

# Project Topicus Track & Trace

## Team 5

### Proposals from company and our solution

Must have	
Customer	
<u>Requirement</u>	<u>Our solution</u>
A customer and service provider must be able to login	<p>We decided to store everything related to the login inside the database. We stored a unique id of the user, also a boolean attribute if the user is staff or not for further distinction.</p> <p>Furthermore, we wanted to store the password in the database as a very strong hash that is supported with randomly generated salt values that add extra security.</p> <p>Also, we managed to create a user-friendly interface that takes the user input and gives a warning when it doesn't match the data in the database or doesn't exist yet.</p> <p>When logging in as staff a different home page will be visible since the service provider has more functionalities/privileges than the customer</p>
A customer must be able to apply for or cancel a mortgage	<p>- The customer is able to fill in an application form that registers all the necessary information (including the financial obligations, income and collateral) to begin with the mortgage request. The customer is going to fill in those fields and submit the application and it will be immediately visible on his "My mortgages" page where he/she can examine their request and check it's progress via a dynamic progress bar that has all the states that the customer should go through when applying for a mortgage.</p> <p>-To delete a mortgage, customers can click on "Delete" option and the state of the mortgage is updated to "Delete Request" so that when SP logs in they can know that the customer wants to delete the mortgage.</p>

<p>A visual indication of the current state within the larger process</p>	<p>We defined the process state of the mortgage with 5 steps namely: <i>Application, Document Check, Interest Offer, Binding Offer and Done</i> and they are displayed in the form of a progress bar.</p> <p>Each state has unique actions that are required to be taken. Once the customer is in each step, the status will be Processing or Action Required (incase SP required some actions from customer ).</p> <p>Different States of the mortgage process are uniquely defined by colors, so that customers can easily know their current state.</p> <p>For example, the Document check requires the customer to upload certain documents in order to support the claims of his application form (from the “Application” step). When a customer or service provider accesses the table of all applications they can see the current state and status of all related mortgages. When they access a specific mortgage, they can see a progress bar in the middle of the page to indicate the progress of the mortgage.</p>
<p>Including completed states with a timestamp of completion</p>	<p>If a state is completed in the mortgage application the progress bar will be colored in green till the step that it is currently in. And also the lettering underneath the progress bar is going to be bold indicating the current state of the application.</p> <p>Furthermore we added timestamps, once you can hover on the lettering underneath the progress bar you can see the time of the application. But if you want to know when it is possible that your application is going to be completed, then you can hover over the other states upfront and check out the predictions of the future steps and when they are supposed to be finished.</p> <p>The complete timestamp of each state is recorded and updated every time a service provider click on next step (allow customer to access next state of mortgage)</p>
<p>Including possible failed states (application denied, document unusable/unreadable, ...)</p>	<p>This is clearly shown on the list that appears on the “My Mortgages” page. There you can check out the status of an individual mortgage request as: <i>Failed, Processing, Action Required or Finished</i>.</p>

	<p>The failed state can happen in the Documents Check step when the service provider doesn't accept the financial obligations, income, collateral, it then updates the status of state to "Failed" and customers need to upload additional documents.</p> <p>"Failed" also happens in Binding Offer step where customer can reject the final offer and the status of Binding Offer is updated to "Failed"</p>
Information about the current state and whether or not an action of the customer is required.	<p>The customer and service provider can know whether they need to take actions by watching the status of the mortgage state. For the customer they can know whether an action is required when they see the status of the mortgage is updated to "Action Required" or "Failed". The "Action Required" status is shown when customers need to choose an option for Interest Offer and Binding Offer. (if they finish then the status is updated to "Processing")</p> <p>If the status is shown as "Processing" then a service provider needs to perform a checking action on the mortgage. After checking, the service provider can allow the customer to move to the next step.</p>
Service provider (SP)	
<b><u>Requirement</u></b>	<b><u>Our solution</u></b>
View and change the state of a mortgage application.	<p>The service provider has a special type of account with which he/she can login. The service provider will then be able to see all the applications assigned to him, each with some basic info such as the customer name. Each mortgage can also be viewed on a specific page where the SP can see a progressbar similar to that of the customer. On the specific so-called "track and trace" page the SP has a special clickable button "next step" to advance the next step after evaluating the customer's actions and allow the customer to enter the next state. Service provider can know when he need to</p>

	perform action and allow customer move to next step by checking if the mortgage is in "Processing" status
Delete mortgage	Service providers can click on the Delete option of the mortgage which has "Delete Request" state, then the mortgage is deleted.
Including failed states	For the Document Check step in the process the SP can validate the mortgage's information. This is done with an interface specific to that step where the SP can inspect and approve or decline the actions given an explanation when the customer failed to properly perform the actions. If SP choose to decline then the state's status is updated "Failed" and customer can see that when they log in

Nice to Have	
Customer	
<u><b>Requirement</b></u>	<u><b>Our solution</b></u>
Uploading documents (credit verification, assets and debts, passport copies, ...)	<p>The upload documents action is done in the Documents Check step of the customer. The field box named "Document Required" will show all the documents that are required by the SP (they can add and specify document type that they want from the customer) so that the customer will know which document to upload. The customer can also see the preview of the uploaded document.</p> <p>The status of the mortgage process will be "Failed" once the document is not accepted by the SP, so that customer can know and can upload it again.</p>
Chat functionality with the Service Provider	<p>We think this would add great value to the application.</p> <p>Thus we tried to include it in our final product but weren't able due to time restrictions and its low priority.</p> <p>The backend for this feature is mostly done.</p>

	<p>You are able to create chats and start messages via the api but the frontend only shows the messages from a hardcoded chat. There are also some things that still need to be figured out, like: how do get in contact with an sp and can this happen before you apply for a mortgage.</p>
Predict when the process will be completed based on similar requests	<p>We record the start and end time for each step in applying for a mortgage. We then periodically calculate the average time taken for each step (every month) and add it to the start time of the current step to get the predicted end time. We show these predicted times the same way as we do the recorded end times: when hovering over the step.</p>
Adapt to peak demand (i.e., start of new government regulations)	<p>This is not implemented</p>
Service provider	
<u><b>Requirement</b></u>	<u><b>Our solution</b></u>
Add explanations to failed states	<p>In the Document Check step, the service provider can specify a failed state's explanations by entering it inside a textbox (after clicking on Document Check button). And when a customer logs in he can see the reason why his information is rejected.</p>
Chat functionality with the customer	<p>See "Chat functionality with the Service Provider"</p>
Able to trigger status changes externally, for example through API calls to your system	<p>We used Swagger to automatically generate documentations for API. So, it's easy to use for people reviewing our code.</p>
Preview Uploaded document and request for document	<p>In the Documents Check step, SP can see the application form of the customer, and also have a check box to check some requirements of the customer's mortgage. In the "Document Required" field where SP can see the uploaded document of the customer, see the preview of each document that they've uploaded, and also can add some document requests if they need another one.</p>