TEAM5OIES

Feasibility Study

Version 2.0

Signature Block

COSC 4351	Name	Signature	Date
SE Team Leader	Obinna Ugwuzor		02/11/18
SE SQA	Shah Zaib		02/11/18
SE SQA	Edison Guevara		02/11/18

Feasibility study content hints:

This document contains the information about the feasibility of the Team Project TEAM5OIES that your team is going to OOA, OOD, and OO Implement.

Find existing similar software products:

- get link,
- get screenshots;
- get technology,
- get interface,
- get cost,

Please remove

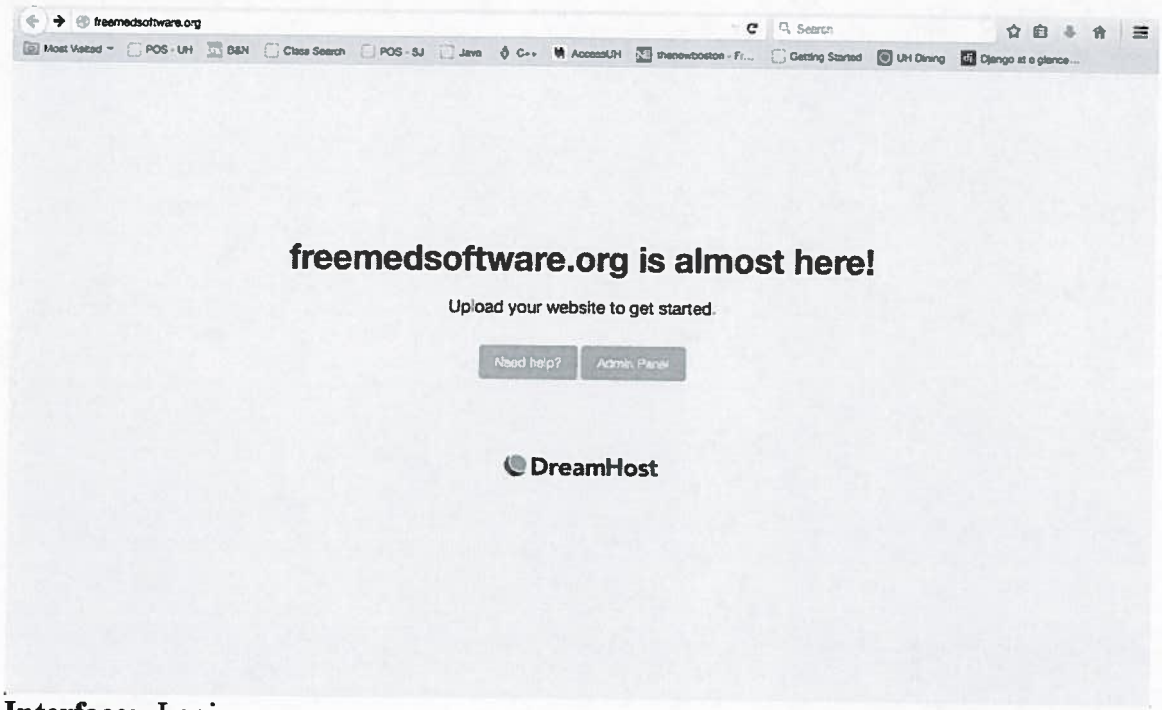
Each team member, including the TL should do this research.
Show good ones versus bad ones, and how they solved some of the technical issues, such as live chat, security.

In the process start PROTOTYPING (find the Artist and Psychologist in your Team) your Team Project TEAM5OIES and decide on the WEB SITE design (MASTER PAGE wireframe), each web page design, colors, pictures, links, etc. There should be actual work on your Team Project TEAM5OIES while investigating similar systems.

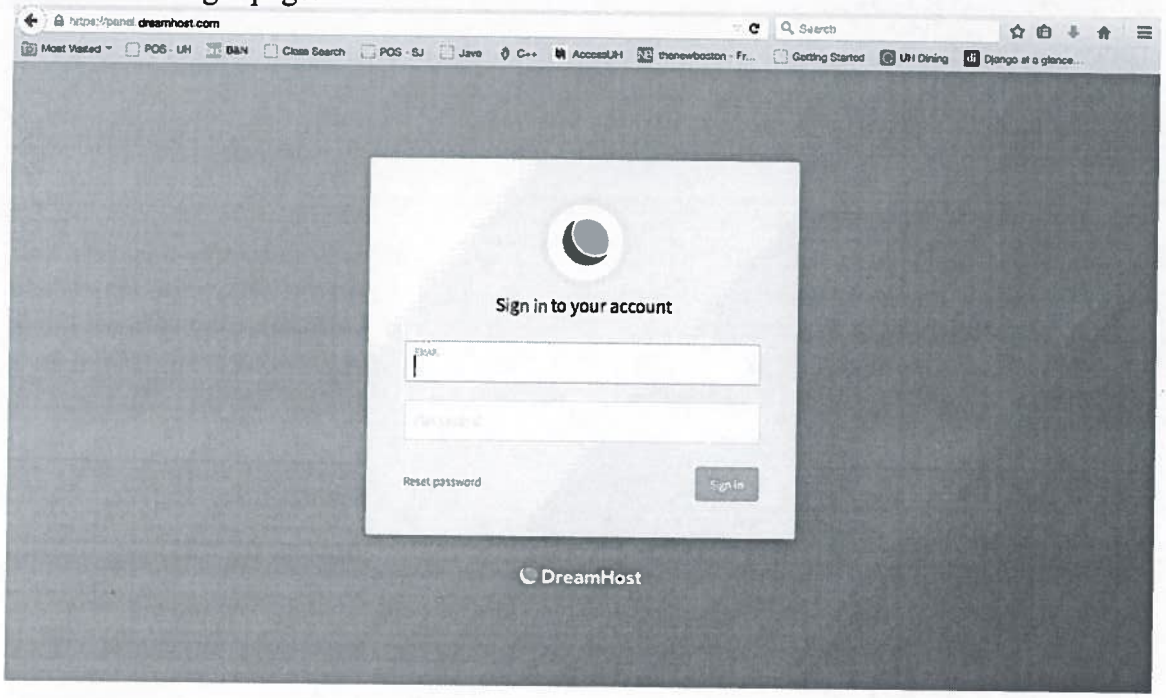
1

***FreeMED**
Link: http://freemedsoftware.org/

Technology:
-Electronic medical record website
-Linux, Apache, MySQL and PHP based website
-Uses REMITT, an electronic, external billing program to translate multiple forms of output to be compiled from the same data base
-Homepage:

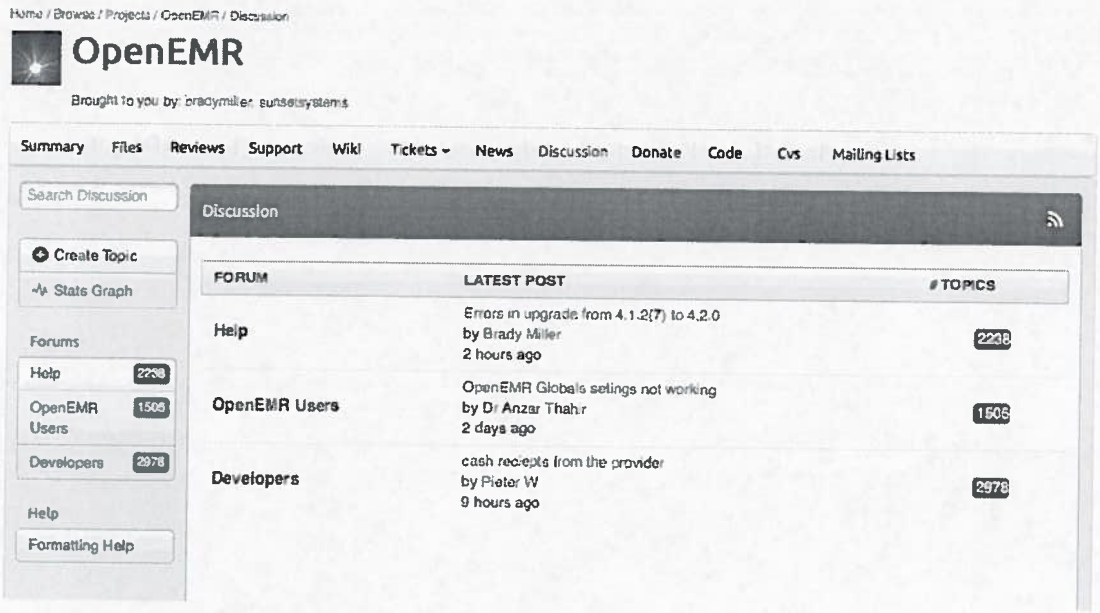


Interface: -Login page:

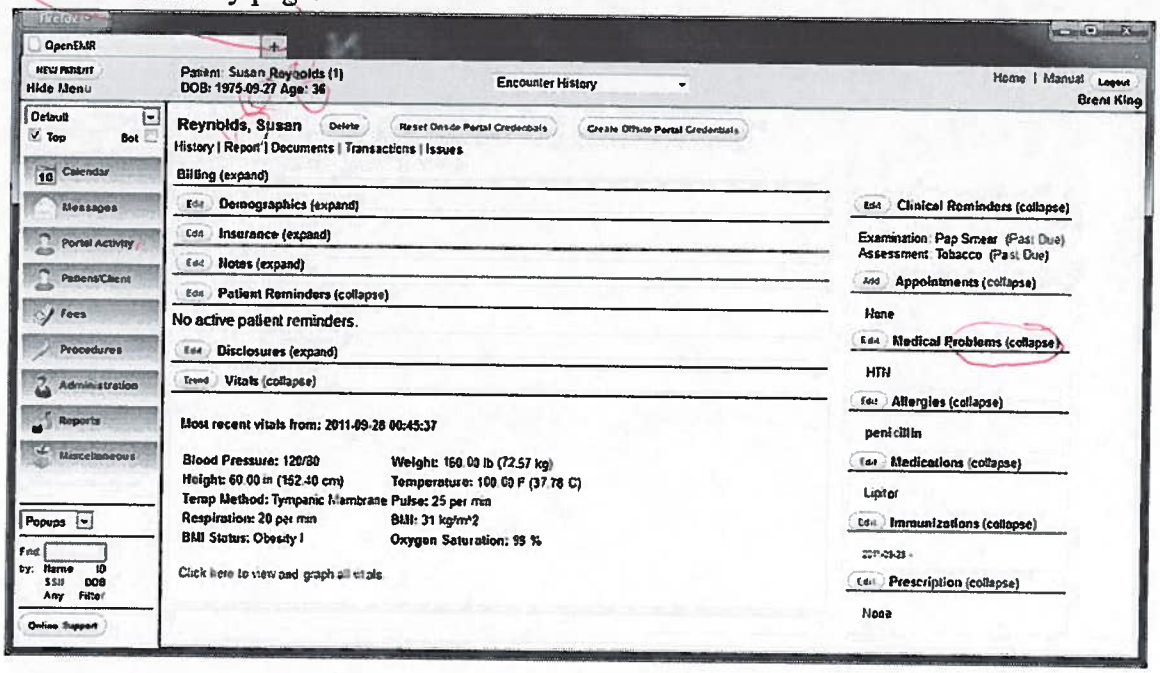


***OpenEMR**
Link: **http://www.open-emr.org/**
Technology: -back end server written in PHP

-Forum/Support page, external link to SourceForge.net:

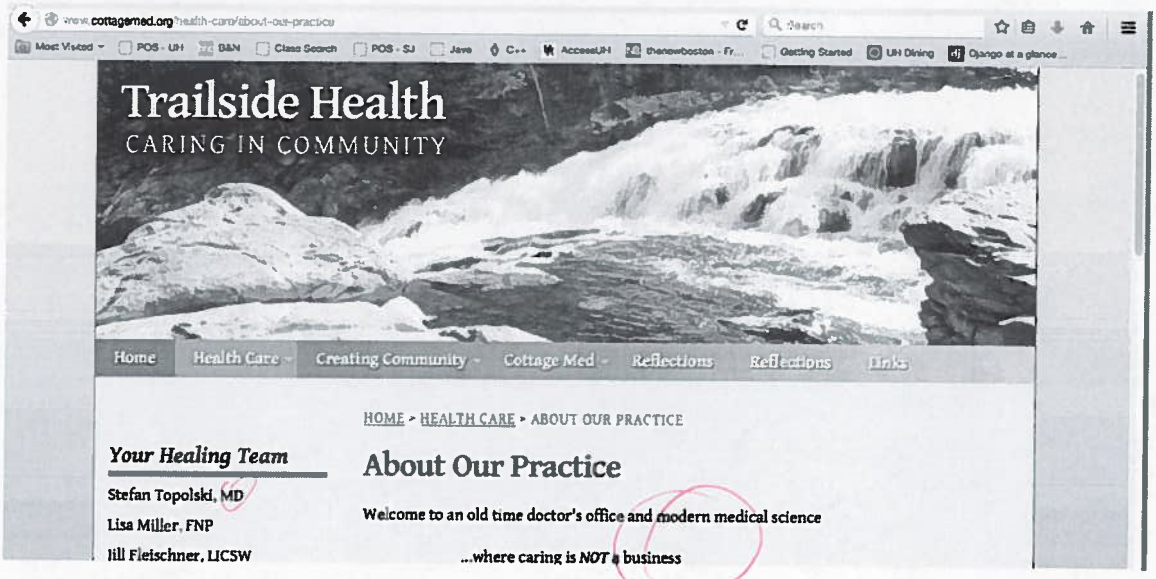


-Patient Summary page:



Not for postprocessing of CT (or any) Medical Drugs

***CottageMed**
Link: http://www.cottagemed.org/
Technology:-uses FileMaker for it's DBMS which is mainly a MySQL based server
-AboutUs page/page layout:


www.cottagemed.org/health-care/about-our-practice
Trailside Health
CARING IN COMMUNITY
Home
Health Care
Creating Community
Cottage Med
Reflections
Reflections
Links
HOME > HEALTH CARE > ABOUT OUR PRACTICE
Your Healing Team
Stefan Topolski, MD
Lisa Miller, FNP
Jill Fleischner, LICSW
About Our Practice
Welcome to an old time doctor's office and modern medical science
...where caring is NOT a business

Introduction

Purpose

The purpose of this is study is to examine software to aid in the assistance of creating a web based system with a large database backend.

