

IT-400 Final Project
Laboratory Hardware / Software Upgrade
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SUMMARY OF LABORATORY H/S UPGRADE

AmeriPath's laboratory, the Center for Advanced Diagnostics, is one of the largest laboratories in the corporate structure. The facility acts as a clinical pathology hub to the rest of the laboratories across the entire south east of the United States. Many of the other AmeriPath sites rely heavily on this laboratory complex to complete some of the more specific and advanced diagnostic procedures that are not readily available elsewhere. This lab was purchased in a buyout of the Derrick & Associates Pathology Corporation, but much of the existing managerial staff is still employed there. While much of the equipment at this laboratory is state of the art, most of the day to day operations conducted are performed on significantly substandard hardware and software. At present the entire laboratory functions on an old AS/400 series of machines. This workstation array requires the use of three old AS/400 servers, and a host of about 50-60 WYSE and Digital dumb terminals. None of this equipment has been produced for two decades and the circulation and availability of these machines are becoming limited at best. The primary reason why this hardware is still employed is because of the requirements of the lab's primary accessioning / reporting software. Originally put into service in the late 70s, this software was written in a language known as MUMPS. MUMPS stands for Massachusetts Utility Multi-Programming System. This particular language uses what is known as an "interpreted environment", meaning that the operating environment is itself the programming environment (similar to the BASIC language). Because of this, the software is hardware dependant.

Business Process: Pathologic specimen scenario, the following steps take place:

1. The Primary Care Physician (to be known as PCP) takes the biopsy or fine needle aspirate (to be known as FNA) from the patient. The PCP puts the sample into one of several AmeriPath approved specimen containers. The PCP fills out an electronic form provided by AmeriPath, and places everything in a specific tamper-proof container to be picked up by the courier.

2. The courier comes by at the allotted time frame, and retrieves the specimen container. The courier then delivers the specimen package to the receiving area of the laboratory.
3. The receiving area of the laboratory is staffed by medical coders who are assigned to the “accessioning group.” Upon receipt of the specimen package, the specimen / incident is given an “accession number”. The accession number is auto-generated by the system and remains tied to this lab request. All of the items in the specimen package are accounted for and recorded into the lab system through a dumb terminal.
4. The specimen is then delivered to the laboratory technicians (to be referred to as “lab techs”) in the “grossing” department. The specimen is examined under a low-powered microscope and given a basic “gross description”. The gross description consists of basic size and color descriptions of the specimen. This information is recorded into the existing laboratory software with a dumb terminal.
5. The specimen is then transferred to a new department where the specimen undergoes what is referred to as the “microscopic description”. The microscopic description consists of specific specimen measurements. This information is recorded into the existing laboratory system through a dumb terminal. It’s worth noting that this station requires two computers per lab tech. One machine is a dumb terminal used to access the laboratory software while the other operates the microscopic measurement software.
6. The specimen then heads to the processing department. Depending upon whether or not the specimen is dermatological, or cytology or histology, the specimen will be processed differently. Generally speaking, the specimen will undergo its preparation for viewing by the pathologist. This would typically include encasing the specimen in a wax cartridge where it then gets shaved into 10-15 or 20 slides

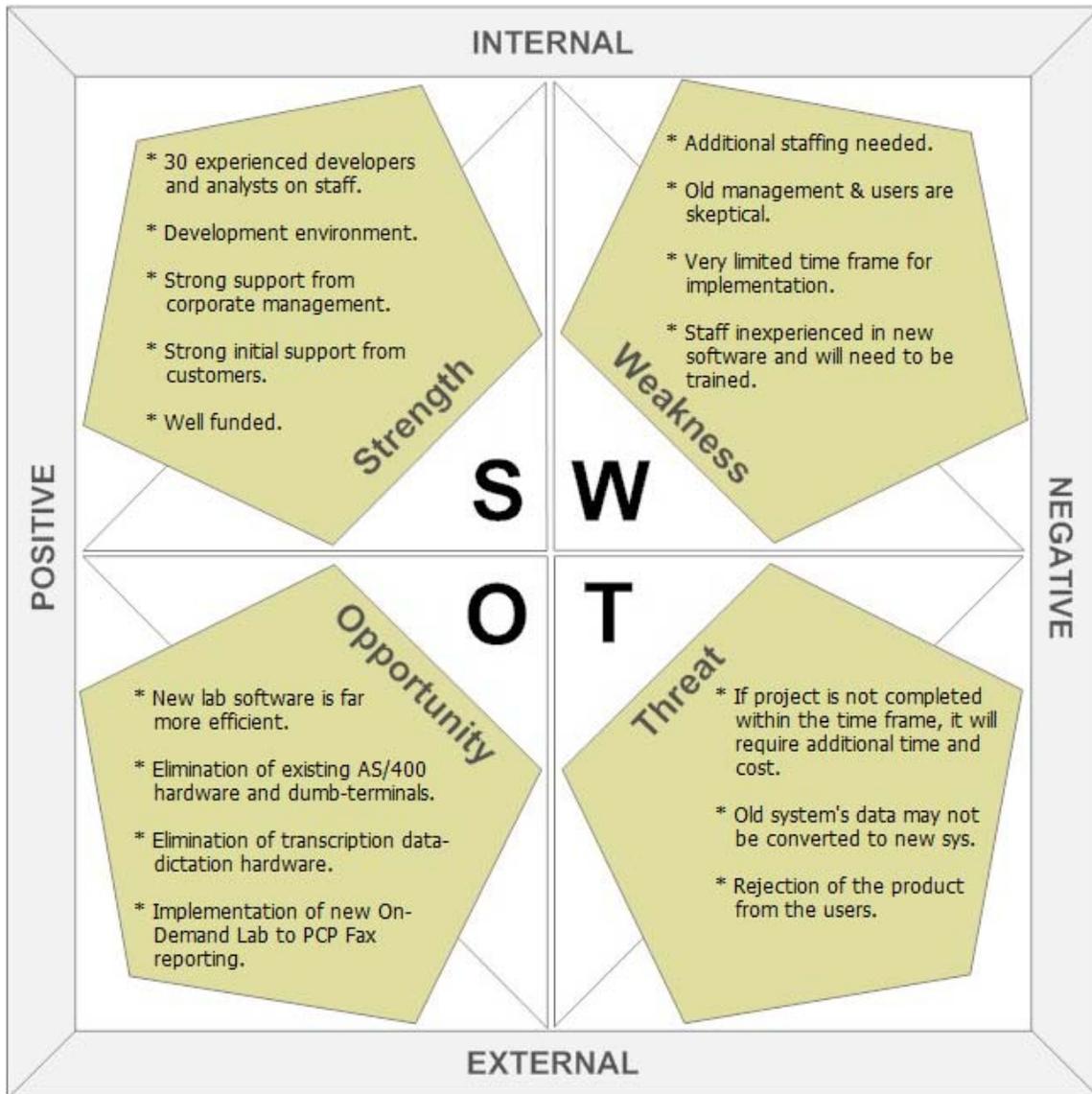
- depending upon the quality. These slides are then placed on a “plate” along with printed information and hand-delivered to the receiving area for the pathologist.
7. The Pathologist receives the slide plate, and views all of them. The doctor attempts to make a diagnosis based on what he / she sees on the individual slides. The doctor then records his information on an old transcriptionist dictation and transcription server.
 8. The tape recording from the pathologist is then retrieved from the old system by a single transcriptionist out of a bank of several, and the pathologists diagnosis is typed into the old laboratory system.
 9. The data is combined in the old lab system and a final report is produced. The report is then either shipped out using FedEx priority overnight, or hand delivered by a courier. Standard fax hardware is no longer permitted due to the lack of appropriate encryption required by the HIPAA requirements.
 10. All of the existing specimen slides go into cold storage at the facility where they are stored for a period of up to 10 years.

PROJECT GOALS / OPPORTUNITIES

There are several goals to be accomplished in this upgrade:

- Upgrade to the newer more efficient laboratory software
- Elimination of the existing AS/400 hardware and dumb-terminals.
- Elimination of the transcriptionist data-dictation hardware.
- Implementation of new On-Demand Lab to PCP Fax reporting.

INITIAL S.W.O.T. ANALYSIS



Note: For a more complete list of the SWOT analysis, please refer to the detailed Project PROS / CONS section of the project documentation.

PROJECT PROS / CONS:

PROS / STRENGTHS:

- New lab software will provide a quicker turn-around time. Specimen handling which normally takes two days can be accessioned and diagnosed within the same day. This provides for a turn-around time of a specimen in a single day. In some circumstances, specimens received early morning can be processed and a diagnoses delivered by the close of business day.
- The new laboratory software will work on standard, readily available Microsoft Windows compatible platforms. This means that legacy hardware will no longer need to be supported.
- Depending on job responsibilities and duties, most employees and lab techs require two machines at their stations; a dumb terminal, and a PC compatible to operate their hardware and receive interoffice communications. With the new hardware to be purchased for the lab software, employees will have only a single machine at their station. This will reduce the amount of IT infrastructure support and down-time.
- The new software provides digital storage of the photomicrographs. This provides two benefits:
 - The pathologist no longer needs to rely solely on a microscopic and physical slide, but instead can compare multiple slides at the same time on his / her screen.
 - Since the slides are stored electronically, the lab is no longer required to house the physical slides for long-term storage (currently at 10 years as per HIPAA requirements). Long term storage is effectively eliminated

moving forward. This provides a long-term cost savings as the 10 year mark is approached and warehouse usage can be increasingly diminished each year.

