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Session 4 Portfolio Task

Topic: Requirements Engineering

Submission Format: Requirements Specification

Introduction

The need for the system and how it fits in with the overall business objectives

The Patient Information System for Mental Health care maintains information about patients suffering from mental health ailments and the treatments they are receiving. This system caters also for mental health patients who are not currently hospitalized but who need to see a clinician regularly who has to have detailed knowledge of their condition. These sessions/visits/appointments are therefor not just run at hospitals but also at local medical surgeries or community centers, hence the need for a centralized system that serves requests from many locations and that continuously syncs all the information into one centralized and secure database.

The system's functions

The Patient Information System for Mental Health care, will primarily have the following functions:

- 1) To allow health service managers to generate information reports from the system to help them assess performance against local and government targets.
- 2) To enable medical staff to have access to the right information, at the right time, to support the treatment of their patients.

How it will work with other systems

Although the system does not maintain information about medical conditions other than mental health, it may interact and exchange data with other clinical information systems.

It may also interact with the police' and social services' systems in the event a patient is sanctioned by a clinician, eg for being a danger to themselves or others.

Glossary

Succinct definitions of technical terms

System Function

An end goal achieved through one or more activities performed on the machine, and for the purpose of which the machine has been designed for.

User requirement

A broad specification of an individual task the machine should allow a user to achieve, seen from a non-technical perspective and usually specified by the software contractor.

System requirement

A User Requirement taken, and from the perspective of a developer turned into an individual or set of, detailed activities. Those activities, to be performed on a machine, for the purpose of accomplishing a single but complete task for which the machine was designed for.

Functional requirement

A task that the machine must do or must allow the user to do

- ❖ Eg search results for a patient.

Non-Functional requirement

A constraint on a specific functional requirement or a general requirement on the system as a whole

- ❖ Eg only return results if the user executing the search is logged in.
- ❖ Eg the system must be available for use at all times.

Function (in the System requirement definition tables)

An appropriate name for a single System Requirement that adds a task to the system's résumé, ultimately making up the many small functions that together achieve the general system's goals.

User requirements definition

Functional requirements

Clinicians **must** be able to:

- Create records for patients
- Edit information in the system
- View patients history
- View a history summary for a patients
- Generate medical report for an individual patient

Clinicians **should** be able to:

- Make use of advanced search functionality

Clinicians **could** be able to:

- Generate appointment report, listing all the patients' appointments expected that day for all clinics

Clinicians **won't** be able to:

- Have the system suggest treatments or medications for the patient

Administrators **must** be able to generate monthly reports showing:

- The number of patients treated at each clinic
- The number of patients who've registered or left the system's active registrar
- The number of patients sanctioned
- The drugs prescribed
- The cost of the drugs prescribed

Administrators **should** be able to:

- export their reports in readable format

Administrators **could** elect to include in their monthly report:

- The conditions treated

Administrators **won't** be able to:

- Perform advanced automated analytics on the data

The system **must** monitor and generate a warning, flagging up:

- If a patient has not seen a doctor for sometime due to missed appointments
- For a patient to be sanctioned in the event a patient is assessed, based on their recent history, to be potentially suicidal or a danger to others

The system **should**:

- Allow staff to register and schedule appointments for users

The system **could**:

- Distinguish between administrative personal information, such as address and phone number, and **medical** personal information

The system **won't**:

Generate appointments reports (i.e. a list of all appointment, with which patients, expected that day) for individual clinics **but for all clinics together only**

Non-functional requirements

Product constraints:

- The system must be available when needed
- The system must be synced and continuously update a centralized Patient Information Database with the new inputs that are coming in from all connected users
- Even if the user is offline, they must be able to download local copies of whichever type of data they have permission to access. (i.e. medical interface vs administratorial interface)
- Each user using the system should only be allowed access after their eight-digit ID number has been verified
- The system (server) must allow access from sites that do not have secure network connection, however it will only access, use and transfer of **personal** patient information from the **Patient Information Database** over a secure network connection (Eg. a patient's file is downloaded over a secure connection only, but all other system functionality like statistical reports and clinician availability etc, that require online connectivity, will function even over unsecure connection).