Problem

We've been asked to design a system which will allow uploading of patient preoperative and postoperative long term follow-up EVAR Data. The client has asked that the system be designed with the following specifications in mind:

- The EVAR Data must be Anonymized by the system
- The system must manage EVAR CT Slice Data with proper annotations and endograft characteristics. The data is approximately 1GB in size per patient and is uploaded by the user.
- EVAR CT metadata must be able to be uploaded into the database from a Microsoft Excel file.
- The EVAR CT data in the system must be viewable. Information related to the patient, study, series, or slice information must be available as well as graphical representation of the data.
- Patient, study, and series information must be searchable in the database according to their unique identifiers.
- Reproduce selected, or viewed, data into an Excel file upon request.
- The EVAR Data must be downloadable for image analysis and CFD flow simulations. The results of the image analysis and flow simulations will later be uploaded into the database.
- Paraview, an open-source software, must be integrated with the system in order to view velocity, pressure, and wall shear stress as requested.
- The system must have a workflow integrated to e-mail the appropriate surgeon regarding available anatomical and functional analysis results.

Due to the unique nature of the data, and scope of the project, research was conducted on the basis of finding a flexible file management system for medical study and patient information management. A purposed solution for software to be used as the framework for this project is Caisis. The remainder of this report will discuss the extent at which this software meets the problem specifications.

Discussion

Background Information

Caisis is an open source, web based, patient data management system with a focus in cancer research. Despite the focus in cancer research, Caisis was developed as an open source software in order to provide the framework for a system capable of integrating patient information and research data. The software and necessary documentation can be downloaded on their website: http://www.caisis.org/

Features

- Eforms for Data Collection
- Data Workflows
- Data Analysis with support with charting and Exporting to Excel/Access

Requirements

- Web Server
  - Web Server Windows 2000 or above
  - IIS 6 and above
  - Microsoft .NET Framework 3.5/4.0
- DataBase
  - Microsoft SQL Server 2008+

Security

Caisis has stated the following in regards to its software security:

> "The Caisis security system strictly adheres to the guidelines set forth by HIPAA. Steps have been taken to limit unauthorized access to patient data, or other security and confidentiality breaches. Once logged into the application, users can prevent unapproved access to entire sections of data."

Interface

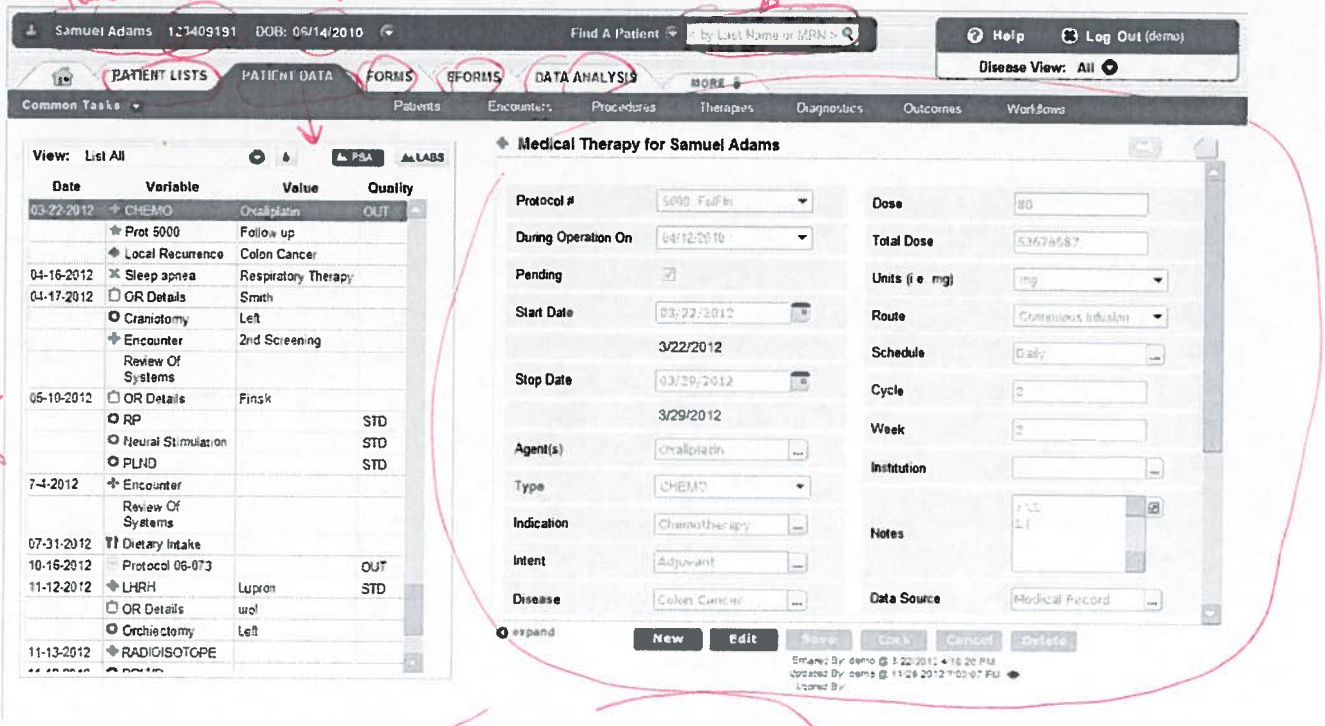


***Figure 1**: Patient Data Input Forms*

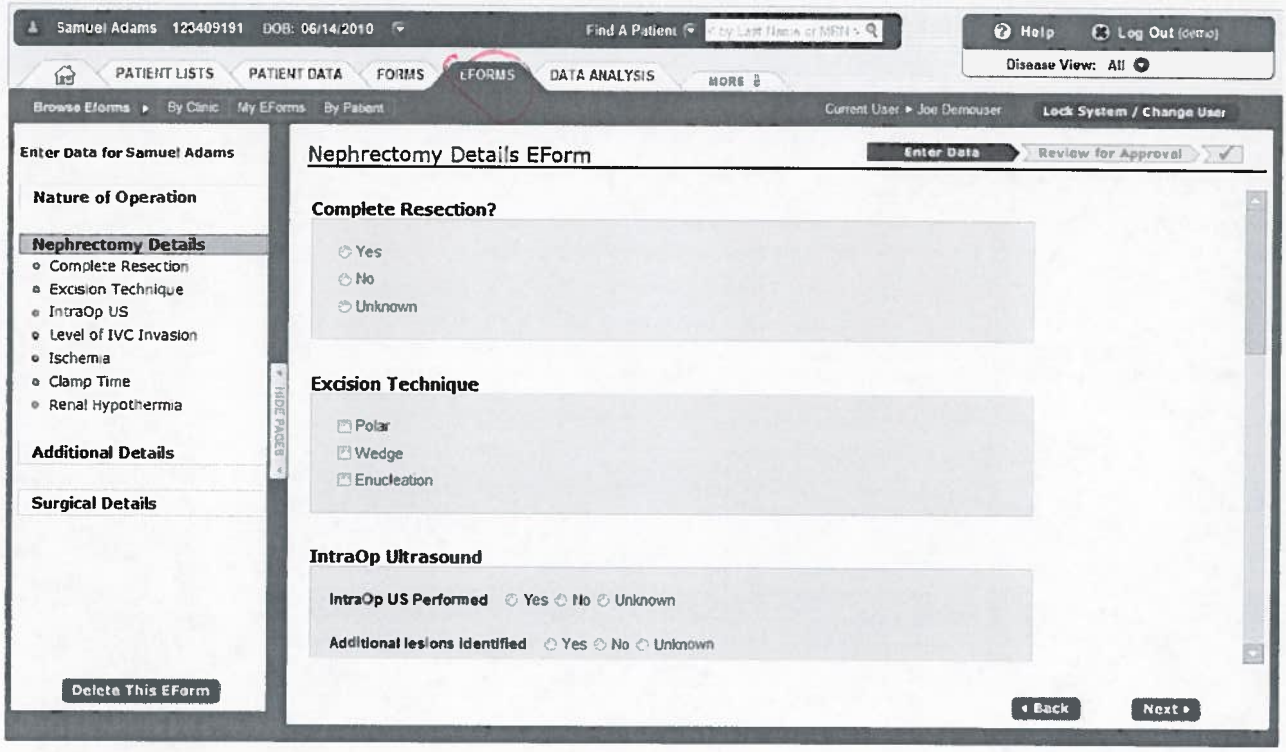


***Figure 2**: Data Workflows Pertaining to the Nature of the Operation*

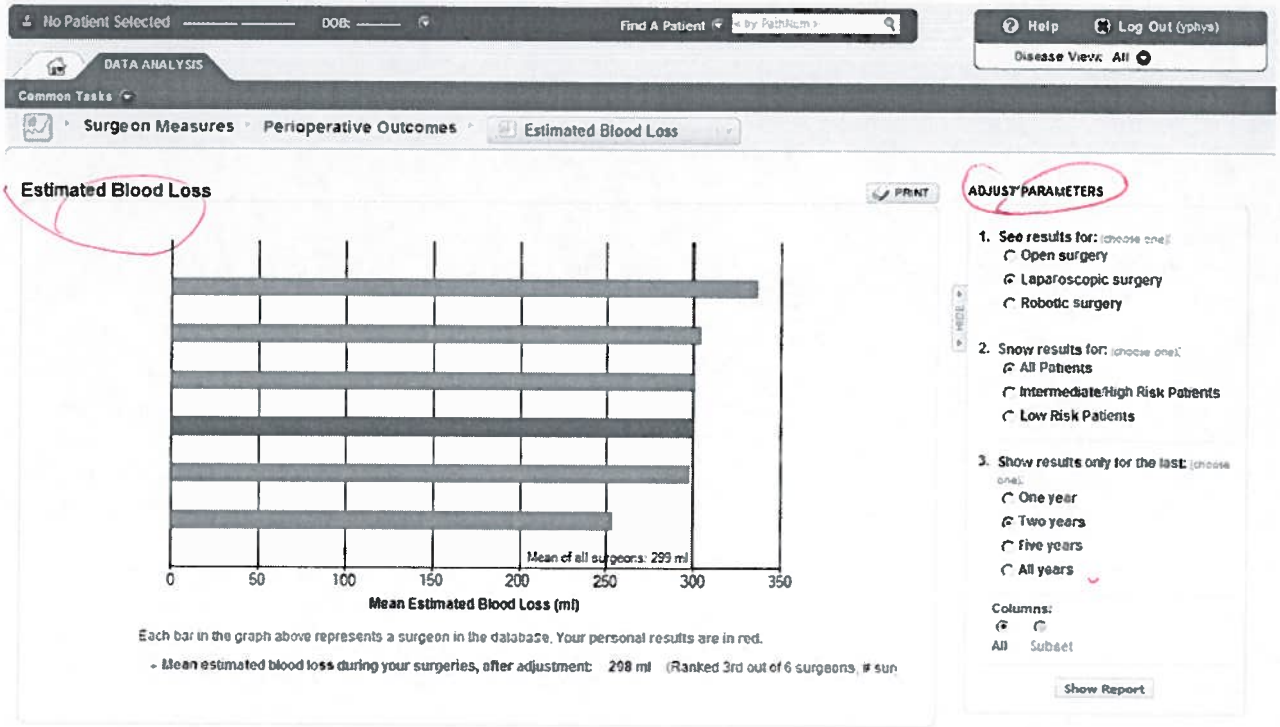
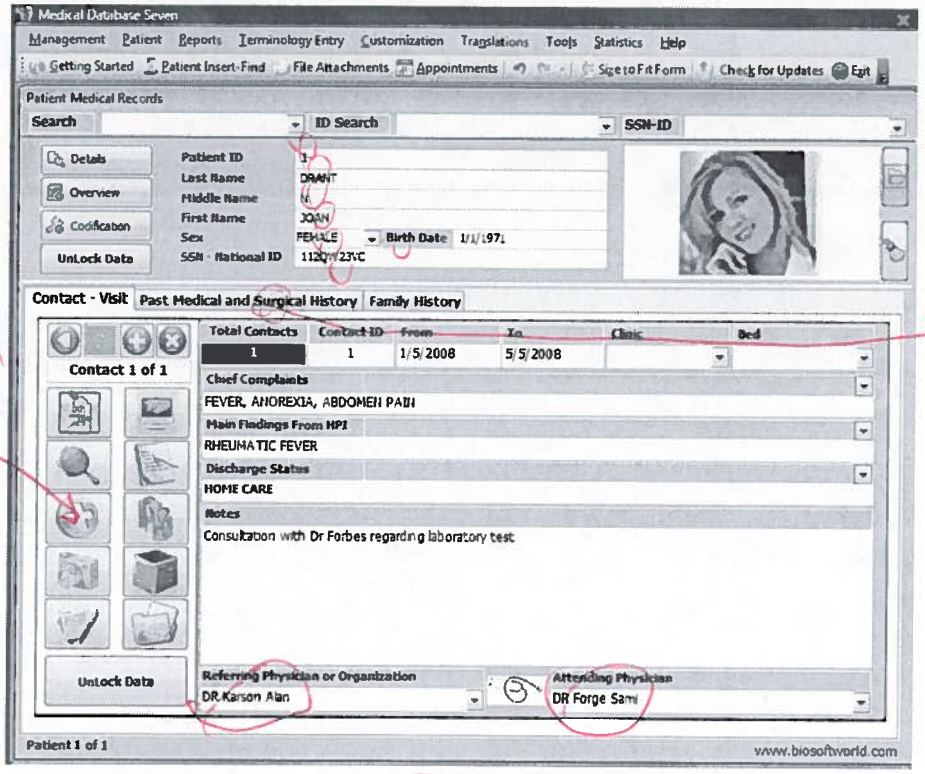


***Figure 3**: Graphical Analysis of Patient Data in the System w/ Filters*

Medical Database Seven:
Link: http://www.biosoftworld.com/Features/Medical-Database-Seven.html

Technology: Desktop application frontend
SQL database backend

Interface:



Pricing:

- **1** Workstation: **$119.95**
- **2 - 4** Workstations: **$79.95** per license.
- **5 - 8** Workstations: **$69.95** per license.
- **9+** Workstation: **$59.95** per license.

