Technical Solution Description

eCare mobile

Version 1.0

Last revised 10-06-2012

Status done

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Imprint

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| **Issued by**  T-Systems RUS | | |
| **File name**  Technical solution description for eCare mobile.docx | **Document number**  not applicable | **Document name**  Technical solution description |
| **Version**  1.0 | **Last revised**  10-06-2012 | **Status**  done |
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# Introduction

Mobile operator website must be developed. Essential functionality includes plans and features management (CRUD and managing links and dependencies), processing customers and contracts for providing mobile services (each customer can have any amount of contracts with unique phone numbers), personal accounts where customers can block and unblock their contracts (only if respective contracts are not blocked by system’s manager). While proceeding with contract changes all data must be stored in basket on the client side. Only authenticated users with must be able to use personal account features. Only users with privileges of manager or admin must be able to use CRUD functions. Only users with privileges of admin must be able to change privileges.

As addition second application must be developed. Essential functionality includes retrieving mobile plan usage statistics from the web service provided by the main application. Report in .pdf format must be generated using retrieved statistics.

# Technologies and frameworks

* Hibernate
* Spring MVC
* Spring Security
* HTML5, CSS3, JQuery

Also used in additional part:

* EJB
* JSF

# Additional features

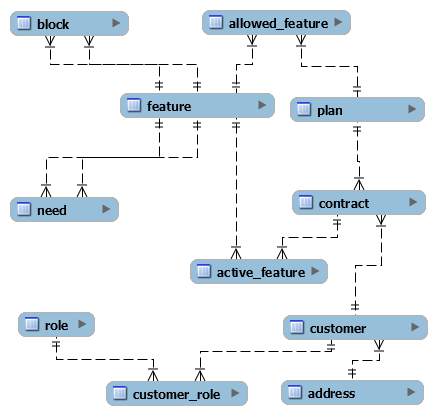
Passwords for new customers of the service are being delivered via SMS. Fresh password creation and sending is triggered when the first contract for this customer is created. Customer doesn’t have access to his profile at all until that.

# Database description

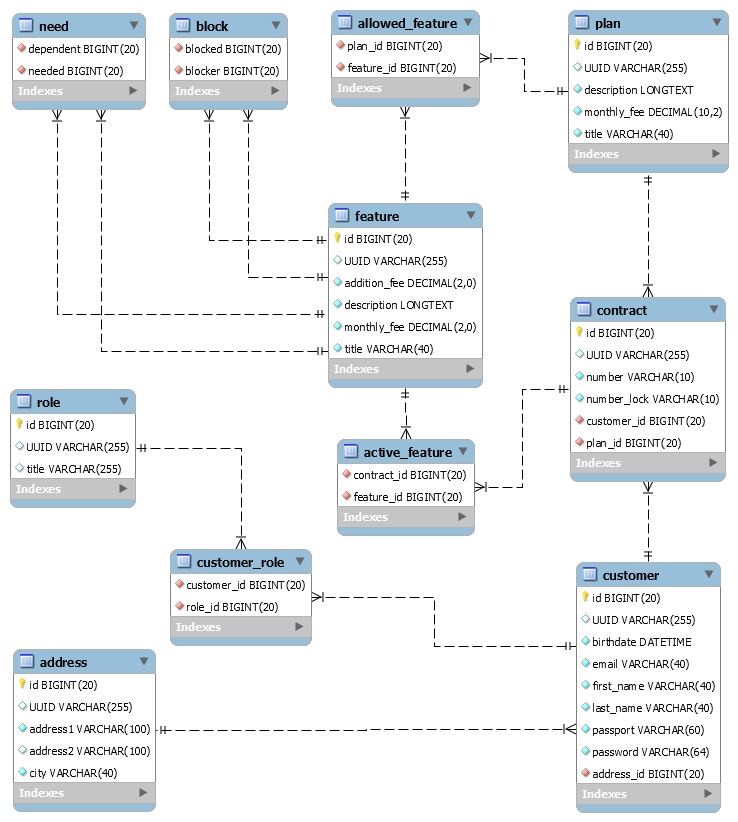
All database tables are listed in the table below.

