# SME Digital Lending and Underwriting 1.0.0

# User Guide

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# Overview

SME Digital Lending and Underwriting solution helps financial institutions cover one of the critical parts of an underwriting process: data collection and initial risk assessment.

The user is a financial institution representative, and the application process is assisted. This means that the customer goes through the process helped by a bank representative who operates the credit facility application in a branch to collect the necessary data for various analyzes in the application process.

The SME Digital Lending and Underwriting solution is aimed at resolving some of the pain points when collecting data for the underwriting process, such as increased costs due to manual data collection and processing, increased time to evaluate the application, and decreased customer experience due to difficult and time-consuming processes.

Here are some of the major benefits the solution offers:

- The simplified process helps the bank representative automatically obtain or manually collect most of the data in minutes to submit an application.
- Initial creditworthiness and financial assessments are performed to automatically determine whether to approve or reject the application early in the process.
- All collected data is accessible from one place to help an underwriter make decisions with confidence.
- Pre-integrations with third parties are available to collect critical data (KYB process Companies House and Ideal Postcodes), accounting data (Codat) and initial assessment (fetching info from Experian and Lexis Nexis) but can be easily modified to accommodate the bank's current providers and reduce implementation time and budget.

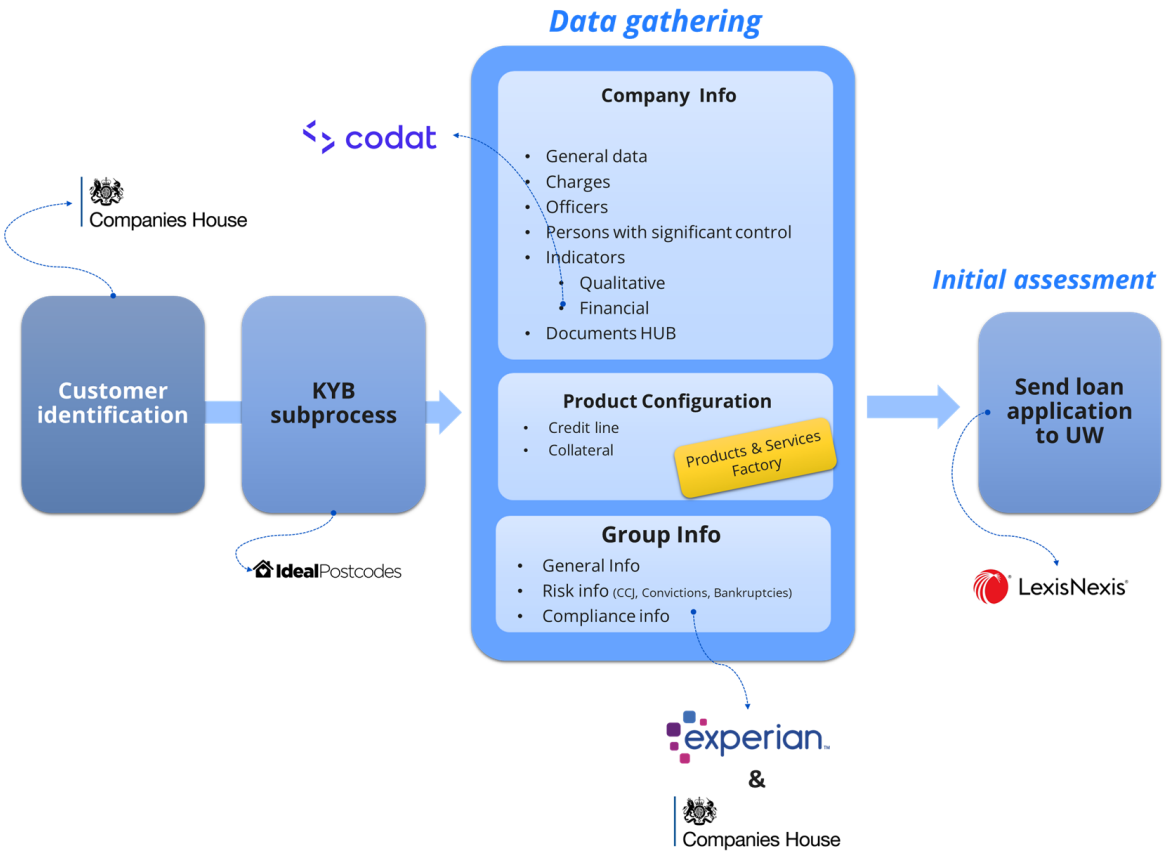
The SME Digital Lending and Underwriting is further customizable and can be personalized according to specific requirements. For example, you can:

- modify the algorithms for different calculations: eligibility, loan amount, scoring, etc.

- modify the flow as per your business requirements.
- integrate different platforms with APIs.

The solution uses data from third parties and enables data collection using the following connectors:

- Companies House to get and display information such as company details, name and role of the representative in the company, and so on.
- Ideal Postcodes to access and retrieve addresses.
- Experian to get credit scores.
- Lexis Nexis to retrieve data regarding fraud or potential fraud.
- Codat to access and retrieve relevant financial information.




These integrations with third parties can be modified to accommodate the financial institution's current providers.

# Installing SME Digital Lending and Underwriting

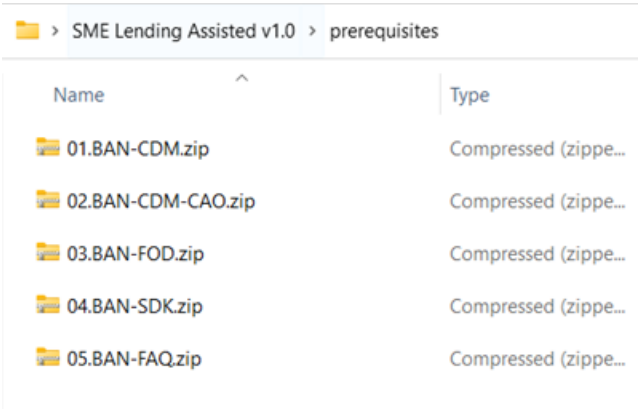
Follow the guidelines below to install and configure SME Digital Lending and Underwriting 1.0.0.

> **NOTE**
> Digital assets are exported as sealed, with dependency on the **22.1.4** version of **FintechOS Platform**, for compatibility reasons. This means that you cannot make any changes to assets on the environment in which they are deployed.

## Prerequisites

1. Install and configure:
    - SySDigitalSolutionPackages **v22.1.4000.zip**
    - FTOS Platform **v22.1.4** (with B2CPortal, B2CProxy, JobServer, OpenAPI v3)
    - Banking Product Factory **4.0**
    - dotnet-scvutil on Innovation Studio and on the Portal where the solution is deployed.
2. Import the packages for the following integrations: Company House, Ideal Postcodes and Experian (you can find these connectors in the **Connectors 22.1.4.zip** archive file available on Release Hub).
3. Install the Codat Connector.

4. Unzip the **SME Lending Assisted v1.0.zip** archive file and import the BAN-CDM, BAN-CDM-CAO, BAN-FOD, BAN-SDK, and BAN-FAQ packages available in the **prerequisites** folder.




5. Check that the items contained in the **FTOS_DBK_Common** asset are not linked to any other digital asset:
   - Attribute companyStatus on the **Corporate Applicant Data** entity.
   - Workflow Library FTOS_BAN_GeneralHelper

# Install the Solution

Add the latest syspackdeployer in the `solution` folder, edit the installer and run it in admin mode.

The packages available in the solution folder contain the following assets:

| Package | Assets |
|---|---|
| 01.FTOS_DBK_SQLBefore | FTOS_DBK_SQLBefore |
| 02.FTOS_DBK_DataModel | FTOS_DBK_DataModel |
| 03.FTOS_DBK_Resources | • FTOS_DBK_Resources<br>• FTOS_DBK_Common |
| 04.Lexis Nexis | LexisNexis |
| 05.FTOS_DBK_Data | FTOS_DBK_Data |
| 06.FTOS_DBK_Data_BankingProduct | FTOS_DBK_BP |
| 07.FTOS_DBK_SQLAfter | FTOS_DBK_SQLAfter |

# Post-Installation Setup

1. Go to Vault – platform system parameters and update as follows:
    - `sys-compatibility-url-params-router`
    - `sys-single-page-app-router`

      Both parameters must contain the following JSONs:

      ```
       {"portal":"Digital Banking RM","value":"0"},
      {"portal":"BAN-B2C","value":"0"}
      ```

    - `sys-hide-app-dashboard`

      Set to 1 on portal **Digital Banking RM**.

2. In Vault, add the following settings for Portal:

| Key Name | Value |
|---|---|
| core-setting-portal-profile | Digital Banking RM |
| FTOS_DBK_CodatApiUrl | https://app-ecos-apache-camel-test.azurewebsites.net/services/api/codat |
| FTOS_DBK_CorporateStructureMock | {"ParRegNumber":"999998","TreePosition":"2","TotalNumSubs":"1","TotalElements":"3"}"} |
| FTOS_EXTD_EXPE_baseUrl | https://sandbox-uk-api.experian.com/risk/business/v2 |
| FTOS_EXTD_EXPE_ClientId | 1 |
| FTOS_EXTD_EXPE_ClientSecret | *Experian client secret* |
| FTOS_EXTD_EXPE_DelphiBaseUrl | https://sandbox-uk-api.experian.com/risk/consumer/v1 |
| FTOS_EXTD_EXPE_DEV | 1 |
| FTOS_EXTD_EXPE_Password | *Experian password* |
| FTOS_EXTD_EXPE_UrlOAuth2 | https://sandbox-uk-api.experian.com/oauth2/v1/token |
| FTOS_EXTD_EXPE_UserName | *Experian username* |

| Key Name | Value |
|---|---|
| FTOS_EXTD_ POST_ApiKey | *IdealPoscodes client secret* |
| FTOS_EXTD_ POST_ApiUrl | https://api.ideal-postcodes.co.uk/v1 |
| lexn-client-id | FintechOSUKTest |
| lexn-password | *LexisNexis password* |
| lexn-role-type-role | Administrator |
| lexn-role-type-user | *LexisNexis role type user* |
| lexn-url | https://staging.bridger.lexisnexis.eu/LN.WebServices/12.0/XGServices.svc/Search |
| lexn-user-id | *LexisNexis user id* |
| OpenAPI_BaseUrl | The OpenAPI app service base url. E.g.: "https://app-openapi-ban22-qa.azurewebsites.net" |
| OpenAPI_ Password | qweQWE123!@# |
| OpenAPI_User | api.caller |
| SMTP:EnableSSL | 0 |
| SMTP:Host | *SMTP host* |
| SMTP:Password | *SMTP password* |
| SMTP:Port | *SMTP port* - usually "587" |
| SMTP:User | *SMTP user* |
| CompanyHouseApiKey | *Companies House api key* |

| Key Name | Value |
|---|---|
| CompanyHouseApiUrl | https://api.company-information.service.gov.uk |
| B2CProxy | B2C url. |

3. Add the following app settings in the b2cportal section in Vault.

| Key Name | Value |
|---|---|
| feature-b2c-userjourneys | 1 |
| feature-b2c-userjourneys-api-key | **API_KEY** mentioned in step 5. |
| feature-b2c-userjourneys-impersonated-user | b2c.guest |

4. Navigate to Innovation Studio and create a user with the above mentioned data in the OpenAPI_User and OpenAPI_Password fields and assign them the **FTOS_DBK_ApiCaller** role.

