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RENTAL DEVICES MANAGEMENT BY EXAMPLE OF TELIA AS

Bachelor's thesis

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MSc

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TALLINNA TEHNIKAÜLIKOOL
Infotehnoloogia teaduskond

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ASENDUSSEADMETE HALDAMINE TELIA AS NÄITEL

Bakalaureusetöö

Juhendaja: Karin Rava
MSc

Tallinn 2017

Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

Author: Enelin Mitt

26.11.2017

Abstract

In this thesis, I am analysing Telia AS's loaner devices processes which were changed to rental device processes. Loaner devices were given out to customers as part of device repair process, until customers own device was in repair.

The process was not clearly defined and therefore caused bad customer experience, also inconvenient situations for shop employees, when customers had lost or broken the device. Therefore arose a need to work out new, improved process for providing substitution device to customers during repair. There needed to be process, where shops can provide customers clear understanding of what happens in case of losing the phone, when breaking it or when customer wants to keep it for some other reason.

Goals in this thesis are:

1. Analyse earlier process for loaning out devices to Telia customers
2. Design new process for renting out devices to Telia customers
3. Define functional and non-functional requirements for the application that is meant for managing the rental devices and their pricing
4. Create sketches of user interface for that application
5. Create test scenarios for main user stories

Based on the result of this thesis there has been created an application, which enables to:

1. Define rental devices levels and conditions
2. Manage rental devices pricing according to their level (rental price, deductible price, insurance price)
3. Manage rental devices pricing according to their condition and value (compensation price, repair price)

4. Define a list of products that can be used as rental devices in Telia shops

This thesis is written in English and is 45 pages long, including 9 chapters, 19 figures and 1 table.

Annotatsioon

Asendusseadmete haldamine TELIA AS näitel

Käesolevas bakalaureusetöös analüüsitakse Telia asendusseadmete haldamise protsessi ja antakse alus uue, parendatud protsessi loomiseks. Asendusseadmeid antakse kliendile remondiprotsessi käigus, kuniks nende enda telefon on paranduses.

Kuna varasem asendusseadmete protsess ei olnud selgelt kirjeldatud, siis põhjustas see mitmeid arusaamatusi ja ebamugavaid juhtumeid nii kliendile kui Telia poetöötajale. Kui klient lõhkus või kaotas telefoni, siis ei olnud poetöötajal konkreetselt teada, mida sellises olukorras teha. Samuti ei olnud asendusseadmetele määratud mingeid hindasid selleks olukorraks kui klient seadme kaotab või lõhub

Antud töö eesmärkideks on:

1. Analüüsida varasemat asendustelefonidega seotud protsessi Telias ning tuua välja selle nõrkused
2. Kujundada uus protsess asendustelefonide välja rentimiseks kliendile
3. Määratleda funktsionaalsed ja mittefunktsionaalsed nõuded uues protsessis kasutatavale rakendusele
4. Luua eskiisid kasutajaliidesest, mis on mõeldud võimaldamaks hallata asendusseadmeid ja nende hindasid.
5. Kirjutada testjuhtumid põhilistele kasutajalugudele

Lõputöö tulemi alusel on valmistatud rakendus, mis võimaldab:

1. Hallata asendustelefonide tasemeid
2. Hallata asendustelefonide tasemetele vastavaid hindu (rendi hind, kindlustuse hind, omavastutuse hind)
3. Hallata asendustelefonide paranduse ja kompensatsiooni hindu vastavalt telefoni seisukorrale ja väärtusele

4. Hallata Telia esindustes asendustelefonidena kasutatavaid tooteid

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 45 leheküljel, 9 peatükki, 19 joonist, 1 tabelit.

List of abbreviations and terms

TUT	*Tallinn University of Technology*
DST	*Telia shops frontend system, where rental phones management views for shops are available*
COLT	*Telia backoffice system, where rental phones management for backoffice is available*

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1 Introduction

Telecommunication companies have found different ways to offer support services to their customers, which at the same time could create positive cashflow for the company. One of those services is offering a ’loaner phone’ to customer while their own phone has been sent to repair.

Earlier loaner phone solution had mostly been a great opportunity for customer, but due to its indistinct process, it could cause bad customer experience and decreased revenue to the company. There were mainly 2 reasons to bring out here.

Firstly, there was no binding contract regarding loaner phone prices, terms and conditions etc. with customer who lent the phone from Telia shop. This lead to loaner phones that were never returned to shop. When there happened to be an incident where customer had broken the phone, there could be a lot of misunderstanding between customer and shop due to unclear contractual binding.

Secondly, there was no organized way for back office to manage the loan devices: set prices for the loan devices, follow up on who has the rental phone and generate agreement for customer to sign.

There arose a need for completely new business process for the loaner phones given to customer during repair. A project was initiated for creating this process and building needed system support for the business process.

The first step of the project was about changing the mindset: moving forward from earlier ’loaner phones’ solution to new ’rent phones’ process, where each phone has a set of prices defined and process for renting out a device to customer is designed in a way that supports both customer and shop. In this document, I will mainly use the term ’rental phones’.

Author of this thesis is analyst in the software development process for this solution. Thesis is written based on the analysis done by the author.

The solution done based on the thesis has been implemented in Denmark and is in piloting phase for in Telia in Sweden, Norway, Estonia and Finland.

Goals in this thesis are:

1. Analyse earlier process for loaning out devices to Telia customers
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3. Define functional and non-functional requirements for the application
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Based on the result of this thesis there has been created an application, which enables to:

1. Define rental devices levels and conditions
2. Manage rental devices pricing according to their level (rental price, deductible price, insurance price)
3. Manage rental devices pricing according to their condition and value (compensation price, repair price)
4. Define a list of products that can be used as rental devices in Telia shops

In the second chapter, I will introduce the background information for deciding to create the rental phones process in Telia AS.

In third chapter, I briefly introduce the overall process of repairing customers device, where rental device process is a sub-process.

Fourth chapter is a detail analysis of AS IS and TO BE rental phone related flows. Please note, that AS IS flows in this document refer to the earlier situation, before the change was implemented (not today's situation, as the new solution is already in live by now). Using process diagrams, I describe processes in Telia shop and backoffice, which needed

to change, to achieve the target solution. I also explain the new price set created for each device and describe the algorithms for calculating the device prices.

Fifth chapter is for specifying functional and non-functional requirements for the application.

In the sixth chapter, there are prototypes of the user interface for shop and backoffice views in the application presented.

In seventh chapter, there are test scenarios for main flows of rental device processes.

2 Background

To minimise the inconvenience of having your mobile in for repair, many telecom companies may offer a loaner phone for the period your device is out of action. In the earlier loaner phone process, there was a high risk that the returned loaner phone is given to the next customer without cleaning it from previous customer information.

Looking at competitors, similar process is used for loan devices. This leads to similar risks and problems. For example, in Elisa there was an incident in April 2016, which got media coverage [1]. Loan device that was given to a 10-year-old child, was not cleaned from previous user information and therefore included nude photos of a male. Such incidents could be avoided by implementing an organized process, where the device must be cleaned upon return.

With the earlier process, it was often assumed that telecommunication company always gives out loan devices to customers during their phone repair, although there was not such commitment. There have also been discussions in the media where customer has reported to be confused about when exactly can he get a loan device and when not. This could be avoided when the pricing, terms and conditions can be introduced to customer up front when giving their own phone to repair. [2]

3 Device Repair Process

When customer has a phone that needs repair, then he/she goes to Telia shop. Telia shop is registering phone repairs in a centralized system, which also supports other value adding services like renting out a device during repair.

