Requirements document (team white)

Preface

Target audience

This document was written to describe the requirements for the MHC-PMS (MHC patient management system) in details. It includes every aspect of the system and focuses on the technical side. The reader should have a basis understanding of the healthcare section and information technology.

Authors

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Document history

For details about the evolution of this document please check the commit history in the git repository. Or the command mentioned below:

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$ git log
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Document releases

Major and minor releases of this document are listed in the table below.

Release	Who	Summary of changes
0	Team	Creation of the document
0.1	Team	Release after first day. Content added
0.2	Team	Content added

Introduction

Your regional health authority wishes to introduce a patient management system (PMS) to manage the care of patients suffering from mental health problems. The overall goals of the system will be:

1. To provide medical staff with timely information to facilitate the treatment of patients.
2. To generate management information that allows health service managers to assess performance against local and government targets.

Most mental health patients do not require dedicated hospital treatment but need to attend specialist clinics regularly where they can meet a doctor who has detailed knowledge of their problems. The health authority has a number of clinics that patients may attend. To make it easier for patients to attend, these clinics are not just run in hospitals. They may also be held

in local medical practices or community centres. Patients need not always attend the same clinic and some clinics may support ‘drop in’ as well as pre-arranged appointments.

The nature of mental health problems is such that patients are often disorganised so may miss appointments, deliberately or accidentally lose prescriptions and medication, forget instructions and make unreasonable demands on medical staff. In a minority of cases, they may be a danger to themselves or to other people. They may regularly change address and may be omeless on a long-term or short-term basis. Where patients are dangerous, they may need to be ‘sectioned’ – confined to a secure hospital for treatment and observation.

Users of the system include clinical staff (doctors, nurses, health visitors), receptionists who make appointments and medical records staff. Reports are generated for hospital management by medical records staff. Management have no direct access to the system.

The system is affected by two pieces of legislation:

1. Data Protection Act that governs the confidentiality of personal information
2. Mental Health Act that governs the compulsory detention of patients deemed to be a danger to themselves or others.

The system will NOT become a complete medical records system where all information about a patients medical treatment is maintained. It will solely intended to support mental health care so if a patient is suffering from some other unrelated condition (such as high blood pressure) this would not be formally recorded in the system.

Glossary

This section define the technical terms used in the document.

- **Clinic**: A clinic is a health care facility that provide ambulatory or hospitalized care for patients.
- **Diagnosis**: Medical diagnosis refers both to the process of attempting to determine or identify a possible disease or disorder (and diagnosis in this sense can also be termed (medical) diagnostic procedure), and to the opinion reached by this process (also being termed (medical) diagnostic opinion). From the point of view of statistics the diagnostic procedure involves classification tests. It is a major component of, for example, the procedure of a doctor's visit.
- **Drugs**: A drug is a substance which may have medicinal, intoxicating, performance enhancing or other effects when taken or put into a human body or the body of another animal and is not considered a food or exclusively a food.
- **DSM**: The Diagnostic and Statistical Manual of Mental Disorders is a classification system by the American Psychiatric Association. It's a complement to the corresponding sections in the ICD.
- **History**: In this context, history means the complete list of past events all around the patient. For example, this includes treatment, drug prescriptions, orders given to nursing staff and so on.
- **ICD**: The International Statistical Classification of Diseases and Related Health Problems is a medical classification list published by the World Health Organization (WHO). It contains codes for diseases, signs and symptoms, abnormal findings,