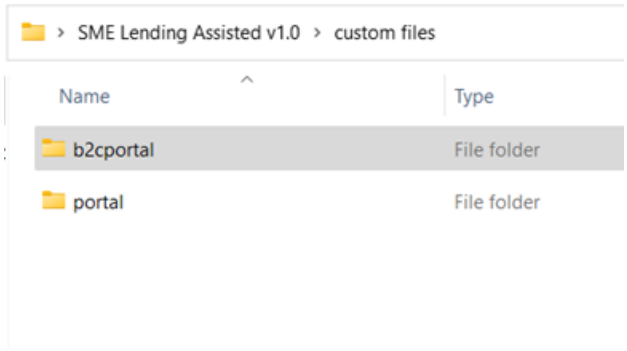
5. Configure the B2C Proxy as follows:

   - Add the following in the b2cproxy app service > proxy > proxy.config.js:

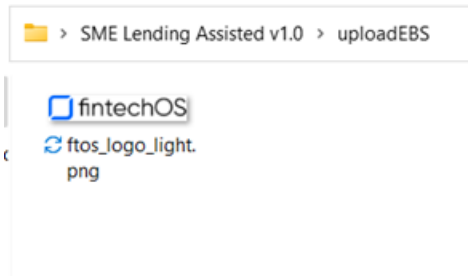
```
if (output.path === "/Agreements") {
    output.path = "/Main";
    output.query += "#/customform/FTOS_BASME_
ConfirmAgreements";
    return output.redirect();
}
```

   - Navigate to Anonymous Frontends and make sure there is a record with the same name and api key as mentioned in the **proxy.config.js** file, on the line where request headers are set. E.g.: output.requestHeaders.set ("NAME", "API_KEY");
   - Open this record and make sure the custom flow **FTOS_BASME_ConfirmAgreements** is published.

6. Import the custom files into their respective app service and folder, as described in the custom files folder structure.



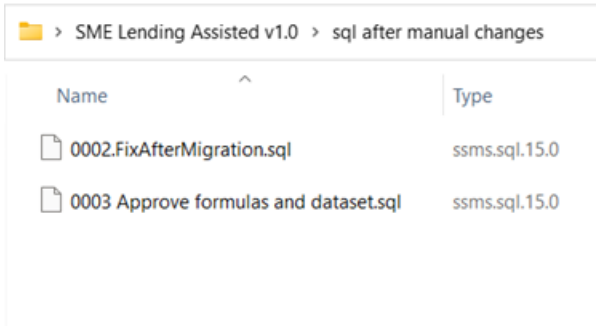

7. Navigate to portal profile > Digital Banking RM and add the company logo: ftos_logo_light.png. The logo is available in the **uploadEBS** folder.




8. Navigate to **Innovation Studio/Main#/entity/FTOS_BP_Agreement/list** and insert the following data:

| Code | Name | Display Name |
|---|---|---|
| 200 | gdpr | GDPR Agreement |
| 201 | marketing | Marketing Agreement |
| 202 | relative | Relative with Bank Employee |
| 203 | information | Information Agreement |
| 204 | affiliates | Affiliates Agreement |
| 205 | business | General Business Agreement |

9. After creating each agreement, insert a record in the Banking Products view, having the same code as the agreement and the Banking Product **CL**. Attach them to the **CL** banking product.
10. Run the sql files from the **sql after manual changes** folder.




11. Navigate to **Innovation Studio> Banking Factory > Banking products**, select the **CL** code and enter the following records in the **Formula Engine > Banking Product Formulas** section:

| Name | Formula Type | Formula | Data Mapping |
|---|---|---|---|
| FTOS_DBK_ CheckAgreementsAnswers | Agreements | FTOS_DBK_ AgreementsAnswers | FTOS_DBK_ AgreementsAnswers% |
| FTOS_DBK_ CheckEligibility | Eligibility | FTOS_DBK_ CheckEligibilityQuestions | FTOS_DBK_ CheckEligibilityQuestions% |

# Security Roles for SME Digital Lending and Underwriting

A security role is a set of privileges and levels of access to various actions or functions within the High Productivity Fintech Infrastructure.

In terms of extensibility, the SME Digital Lending and Underwriting solution can accommodate more than the predefined security roles. This means that you can create a new security role to fit your financial institution's business needs. For example the *Underwriter* is a generic role and you might add two particular roles: *Risk Compliance* and *Risk Officer*.

## Predefined Security Roles

SME Digital Lending and Underwriting comes with the following predefined security role that grants specific access rights to the users associated with such a role to the High Productivity Fintech Infrastructure's actions and functions:

- **Relationship Manager:** Users with this security role have `read, insert` and `update` access rights to the product records within their organization.

Below you can find detailed information about the security role's access rights to entities, form driven flows and endpoints within the High Productivity Fintech Infrastructure:

### Relationship Manager

A user with this security role has the following access rights to records in High Productivity Fintech Infrastructure's entities:

| Entity | Read | Insert | Update |
|---|---|---|---|
| Address of Retail Applications | Yes | Yes | Yes |
| Application Accounts | Yes | Yes | Yes |
| Data for Retail Applicant | Yes | Yes | Yes |
| Account Application | Yes | Yes | Yes |
| District | Yes | Yes | Yes |
| Address of Corporate Applicant | Yes | Yes | Yes |
| Loan | Yes | Yes | Yes |
| Application | Yes | Yes | Yes |
| Banking Product | Yes | No | No |
| Data for Corporate Applicant | Yes | Yes | Yes |
| Data for Corporate Applicant | Yes | Yes | Yes |

A user with this security role can access the following endpoints:

| Endpoints |
|---|
| FTOS_EXTD_POST_AddressesSearch |
| FTOS_BNKAP_GetProductQuestionsMapped |
| FTOS_GetFlowProcessorSettingsByName |
| FTOS_BASME_WelcomeWidget |
| FTOS_BASME_GetCompanyDetails |
| FTOS_DBK_CustomLoadAttrUpdate |
| FTOS_DBK_GetSMELoanApplications |
| FTOS_DBK_GetProductQuestionsMapped |
| FTOS_DBK_CustomLoadAttrRead |
| FTOS_BASME_SearchCompany |
| FTOS_DBK_GetTypeOfTransaction |

| Endpoints |
| --- |
| FTOS_BASME_InsertNewApplication |
| FTOS_DBK_GetApplicantAddress |
| FTOS_DBK_GetCityId |
| FTOS_DBK_GetDistrictId |
| FTOS_BNKAP_GetCompanyApplicationsNo |
| FTOS_DBK_SMELoanLinkApplicantData |
| FTOS_DBK_CheckEligibilityAnswers |
| FTOS_DBK_GetAdditionalBusinessDetails |
| FTOS_DBK_GetCompanyDetails |
| FTOS_DBK_CheckAgreementsAnswers |
| FTOS_DBK_GetProductAgreementsMapped |
| FTOS_BASME_AgreementNotification |
| FTOS_BASME_getChargeDocument |
| FTOS_DBK_EmailApplicantCodat |
| FTOS_DBK_GetCodatData |
| FTOS_DBK_ProcessCodat |
| FTOS_DBK_CheckLoanBusinessStatus |
| FTOS_DBK_NewRequestProductConfig |
| FTOS_DBK_SaveCreditLineDetails |
| FTOS_DBK_AddNewCollateral |
| FTOS_BNKAP_GetApplicationDocument |
| FTOS_DBK_UploadDocuments |
| FTOS_BASME_ApplicationDeleteDocument |

A user with this security role can access:

- form driven flows: FTOS_BASME_NewApplication and FTOS_BASME_NewRequest
- custom flow FTOS_BASME_ConfirmAgreements
- FTOS_BASME_RelationshipManagerDashboard which represents the main page when the application is accessed.

# Collecting Company's Data

The SME Digital Lending and Underwriting accommodates several steps that enable you as a bank representative to operate the customer's application. This part of the process has the role of collecting data about the SME customer and the SME customer representative. The following data is collected: general company information, company documents and charges, details of officers and persons with significant control, group details, company indicators, as well as product details.

Below you can find the actions you can perform as a bank representative:

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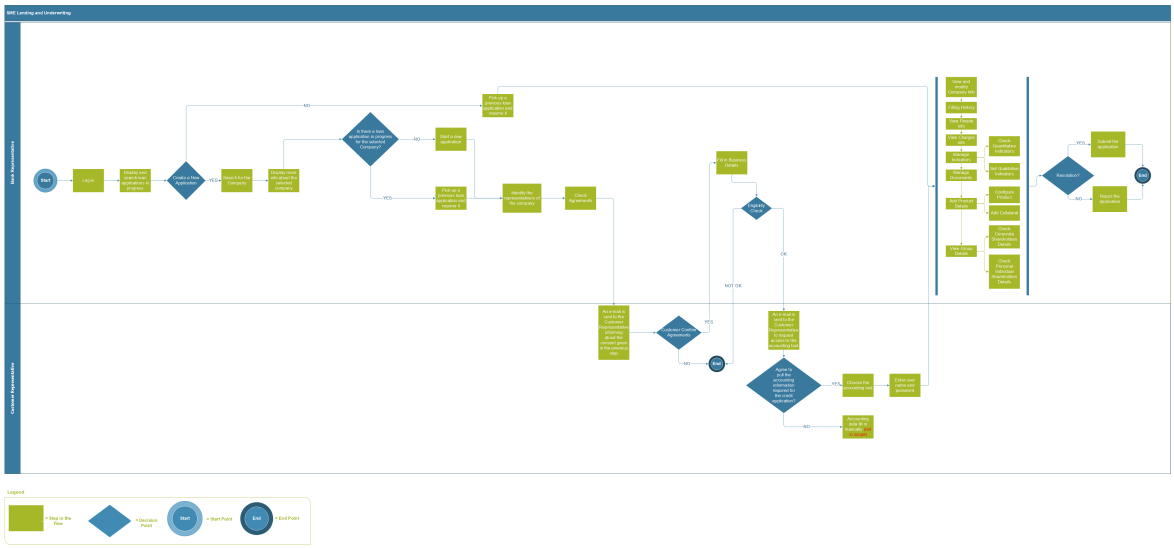
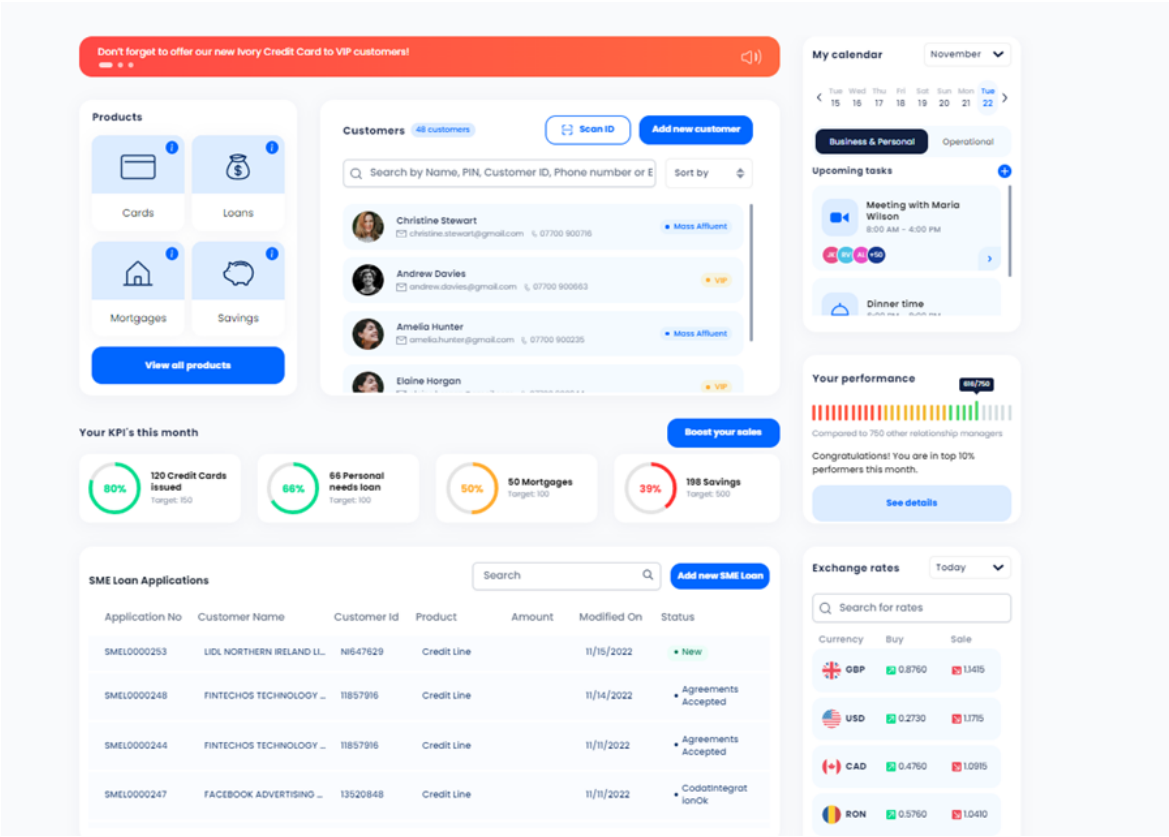
See below the UML diagram showing the main actions taken by the bank representative and customer representative.