DOCUMENT CONTROL

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (all SQAs)

Revision	Name	**Due Date**	**Description**
1.A	TM Johnathan Hornik	02/09/2015	Complete Document
1.B	TM Hector Reyna	02/09/2015	Complete Document
1.C	DBA Jessica Balanag	02/09/2015	Complete Document
1.X	SQA Edison Guevara	02/09/2015	Review Document
1.Y	SQA Shah Zaib	02/09/2015	Review Document

Table 2: Entries when work completed (SVN Commit Comment matches Description)

Revision	Name	**Completed Date**	**Description**
1.B	TM Hector Reyna	02/09/2015	I Completed Document
1.C	DBA Jessica Balanag	02/08/2015	I Completed Document
1.X	SQA Eddie Guevara	02/09/2015	I reviewed Document
1.Y	SQA Shah Zaib	02/09/2015	I reviewed Document

Table 3: TL entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	**Due Date**	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in SVN at https://svn.cs.uh.edu/svn/cosc4351/team5/TEAM PROJECT DELIVERABLES/**Feasibility Study.doc**.

TEAM5OIES

Input Forms and Output Reports

Version 2.0

Signature Block

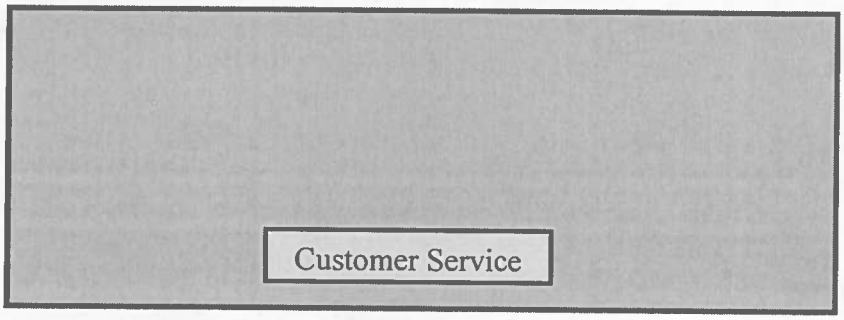
COSC 4351	Name	Signature	Date
SE Team Leader	Obinna Ugwuzor		02/11/15
SE SQA	Edison Guevara		02/10/15
SE SQA	Shah Zaib		02/4/15
SE Team Leader			
SE SQA			
SE SQA			
SE Team Leader			
SE SQA			
SE SQA			

UC1: CustomerService

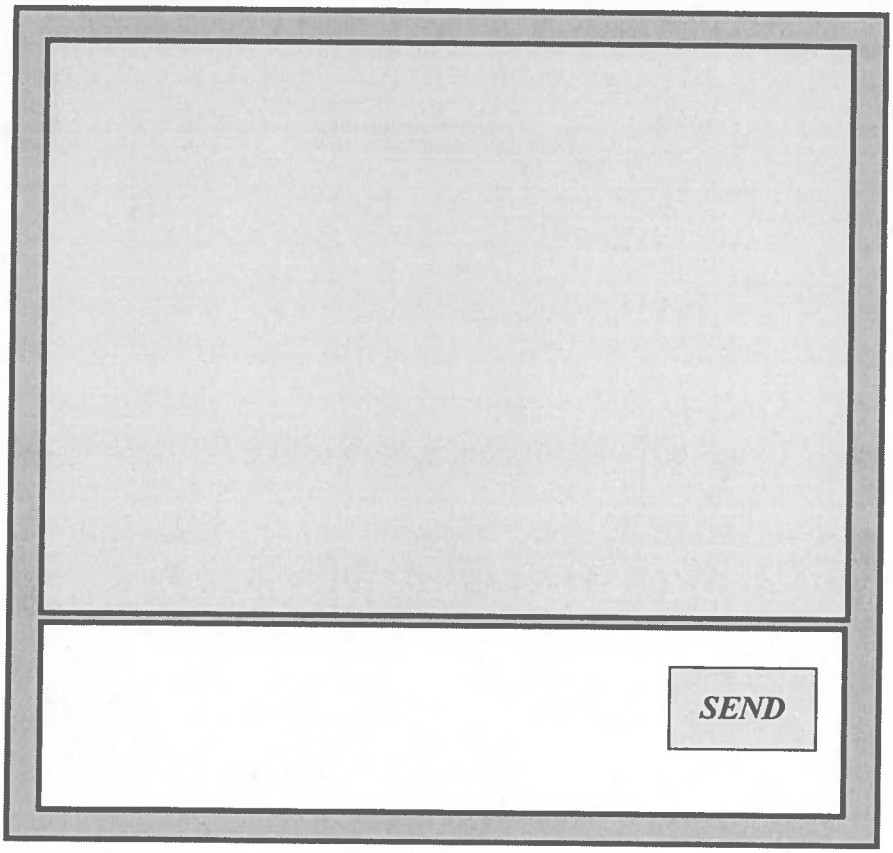
Actor: Visitor, Administrator, SuperAdministrator

A visitor may request to start an online chat with customer service by clicking on the Customer Service tab. After they push the tab on the site, a chat window will open.

Input Form:



Output Report:

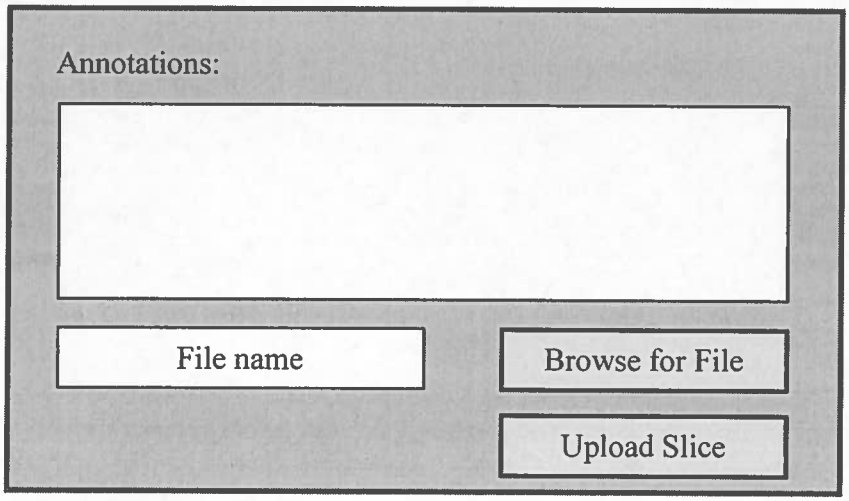


UC2: UploadSlice

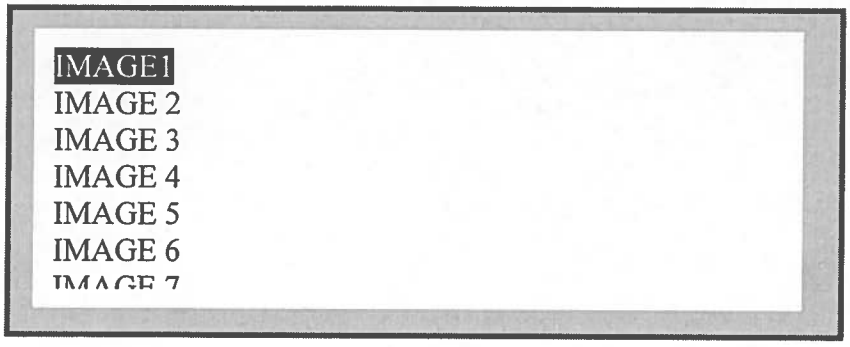
Actor: Technician, Doctor, Administrator, SuperAdministrator

Once the actors decide to upload an EVAR CT Slice into the database, they are presented with the following view. To see a list of possible files to upload, the actor will click Browse for File. They are then able to browse a list of files. The file name will show up in the blank. There is also room for annotations regarding the upload. They then press upload slice.

Input Form:



Output Report:

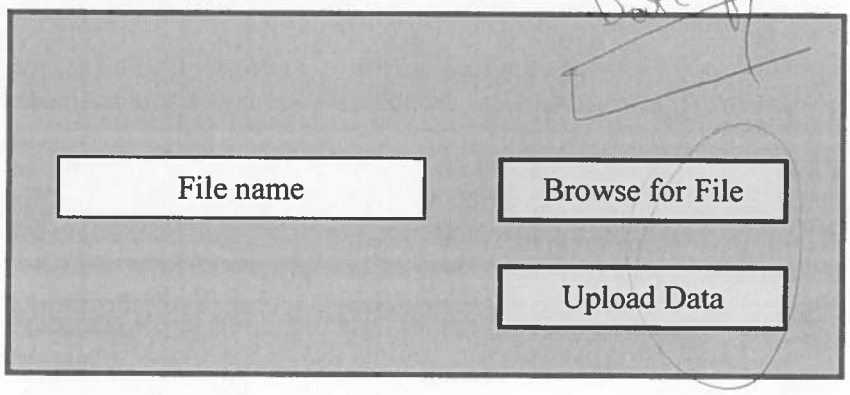


UC3: UploadMetaData

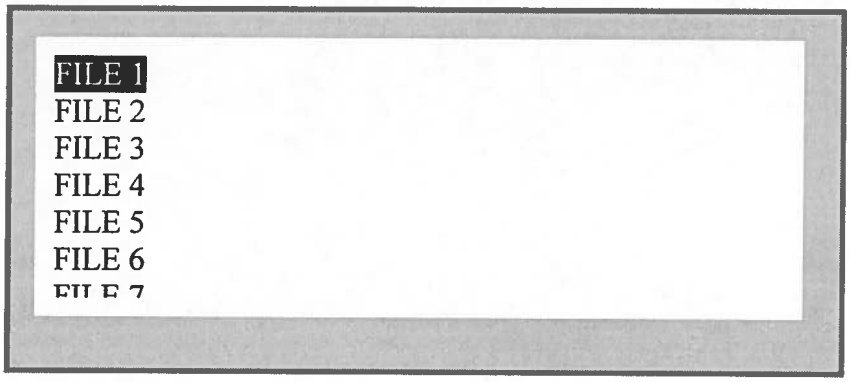
Actor: Technician, Doctor, Administrator, SuperAdministrator

Once the actors decide to upload Excel file5555 containing metadata, they are presented with the following view. To see a list of possible files to upload, the actor will click Browse for File. They are then able to browse a list of files. The file name will show up in the blank. They then press upload.

Input Form:



Output Report:

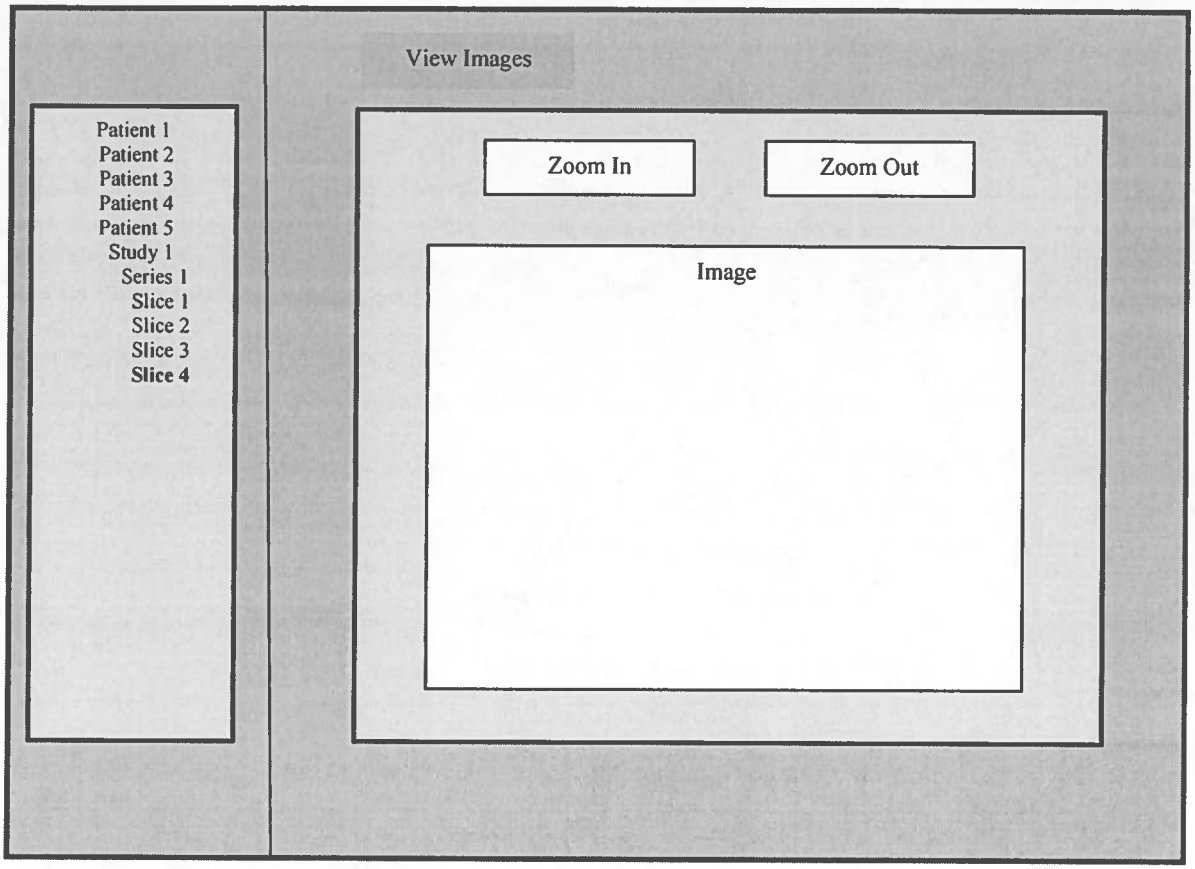


UC4: ViewCT

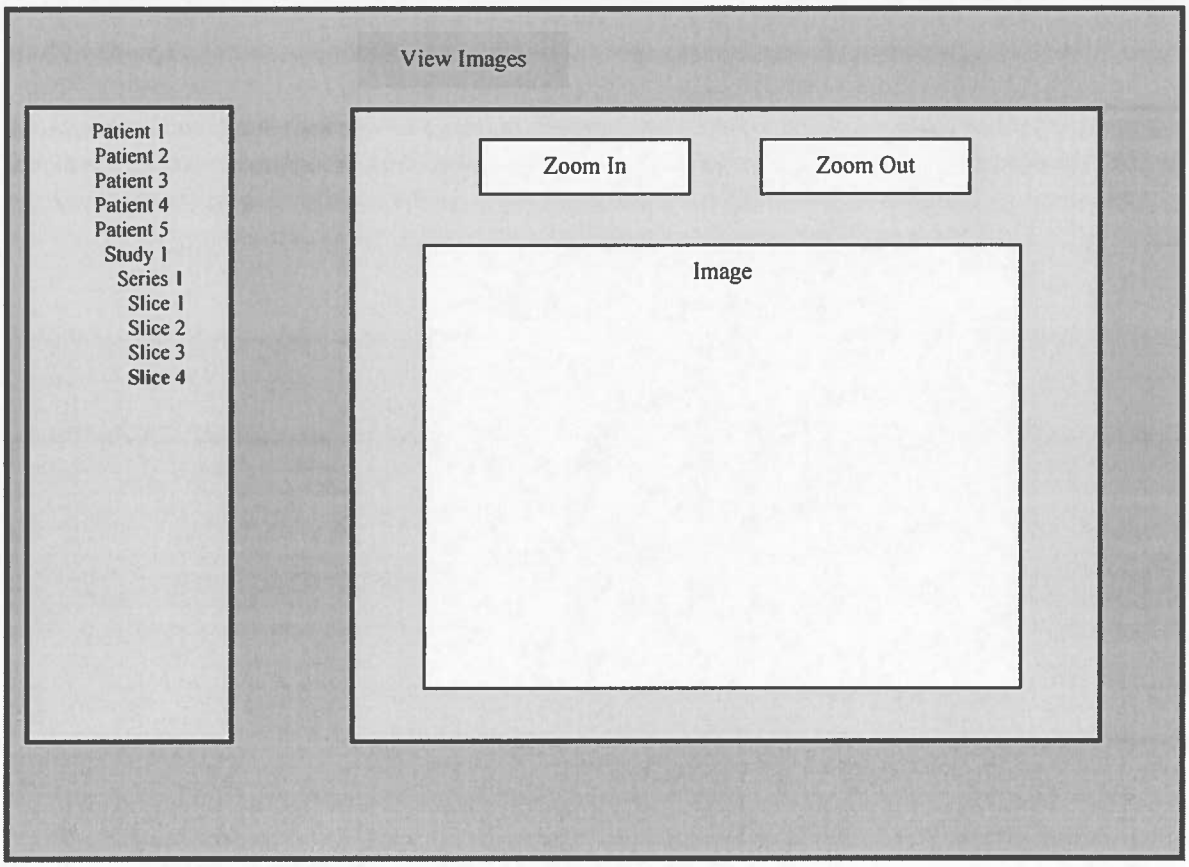
Actor: Doctor, Administrator, SuperAdministrator

The actor may use the panel on the left side to select a patient, the study, series, and then slice to view. The slice will then appear on the right. The user can chose to zoom in and out of the image.

Input Form:



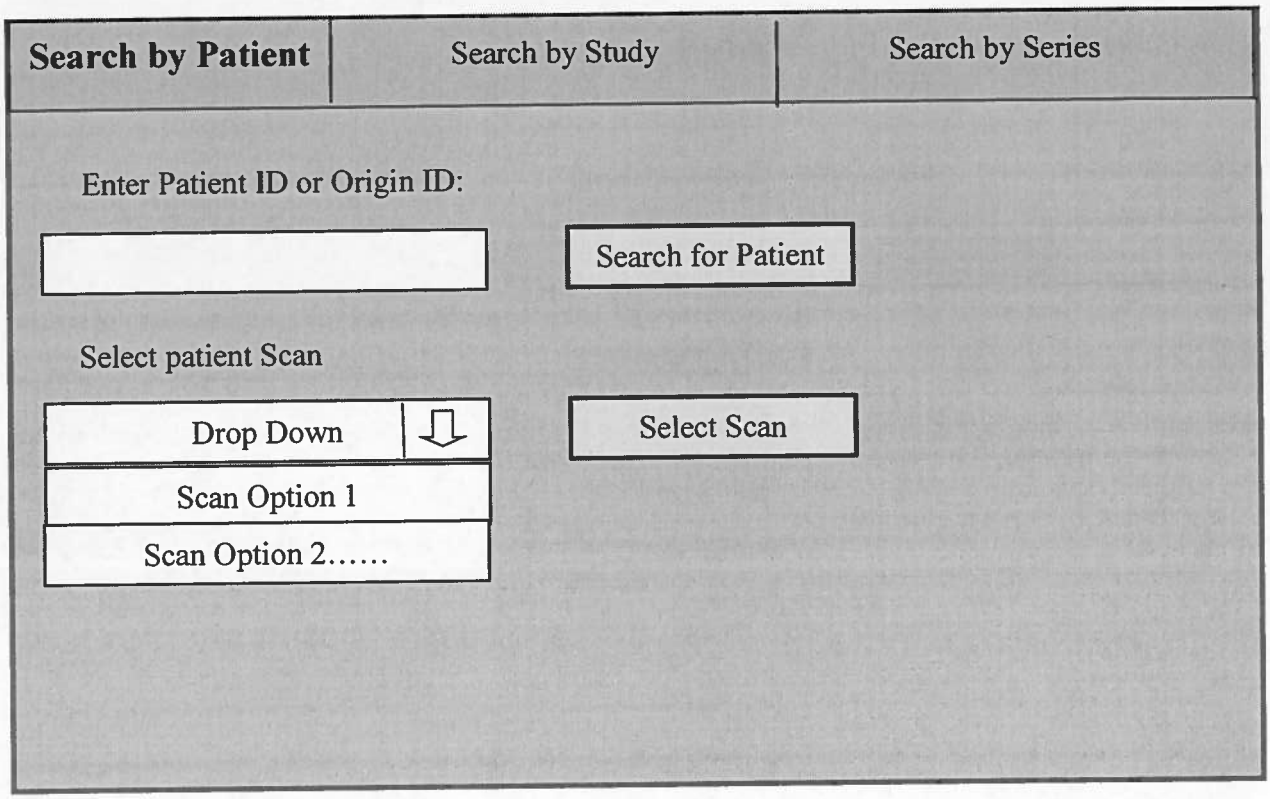
Output Report:



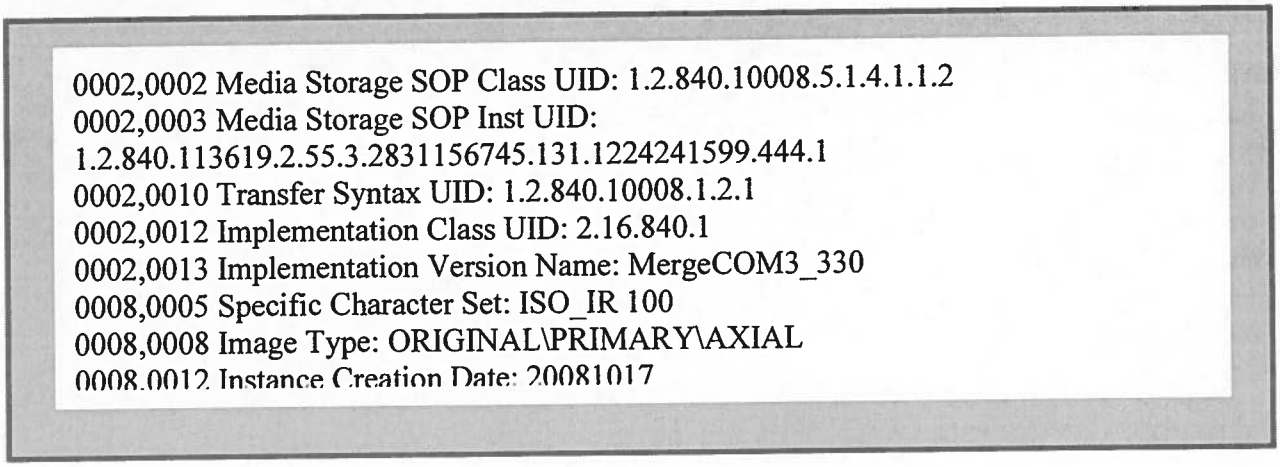
UC5: SearchDB

Actor: Doctor, Administrator, SuperAdministrator
The actors are able to Search by Patient, Study, or Series. They first select the correct tab from the top. If choosing Search by Patient, the actor can search for the patient by patient ID or origin ID. Then press Search. The available scans for that patient will then show up on the drop box to be selected. They then press Select Scan.

Input Form:

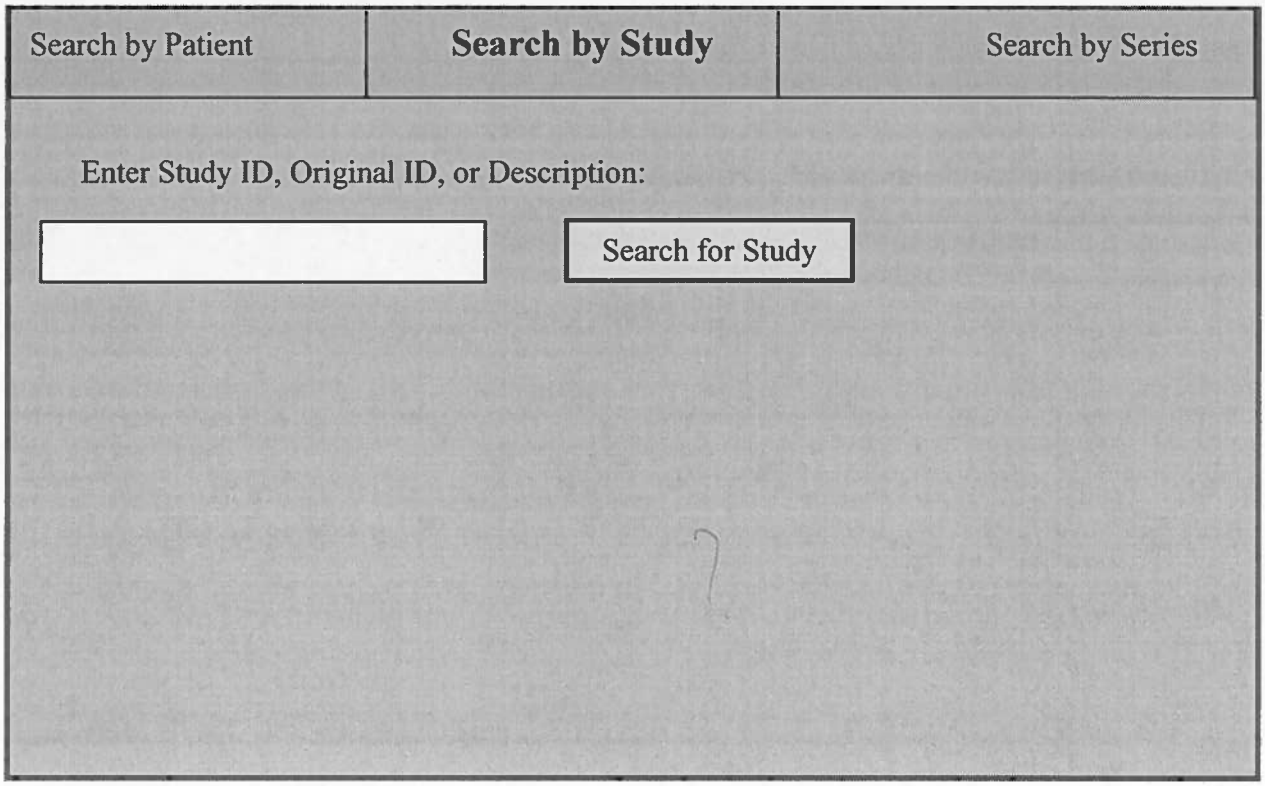


Output Report:



The actors are able to Search by Patient, Study, or Series. They first select the correct tab from the top. If choosing Search by Study, the actor can search for the study by study ID, original ID, or description. Then press Search for Study.

Input Form:

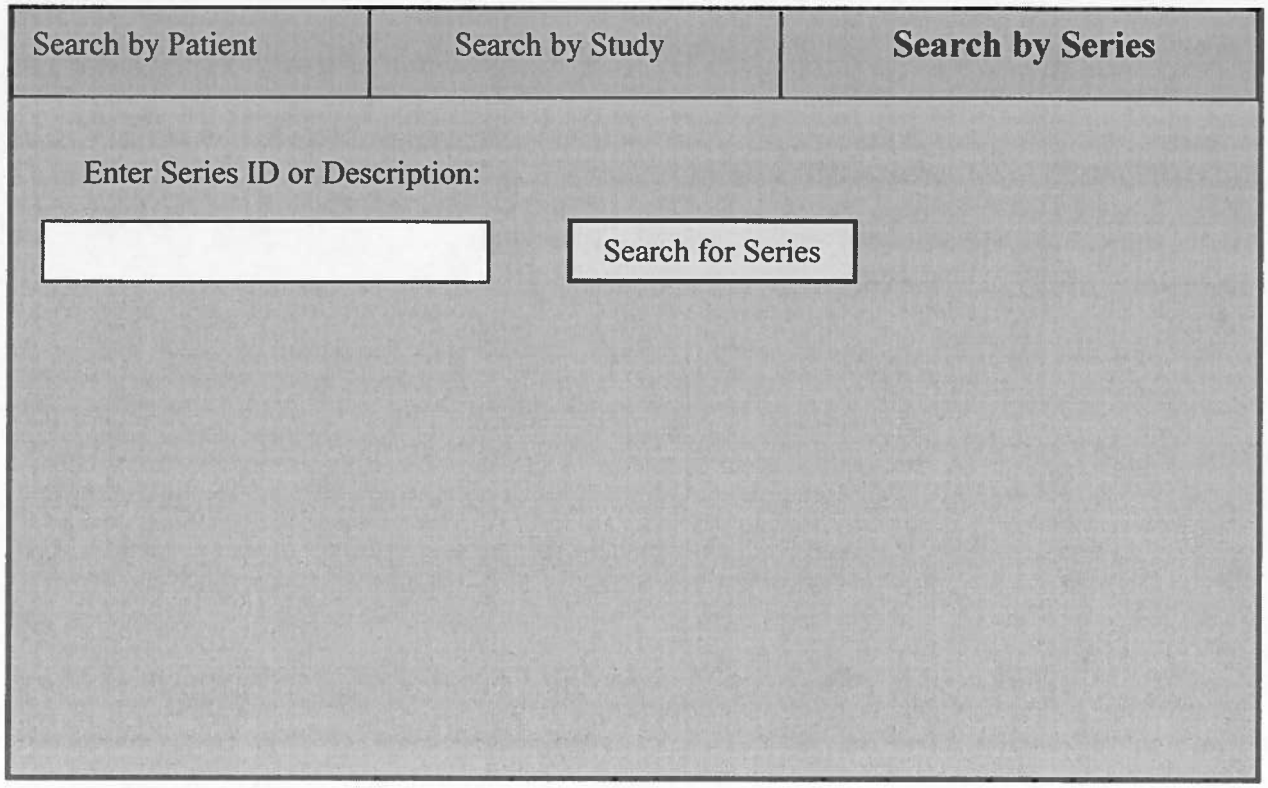


Output Report:

0002,0002 Media Storage SOP Class UID: 1.2.840.10008.5.1.4.1.1.2
0002,0003 Media Storage SOP Inst UID:
1.2.840.113619.2.55.3.2831156745.131.1224241599.444.1
0002,0010 Transfer Syntax UID: 1.2.840.10008.1.2.1
0002,0012 Implementation Class UID: 2.16.840.1
0002,0013 Implementation Version Name: MergeCOM3_330
0008,0005 Specific Character Set: ISO_IR 100
0008,0008 Image Type: ORIGINAL\PRIMARY\AXIAL
0008,0012 Instance Creation Date: 20081017

The actors are able to Search by Patient, Study, or Series. They first select the correct tab from the top. If choosing Search by Series, the actor can search for the series by series ID or description. Then press Search for Series.