complaints, social circumstances, and external causes of injury or diseases. The postifx number marks the revision, ICD-10 is the 10th revision.
- **Order**: In this context, an order means an assignment from a therapist to nursing staff, administration staff or any other person, which is involved in the treatment and administrative process of the patient.
- **Patient**: A patient is any recipient of health care services. The patient is in need of treatment by a health care provider. In this case, this provider is a therapist.
- **Psychiatrist**: A psychiatrist is a physician who specializes in psychiatry. Psychiatrists are authorized to prescribe medicine, conduct physical examinations, order and interpret laboratory tests, and may order brain imaging studies such as computed tomography (CT/CAT Scan), magnetic resonance imaging (MRI), and positron emission tomography (PET) scanning. A psychiatrist has an MD.
- **Psychologist**: A psychologist evaluates, diagnoses, treats, and studies behavior and mental processes. Some psychologists, such as clinical and counseling psychologists, provide mental health care, and some psychologists, such as social or organizational psychologists conduct research, usually in university or other academic settings. A psychologist has a graduate degree (usually a PhD or MA).
- **PMS**: **P**atient **M**anagement **S**ystem
- **Therapist**: Psychotherapists employ a range of techniques based on experiential relationship building, dialogue, communication and behavior change that are designed to improve the mental health of a client or patient, or to improve group relationships (such as in a family).