|  |  |
| --- | --- |
| **Table** | **Description** |
| customer | Stores all users of application information. |
| contract | Stores information about contracts between customers and mobile service provider. |
| plan | Stores information about plans one and only one of which must be applied to each contract. |
| feature | Stores information about options that can be additionally applied to any contract. |
| address | Stores information about addresses where customers live. |
| role | Stores information about system roles for access restriction. |
| **Many-to-many support tables** | |
| block | Link from feature table to itself. Presents features being blocked by each other. |
| need | Link from feature table to itself. Presents situation when one of features depends on another. |
| allowed\_feature | Link from plan table to feature table. Presents feature allowed to be switched on when respective plan is activated for contract. |
| active\_feature | Link from contract table to feature table. Presents feature activated for repective contract. |
| customer\_role | Link from customer table to role table. Presents user having role. |

Minified database diagrams is show at Picture 4.1. Full database diagram with fields and types is shown at Picture 4.2.



Picture 4.1 – Database diagram (minified)



Picture 4.2 – Database diagram (full)

# Explication and implementation

Sdrhdj

# Modules

Ssgf

# UI

Dwgrnmhfj

# Business logic level

# Entities and DAO layer

Abstract Entity is a base for all other entities. It provides an equals and hashcode that will always work correctly in all circumstances. This avoids frequent errors related to the implementation of those same methods.

|  |  |
| --- | --- |
| **Column** | **Description** |
| id | Automatically generated primary key |
| UUID | Unique value for every entity that is used for providing equals and |

Role – represents access role in system. Only two predefined roles exist at the moment, but separate entity is designed to make access system to be extendable.

|  |  |
| --- | --- |
| **Column** | **Description** |
| title | Automatically generated primary key |

Feature – represents option that can be applied to contract in addition to plan. One contract can have any amount of options being active simultaneously. Options may block each other from usage or depend from other options.

|  |  |
| --- | --- |
| **Column** | **Description** |
| title | Title for the option |
| description | Description for the option |
| additionFee | Cost of switching option on |
| monthlyFee | Cost per month of using option |
| blockers | List of options that block this option |
| blockedFeatures | List of options blocked by this option |
| neededFeatures | List of options that needed for this option |
| dependentFeatures | List of options that dependent from this option |

Plan – represents mobile plan that (one and only one) must be applied to each contract. Plan may have any options allowed to add to contracts with this plan.

|  |  |
| --- | --- |
| **Column** | **Description** |
| title | Title for the plan |
| description | Description for the plan |
| monthlyFee | Cost per month of using option |
| allowedFeatures | List of options that are allowed for this plan |

Address – represents address of customers.

|  |  |
| --- | --- |
| **Column** | **Description** |
| address1 | Address line 1 |
| address2 | Address line 2 |
| city | City part of address |

