

MANAGING A HARDWARE/SOFTWARE PROJECT FOR DISASTER RECOVERY

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Abstract—a project initiation document was initially written for a backup wireless network system for a hospital in Ebne-Sina because of its location next to an earthquake zone. The design was to wirelessly reconnect a disconnected ward to the server so that the hospital could stay up and running during this disaster. So, for that final part of the project planning, this report will discuss areas such as risk management, Code of Practice on sustainability and ethical and legal issues and quality assurance.

INTRODUCTION

Third sector organizations are generally value-driven. This project is motivated by the desire to achieve social goals, in this case improving public hospitals network infrastructures in a case of a disaster.

Throughout this report we will be discussing the risk management for the Third Sector Project, including a risk evaluation matrix.

Sustainability issues for the Third Sector Project including analysis of the first, second and third order sustainability issues. Ethical and Legal issues for the Third Sector Project including application of the British Computer Society Code of Conduct and the IEEE Code of Conduct.

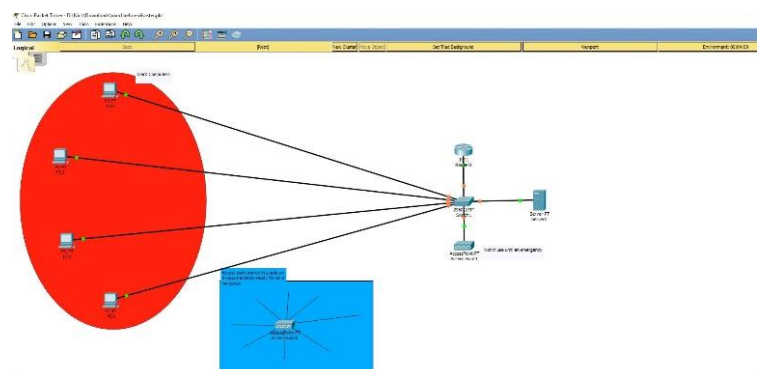
Predictions will also be giving on the possible legal and ethical outcomes for UK Third Sector organizations as a result of Brexit.

At the end of this report quality assurance issues for the Third Sector Project like customer satisfaction, ratings, quality of service and quality control will be discussed with explanation.

PROJECT INITIATION DOCUMENT

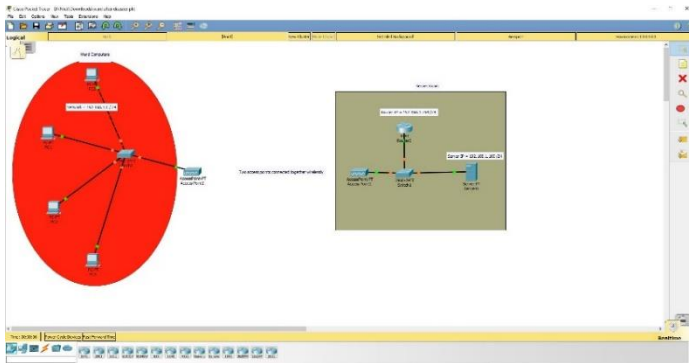
The project initiation document shows a standard wired network infrastructure, where the wards would have all the computers linked up to the server using cables. Before creating and demonstrating the disaster recovery project, the group demonstrated what the network infrastructure was like before the disaster. *Figure 1* shows computers in a ward connected to the server using cables. The big blue box is as seen in *Figure 1* is the disaster recovery box (stored safely ready for an emergency).

Figure 1



The disaster scenario is an earthquake erupts and have the damage effects on the computers in the hospital. The cables and switch are damaged, so they need to be quickly replaced by the pre-set kit which was designed. The access points would be taken out of the secured box by the doctors or nurses (will be fully trained on how to setup the recovery network) and then connect all the computers in the ward to the access points, which would link them all to the server by Wi-Fi instead of wired cables. You can see the design in *Figure 2*.

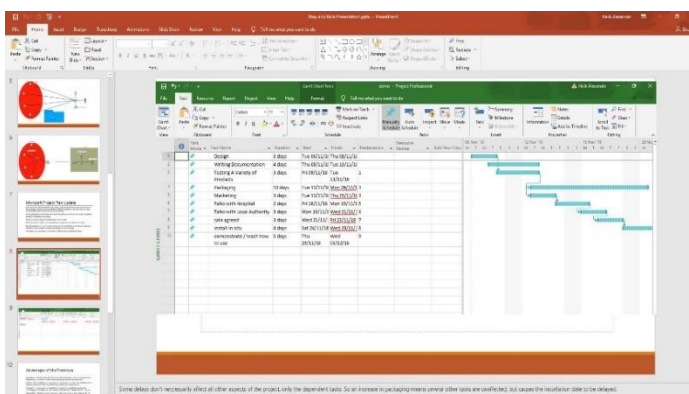
Figure 2



DEMONSTRATION

Time management was a big part of the project planning, including showing which stages of the process would affect other aspects. Microsoft Project was the software used to create the plan. During the demonstration the team provided an example of how a delay in one of the tasks affects other tasks and delays them also. This would later delay the final date promised to the customer. Figure 3 below shows the updated time plan for the project created in Microsoft Project but demonstrated in PowerPoint during demonstration.

