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1. Project Description

A healthcare web app that enables doctors and patients to record and share health documents. The web app will use ai to create a quick summary of a patient's health information via a QR code scan in the event of an emergency.

2. Functional Requirements

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| FR01 | the software must enable users to create and manage accounts |
| FR02 | the software must enable doctors to view and update account records |
| FR03 | the software must enable an ai system to read and summarize account records |
| FR04 | the software must enable users to upload a pdf form for their records |
| FR05 | the software must enable doctors to download a pdf form of a patient's records |
| FR06 | the software must enable user to securely share their info with a doctor using a pin |
| FR07 | the software must enable a user to create a qr code that contains their pin |
| FR08 | the software must enable doctors to scan a qr code to access documents |
| FR09 | the software must enable patients to see who has access to their account, and who has viewed it |
| FR10 | the software must enable doctors to remove patients from their view |
| FR11 | the software must enable patients to remove doctors from having access to their records |
| FR12 | The site must have authentication checks to not allow access to patient records for non-medical workers |

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| FR13 | The doctors account should have a list view of every patient in their care |
| FR14 | Two different account types able to be created, one for patients, one for doctors |
| FR15 | Before the patient commits changes to their medical records, they must be presented with an end user agreement |
| FR16 | Before a doctor's changes are committed a patient's records, the patient must hit an agree button |
| FR17 | The software must enable the patient to view a doctor's changes before agreeing to them |
| FR18 | Doctors should have public and private keys, that allow patients to share with them based on if the doctor's account is set to public or private |

3. Non-Functional Requirements

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| NFR01 | The Ai must be able to accurately summarize a patient's medical data in no longer than 15 seconds, including the most important points first in case of an emergency. |
| NFR02 | The software must be able to load a patient's record within 2 seconds of the request |
| NFR03 | The software must update an account record within 2 seconds of the request |
| NFR04 | The web app will be hosted using https protocol |
| NFR05 | A pdf must be downloaded within 10 seconds of the request |
| NFR06 | The web app will route traffic through a firewall |
| NFR07 | The UI must be intuitive and easy to navigate for patients and doctors alike |
| NFR08 | Authentication checks must utilize two factor authentication |
| NFR09 | The web app must not allow users to inject sql commands |
| NFR10 | The data must be updated at least within 10 minutes of uploading them |
| NFR11 | Site should allow for a single log in to keep user logged in for no more than 30 minutes without their sessions expiring |
| NFR12 | Site should have 99.90% uptime |
| NFR13 | The database should be able to store over 10,000 entries |
| NFR14 | The system should keep a log of actions access to developers |

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| NFR15 | Site should have accessibility features adherent to (WCAG) 2.1 |
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4. Use Case Specification

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| UC01 Name: | Manage Records |
| Description: | The software allows patient/doctor to add/update their Medical Records |
| Actor: | Patient and Doctor |
| Entry Condition: | Either the patient or the doctor wants to manage medical records |
| Basic Path: | <ol style="list-style-type: none"> 1. The system presents the customer registration screen containing: [PRO01] <ul style="list-style-type: none"> - Page Navigation Options - Embedded PDF editor - PDF management buttons <ul style="list-style-type: none"> — Download PDF Template — Upload PDF — Save — Cancel 2. The actor selects the option 'Download PDF' [A01] [A02] 3. The system downloads a .pdf file containing an editable table to the actors drive 4. The actor uploads an updated version of the template using 'Upload PDF' [E01] 5. The actor clicks save and the system updates the database and the page [BR01] |
| Alternative Paths: | <p>[A01] (editing the pdf in the browser)</p> <ol style="list-style-type: none"> 1. The actor selects a field in the "PDF editor" 2. The "download pdf template" and "upload pdf" options are grayed out, indicating that they are unusable at the moment [A06] 3. The actor edits/adds/deletes information in the selected field <ol style="list-style-type: none"> a. The actor may repeat steps 1 and 2 for as many fields as they choose 4. The actor selects save [A03](cancel), [A04](back), [E02], [BR01] 5. The system displays a message that the changes have been successfully saved 6. The "upload pdf" and "download pdf template" become no longer grayed out 7. Return to step 1 of the basic path <p>[A02] (the actor selects cancel and has not made any changes)</p> |