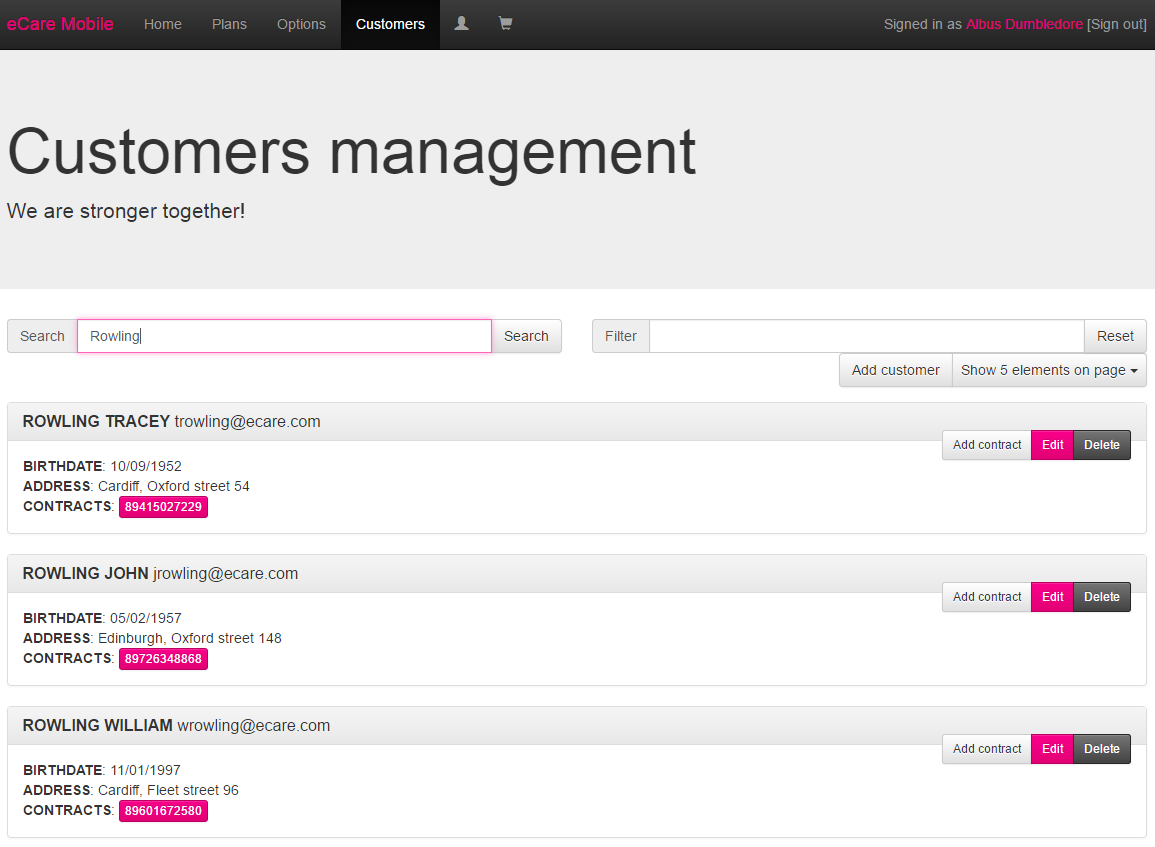
Customer – represents customer of mobile operator. Each customer can have any amount of contracts.

|  |  |
| --- | --- |
| **Column** | **Description** |
| firstName | First name |
| lastName | Last name |
| birthdate | Date of birth |
| passport | Passport data |
| email | Email of customer |
| password | Hash of password |
| contracts | List of contracts owned by customer |
| address | Address of customer |
| roles | List of roles applied to customer |

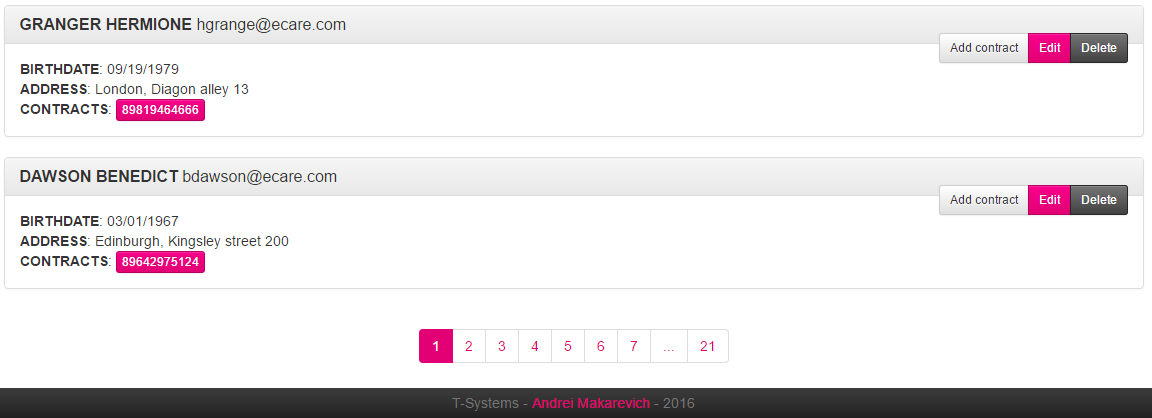
Contract – contract between mobile operator and customer with unique phone number.

|  |  |
| --- | --- |
| **Column** | **Description** |
| number | Unique phone number |
| customer | Customer who owns this contract |
| plan | Plan applied to contract |
| activeFeatures | Options activated for contract |
| numberLock | State of number (can be unlocked, locked by user, locked by manager) |