This high-level diagram illustrates the customers device repair process:

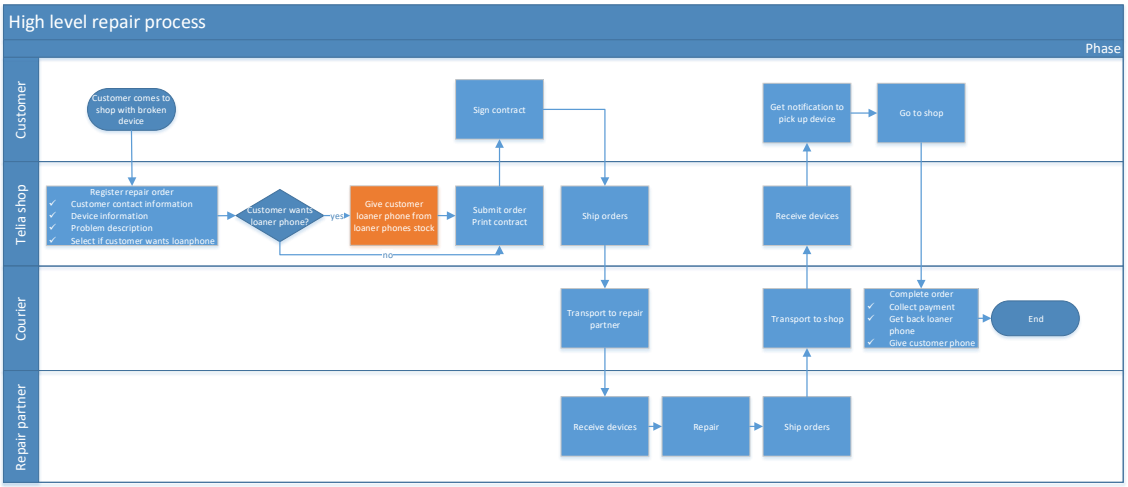


Figure 1 - Device repair process diagram

Device repair process starts, when a customer comes in to Telia shop with a concern that their phone is not working as expected. In such cases, Telia shop employee opens a web based application named ‘DST’ (Device Support Tool).

In DST, Telia shops can register device repairs, but it is also meant to be used in many other processes, which all have one common attribute: customer comes in to shop with a piece of hardware in their hands and want to do something with it. It can be either a repair need, returning of a device (e.g. buyback) etc.

DST was initially built to be used by shop employees, but has by now also been released as an end-customer facing application, where customers can register their device repairs themselves. In this thesis, we are focusing on DST shop application, where loaner phones are given out as a part of device repair order registration in shop.

In device repair registration, shop employee must fill in required information and submit repair order. Part of this information is also selecting, if customer wants a loaner phone

and which loaner phone exactly they want. This repair order will be sent to a service partner system, using an integration layer built for that purpose.

After repair order registration, customer needs to sign an order confirmation printed from DST. Using DST integrations to courier system, the courier is notified to pick up the device from the shop.

Using DST integrations to service partner system, customer and shop will be notified of order status updated throughout the whole repair process (from customer handing in the device to the device being back in shop, ready for pickup).

Once order is received back in the shop, then DST sends a notification to the customer to come and receive their device.

Customer picks up the device from shop and shop employee completes the order in DST, which then sends information to POS (point of sales) system for payment. Customer needs to hand back the loaner phone that they used during repair.

Another application worth mentioning here is COLT (common outbound logistics tool). COLT is simply the backend system for DST. COLT was initially used to track all outbound logistics orders, like devices ordered from Telias e-shop to customer home. DST was built ‘on-top’ of COLT database. Backoffice users are mainly using COLT to track device repair orders, shops are mainly using DST for that.

4 Rental Phone Processes

Below I will go into more detail with the rental phone specific processes. There are mainly 2 departments which deal with rental phones: Telia shops and Telia backoffice.

Telia shops, who are held responsible for offering the rental phones to customers, registering them correctly with the repair order and following up on the rental phones that are not returned on time. Telia shop employees are also doing wiping of the phones, to make sure no sensitive customer data is exposed to next customer who gets the device.

Another actor in rental phone related processes is Telia backoffice. In each Telia country, there is usually an aftersales manager, who is administering the rental phones pool (what products can be used as rental phones in Telia stores). After sales manager also decides the price set for each rental phone.

There were 5 main requirements defined in the pre-analysis phase together with the product owner from Telia side, to achieve the target solution for improving the loaner phones processes:

1. Backoffice should start defining price set for each product that is used as rental phone in a Telia store

2. Shops should start seeing the prices defined by backoffice in shops rental phone stock

3. Renting out a phone to customer should become organized process, where shops introduce the pricing set of the phone and asks customer to sign a contract

4. Shops should see the history of the rent phones and which customers have used the phone in what period

5. Shops should mark in the system, when they have done wiping of the rental phone

In the next subchapters I will describe in detail, what needed to change in AS IS (phones loan process before the project) process, to deliver solution that meets the above requirements. Main difference between old and new process is changing the phones 'loan' process to phones 'renting' process.

4.1 Defining rental products prices

There was no existing process for defining rental products pricing what so ever. Loaner phones were simply added to rental phone stock in shops repair registration system. Our target was to create a backoffice view, where the prices for rental products could be defined. Then, when shops add phones to stock in their view, then system will fetch prices that are defined in backoffice view and connect them to rental phones in shops stock.

4.1.1 AS IS process for defining loaner products prices (does not exist)

There was no existing process for defining loaner products prices.

4.1.2 TO BE process for defining rental products prices

Backoffice will have their own view, where they define rental phone related pricing information. This view is not available for shops employees. Access to this view is regulated with user rights.

Rental phone pricing is set on product level. Short explanation: If in shops there are specific devices added to stock – device has a conrete IMEI, manufacturer and model. Then in backoffice view, the prices are defined on product level – product has a prodcut code, manufacturer and model. Many devices can be the same product.

Rental product prices can differ from country to country and therefore there is a country filter in the view.

Rental products pricing is set by aftersales manager or some other backoffice employee who is assigned to do that job.

Rental phone pricing definitions

1. Device value

    a. Price of the phone when it was new. This price is not shown to customer but is added by backoffice only, to use in algorithms to calculate current value of the phone, which is named ’compensatio cost’

2. Compensation cost

    a. Price that customer has to pay when they lose the phone or want to keep it

3. Rental price

    a. Price per day that customer has to pay for using the phone after repair has ended and they have not brought back the rental phone.

4. Insurance

    a. If customer wants their rental phone to be covered by insurance, then customer need to pay this amount

5. Deductible

    a. If customer paid for insurance and breaks the phone, then they need to pay the deductible

6. Repair price

    a. In case customer has no insurance and they break the phone, then customer need to pay the repair price. It is a fixed amount and is not always the same amount that repair will cost.

Rental products prices are defined by 3 steps:

1. Defining rental product levels

    a. A level usually defines the quality of the phone. The higher level number, the better phone. E.g. Apple iphones usually belong to the highest level.

    b. All rental products need to belong to a one conrete level

    c. Each country can define their own set of levels.E.g. 1-Basic, 2-Smartphone 3- VIP

    d. For each level there need to be added rental price, insurance price and deductible.

2. Defining rental product conditions and price margins based on condition

    a. Condition indicates the appearance and shape of the phone. Higher condition number indicates worse condition of the phone.

    b. Rental phone (concrete device with IMEI) condition is set by the shop in shop view. Backoffice defines the list of conditions and the margins according to each condition.

    c. Each country can define their own set of conditions.

        i. *E.g. 1-New, 2- Minor scratches, 3-major scratches, 4-Needs to be* replaced.

    d. For each condition there need to be set the margins. Margin is multiplied with the phone value, to calculate phone's repair cost and compensation cost.

        i. *E.g. Phone is in '3-major scratches' condition which compensation cost multiplier is 0.8. Phone value is 700 EUR then phone repair cost will be 0.8*700 = 560 EUR.*

3. Adding rental phones to rental phone pool

    a. After backoffice has defined rental product levels and condition margins, then he can start adding products country's rental phone pool. All prodcuts that are added to the rental phone pool, can be used as rental phones in Telia shops.

    b. For each product, user will have to select a level, whis it belongs to and product value. Using these 2 values, system calculates all prices per product and displays them

After completing these 3 steps, the rental phone pool and prices has been set by backoffice. Now shop can start adding rental phones to shops stock.

Below presented diagram illustrates the dependencies how prices are calculated based on 3 parameters: device condition, product value, product level.