- With the new hardware provided, the transcriptioning department will no longer need to rely on the old data dictation server and hardware. All desktops will come equipped with the proper accessories and software necessary to store the pathologists' dictation. Transcriptionists will have this data accessible to them on the same machine they provide the transcriptioning. This system is optional in the new lab implementation, but highly recommended.
- The new software is compatible with new HIPAA compliant software that provides immediate electronic faxing services. On loan from the lab, a color printer and hardware encrypted modem may be installed on location to provide immediate diagnostic results to the PCP as soon as they are made available. This will help eliminate the need for some courier services and cut down the service time by anywhere from 30 minutes to two hours.
- Some of the initial costs can be recovered by selling the old hardware to other labs, or re-using some of it with other affiliated labs that have yet to be upgraded.

CONS / WEAKNESSES:

- The new lab software requires considerable initial development and testing. It is estimated that the project will require a team of up to 50 software developers and analysts to complete. The majority of these developers and analysts will need a great detail of medical programming, experience, and exposure in order to efficiently make use of the development time. This may increase the overall

staffing costs. At present, the corporation already has about 30 developers and analysts on staff, but more would need to be hired on a contract basis.

- New hardware will need to be purchased requiring a significant initial investment. The required hardware will include everything needed to incorporate a completely operational modern server room. This includes a SAN, domain controllers, power backup, etc. The project looks to replace and install a total of about 100 workstations.
- In order to properly implement the software and hardware, the laboratory will need to be closed down for a period of just under a week. Agreements and contracts have been made between neighboring labs, as well as some of the local AmeriPath labs. The total loss of income will equate to about 80% of the normal weekly revenue.
- The staff will need to be retrained on the new software and hardware.
- The implementation staff will need to be housed for a period of up to two weeks. One week for the initial implementation, and a second week for follow-up issues. The employee's entire stay will be expensed, and the employee will be given a per diem for food and other expenses.

THREATS:

- If the project is not completed within a one week's time, the initial cost would skyrocket due to the lost revenue and increased consulting and salary allocated.
- If the old system's data cannot be converted to the new system, we will need to maintain a basic legacy infrastructure to support the historical data.
- Rejection of the product from the users.

INITIAL BUSINESS COST ANALYSIS

Created by: Ralph Andrews					
Note: These figures are estimates. They are expected to change slightly for better or worse as the project progresses. The ROI is not expected to change significantly.					
Discount rate	8%				
Project will be completed in 1st year.	Year				
	0	3	6	9	Total
Costs	340,000	3,000	30,000	3,000	
Discount factor	1.00	0.79	0.63	0.50	
Discounted costs	340,000	2,381	18,905	1,501	362,787
Benefits	20000	155,000	275000	475000	
Discount factor	1.00	1.10	1.20	1.30	
Discounted benefits	20000	170,500	330,000	617,500	1,138,000
Discounted benefits - costs	(320,000)	168,119	311,095	615,999	775,213 ← NPV
Cumulative benefits - costs	(320,000)	(151,881)	159,213	775,213	
ROI →	214%				
	Payback before Year 3				

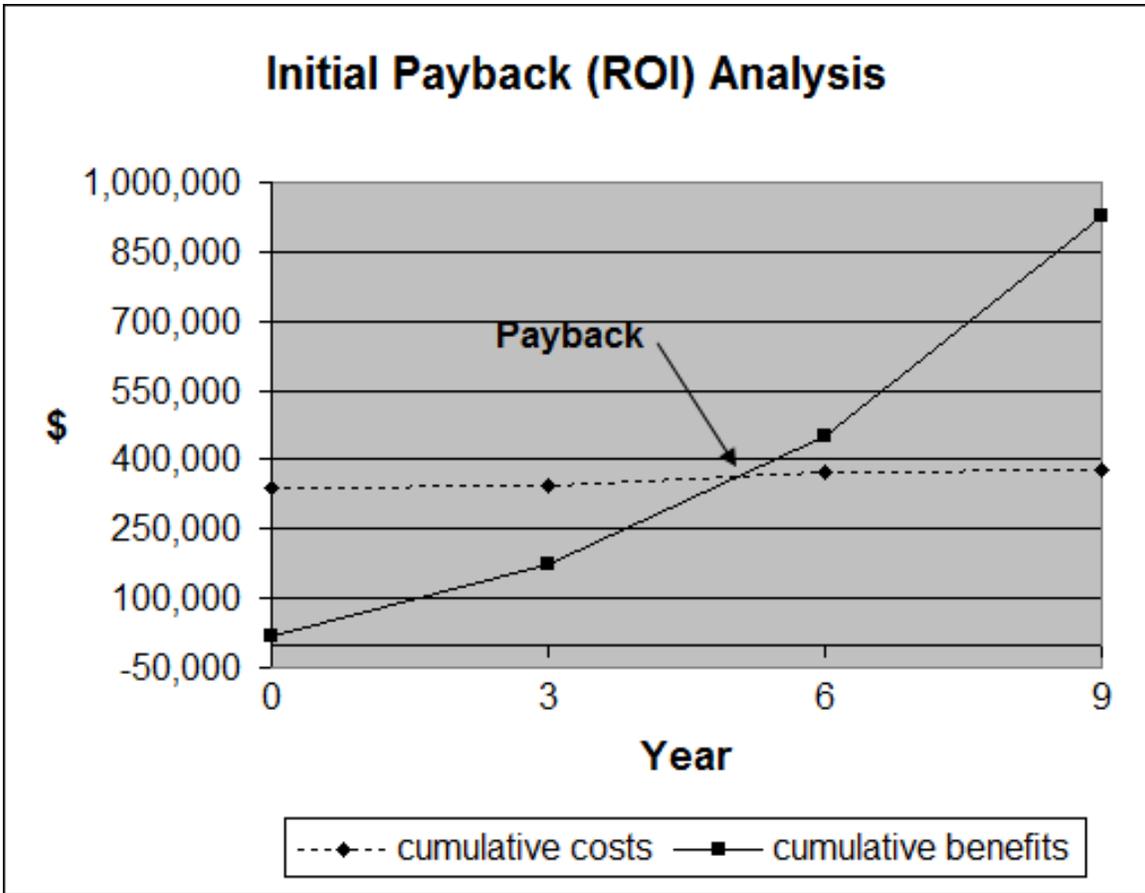
ASSUMPTIONS

COSTS:

- Initial investment will include a one-time cost of \$340,000. This figure includes the cost of staff / programmers / analysts for the development and implementation of the product.
- Standard maintenance costs for the hardware are estimated at \$3,000 with current hardware insurance policy. An upgrade of workstations is planned every 6 years for a pre-determined cost of \$30,000.

BENEFITS:

- Old hardware can be sold or recycled within the company for a corporate cost savings.
- Every year, business is expected to grow by 10-20% due to increased efficiency and product availability.
- Within a 10 year period, cold storage will be completely eliminated as records are slowly phased out and saved digitally. Est. \$5,000 annually.



Explanation of ROI:

As shown in the ROI payback estimate chart, the company expects to see an actual return by the 5th year. The initial investment is significant; however the existing hardware and software has been in use since early 1979. The improvement to the business in terms of product and efficiency will significantly outweigh the costs in the years following the initial implementation. It is fully expected that this new system will exist as long, or possibly outlast the previous 30 years of service from the old system.

LABORATORY UPGRADE - CHARTER

Project Title: Laboratory Hardware / Software Upgrade

Project Start Date: 11/1/2008

Projected Finish Date: 1/1/2009

Budget Information:

Corporate headquarters for AmeriPath has set aside a maximum of \$400,000 for this project. The estimates have come in at around \$340,000 but the additional \$60,000 is for a contingency plan and incidentals. The money is to be completely tracked and monitored. Most of the resources will be coming from internal corporate sources. The corporate development department will be focusing about 90% of its primary resources exclusively on this project.

Project Manager: Ralph Andrews, 561-330-6565, randrews@ameripath.com

Project Objectives:

- Upgrade to the newer more efficient laboratory software
- Elimination of the existing AS/400 hardware and dumb-terminals.
- Elimination of the transcriptionist data-dictation hardware.
- Implementation of new On-Demand Lab to PCP Fax reporting.

Approach:

Development of the project has already begun. The corporation has a basic platform by which all newly acquired labs under the AmeriPath umbrella will eventually move. This platform will need to be tweaked and implemented to meet the rigorous and significantly more diverse products that the Center for Advanced Diagnostics (C.A.D.) provides. Testing will begin in the development environment. When all issues have been worked out, the implementation will begin. The lab will need to be shut down for an entire week during this process. Provisions will be made to move and temporarily contract the lab work to outside vendors for the time being. The entire implementation should take no longer than a week. In the unlikely event the implementation takes longer, there will be a 24/7 contingency plan to complete the implementation. In a worst case scenario, the existing infrastructure and software can be reactivated will remain completely intact until the product goes live.

Roles & Responsibilities:

Role	Name	Organization/ Position	Contact Email @ ameripath.com
Sponsor	Board of Directors	AmeriPath B.o.D.	N/A
Consultant	John Derrick	President of C.A.D.	jderrick
Team Member	David Nunes	Director of Finance	Dnunes
Program Manager	Theresa Lamontagne	Lab Operations Manager	Tlamontagne
Project Manager	Ralph Andrews	Project Manager	Randrews
Team Member	Brian Nerzig	Lead Apps. Developer	Bnerzig
Team Member	John London	Lead Hardware Tech.	Jlondon
Team Member	Dr. Kip Amazon	Lead Pathologist	Kamazon
Team Member	Damon Ball	Lead Lab Technician	Dball

Sign-off: (Signatures of all above stakeholders)

1. John Derrick _____ X
2. David Nunes _____ X
3. Theresa Lamontagne _____ X
4. Ralph Andrews _____ X
5. Brian Nerzig _____ X
6. John London _____ X
7. Dr. Kip Amazon _____ X
8. Damon Ball _____ X

Comments:

John Derrick: is concerned about the training of his staff and wants to ensure that his staff receive adequate training. Also wants to make sure that the resources earned from the sale of the old hardware goes back into the C.A.D. laboratory and not the corporate budget.

