EMRKS -- Requirements Document

Dustin Salentiny

Jordan Torres

Jeffrey Schafer

MyHealth® System

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0   Introduction

The MyHealth system is an electronic medical record keeping system (EMRKS). An EMRKS is a system that provides a health care facility the ability to centralize and maintain their record keeping electronically. The MyHealth system will be built to help a hospital organize staff and patient information. The system includes a webpage type interface which will contain multiple webpages to accommodate all the different pages for staff and customers alike. The interface will be connected to the database although will be invisible to the staff the actual database interface. The staff will only have interaction with the webpages and the data that is generated from connecting to the database. The system will also help with efficient access to information to all involved.The primary actors involved in the MyHealth System include: accountants, auditors, cleaning staff, customer support personnel, nurses, patients, pharmacists, physicians, or receptionists. All personnel will be defined below and each section will include typical scenarios for each.

The hardware required for this system will be: a few large servers with enough capacity to maintain all the data for patients' medical records, billing staff, and any other data that needs to be stored. The webpages built will be built upon separate servers and connected to the database servers via a network.

*Note: All users use the same style authentication screen.

1   Accountants

The MyHealth System recognizes an organization's need for proper

billing and payment processing. Accountants primary goals include running billing reports, processing payments, and verifying account balances. After authentication, accountant users will see the options to do Billing Reports, Process Payments, and Verify Account Balance.

1.1 Billing Reports

Accountants will run billing reports each month for the organization. These reports are printed and mailed to patients and other organizations. On this screen, accounting users will enter the customers ID, which can be either their SSN or MYID, into the lookup box and see a report of all of the customer's charges in a line by line form. These screens are read-only.

1.2 Process Payments

Patients and organizations may send their payments in via mail or they may call their payments in. Accountants will process the payments through this system so they are logged as received. Once a payment has cleared, the balance of the account will be adjusted. This screen will show a list of all of the payments pending. These payment types range from checks to credit cards. After the payment has been processed and confirmed, the accounting user will press a confirmation button or if there is an error the user can give a reason for payment failure in a box provided and select the payment declined option and submit the form to be billed out to the customer (with reason for payment failure). These screens do have write access to allow confirmation of payment or in a payment failure, write access to post a notice in the customer's account warning of payment failure. These notes (confirmation or failure) will appear in billing reports.

1.3 Verify Account Balance

From time to time, patients and organizations may call in to verify their balances. Accountants will use the system to retrieve the inquirer's

balance. By entering into a lookup box the customer's SSN or MYID, the accountant will be able to see the the customer's current balance and the line items on their bill.

2 Auditors

Auditors access the organization's billing records and expenses to see current and recent activity. They are allowed to look but not modify any existing transactions or payments that does not compromise patient confidentiality. Auditors also verify the pharmacological stock matches purchase and prescription records. After authentication, the auditing user will see options to do a Billing Audit or a Pharmacy Audit.

2.1 Billing Audit

Accessing expense data will be business expenses that the hospital incurs that is applicable to auditing. The billing audit screen will show all of the line items, their corresponding billable amount, and the amount a customer has paid toward the balance. This screen can be sorted by line item type or by date. This list will be read only.

2.2 Pharmacy Audit

Accessing and tracking prescriptions and pharmacological stock. The pharmacy audit screen will show, for each pharmacological item, the pharmacy's purchased amount, the current inventory amount, and the amount prescribed. The audit user will be able to view an entire history of a pharmacological item by selecting it from the list. This history will show chronologically the inventory levels, including purchases, prescriptions, or expirations.

3 Facility Staff

One of the most important priorities for any medical facility is the cleanliness of its rooms. Facility staff primary goals are to clean rooms soon after being vacated, make sure equipment is the proper location, and find equipment that has been requested. After authentication, the facility staff will see options to look up rooms that need cleaning, retrieve equipment move requests, and find equipment location.

3.1   Rooms That Need Cleaning

Rooms that are assigned the need for cleaning with a description of the type of cleaning (equipment, floors, bedding, etc) shall be kept in an updated list that is easily marked off by staff as they are done with completion of cleaning. On this screen, the facility staff will be able to see the rooms that need cleaning. After service has been rendered, the user will select the room completion option or select the an option to detail why a room is not clean. Such circumstances may be: the room has a leaky room, the bathroom sink is broken, a floor tile is cracked, etc. Once the room has been repaired, the user will select the room completion option to notify the system of a room available.

3.2   Retrieve Equipment Move Requests

Medical staff need equipment and materials to be in a room. The request specifies the equipment and to the room to which it should be moved. The screen will be an ordered list of equipment move requests. The list will be a first come, first serve order. Once the request has been completed, the facility user will choose the request completed option and then next request will be shown.

3.3   Find Equipment Location

An online look up system shall be implemented to allow staff to look up equipment location quickly at any network accessible location. This

screen will ask for the major equipment ID or equipment name and display a list of equipment and its location. This screen is read only.

