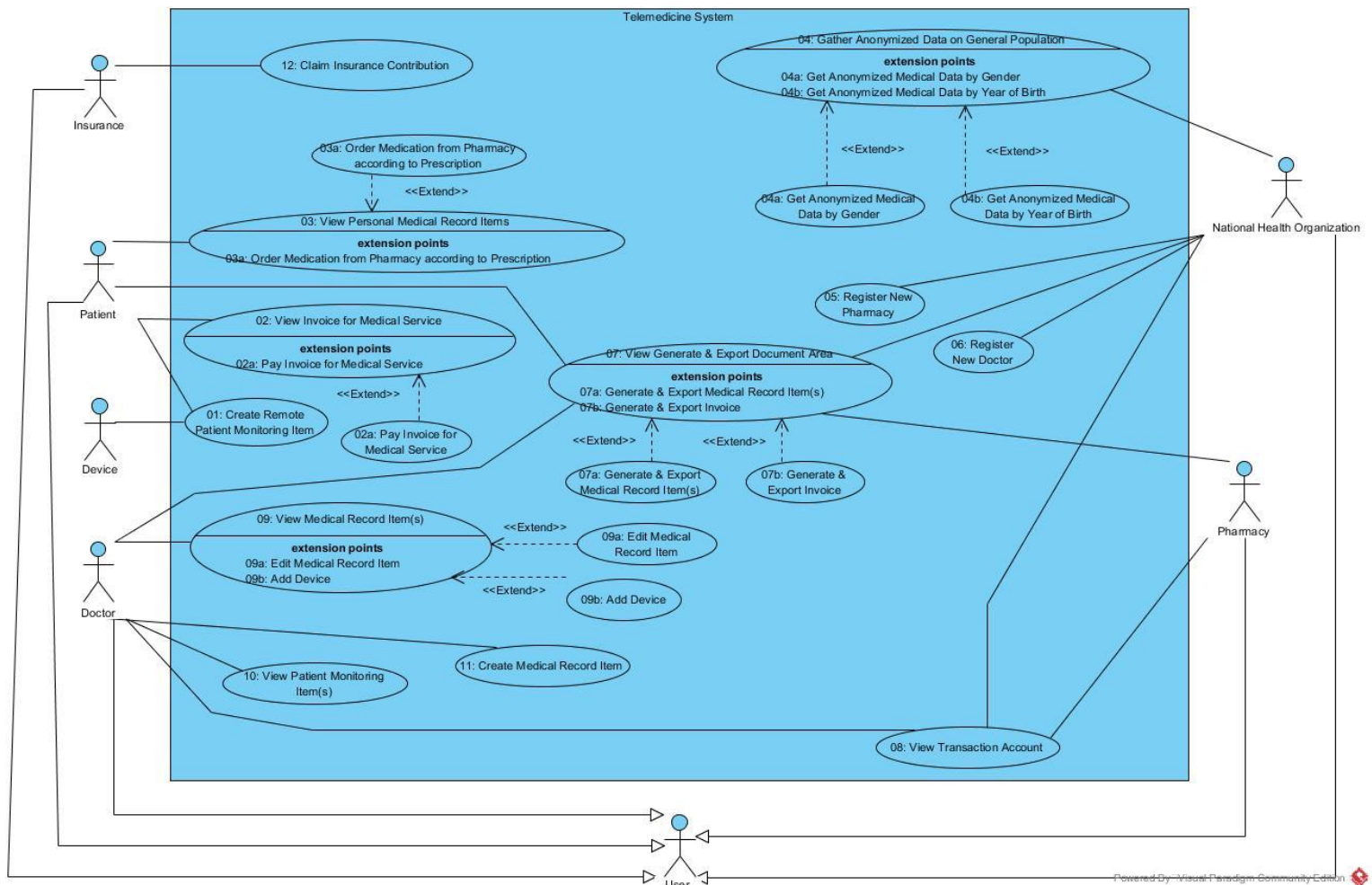


**Use Case Diagram:**



***Note:***

The user-related processes of “login”, “register”, and “logout” are considered in the project, but should not be modelled elements of the use case diagram<sup>1</sup>. In this project, only the user can register herself/himself. A doctor or pharmacy needs to be “registered” (or respectively accredited by the national health organization).