Brian Nerzig: Wants to make sure that the new hardware arrives on time to ensure that the implementation goes smoothly.

Laboratory Upgrade – Change Control Procedures

Purpose:

The change control process will be crucial in containing the number of requests that are submitted. This will ensure that only the necessary changes will be implemented and that “improvements” above and beyond the initially scoped development will be relegated to a phase 2 project implementation. This will be vitally crucial in holding back scope creep in this project.

If initially approved and in order to ensure that the change are inline with the goals outlined; all forms must be approved by the various departments involved. This ensures that everyone is on-board and aware of the ramifications to their segment of the project.

Procedure:

The procedure for submitting a change request will be through the use of the change request form, IT400LAB-110109-XXXX (0001-9999). Change request forms are to be submitted directly to the project manager, Ralph Andrews. The project manager will take the initial responsibility of validating a request or pushing it to a phase 2 status. If the project manager deems this change critical, he will acquire signatures and approval from all specified department heads. The department heads are as follows:

Change Control Board

Project Manager	Ralph Andrews	Project Manager	Randrews
Consultant	John Derrick	President of C.A.D.	jderrick
Team Member	David Nunes	Director of Finance	Dnunes
Program Manager	Theresa Lamontagne	Lab Operations Manager	Tlamontagne
Project Manager	Ralph Andrews	Project Manager	Randrews
Team Member	Brian Nerzig	Lead Apps. Developer	Bnerzig
Team Member	John London	Lead Hardware Tech.	Jlondon

PROJECT IT400-LAB-110109 CHANGE REQUEST FORM

TITLE OF CHANGE REQUEST: _____ DATE: _____

CHANGE REQUEST NUMBER: IT400LAB-110109- _____

SUBMITTED BY: _____

CHANGE CATEGORY: Scope Schedule Cost Technology Other

DESCRIPTION OF CHANGE: _____

REASON FOR CHANGE REQUEST: _____

IMPACT OF PROPOSED CHANGE

Scope:	_____
Schedule:	_____
Cost:	_____
Staffing:	_____
Risk:	_____
Other:	_____

ADDITIONAL COMMENTS / NOTES: _____

REQUIRED APPROVALS

Name / Title	Date	Approve / Reject
Ralph Andrews _____ X		
John Derrick _____ X		
David Nunes _____ X		
Theresa Lamontagne _____ X		
Brian Nerzig _____ X		
John London _____ X		

Scope Statement (Version 1.01)

Project Title: Laboratory Software and Hardware Implementation

Date: 11/02/2008

Prepared by: Ralph Andrews

Project Justification:

Our existing software has been in service for almost 30 years now. It's served its purpose, but the laboratory could stand to benefit greatly by upgrading to more efficient software. The more efficient software will permit the laboratory to increase its business and decrease its turn-around time for laboratory requests. It's currently impossible for the lab to turn around a specimen in a single day, but this will be possible once we've upgraded. This will also allow us to build a more permanent relationship with our long-time primary care physician customers.

Product Characteristics and Requirements:

1. Upgrade to the newer more efficient laboratory software
2. Elimination of the existing AS/400 hardware and dumb-terminals.
3. Elimination of the transcriptionist data-dictation hardware.
4. Implementation of new On-Demand Lab to PCP Fax reporting.

Summary of Project Deliverables

Project management-related deliverables:

Summary, Business Process, Business Case, Project Goals, SWOT Analysis, PROS, Strengths, CONS, Weaknesses, Threats, Cost Analysis, Benefits, ROI, Charter, Objectives, WBS, Change Control, Scope Statement, GANTT Chart, Schedule, Cost Baseline, Final Project Presentation.

Product-related deliverables:

1. Laboratory Software
2. Laboratory Hardware
3. Data Dictation Hardware
4. Database Conversion
5. On-Demand Fax

Project Success Criteria:

The project will be considered successfully completed when the new laboratory software has been successfully implemented, and the new hardware has been installed.

Work Breakdown Structure for Laboratory Upgrade

Prepared by: Ralph Andrews

Date: 11/02/08

1.0 Initiating

- 1.1 Assign Project Manager
- 1.2 Identify Stake-holders
 - 1.2.1 Programmers
 - 1.2.2 Hardware Staff
 - 1.2.3 Lab Technicians
- 1.3 Prepare Project Charter
- 1.4 Conclude Activities

2.0 Planning

- 2.1 Prepare Team Contract
- 2.2 Prepare Scope Statement
- 2.3 Prepare WBS
- 2.4 Prepare Schedule
- 2.5 Prepare Cost Baseline
- 2.6 Identify and Prioritize Risk
 - 2.6.1 Risk Determination
 - 2.6.2 Risk Register
 - 2.6.3 Risk Register

3.0 System Engineering & Design

- 3.1 Develop System Software
- 3.2 Prepare Test Environment
- 3.3 Test System Functionality
 - 3.3.1 Lab Software
 - 3.3.2 On-Demand Reports
- 3.4 Create Technical Documentation

4.0 System Installation and Implementation

- 4.1 Install Hardware
- 4.2 Install Software
- 4.3 Install Data Dictation
- 4.4 Convert Legacy Database

5.0 Monitoring & Controlling

- 5.1 Provide Support for Employees.
- 5.2 Take Notes / Possible Phase 2
- 5.3 Assess Issues
- 5.4 Status Reports

6.0 Closing

- 6.1 Prepare Final Report
- 6.2 Prepare Final Presentation
- 6.3 Prepare Lessons Learned

Task Name	Duration	Start	Finish	Resource Names
Initiating	2.5 days?	Thu 10/2/08	Mon 10/20/08	Initiating
Assign Project Manager	1.5 days?	Thu 10/2/08	Fri 10/3/08	Project Manager
Identify Stake Holders	1 day?	Thu 10/9/08	Thu 10/9/08	Identify Stakeholders
Prepare Project Charter	2 days?	Thu 10/9/08	Fri 10/10/08	Project Charter
Conclude Activities	6 days?	Mon 10/13/08	Mon 10/20/08	Activities
Planning	0.5 days?	Sat 11/1/08	Fri 11/14/08	Planning
Prepare Team Contract	1 day?	Sat 11/1/08	Sat 11/1/08	Prepare Team
Prepare Scope Statement	1 day?	Mon 11/3/08	Mon 11/3/08	Scope
Prepare WBS	1 day?	Tue 11/4/08	Tue 11/4/08	WBS
Prepare Schedule	7.5 days?	Wed 11/5/08	Fri 11/14/08	Schedule
Prepare Baseline & Risk	1 day?	Tue 11/4/08	Tue 11/4/08	Risk
System Engineering & Design	12 days?	Mon 11/10/08	Tue 11/25/08	Development
Develop System Software	12 days?	Mon 11/10/08	Tue 11/25/08	Develop Software
Prepare Test Environment	10 days?	Wed 11/12/08	Tue 11/25/08	Test Environment
Test System Functionality	7 days?	Mon 11/17/08	Tue 11/25/08	Test System
Create Technical Documental	7 days?	Mon 11/17/08	Tue 11/25/08	Technical Documentation
System Installation & Implement	15 days?	Mon 12/8/08	Fri 12/26/08	Maintenance
Install Hardware	5 days?	Mon 12/8/08	Fri 12/12/08	Install Hardware
Install Software	5 days?	Mon 12/15/08	Fri 12/19/08	Install Software
Install Data Dictation	3 days?	Mon 12/22/08	Wed 12/24/08	Install Data Dictation
Convert Legacy Database	2 days?	Thu 12/25/08	Fri 12/26/08	Convert Database
Monitoring & Controlling	5 days?	Mon 12/29/08	Fri 1/2/09	Maintenance
Support / Notes	5 days?	Mon 12/29/08	Fri 1/2/09	Support / Notes
Issues / Status Reports	5 days?	Mon 12/29/08	Fri 1/2/09	Issues / Status
Closing Reports / Lessons Learn	5 days?	Mon 1/5/09	Fri 1/9/09	Software training

The project management of LH/SW was supported by a SWOT analysis which helped us keep track of our strengths, weakness opportunities and threats. An initial business cost analysis was provided along with a GANNT chart, supplied the work schedule of the project. An initial pay back (ROI) analysis was project to provide a basic view of the laboratories future.

The above GANTT chart outlines the progress and work structure of the project. All changes to the process must be approved and authorized by
Ralph Andrews.

TIME MANAGEMENT

To get an accurate estimation of time for this project, we have decided to implement the **bottom-up** estimate technique. We have broken down the different tasks into smaller activities. This technique will permit us to determine what is specifically needed to meet the exact requirements of each activity. Estimating an activity as a whole is not as accurate as estimating small individual components.

The Project Management task has different types of activities which need to be organized and analyzed the work, plan accordingly to the project, and estimate and allocate resources. To accomplish this activity, it is important to assign tasks to team members with the appropriate priorities and due dates. Then, the progress of each activity needs to be monitored and controlled. In the intervening time, some team members will need to conclude some tasks in order to start a new activity.

The activities performed during the *System Engineering and Designing* characterize the smallest amount of time required for a large information systems engineering effort. System design is important in the development, maintenance, and integration of the new software. The design provides helpful information used by the project manager, developers, testers, and maintenance personnel among others. Setting up a test environment, developed the integration of untested modules, and other errors introduced by new modules. The test should be conducted under the same type of daily environment that will be encountered during standard operations.