Input Form:



Output Report:

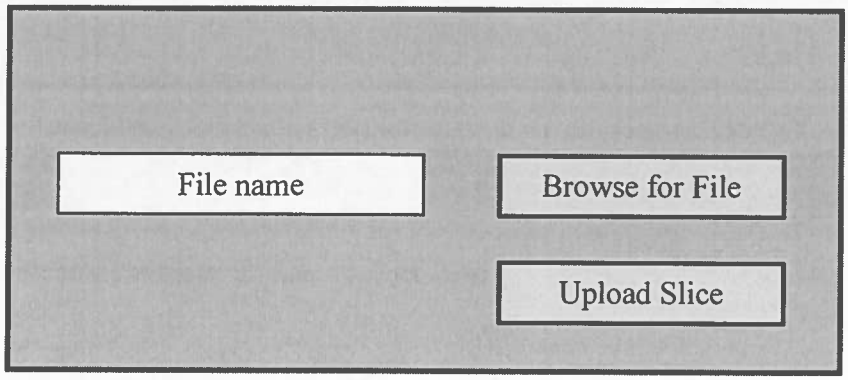
0002,0002 Media Storage SOP Class UID: 1.2.840.10008.5.1.4.1.1.2
0002,0003 Media Storage SOP Inst UID:
1.2.840.113619.2.55.3.2831156745.131.1224241599.444.1
0002,0010 Transfer Syntax UID: 1.2.840.10008.1.2.1
0002,0012 Implementation Class UID: 2.16.840.1
0002,0013 Implementation Version Name: MergeCOM3_330
0008,0005 Specific Character Set: ISO_IR 100
0008,0008 Image Type: ORIGINAL\PRIMARY\AXIAL
0008,0012 Instance Creation Date: 20081017

UC6: ProduceFile

Actor: Technician, Doctor, Administrator, SuperAdministrator

The actor can produce an excel file with requested information from the database.

Input Form:



Output Report:

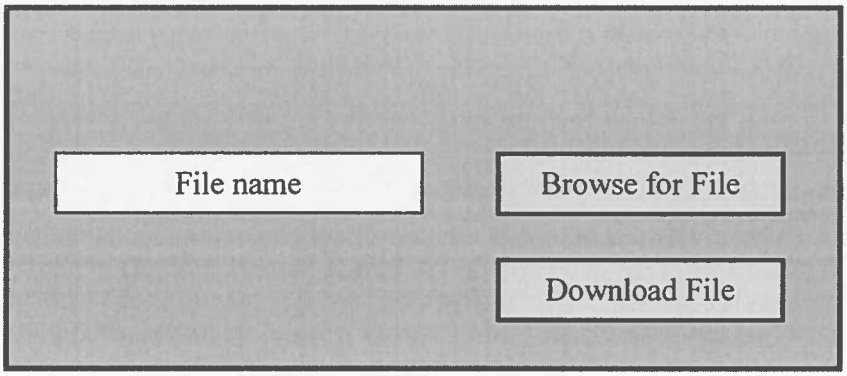
Patient ID	Size	YearsInStudy	Doctor	etc.	etc.	etc
xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx
xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx

UC7: DownloadCT

Actor: Administrator, SuperAdministrator

The actor can download the image analysis and perform an automatic quantitative image analysis on the 3D reconstruction which will extract 7 measurements.

Input Form:



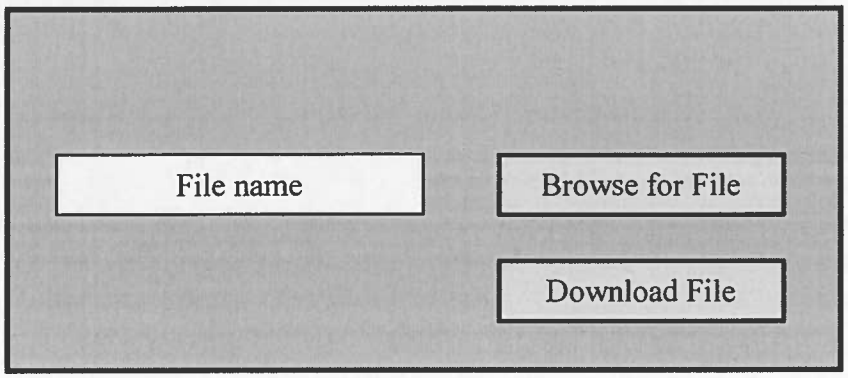
Output Report:

UC8: DownloadData

Actor: Administrator, SuperAdministrator

The actor can download CFD flow simulations which will be stored back into the database. CFD simulations provide indicators that help to improve the understanding of the interaction between the aorta, the flow characteristics and the endograft. Simulation files for pressure, velocity, and wall shear stress will be generated during this step

Input Form:



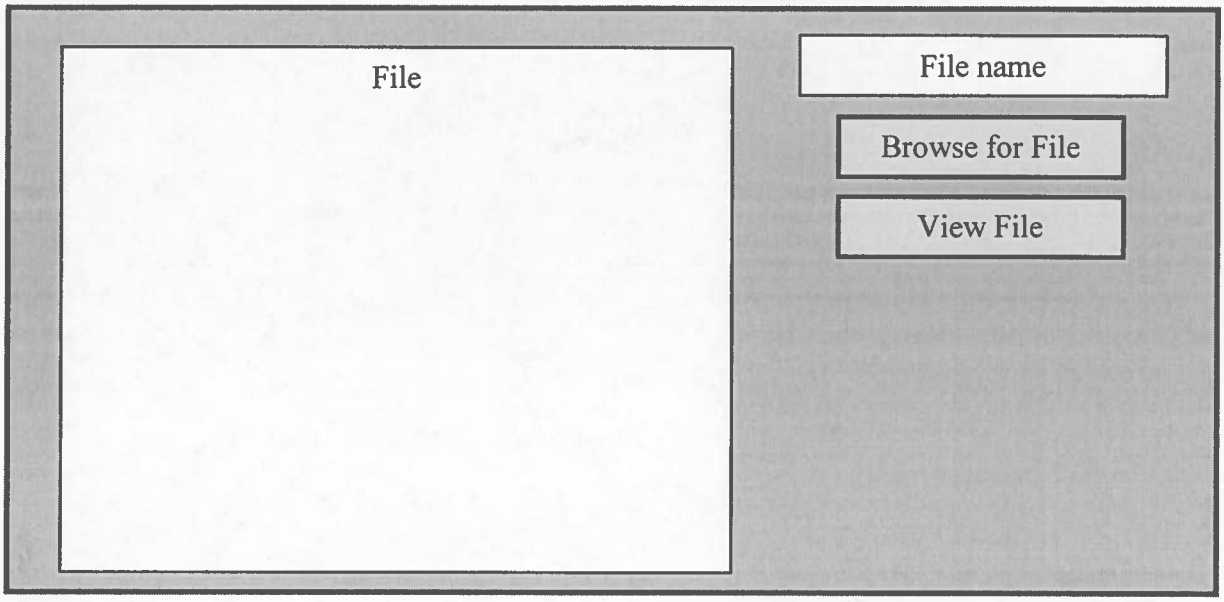
Output Report:

UC9: ViewWithParaview

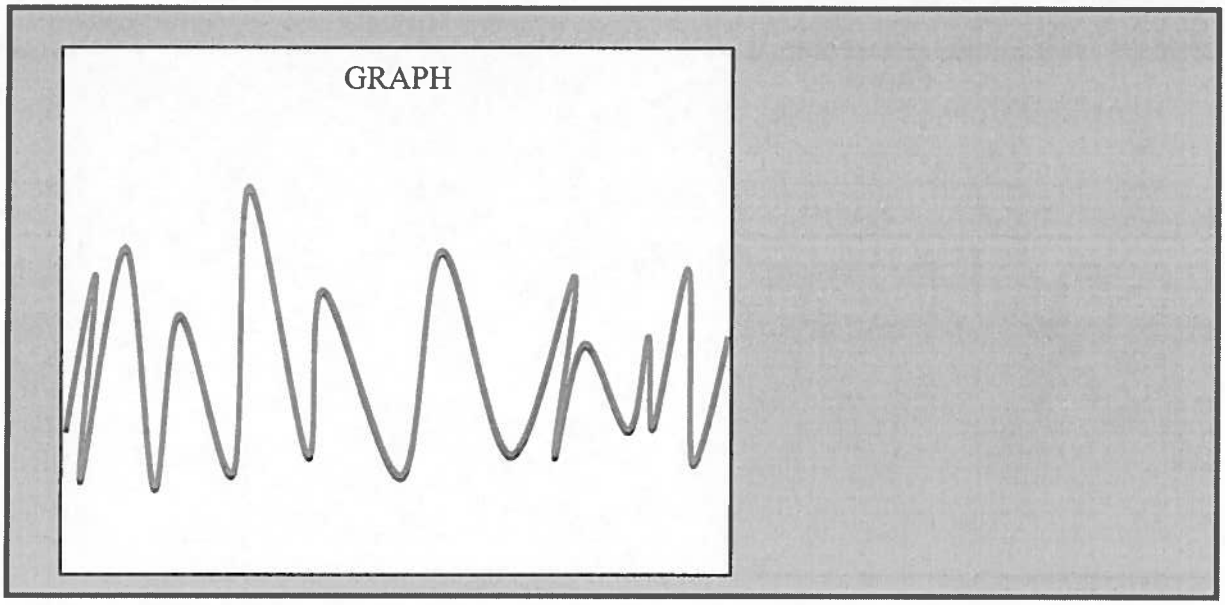
Actor: Doctor, Administrator, SuperAdministrator

The actor can view .vtu pressure, or velocity, or wall shear stress with Paraview, on open source software

Input Form:



Output Report:

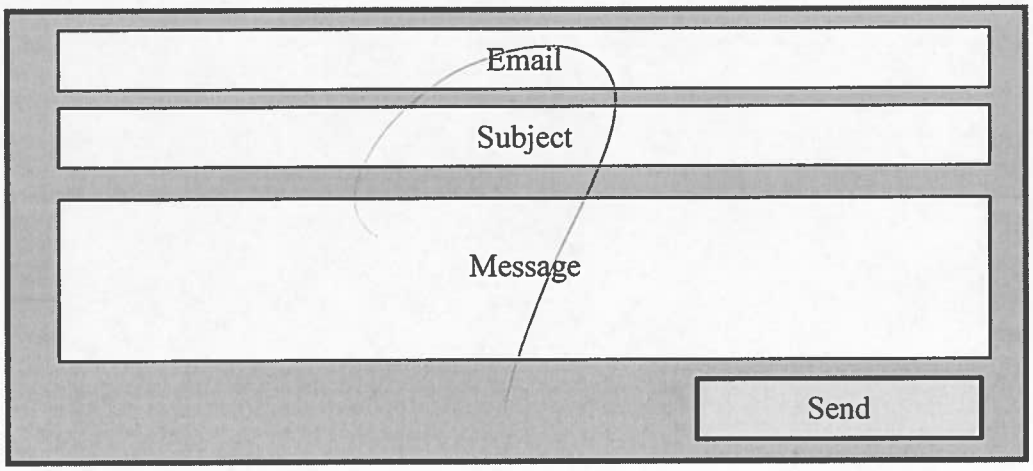


UC10: TriggerEmail

Actor: Administrator, SuperAdministrator

The Actor can trigger an email that can be sent to the appropriate surgeon informing him/her that the anatomical and functional analysis results are ready to be viewed.

Input Form:



Output Report:

DOCUMENT CONTROL

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (all SQAs)

Revision	Name	**Due Date**	**Description**
1.A	TM Michelle George	02/09/2015	Complete input form
1.B	TM Joe Lu	02/09/2015	Complete input form
1.C	DBA Jessica Balanag	02/09/2015	Complete output report
1.X	SQA Edison Guevara	02/09/2015	Review Document
1.Y	SQA Shah Zaib	02/09/2015	Review Document

Table 2: Entries when work completed (SVN Commit Comment matches Description)

Revision	Name	**Completed Date**	**Description**
1.A	TM Michelle George	02/05/2015	I completed input form
1.B	TM Joe Lu	02/05/2015	I updated the input form
1.C	DBA JESSICA BALANAG	02/09/2015	I completed the output report
1.X	SQA Edison Guevara	02/09/2015	I reviewed Document
1.Y	SQA Shah Zaib	02/09/2015	I reviewed Document

Table 3: TL entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	**Due Date**	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in SVN at https://svn.cs.uh.edu/svn/cosc4351/team5/TEAM PROJECT DELIVERABLES/**Input Forms and Output Reports.doc**.

Same due dates?