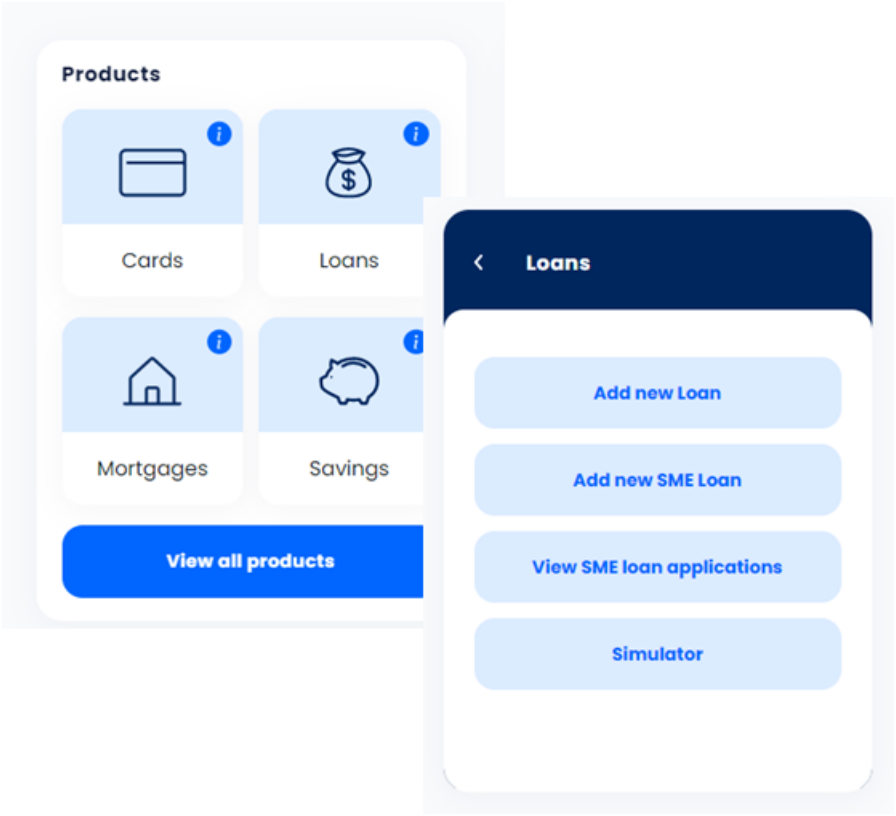
# Accessing the Solution

After you authenticated to the FintechOS Portal, a dashboard is displayed in order to access the SME Digital Lending and Underwriting solution.

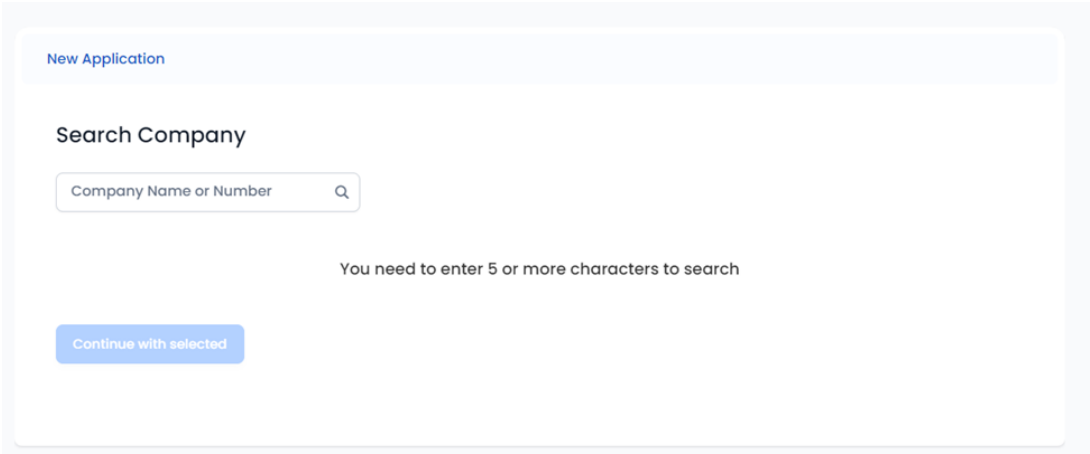



Using the dashboard features you can view the current credit line applications assigned to you or you can start a new credit application directly from the dashboard:

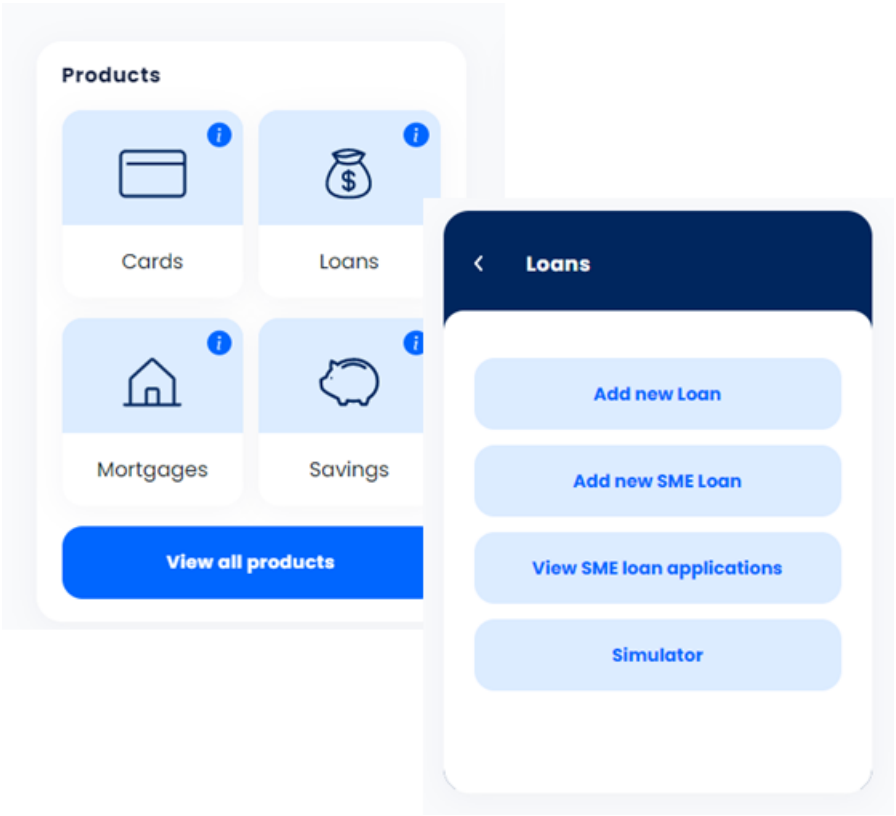
1. Click the **Loans** icon **> Add new SME Loan** to add a new SME loan.



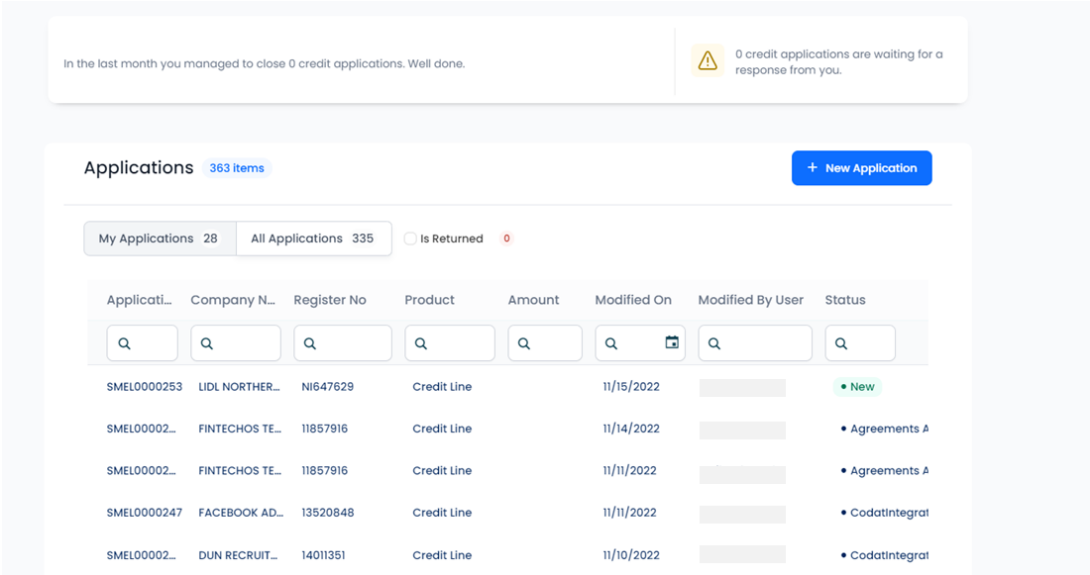

The New Application page is displayed.



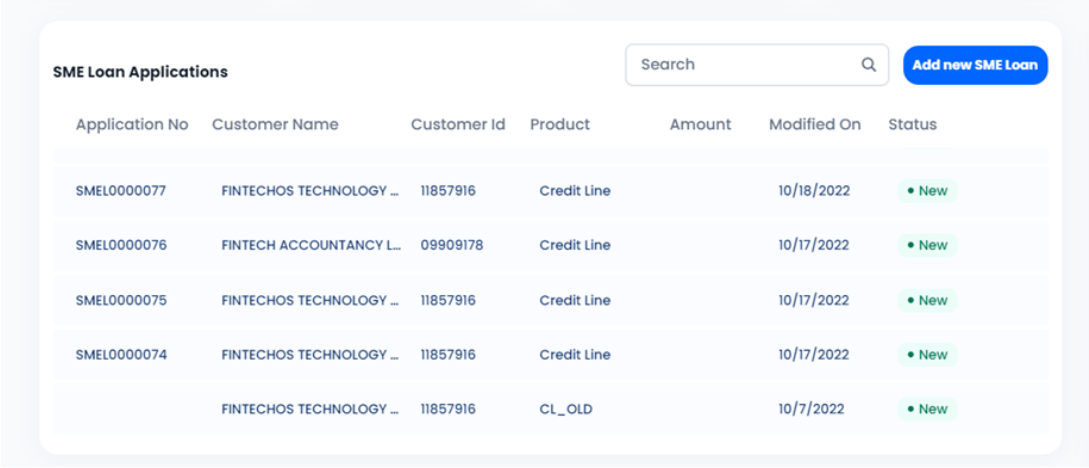

2. Click the **Loans** icon **> View SME loan applications** to view all the SME loan applications.




A dashboard with all the SME loan applications is displayed.