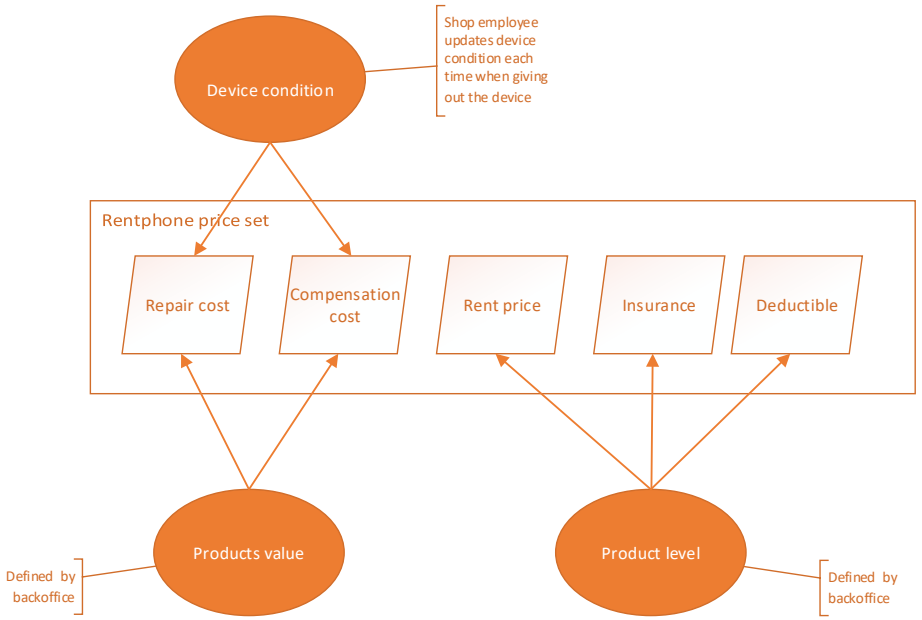


Figure 2 - Rental product pricing dependencies illustration

4.2 Adding loaner phones to shops stock

Loaner phones stock in shops is created and updated by shop employee, usually manager. Shop can only add these phones to stock, that are previously added to rental phone pool by backoffice. Shop employee fills in relevant information about each phone and system fetches price set automatically.

4.2.1 AS IS process for adding loaner phones to shops stock

In the earlier process, shop employee adds a new phone to stock by manually filling in needed information: IMEI, model, device current condition. There are no prices associated with the rental phones and no automatic fetching of prices is happening.

Below process diagram illustrates adding a rental phone to shops stock:

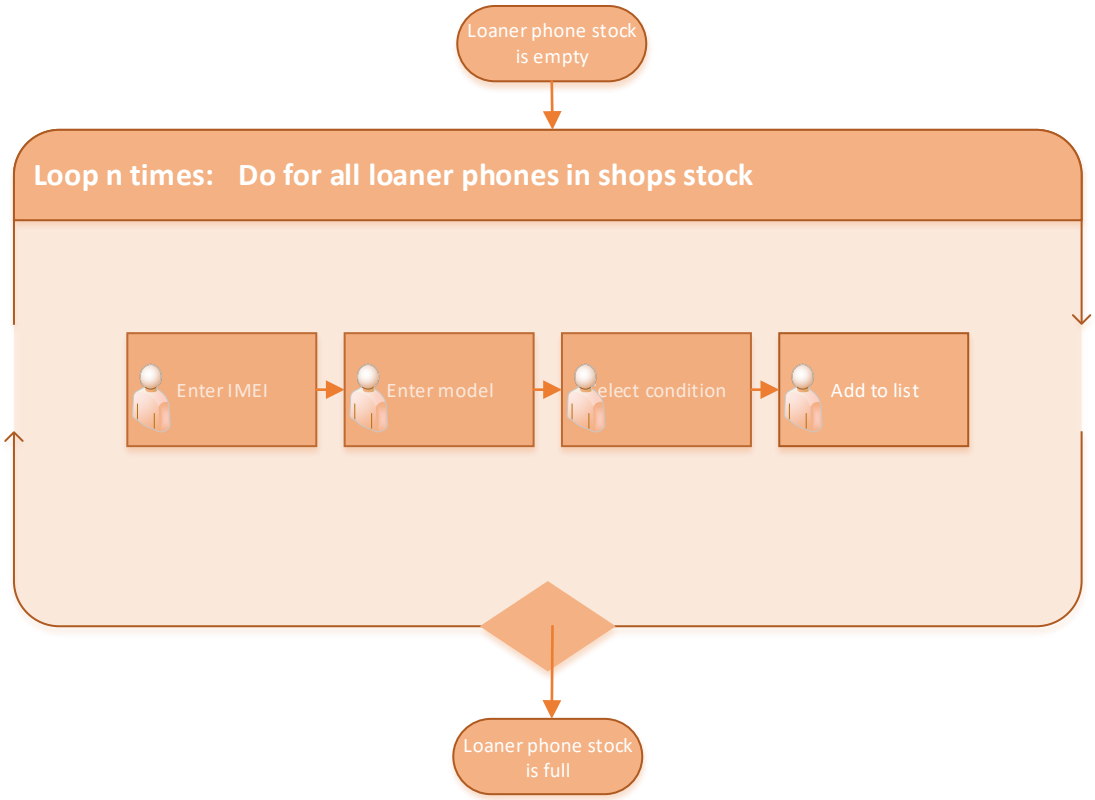


Figure 3 – AS IS diagram adding loaner phones to shops stock

4.2.2 TO BE process for adding rental phones to shops stock

In the new and improved flow, shop employee needs to enter only IMEI and select current condition of the phone. System will then fetch phone model and phone price set and fills it in automatically. Shop employee cannot change the prices, they are only informative for them.

Fetching phone model by using it's IMEI is a small improvement added to this flow. Although it does not have anything to do with rental devices, it was an existing solution already used in other parts of the system and could be easily implemented into this flow.

As a conclusion, the improvements save shop employees time by avoiding manual input.

At this point, shop employee first sees the rental phone related pricing for new rental phone. These prices will be also displayed later in repair registration process, where shop employee needs to introduce the prices to customer before handing out the rental phone to them.

Below diagram illustrates the new and improved process for adding rental phone into shops stock