No TOC -10

TEAM5OIES

Team Project Report

-2
-3

90

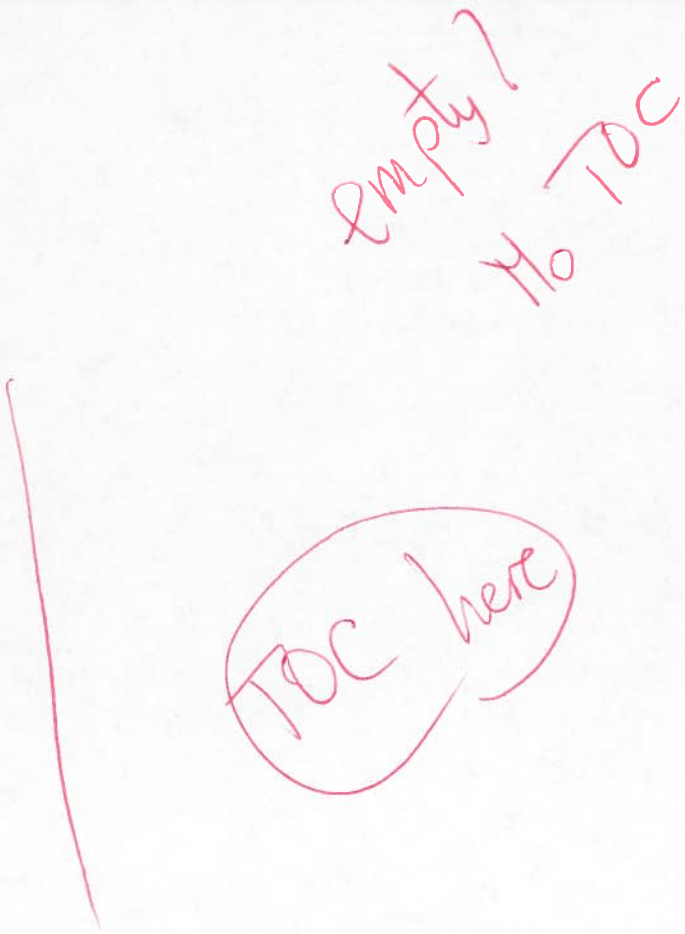
TL
Note: please copy Tables 1,2,3 and use for Purple Teams Iteration changes
-2

-10

Version 2.0

Signature Block

COSC 4351	Name	Signature	Date
SE Team Leader	Obinna Ugwuzor		
SE SQA	Edison Guevara	Edison Guevara	02/11/15
SE SQA	Shah Zaib	Shah Zaib	02/11/15
SE Team Leader			
SE SQA			
SE SQA			
SE Team Leader			
SE SQA			
SE SQA			


empty?
No TOC
TOC here

Report Format and Content

Chapter I: Introduction to TEAMSOIBS

A. Introduction

The purpose of this project is to create a database for the surgeons to place EVAR information about their patients. The database will automatically anonymize the patient's information to protect their confidential information. Surgeons and other authorized users will be able to upload data, download image analysis, and view specific data. Once a user downloads an image, the user can perform automatic quantitative image analysis on the 3D reconstruction by automatically extracting relevant anatomical data, with 7 measurements.

B. Research Methodology

There are many software products that are slightly similar to our product, many of which are databases for other medical purposes such as *Endrov*, an Image and data viewer and editor, *InVesalius*, a 3d medical imaging reconstruction software, and many others. This product will have more capabilities as compared to the other software such as anonymizing patient's data, performing automatic quantitative image analysis, and uploading and downloading data.

C. Report Organization

Chapter II: Requirements will be discussing the main problems that could arise during the project. It focuses on the pros and cons of learning new languages versus utilizing languages that the programmers already know. In addition, it will discuss software maintenance that will allow expanding of the system as opposed to creating an entirely new system after several years.

Chapter III: Educating the User discusses the phases of software development as well as several possible problems that could arise during implementation of the project. These include software complexity, conformity, and changeability. The large size of the data files is one topic we will discuss.

Please make sure you add subsequent chapters

Chapter II: Requirements

A. Problem Statement

Historically, a large portion of software products have been deemed failures, whether it is due to not meeting deadlines, not finishing within the budget, or the product simply not working. A result of this was the creation of the term software engineering, in hopes that it would hold software products to the same standards as other engineering products such as bridges, planes, etc. Economically, the issue of cost must be addressed. One main aspect of cost in developing a software product is time taken to complete. In this case, a particular technology/coding method is what can make a difference in the time taken to develop. On one hand, a team of developers might be familiar with a language that takes a certain amount of time. A new language might be much faster to develop, making the cost less to the client. However, the team has to take into

consideration the time it will take to train on the new language, implement it with a few more issues at first than with the old language, and various other issues. While the new language is easier to code in, it might end up taking more time in the long run and not decrease cost overall. It could also create more issues with maintenance of the code after installation, which prolongs costs over the lifetime of the software. There is more time spent with maintenance than the actual development of code, so in the long run, it might be best to go with the technology that helps create less need for maintenance.

TEAM5QIES plans to address these issues by ensuring to have documents and deliverables finished with plenty of time to look over and change anything needed. One way to avoid historical issues is to make sure everyone has the knowledge needed and to make sure there is a strong leader over everyone. We will ensure that we have both of these. Economically, we will focus on using languages that we are familiar with in order to avoid lengthy learning curves. This will prevent the cost from being high. By avoiding languages we are not familiar with, this should allow us to develop code that will not require heavy post-delivery maintenance.

B. Expanding the Borders

Maintenance, as compared to delivery, typically accounts for a much greater percentage of the software production process. Since many of the software deal with variables that are constantly changing, such as tax percentages, laws, and labor costs, maintenance must be done post-delivery to keep the software up to date. This can involve heavy measures if the code isn't developed in a way that it can be changed easily after installation. Because of this, implementing measures to avoid lengthy maintenance is worthwhile cost-wise. One way TEAM5OIES can ensure this will be done is to utilize constants on variables that could change at one point in time. This will decrease the number of actual changes to be made as well as reduce the chance an error can be made during its implementation.

C. Expanding vs. Replacing the System

Both perfective and adaptive maintenance are essential in the software life cycle. Perfective maintenance is the maintenance done when the client thinks a change can be made to increase effectiveness of the product. This can be anything from a change in code to improve upon response time to a change in website appearance to better appeal to customers. Adaptive maintenance is done due to a change in the environment in which a software product runs. These can be changes because of change in laws, hardware changes, or various other environmental issues.

One important aspect of both types of maintenance is the development of Object Oriented code upon implementation. By using OO from the beginning, maintenance can be done by reusing code if it is implemented correctly. This decreases the time needed to complete the maintenance and thus the cost of the product. Creating code that has the ability to be expanded upon instead of code

that is created without room to have any changes made or grow is a great help to a client who plans on keeping the software long term.

D. **Concluding Remarks**

The historical, economic, and maintenance aspects of software engineering are very important to consider at the beginning of development. TEAM5OIES will focus on deadlines, time of production, and creation of code that will be able to be maintained quickly and effectively in order to create a successful software product.

Chapter III: Educating the User The Software Process

The unified process consists of four distinct phases, inception, elaboration, construction, and transition. Inside each of these phases are various amounts of workflows including requirements, analysis, design, implementation and testing. To ensure that we meet our goals on time and with a working product, TEAM5OIES is following this process software closely by starting with understanding the product domain, working with the client to ensure our proposed solution meets their requirements, and using the object oriented paradigm to complete the construction and testing of our solution. Since we are targeting CMM 3, following the unified process allows us to meet these requirements.

A. Problems with Software Complexity

One of the major problems with this product will be the complexity of the scans. Not only are these large files, but they are extremely complex data structures. It's potentially difficult to do simple things such as getting an image or date from them and even more difficult to explain this complexity to a non-programmer due to the existence of programs that already do this.

B. Problems with Software Conformity

As referenced in the section above, these scan files we will be working with are extremely large and complex files. They also include quite a bit of extraneous information for our purposes, however because this system must conform to their existing workflow, we must keep this complexity.

Ideally, the two additional steps of analyzing the measurements and running the flow analysis software would be integrated into the system and run automatically. However, this is an extremely complex operation, and one that is far outside of our current scope of the project.

C. Problems with Software Changeability

It has already been established that this program is expected to last for many years (as evidenced by the fact that it's for a long-term study). It should be expected that during this duration there will be requests to change the software to better fit into the existing workflow or to conform to a new one. To assist with these inevitable demands, TEAM5OIES will be ensuring that all code is well documented and that it follows all established conventions.

D. Problems with Software Invisibility

In general, it is extraordinarily difficult to, with any accuracy, visually describe a software program. Of course there are UML diagrams and the like which are useful to visualize certain sections of the program, but there's no good way to visualize

the entire thing at once like a 3-d model of a building could do for an architect. To combat this as effectively as possible, TEAM5OIES will be utilizing the UML constructs and diagrams as often as possible. Our plan is to create a full set of UML diagrams documenting every portion of the system so that, much like a set of blue prints for a building, all but the tiniest of details will be documented.

E. Concluding Remarks

While this project will certainly be a challenge, and there are many things we must consider, TEAM5OIES is confident we can succeed. Throughout the design and implementation processes we will be vigilant for issues that could affect the design through any of the above mentioned issues.

Chapter IV: Choosing the Right Team ("Teams" - textbook)

A. Problem Statement
B. Assembling the Team

i. The Democratic Approach
ii. The Classical Approach (Chief Programmer)
iii. The Modern Approach (Chief Programmer & Business Manager)
iv. Additional Team Approaches

C. Recommendation for *TEAM5OIES*
D. Concluding Remarks

Chapter V: Choosing the Right Model ("Software Life-Cycle Models" - textbook)

A. Problem Statement
B. Comparing Models

i. Waterfall Model
ii. Incremental Model
iii. Extreme Programming
iv. Synchronize and Stabilize
v. Spiral Model
vi. Object-Oriented Model

C. Recommendation for *TEAM5OIES*
D. Concluding Remarks

Chapter VI: Analysis and Development Methods ("The Tools of Trade" - textbook)

A. Problem Statement
B. Conventional Engineering Methods

i. Stepwise Refinement
ii. Cost Benefit Analysis
iii. Software Metrics
iv. CASE
v. Software Versions
vi. Configuration Management
vii. Problem Statement
viii. Other Applicable Engineering Tools

C. Recommendation for *TEAM5OIES*
D. Concluding Remarks

Chapter VII: Testing ("Testing" - textbook)

A. Problem Statement
B. Quality Assurance

Nonexecution-Based Testing
Execution-Based Testing

C. Recommendation for *TEAM5OIES*
D. Concluding Remarks

Chapter VIII: Developing *TEAM5OIES* Page Master and Home Page ("Requirements Workflow" - textbook)

A. Problem Statement
B. *TEAM5OIES* **Page Master** and **Home Page**
C. Concluding Remarks

Chapter IX: OO Analysis Models ("OO Analysis Workflow" - textbook)

(Develop *TEAM5OIES* UML OO Analysis Models)
A. Problem Statement
B. The UML Diagrams
C. Concluding Remarks

Chapter X: OO Design Models ("OO Design Workflow" - textbook)

(Develop *TEAM5OIES* UML OO Detailed Design models)
A. Problem Statement
B. The UML Diagrams
C. Concluding Remarks

Chapter XI: Deployment Diagram ("More on UML" - textbook)

(Develop *TEAM5OIES* **UML** Package and Deployment models)
A. Problem Statement
B. The UML Diagrams
C. Concluding Remarks

DOCUMENT CONTROL

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (all SQAs)

Revision	Name	**Due Date**	**Description**
1.A	TM Michelle George	02/09/2015	Complete Chapter 1 and 2
1.B	TM Joe Lu	02/09/2015	Complete Chapter 1 and 2
1.C	DBA John Loveall	02/09/2015	Complete Chapter 3
1.X	Shah Zaib	02/09/2015	Review Document
1.Y	SQA Name	02/09/2015	Review Document

Table 2: Entries when work completed (SVN Commit Comment matches Description)

Revision	Name	**Completed Date**	**Description**
1.A	TM Michelle George	02/05/2015	I Completed Chapter 2
1.B	TM & Joe Lu	02/06/2015	I Completed A and B chapter 1
1.C	DBA John Loveall	02/07/2015	I Completed Chapter 3
1.X	Shah Zaib	02/09/2015	I reviewed Document
1.Y	SQA Edison Guevara	02/09/2015	I reviewed Document

Table 3: TL entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	**Due Date**	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in SVN at https://svn.cs.uh.edu/svn/cosc4351/team5/TEAM PROJECT DELIVERABLES/**Team Project Report.doc**.

TEAM5OIES

DB Team Project with Line Numbers for ERD Modeling

Version 2.0

Approvals Signature Block

	Name	Signature	Date
DBA	Kenny Loveall	Kenny Loveall	9 February 2015
DBA	Jessica Balanag		02/11/15
TL	Obinna Ugwuzor		?
SQA	Shah Zaib		?
SQA	Edison Guevara		11 Feb 2015

Document Control

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (all DBAs & SQAs)

Revision	Name	Due Date	Description
1.A	DBAs Jessica Balanag	02/09/2015	Complete ERD What Modeling
1.B	DBAs John Loveall	02/09/2015	Complete ERD What Modeling
1.X	SQA Edison Guevara	02/09/2015	Review Document
1.Y	SQA Shah Zaib	02/09/2015	Review Document

Table 2: DBAs & SQAs entries when they completed their work

Revision	Name	**Completed Date**	Description
1.A	Jessica Balanag	02/03/2015	I completed XXX **I certify that the TEAM has used "COMPILABLE" ERD LANGUAGE where EACH E, R, and A has a NUMBER and LABEL and they are marked on THIS DOCUMENT.**
1.B	John Loveall	02/03/2015	I completed YYY **I certify that the TEAM has used "COMPILABLE" ERD LANGUAGE where EACH E, R, and A has a NUMBER and LABEL and they are marked on THIS DOCUMENT.**
1.X	SQA Edison Guevara	02/08/2015	I reviewed Document
1.Y	SQA Shah zaib	02/09/2015	I reviewed Document