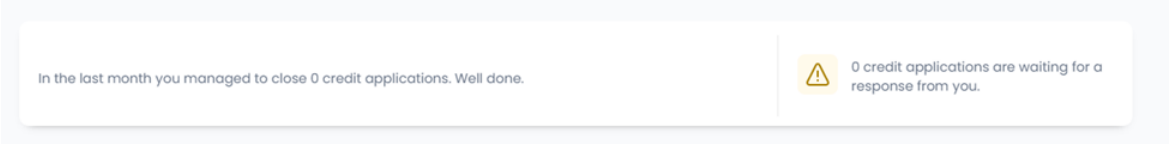
3. View only the SME Loan applications that are allocated to you in the **SME Loan Applications** section available on the dashboard. The following details are displayed: Application No (a unique number with the prefix SMEL), Customer Name, Customer Id, Product (the name of the product accessed by the customer), Amount (the requested loan amount), Modified on (the date of the last modification), and Status (the current status of the application).




4. Add a new SME loan application by clicking the **Add new SME Loan** button, and you are redirected to the New Application page.

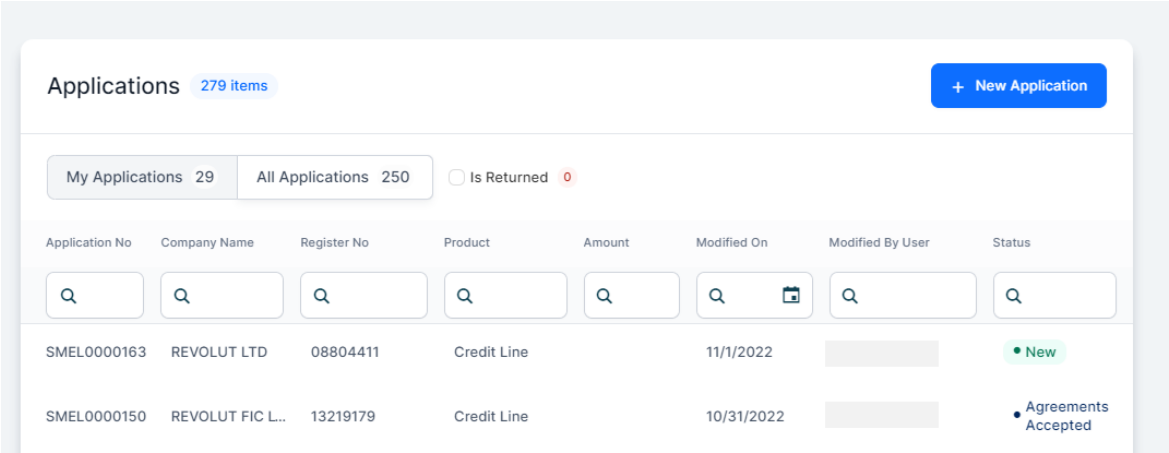
# Working with Dashboard

On the **Dashboard** page, you can see the number of applications you have closed this month, the number of applications that need a response from you and the applications section.




View, filter, and open existing credit applications for your customers in the **Applications** section.

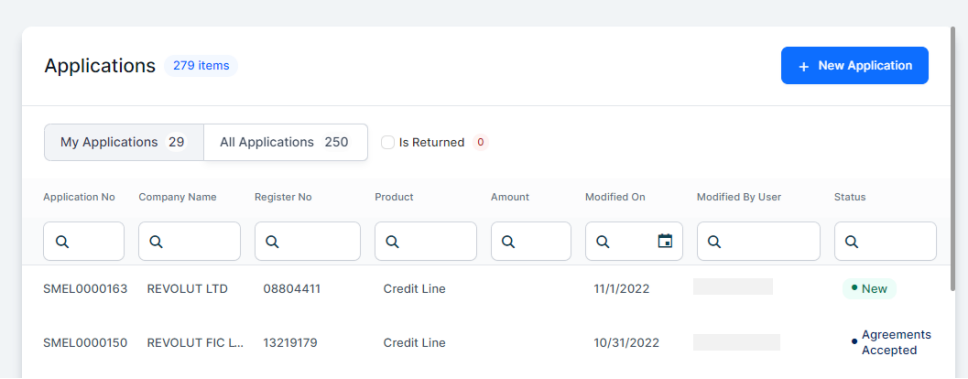
The following details are displayed: Application Number (a unique number with the prefix SMEL), Company Name, Register Number (a unique business identifier of the company ), Product (the name of the product accessed by the customer), Amount (the requested loan amount), Modified On (the date of the last modification), Modified by User (the last user who made the change), and Status (the current status of the application).




Below you can find the actions you can perform as a bank representative:

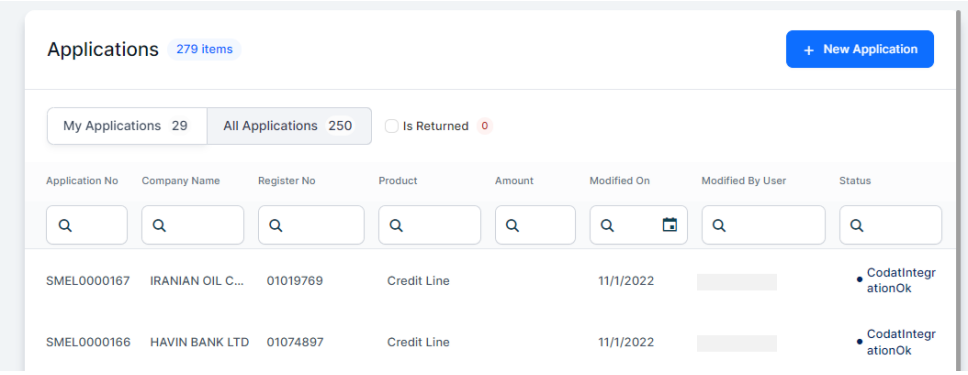
# Viewing Applications

1. Click **My Applications** to view only the applications you have created.



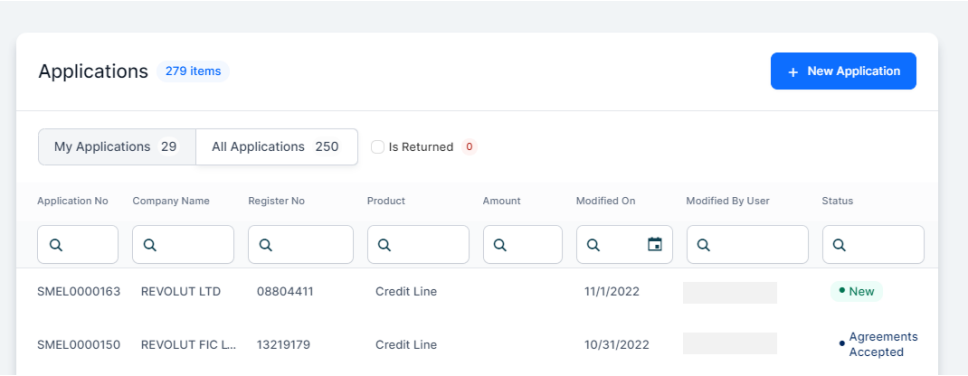

   The applications are sorted based on the last time they were modified, the applications you have modified most recently are shown first.

2. Click **All Applications** to view all the applications except yours.



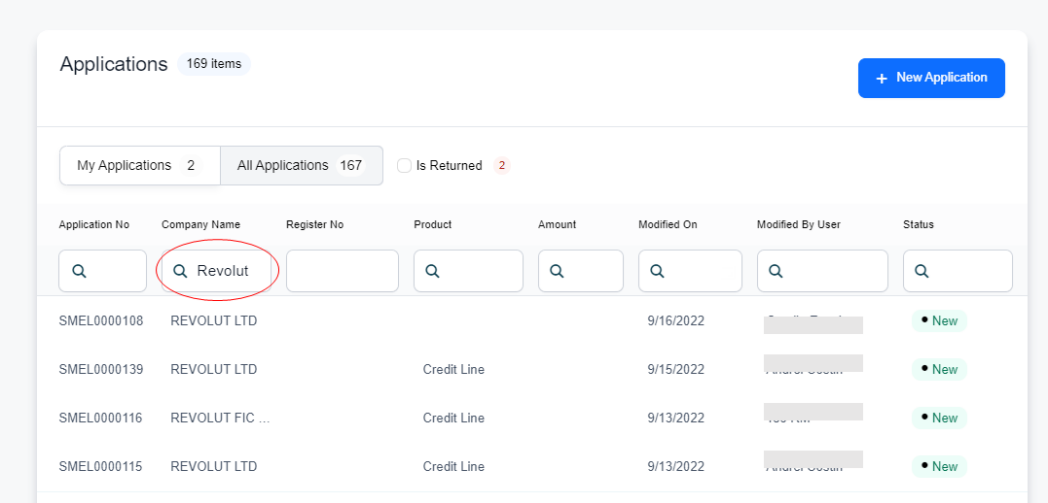

The default sorting is based on the last modification date.

3. Select the **Is returned** checkbox to view the applications that are returned from the Underwriter or Legal Representative.



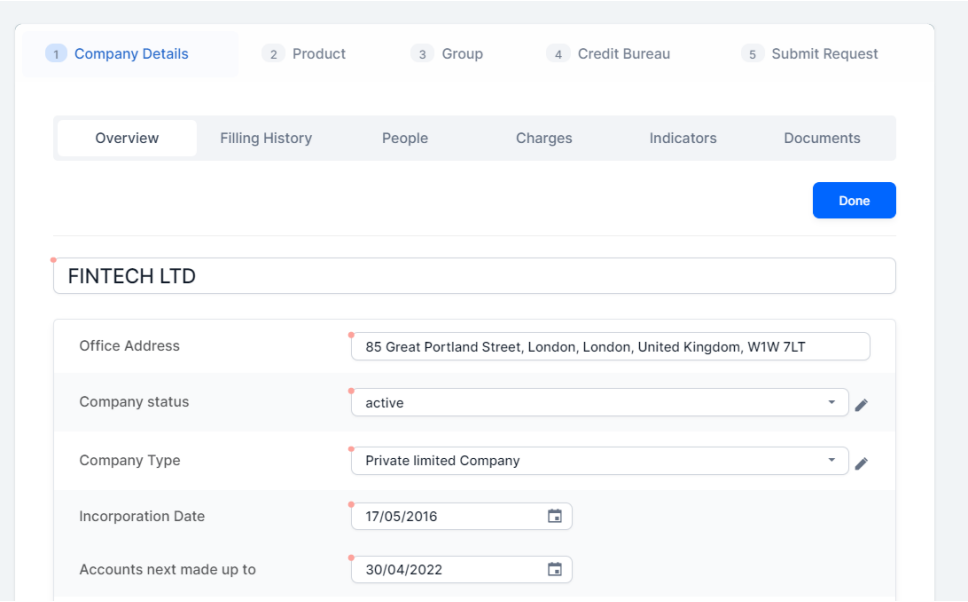

# Filtering Applications

You can filter each column to find the application you are looking for.