In addition to this, processes which are automatically carried out by the Telemedicine System are not shown in the use case diagram, as they are triggered by the system itself. Such automated processes are for instance the scheduled events and notifications (in line with the guard-based examination and instrumentation).

<sup>1</sup> See Slides & References by Prof. Benkner (VO+UE Software Engineering).

**Clarification with regard to the SUPD feedback:**

**What is meant by “Patient Monitoring Item”?**

A Patient Monitoring Item is all information, which is remotely added via a Patient Account on a specific disease or condition. The information can either stem from a patient directly or from a device, which is tied to a patient.

**What is meant by “Medical Record”?**

A Medical Record Item is all information, which is produced directly by a Doctor. This means that it covers the results of an examination of the Patient by the Doctor for instance.

Additionally, the Doctor can create a Medical Record Item when tackling a Patient Monitoring item (which was information entered remotely into the system). Then the Patient Monitoring item is marked as “treated” and the Medical Record as a reaction to the information entered remotely, is created.

*If the difference between these two classes and the related use cases is still not clear, please contact the workgroup team for further discussion/explanation.*

**Use Case Descriptions:**

Use Case: Create Remote Patient Monitoring Item	
Use Case ID:	01
Actor(s):	Patient; Device
Brief Description:	If the Patient uses remote medical services and devices, he can create a medical record item by himself, or a Device attached to the Patient’s ID can enter Patient Monitoring Data. This occurs for instance if the Patient/Device enters measures of the blood sugar level in case of diabetes or if he is ill and measures the temperature or in case of blood pressure measurements for heart insufficiency conditions. For this, the data he enters is placed into a new Remote Patient Monitoring Item.
Pre-Conditions:	The Patient must be registered in and logged into the Telemedicine System.

	The Device must have been previously attached to a PatientId.
<b>Post-Conditions:</b>	The new Remote Patient Monitoring Item will be saved.
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Patient clicks on “Create Patient Monitoring Item”</li> <li>2. Patient fills in information required for the Patient Monitoring Item (in the respective form)</li> <li>3. Patient saves the Patient Monitoring Item</li> </ol> <p>OR</p> <ol style="list-style-type: none"> <li>1. Device adds Patient Monitoring Item by “create Patient Monitoring” procedure for devices.</li> <li>2. Device saves the Patient Monitoring Item</li> </ol>
<b>Extensions:</b>	--
<b>Priority:</b>	High
<b>Performance Target:</b>	System can handle several hundreds of Item creation requests on a daily basis.
<b>Issues:</b>	--

Use Case: View Invoice for Medical Service	
<b>Use Case ID:</b>	02
<b>Actor(s):</b>	Patient
<b>Brief Description:</b>	Patient view the Invoice for a Medical Service via the GUI
<b>Pre-Conditions:</b>	Patient must be logged into the system and must be in the invoices area
<b>Post-Conditions:</b>	Patient can decide if he wants to pay the Invoice now or later

<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. Patient clicks on “View Invoice”</li><li>2. Patient reads Invoice</li></ol>
<b>Extensions:</b>	Patient can decide to pay the Invoice now (see Use Case 02a)
<b>Priority:</b>	High
<b>Performance Target:</b>	System can handle several hundreds of Invoice view requests daily.
<b>Issues:</b>	--

<b>Use Case: Pay Invoice for Medical Service</b>	
<b>Use Case ID:</b>	02a
<b>Actor(s):</b>	Patient
<b>Brief Description:</b>	Patient pays open Invoice for a medical service (e.g. for medication ordered from a Pharmacy, for contribution to National Health Organization, or for medical examination & treatment by Doctor)
<b>Pre-Conditions:</b>	Patient must be logged into the system and an open Invoice must be available
<b>Post-Conditions:</b>	Payment information (of the Invoice under concern) is transferred to the transaction account of the National Health Organization/Pharmacy/Doctor
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. Patient views an Invoice (which is still open for payment)</li><li>2. Patient clicks on “Pay Invoice”</li><li>3. Payment is confirmed</li><li>4. Payment information is entered into the respective transaction account of the creditor</li></ol>

<b>Extensions:</b>	--
<b>Priority:</b>	Medium-High
<b>Performance Target:</b>	System can handle several hundreds of payment requests per day
<b>Issues:</b>	Is invoice payment currency always euro?