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| | <ol style="list-style-type: none"> 1. Nothing happens 2. Return to the previous path the actor was on <p>[A03] (the actor selects cancel and has made changes in the pdf editor)</p> <ol style="list-style-type: none"> 1. The system presents a pop-up giving the actor two select options, cancel or continue 2. The actor selects cancel [A05] 3. The changes in the pdf form are cleared, reverting to the previous version 4. The “upload pdf” and “download pdf template” buttons become no longer grayed out 5. Return to step 1 of basic path <p>[A04] (the actor selects back and has made changes in the pdf editor)</p> <ol style="list-style-type: none"> 1. The system presents a pop-up giving the actor two select options, “go to previous page” or continue 2. The actor selects “go to previous page” [A05] 3. The changes to the pdf get discarded 4. The actor gets redirected to the previous page <p>[A05] (the actor selected back or cancel, but hit continue in the popup)</p> <ol style="list-style-type: none"> 1. The popup disappears 2. The user is kept on the page 3. The system makes no changes 4. Return to the previous path the actor was on <p>[A06] (the actor selects a pdf option when they are grayed out)</p> <ol style="list-style-type: none"> 1. The actor presses either “download pdf template” or “upload pdf” and they are grayed out 2. The system presents a popup that says “please finish editing pdf by either selecting “save” or “cancel”” 3. The popup is removed when the actor presses anything outside of the borders of the popup 4. Return to the previous path the actor was on |
| Exception Paths: | <p>[E01] Invalid file type upload</p> <ol style="list-style-type: none"> 1. System displays message informing actor of invalid file type 2. Returns to step 4 <p>[E02] Field description too long</p> <ol style="list-style-type: none"> 1. System displays a message informing the actor that they have input too many characters in a particular field |
| Business Rules: | <p>[BR01]</p> <ol style="list-style-type: none"> 1. All data must be encrypted in database and in transition <p>[BR02]</p> |
| Data Description | |

| | <table><tr><th>Name</th><th>Type</th><th>Length</th><th>Mask</th></tr><tr><td>Record</td><td>PDF</td><td>50 MB</td><td>-</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> | Name | Type | Length | Mask | Record | PDF | 50 MB | - | | | | | | | | |
|------------|--|--------|------|--------|------|--------|-----|-------|---|--|--|--|--|--|--|--|--|
| Name | Type | Length | Mask | | | | | | | | | | | | | | |
| Record | PDF | 50 MB | - | | | | | | | | | | | | | | |
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| Prototype: | <div><div>[PRO01]</div><div><div><div><div>back</div><div>doctor</div><div>patient</div><div>cancel</div><div>save</div><div>download pdf template</div><div>upload pdf</div></div><div>PDF editor</div><div><div><div>~~~~~</div><div>~~~~~</div><div>~~~~~</div><div>~~~~~</div></div></div></div></div><div>[PRO02]</div></div> | | | | | | | | | | | | | | | | |
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| UC02 Name: | Account creation |
| Description: | The software allows a new user to create an account |
| Actor: | New user |
| Entry Condition: | The actor wants to make an account in the RBAC |
| Basic Path: | <p>1. The system presents the customer registration screen containing: [PRO01]</p> <ul style="list-style-type: none"> - Login option for existing user - Sign up option for new users - Back button <p>2. The actor selects the sign up option [A01] [A02]</p> <p>3. The system presents the customer to input their information:</p> <ul style="list-style-type: none"> - First Name - Last Name - Email address |