It is important to coordinate the installation process with the stakeholders. In this process is vital to complete any essential modifications to the hardware installation. Testing the hardware that will support the new software allow time to check for broken equipment to be repaired or replaced. After that, begin the data load and conversion to install the software onto the hardware.

Producing and performing training is the last activity. For this task is imperative to have total support from the stakeholders to produce the material. For the implementation of the training we have decided to make different groups depending on the users' level.

Time management is significant for any successful project manager. The most common cause of failure in projects is the lack of schedule management. To prepare the project activities, project managers needs to understand what tasks are essential, how long are each task will take, what resources are needed, and in the sequence they should follow. We have used Microsoft Project Management to manage our project schedule on a timely manner.

MILESTONES

Task Name	Duration	Start	Finish
1. Initiation			
1.1. Assign Task			
1.2. Monitor project			
1.3. Conclude activities			
2. System Engineering and Design			
2.1. Develop system design			
2.2. Set up test environment			
3. Installation			
3.1. Install hardware			
3.2. Install software			
4. Training			
4.1. Produce Material			
4.2. Perform Training			

INITIAL COST ANALYSIS

ASSUMPTIONS

COSTS:

- Initial investment will include a one-time cost of \$352,000. This figure includes the cost of staff / programmers / analysts for the development hardware, implementation of the product and yearly service contract agreements.
- Standard maintenance costs for the hardware are estimated at \$3,000 with current hardware insurance policy. An upgrade of workstations is planned every 6 years for a pre-determined cost of \$30,000.
- Standard maintenance cost for software is estimated at \$4,000. This is being implemented in order to keep all software customization in working order with each update release of the packaged software.

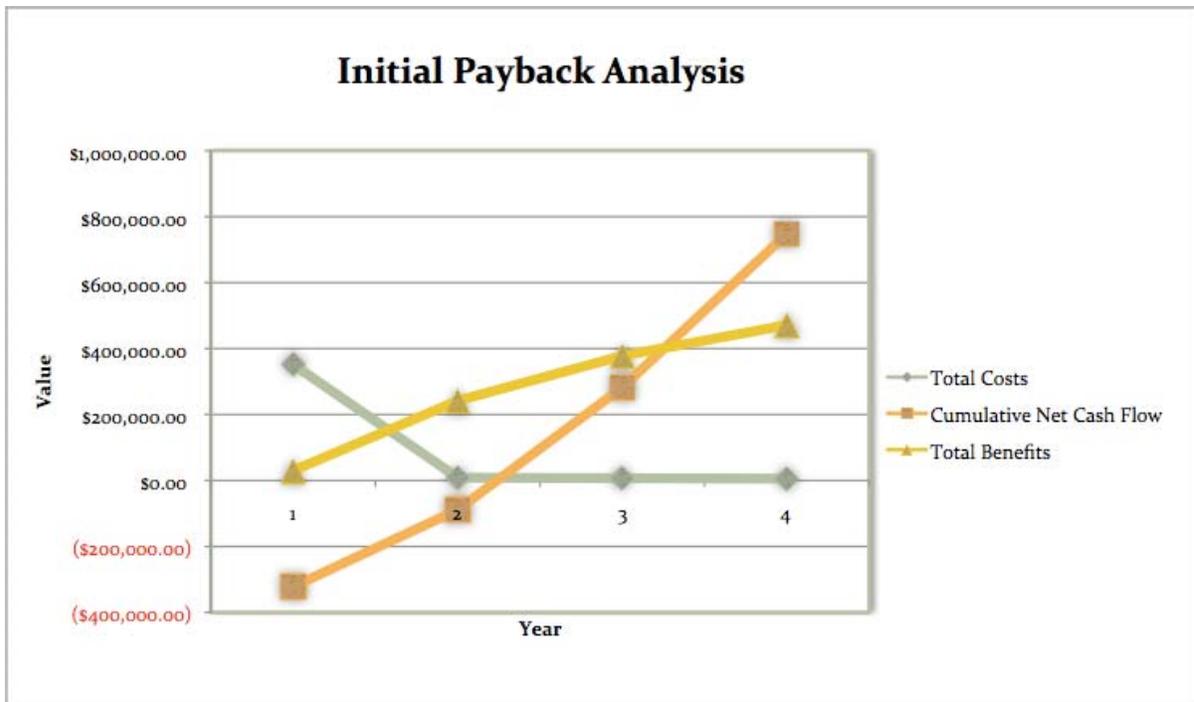
BENEFITS:

- Old hardware can be sold or recycled within the company for a corporate cost savings.
- Every year, business is expected to grow by 10-20% due to increased efficiency and product availability.
- Within a 10-year period, cold storage will be completely eliminated as records are slowly phased out and saved digitally. Est. \$5,000 annually.

	2009	2010	2011	2012 4 Year Totals
Benefits				
Recycled Hardware	\$5,000.00	\$5,000.00	\$5,000.00	\$20,000.00
20% growth due to efficiency	\$20,000.00	\$210,000.00	\$305,000.00	\$887,500.00
Elimination of cold storage	\$5,000.00	\$5,000.00	\$5,000.00	\$20,000.00
Discount Factor	1.00	1.10	1.20	1.30
Total Benefits	\$30,000.00	\$242,000.00	\$378,000.00	\$1,121,250.00
Costs				
Project Manager	\$30,000.00			\$30,000.00
Project Team Memebers	\$70,000.00			\$70,000.00
Hardware + yearly maintenance	\$100,000.00	\$3,000.00	\$3,000.00	\$109,000.00
Software + yearly maintenance	\$50,000.00	\$4,000.00	\$4,000.00	\$62,000.00
Testing	\$40,000.00			\$40,000.00
Training and Support	\$30,000.00	\$3,000.00	\$3,000.00	\$39,000.00
Reserves 10% of total estimates	\$32,000.00	\$1,000.00	\$1,000.00	\$35,000.00
Discount Factor	1.00	0.79	0.63	0.50
Total Costs	\$352,000.00	\$8,690.00	\$6,930.00	\$373,120.00
Total Benefits - Total Costs	(\$322,000.00)	\$233,310.00	\$371,070.00	\$748,130.00
Cumulative Net Cash Flow	(\$322,000.00)	(\$88,690.00)	\$282,380.00	\$619,820.00
Return On Investment	-91.48%	2684.81%	5354.55%	200.51%
4 Year ROI	200.51%		8468.18%	
Break Even Point	2.01	Year(s)		
NPV				\$748,130.00
Dollar value at 6% interest rate over 4 years				\$628,429.20
Dollar value at 10% interest rate over 4 years				\$561,845.63
Dollar value at 15% interest rate over 4 years				\$427,930.36

INITIAL PAYBACK ANALYSIS

The project implementation will reach the breakeven point during year two with an estimated gross income of \$282,380.00 in year three. A total cumulative net cash flow of \$619,820.00 is estimated after the fourth year of the finished project. This project has an estimated ROI of 200.52% across the four-year implementation period. The cost analysis includes yearly maintenance across the four years for the hardware and the customization of the software.

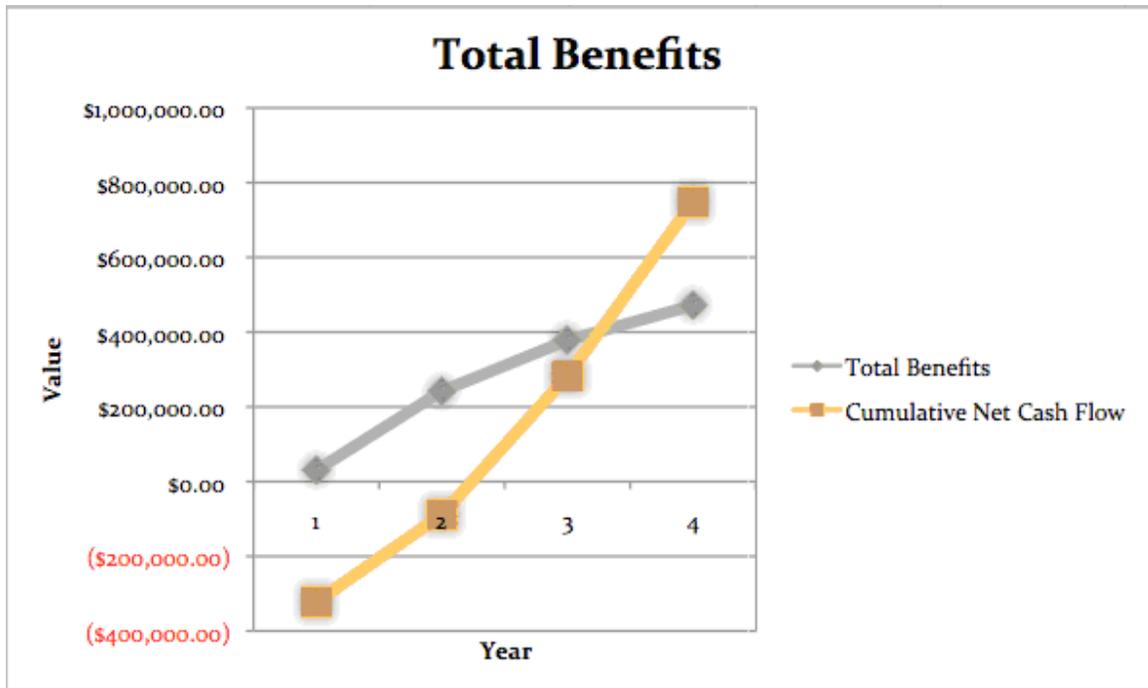


Earned Value Calculations - after hardware installation (week 4)

All hardware and server installations should be completed during week 4 of the project implementation period.

