**File-Mate 1500 Requirements**

Revision 3

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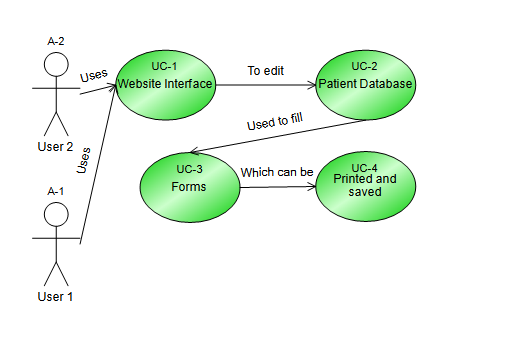
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# Introduction

Our sponsor is Dave Schurz the owner of Form Magic. Form Magic produces desktop software that helps fill out a variety of different medical documents. In particular we are focused on the File-Mate 1500 system that fills out the CMS 1500 medical form. The software solutions cut down on time spent filling out repetitive paperwork by allowing the documents to be filled out automatically and printed or saved as a PDF. It supports a lot of options including importing and exporting data, multiple OS support, auto-complete functions, templates, and a variety of printing options.

Form Magic would like our capstone group to write a web based solution that is similar to their desktop software. The current software runs on a desktop client meaning the data is stored locally and cannot be shared between multiple machines. This makes it hard for a business to update, and share the data among their employees. A web based service would allow all of the employees of a business to interact with an online database at one time, sharing the information and allowing them to create forms from anywhere. A web based service also provides better portability through multiple browser support and mobile device support.

The biggest pieces of functionality required are related to the database and the management of patient information and concurrent access. To improve on the drawbacks of the current system it needs to be simple and fast for employees to access and modify patient information that is used to fill out the forms. That information needs to be usable and editable by any other employees with the rights to do so. The availability of the database needs to be high to achieve the goal of enhanced productivity.

The data stored on patients will be used to populate the CMS medical form. The data should be used to fuel a partial auto complete of the form and provide checks and warnings about the validity of the data. The data needs to be exportable to format usable by File-Mate 1500 itself as well as those supported by the desktop client. Once the forms have been filled they need to be able to be saved to a PDF both locally and to the server. That PDF then needs to be printable supporting direct printing to a form as well as to plain paper.

Figure 1: Simple Use Case

# Functional Requirements

1. ***Client***
   1. ***Usergroups***
      1. Administrator
      2. Has the ability to add and remove users to their group
      3. Can access and use group information to fill out health insurance payment forms
      4. Can add patient information to the database
      5. Registered User
      6. Has the ability to access and use group information to fill out health insurance payment forms
      7. Can add patient information to the database
      8. Trial User
      9. Has the ability to use the application with a limited amount of patient data
      10. Forms are presented with a watermark
      11. Trial account can be upgraded to be a registered user
   2. ***Interface***
      1. ***Page Types***
      2. Welcome Page
         1. This will present the visitor with basic information about Form-Magic and more specifically Filemate 1500.
         2. There will be links providing navigation to the login page, and the demonstration pages.
      3. Login Page
         1. The login page must allow users to input login information in order to be identified as either an admin, or registered user. There will be an option to continue without registration which will lead you to the demonstration pages.
      4. Registration Page
         1. Unregistered users will have to option to access the registration page which will allow them to change status to a registered user.
         2. An “advance to demo without registering” option will allow users who do not wish to register to access the same demo pages accessible from the login page.
      5. Trial User/Demo Pages
         1. Unregistered users will have a limited set of pages to access within the website. These pages will demonstrate how the system will work by allowing the trial user to update, modify and view test a limited amount of data.
      6. User Data Information and Modification Page
         1. These pages will hold all information that pertains to the client such as login name, password and email as well as options to change the current password and/or email.
      7. Patient Data Modification Page
         1. Each client will have all of their patient and associated patient information viewable and able to be queried from the database.
      8. Contact Us Page
         1. Basic contact information will be present, including but not limited to contact email, phone number and address.
   3. ***Compatibility***
      1. ***Browser Support***
      2. The system must support all major browsers including but not limited to Chrome, Firefox, Internet Explorer, and Safari.
      3. Previous versions of these supported browsers dating back to two to three years prior will be supported in order to accommodate those clients not using an up to date web browser.
      4. ***Mobile Devices***
      5. All client information and associated patient information must be easy to interpret and read on iPad and tablet hardware as well as laptop and desktop hardware.
      6. iPhone and Android application support is optional.
2. ***Server***
   1. ***Web Application***
      1. ***Concurrent Access***
      2. The system shall support a number of users of different accounts performing any function of the system concurrently without error.
      3. The web server application and database management system shall ensure that all operations carried out on the database preserve the integrity of the data regardless of how many sessions are active.
      4. ***Secure Access***
      5. The server application shall use modern cryptography and defenses against exploits.
      6. The database shall be accessible only in approved ways and by approved accounts, and shall only be queried securely, that is in a way that does not leave it vulnerable to SQL injection attacks.
      7. ***Document Generation***
      8. The server application shall be able to generate completed forms in the Portable Document Format.
      9. The server application shall generate these forms in a responsive manner; that is, it shall generate the form as soon as possible after information has been entered or modified, but without affecting the user experience.
      10. ***Data Import and Export***
      11. User data shall be exportable into a variety of common formats for portability.
      12. The web server application should be able to generate these formats using the data stored in the database on user command.
      13. The web server should be able to accept data that has been exported in any format available for export and store it in the database.
   2. ***Database***
      1. ***User Accounts***
      2. Must include information such as name, email and password
      3. Must track failed login attempts
      4. Must log successful login attempts
      5. Must have a unique user ID used to identify the account
      6. Must support the variety of user groups outlined in the section
      7. ***Patient information***
      8. Must include first name, middle initial, last name, account number, full address, phone, birth date, sex, relationship to the insured person, status, and if the patient has a signature on file
      9. Must also include an insured and provider
      10. This information should be subject to checks for validity prior to being entered
      11. Must provide frequent backups and easy restoration of those backups
      12. ***Service information***
      13. Must provide medical information about the patient including dates of illness, dates the patient could not work, hospital stays, and procedures performed
      14. This information should be subjected to checks prior to being entered
      15. Must provide frequent backups and easy restoration
      16. ***Carriers***
      17. Must include a name and full address of a valid carrier
      18. This information should be subjected to checks prior to being entered
      19. Must provide frequent backups and easy restoration
      20. ***Providers***
      21. Must include a tax ID, phone number, full address for the service facility as well as the billing provider with their respective NPI and license numbers
      22. Must include if a signature for the physician or supplier is on file
      23. This information should be subjected to checks prior to being entered
      24. Must provide frequent backups and easy restoration