| | <ul style="list-style-type: none">- Username- Password <p>4. System checks to see that info is valid (ie user isn't already in database, email is a valid email etc) [E01] [E02]</p> <p>5. Updates the database to include new patient information and presents the patient home page [PRO02]</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|--|--------|-------|--------|------|------------|--------|----|---|-----------|--------|----|---|---------------|--------|----|---|-----------|--------|----|---|----------|--------|----|-------|---------|--------|----|---|
| Alternative Paths: | <p>[A01] (Logging in an existing user)</p> <ol style="list-style-type: none">1. The actor selects the login option2. The system presents the customer to input their account details:<ul style="list-style-type: none">- Username- Password3. System looks up account info in database, and if info is correct presents user with patient home page [PRO02] <p>[A02] (user selects the back button)</p> <ol style="list-style-type: none">1. Returns the user to the home page | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Exception Paths: | <p>[E01] (User attempts to create an account when one already exists under the email)</p> <ol style="list-style-type: none">1. System redirects to an error page that states that the account already exists2. Error page displays login option, which then redirects to the login page <p>[E02] (User email isn't a valid email address)</p> <ol style="list-style-type: none">1. Page displays a pop-up error message that the email is invalid and prompts them to reenter their email and password2. Wipes already inputted user info in the textbox | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Business Rules: | <p>[BR01] Database of all user info must not be visible to anyone on the front end</p> <p>[BR02] Database can accept multiple users with same name as long as they have different emails</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Description | <table><tr><th>Name</th><th>Type</th><th>Length</th><th>Mask</th></tr><tr><td>First_Name</td><td>String</td><td>25</td><td>-</td></tr><tr><td>Last_Name</td><td>String</td><td>25</td><td>-</td></tr><tr><td>Email_Address</td><td>String</td><td>50</td><td>-</td></tr><tr><td>User_Name</td><td>String</td><td>15</td><td>-</td></tr><tr><td>Password</td><td>String</td><td>20</td><td>*****</td></tr><tr><td>User_ID</td><td>String</td><td>50</td><td>-</td></tr></table> | Name | Type | Length | Mask | First_Name | String | 25 | - | Last_Name | String | 25 | - | Email_Address | String | 50 | - | User_Name | String | 15 | - | Password | String | 20 | ***** | User_ID | String | 50 | - |
| Name | Type | Length | Mask | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First_Name | String | 25 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Last_Name | String | 25 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Email_Address | String | 50 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| User_Name | String | 15 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Password | String | 20 | ***** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| User_ID | String | 50 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Prototype: | <p>[PRO01] Login page</p> <hr/> <div> back doctor Patient </div> <div> login sign up </div> <div> email password </div> |

| back | | doctor | patient |

| edit |
| send access |
| profile settings |

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| UC03 Name: | AI Summarization |
| Description: | The doctor will have access to an AI tool which allows for the user to summarize specific areas of a patient's medical record. |
| Actor: | Doctor |
| Entry Condition: | Actor needs specific information quickly from a specific medical record |
| Basic Path: | 1. The system presents the doctor with the login page containing: [PRO01] -email (editable) |