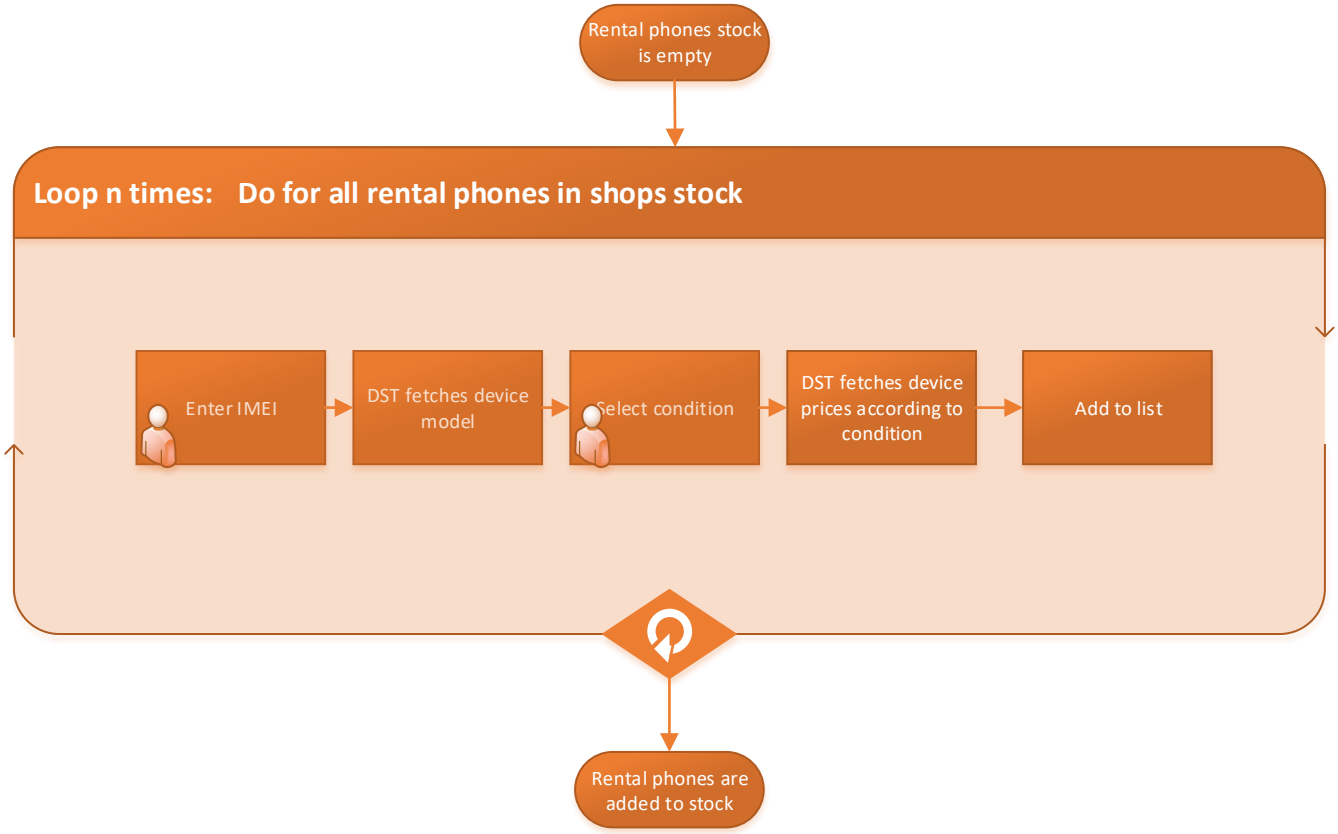


Figure 4 - TO BE add rental phones to stock

4.3 Renting out a phone to a customer

When customer comes to shop to register a repair order for their broken phone, then shop employee opens shops repair registration system to register repair order. On form that shop employee fills in, there is also a section for registering if customer wants to use a rental phone during the repair process. In this section, system shows a full list of shop's rental phone stock. Employee can select a phone from there according to customer wish. Upon saving the repair order, the selected rental phone will also be stored on the order.

4.3.1 AS IS process for loaning out a phone to a customer

In the earlier process, shop employee selects a rental phone on the order and registers it. There was no communication to customer, what happens if they lose the phone or break it. There was also no agreement, when should the phone be returned or what are the consequences if not returning it.

Below diagram illustrates the AS IS process for renting out and returning of a loaner phone:

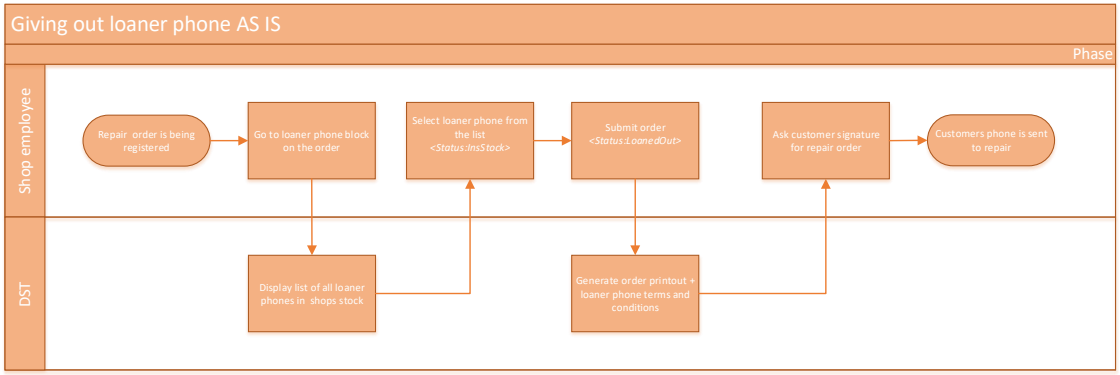


Figure 5 - AS IS diagram giving out loaner phone

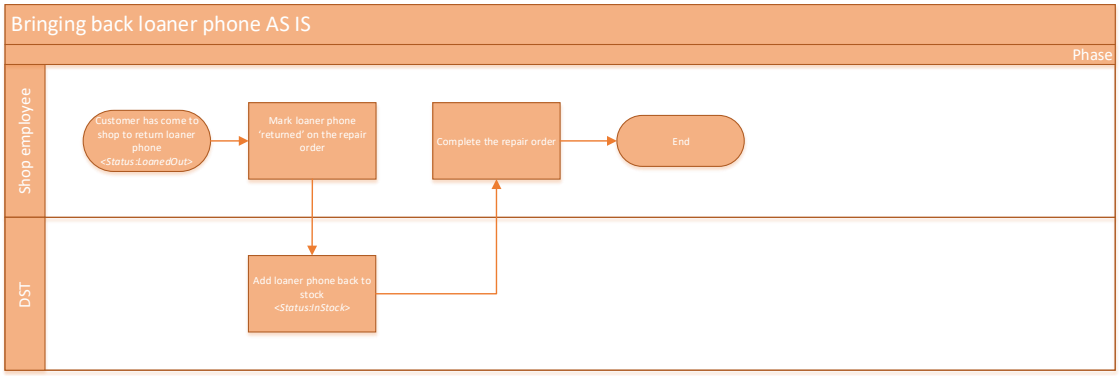


Figure 6 - AS IS diagram returning loaner phone

Loaner phone status is changed throughout the process. On the diagram, loaner phone status is marked in <> signs in Italic font. Status flow of loaner phones is detailed in section 4.4.2.

Please note, that in the earlier loaner phone process, when loaner phone was returned by customer then it when straight from status ‘LoanedOut’ to ‘InStock’. In the new solution this is changed, because shops need to wipe the phone before it can be made available in stock again – therefore the phones will start going to status ‘NeedsWipe’ after they are returned. This flow will be detailed in subchapter 4.4.

4.3.2 TO BE process for renting out a phone to a customer

In the new and improved process, shop employee will see the price set upon selecting the rental phone from the list. Shops employee will introduce the prices to customer, explains what each price means and makes sure they have a common understanding with customer about the price set. After submitting the repair order, customer will need to sign a document, where they agree to bring back the phone after repair. They also agree to the price set and to the usage of prices in case they lose, keep or break the phone.

Usage of the rental phone during repair is still free to a customer, but after repair has ended, they should return the phone to shop. If the phone is returned later than agreed on the contract, then customer needs to pay rent for the additional days.

Below diagrams illustrate the new and improved renting out process:

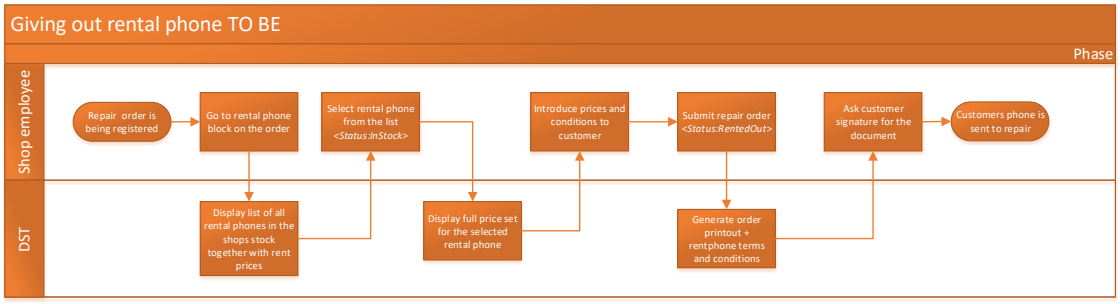


Figure 7 - TO BE diagram giving out rental phone

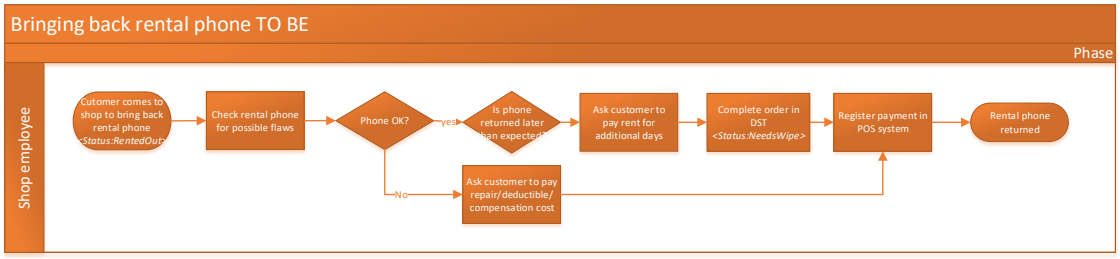


Figure 8 - TO BE diagram returning rental phone

As can be seen from the diagrams, in the new process I have also introduced new rental phone status ‘NeedsWipe’ to the rental phone return process, to capture the wiping activity done by shop employee.

4.4 Wiping a rental phone

Wiping of the phone needs to be done each time customer returns a rental phone. It needs to be done to ensure, that next customer will not get access to any sensitive information

of previous customer. It is also needed to do, to detect if customer has turned on Find my iPhone in case it is Apple phone. If FMIP is enabled, then phone becomes unusable.