# Non-Functional Requirements

* 1. ***Security***
     1. Because this system will be holding and transferring important and confidential patient information, security is the most important requirement the system must exhibit.
     2. The system must transfer data from the database to the website in a manner so that no third-party program or user is able to view the data during transfer.
     3. The system must allow only the logged in user, aside from the admin, associated with the data set to view and/or make changes to that data set.
  2. ***Scalability***
     1. The system must be able to support multiple users accessing and altering the same data set concurrently.
     2. The system must support any amount of patients for each client.
  3. ***Usability***
     1. The system must have an easy to understand user interface so that all information is immediately available for the user.
     2. All text within the system must concisely explain the functionality that each section of the system allows.
  4. ***Performance***
     1. Because this system is mainly concerned with keeping all of the confidential data secure, some performance may be sacrificed in order to accomplish this.
     2. The system must retrieve and display the data to the querying user in less than 2 seconds.
     3. The system must generate the PDF document in no more than 10 seconds.

# Environmental Requirements

Form Magic intends File Mate 1500 to be used both by doctors and other medical personnel, and by patients. Thus, it must be user friendly and intuitive enough to be learned quickly.

The software’s operational environment will be a standard web stack consisting of Apache, PHP, and MySQL. The application must be written to take advantage of the features of each of these technologies in order to provide the functional requirements and effect the non-functional properties desired.

For Apache, not much is needed. Apache is a web server and is designed to be as generic as possible in order to support as many different web applications as possible. Our largest concern here will be to ensure that traffic between client and server is secure by using Secure Socket Layer communications.

For PHP, we will need to pay attention to vulnerabilities both in the PHP runtime itself and in the way in which it is used. PHP code is often criticized as being insecure, and the language itself has several issues related to easily exploitable patterns. To that end, the web application must be programmed with the intention of avoiding or plugging these exploits to ensure that user data is not compromised.

Similar to PHP, MySQL is a common database product and is often targeted for attacks. We will need to ensure that all permissions are set up properly and operate under the policy of least access. In addition, we must take care not to allow any holes in the web application through which arbitrary queries may be executed, as this will lead quickly to SQL injection vulnerabilities.

# Potential Risks

## Database:

* Loss of database use will Inconvenience to users who are not able to access their data when needed, fill in forms, or create PDFs
* Information should still be intact upon access being returned
* Not being able to login to account
* An SSL connection will be used between the database and user

## Website:

* Clients not being able to use the application and access information during any down time
* Information should still be intact when access to the website returns

## Patient Information:

* Each user group will be storing their patient information in the Filemate 1500 database
* Potentially bad for client using application if they don’t have this information backed up

## HIPAA

* Data will be AES encrypted when sent
* Any information in violation of HIPAA must be omitted or blocked out
* Any patient information getting out is not desirable and security measures must be in place to protect it

# 6. Project Plan

1. Continue refining requirements (2-3 Weeks)
2. Design overall system (4-5 Weeks)
3. Implementation (6-10 Weeks)
4. Delivery and Close Out of Project (3-4 Weeks)