Earned Value (EV)	\$85,000.00
Planned Value (PV)	\$100,000.00
Actual Cost (AC)	\$170,000.00
Cost Variance (CV)	(\$85,000.00)
Schedule Variance (SV)	(\$15,000.00)
Cost Performance Index (CPI)	50.00%
Schedule Performance Index (SPI)	85.00%

Total Benefits against Cumulative Net Cash Flow



As yearly cost are reduced the initial cost of \$352,000.00 are recovered creating greater profit gains as the life of the project grows. Cumulative net cash flow will surpass total benefits in year four. Total cost four-year total is \$1,121,250.00 and cumulative net cash flow four-year total is \$619,820.00.

QUALITY MANAGEMENT

Quality Standards / Stakeholder Requirements: In order to meet Stakeholder and Senior Management expectation several quality standard have been develop.

a. Training

- I. Management
- II. PCP Staff
- III. Lab Staff

b. Hardware / Software Implementation

- I. Sale of current hardware
- II. Installation of new hardware
- III. Hardware repair/replacement

c. Communication

- I. Lab service requests
- II. Lab tech department communication
- III. Results delivery

d. Deliverables

- I. Timeframes
- II. Archiving
- III. HIPPA

TRAINING:

Training will play a big part in the Hardware / Software Upgrade. Because the new software is completely different training has to range from Upper management to the least involved individual. The new system require training on new and update specimen hardware, the new software has to be taught to all users, and

- I. Management will need to be trained on the new systems in order to view laboratory stats, client's information, budget reports, Specimen status reports, medical and PCP information. Management will need access to make determinations on facility expansions or closure, to be determined by client activity and service requests.
- II. Primary Care Physician's offices will have to be training by AmeriPath on the new software. The training is to include new request access via internet/ On-Demand faxing, sing-on, online forms, setting test priorities, referrals for clients, updating of client information.
- III. Lab Staff will require the biggest amount of training. Due to the new software and hardware procedures set in place with the previous hardware/software will have to be updated to include the new products. Lab staff has to be re-trained on retrieving PCP online requests, routing test result to lab technicians, contacting clients if necessary, testing, archiving and storing samples and client result for PCP retrieval.
- IV. Future training for new software and any additional hardware purchased for the expansion of labs.

HARDWARE / SOFTWARE IMPLEMENTATION:

- I. Installation of new hardware will require that it be delivered as planned in order to complete the installation in its allotted time. A one week period has been designated to allow installation and implementation of the systems. Any delays in the installation would increase the loss of income and increase the project budget.

- II. Migration of current data to new system within a timely manner, enough time to allow for problem resolutions for errors during migration.

- III. Repair procedures have to be designed and guidelines implemented to where the repairs would not affect regular laboratory activities. Vendor warranties have to be reviewed; equipment return and repairs need to be cleared. IT department has to provide software repairs within a specific allotted time. Additional machines have to be readily available for temp use or replacement.

- IV. A self help and online Q & A section for technical support to PCP offices and internal Lab and Management Staff.

- V. All profits from current hardware sales must be budgeted for C.A.D Labs not general company funds. Can be used for upgrades at later times or

DELIVERABLES:

- I. Time frames need to be established for training, installations, and testing.
- II. Lab staff training needs to occur prior or at same time as installations. Continuous training for additional or new incoming staff.
- III. Incoming hardware needs to be delivered in time for installation, no delays can occur without incurring additional project costs.

ARCHIVING, DELIVERY, and PRIVACY:

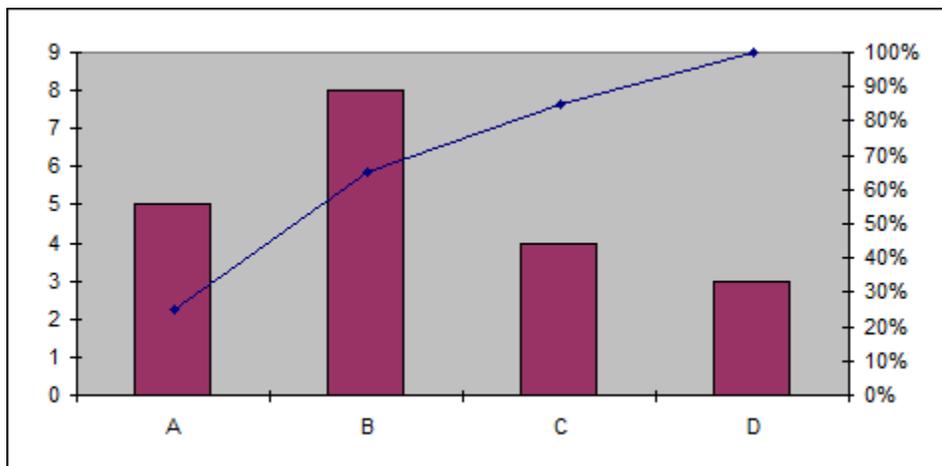
- I. Archiving of testing samples procedures to be reviewed and revised as necessary.
- II. Delivery of results to PCP by paper, fax or online, should be in a timely manner.
- III. HIPPA and privacy policies need to be enforced and reviewed. Software must meet all HIPPA laws; PCP offices must sign affidavit accepting service policies.

Pareto Diagram for Laboratory Hardware and Software Upgrade

Created by: Ralph Andrews

Date: 12/05/2008

Problem	Count	%	Cumulative %
A	5	25%	25%
B	8	40%	65%
C	4	20%	85%
D	3	15%	100%
Total	20		



GRAPH KEY DESCRIPTION

- Problem A** Lab staff had issues signing in to system for the first time.
- Problem B** Staff was not clear about new procedures with new software
- Problem C** Machines needed to be repaired by vendor because of faulty Hard Drives
- Problem D** PCP Offices did not all have Color printers to print test results in color for delivery to patients.

TESTING:

After completion of the installation of the system as a whole group testing will be used to determine defect if any. A group of 20 testing subject will be used, to determine the usability, reliability and integrity of the equipment and software. Unit test will be conducted on each piece of hardware that is being installed Unit testing will include lab hardware, new computers that will replace dummy terminals, printers, server, SAN Devices, backup hardware, storage and archiving tools. The testing of all components as individual units will determine reliability of the hardware. Lab technicians will use the hardware in the lab by simulating receiving of request, running actual testing of samples, routing test results, and transmitting to PCP as requested.

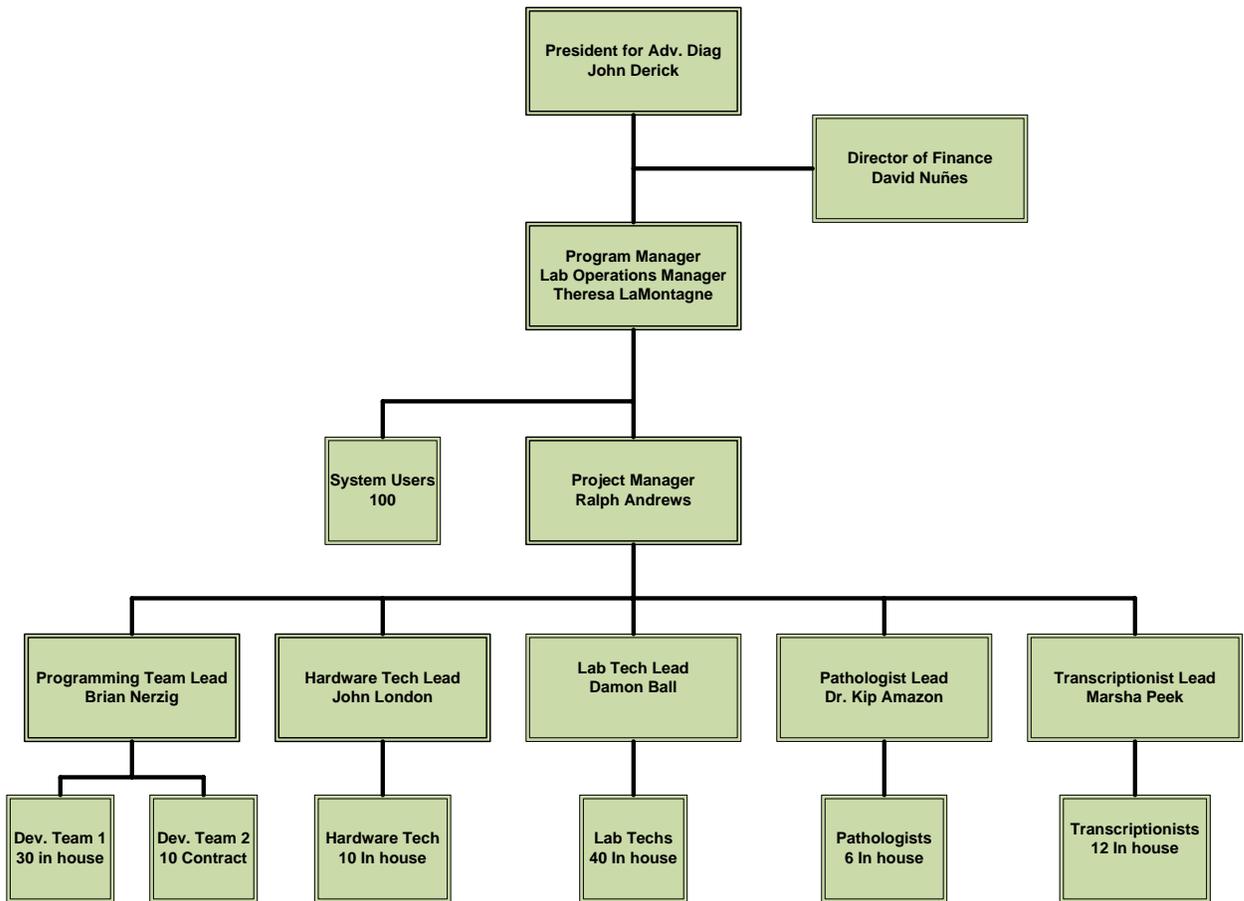
Integration testing will insure that the system works together as designed. Simulating a test, lab staff will place input in the pc to run test on the specimen software. Running software test, computer and server tests, backing up data printing from client stations and insuring the all the equipment can communicate with each other.