4.4.1 AS IS wiping of the loaner phone (manual)

There is no wiping process in AS IS flow. Wiping of the phones was done by shop employees, but it was done in unorganized manner and it was not logged in the system.

4.4.2 TO BE process for wiping a rental phone

Rental device goes to 'NeedsWipe' status after it is being returned (either by pressing 'return' on repair order, or in rental phones stock view).

Shop employee then needs to wipe the phone and press 'Wiped' in the system, for phone to go back to status 'InStock'.

Rentals that are in status ’NeedWipe’, are not be available for renting (not shown in rental phone section on repair order creation).

Below status flow illustrates rental phones status flow, including wiping activity and new status ‘NeedsWipe’ :

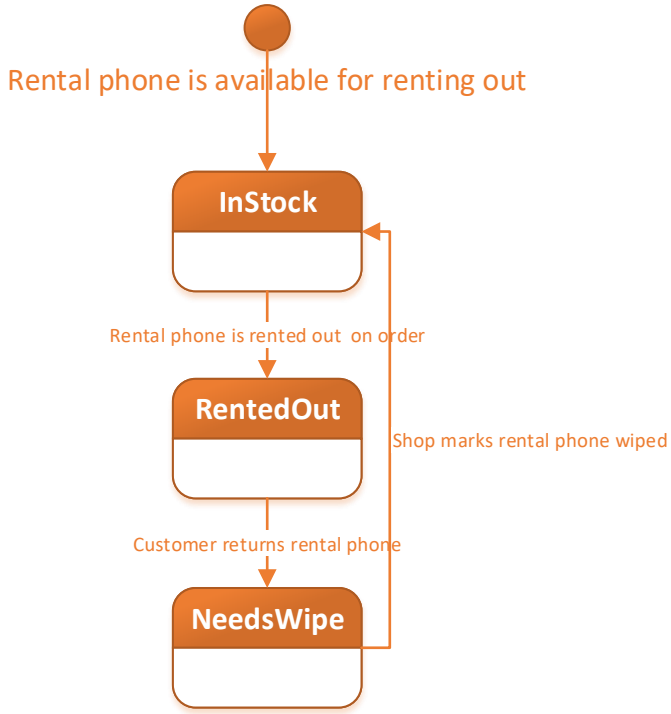


Figure 9 - TO BE status flow of rental phone together with wiping

4.5 History of a rental phone

System needs to start storing history of the rental phones, so it is possible to follow up, who was the customer using the phone, in case they forgot some important data removed, or if there is some other problem with the phone that shop needs to contact the customer about.

It is also important to see, who was the shop employee giving out or receiving the phone back. Sometimes it can happen that he/she forgot or did not know how to wipe the phone. Using history, shop manager can follow up who was the shop employee and can provide needed training for him/her.

4.5.1 AS IS history of loaner phone (does not exist)

There was no earlier process for storing the history of loaner phones. It was possible to take out from database logs, on which repair order the loaner phone was handed out, but this information was not available for the shops.

4.5.2 TO BE history of rental phone

History of the rental phones becomes available in shop view rental phone management. User can click on each rental phone to see the details and history log.

Rental phone history has 2 level details

1. Repair order list – you can see a list of repair orders where the device has been handed out

2. Repair order specific history – you can see a list of activities done with the rental phone during a one specific rental phone lifetime

Rental phone history shows following information:

1. Repair order number

    a. This is the order number on which the rental phone was given out to customer

2. Acitvity

    a. Shows an activity that is logged. Usually performed by shop employee. Possible activities: Rented out, returned, wiped.

3. Date

    a. Timestamp of the activity

4. Customer

    a. Name of the customer who used the rental phone

5. User

    a. Name of the shop employee who performed the activity

6. Shop

    a. Name of the shop where the activity was performed

5 Requirements

In this chapter are specified functional and non-functional requirements for the repair registration application (DST), to support the new process of rental devices. These are additional requirements to the system that is already in use by shop employees, to register device repairs.

5.1 Functional requirements

1. Backoffice employee must be able to insert base data like levels, conditions and phone values, which are used to calculate rental phone pricing.

2. System needs to calculate phone pricing based on the base data inserted by back office employee.

3. Backoffice employee must be able to manage, which products can be used as rental phones in Telia shops.

4. Telia shop employee must be able to see the rental phone pricing when registering a repair order for customer device

5. Telia shops employee must be able to register that they have done wiping for the rental phone, before it is returned to stock

6. Telia shop employee must be able to see the rental phone history, of which customers have used the phone on which repair orders.

5.2 Non-functional requirements

1. New views must follow the same design guidelines for the existing system

2. Rental phone pricing must be available instantly to shops after they are added by back office.

3. Labels and naming of the new fields and views must be informative and easily understandable for the user.

4. Fetching the rental phone pricing from database and displaying it to the shop employees should not take longer than 1,5 seconds.

6 Design and description of the user interface

In this chapter there are sketches of the backoffice and shop views in the system. Each sketch is introduced with a user story, to explaing who are using the views and how.

6.1 Defining rental product prices (backoffice view)

As a back office employee, I want to define rental phone level, so that it could be used in rental phone price calculation.

Rental phone levels can be defined seperately for each country. User needs to select level number and enter a name for this level. Then user will enter prices, that apply to each rental phone level.

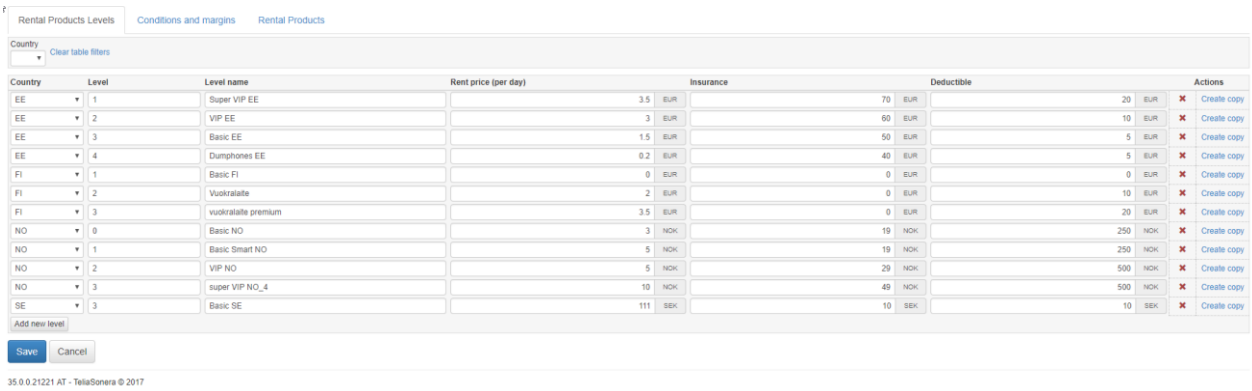


Figure 10 - Backoffice view: defining levels

As a back office employee, I want to define possible values for rental phone conditions, so that these can be set by Telia shop employee to specific rental phones in shops system DST.

Rental phone conditions can be defined seperately for each country. User needs to select a condition and set the repair price and compensations price multipliers for the selected

condition. The entered multiplier will be multiplied by phone value to calculatate phones repair price and compensation price.

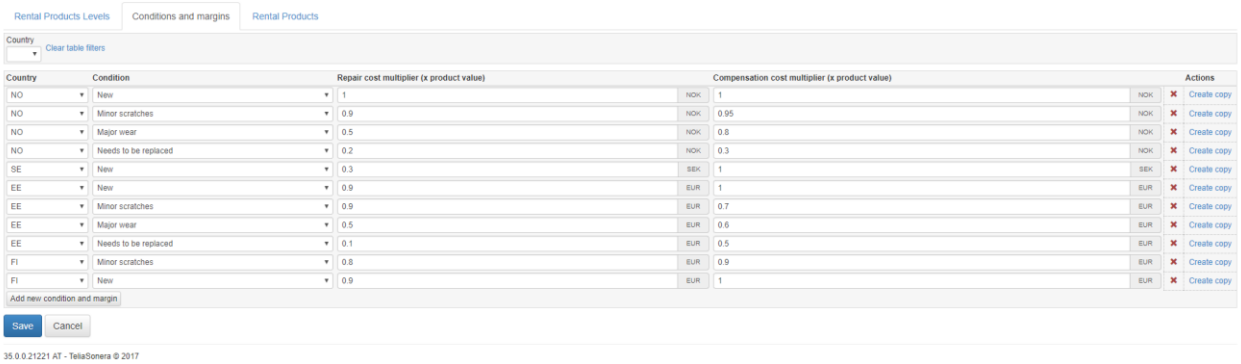


Figure 11 - Backoffice view: defining conditions and margins

As a back office employee, I want to define a list of possible products, that can be used as rental devices in Telia shops, so that shops would not rent out products that are not meant for renting.