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| | <p>-password (editable)</p> <p>-The options:</p> <ul style="list-style-type: none"> — login — sign up <p>2. The doctor selects the login option, they enter the email and password [A01]</p> <p>3. The doctor is sent to the doctor home page containing: [PRO02]</p> <ul style="list-style-type: none"> — view patient — new patient — profile settings — back <p>4. The doctor selects view patient [A02] [A03] [A04]</p> <p>5. The system presents the doctor existing patients page containing: [PRO03]</p> <ul style="list-style-type: none"> — edit — view — remove — back <p>6. The doctor clicks the view button [A05] [A06] [A07]</p> <p>7. The doctor is sent to the records view page containing: [PRO04]</p> <ul style="list-style-type: none"> — ai summarization — download pdf template — back <p>8. The doctor click the ai summarization button [A08] [A09]</p> <p>9. The AI summarization page pops up on the right side of the screen containing: [PRO05]</p> <ul style="list-style-type: none"> - enter prompt (edible) — download pdf template — back <p>10. The doctor enters a prompt and is given a summarization accordingly [A13] [A14]</p> |
| Alternative Paths: | <p>[A01] (the actor clicks signup and enters their email and password)</p> <ol style="list-style-type: none"> 1. The use case returns to step 3 of the basic path <p>[A02] (the actor selects back while on the doctor home page)</p> <ol style="list-style-type: none"> 1. The use case returns to step 1 of the basic path <p>[A03] (the actor selects new patient)</p> <ol style="list-style-type: none"> 1. The doctor is sent to the doctor new patient page containing: [PRO06] <ul style="list-style-type: none"> - patient name (editable) - patient key (editable) - emergency key (editable) — back <ol style="list-style-type: none"> 2. The doctor enters patient name and key [A10] [A11] 3. The doctor returns to step 7 of the basic path <p>[A04] (the actor selects profile settings)</p> <ol style="list-style-type: none"> 1. The doctor is sent to the doctor profile settings page containing: [PRO07] <ul style="list-style-type: none"> - change email (editable) |

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| | <p>- change password (editable) — back</p> <ol style="list-style-type: none"> The doctor enters a new email and returns back to step 1 of alternative path [A04] [A12] [A11] <p>[A05] (the actor selects back while on the doctor existing patients page)</p> <ol style="list-style-type: none"> The actor is redirected to step 3 of the basic path <p>[A06] (the actor selects edit)</p> <ol style="list-style-type: none"> The actor is redirected to the manage records use case <p>[A07] (the actor selects remove)</p> <ol style="list-style-type: none"> The doctor is redirected to [UC04] (undefined), use case for removing a patient from a doctor's view <p>[A08] (the actor selects back while on the view records page)</p> <ol style="list-style-type: none"> The doctor returns to step 5 of the basic path <p>[A09] (the actor selects the download pdf button on the view records page)</p> <ol style="list-style-type: none"> The pdf is downloaded onto the user's computer and they return to step 7 of the basic path <p>[A10] (the actor enters the emergency key in the new patient page)</p> <ol style="list-style-type: none"> The doctor returns to step 7 of the basic path <p>[A11] (the actor selects back in the new patient page)</p> <ol style="list-style-type: none"> The doctor returns to step 3 of the basic path <p>[A12] (the actor enters a new password)</p> <ol style="list-style-type: none"> The doctor returns to step 1 of alternative path [A04] <p>[A13] (the actor selects back while on the ai summarization page)</p> <ol style="list-style-type: none"> The doctor returns to step 5 of the basic path <p>[A14] (the actor selects the download pdf button on the ai summarization page)</p> <ol style="list-style-type: none"> The pdf is downloaded onto the user's computer and they return to step 9 of the basic path |
| Exception Paths: | <p>[E01]</p> <ol style="list-style-type: none"> The actor asks for data of a patient that they do not have access for. <ol style="list-style-type: none"> The actor responded with a message that lets them know that they do not have the ability to view said data. The actor is presented with an option to get access to that patient's record. The actor asks for a data that doesn't exist <ol style="list-style-type: none"> The actor is presented with a message that lets them know that it doesn't exist. |
| Business | [BR01] |