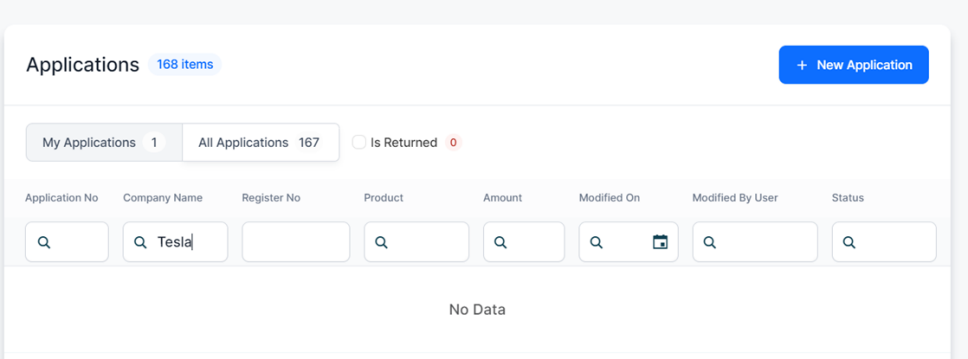



# Opening / Creating Applications

1. After you found the desired application, just double-click it and the **Company Details** tab opens.




2. If you don't have any application created for your customer, click the New application button to create a new application and to navigate to the next screen.



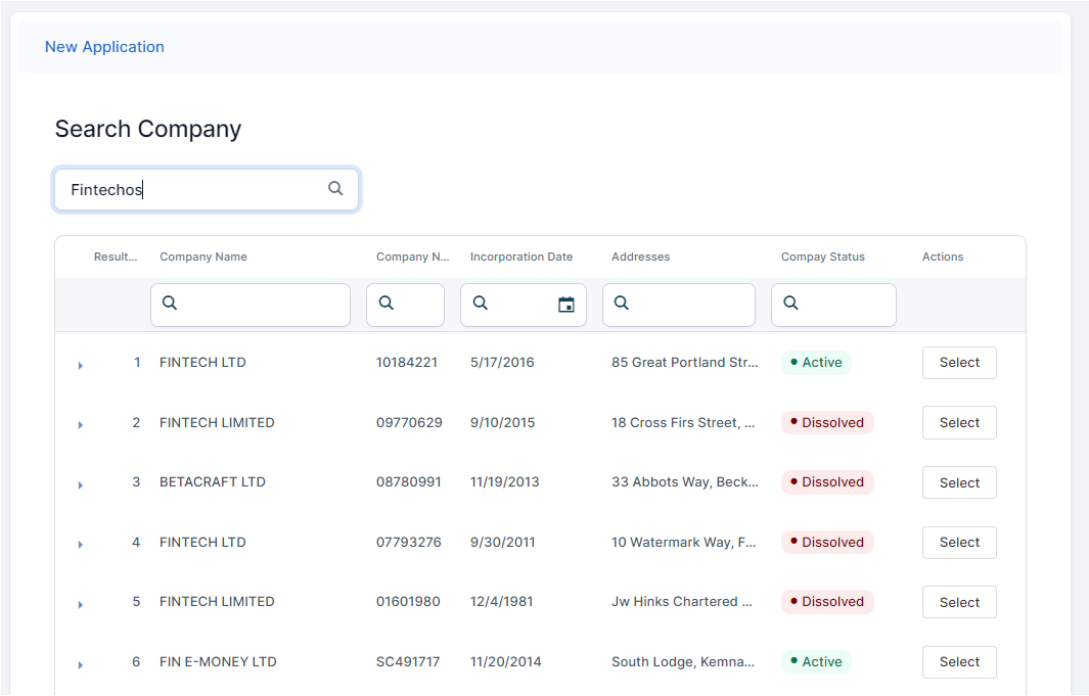

# Managing Applications

When creating a New Application from the **Dashboard**, you can search for an existing company to find the SME company's identification details. The solution uses integrations that bring data from external sources, such as Companies House Connector. This connector queries the Companies House database to find public information about companies and their representatives in the United Kingdom.

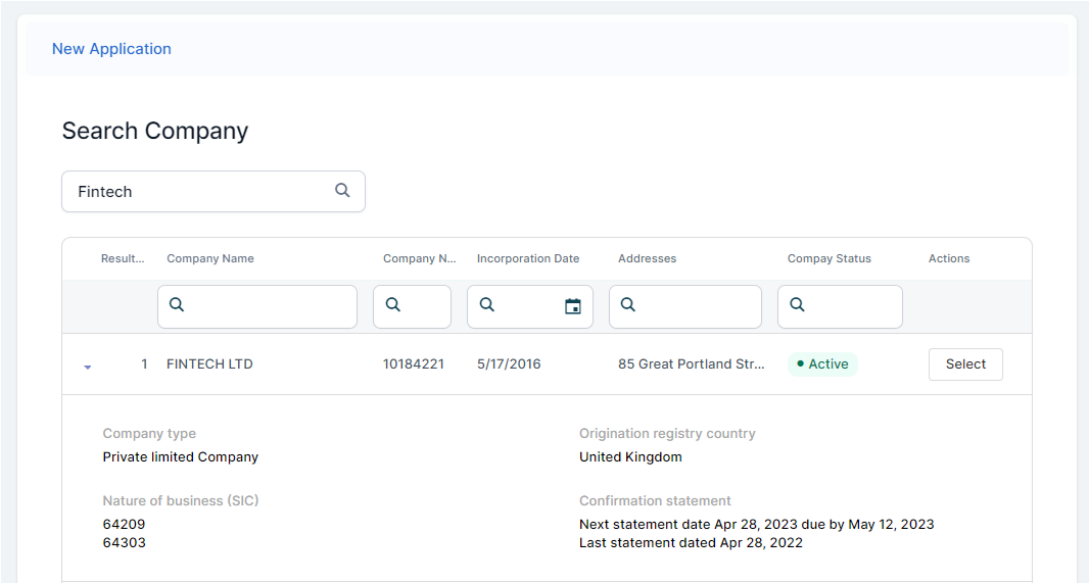
In terms of extensibility, the SME Digital Lending and Underwriting solution can accommodate any other third-party software. Depending on localization, you can use other connectors produced by FintechOS, for example, KeysFin (for the Romanian market) or Dun and Bradstreet (available worldwide).

1. On the **New Application** screen, enter the **company identification number** or **the company name** in the **Search Company** box, to find the company for which you want to start an application. You have to enter a minimum of 5 characters to perform the search.

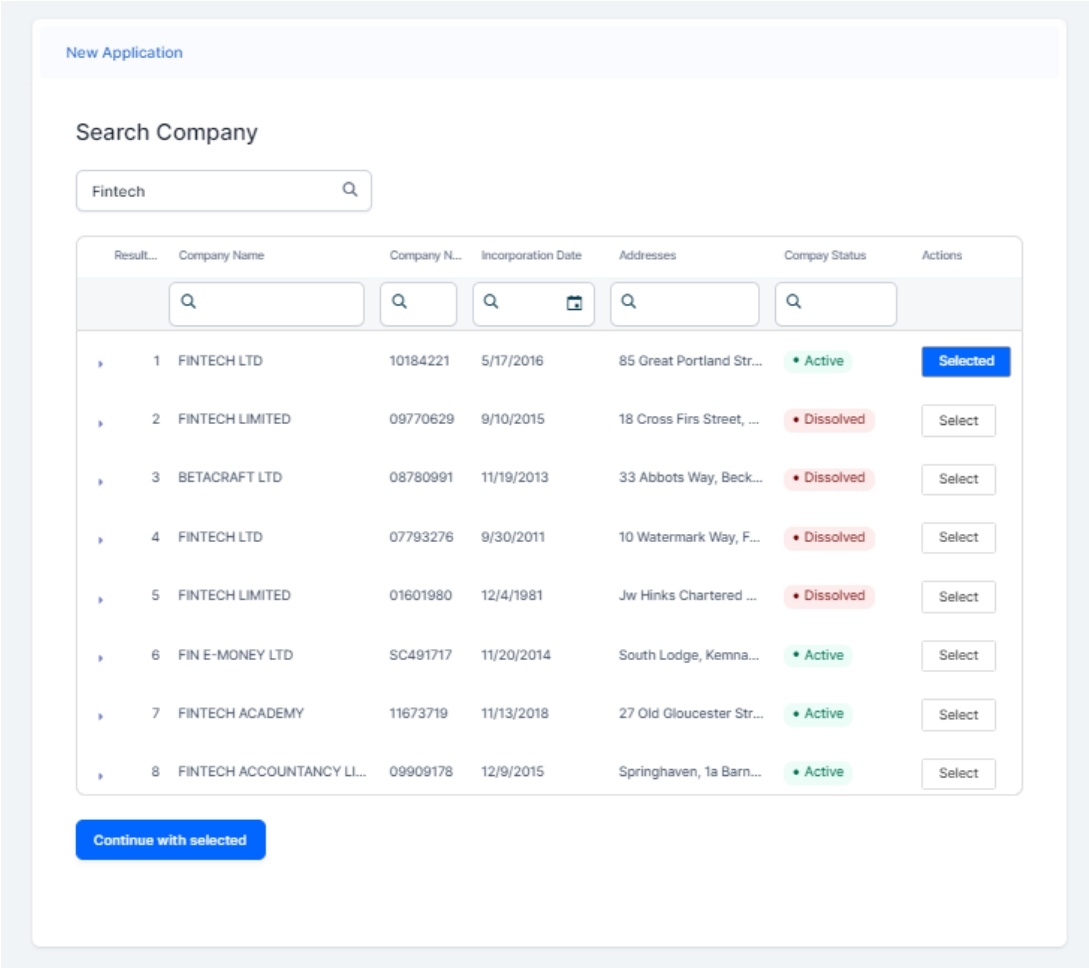
   A list of companies is displayed. For each company, the following details are available: **Result No, Company Name, Company Number, Incorporation date** (the date of creation), **Addresses**(registered office address), and **Company Status.**



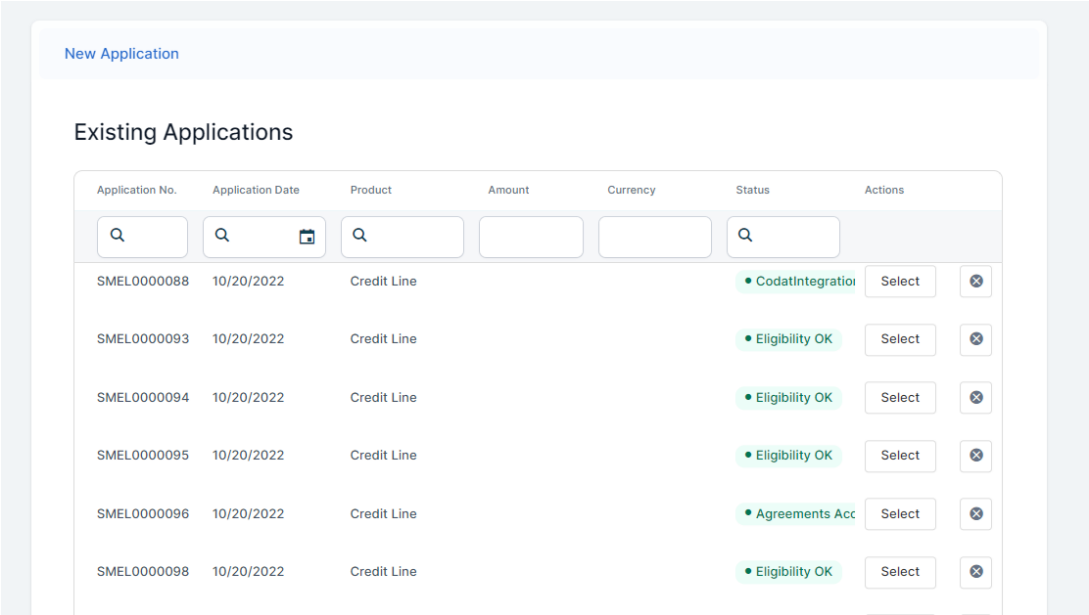

2. Optionally, you can expand the company for which you want to continue the application, and an overview opens with additional company details: **Company type** (the type of the company)**, Origination registry country** (the country in which the company was incorporated)**, Nature of business (SIC)**(the SIC codes for this company), and **Confirmation statement.**