Products can be defined separately for each country. User needs to enter product category, manufacturer and model of the product. Then user needs to set, in which level this product is and set product value. Then system will calculate the rental product prices according to entered data.

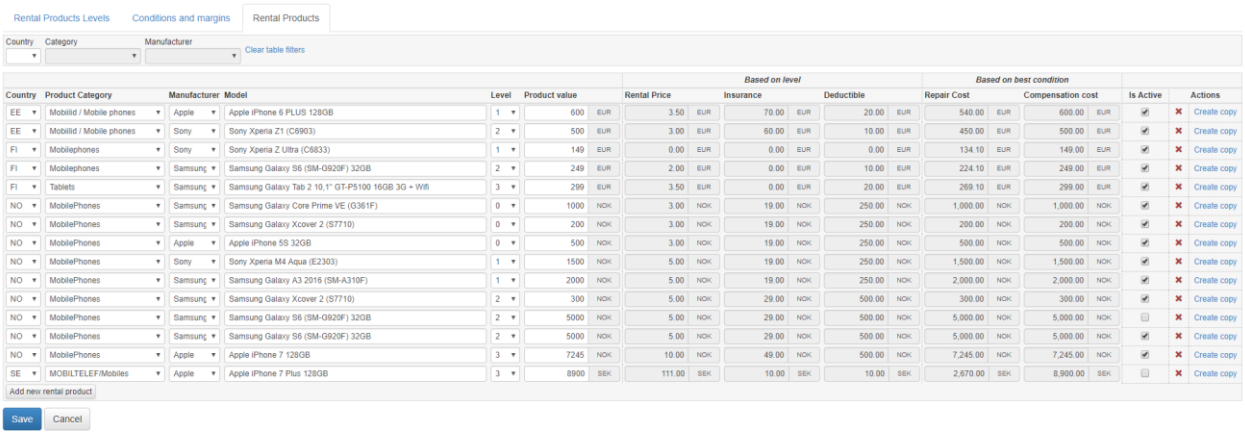


Figure 12 - Backoffice view: adding rental products

6.2 Adding rental phones to shops stock (shops view)

As a Telia shop employee, I want to add rental phones to shops rental stock, so that during repair registration I can select an available phone from the stock to be rented out.

New phone information can be added by clicking the '+/-' button in rental device management view. User needs to enter the IMEI of the phone and select, in which condition the phone is. System will auto-fill product field according to the IMEI.

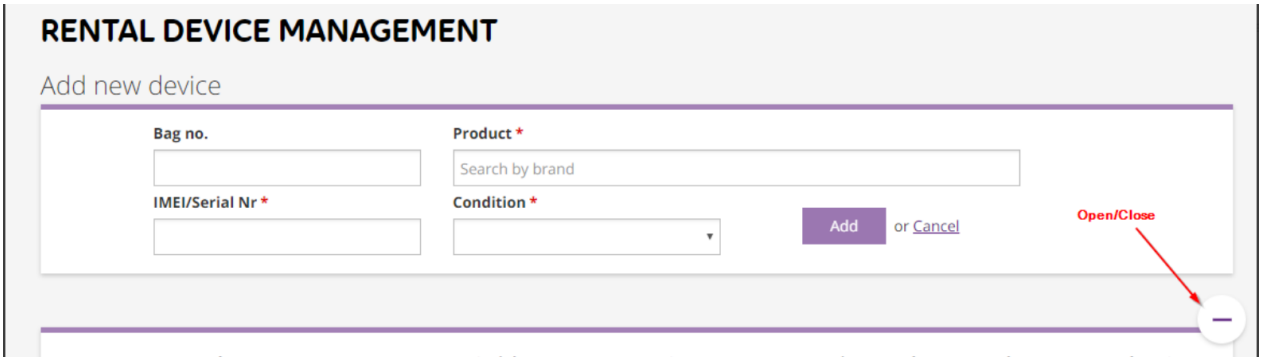
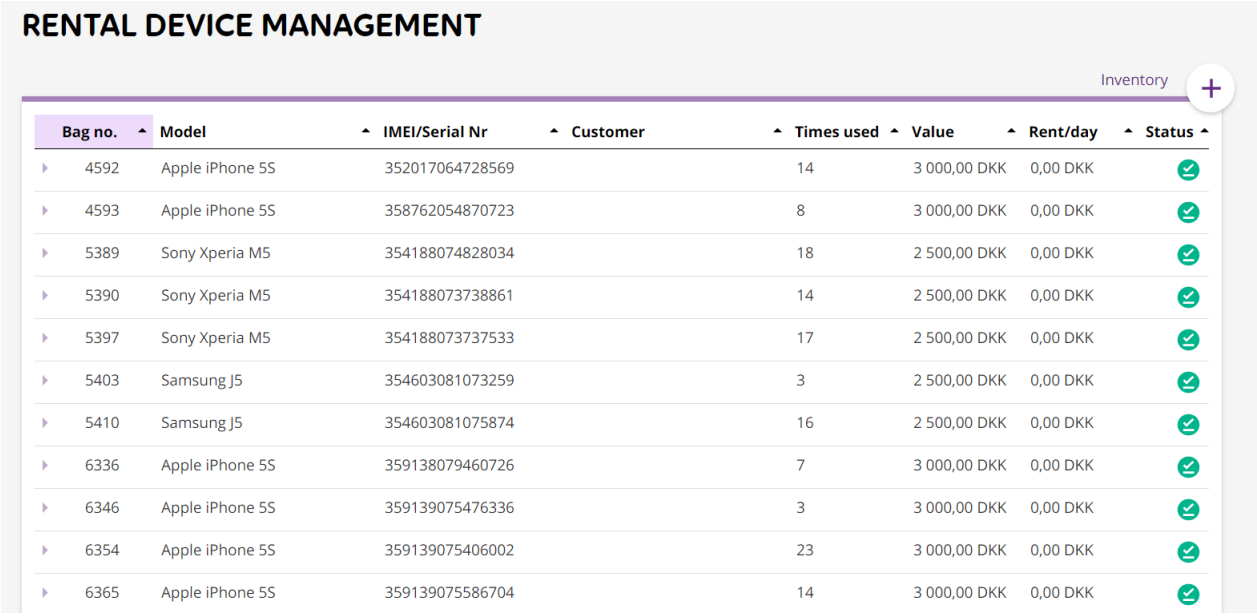


Figure 13 - Shop view: adding rental devices to stock

After adding the phone to stock , system will fetch the prices for the product and display them on the phone in stock view.



Bag no.	Model	IMEI/Serial Nr	Customer	Times used	Value	Rent/day	Status
4592	Apple iPhone 5S	352017064728569		14	3 000,00 DKK	0,00 DKK	
4593	Apple iPhone 5S	358762054870723		8	3 000,00 DKK	0,00 DKK	
5389	Sony Xperia M5	354188074828034		18	2 500,00 DKK	0,00 DKK	
5390	Sony Xperia M5	354188073738861		14	2 500,00 DKK	0,00 DKK	
5397	Sony Xperia M5	354188073737533		17	2 500,00 DKK	0,00 DKK	
5403	Samsung J5	354603081073259		3	2 500,00 DKK	0,00 DKK	
5410	Samsung J5	354603081075874		16	2 500,00 DKK	0,00 DKK	
6336	Apple iPhone 5S	359138079460726		7	3 000,00 DKK	0,00 DKK	
6346	Apple iPhone 5S	359139075476336		3	3 000,00 DKK	0,00 DKK	
6354	Apple iPhone 5S	359139075406002		23	3 000,00 DKK	0,00 DKK	
6365	Apple iPhone 5S	359139075586704		14	3 000,00 DKK	0,00 DKK	

Figure 14 - Shops view: rental devices stock

When click on the rental phone line, opens detail view with full price set.