Organisational constraints:

- The system must also run on laptops (or other devices) belonging to authorized users as well as on the computers in the clinics where they were designed to run on
- The monthly reports Administrators generate, won't contain personal information but will be anonymised

External constraints:

- The system must only allow its functions to be invoked in accordance with the laws on data protection and confidentiality of personal information
- The system must only allow its functions to be invoked in accordance with the laws on mental health including those that govern the compulsory detention of patients deemed to be a danger to themselves or others

System requirements definition

- Register patient
- Search patient
- View/Edit personal admin information
- View/Edit personal medical information
- View patient medical history summary

- Setup appointment
- Generate appointments report
- Generate medical report
- Export current report
- Maintain/preserve system information and record keeping procedure
- Flag patient having missed 3 appointments
- Flag patient as sanctioned
- Generate data or patient care breach warning
- Download local copy of the system

Function	Register patient
Description	A staff member registers a patient into the system
Inputs	Patients details, eg name, address, phone number and next of kin etc
Source	From patient, next of kin, previous surgery or hospital records
Outputs	A record created for the patient in the system
Preconditions	Patient has been referred to be put on this program by a medical clinician
Post conditions	A notification sent to a clinician working with the patients registered on the system to review patients record on how to proceed

Function	Search patients
Description	A system user searches for a particular patient's record in the system
Inputs	The name or address of the patient
Source	From a staff, patient, social service etc or paper record
Outputs	Patients record displays on computer screen
Preconditions	Patient's record exists in the system/database
Post conditions	

Function	View/Edit personal admin information
Description	A staff member edits or views a patient's name, address, phone no etc.
Inputs	The new information if changes are made

Source	From patient, next of kin or records relating to this patient from a different system, that this system interacts with
Outputs	The patient's (edited) record is displayed on screen
Preconditions	Patient's record exists in the system/database
Post conditions	If changes occur, they are reflected back to the database

Function	View/Edit personal medical information
Description	A clinician or other authorized member of staff (eg nurse) is viewing or editing the personal medical information of a patient
Inputs	The new information if changes are made
Source	From patient, next of kin, other clinician's notes or records relating to this patients from a different system, this system interacts with
Outputs	The patients (edited) record is displayed on screen
Preconditions	Patient's record exists in the system/database
Post conditions	If changes occur, they are reflected back to the database

Function	View patient medical history summary
Description	A clinician or other authorized member of staff (eg nurse or clinician new to the case), is requesting for a summary of the personal medical history of a patient
Inputs	A date From, a date To and a category of the type of appointment to be included in the summary (eg consultation, test etc)
Source	The clinician making the request
Outputs	The required information displayed on the screen
Preconditions	Patient's record exists in the system/database
Post conditions	

Function	Setup appointment
Description	A staff member sets up an appointment for a patient
Inputs	Personal admin details of the patient, a date and time, reason and clinician to be seen
Source	Clinician, Patient or Next of kin
Outputs	Confirmation that appointment has been booked, displayed on screen
Preconditions	Patient is not sanctioned
Post conditions	Notification is sent to clinician confirming booked appointment

Function	Generate appointments report
Description	A clinician or other authorized member of staff (eg nurse) is requesting for a list of appointments for all clinics for a given day
Inputs	Date of the day, the report is being generated for
Source	Authorised user making this request
Outputs	A list of all appointments for that day ordered by time, name of patient, at which clinic, with which clinician it was scheduled with and the reason for the appointment
Preconditions	There are appointments booked for that day
Post conditions	

Function	Generate medical report
Description	A clinician wants to generate a full medical report for an individual patient or Administrator wants to generate an anonymised monthly report for all patients
Inputs	Name of patients if for individual non-anonymised patient or just a Month, for an anonymised one
Source	The Clinician or Administrator making the request
Outputs	An exportable detailed medical report for one patient per report, or an anonymised report for all patients, listing the: <ul style="list-style-type: none"> number of patients treated at each clinic