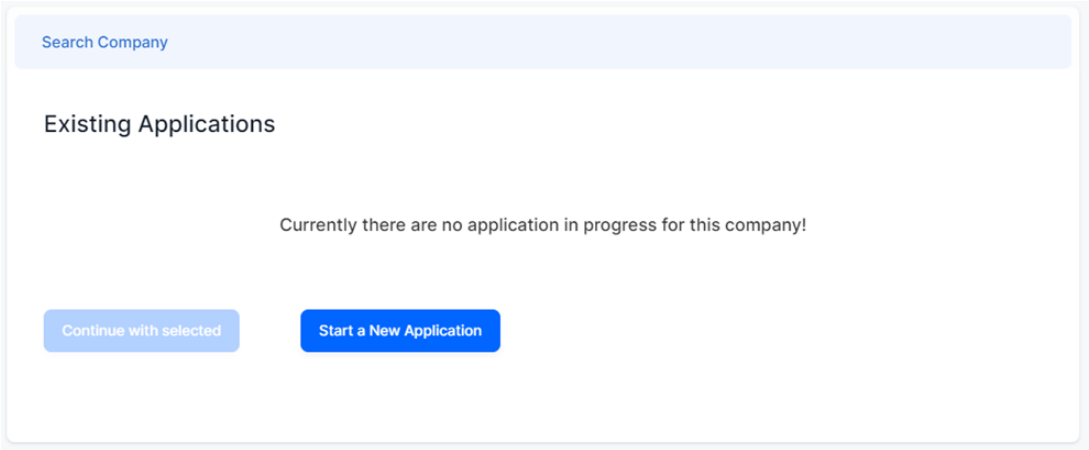

3. Click **Select** to proceed with the company, and then **Continue with selected.**




4. On the newly displayed **Existing Applications** page, you can view all the applications available for the SME customer with the following details: Application Number, Application Date, Product, Amount, Currency, Status, and Actions. Select one of the available applications and click **Continue with selected.**




5. If you didn't find any applications in progress, then click **Start a New Application** to continue.



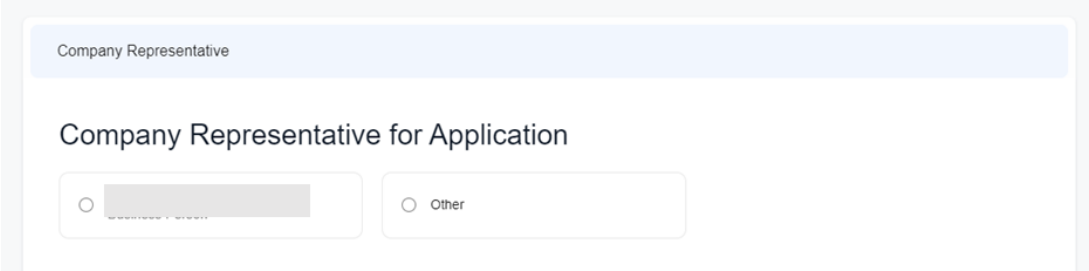

# Adding New Applications

New applications require information about company representatives, business details, eligibility, accounting, and group information, also product setup with collateral if needed. Add the information by following the steps below:

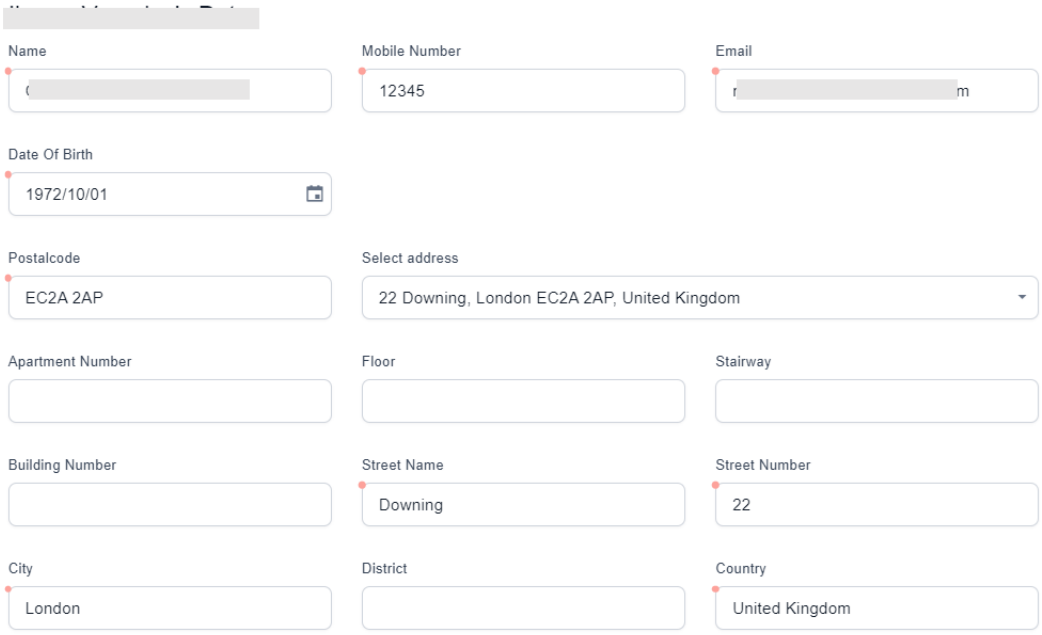
## Adding Company Representatives

The SME Customer Representative needs to provide information about their role within the company.

1. On the **Company Representatives** screen, select the SME Customer Representative name from a list with all the director roles within the company. The list is brought from the integration with the Companies House Connector, which collects publicly available information about all the company associates.



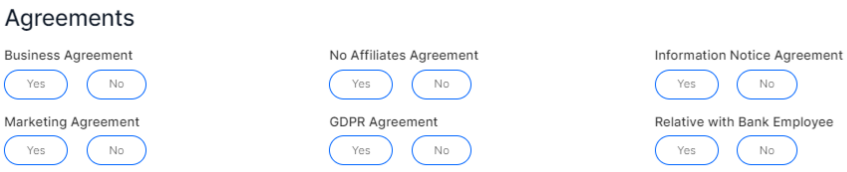

2. If you didn't find the name of the Customer Representative in the displayed list, select **Other**.
3. After selecting the Customer Representative, the details displayed about the customer representative are populated with information from the integration with the Companies House Connector. If needed, enter the missing details about the Customer's representative . All the fields are mandatory, except: **Apartment number, Floor number, Stairways, Building** and **District**.




4. If the address is not automatically added, you can enter the **Postcode**, **Street Name, Street number, City** or **Country**, and a list with all the corresponding addresses is displayed in the **Select Address** field due to the integration with Ideal Postcode.

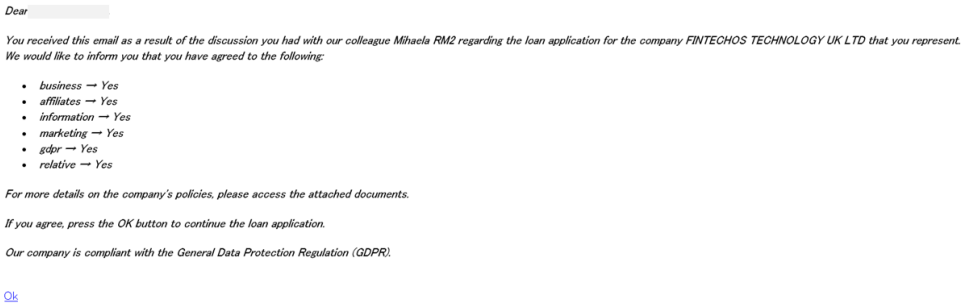
# Obtaining Customer Agreement

1. After you entered all the mandatory information about the Customer Representative, ask the Customer Representative if they agree or disagree with the following:



**IMPORTANT!**
The application process can only continue if the company representative agrees to the **GDPR, Information** and **Business** Agreements.

2. After the agreements were checked, click **Send Email with Agreements** and an e-mail is sent to the **Customer Representative** informing about the consent given in the previous step. In the same e-mail, the Customer Representative finds attached the documents with the details about these agreements: GDPR, Marketing, Relative, Information, Affiliates, and Business Agreements.



*Dear*

*You received this email as a result of the discussion you had with our colleague Mihaela RM2 regarding the loan application for the company FINTECHOS TECHNOLOGY UK LTD that you represent.*
*We would like to inform you that you have agreed to the following:*

- *business → Yes*
- *affiliates → Yes*
- *information → Yes*
- *marketing → Yes*
- *gdpr → Yes*
- *relative → Yes*

*For more details on the company's policies, please access the attached documents.*

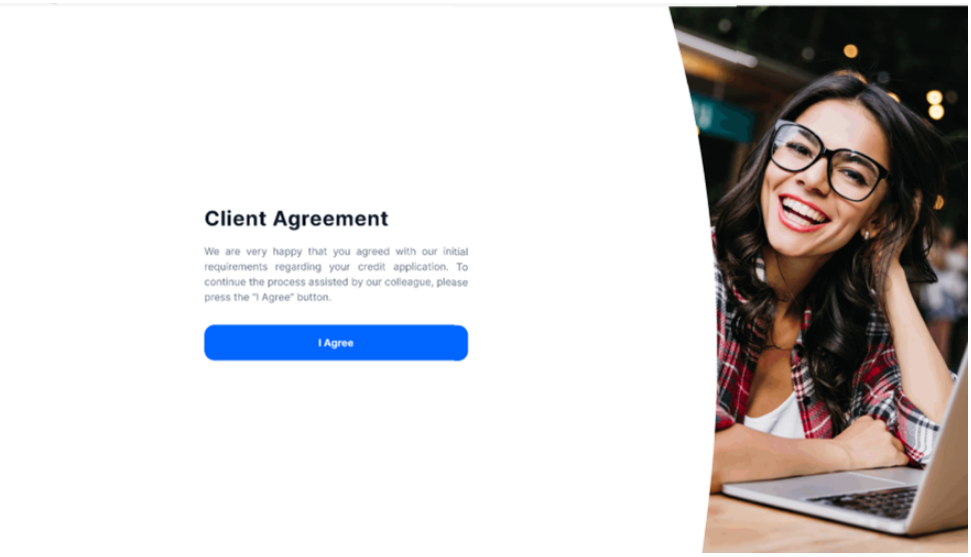
*If you agree, press the OK button to continue the loan application.*

*Our company is compliant with the General Data Protection Regulation (GDPR).*

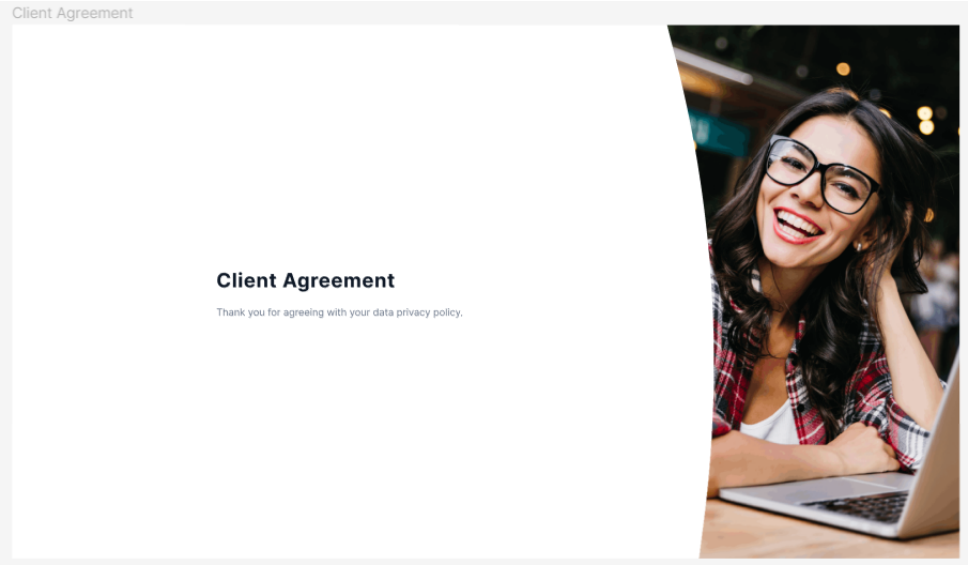
Ok

To continue the assisted application, in the e-mail received, the Customer Representative is informed to click **OK**.