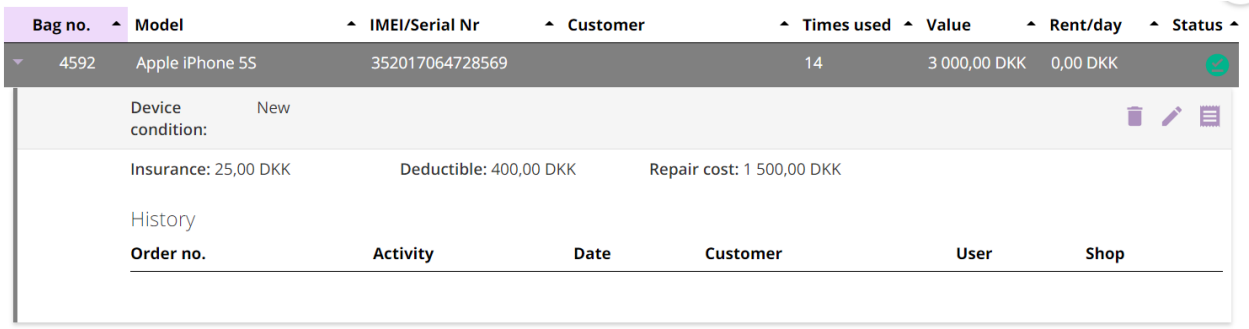


Figure 15 - Shops view: rental device details

6.3 Renting out a phone to customer (shops view)

As a Telia shop employee, I want to register renting out a phone to customer, so that it can be followed, who currently has rental device..

Renting out is done in the repair registarion view. Rental phone section in the repair registration form:

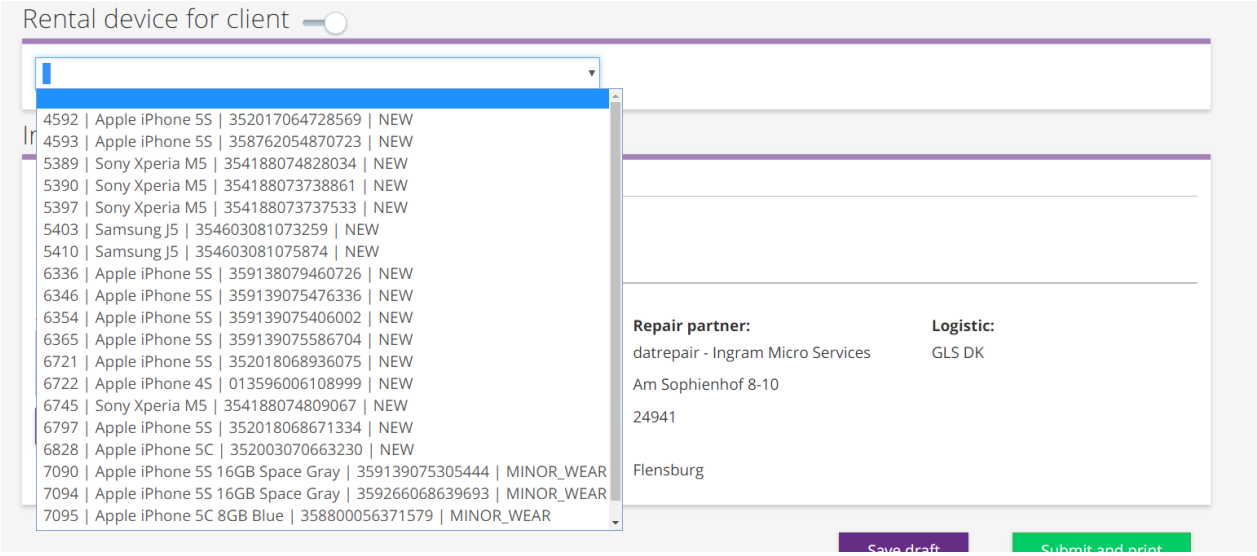


Figure 16 - Shops view: renting out

Upon selecting a device from the list, system displays prices. User can select, if customer wants to use rental phone insurance:

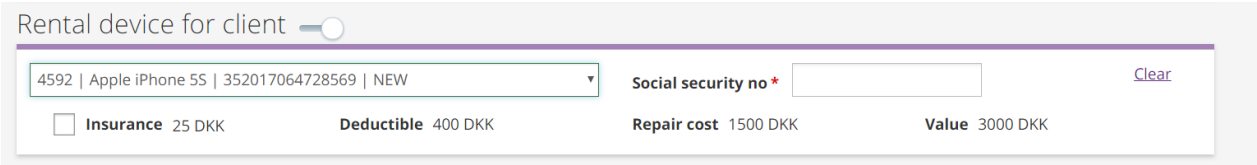


Figure 17 - Shops view: renting out, pricing

6.4 Rental phone history (shops view)

As a Telia shop employee, I want to see history of a rental phone, so that I can find which customers have used the phone.

Retphone history is shown in rental phone management view,when click on a specific phone in rental phone management:

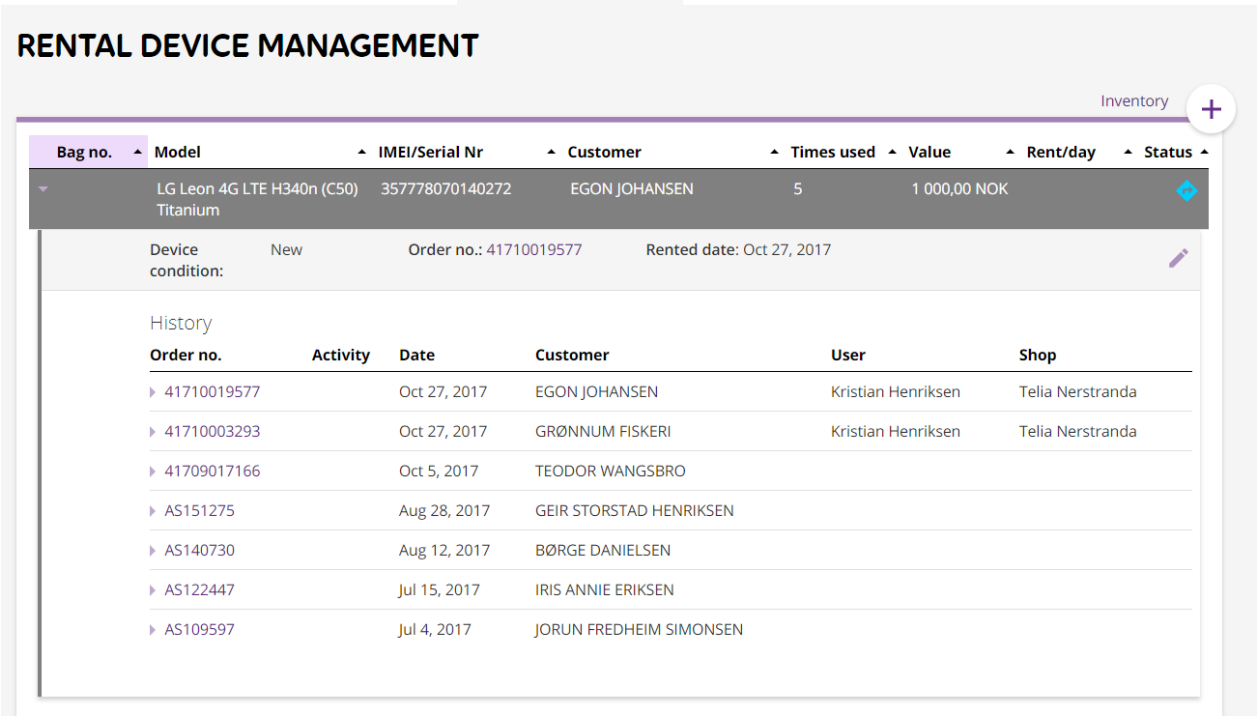


Figure 18 - Shops view: rental phone history

6.5 Wiping rental phone

As a Telia shop employee, I want register, that I have wiped the rental phone upon, so that it could rented out to new customer.