Figure 3



IMPLEMENTATION

The Plan

To start off, the project needs a plan for the technical design of the backup wireless network. This plan will consist of teaching, demonstrating and giving every staff different role to complete every aspect of the project and making sure it's completed on time.

The team created a staff plan with different roles, ready to input the wireless network in case of a disaster. The technical staff were designing, building, installing the equipment and in charge of training the hospital staff. The admin staff's roles are to keep record of hours worked by staff and answering calls. Financial staff are buying the equipment and paying salaries, and lastly the manager was overseeing the work. He will be making sure the targets are met, employing staff & ensuring everyone knows their role, negotiating with hospital managers and making sure no one breaks the rules/law.

The Structure

The manager and technical staff are to meet nearly every day to make sure everyone's working hard, sharing ideas and work together on the design. Whilst the financial staff and admin staff can stay at home to work and communicate over the phone, email or Skype calls.

The Design

The team have designed the project in a software called 'Packet Tracer' as seen in *Figure 1* and *Figure 2*. The design works perfectly and will live up to its expectations. Using this design, it will have to be created by purchasing the correct products, the same as used in Packet Tracer so that the testing and quality control are up to scratch.

RISK MANAGEMENT

Risk management is very important when it comes to project planning. The project is set to run smoothly but there are many paths the project can fall onto and put the plan at risk. In order to identify the possible risks towards the project, the team gathered a table showing all the possible risks towards the project and the method to avoiding any of these happening. Refer to *Figure 4*.

Figure 4

Risk label	Risk	Solution to Mitigate the Risk
a	Unable to acquire the required parts	Source parts from several suppliers & start order early. Use standard 'off the shelf' equipment. Regular quality controls. Incremental development.
b	Product not finished on time	Employ people with previous experience in setting this up. Setup a work rota that ensures enough time has been devoted to it's creation. No 'gold plating'.
c	Not finished within the quoted budget	All parts priced up accurately before quoting, some contingency added to the quote incase of unforeseen costs. Regular cost analysis to check expenditure vs financial forecast.
d	Not being able to create an adequate wifi solution	Several 'backup' solutions kept in mind just incase the original idea doesn't work perfectly; such as a mesh wifi network. Prototyping. Training to hospital staff. Simulation already created.
e	Hospital managers not agreeing to pay the cost	Proper contract drawn up and agreed to before the solution installed (and signed). Less likely if the solution is kept within the original quote.

Figure 5 – Probability impact matrix of the risks identified in Figure 4

		Consequences				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain					
	Likely			c		
	Possible			b	e	
	Unlikely					a, d
	Rare					

This matrix was used when risks were identified to understand the 'tolerance line'[3] as shown above in Figure 5. Even though tasks 'C' and 'B' are in the moderate section on the matrix, they are easily manageable and avoiding the obstacles early will help for the future.

Referring to Figure 4, task 'a' is not really a threat of a risk. As shown in the matrix in Figure 4 it is very unlikely this would happen. Although say if it was to happen it would be catastrophic and the project will not be able to go on any further.

Task 'b' is a moderate risk and is possible to happen. Time frames will be moved, and tasks will be held up but considering this project is for an earthquake disaster (unlikely event to happen any time soon) the consequence of being late is imperceptible.

Task 'c' is the most likely to happen out of all the tasks because usually wireless networks are pricey. But in this case, there are not too many employees involved and only a dozen components needed so the project shouldn't go over budget. If it was to happen it could affect task 'e'.

Task 'd' is also unlikely to happen, it would be catastrophic if it was to happen and would affect task 'b', but there are many solutions to Wi-Fi disruptions.

Task 'e' is a major consequence and is quite possible to happen, especially in Ebne-Sina due to less salary. Doctors and nurses may not feel the need to pay the extra cost to install a backup wireless network system because they think the wired one is just fine. This would mean the project might not go ahead if an agreement can't be reached, this indicates the need to be on time and stay within budget.

