly.	
How?	I have and will need to invest more time resources on aspects that are behind the date line at this point. I must monitor my position and how long I am spending on tasks to ensure I do not go too far under or over time.	
What?	<p>We are addressing the risk in three specific ways:</p> <ol style="list-style-type: none"> I will continue a nightly 30-60 minutes of reading forums, documentation, and a mastering SCCM book. I will prioritise the items that should have been done over the last two weeks. I will phisically get sign off of documents holding up the project. <p>We'll upgrade the impact on this risk to a higher level if any of the following conditions become true:</p> <ul style="list-style-type: none"> The project has yet to get sign off of requirments, QA, and proposal by the 1st of April The project maintains a trend behind schedule for two consecutive weeks. 	
Who?	<p>The Project lead is responsible for maintaining their own time management.</p> <p>The industry supervisor is responsible for signing the documents and feedback.</p> <p>The academic supervisor is responsible for the same as above.</p>	
When?	This Risk will be with us throughout the entire project.	
How much?	Providing I manage this correctly, there will be little additional cost to the project.	

Final risk register.

<div> <div>Risk Register</div> <div>Windows 10 Implementation Project</div> <div>Michael English</div> </div>						
Risk ID	Description	Date Edited	Expected Phase	Probability (%)	Impact 1-100	Risk P*I
2.0	Microsoft updating systems during implementation	11-Mar	4,5	0.8	35	28
4.0	Unintentional change to live system	11-Mar	5	0.6	43	25.8
10.1	Unexpected project changes from the company merger	9-May	All	0.2	60	12
1.1	Faults in product that affect Ara systems	9-May	3,4,5	0.2	50	10
7.1	Project goes over time	11-Mar	All	0.2	40	8
6.1	Features required do not work in Ara systems	9-May	4,5	0.2	35	7
9.0	Data corruption during migration	11-Mar	5	0.35	20	7
5.1	Industry supervisor unavailable	11-Mar	All	0.2	15	3
3.2	Lack of technical knowledge to complete the project	9-May	3,4,5	0.1	3	0.3

Methodologies

The methodology I chose was a mix of project management body of knowledge (PMBOK) and waterfall. The PMBOK is a framework designed to standardise terminology and processes in the project management industry. There are five phases to the PMBOK project management life cycle including Initiate, Plan, Executing, controlling, closing. Waterfall model is a sequential design process in which progress is depicted in a downward flow. This also consists of a similar life cycle with requirements gathering, design, implementation, verification, maintenance. These methodologies have been taught over many courses throughout the business and computing departments at Ara to provide students a comprehension of international standards and best practices. They are applicable with Software development and project management through to network design and process mapping.

I choose a hybrid of these methodologies as it fitted the nature of this project closely and both are well defined. As with most theoretical frameworks and best practices, there is always something lost (and found) in the application into real world events. As Ara teaches both of these methodologies comprehensively, it was expected that the ICT department would use something similar as there is no obvious stand-up meetings of an agile embraced company. This however was inaccurate as the ICT department chooses to focus more on an ITIL process putting clear focus on disruption to service over the heavy documentation of the classical waterfall/PMBOK structures. Within the department there are varying levels of documentation expected and seldom in projects are requirements documented, agreed to, or have an owner. Particularly when interacting with projects outside of the department, a void for feedback is created making it hard to discern if the implementation provided meets the user's requirements and expectations or what the value to the business has been.

I followed the methodology quite closely which can be seen by the project being broken down into 6 phases which over time changed to include the verification inside the executing phase. My Quality assurance management plan and risk management plan were kept up to date when relevant changes occurred and sign off of the initial documents was acquired from all parties before the phase continued. Throughout the project, with the help of Gantt charts and scheduling, a clear procedure for moving forward throughout the phases was documented and mostly adhered to. While time management often fall behind the baseline, and changes to the schedule were numerous, an increase to the amount of time resources I allocated to this project made delivery well before schedule. Closing the project will only be possible after we are in agreement that the number of devices without the latest client is acceptable. Therefore I have documented the expected process and available resources to release for the decommission. This report will be kept available for use as the lessons learned and the project will have one final wrap up communication sent to all stakeholders.

I believe that whilst the project may not have been as efficient as I would have liked, the methodology I used was very effective. An agile environment would not work with a team the size of mine, nor would it be in line with the culture or nature of the project. The project delivered on time and while over budget this was due to a limitation of Microsoft's services not due to the methodology. The product meets all the QA metrics provided by stakeholders and the risks that did eventuate were managed through the plan devised at in the initial phases. Lastly, there is the opportunity with the hybrid approach to close the project in such a way that feedback can be gathered from stakeholders to improve the new rapid prototyping model SCCM has moved to.

Appendixes

1. Requirements document
2. Intune analysis
3. Polyview analysis
4. WBS and Gantt chart
5. Weekly communications
6. QA
7. Risk
8. Methodology essay