User requirements specification

Use Cases

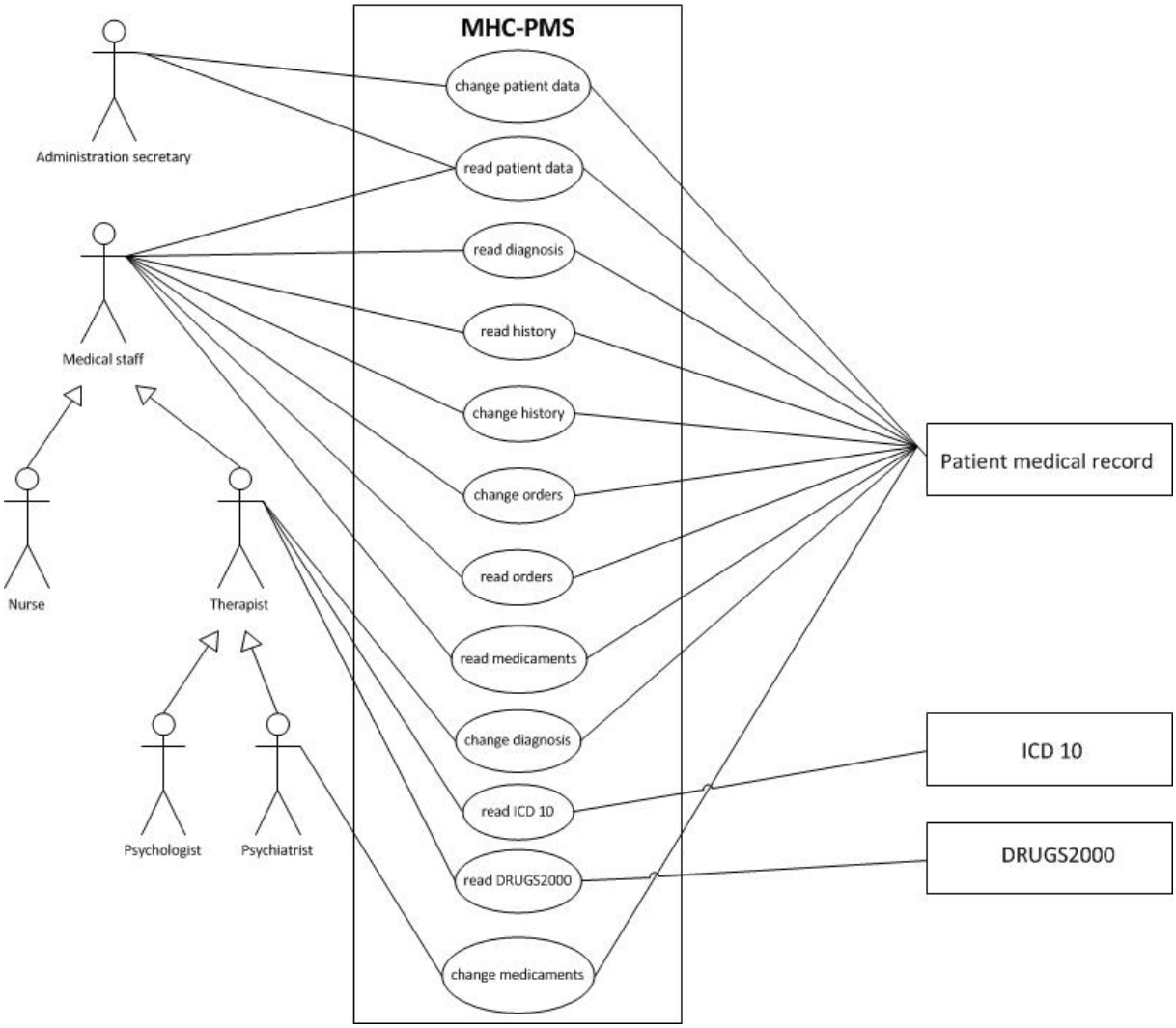
List of all known use cases

User: psychotherapist (psychiatrist or psychologist)

- (1) read patient data
- (2) read diagnosis
- (3) change diagnosis
- (4) read medication
- (5) change medication (only psychiatrist)
- (6) read ICD-10 catalog (diagnosis database)
- (7) read medication catalog (drugs database)
- (8) read history
- (9) change history
- (10) read orders
- (11) change orders
- (12) help system

User: administration staff (not relevant for this project)

- change patient data



Functional user requirements

1. Read patient data

1.1 Show all patients in a table on the home screen: show status, name, psychotherapist (current), clinics (hospitals or local medical practices).

1.2 Search a specific patient: search by status, name, psychotherapist (current), clinics (hospitals or local medical practices).

1.3 Sort the patient table: sort by status, name, psychotherapist (current), clinics (hospitals or local medical practices).

1.4 Filter the patient table: filter own patients, clinic patients, all patients.

1.5 Open the dossier of a specific patient from the start screen: personal data, diagnosis, drugs, orders to other staff, history.

1.6 Show personal data of a specific patient: first name, last name, dangerousness of the patient, comment about dangerousness, gender, birthday, civil status, mother language,

communication language, nationality, religion, adress, home location, postal code, country, phone private, phone business, mobile phone number, e-mail.

2. Read diagnosis

2.1 Show diagnosis of patients in a table and details view.

2.2 The details view shows: name of the patient (optional), name of the diagnosis, ICD code (ev. DSM code), date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.3 The table view shows: name of the patient (optional), name of the diagnosis, ICD code (ev. DSM code), date of creation, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.4 Filter the diagnosis of one patient: self created diagnosis, diagnosis created by therapists from the same clinic, diagnosis created by all existing therapists.

2.5 Filter the diagnosis of multiple patients: current patient, all own patients, all patients from the same clinic, all existing patients.

2.6 Search diagnosis of patients: search by name of the patient, name of the diagnosis, ICD code (ev. DSM code), date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.7 Sort diagnosis of patients: sort by name of the patient, name of the diagnosis, ICD code (ev. DSM code), date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3. Change diagnosis

3.1 Add a new diagnosis for the current patient: select and save the name of the diagnosis, ICD code (ev. DSM code), date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3.2 Change an existing diagnosis for the current own patient: change and save the name of the diagnosis, ICD code (ev. DSM code), date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3.3 Delete an existing diagnosis for the current own patient.

4. Read medication

4.1 Show medication of patients in a table and details view.

4.2 The details view shows: name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

4.3 The table view shows: name of the patient (optional), medication name, prescribing person (doctor), prescribing details.

4.4 The prescribing details includes: duration, frequency, point in time (morning, noon, evening, night), dose and dose unit by point in time.

4.5 Filter the medication of one patient: self created medication, medication created by doctors from the same clinic, medication created by all existing doctors.

4.6 Filter the medication of multiple patients: current patient, all own patients, all patients from the same clinic, all existing patients.

4.7 Search medication of patients: name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

4.8 Sort medication of patients: Sort by name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

5. Change medication

5.1 Add a new medication for the current patient: select and save medication name, medication description, medication manufacturer, prescribing person (doctor), clinic, prescribing details.