Use Case: View Personal Medical Record Items	
<b>Use Case ID:</b>	03
<b>Actor(s):</b>	Patient
<b>Brief Description:</b>	The Patient can access the list of personal Medical Record Items, which have occurred in line with the Telemedicine System so far
<b>Pre-Conditions:</b>	Patient must be logged into the system. Access is restricted to the individual data entries for the Patient who is logged in.
<b>Post-Conditions:</b>	--
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. Patient goes to Personal Medical Records area</li><li>2. Patient views the list of his Medical Records associated with his user account</li></ol>
<b>Extensions:</b>	Order Medication from Pharmacy according to Prescription (see Use Case 03a)
<b>Priority:</b>	High
<b>Performance Target:</b>	System can handle several hundreds of view requests per day
<b>Issues:</b>	--

Use Case: Order Medication from Pharmacy according to Prescription	
Use Case ID:	03a
Actor(s):	Patient
Brief Description:	Patient orders medication prescribed by a Doctor from a Pharmacy
Pre-Conditions:	Patient must be logged into the system and must be in the “View Personal Medical Records” area
Post-Conditions:	Invoice is created so that the price of the medication can subsequently paid by the Patient into the Pharmacy’s transaction account
Main Success Scenario:	<ol style="list-style-type: none"><li>1. Patient is in the list of personal Medical Record Items</li><li>2. Patient clicks on “Order Medication” (from an available Pharmacy) where the Doctor entered a medication name in the prescription field</li><li>3. Medication order is confirmed</li></ol>
Extensions:	--
Priority:	Medium
Performance Target:	System can handle several hundreds of requests per day
Issues:	--

Use Case: Gather Anonymized Data on General Population	
Use Case ID:	04
Actor(s):	National Health Organization

<b>Brief Description:</b>	The National Health Organization can request medical record data on the general population in an anonymized form.
<b>Pre-Conditions:</b>	National Health Organization must be logged into the system
<b>Post-Conditions:</b>	--
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. National Health Organization clicks on “gather data on population”</li><li>2. Anonymized data is made available</li></ol>
<b>Extensions:</b>	<ul style="list-style-type: none"><li>- 04a Get Anonymized Medical Data by Gender</li><li>- 04b Get Anonymized Medical Data by Year of Birth</li></ul>
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Requests made by the National Health Organization can be served at any time
<b>Issues:</b>	Which export formats are offered for the data?

<b>Use Case:</b>	<b>Get Anonymized Medical Data by Gender</b>
<b>Use Case ID:</b>	04a
<b>Actor(s):</b>	National Health Organization (NHO)
<b>Brief Description:</b>	The National Health Organization can make a query for medical data by gender of the general population in an anonymized form.
<b>Pre-Conditions:</b>	National Health Organization employee must be logged into the system and must be in the area “Gather Anonymized Data on the General Population” in the GUI
<b>Post-Conditions:</b>	--

<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. National Health Organization clicks on “Get Medical Data by Gender”</li><li>2. Anonymized data is made available and export options are available</li></ol>
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Requests made by the National Health Organization can be served at any time
<b>Issues:</b>	What does the data presentation look like?

<b>Use Case:                   Get Anonymized Medical Data by Year of Birth</b>	
<b>Use Case ID:</b>	04b
<b>Actor(s):</b>	National Health Organization (NHO)
<b>Brief Description:</b>	The National Health Organization can make a query for medical data by year of birth of the general population in an anonymized form.
<b>Pre-Conditions:</b>	National Health Organization employee must be logged into the system and must be in the area “Gather Anonymized Data on the General Population” in the GUI
<b>Post-Conditions:</b>	--
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. National Health Organization clicks on “Get Medical Data by Year of Birth”</li><li>2. Anonymized data is made available and export options are available</li></ol>



<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Requests made by the National Health Organization can be served at any time
<b>Issues:</b>	What does the data presentation look like?