Phone needs to be in status ’NeedsWipe’ in order for the ’wiped’ button to be shown. After pressing wiped, phone goes to status ’InStock’

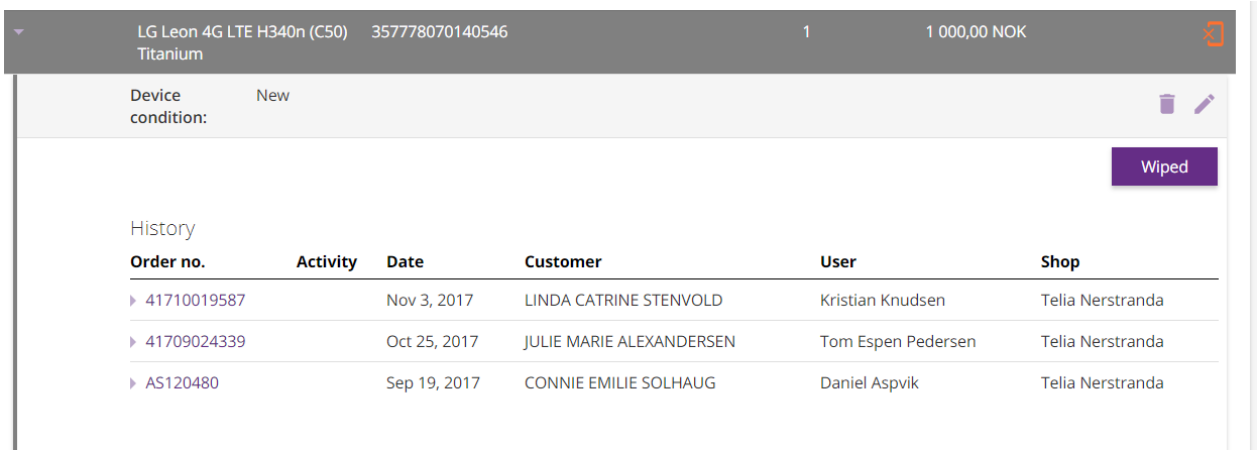


Figure 19 - Shops view: wiping

7 Test scenarios

Test scenarios for the implemented TO BE rental phones processes can be found in the table below. Following are the main user stories, for which the text scenarios apply to:

1. As a back office employee, I want to define rental phone level, so that it could be used in rental phone price calculation.

2. As a back office employee, I want to define possible values for rental phone conditions, so that these can be set by Telia shop employee to specific rental phones in shops system DST.

3. As a back office employee, I want to define a list of possible products, that can be used as rental devices in Telia shops, so that shops would not rent out products that are not meant for renting.

4. As a Telia shop employee, I want to add rental phones to shops rental stock, so that during repair registration I can select an available phone from the stock to be rented out.

5. As a Telia shop employee, I want to register renting out a phone to customer, so that it can be followed, who currently has rental device.

6. As a Telia shop employee, I want to register returning of the rental phone by customer, so that it can be followed, who currently has rental device.

7. As a Telia shop employee, I want register, that I have wiped the rental phone upon, so that it could rented out to new customer.

8. As a Telia shop employee, I want to see history of a rental phone, so that I can find which customers have used the phone.

It should be noted, that these test scenarios were performed to test the new solution of rental phones. Also other test scenarios were performed, like regression tests to the entire system, which are not described in this thesis.

First two columns of the table refer to test scenario range number and name. In third column ’Test Step#’ there is range number of test step performed in the scenario.

’View’ column indicates, in which application (backoffice/shop) the test should be performed. Backoffice application as COLT, shop application as DST.

’Expected result’ is the wanted result that the test step must end with, in order to get positive test result. Therefore, ’Test result’ shows the actual result of performed test step (OK/NOT OK).

S. No	**Test Scenario**	**Test Step#**	**Test Step**	**View**	**Expected result**	**Test Result**
1	Defining rental phone levels	1.01	Select country	Backoffice		
		1.02	Select level	Backoffice		
		1.03	Set rent price for this level	Backoffice		
		1.04	Set insurance price for this level	Backoffice		
		1.05	Set deductible price for this level	Backoffice		
		1.06	Press save	Backoffice	New level with set prices is saved into database	
2	Defining rental phone conditions	2.01	Select country	Backoffice		

		2.02	Select condition from the dropdown	Backoffice		
		2.03	Set repair cost multiplier for the condition	Backoffice		
		2.04	Set compensation cost multiplier for the condition	Backoffice		
		2.05	Press save	Backoffice	Entered data is saved into database.	
3	Adding products to rental phone pool	3.01	Select country	Backoffice		
		3.02	Select category	Backoffice		
		3.03	select Model	Backoffice		
		3.04	Select level of the phone	Backoffice		
		3.05	Enter product value	Backoffice		
		3.06	Validate prices that system calculated	Backoffice		

		3.07	Press save	Backoffice	Entered data is saved into database.	
4	Adding rental phones shops stock	4.01	Navigate to rental devices management view	Shop		
		4.02	Press '+' icon for adding new phone	Shop		
		4.03	Enter phone's IMEI	Shop	Phone model is displayed automatically	
		4.04	Select phone condition	Shop		
		4.05	Press 'Add'	Shop	Phone is added to stock list. Prices are fetched and displayed with the phone.	
5	Renting out a phone to customer	5.01	Create device repair order in shops system	Shop		
		5.02	In 'rental device' section on the order, select a phone from a dropdown	Shop	All phone prices are fetched and displayed to the user	

		5.03	Submit order	Shop	Rental phone agreement is printed. Rental phone status goes to 'Rented out'. Rental phone should not be visible to be rented out on other orders.	
6	Returning a rental phone to shop	6.01	Open repair order that has rental phone on it	Shop		
		6.02	Press 'return' in rental phone block	Shop		
		6.03	Press 'complete', to complete order	Shop	Rental phone goes to status 'NeedsWipe' and becomes visible to be rented out on new orders. Customer and order information is logged into the rental phone history.	
7	Wiping a rental phone	7.01	In rental phone management shop view, find	Shop		

			rental phone in status 'NeedsWipe'			
		7.02	Press pencil button (edit)	Shop	Wipe' button should become visible	
		7.03	Press 'Wipe' button	Shop	Confirmation popup should be displayed	
		7.04	Confirm wipe	Shop	Rental phone goes to status 'InStock'. Phone should be visible to be rented out on repair order.	
8	History of a rental phone	8.01	Select a rental phone in stock and click on it	Shop	Rental phone details (history, actions, prices) are displayed	
		8.02	Check rental phone history lines	Shop	History lines should show information of historical orders, where rental phone was handed out	
		8.03	Check rental phone history details	Shop	Should show: Order no. Activity Date	

					Customer User Shop	
		8.04	Click on one order to see details	Shop	Details of one specific order are displayed	
		8.05	Click on order number	Shop	Should direct to that order in new tab	

8 Summary

Goal of this thesis was to analyse the problems with earlier loaner phones processes in Telia AS. Loaner phones were given out to customers during the time their own device had been sent to repair. Main problems addressed in this thesis were customer satisfaction and lack of system support for Telia to define the pricing information for the loaner phones. This lead to the need for creating new, improved process.

The journey from the idea to sketches of the new user interface is described in this thesis. Author of this thesis has been working as an analyst for rental devices solution, but also other software solutions built for Telia.

Defining the new process started with a change of mindset: replace ‘loaning out’ devices with ‘renting out devices’. As a next step from setting the mindset, this thesis creates a basis for moving from old process to new, by describing AS IS and TO BE flows for renting out a device.

For supporting the TO BE flows, there arose a need to create a rental devices management system that could allow managing the devices and pricings in an organized way. Telia backoffice employees needed to define rental device pricing and Telia shops employees needed to view the pricing information and introduce it to customers. Describing user stories helped to understand the goals that the new system needed to fulfill.

As a prerequisite for building a rental devices management system, author defined functional and non-functional requirements for the system. Thesis ends with a list of test scenarios for main user stories, which can help tester to validate the systems reliability after it has been built.

Goals set in this thesis were accomplished. Although, there are more problems that could be raised regarding the rental phones process, the author finds that implementing the changes described in the thesis, raise customer satisfactory and make Telia employees work faster and more convenient – which were the main targets in the pre-analysis phase.

9 References

[1] [Online]. Available: http://kasulik.delfi.ee/news/uudised/elisast-antud-asendustelefon-oli-pungil-eelmise-meeskasutaja-alasti-pilte-mis-sattusid-10-aastase-lapse-katte?id=74363235.

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