| Rules: | <div>1. The AI response time must be in under 15 seconds</div> <div>[BR02]</div> <div>1. The AI response must be 100% accurate to medical records</div> <div>[BR03]</div> <div>1. The AI response must be sent using HTTPS and through a secure firewall</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|--------|------|--------|------|--------------|--------|----|---|-----------|--------|----|---|------------|--------|---|---|----------------------|--------|------|---|--------------|--------|------|---|-------------|--------|------|---|
| Data Description | <table><tr><th>Name</th><th>Type</th><th>Length</th><th>Mask</th></tr><tr><td>Patient_Name</td><td>String</td><td>50</td><td>-</td></tr><tr><td>Allergies</td><td>String</td><td>25</td><td>-</td></tr><tr><td>Blood_Type</td><td>String</td><td>3</td><td>-</td></tr><tr><td>Major_Injury_History</td><td>String</td><td>1000</td><td>-</td></tr><tr><td>Prompt_Entry</td><td>String</td><td>1000</td><td>-</td></tr><tr><td>AI_Response</td><td>String</td><td>3000</td><td>-</td></tr></table> | Name | Type | Length | Mask | Patient_Name | String | 50 | - | Allergies | String | 25 | - | Blood_Type | String | 3 | - | Major_Injury_History | String | 1000 | - | Prompt_Entry | String | 1000 | - | AI_Response | String | 3000 | - |
| Name | Type | Length | Mask | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Patient_Name | String | 50 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allergies | String | 25 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood_Type | String | 3 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Major_Injury_History | String | 1000 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prompt_Entry | String | 1000 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI_Response | String | 3000 | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prototype: | <div><div>[PRO01]</div><div><div> back doctor patient </div><div>login sign up </div><div>email </div><div>password </div></div><div>[PRO02]</div><div><div> back doctor patient </div><div>view patients </div><div>new patient </div><div>profile settings </div></div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[PRO03]

| | | | | |
|--|-------------|--|------------------|--|
| | back | | doctor patient | |
| | | | | |
| | patients: | | edit | |
| | | | view | |
| | (scrolling) | | remove | |
| | | | | |
| | | | | |

[PRO04]

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|--|-----------------------|--|------------------|--|
| | back | | doctor patient | |
| | | | | |
| | ai summarization | | | |
| | download pdf template | | | |
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| | PDF viewer | | | |
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[PRO05]

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| | back | | doctor patient | |
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| | ai summarization | | enter prompt | |
| | download pdf template | | | |
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| | PDF viewer | | | |
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[PRO06]

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| | back | | doctor patient | |
|--|------|--|------------------|--|

Both types of accounts can set their privacy status to public or private, to enable or disable new accounts from sharing/accessing documents with them. Accounts are created using an email, which is sent a verification email, and can be deleted.

Pages:

Login page

| | | | |
|--|------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | login sign up | |
| | | | |
| | | email | |
| | | password | |
| | | | |

Doctor home page

| | | | |
|--|------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | view patients | |
| | | new patient | |
| | | profile settings | |
| | | | |
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Doctor new patient page

| | | | |
|--|------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | patient name | |
| | | patient key | |
| | | | |
| | | emergency key | |
| | | | |

Doctor existing patients page

| | | | |
|--|-------------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | | |
| | patients: | edit | |
| | | view | |
| | (scrolling) | remove | |
| | | | |
| | | | |
| | | | |

Doctor profile settings page

| | | | |
|--|-----------------|------------------|--|
| | back | doctor patient | |
| | | | |
| | change email | | |
| | change password | | |
| | | | |
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| | | | |
| | | | |

Patient home page

| | | | |
|--|------------------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | | |
| | edit | | |
| | send access | | |
| | profile settings | | |
| | | | |
| | | | |

Patient send access page

| | | | |
|--|------|------------------|--|
| | back | doctor patient | |
| | | | |
| | | | |

| | | |
|--|----------------|--|
| | doctor name | |
| | share cancel | |
| | | |
| | | |
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Records edit page

| | | | |
|--|-----------------------|------------------|--|
| | back | doctor patient | |
| | cancel | save | |
| | download pdf template | upload pdf | |
| | | | |
| | PDF editor | | |
| | ~~~~~~ | | |
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Profile settings page

| | | | |
|--|--------------------|------------------|--|
| | back | doctor patient | |
| | | | |
| | visibility: ~~~~~~ | | |
| | | | |
| | | | |
| | | | |
| | delete account | | |

Records view page

| | | | |
|--|------|------------------|--|
| | back | doctor patient | |
| | | | |

ai summarization |

download pdf template |

PDF viewer |

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AI Summarization Page

back | doctor | patient |

ai summarization |

download pdf template |

PDF viewer |

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enter prompt