	<ul style="list-style-type: none"> • number of patients who've registered or left the system's active registrar • number of patients sanctioned • drugs prescribed • cost of the drugs prescribed • optionally the conditions treated. <p>Both type of reports are for a given timeframe</p>
Preconditions	For an individual report, the user must be authorised to see a patient's personal information; For an anonymised report, the option Anonymised must be selected
Post conditions	

Function	Export current report
Description	A clinician or Administrator chooses to export the report they've generated in a readable format
Inputs	A request for the report to be exported and indication on format to be exported in i.e. pdf, excel, html etc.
Source	The Clinician or Administrator making the request
Outputs	A readable format of the file downloaded onto their local desktop
Preconditions	The connection over which the report is downloaded is secure and the device onto which it's downloaded is approved
Post conditions	Note made about this event for data protection measures

Function	Maintain/preserve system information and record keeping procedure
Description	A clinician (or medical record staff member) is choosing to maintain the information kept in the system for example, by way of updating manuals and workflow documents, backuping data and in general preserving the system's information and ensuring that record keeping procedure have been properly implemented
Inputs	Changes or checks to be made to relevant components of the system
Source	Organisational, technical or legislative needs
Outputs	The changes that have been made and results of checks that have been performed, reflected in the system's functionality or how the system is to be used
Preconditions	The clinician or medical record staff member has the relevant authority to make the changes
Post conditions	

Function	Flag patient having missed 3 appointments
Description	If a patient has missed 3 of their scheduled appointments, the system automatically recognises it and flags the patients as that, generating a warning that a clinician ought to look into
Inputs	Inputs indicating that they have attended have failed to be put in for 3 consecutive times
Source	Programmed into the software code
Outputs	A warning is generated so that the clinician or clinic staff members at the clinic appointed to this patient are aware and have to look into it
Preconditions	Patient must have missed 3 scheduled appointments
Post conditions	

Function	Flag patient as sanctioned
Description	If a patient shows to be of danger to themselves or others, the clinician flags the patients as sanctioned and recommends a secure hospital where they're to be confined for treatment and observation
Inputs	Name of the patient, reason and duration of sanctioning and hospital where they're to be treated
Source	Patient, next of kin, patient's record already in the system or from law enforcement agent
Outputs	Patient is flagged in the system as sanctioned, for whoever accesses their profile to see, until changed to otherwise
Preconditions	Patient must show in consultation or in action, and be assessed by clinician, to be of danger to themselves or to other people
Post conditions	Confirmation is received that patient has is under control, at relevant confined medical institution

Function	Generate data or patient care breach warning
Description	System continuously monitors the two above aspects so that if for eg access is attempted by unauthorized user, personal medical data download is attempted over unsecure connection or an action on the system, is attempted by clinician or any other authorised member of staff (eg nurse), that goes against patient care and safety regulations, a warning is generated that prevents the user from proceeding
Inputs	A request foreign to the rules that guide the system's software instructions
Source	From an unauthorized user, unauthorised device or just an unauthorised request
Outputs	A warning generated on the screen explaining what the user did wrong
Preconditions	
Post conditions	A log of what has happened for a medical record staff to review

Function	Download local copy of the system
Description	If a clinician is for eg seeing a patient at a local community center and they're using their personal device not over a secure internet connection then they can download a local copy of the relevant patient's file, make the changes required, and later when they're back on a secure connection, the changes will automatically get synced to, and update, the central Database
Inputs	A request to download a local copy of the patient's file together with the relevant components of the system needed for manipulating it
Source	The clinician making the request from the system's server
Outputs	A local copy of the requested system's components, usable on the user's personal device
Preconditions	The user and their machine must be authorised to access the relevant components
Post conditions	The changes which the user makes to the files are later reflected back to the Database