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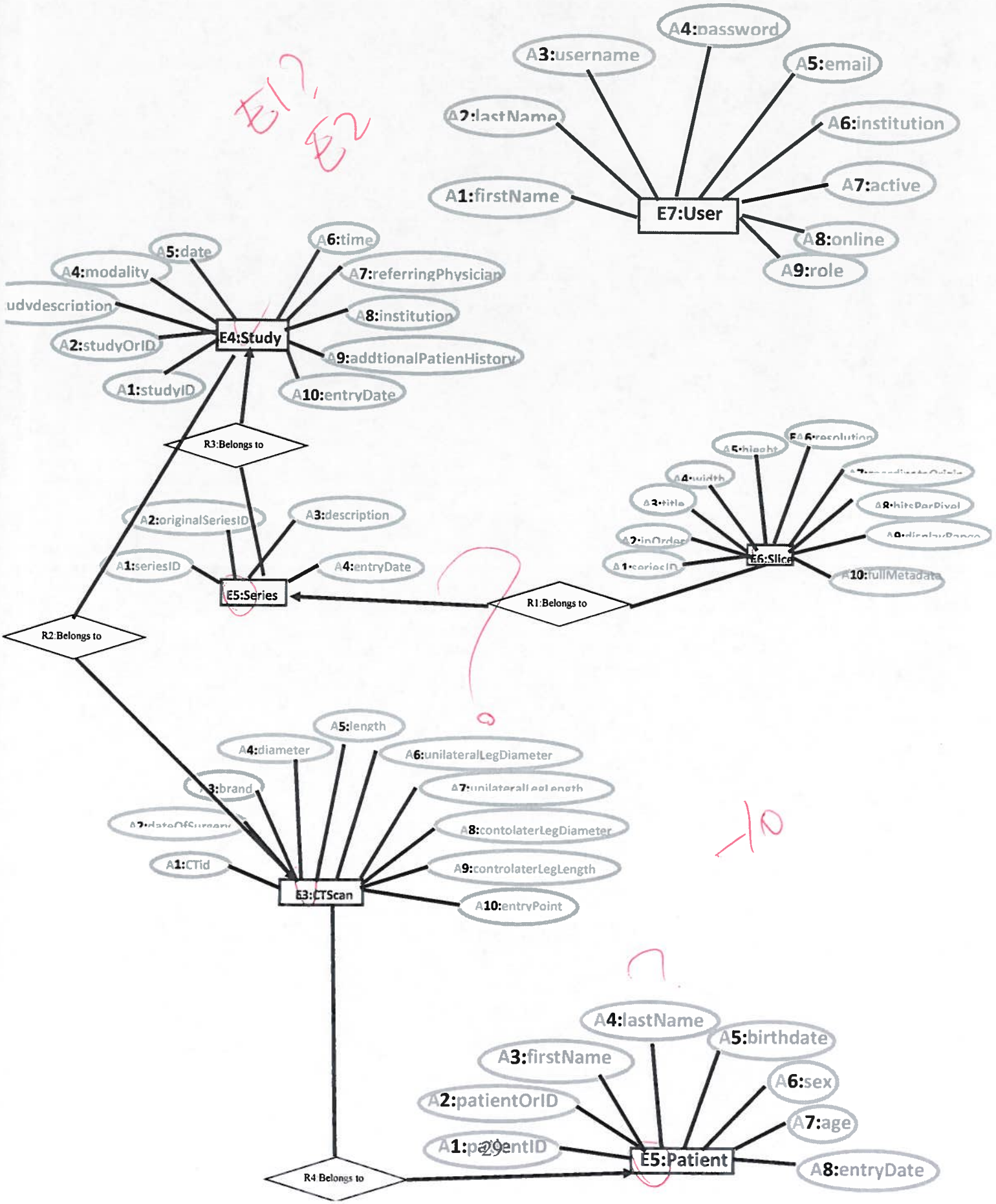
Table 3: TLs entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	Due Date	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in **SVN** at https://svn.cs.uh.edu/svn/cosc4351/team5/**DB TEAM PROJECT DELIVERABLES /DB Team Project with Line Numbers for ERD Modeling.doc.**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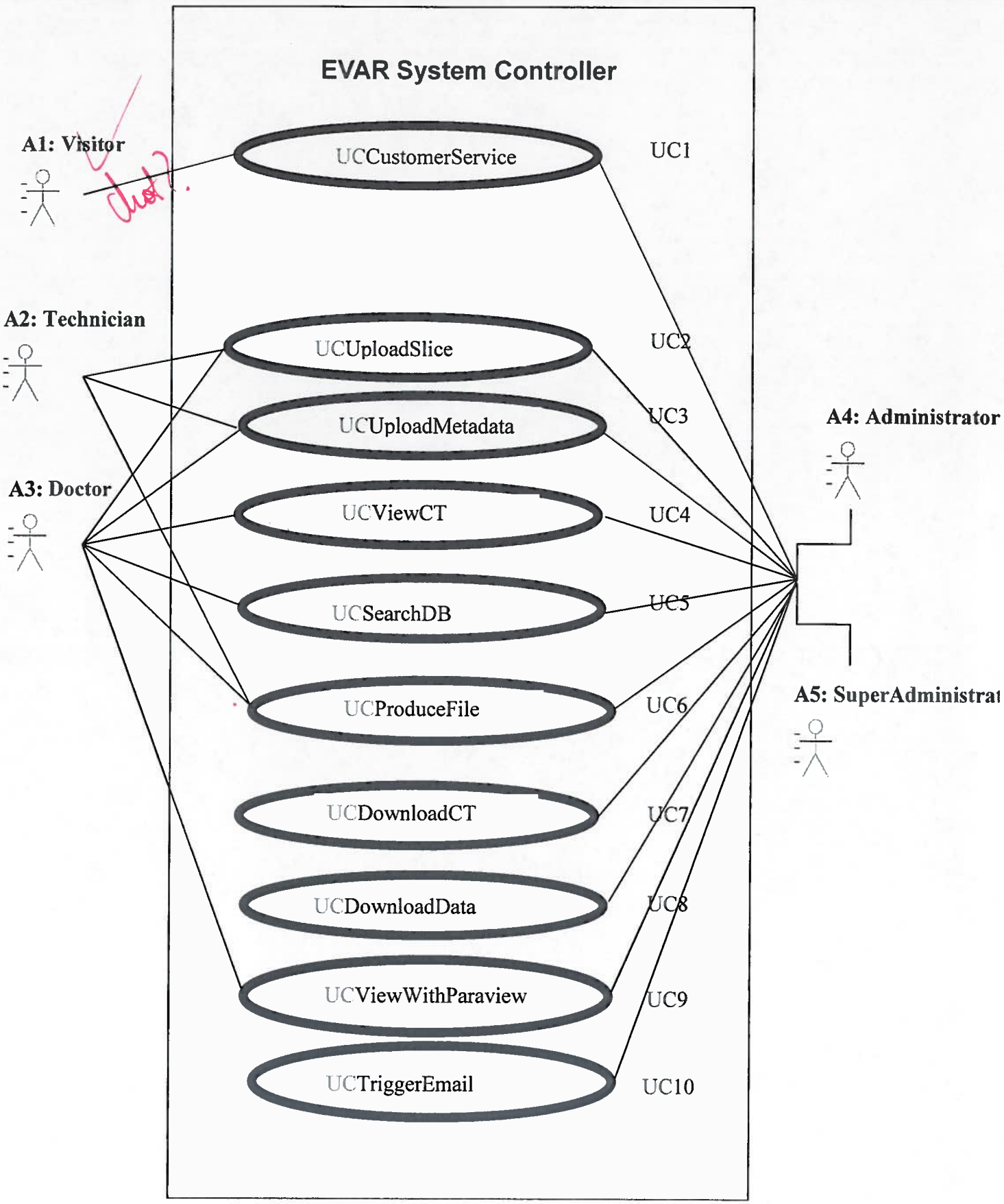
A3:username
A5:email
A2:lastName
A6:institution
A1:firstName
A7:active
E7:User
A8:online
A9:role
A5:date
A6:time
A4:modality
A7:referringPhysician
udydescription
A8:institution
A2:studyOrID
E4:Study
A9:addtionalPatienHistory
A1:studyID
A10:entryDate
R3:Belongs to
A2:originalSeriesID
A3:description
A1:seriesID
A4:entryDate
E5:Series
R1:Belongs to
E6:Slice
A10:fullMetadata
R2:Belongs to
A5:length
A4:diameter
A6:unilateralLegDiameter
A8:contolaterLegDiameter
A1:CTid
A9:controlaterLegLength
A10:entryPoint
E3:CTScan
R4 Belongs to
A4:lastName
A5:birthdate
A3:firstName
A6:sex
A2:patientOrID
A7:age
A1:patientID
E5:Patient
A8:entryDate

TEAM5OIES

SE Team Project with Line Numbers
TEXTUAL ANALYSIS for
Requirements Workflow
UML USE CASE DIAGRAM

Version 2.0


EVAR System Controller
A1: Visitor
A2: Technician
A3: Doctor
A4: Administrator
A5: SuperAdministrat
UCCustomerService
UCUploadSlice
UCUploadMetadata
UCViewCT
UCSearchDB
UCProduceFile
UCDownloadCT
UCDownloadData
UCViewWithParaview
UCTriggerEmail
UC1
UC2
UC3
UC4
UC5
UC6
UC7
UC8
UC9
UC10

UC1 UCCustomerService Description

Name:	**UCCustomerService**
Actor:	**Visitor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Vistor, Administrator, and SuperAdministrator to implement live online support chat with the website's customer service**
Successful Completion:	**Visitor requests to start a chat by clicking on Customer Service tab** **1. Team5OIE System begins a real time chat between Visitor and Customer Service.**
Alternative:	**Visitor requests to start a chat by clicking on Customer Service tab** **1. Team5OIE System is unavailable to begin a real time chat with visitor due to high volume of support needed by other visitors** **2. Team5OIE System display message to Visitor that chat is unavailable and to check back again later**
Pre-Condition:	**Visitor requests to start a chat with Customer Service**
Post-Condition:	**Visitor is able to chat with Customer Service successfully or Unsuccessfully**
Assumptions:	**There is a Customer Service tab on site, someone is available to chat with the visitor in real time**

UC2 UCUploadSlice Description

Name:	**UCUploadSlice**
Actor:	**Technician, Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Technician to upload EVAR CT slice data to database with the annotations about the endograft characteristics**
Successful Completion:	**Technician requests to upload EVAR CT slice data** **1. Team5OIE System allows successful upload of the EVAR CT slice data complete with the annotations about the endograft characteristics.**
Alternative:	**Technician requests to upload EVAR CT slice data** **1. Team5OIE System is unable to successfully upload the EVAR CT slice data with the annotations about the endograft characteristics.**
Pre-Condition:	**Technician requests to upload EVAR CT slice data**
Post-Condition:	**EVAR CT slice data is uploaded to the database successfully or UNsuccessfully**
Assumptions:	**Technician has data to upload**

UC3 UCUploadMetaData Description

Name:	**UCUploadMetaData**
Actor:	**Technician, Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Technician to upload EVAR CT data metadata from Excel file5555**
Successful Completion:	**Technician requests to upload metadata from Excel file5555** **1. Team5OIE System checks for space in the database for new data** **2. Team5OIE System prompts for data to be uploaded** **3. Metadata from file is uploaded to the database and successful message is sent to the Technician**
Alternative:	**Technician requests to upload metadata from Excel file5555** **1. Team5OIE System checks for space in the database for new data** **2. Movie Company System prompts for data to be uploaded** **3. If data either ALREADY present or NO MORE ROOM NOT added and UNsuccessful message is sent to the Technician**
Pre-Condition:	**Technician requests upload metadata from Excel file5555**
Post-Condition:	**Metadata from Excel file5555 is upload to database successfully or Unsuccessfully**
Assumptions:	**Technician has data from Excel file5555**

UC4 UCViewCT Description

Name:	**UCViewCT**
Actor:	**Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Doctor to View the EVAR CT data stored in the database**
Successful Completion:	**Doctor requests to View CT** **1. Team5OIE System displays all the EVAR CT data including the studies, series, and slices of a patient on the left side of the panel and the slice image on the right side of the panel** **2. Team5OIE System allows Doctor to select different display options to view the slice**
Alternative:	
Pre-Condition:	**Doctor requests to View CT**
Post-Condition:	**EVAR CT data about a patient is displayed**
Assumptions:	**Patient is already in the database, data was entered by Technician**

UC5 UCSearch Description

Name:	**UCSearchDB**
Actor:	**Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Doctor to search the database by patient, EVAR CT scan, patient study, and series**
Successful Completion:	**Doctor requests to search the database** **1. Team5OIE System prompts if Doctor wishes to search by patient, EVAR CT scan, study, or by series** **2. Team5OIE System prompts for Doctor to enter/select search criteria** **1. if by patient, Team5OIE System prompts for patient ID or origin ID** **2. if by CT scan, Team5OIE System displays a pulldown menu of all the patient's CT scans** **3. if by study, Team5OIE System prompts for the study ID, original ID, or study description** **4. if by series, Team5OIE System prompts for the series ID or series description**
Alternative:	**Doctor requests to search the database** **1. Team5OIE System prompts if Doctor wishes to search by patient, EVAR CT scan, study, or by series** **2. Team5OIE System prompts for Doctor to enter/select search criteria** **3. Team5OIE System checks to see if not the criteria entered by the Doctor exists in the database** **4. If not, then UNsuccessful message is sent to the Doctor**
Pre-Condition:	**Doctor requests search the database**
Post-Condition:	**Search through the database by the patient, CT scan, study, or series is done successfully or UNsuccessfully**
Assumptions:	**Doctor has information about what they want to search**

UC6 UCProduce Description

Name:	**UCProduceFile**
Actor:	**Technician, Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Technician to produce a new excel file with the requested information from the database5555**
Successful Completion:	**Technician requests to produce a new excel file with the requested information from database5555** **1. Team5OIE System creates and produces a new excel file**
Alternative:	
Pre-Condition:	**Technician requests to produce a new excel file**
Post-Condition:	**New excel file is created and produced**
Assumptions:	**The information requested by Technician is actually in the database**

all uppercase

UC7 UCDownloadCT Description

Name:	**UCDownloadCT**
Actor:	**Administrator, SuperAdministrator**
Description:	**This use case describes the process of downloading the CT image data to be analyzed by computational scientists for image analysis**
Successful Completion:	**1. Data about the CT image is downloaded and ready to be passed off to computational scientists for analysis**
Alternative:	
Pre-Condition:	**Data to be downloaded is in database**
Post-Condition:	**The data is downloaded**
Assumptions:	

UC8 UCDownloadData Description

Name:	**UCDownloadData**
Actor:	**Administrator, SuperAdministrator**
Description:	**This use case describes the process of downloading the CT image data to be analyzed by computational scientists for CFD flow simulations**
Successful Completion:	**1. Data about the CT image is downloaded and ready to be passed off to computational scientists for analysis**
Alternative:	
Pre-Condition:	**Data to be downloaded is in database**
Post-Condition:	**The data is downloaded**
Assumptions:	

UC9 UCViewWithParaview Description

Name:	**UCViewWithParaview**
Actor:	**Doctor, Administrator, SuperAdministrator**
Description:	**This use case describes the process used by Doctor to view the pressure, velocity, or wall shear stress of a patient's EVAR CT scan**
Successful Completion:	**Doctor requests to view a patient's EVAR CT scan information** **1. Team5OIE System displays requested information**
Alternative:	**Technician requests to produce a new excel file with the requested information from database5555** **1. Team5OIE System does not have information in the database and information is not able to be displayed**
Pre-Condition:	**The data resides in the Team5OIE System database.**
Post-Condition:	**The data is displayed**
Assumptions:	

UC10 UCTriggerEmail Description

Name:	**UCTriggerEmail**
Actor:	**Administrator, SuperAdministrator**
Description:	**This use case describes the process of sending and email to Doctor informing them that the data and it's results are ready to be viewed**
Successful Completion:	**1. Email is sent to Doctor**
Alternative:	**1. Information is not ready to be viewed so email is not sent or failed to send to appropriate Doctor**
Pre-Condition:	**The data has been analyzed and it's results are ready to be view by the appropriate Doctor**
Post-Condition:	**Appropriate Doctor gets an email that the results are ready**
Assumptions:	

on a page by itself

DOCUMENT CONTROL

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (both SQAs)

Revision	Name	Due Date	Description
1.A	TM Michelle George	02/09/2015	Defining the Actors and Actors Roles
1.B	TM Joe Lu	02/09/2015	Defining the Actors and Actors Roles
1.C	DBA Jessica Balang	02/09/2015	Review the Actors/Actors Roles, Define Use Cases
1.D	DBA John Loveall	02/09/2015	Review the Actors/Actors Roles, Define Use Cases
1.X	SQA Edison Guevara	02/09/2015	Review Document
1.Y	SQA Shah Zaib	02/09/2015	Review Document

Table 2: Entries when work completed (SVN Commit Comment matches Description)

Revision	Name	**Completed Date**	Description

same Due Date?