5.2 Change an existing medication for the current own patient: medication name, medication description, medication manufacturer, prescribing person (doctor), clinic, prescribing details.

5.3 Delete an existing medication for the current own patient.

6. Read ICD-10 catalog

6.1 Start the ICD-10 diagnosis catalog from the diagnosis screen.

6.2 Show ICD-10 catalog in a table and details view.

6.3 The details view shows: diagnosis name, ICD-10 code, diagnosis description.

6.4 The table view shows: diagnosis name, ICD-10 code, diagnosis description.

6.5 Filter the ICD-10 catalog entries: Filter by ICD-10 code group.

6.6 Search in the ICD-10 catalog: search by diagnosis name, ICD-10 code, diagnosis description.

6.7 Sort the ICD-10 catalog entries; sort by diagnosis name, ICD-10 code, diagnosis description.

7. Read medication catalog

7.1 Start the medication catalog from the medication screen.

7.2 Show medication catalog in a table and details view.

7.3 The details view shows: medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

7.4 The table view shows: medication name, dope (Wirkstoff), category, medication manufacturer.

7.5 Filter medication catalog entries: Filter by category, medication manufacturer.

7.6 Search in the medication catalog: medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

7.7 Sort the medication catalog entries; medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

8. Read history

8.1 Automatic event creation of all changed diagnosis, medications, orders.

8.2 Show history of patients in a table and details view (all changed diagnosis, medications, orders, and self created events).

8.3 The details view shows: name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

8.4 The table view shows: name of the patient (optional), event type, responsable therapist, date of event, clinic.

8.5 Filter the history of one patient: own events, events created by therapists from the same clinic, events created by all existing therapists.

8.6 Filter the history of multiple patients: current patient, all own patients, all patients from the same clinic, all existing patients.

8.7 Search history entries: search by name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

8.8 Sort history entries: sort by name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

9. Change history

9.1 Add a new event for the current patient: event type, responsable therapist, comment of responsable therapist, date of event, clinic.

9.2 Change an existing (self created) event for the current own patient: event type, responsable therapist, comment of responsable therapist, date of event, clinic.

9.3 Delete an existing (self created) event for the current own patient.

10. Read Orders

10.1 Show orders to other medical staff in a table view: acceptor of order, responsabe therapist, description, date, status, clinic.

10.2 Search orders: serach by acceptor of order, responsabe therapist, description, date, status, clinic.

10.3 Sort orders: order by acceptor of order, responsabe therapist, description, date, status, clinic.

11. Change Orders

11.1 Add new order for the current own patient: acceptor of order, responsabe therapist, description, date, status, clinic.

11.2 Change an existing order for the current own patient: acceptor of order, responsabe therapist, description, date, status, clinic.