4   Customer Support Personnel

Customer Support Personnel include such people as receptionists and staff that are allowed access to things such as patients' appointment times and any cancellations or rescheduling as necessary. They will not be allowed access to private files such as patient medical history without approved permission or authorization. Customer Support Personnel also take phone calls for the organization to redirect or answer general questions. After authentication, the customer support personnel will see options to do patient scheduling or answer general facility questions.

4.1   Patient Scheduling

Customer support personnel are allowed to view appointment times for doctors as patients call in to make appointments/cancellations and at the hospital where the patients are leaving/arriving. Customer support personnel are able to access a patient's schedule after entering the patient's SSN or MYID into a lookup box and submitting it. Once the patient records are visible, the customer support user will select a doctor or date, enter the amount of time needed with the doctor and then can view available times for either the date or the doctor. Once an time has been agreed upon, the user will confirm the appointment by selecting the schedule button. Customer support personnel are then able to update their requests for them if necessary.

4.2 General Facility Questions

Customers ask questions regarding patient records or visit information. Support personnel will ask verification questions before giving out patient information, which may include records transfer to another facility or verification of previous patient visit. This screen will have a lookup box for the customer support user to enter the patient's MYID or SSN. After verification, the screen will display all of the patient's history. If the patient makes a request to transfer records, there will be an option to make a transfer request, which the customer support user will fill out the receiving institution's name and address and then submit it to be recorded in the patient's history. The customer support user will have to manually fax the patient's records to the requested institution; this process takes place outside of the MyHealth System.

5   Nurses

Nurses are responsible for the well-being and early seeing of the patients. As such they will have access to the patients files to prep them before being seen by a doctor or physician. Nurses also enter details about their interactions with patients. After authentication, nurses will be able to do patient record retrieval and do a patient visitation detail submission.

5.1 Patient Record Retrieval

After logging in and entering the patient's SSN or MYID, nurses will have similar access to patient files as doctors will in regards to updating and modifying new data such as allergies, history and other relevant medical data. On this screen, nurses will see the entire history of the patient on one screen. This screen is read only.

5.2 Patient Visitation Detail Submission

Nurses and doctors are required to enter details from the patient's visit. After entering the patient's MYID or SSN, nurses will be able to enter the details of the visit into the patient's record. This data includes: height, weight, blood pressure, heart rate, reason for visit, medications currently on, and other visitation details. Once complete, the form is submitted and cannot be edited.

6 Patients

Patients are the primary focus of this system. They are the ones tended to and need to have access to their own files but no one else's. They also should be able to see their files online and to schedule/cancel appointments online, pay bills etc.

6.1 Patient History

An online viewing system (this is a part of the MyHealth EMRKS) will be set up with authorization that the patient can review their own medical history and medical files. Patient history will include all relevant medical history data. Relevant medical history includes: blood pressure, cholesterol, height, weight, surgeries, date of visit, prescribed medicine, notes, and allergies.

6.2 Patient Scheduling

Patients will, with proper authentication, be able to view their upcoming appointments and request to modify them to cancel/reschedule according to time-slots available with their doctor/physician. Upon approval they will receive an email, mail, or telephone call notifying them of the changes.

7 Pharmacists

Pharmacists are responsible for the administration of drugs with proper forms given by a doctor. As doctors fill out prescriptions (online or by paper) the pharmacists are allowed to check and see prescriptions for patients and give out the medicine as needed. Pharmacists will also need to update inventory when new shipments arrive.

7.1 Patient prescriptions

Pharmacists will have limited access to an online page to see if the patient has the requested prescription approved by the doctor or not. The doctor must have administered it, and approved it, then marked a check box to authorize it as a digital signature. The pharmacist will be able to log in and put in the patient's SSN or MYID and be able to pull up their past and current prescription requests along with who administered them, known patient drug interactions, the dosage, the medicine and the digital signature from the prescribing doctor. When a prescription has been entered, the prescription will be checked for known drug interactions or existing medical conditions. As prescriptions are filled, inventory is automatically updated as the pharmacist must close out the request for the medicine by either allowing it or denying it.

7.2 Pharmacological Inventory

Pharmacists will need to maintain an up-to-date inventory. When new stock arrives, it will need to be entered into the system in a spreadsheet type format page online. There will be a page which will tell of current medical stock, if the pharmacist wants to make any changes, and an update section will allow them to increase stock as new stock comes in.

8   Physicians

Physicians are responsible, along with nurses, for caring for the patients. As the doctors see patients they will have access to patient medical history and be responsible for electronically logging the details of the most previous patient visit. However, they will not have access to things such as patient financial information. Physicians will enter patient visit details after the visitation has ended.

8.1   Patient Medical History

Upon authentication with the system, the physician is able to see all the patients medical history in one easy access view. The easy access view will contain patient history with the current hospital, and any other history that can be obtained by collaboration with other hospitals. In the patient history there will be things such as: previous surgeries with date, type, and doctor operating; previous prescriptions with what type of medicine and when it was administered; previous height, weight, cholesterol, blood pressure, and any other relevant medical data history.