System testing will test all the systems as a whole. We will simulate a PCP request to run several tests for a client. The test will start with a PCP online request, then the request will be received by the lab staff, it will be routed to the lab technician for collection of the specimen of the client. Once the specimen has been collected it will be tested using all necessary hardware. Specimen will be archived as required by law; results will be submitted for retrieval by PCP office.

A user acceptance testing will be conducted to insure that the staff accepts the software and hardware after installation. This test will be the final test to determine if the system is ready for delivery. This test will conclude if the system meets all the requirements from stakeholders as far as system usage, integrity and stability.

A follow up meeting with PCP Personnel, Lab Staff along with management to discuss potential risks and issues that may have come up during any of the testing phases.

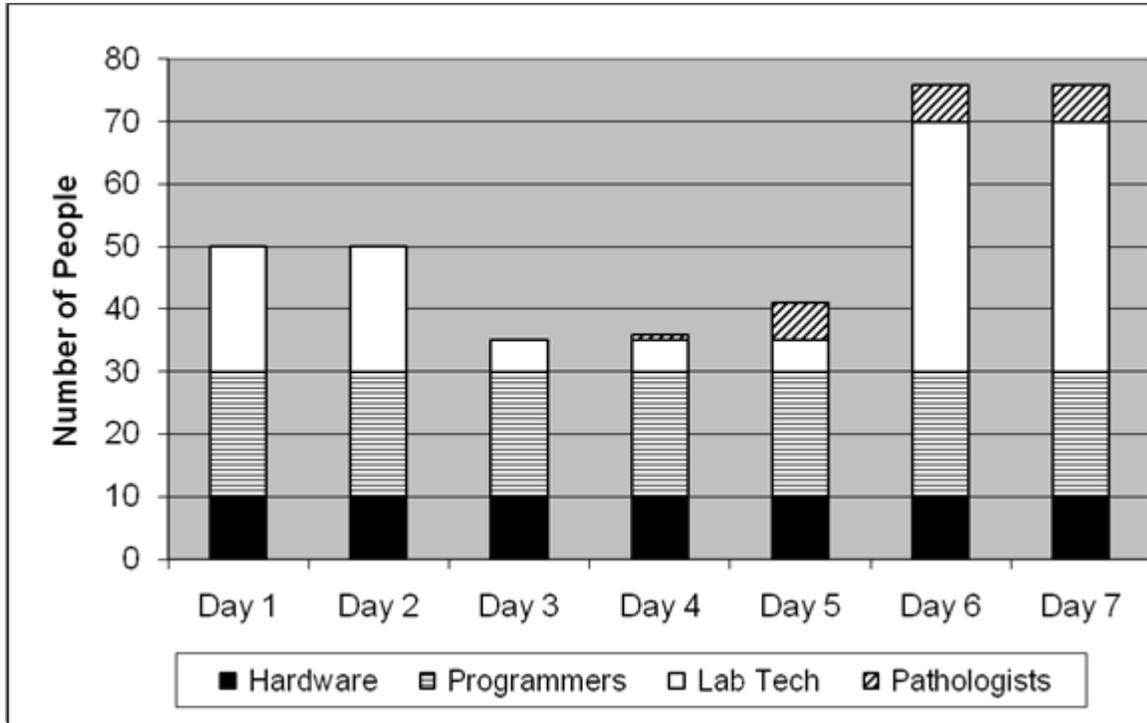
ORGANIZATIONAL CHART



- **Program Manager** - reports directly to president, sponsors project, oversees evolution of project, mediates between project team and business units.
- **Project Manager** – reports directly to program manager, in charge of all team leads, responsible for the development, execution and monitoring of project plan. Over all responsible for success of project.
- **Team Lead** – reports directly to project manager, in charge of a group of resources, responsible for the successful completion of tasks assigned to his\her specific group.
- **Team member** – reports directly to team lead. Responsible for the successful completion of tasks assigned.

RESOURCE HISTOGRAM

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Hardware	10	10	10	10	10	10	10
Programmers	20	20	20	20	20	20	20
Lab Tech	20	20	5	5	5	40	40
Pathologists	0	0	0	1	6	6	6



Hardware Technicians – Responsible for the installation, monitoring and support of all servers, client PCs, network infrastructure and wiring for the project. This number is adjustable pending development of implementation.

Programmers – Responsible for the installation, monitoring and support of application on servers and client PCs for the project.

Lab Technician – Responsible to assist hardware tech and programmers on deployment of application. Input on application and hardware behavior, aesthetic and final approval is needed from this group.

Pathologists – Responsible to assist hardware tech and programmers on deployment of application. Input on application and hardware behavior, aesthetic and final approval is needed from this group.

RACI CHART

	Development	Hardware	Lab Tech	Pathology	Project Manager
System Test	A	R	C	C	I
Integration test	A	R	R	R	I
Determine testing users	C	C	C	R	I
Find testing users	I	I	C	C	R
Develop user test	R	C	C	C	A
Ready facility for user test	I	R	C	C	A
Create survey for feedback	R	C	C	C	A
Analyze results	R	C	C	C	A

Responsibility Assignment Matrix

WBS	Development	Hardware	Lab Tech	Pathology	Project Manager
3.1	X				X
3.2	X	X			
3.3	X	X	X	X	
3.4	X	X			X

- The **RACI** chart displays basic responsibility based on task.
- The **RAM** chart displays responsibility assigned based on work breakdown structure.

PROJECT COMMUNICATION PLAN

DAILY REPORT – PROJECT MANAGER:

- Daily conference call with team leads will be held to discuss tasks and issue status. This information will be recorded and sent to all stakeholders via E-mail.

WEEKLY REPORT – PROJECT MANAGER:

A weekly meeting with each individual group will be held to discuss tasks progress, issues status, and milestones. This information will be recorded and updated in the WBS.

- A weekly meeting with all team lead will be held to discuss WBS and any personnel issues. This information will be recorded and sent with an updated WBS to all team leads via e-mail.
- A weekly conference call with President of Advance Diagnostic, Program Manager, and Director of Finances will be held to discuss status of project. Information from this conference call will be recorded and sent to the President, Program Manager, Director of Finances, and all team leads via e-mail.

TEAM LEADS:

Team leads will choose a daily meeting or conference call with group:

- Team leads will discuss assigned tasks, responsibilities, challenges and work load with members.
- Team lead will evaluate the state of its members (motivation, emotion, stress and attitude) in order to make adjustments. Adjustments could include rotation of resources to keep them fresh and proposing the addition of extra resources to the group.
- Team lead will make note of any suggestion made by the group members and report to the project manager.
- Team lead will report on all completed tasks and members that go beyond call of duty in order to be recognized by Project manager.

SHARE POINT SITE:

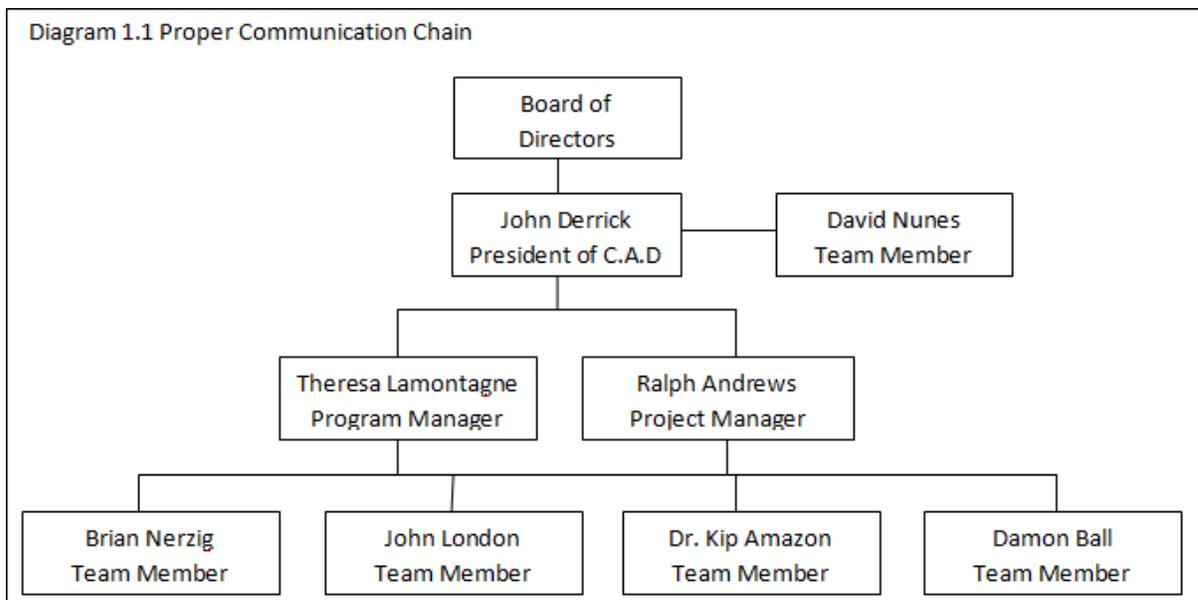
A Share Point site will be created for all team members to access. This site will be updated daily with new information, meeting dates and time, project status and miscellaneous activities dates and time. This site will also host a “blog” to encourage member’s information exchange.