Use Case: Register New Pharmacy	
<b>Use Case ID:</b>	05
<b>Actor(s):</b>	National Health Organization
<b>Brief Description:</b>	The National Health Organization registers (or respectively accredits) a new Pharmacy in the Telemedicine System
<b>Pre-Conditions:</b>	National Health Organization must be logged into the system
<b>Post-Conditions:</b>	Registration process for the Pharmacy as a new user is completed
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. National Health Organization clicks on “Register New Pharmacy”</li><li>2. National Health Organization enters the registration data</li><li>3. National Health Organization confirms accreditation of new Pharmacy to the Telemedicine System</li></ol>
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	National Health Organization can register new Pharmacy at any time

<b>Issues:</b>	--
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Use Case: Register New Doctor	
<b>Use Case ID:</b>	06
<b>Actor(s):</b>	National Health Organization
<b>Brief Description:</b>	The National Health Organization registers (or respectively accredits) a new Doctor in the Telemedicine System
<b>Pre-Conditions:</b>	National Health Organization must be logged into the system
<b>Post-Conditions:</b>	Registration process for the Doctor as a new user is completed
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. National Health Organization clicks on “Register New Doctor”</li> <li>2. National Health Organization enters the registration data</li> </ol> <p>National Health Organization confirms accreditation of new Doctor to the Telemedicine System</p>
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	National Health Organization can register new Doctor at any time
<b>Issues:</b>	--

Use Case: View ‘Generate & Export Document’ Area	
<b>Use Case ID:</b>	07

<b>Actor(s):</b>	Patient, Doctor, Pharmacy, National Health Organization
<b>Brief Description:</b>	This area shows the option available tailored to the respective user type (depending on their access rights)
<b>Pre-Conditions:</b>	User is logged into the system
<b>Post-Conditions:</b>	Document generation & export is chosen or not
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Go to ‘Generate &amp; Export Document’ Area</li> <li>2. View available options (depending on the user type’s access rights)</li> </ol>
<b>Extensions:</b>	<ul style="list-style-type: none"> <li>- Generate &amp; Export Medical Record Item(s) (Use Case 07a)</li> <li>- Generate &amp; Export Invoice (Use Case 07b)</li> </ul>
<b>Priority:</b>	High
<b>Performance Target:</b>	Documents can be generated and exported at any time
<b>Issues:</b>	--

Use Case: Generate & Export Medical Record Item(s)	
<b>Use Case ID:</b>	07a
<b>Actor(s):</b>	Patient, Doctor, Pharmacy, National Health Organization
<b>Brief Description:</b>	Each user type can generate and export the document, which he is allowed to access, in the chosen document format
<b>Pre-Conditions:</b>	User is logged into the system and is in the “View ‘Generate & Export Documents” area
<b>Post-Conditions:</b>	Medical Record Items information is generated and exported

<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Click on “Generate &amp; Export Medical Record Items”</li> <li>2. Choose document export format</li> </ol>
<b>Extensions:</b>	--
<b>Priority:</b>	High
<b>Performance Target:</b>	Documents can be generated and exported at any time
<b>Issues:</b>	--

<b>Use Case: Generate &amp; Export Invoice</b>	
<b>Use Case ID:</b>	07b
<b>Actor(s):</b>	Patient, National Health Organization
<b>Brief Description:</b>	Patient/National Health Organization can generate and export the Invoice, which he is allowed to access, in the chosen document format
<b>Pre-Conditions:</b>	Patient/National Health Organization is logged into the system and has the according rights
<b>Post-Conditions:</b>	Invoice is generated and export
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Click on “Generate &amp; Export Invoice Document”</li> <li>2. Choose the document export format</li> </ol>
<b>Extensions:</b>	--
<b>Priority:</b>	High
<b>Performance Target:</b>	Invoices can be generated and exported at any time
<b>Issues:</b>	--

Use Case: View Transaction Account	
Use Case ID:	08
Actor(s):	Doctor, Pharmacy, National Health Organization
Brief Description:	The named actors can view their own transaction account
Pre-Conditions:	Doctor/Pharmacy/National Health Organization is logged into the system
Post-Conditions:	--
Main Success Scenario:	<ol style="list-style-type: none"> <li>1. Click on “View Transaction Account”</li> <li>2. Read the information on transactions (i.e. paid Invoices)</li> </ol>
Extensions:	--
Priority:	Medium
Performance Target:	Transaction account can be viewed at any time
Issues:	--

Use Case: View Medical Record Item(s)	
Use Case ID:	09
Actor(s):	Doctor
Brief Description:	The Medical Record Item(s) of a specific Patient are viewed
Pre-Conditions:	Doctor is logged into the system
Post-Conditions:	--

<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Click on “View Medical Record Item(s)</li> <li>2. Select/Search for Patient</li> </ol>
<b>Extensions:</b>	Edit Medical Record Item(s) (Use Case 09a)  Add Device (Use Case 09b)
<b>Priority:</b>	High
<b>Performance Target:</b>	Medical Record Item(s) can always be viewed
<b>Issues:</b>	--