3. Once the Customer Representative clicks **OK**, the **Confirm Agreements** page is displayed, and the Customer Representative has to click **I agree** in order to continue the application.



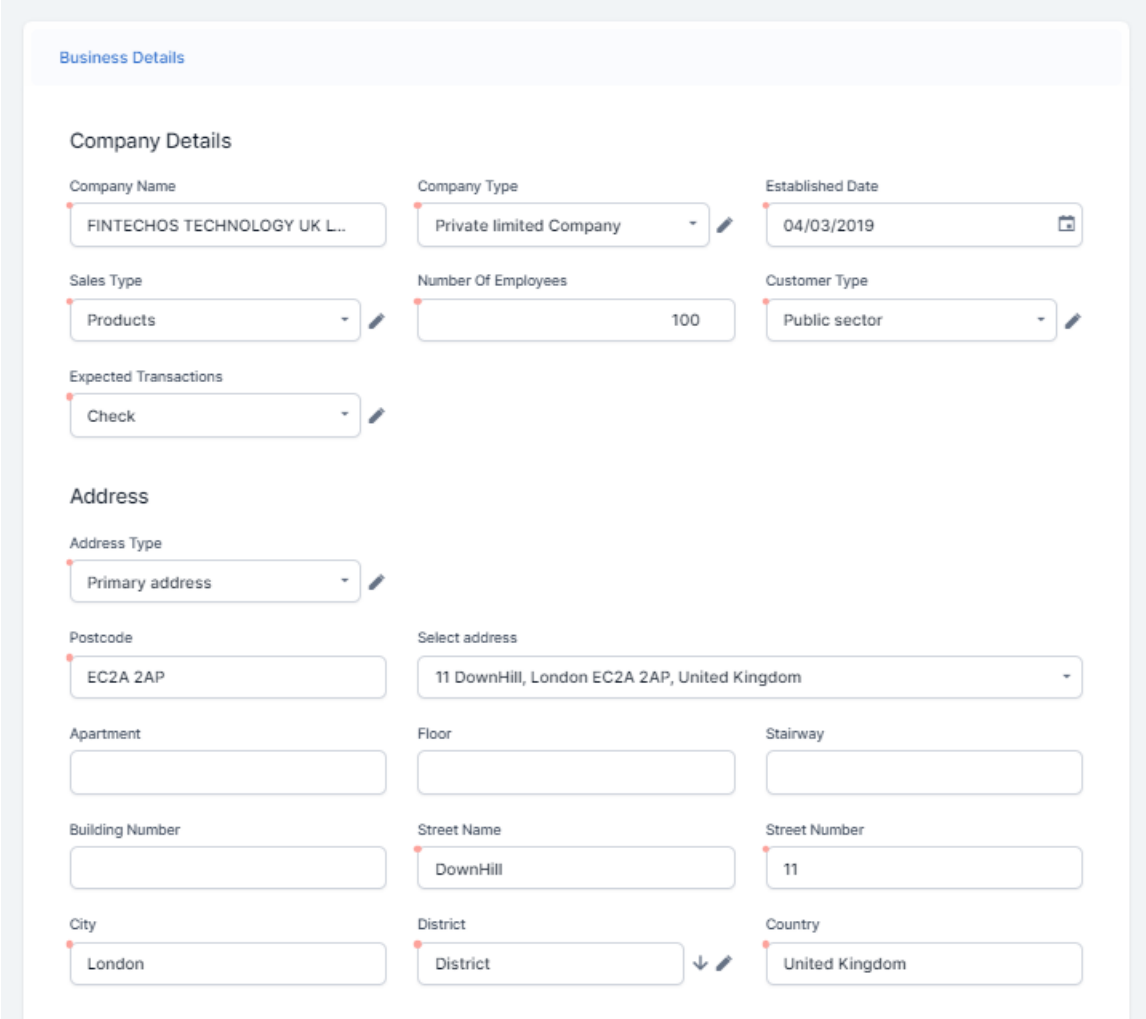

An additional **Client Agreements** page is displayed with a thank you message.




4. You can proceed with the application only after the Customer Representative has clicked **I agree** on the Customer Agreement page. To do so, on the **Company Representatives for Application**, click **Continue**.

## Filling Business Details

Review the company's details displayed on the **Business Details** screen. The fields are auto-completed, and the information is collected through the integration with Companies House (for the Company Details section) and Ideal Postcode (for the Address section).



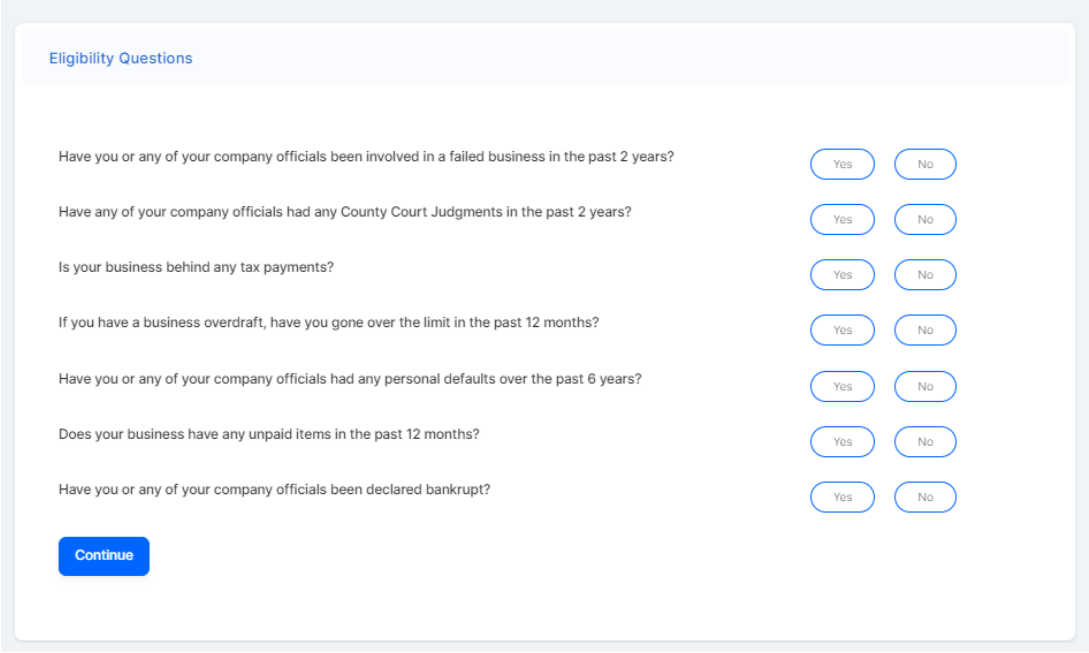

1. In the **Company Details** section, all the fields are mandatory to continue the application: **Business name, Type of company, Established Date** (date of starting a business), **Sales Type, Number of Employees, Customer Type,** and **Expected Transactions.** Fill in the fields where the information is missing.
2. In the Address section, all the fields are mandatory except **Select address, Apartment, Floor, Stairway,** and **Building Number.**

   Fill in the fields where the information is missing. In the **Select address** option, you can find a list of address suggestions based on the **Postcode, City, Street Name, Street Number,** and **Country.**
3. Click **Continue**.

## Determining Eligibility

A set of predefined questions and answers are displayed in this step.

1. To determine if the SME customer is eligible for the credit application, ask the Customer Representative the following questions:

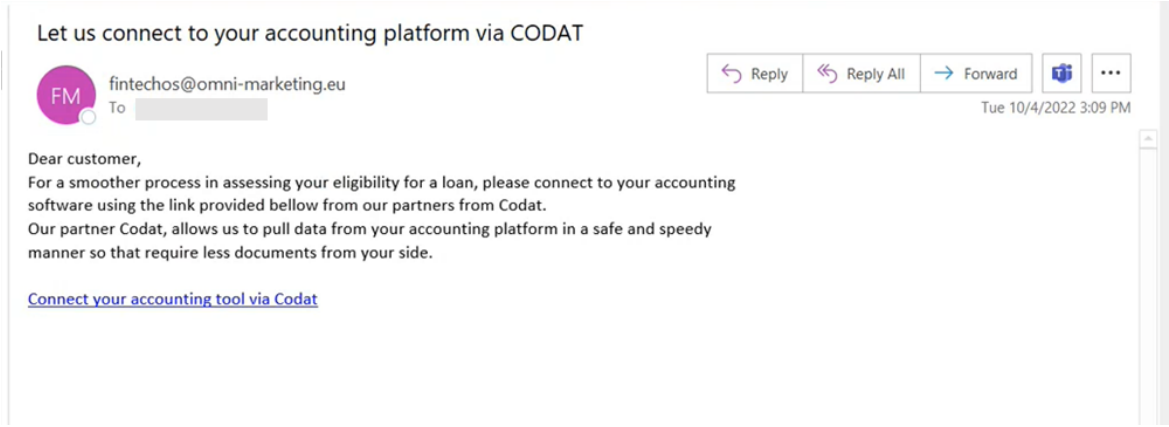



   The application process can continue if the Customer Representative answers **No** to all the questions available in the **Eligibility** step.

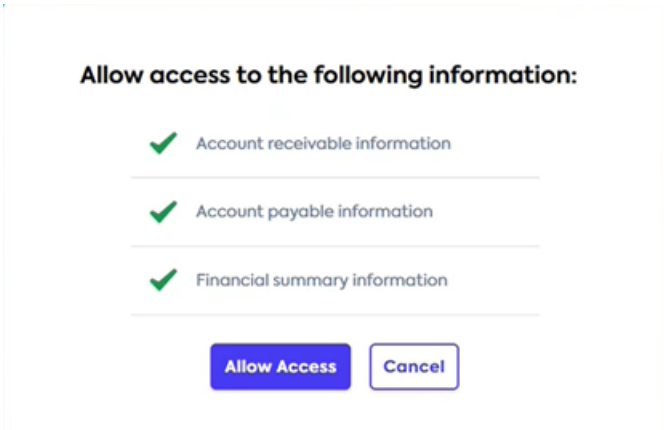
2. Click **Continue.** If the applicant is found eligible, you can continue the application otherwise, you can't navigate to the next step of the application. A message is displayed informing you that the customer hasn't passed the minimum eligibility checks.