1.A	TM Michelle George	01/31/2015	I completed My Portion of Use Case Modeling
1.B	TM Joe Lu	01/31/2015	I completed My Portion of Use Case Modeling
1.C	DBA Jessica Balanag	02/01/2015	I completed Use Case Modeling
1.X	Edison Guevara	02/08/2015	I reviewed Document
1.Y	Shah Zaib	2/09/2015	I reviewed Document

Table 3: TL entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	Due Date	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in SVN at https://svn.cs.uh.edu/svn/cosc4351/team5/TEAM PROJECT DELIVERABLES/**SE Team Project with Line Numbers for UML USE CASE DIAGRAM.doc**.

TEAM5OIES

SE Team Project with Line Numbers
TEXTUAL ANALYSIS for
OOA Workflow
UML MVC CLASS DIAGRAM

Version 2.0

MODELS

User

- userType: int
- firstName: String
- lastName: String
- username: String
- password: String
- email: String
- institution: String
- active: boolean
- online: boolean

Series

- seriesID: int
- originalSeriesID: string
- description: String
- entryDate: datetime

Study

- id: int
- originalId: int
- description: String
- modality: String
- dateProcessed: date
- timeProcessed: time
- referringPhysician: string
- institution: string
- additionalPatientHistory: string
- entryDate: datetime

Slice

- sliceID: int
- inOrder: int
- fileName: String
- title: String
- width: double
- height: double
- resolution: double
- coordinateOrigin: Pair<int,int>
- bitsPerPixel: int
- displayRange: Pair<int,int>
- fullMetaData: String
- entryDate: datetime

CTScan

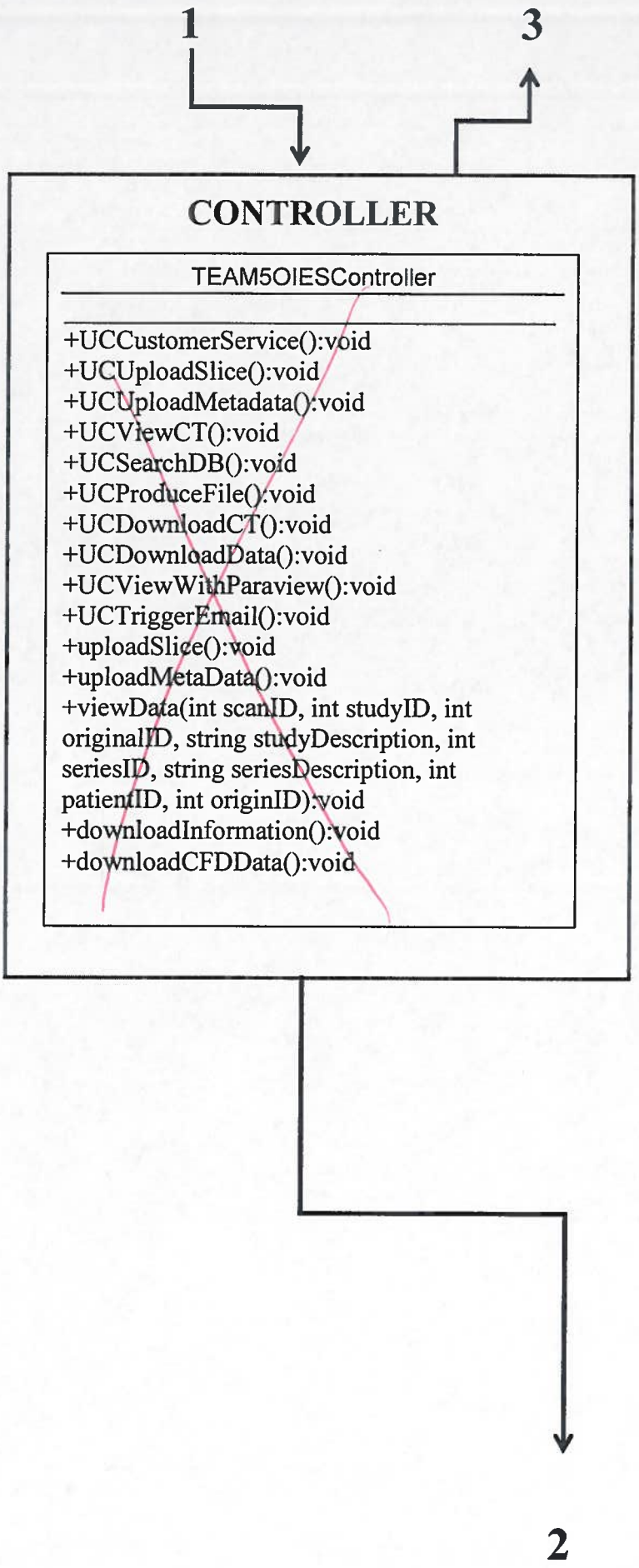
- scanID: int
- dateOfSurgery: String
- brand: String
- diameter: int
- length: int
- unilateralLegDiameter: int
- unilateralLegLength: int
- controlaterLegDiameter: int
- controlaterLegLength: int
- entryPoint: String

Patient

- patientID: int
- originalID: int
- firstName: String
- lastName: String
- birthDate: String
- sex: String
- age: int
- entryDate: datetime

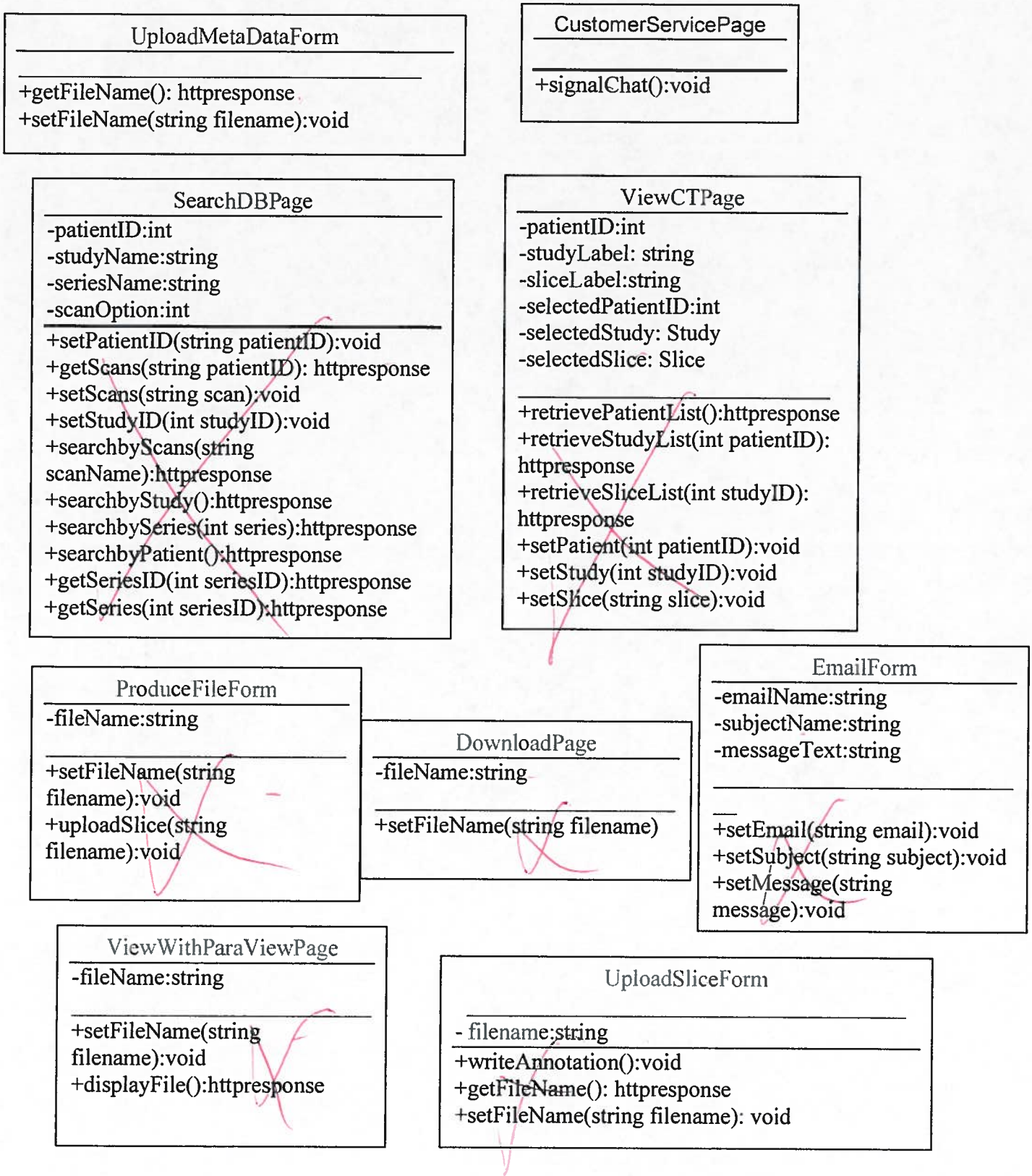
1

3


1
3
CONTROLLER
TEAM5OIESController
+UCCustomerService():void
+UCUploadSlice():void
+UCUploadMetadata():void
+UCViewCT():void
+UCSearchDB():void
+UCProduceFile():void
+UCDownloadCT():void
+UCDownloadData():void
+UCViewWithParaview():void
+UCTriggerEmail():void
+uploadSlice():void
+uploadMetaData():void
+viewData(int scanID, int studyID, int originalID, string studyDescription, int seriesID, string seriesDescription, int patientID, int originID):void
+downloadInformation():void
+downloadCFDData():void
2

2

VIEW


UploadMetaDataForm
+getFileName(): httpresponse
+setFileName(string filename):void
CustomerServicePage
+signalChat():void
SearchDBPage
-patientID:int
-studyName:string
-seriesName:string
-scanOption:int
+setPatientID(string patientID):void
+getScans(string patientID): httpresponse
+setScans(string scan):void
+setStudyID(int studyID):void
+searchbyScans(string scanName):httpresponse
+searchbyStudy():httpresponse
+searchbySeries(int series):httpresponse
+searchbyPatient():httpresponse
+getSeriesID(int seriesID):httpresponse
+getSeries(int seriesID):httpresponse
ViewCTPage
-patientID:int
-studyLabel: string
-sliceLabel:string
-selectedPatientID:int
-selectedStudy: Study
-selectedSlice: Slice
+retrievePatientList():httpresponse
+retrieveStudyList(int patientID): httpresponse
+retrieveSliceList(int studyID): httpresponse
+setPatient(int patientID):void
+setStudy(int studyID):void
+setSlice(string slice):void
ProduceFileForm
-fileName:string
+setFileName(string filename):void
+uploadSlice(string filename):void
DownloadPage
-fileName:string
+setFileName(string filename)
EmailForm
-emailName:string
-subjectName:string
-messageText:string
+setEmail(string email):void
+setSubject(string subject):void
+setMessage(string message):void
ViewWithParaViewPage
-fileName:string
+setFileName(string filename):void
+displayFile():httpresponse
UploadSliceForm
- filename:string
+writeAnnotation():void
+getFileName(): httpresponse
+setFileName(string filename): void

DOCUMENT CONTROL

CHANGE HISTORY

Table 1: TLs entries (assigned work and due dates) before releasing to the team (both SQAs)

Revision	Name	Due Date	Description
1.A	TM Johnathan Hornik	02/09/2015	Complete Classes and Attributes
1.B	TM Hector Reyna	02/09/2015	Complete Classes and Attributes
1.C	DBA Jessica Balanag	02/09/2015	Complete Methods
1.D	DBA John Loveall	02/09/2015	Complete Methods
1.X	SQA Edison Guevara	02/09/2015	Review Document
1.Y	SQA Shah Zaib	02/09/2015	Review Document

Table 2: Entries when work completed (SVN Commit Comment matches Description)

Revision	Name	Completed Date	Description
1.A	TM Johnathan Hornik	02/06/2015	I completed my portion of classes and attributes
1.B	TM Hector Reyna	02/09/2015	I completed a portion of Classes and attributes. I also updated the class and attribute table to reflect this.
1.C	DBA Jessica Balanag	02/09/2015	I completed Use Case Modeling
1.X	SQA Shah Zaib	02/09/2015	I reviewed Document
1.Y	SQA Edison Guevara	02/09/2015	I reviewed Document

Table 3: TL entry for RED DELIVERABLES (SVN Commit Comment matches Description)

Revision	Name	Due Date	Description
2.0	TL Obinna Ugwuzor	02/11/2015	I changed Version to 2.0

DOCUMENT STORAGE

This file is stored in SVN at https://svn.cs.uh.edu/svn/cosc4351/team5/TEAM PROJECT DELIVERABLES/**SE Team Project with Line Numbers for UMLOOA MVC CLASS DIAGRAM.doc**.