Finance

The risk towards finance of the project is minimum. This project is a straight forward setup, install the network, demonstrate how to use, store away safely ready for use when the time comes. Therefore, no extra money should be involved. The technical design is possibly the main risk of taking longer than planned, there is no use for new employees to complete any of the tasks because there is so hard-coding, and everything can be taught/demonstrated within a few days. If the project was to go over the original budget, it should not go over 10% of it.

CODE OF PRACTICE - SUSTAINABILITY

Sustainability table (1st order, 2nd order, 3rd order)

Figure 6

1st Order	Electronic waste from equipment bought for project; equipment used for running project such as computers and mobiles. Travel to office, and to foreign hospital (car & plane fuel). Metal used in the case. Many indirect effects such as car wear and tear, tyre usage, pollution from cars and planes. Minerals mined for printed circuit boards.
2nd Order	Admin and finance staff don't need to travel - skype + email is adequate. IT staff don't need to travel to the hospital in the event of an emergency. Jobs created for the project, also help to sustain the manufacturers and suppliers of the equipment. Tax paid in paye, as well as on the purchases (and eventually the sale), as well as on fuel, taxis etc.
3rd Order	Potentially saving lives during an emergency, because medical staff will be able to be dealing with patients rather than trying to reconnect the computers systems to book in patients. If successful could be repeated in hospitals around the world. Low carbon foot print solution compared to many alternatives - doesn't need replacing, isn't wearing out when there is no emergency. Device is low power consumption

The 1st order of sustainability shows the effect the project has on the environment through electronic waste, wear and tear, minerals mined for printed circuit boards. All these effects take place before and after the project.

The 2nd order of sustainability shows how the project will benefit the environment and the community. It creates more learning opportunities, taxes payed in paye, admin and finance staff do not have to travel, and IT staff don't have to travel to the hospital in the event of an emergency.

The 3rd order of sustainability looks towards the future, including the good things that will happen because of this project and some bad things. For example, potentially saving lives and expanding throughout other hospitals. But this project will also leave behind some electronic waste and use a lot of electricity and fuel.[2]

Refrain from retaliation – IEEE code of conduct states that ‘We will not retaliate against any IEEE member, employee or other person who reports an act of misconduct, or who reports any violation of the IEEE Code of Ethics or this Code of Conduct’.[2] This statement from the IEEE code of conduct was not included in *Figure 6*.

This code of practice was developed to guide employees to work effectively but also work within the behavior limits, knowing what's acceptable and what's not. For example, treating people fairly in the work shop or strictly tolerant with being respectful to everyone. Also, laws are changing every so often, so these codes of practice keep everyone up to date with computer laws. For example, data breaches or data protection. All this information is documented in the IEEE code of conduct.[2]

CODE OF PRACTICE – ETHICAL AND LEGAL

When it comes to Brexit, hardly anyone thinks about how it will affect IT and its investment. Brexit and international trade disputes are unlikely to have an impact on IT financially.[4] Brexit and those who deal with data protection daily in the UK and EU, nothing would change immediately, but a no-deal Brexit would dramatically change how organisations manage data with their EU partners and counterparts.[5] No deal Brexit is creating uncertainty for tech businesses and could cause serious issues with readiness and data. The no deal Brexit planning notice warns that the legal framework for transferring personal data from organisations in the EU to organisations in the UK would have to change when the country leaves the EU.[6]

Brexit will stop people transferring personal data from the UK to the EU altogether. An online blog by

Elizabeth Denham states a fact that in a no-deal Brexit situation the UK government has already made it clear its intention to enable data to flow from the UK to EEA countries without any additional measures. But transfers of personal data from the EEA to the UK will be affected.[7]

The UK faces the prospect of being regarded as a third country when it exits the EU. As a result, the transfer of personal data from organisations within the EU to other organisations in the UK will be subject to strict data transfer rules, as set out by the EU General Data Protection Regulation (GDPR).[8]

It's clear to see that the impact of Brexit mainly causes problems for data protection within organisations, as well as personal data use.

QUALITY ASSURANCE

This project set out goals at the beginning to satisfy the customer with all means necessary. That included keeping within budget, staying focused always, negotiating with the hospital manager and hospital every day making sure everything is running smoothly. Creating and testing the project so that the customer was 100% satisfied with its outcome.

Productivity, such as resources was kept to a minimum during design, implementation and manufacture. Also, the safety of the project was always kept as the priority, and that went out to all employees and customers. Making sure the electrical products are in good condition before use to reduce risk. Finally, satisfaction – safety and satisfaction were the main two priorities during setting up this project. Satisfying the customer means good feedback, hope for more work and bigger future for the project. Although this was a ‘backup recovery system’ which will only be used in a disaster, the feedback received from the hospital staff and hospital manager when demonstrating how to use the wireless network was overwhelming.

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