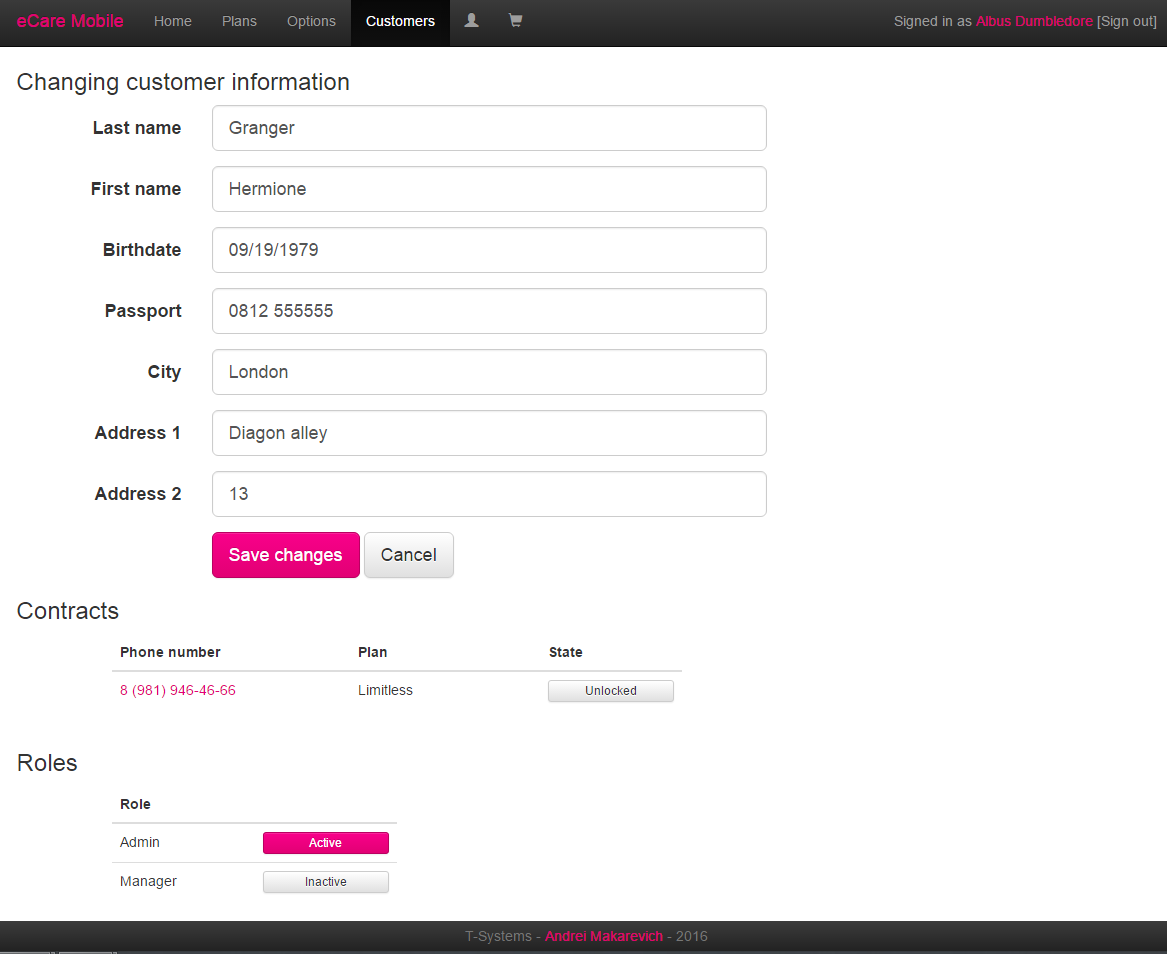
# Screenshots of the application



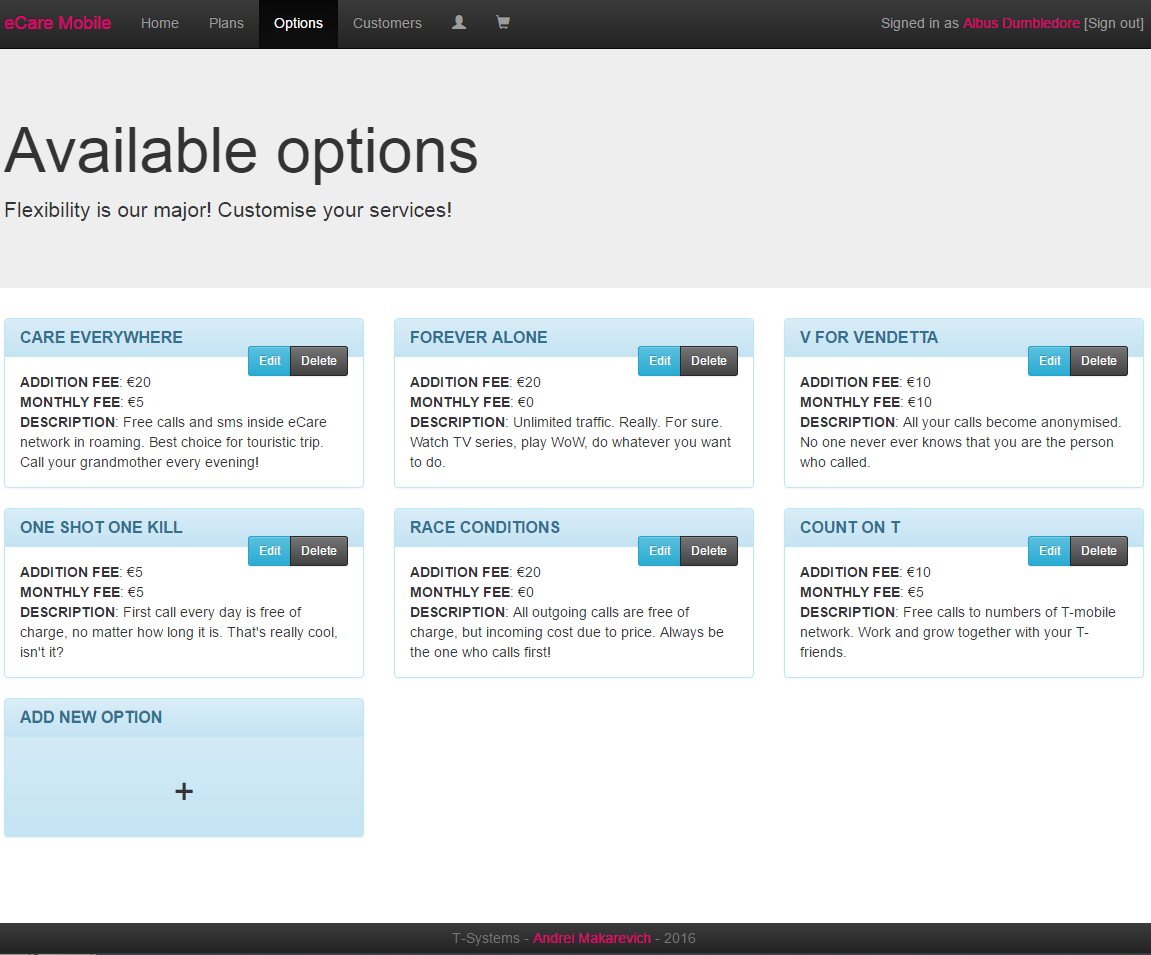