OPEN DOOR POLICY:

The project management team will hold an open door policy for all team members. Team members are encouraged to address any issue with team lead but are welcomed to approach Program or Project Manager.

Communication best practices for Hardware and Software Upgrade

Communication during the Hardware and Software upgrade of the Center for Advanced Diagnostics is very crucial. To be able to stay up to date with the project it will be required to meet as much as possible within each project team to update team leaders. Stakeholders are very interested in the progress of the project and it would be crucial to have monthly update meeting as well as a monthly report due at the beginning of every month of the project. Team leaders who report to the Project manager have to host weekly meeting for progress updates and any change orders that may need to take place.



Since the software that is being implemented is new to the Lab staff communication via hard copy and e-mail is necessary. They must keep up to date on the stages of the project in order to prepare them for the new software. Because training plays a bulk of the project training sessions in the form of retreats would help them adjust to the change. Communication channels must always be opened between all teams during the implementation process. Process updates by team members to managers will make sure project maintains its integrity. Communication diagram (1.1) will provide a guide for proper communication. PCP offices will maintain contact with C.A.D thru E-mail, fax, phone and regular postal mail.

CONFLICT RESOLUTIONS

During project implementation, planning, testing, and even during delivery of product conflicts may occur.

One potential problem that may occur is the lack of communication within departments and team members that can lead to time delay of the project. Communication is the key to a successful project completion. In order to resolve a conflict between team members, it would become necessary for a manager to intervene and use the Compromise technique to resolve the issue. A meeting between the conflicting team members can help the Project or Program Manager to devise a resolution based on the input of the team members. Confronting the two or more team member can help the project manger decide if one team members need to come to a compromise or if the manager has to take charge and force a solution upon them. These actions may work because team member will have

different point of view and sometimes the only solution is to force a resolution upon the conflicting parties.

There may also be a conflict between PCP office and the C.A.D laboratory due to new software or new request procedures. Should this occur during the testing and implementation phase, the manager may have to intervene to design a collaboration plan for both parties. After listening to both parties the decision makers can decide on a resolution that can benefit them. Collaborating would be the best solution because everyone in PCP offices and in the C.A.D. labs have to adjust to the new methods or request and retrieval of result for patients on a timely manner. Manager will incorporate best course of action depending on need or request from parties in conflict, if need be it will also be force in order to complete project in time.

Suggestions to Improve Communication

In order to have effective distribution of information, project managers and project team members must have excellent communications skills. The following are some areas that need to be improved:

- Team members must use e-mail at all times to address any issues, as well as encourage others to report bad news. People have tendency not to say anything when things are not doing good. Also, people can always use different type of media such as phone calls, voicemails, meetings, and website to communicate any issues.

- The project manager must be aware of all the issues related to the project. Consequently, morning meeting are a necessity to follow up the progress and discuss any difficulty. Oral communication helps to build stronger relationships with stakeholders and project personnel.
- **John London** needs to include detailed information regarding technical specifications and how these will affect the software performance. It is important to know about the capabilities and the advancement of the new system. Also, we all agreed that he needs to get more information from all the developers. For that, we recommend him to have more “stand up” meetings. These kind of meetings have no chair, so that force people to focus on what they need to communicate.
- There is an issue that needs to be resolve before we finish this project. The training materials have not arrive as of yet. The printer company is doing arrangement with another printer company to get the material on a timely manner. We need to have all this information before scheduling the training, to know how this will be distributed and get started as soon as possible.
- One of the weaknesses of this project was the lack of developers. The project required a team of at least 50 software developers and analyst to complete. Not many people have experience with medical programming, which is very important to capably make uses of the development time. The incident was reported in a management meeting by Nerzig. Since Nerzig was the most

appropriate to select the personnel, all stakeholders voted for him to accomplish this task. He contacted another company that had hired temporary developers who had some medical programming background. The developers were hired on a contract basis, and the problem was resolved.

- Lastly, during the installation of the new software, the system was showing an error. The problem was reported by London, but it had to be escalated to the developers to correct the misleading message. There are strict rules for the project expenditures and escalations procedures. The error was corrected but delayed the project costing \$50,000.00 over the initial budget. Cost is very important, but not as important as meeting schedule and scope goals.

ISSUE LOG

- **Issue Number** – Number assigned by Project manager
- **Issue Description** – Brief description of issue
- **Risk to Project** – This will be rated as **N** (None) **L** (Low) **M** (Medium) **H** (High)
- **Date Opened** – follow the **mm/dd/yy** format
- **Target Solution Date** – Date when issue is to be completely resolved
- **Owner** – Person responsible for the addressing of issue
- **Assigned to** – Person responsible to resolve issue
- **Status** – **O** (Open) **C** (Closed)
- **Status Update** – Brief information on resolution progress
- **Proposed Resolution** – Brief description of possible resolution
- **Final Resolution** – Brief Explanation of how issue was resolved

Issue Number	Issue Description	Risk to Project	Date Opened	Target Resolution Date	Owner	Assigned To	Status	Status Update	Proposed Resolution	Final Resolution
a-0001	2 Desktop PC Shutting off due to over heating	L	10/29/08	10/31/08	J. London	K. Huni (H. Tech)	C	Replacement hardware shipped by vendor	Replace cooling system	Replaced cooling system
a-0002	Not enough space in description field on module 33-a	L	11/03/08	11/04/08	B. Nerzig	A. Hegi (S. Dev)	O	Task Being assigned	Add 20 ch spaces	
a-0003	Servers KVM switch not working	H	11/03/08	11/05/08	J. London	N. Jones (H. Tech)	O	Contacting vendor for replacement	Deploy new unit	
a-0004	Not enough developers have been hired	H	11/20/08	11/21/08	B. Nerzig	B. Nerzig	C	This may delay the project.	Hire additional contractors.	We had a management meeting, this task was assigned to B. Nerzig. He will hire qualify staff according to the project.
a-0005	Software problems associated w/compatibility	H	11/28/08	12/4/09	J. London	B. Nerzig	C	Cost \$50,000 over initial budget	Changes to the code will be necessary.	There was an error message. The problem was reported by London, but it had to be escalated to the developers to correct the misleading message. The error was corrected but delayed the project costing \$50,000.00 over the initial budget.
a-0006	Material for training not ready	M	12/28/08	1/4/2009	R. Andrews	J. London	O	R.A. emailed and called the printing company on the delay of material for the training. They are having issues with on of their machines, so that they had to ask another printing to do the job for them. We will have to re-schedule the training.	Will have to re-schedule trainings.	

RISK DETERMINATION

The following risks are to be read by the project manager and program managers only. This outline details potential risks which may include specific information about an employee or employee associated project. Information contained in this document is not to be shared with members outside of the immediate group as per H.R. concerns.