Use Case: Edit Medical Record Item	
<b>Use Case ID:</b>	09a
<b>Actor(s):</b>	Doctor
<b>Brief Description:</b>	The Doctor can change the content of a Medical Record Item of a specific Patient
<b>Pre-Conditions:</b>	<ul style="list-style-type: none"> <li>- Doctor is logged into the system</li> <li>- Doctor is in the “View Medical Records Area”</li> </ul>
<b>Post-Conditions:</b>	Medical Record Item is modified and saved
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Click on “Edit Medical Record Item”</li> <li>2. Modify the item</li> <li>3. Save the item</li> </ol>
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Medical Record Item(s) can be edited by a Doctor at any time

<b>Issues:</b>	--
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Use Case: Add Device	
<b>Use Case ID:</b>	09b
<b>Actor(s):</b>	Doctor
<b>Brief Description:</b>	The Doctor can add a Device for PatientMonitoring to a specific Patient (i.e. linked to the Patient ID)
<b>Pre-Conditions:</b>	<ul style="list-style-type: none"> <li>- Doctor is logged into the system</li> <li>- Doctor is in the “View Medical Records Area” and clicked on “View Medical Details” before</li> </ul>
<b>Post-Conditions:</b>	Device is added and saved
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"> <li>1. Click on “Add Device”</li> <li>2. Device is created by the system</li> <li>3. Information is serialized by the system</li> </ol>
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Devices can be edited by a Doctor at any time
<b>Issues:</b>	--

Use Case: View Patient Monitoring Item(s)	
<b>Use Case ID:</b>	10
<b>Actor(s):</b>	Doctor

<b>Brief Description:</b>	The Doctor can view the content of a Patient Monitoring Item of a specific Patient
<b>Pre-Conditions:</b>	- Doctor is logged into the system
<b>Post-Conditions:</b>	--
<b>Main Success Scenario:</b>	4. Click on “View Patient Monitoring Item” 5. View the item
<b>Extensions:</b>	--
<b>Priority:</b>	Medium
<b>Performance Target:</b>	Patient Monitoring Item(s) can be viewed by a Doctor at any time
<b>Issues:</b>	--

<b>Use Case:</b>	<b>Create Medical Record Item</b>
<b>Use Case ID:</b>	11
<b>Actor(s):</b>	Doctor
<b>Brief Description:</b>	If the Patient visits a Doctor and the Doctor carries out an examination, the doctor can create a new Medical Record Item to capture the result of the examination. After the visit at the Doctor’s place, an Invoice (containing the examination/treatment costs) is automatically sent to the Patient. In the Medical Record Item, the Doctor might also include information on the prescription of a medication, which the Patient can order from the Pharmacy.
<b>Pre-Conditions:</b>	The Doctor must be registered in and logged into the Telemedicine System.



<b>Post-Conditions:</b>	The new Medical Record Item will be saved.
<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. Doctor clicks on “Create Medical Record Item”</li><li>2. Doctor fills in information required for the Medical Record Item (in the respective form)</li><li>3. Doctor saves the Medical Record Item</li></ol>
<b>Extensions:</b>	--
<b>Priority:</b>	High
<b>Performance Target:</b>	System can handle several hundreds of Medical Record Item creation requests on a daily basis.
<b>Issues:</b>	Can several prescriptions be added to one Medical Record Item by a Doctor?

Use Case: Claim Insurance Contribution	
<b>Use Case ID:</b>	12
<b>Actor(s):</b>	Insurance
<b>Brief Description:</b>	The Insurance can demand from the Patients that they pay their insurance contribution. For this, the Insurance adds an Invoice that all Patients name will receive.
<b>Pre-Conditions:</b>	The Insurance (employee) must be registered in and logged into the Telemedicine System.
<b>Post-Conditions:</b>	The new Invoice Item will be saved and the Patients will be notified.

<b>Main Success Scenario:</b>	<ol style="list-style-type: none"><li>1. Insurance (employee) clicks on “Claim Insurance Contribution”</li><li>2. Claim process is performed by the system (i.e. Invoice is added and sent to the Patients)</li></ol>
<b>Extensions:</b>	--
<b>Priority:</b>	High
<b>Performance Target:</b>	System can handle several hundreds of Invoice Item creation requests on a daily basis.
<b>Issues:</b>	-