11.3 Delete an existing order for the current own patient.

12. Help system

12.1 Start the help system from every screen of the application.

12.2 Show the diffrent help topics: Navigation tree and description of selected topic.

12.3 Search with keywords in the help system.

Non-functional user requirements

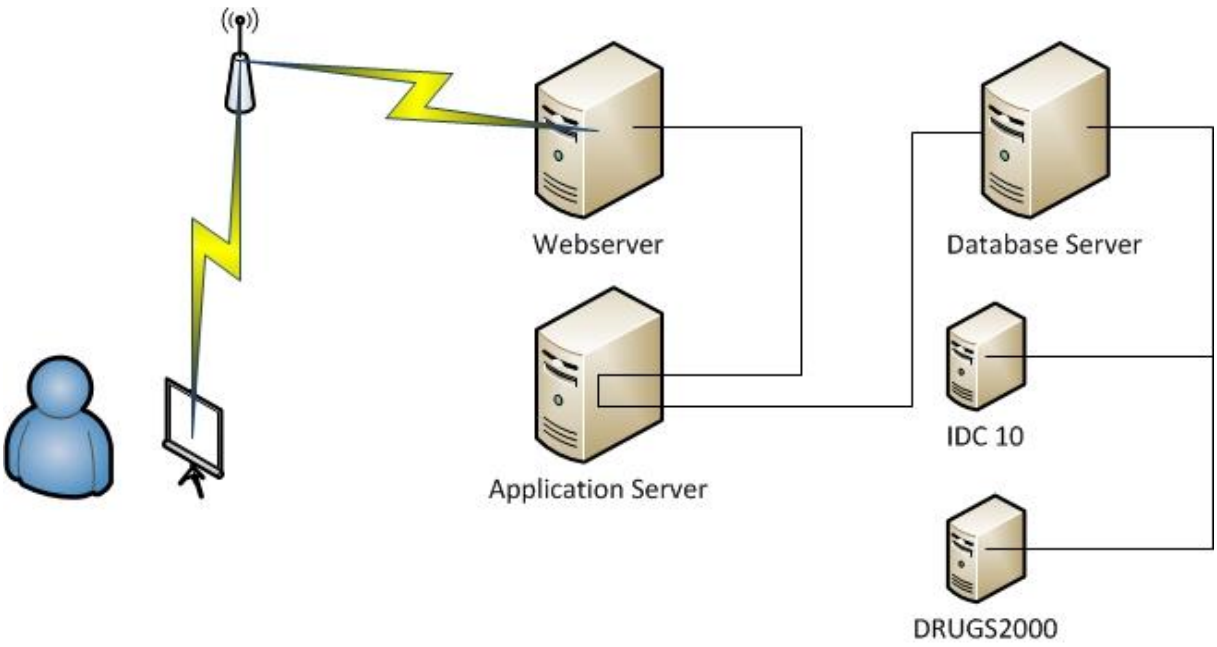
- The application can be used on tablet during a consultation or a meeting (main use).
- The application can be used on desktop when a theparist is doing office work.
- The language of the application is german. It should be possible to integrate a french language version at a later point (clinics in the romandie).
- A therapist can only change data from own patients.
- Only a psychiatrist can do change in medication, a psychologist has a read only access to the medication management functionality.
- Login to the application with encrypted username and password.
- The data protection act must be considered.

System architecture and system models

The basic layout of the architecture will be a client-server web application with multiple layers. Details are visible in the picture.

- Web interface running in the browser

- Webserver
- Application server
- Database server



For maximum performance the database will be hosted on a dedicated server. Every connection between the participient of the backend will be encrypted with industrial standards. The clients will only access the web server on a encrypted channels. No unencrypted communication between the client and the server will be established or allowed.

System requirements specification

Use Case Scenario 1

- **No. and name** : **1** Change diagnosis User Requirements
- **Scenario** : Change an existing diagnosis for a patient (own patient of the therapist)
- **Description** : There are new informations concering the medical situation of the patient and a diagnosis has to be changed.
- **Engaged party** : Therapist / MHC_PMS
- **Trigger / Pre condition** : The patient must already have an existing diagnosis and must exist in the database.
- **Results / Post condition**: The patients diagnosis now is updated

Sequence

Nr.	Who	What
1	Therapist	Login with personal username and password
2	Therapist	Choose the patient in the patient table
3	Therapist	Choose the diagnosis tab in the sidebar menu

4	MHC_PMS	The application changes to the diagnosis screen
5	Therapist	Choose the diagnosis, which has to be changed
6	Therapist	Click the "Bearbeiten" Button for the choosen diagnosis
7	MHC_PMS	The change diagnosis screen will be opened
8	Therapist	The therapist enters the new ICD-10 Code in the ICD-Code Combo-Field
9	MHC_PMS	While typing the application looks up the proper diagnosis from the database
10	MHC_PMS	If the diagnosis exists, the Combo-Field "Diagnose" will show the diagnosis for the choosen ICD-Code
11	MHC_PMS	The textfield "Beschreibung" will show the description for the choosen diagnosis
12	Therapist	The therapist write an new comment in the "Kommentar" textfield
13	Therapist	The therapist clicks the "Speichern" button
14	MHC_PMS	The changed diagnosis is stored in the database
15	MHC_PMS	The application closes the change diagnosis screen and returns to the diagnosis screen