Prepared by: Ralph Andrews

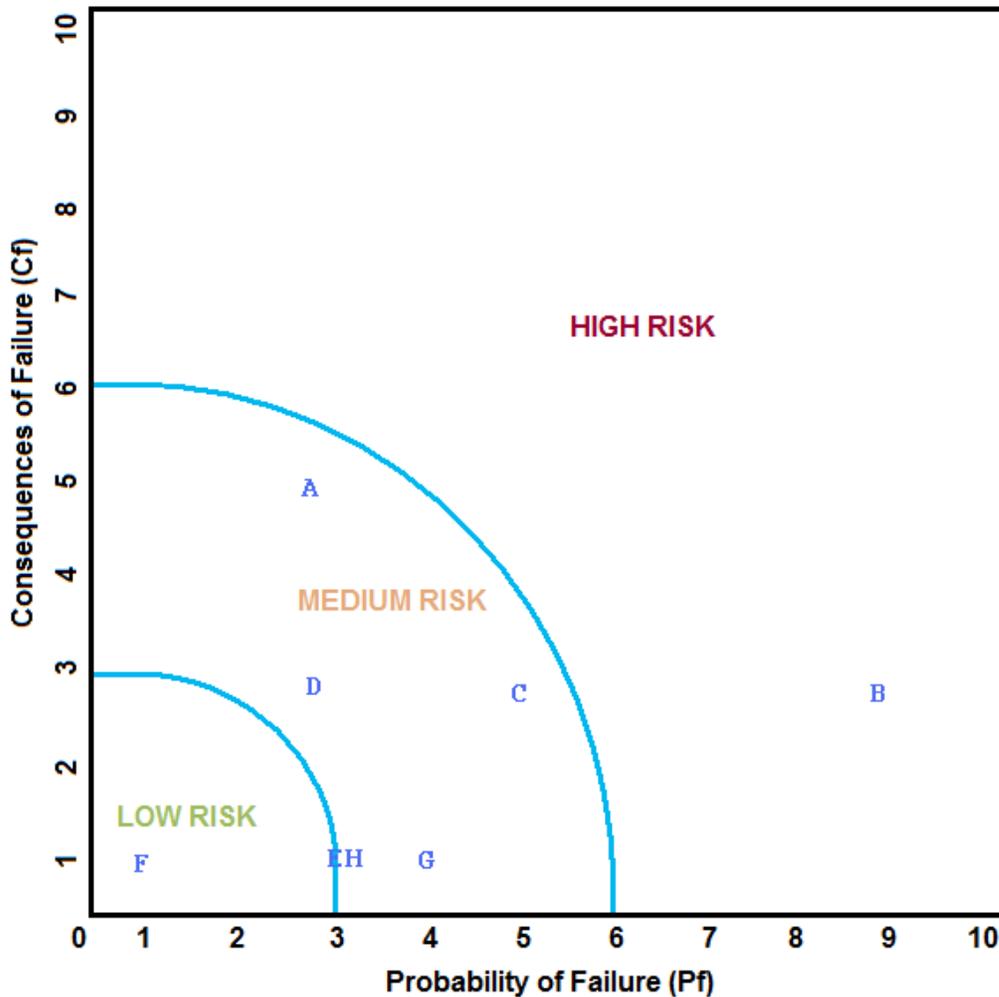
Date: 12/1/2008

RANKING	POTENTIAL RISK
1	<u>Project Completion</u> – if the project is not completed on time, it will increase project costs not substantially, but exponentially. It will also equate to loss of profit and potential loss of long-term business.
2	<u>Old Hardware</u> – The existing hardware and infrastructure is more than 20-30 years old. In the unlikely event that the project must be scrapped, we must be very careful not to damage the existing hardware to ensure its possible continued use.
3	<u>Historical Database</u> – The developers will attempt to convert the existing application’s database (MUMPS) into the newer application’s format. If this fails, we will need to maintain the old system for historical queries.
4	<u>Decreased Productivity</u> – If the new system is rejected by the users, it may lead to reduced productivity in the short term.
5	<u>Health Care Regulations</u> – Our projected future costs include an annual return on investment (averaged by year) to reduce our storage fees for specimen containment. Our move to go digital may not absolve us from specimen storage if the regulations change.
6	<u>Old Hardware Unsellable</u> – To reclaim some of the project costs, we hope to obtain buyers for some of our legacy hardware. If this is not picked up, we will lose some initial return on investment.
POSITIVE RISK	
1	<u>Employee Turnover</u> – Many of the employees have used this current application for twenty or more years. If some of the users are not happy relearning their stations, they may leave the company opening up the position for younger talent with a lower initial salary requirement.
2	<u>Refining Procedures</u> – Although the business process has been outlined numerous times, it is possible that through implementation we may discover redundancy in our procedures. This could lead to reduced operational costs for the business.

RISK REGISTER

Consequence of Failure [Cf] – The scale from 1-10 of severity.
 Probability of Failure [Pf] – The scale from 1-10 of probability.

Consequence (Cf)	Probability (Pf)	RISK ITEM
5	3	A - Project Completion
3	9	B - Old Hardware
3	5	C - Historical Database
3	3	D - Decreased Productivity
1	3	E - Health Care Regulations
1	1	F - Old Hardware Unsellable
1	4	G - Employee Turnover
1	3	H - Refining Procedures



RISK STRATEGY

We have defined several specific risks throughout this project. Each risk has been defined with a probability and consequence as shown in the section above. For each risk, we have defined and outlined a brief summary of our “plan of action” to resolve them should they materialize.

Project Completion – If the project is not completed on time, we have several consultants standing by to assist for development and implementation. At present time, we feel that the project is more than accurately staffed.

Old Hardware – We have several sources for purchase of legacy hardware and our existing infrastructure support is more than adequate to re-vitalize the old systems.

Historical Database – The old database can still be accessed by the old system.

Decreased Productivity – This will resolve itself over time. We have tasked the developers to serve as tech support during the first week of “go-live”. We have also trained several “Master Users”

Health Care Regulations – These are unlikely to change, but it’s unlikely that the old storage items would be grandfathered in. We would simply need to maintain storage for future specimens.

Old Hardware Unsellable – This is of no major significant loss. If we cannot sell the hardware, we will send it to the computer recyclers.

Employee Turnover – We have several part-time staff that are eager to fill full time positions. We have more than enough staffing to compensate. In addition, the local area is rich in health care students so it would be easy to fill new positions (likely at significantly reduced cost).

Refining Procedures – We will be documenting the progress each day to determine if there is a way to enhance the processes.

CONSULTANT CONTRACT:

Below is the template for the contractors hired on as additional resources for the software development portion of the project. All potential candidates will be filtered through Brian Nerzig. They will all undergo a basic security check.

MEDICAL SOFTWARE DEVELOPERS NEEDED

- Experienced Software Developers w/ 10+ years
- Experience in the following languages required:
C#, MUMPS, Cache
- Experience in the following formats required:
HL7, ICD9, CPT, SnowMed

AmeriPath, with the parent company Quest Diagnostics, is now the largest pathology chain in the world. The local branch of AmeriPath is seeking new full-time developers for a one to three month contract in their laboratory implementation process. Only experienced developers need apply, thank you.

Please provide us with:

- Detailed work history in the medical field.
- SS Card / Passport + Drivers License, or Citizenship Papers
- References from previous employers.
- Proof of a Bachelors degree in the Computer Science field.

Note, all resumes must be submitted no later than 10/25/2008 and must be e-mailed to Brian Nerzig at bnerzig@ameripath.com

Thank you for your interest: Ralph Andrews

HARDWARE CONTRACT:

Below is the hardware contract from MicroMaster’s Hardware Emporium. This contract was authorized by the stakeholders and includes all of the hardware necessary for the workstations and server hardware for the new laboratory hardware infrastructure. The dictation hardware was acquired through our existing contract with DynaDict, so no additional contract was necessary.



Hardware Purchasing Contract	Date: 11/08/2009
Workstations.....	65,000
Servers.....	35,000
Maintenance Agreement.....	9,000
<hr/>	
Total: \$	109,000

By signing this agreement, the signer agrees to the requirements as stated in the original hardware request form. All maintenance calls and on-site support will be handled in accordance with the rules and procedures outlined in the company policy disclaimer handout.

Signature: _____ X

Date: _____

Thank you for buying from MicroMaster's Hardware Emporium. The Source for all of your corporate computer and hardware needs! 1-888-555-9121

CONTRACT DEFINITIONS:

In this project, there were several contracts submitted and approved through our stakeholders. The contracts were broken up into two main sections: **HARDWARE**, and **SOFTWARE**.

HARDWARE:

A contract was submitted for acquiring the necessary hardware needed for the installation in the laboratory. The hardware was spec'ed by John London and the initial costs were approved by Ralph Andrews. The costs from this come directly out of the project budget set by the stake holders. This contract also included a maintenance agreement which is supplemented by the President of the lab. This supplement is for the long-term maintenance costs. The initial estimates are included in the cost estimates and final budget. However, an additional maintenance agreement was filed by John Derrick which pads the support for additional staffing outside of the project budget. Although unnecessary, John Derrick requests this additional support for incidental purposes.

SOFTWARE:

A software employment contract was created to fill the additional allocated spaces for software development. All of the positions were developer positions. Each resume was examined, approved or rejected by Brian Nerzig. The contracts are for 1 to 3 months in length which were to be determined on a month by month basis. We may offer to hire one of the contractors in the future for an overtime exempt position stationed at the CAD office. This new position would not be for corporate use.

LESSONS LEARNED REPORT

Prepared by: Ralph Andrews

Date: 1/1/2009

Project Name: Laboratory Hardware / Software Upgrade

Project Sponsor: AmeriPath Inc.

Project Manager: Ralph Andrews

Project Dates: 11/1/2008

Final Budget: \$373,120 (not including maintenance costs)

1. Did the project meet scope, time, and cost goals?

The project was a success. There were several issues along the way (please see issue log and conflict resolution sheets), but the project was completed within budget and the initial cost estimates.

2. What was the success criteria listed in the project scope statement?

The success criteria listed in the project scope statement was: *“The project will be considered successfully completed when the new laboratory software has been successfully implemented, and the new hardware has been installed.”* This criteria was met, and the management and the corporation are happy with the success of the project. There were some initial issues with some of the hardware. Some desktops had overheating issues. This was due to a bad batch of machines shipped to us from the vendor. The cooling systems were replaced and the lab techs were back on schedule.

3. Reflect on whether or not you met the project success criteria.

The project was met with success and all stakeholders are happy. John Derrick (President) is pleased, but still requests additional support until his users are completely confident. Then he would like to move to a stepped down approach to support. He would like additional support (at his cost) and eventually work towards the estimated level of support. Although somewhat unnecessary, he requests this to ensure that in the event of any unforeseen future issues, there will be adequate support.

4. In terms of managing the project, what were the main lessons your team learned?

Things went fairly smoothly on this project. Most of the pieces fell into place as outlined on the original WBS. We found however that there were unaccounted for sections of the project that had not been properly addressed. In the future, we will likely spend additional resources understanding the lab's individual process before implementing the project. Although our research was extensive and quite good, there were a few areas that we hadn't initially accounted for, including printer preferences for the PCPs. We expected them to basically fall in line with our process changes. We also discovered that some PCPs were using the expensive color lab fax printers for printing non-lab related materials. This is explicitly stated in the PCP to laboratory contract.

5. Describe one example of what went right on this project.

There were many aspects of the project that went well. In particular the hardware team had few if any issues implementing the new systems. Few changes were needed in the original assessment. With the exception of some issues related to vender hardware quality, the team functioned flawlessly.

6. Describe one example of what went wrong on this project.

Although software implementation went fairly well, some of the changes related to the PCP to Lab fax system were unaccounted for. Some PCP's requested specific printers that weren't developed for in the initial scope. The PCP's refused to move to the printers we had outlined in our requirements. It was a situation in some cases where we would either lose the long-term business or adjust our contracts. In this manner, we needed additional staffing that exceeded our original scoped resources. This was rectified by Brian Nerzig, but it delayed us a few days. It does not appear as though any revenue was lost as we still completed the project by the end of the scheduled work day.

7. What will you do differently on the next project based on your experience working on this project?

As mentioned above, in future projects it would be advised that we spend additional resources identifying every possible situation with the existing users and the existing office procedures and processes. This may rectify potential future problems related to misunderstandings and contractual agreements.

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