8.2   Patient Visit Details Submission

After the visitation has completed, the physician will log into the system using their SSN or MYID and password and enter their comments and details of the visit into the system of the patient. Upon patient exit the physician will open up the patient's current visit detail page and will be able to jot down notes electronically using a standard keyboard to make any useful notes or references of the current visit.

9 Receptionists

Receptionists are responsible for maintaining the scheduling of patients with the nurses and physicians. They should be allowed to update the scheduling but not see things such as patient medical history. Receptionists sometimes will need to handle patient payment requests. Receptionists, after logging in, will be able to access a screen which will allow them to enter a patient's SSN or MYID which will grant them an easy access view of the patient's schedule.

9.1 Patient Scheduling

Receptionists are able to access a patient's schedule after entering the patient's SSN or MYID into a lookup box and submitting it. They are then able to update their requests for them if necessary. If the patient has electronically requested an update the receptionist is responsible for allowing the change and notifying the patient and personnel necessary. As requests come in the receptionist will be able to confirm or deny the updated change. After either is selected the patient will be notified via email and telephone to let the patient know what decision they made and why.

9.2 Registering Payment

A patient may pay during their visit. The payment must be logged and pended to their account. Payment processing is done by accountants. If a patient is willing to pay during a visit to the hospital they may pay the receptionist. The receptionist is able to log into the system and access a patients billing screen by entering their SSN or MYID. From the billing screen they are able to update pending payments as the balance is adjusted with confirmed payments.

Appendix A   Glossary

account   A "family" unit--all family members are under one account. Any member of the account may access any other member's information.

audit   A process of verifying the current state against the changes since a previous state.

billing report   A printout of a customer balance statement.

EMRKS   Electronic Medical Record Keeping System: a system that provides a health care facility the ability to centralize and maintain their record keeping electronically.

history   Any and all previous patient/organization interactions.

line items   A line in a billing report that corresponds to a billable item, i.e. an allotment of a doctor or nurse's time, any medical supplies, or a laboratory.

log   Any interaction with a customer/patient must be logged/ documented to their account.

lookup box   A small box where the customer's SSN or MYID is entered, once the search button is pressed the data entered into the lookup box will be used to search for the customer's account.

MYID   The MyHealth System ID. e.g., 1000239483.

organization   An organization is an entity that interacts with the MyHealth System, such as a supplier, business, etc.

patient   An entity that is a registered user of the facility, with at a minimum of one in-progress or scheduled and completed visit with a medical professional.

payment   A mailed check, credit card either via phone or in person, or cash tendered at a reception desk.

pharmacological stock unit   A base unit in which the drug arrives. For example, a pill is one unit; fluid milligram is one unit.

prescription   A nurse/physician entered log that specifies a time and/or unit limit of a pharmacological stock unit.

room   A room is divided up into its smallest usable size. A double-room is two units; a triple-room is three units.

scheduling   A patient may be scheduled to a billable employee, if the billable employee is active/scheduled to work.

screen   A page or window that a user utilizes to interact with the system.

SSN   A US Social Security Number. e.g., 123-45-6789.

terminal   An instance of the MyHealth System interface usable on a organization workstation or home computer.

time unit　All employees billable time unit is on the minute system. For example, .5 hour is 30 units (minutes); 2 hours is 120 units (minutes).

user　A user may be a physician, nurse, patient, etc. Each user type will have specific verification of identity specified in Appendix B.

verification　A system the organization uses to verify the identity of a user.

visit　A visit begins when the patient is registered. The visit ends when the patient is either discharged or after the nurse/physician escorts patient back to a waiting room.

window　An area where user-type specific work is performed.

Appendix B   Security

The MyHealth System utilizes abstract layers of security. The two primary security layers are database and interface. Each layer has secondary levels to further limit access or possible privacy violations. Security of private information is a high priority of the MyHealth System.

The database layer will have secondary layers to allow user types to access or modify certain areas of the database. This also prevents users to view or edit areas of the database they do not have permission to access or modify. By limiting access at the database layer also limits the amount of damage done in the event of nefarious activities at a terminal.

The compounds of the interface security layer are derived from authentication of users to access the system and see level specific information. The authentication process is in the form of passwords or pin numbers to allow users to access certain aspects of the MyHealth System and restrict them from access to others. This system ensures that only the individuals that know the account credentials may access that account.

The aforementioned security protocols were developed to be as transparent as possible while still allowing for maximum patient privacy. By limiting access at a user-type level, the security requirements are reduced for higher layers. By having interface-level security, the number of windows available to a user is limited--which further restricts their actions to the bare-essential screens that user type needs to accomplish their goal. These layers function much like a tree-branching system function. The trunk is the widest access and the primary branches have only specific access to the main trunk. Likewise, the secondary functions only have access to specific parts of the primary branches.