Exceptions, variations

Nr.	Who	What
1.1	Therapist	Therapist must have a user account and password
2.1	MHC_PMS	The patient must exist in the database
5.1	MHC_PMS	The diagnosis to this patient must exist in the database
9.1	MHC_PMS	The diagnosis does not exist: A short message will be displayed
9.2	MHC_PMS	The same diagnosis as before the search is displayed

Use Case Scenario 2

- **No. and name** : **2** Change medication User Requirements
- **Scenario** : The medication for a user has to be changed
- **Description** : A patient has major side effects with a prescribed medication. The psychiatrist wants to try a different dosage (morning).
- **Engaged party** : Psychiatrist / MHC_PMS / DRUGS2000
- **Trigger / Pre condition** : The patient must have an existing record and e previously perscribed medication
- **Results / Post condition**: The changed prescription is stored in the patients medical record

Sequence

Nr.	Who	What
1	Therapist	Login with personal username and password
2	Therapist	Choose the patient in the patient table
3	Therapist	Choose the medication tab in the sidebar menu
4	MHC_PMS	The application changes to the medication screen

5	Therapist	Choose the medication, which has to be changed
6	Therapist	Click the "Bearbeiten" Button for the choosen medication
7	MHC_PMS	The change medication screen will be opened
8	Therapist	The therapist enters the new dose in the field "Dosierung am Morgen"
13	Therapist	The therapist clicks the "Speichern" button
14	MHC_PMS	The changed medication is stored in the database
15	MHC_PMS	The application closes the change medication screen and returns to the medication screen

Exceptions, variations

Nr.	Who	What
1.1	Therapist	Therapist must have a user account and password
2.1	MHC_PMS	The patient must exist in the database
5.1	MHC_PMS	The medication to this patient must exist in the database
8.1	MHC_PMS	Wrong input format (characters): an error message is displayed
8.2	MHC_PMS	The old dose value is restored

Functional system requirements

0. General

0.1 Possibility of restricting the search space: own patients, clinic patients, all patients.

0.2 Show possible search results while typing (cp. Google).

0.3 A navigation list can be used as a sidebar in all details screens (On the left or right side of the screen).

0.4 The navigation list can be expanded as a sidbar. This opens the home screen.

0.5 The selection of a diagnosis implies an automatic selction of the ICD code and diagnosis description.

0.6 The selection of an ICD code implies an automatic selection of the diagnosis and diagnosis description.

0.7 The selection of a medication implies an automatic selection of the category, medication manufacturer, and medication description.

0.8 No possibility to change an automatic created event.

1. Read patient data

1.1 Show all patients in a table on the home screen: show status, name, psychotherapist (current), clinics (hospitals or local medical practices).

- Valid values for attribute "status": "Eigene", "Aktiv", "Abgeschlossen", "Wieder aktiv"

1.2 Search a specific patient: search by status, name, psychotherapist (current), clinics (hospitals or local medical practices).

1.3 Sort the patient table: sort by status, name, psychotherapist (current), clinics (hospitals or local medical practices).

1.4 Filter the patient table: filter own patients, clinic patients, all patients.

1.5 Open the dossier of a specific patient from the start screen: personal data, diagnosis, drugs, orders to other staff, history.

1.6 Show personal data of a specific patient: first name, last name, dangerousness of the patient, comment about dangerousness, gender, birthday, civil status, mother language, communication language, nationality, religion, adress, home location, postal code, country, phone private, phone business, mobile phone number, e-mail.

2. Read diagnosis

2.1 Show diagnosis of patients in a table and details view.

2.2 The details view shows: name of the patient (optional), name of the diagnosis, ICD code, date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.3 The table view shows: name of the patient (optional), name of the diagnosis, ICD code, date of creation, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.4 Filter the diagnosis of one patient (1. dimension): self created diagnosis, diagnosis created by therapists from the same clinic, diagnosis created by all existing therapists.