Picture 10.1 – Customers page top



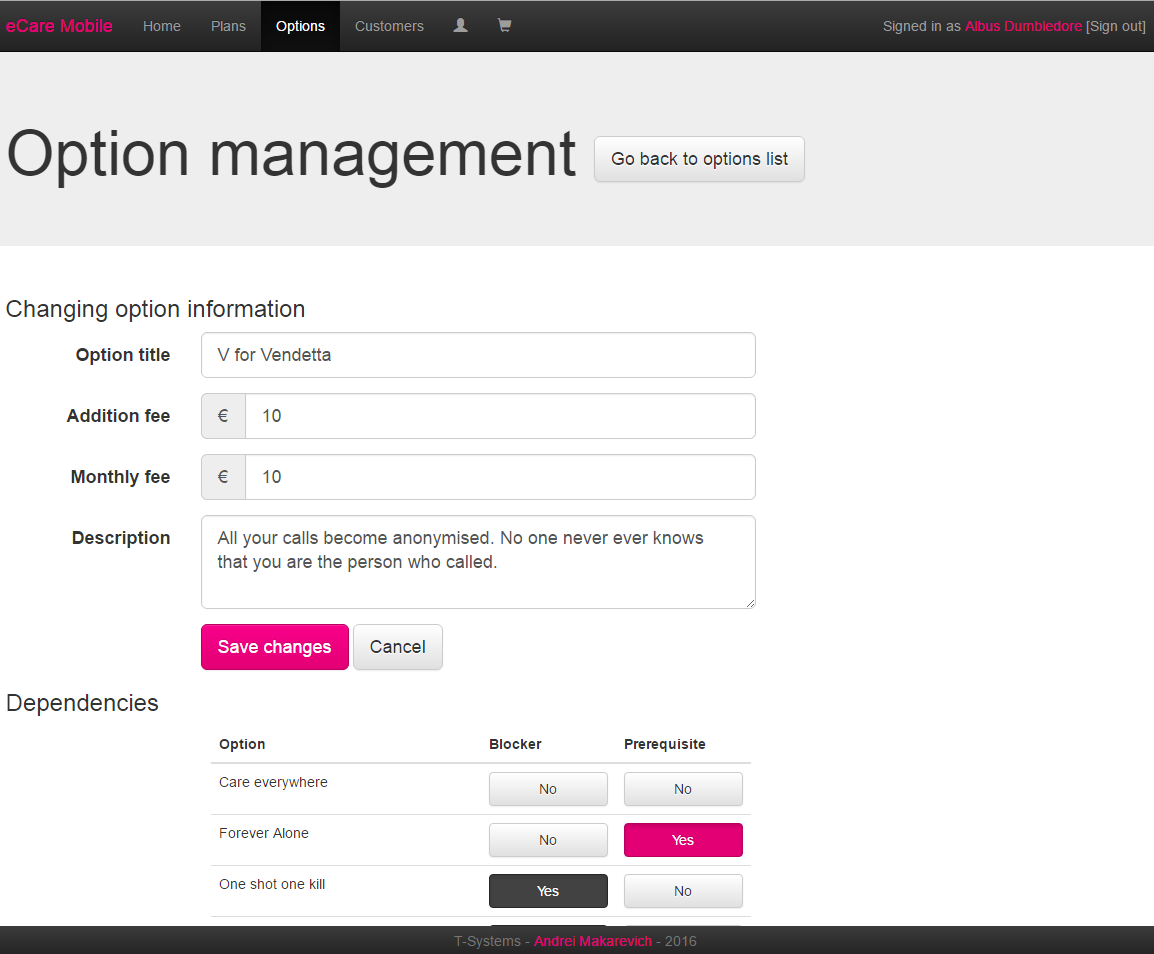