2.5 Filter the diagnosis of multiple patients (2. dimension): current patient, all own patients, all patients from the same clinic, all existing patients.

2.6 Search diagnosis of patients: search by name of the patient, name of the diagnosis, ICD code, date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

2.7 Sort diagnosis of patients: sort by name of the patient, name of the diagnosis, ICD code, date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3. Change diagnosis

3.1 Add a new diagnosis for the current patient: select and save the name of the diagnosis, ICD code, date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3.2 Change an existing diagnosis for the current own patient: change and save the name of the diagnosis, ICD code, date of creation, description of diagnosis, comment of therapist, diagnosis creator (therapist), clinic (hospital or local medical practice).

3.3 Delete an existing diagnosis for the current own patient.

4. Read medication

4.1 Show medication of patients in a table and details view.

4.2 The details view shows: name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

4.3 The table view shows: name of the patient (optional), medication name, prescribing person (doctor), prescribing details.

4.4 The prescribing details includes: duration, frequency, point in time (morning, noon, evening, night), dose and dose unit by point in time.

4.5 Filter the medication of one patient (1. dimension): self created medication, medication created by doctors from the same clinic, medication created by all existing doctors.

4.6 Filter the medication of multiple patients (2. dimension): current patient, all own patients, all patients from the same clinic, all existing patients.

4.7 Search medication of patients: name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

4.8 Sort medication of patients: Sort by name of the patient (optional), clinic, medication name, prescribing person (doctor), medication description, medication manufacturer, prescribing details, doctors comments.

5. Change medication

5.1 Add a new medication for the current patient: select and save medication name, medication description, medication manufacturer, prescribing person (doctor), clinic, prescribing details.

5.2 Change an existing medication for the current own patient: medication name, medication description, medication manufacturer, prescribing person (doctor), clinic, prescribing details.

5.3 Delete an existing medication for the current own patient.

6. Read ICD-10 catalog (diagnosis database)

6.1 Start the ICD-10 diagnosis catalog from the diagnosis screen.

6.2 Show ICD-10 catalog in a table and details view.

6.3 The details view shows: diagnosis name, ICD-10 code, diagnosis description.

6.4 The table view shows: diagnosis name, ICD-10 code, diagnosis description.

6.5 Filter the ICD-10 catalog entries: Filter by ICD-10 code group.

6.6 Search in the ICD-10 catalog: search by diagnosis name, ICD-10 code, diagnosis description.

6.7 Sort the ICD-10 catalog entries; sort by diagnosis name, ICD-10 code, diagnosis description.

7. Read medication catalog (medication database)

7.1 Start the medication catalog from the medication screen.

7.2 Show medication catalog in a table and details view.

7.3 The details view shows: medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

7.4 The table view shows: medication name, dope (Wirkstoff), category, medication manufacturer.

7.5 Filter medication catalog entries: Filter by category, medication manufacturer.

7.6 Search in the medication catalog: medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

7.7 Sort the medication catalog entries; medication name, dope (Wirkstoff), category, medication manufacturer, medication description.

8. Read history

8.1 Automatic event creation of all changed diagnosis, medications, orders.

8.2 Show history of patients in a table and details view (all changed diagnosis, medications, orders, and self created events).

8.3 The details view shows: name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

8.4 The table view shows: name of the patient (optional), event type, responsable therapist, date of event, clinic.

8.5 Filter the history of one patient (1. dimension): own events, events created by therapists from the same clinic, events created by all existing therapists.

8.6 Filter the history of multiple patients (2. dimension): current patient, all own patients, all patients from the same clinic, all existing patients.

8.7 Search history entries: search by name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

8.8 Sort history entries: sort by name of the patient (optional), event type, responsable therapist, comment of responsable therapist, date of event, clinic.

9. Change history

9.1 Add a new event for the current patient: event type, responsable therapist, comment of responsable therapist, date of event, clinic.