Picture 10.2 – Customers page bottom



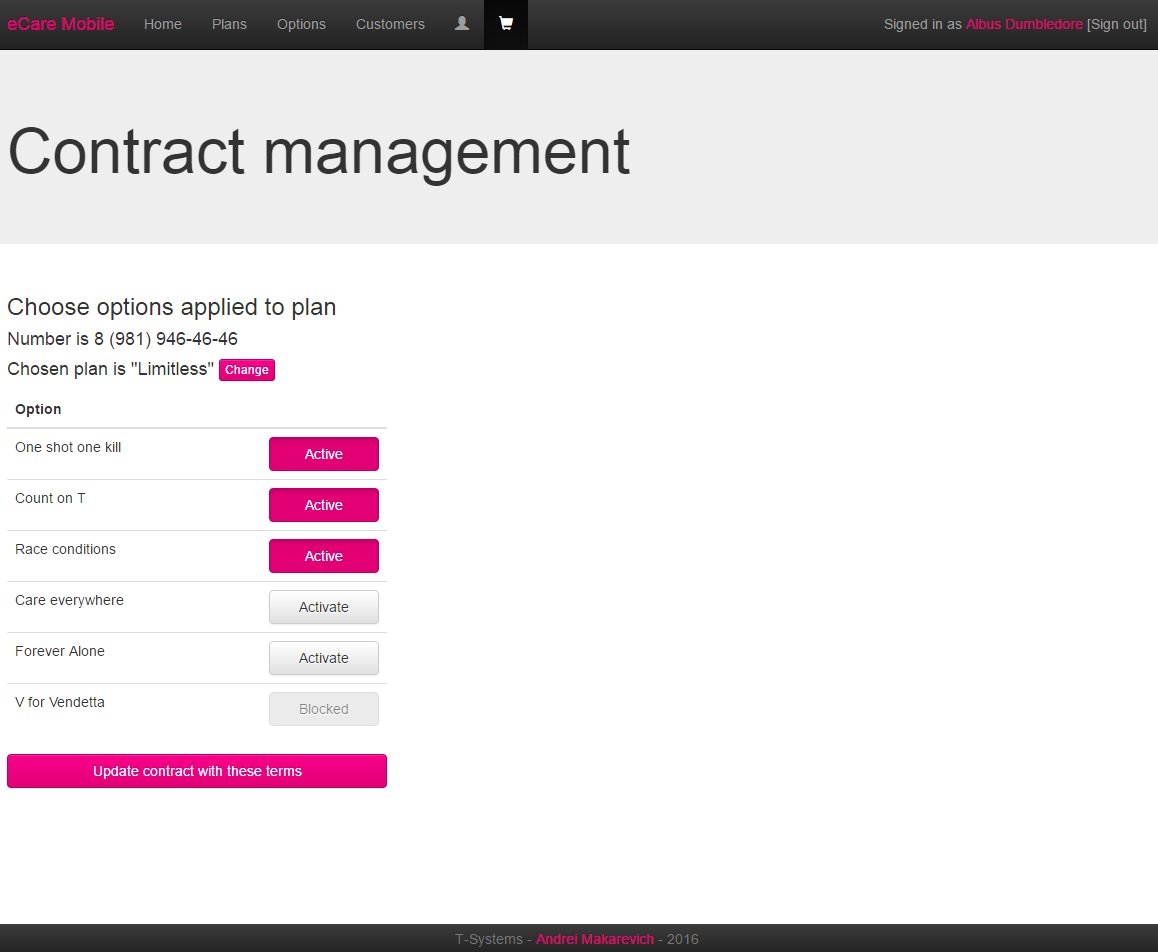
Picture 10.3 – Customers information editing page



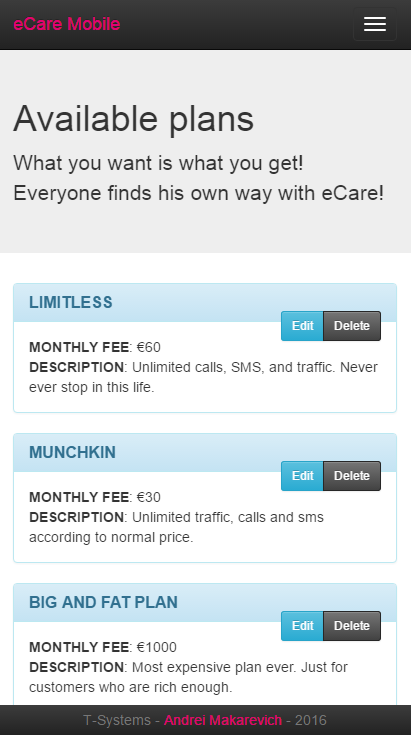
Picture 10.4 – Options page (manager access)



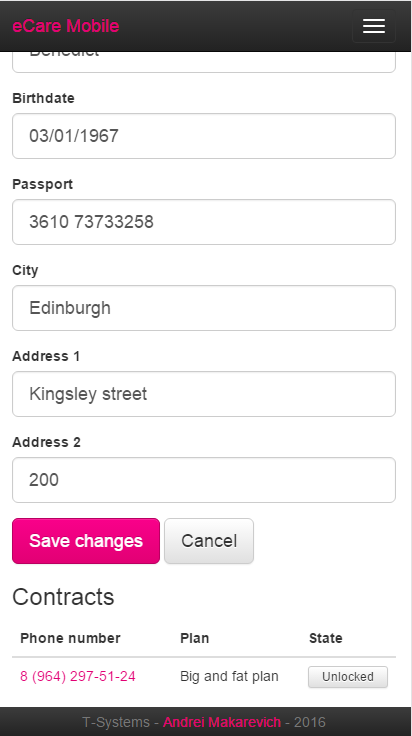
Picture 10.5 – Option editing page



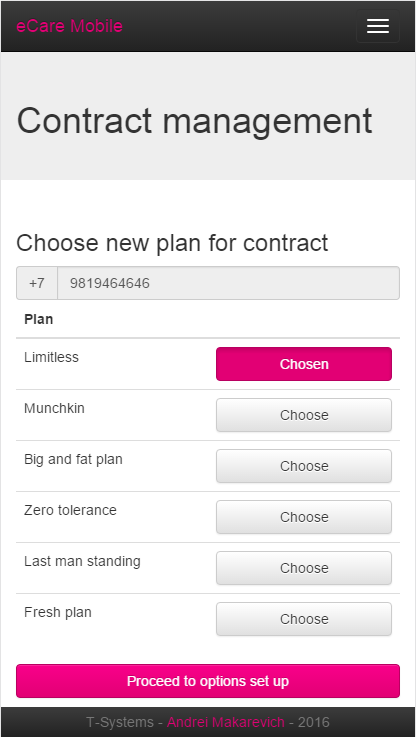
Picture 10.6 – Contract editing page (basket)



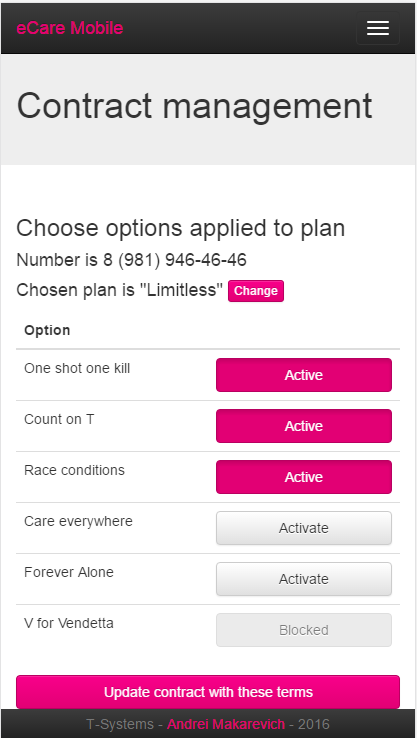
Picture 10.7 – Plans page (mobile view)



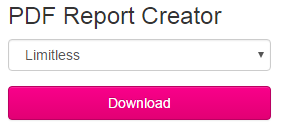
Picture 10.8 – Customer information editing page (mobile view)



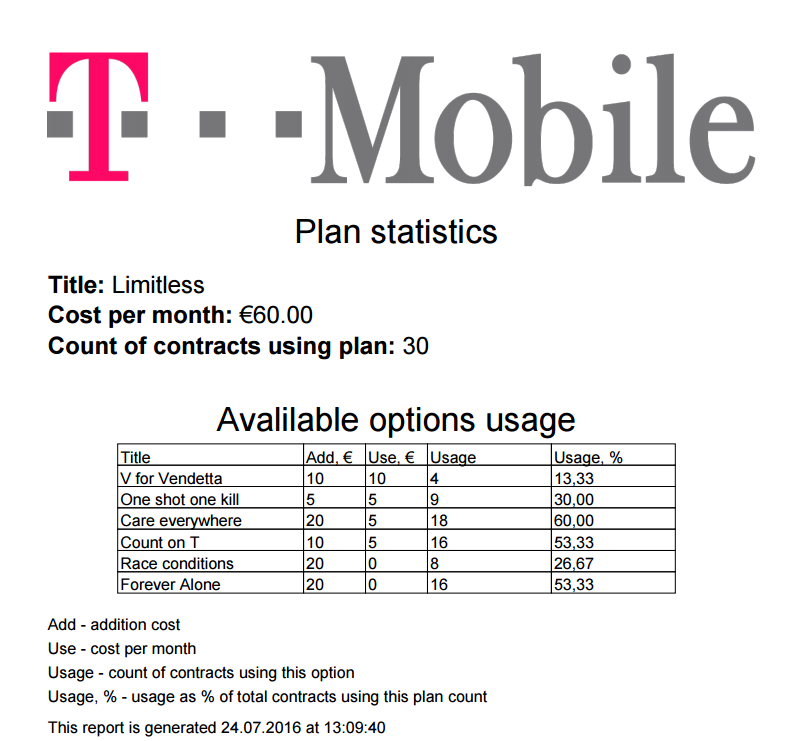
Picture 10.9 – Choosing plan for contract page (mobile view)



Picture 10.10 – Choosing options for contract page (mobile view)



Picture 10.11 – PDF-report creator page



Picture 10.12 – PDF-report example

# Junit tests