- Event type: change dangerousness of the patient, new diagnosis, change diagnosis, new medication, change medication, new order, change order, custom event.
- change dangerousness of the patient: the field change dangerousness in the patient screen is adapted, comment about dangerousness is adapted.

9.2 Change an existing (self created) event for the current own patient: event type, responsable therapist, comment of responsable therapist, date of event, clinic.

9.3 Delete an existing (self created) event for the current own patient.

10. Read Orders

10.1 Show orders to other medical staff in a table view: acceptor of order, responsabe therapist, description, date, status, clinic.

10.2 Search orders: serach by acceptor of order, responsabe therapist, description, date, status, clinic.

10.3 Sort orders: order by acceptor of order, responsabe therapist, description, date, status, clinic.

11. Change Orders

11.1 Add new order for the current own patient: acceptor of order, responsabe therapist, description, date, status, clinic.

11.2 Change an existing order for the current own patient: acceptor of order, responsabe therapist, description, date, status, clinic.

11.3 Delete an existing order for the current own patient.

12. Help system

12.1 Start the help system from every screen of the application.

12.2 Show the diffrent help topics: Navigation tree and description of selected topic.

12.3 Search with keywords in the help system.

Non-functional system requirements

Platform

- The application can be used on tablet during a consultation or a meeting (main use).
- The application can be used on desktop when a theparist is doing office work.

Data access restriction

- A therapist can only change data from own patients.
- Only a psychiatrist can do change in medication, a psychologist has a read only access to the medication management functionality.

Data protection and Law

- An encrypted authentication is needed to enter the application (username and password).
- The data protection act must be considered: A https connection is used for all transactions between client and server.

Architecture and interfaces

- The data of all patients are stored in a central database. This makes it possible to access the needed data from all clinics.
- Medical catalogs (diagnosis, treatment, medication) are integrated into the database and can be used in the application.
- A special tool is required to continuous update the database with changed patient and clinic data (not in scope of this project). This will be done by the administration staff of a clinic.
- There must be interfaces to PMS applications from other medical users (nurses, administration staff).

Multi language

- The language of the application is german. It should be possible to integrate a french language version at a later point (clinics in the romandie).

Domain requirements

- More information about the used medication parameters is needed: duration, frequency, point in time (morning, noon, evening, night), dose and dose unit by point in time (-> new meeting with a doctor).
- More information about the current used ICD-10 catalog is needed (-> new meeting with a doctor).
- More information about the current used medication catalogs is needed (-> new meeting with a doctor).

System evolution

Based on the delivered information the initial hardware requirements will be set with a buffer. This reserve will make it possible to work with a larger user base and higher load on the systems. If the reserve runs out, extra hardware can be integrated easily. Due to the usage of state of the art virtualization technologies the whole life cycle of the MHC-PMS will be covered.

The software part of the system architecture will take into account that customer requirements may change. The design will allow easy upscaling of the application. The main focus will lie on more users and more patients.

Maintenance and bug fixing will be provided. Data protection issues will be fixed with a high priority.

Testing

For testing purposes a dummy database is needed. This means that a patient underlying data source must be ready at the start of the implementing phase. The format is open (full implemented database, simplified database, flat text file, etc.) but a source close to the layout which will be used for the final product is preferred.

The efficiency testing of the hardware and the software is planned as a simulation. According to the delivered information from the customer the test load will be specified in detail at a later point in time.

There will be diffrent levels of testing:

Unit tests:

- All components of the system must be tested with Unit tests and all Units must run successfully before a new release.

System tests:

- There must be also integration tests for testing the functionality of the whole application.

Acceptance tests:

- It is important that the user (therapists) will be ready to accept the new application. A strong interaction with the users is required during the development of the applicarion.

Usability tests:

- The interface of the application will be tested by an Usability test with future users of the system. This shall avoid and minimize interface design faults. This test will increase the level of accteptance, too.

Security tests:

- To test the security of the application, the network connections, and the system design in general in short periods security test will provide detailed information about the level of security. This is necessary to gain and prove the grade which is required according to the Data protection.