## Obtaining Accounting Information

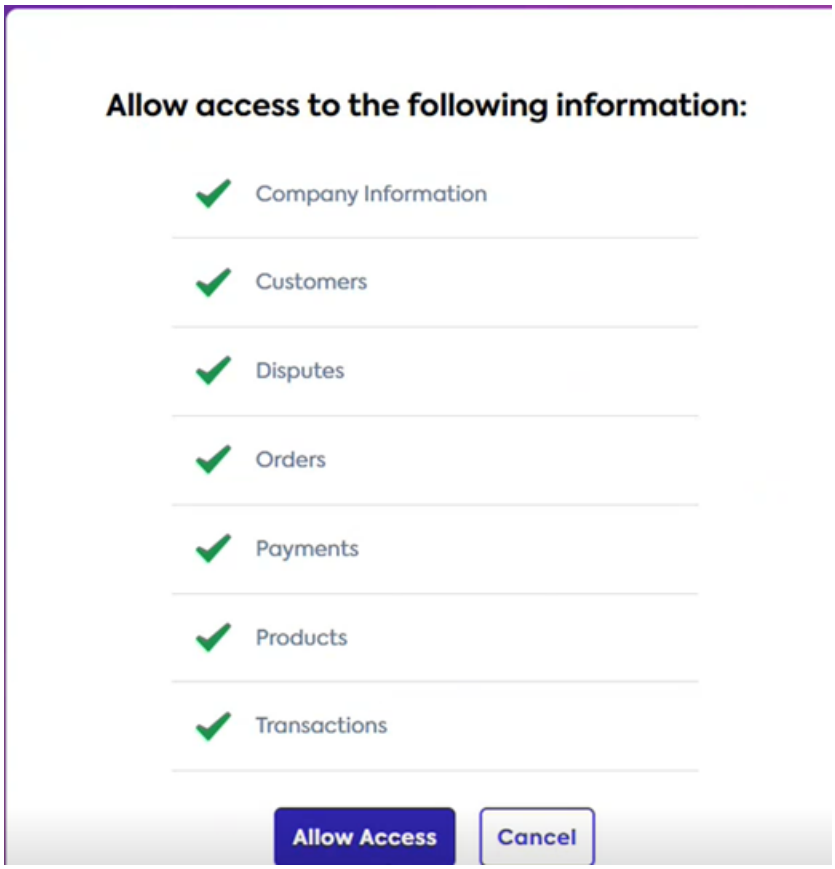
Once the credit application passes the **Eligibility** step, an email is sent to the Customer Representative. To proceed with the application, the Customer Representative needs to provide the bank with permission to pull the accounting information required for the credit application.



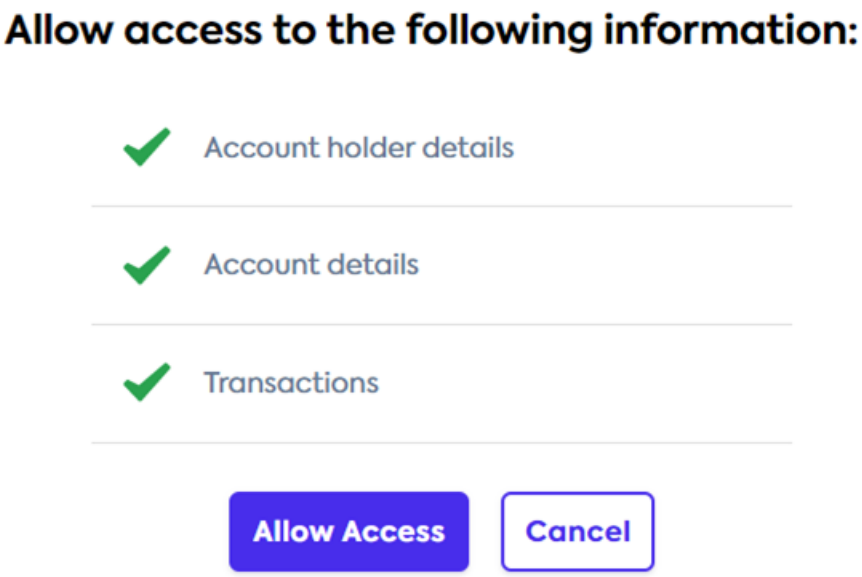

The Customer Representative clicks **Connect your accounting tool via Codat** and is redirected to the Codat portal, where they need to enter their credentials and allow access to their accounts receivable, accounts payable and financial summary information.



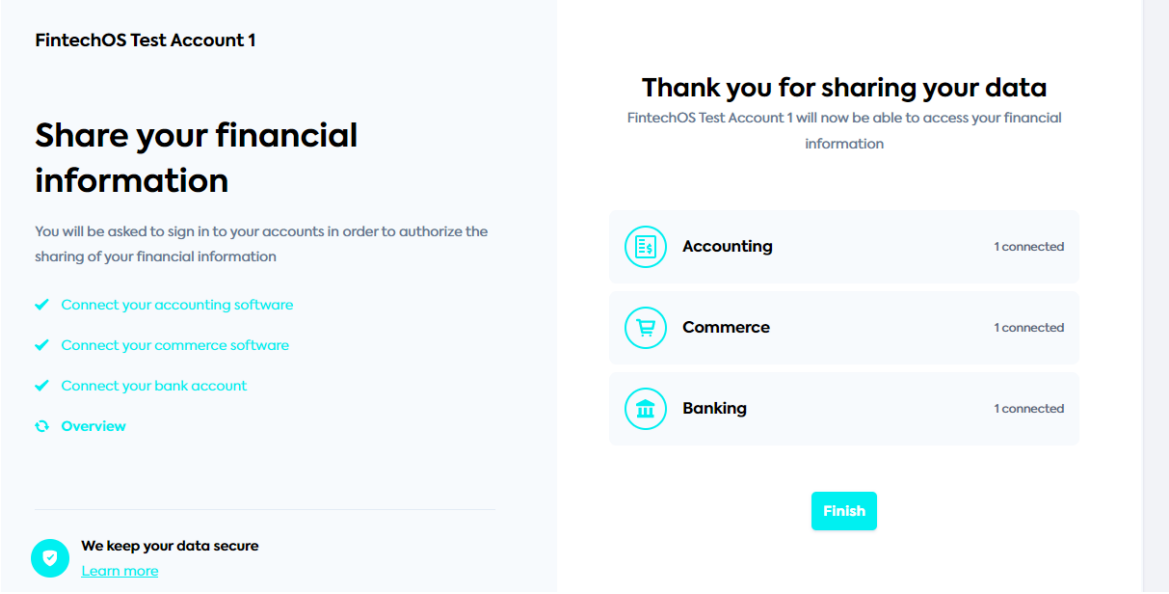

Also, the Customer Representative needs to allow access to the Company Information, Orders & Payments, Products, Disputes & transactions, and Customers.




Optionally, the Customer Representative can allow access to the account holder details, account details, and transactions.




The Customer Representative views all the allowed access on a thank you page and needs to click **Finish**.



After the Customer Representative provides access to the accounting information, on the **Get Integration Data** page, click **Get Accounting Tool** and you are redirected to the Company Details > Overview tab.

# Managing Company's Data Collection

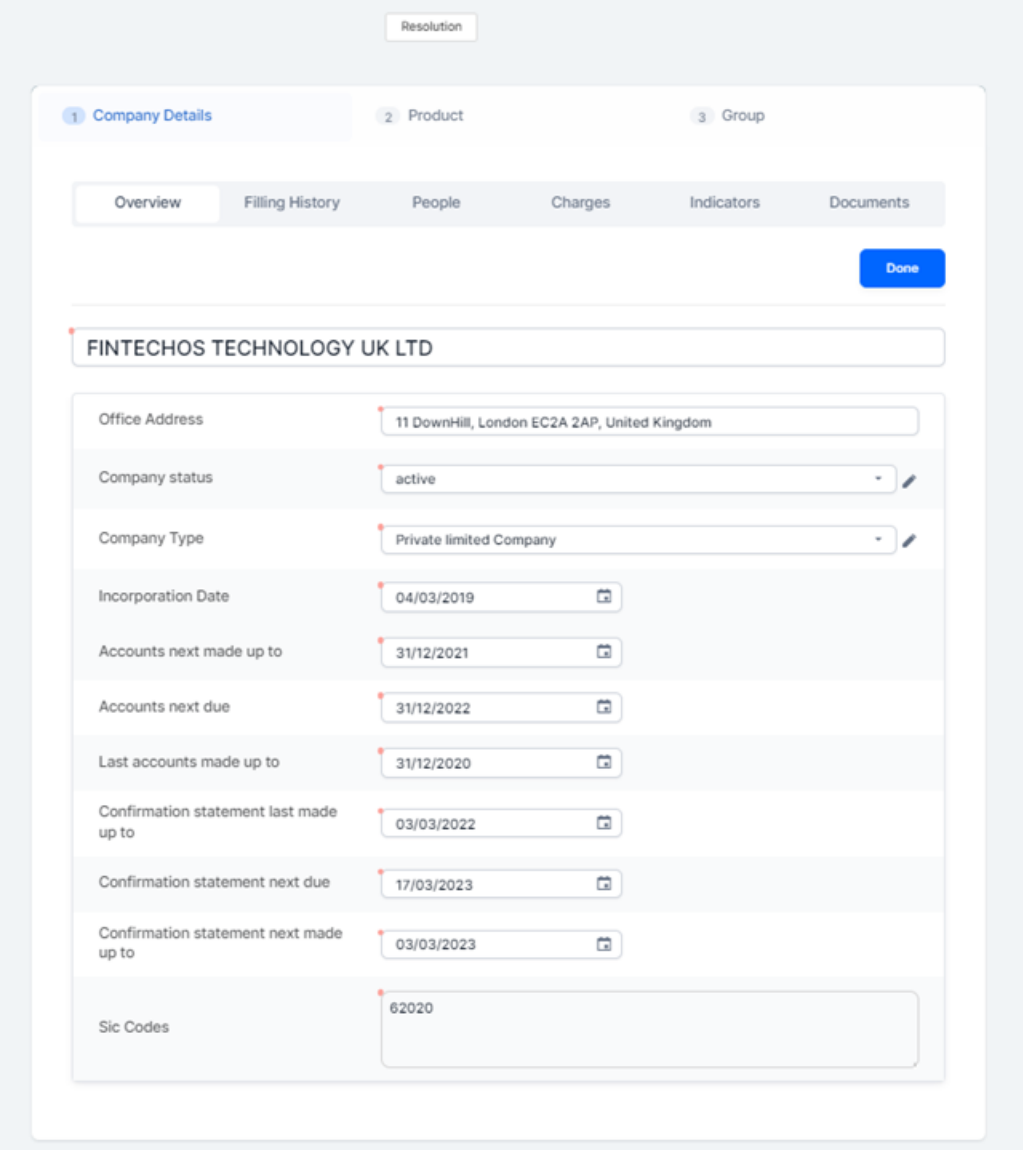
For new or exiting applications, review and verify the company details retrieved from integrations with external sources in order to edit or add the missing data. The company's details are grouped in:

- company documents brought through integrations or added manually
- information about directors and company representatives
- financial and qualitative indicators
- charges
- product configuration
- detailed information about the group from which the company belongs.

## Managing Company's Details

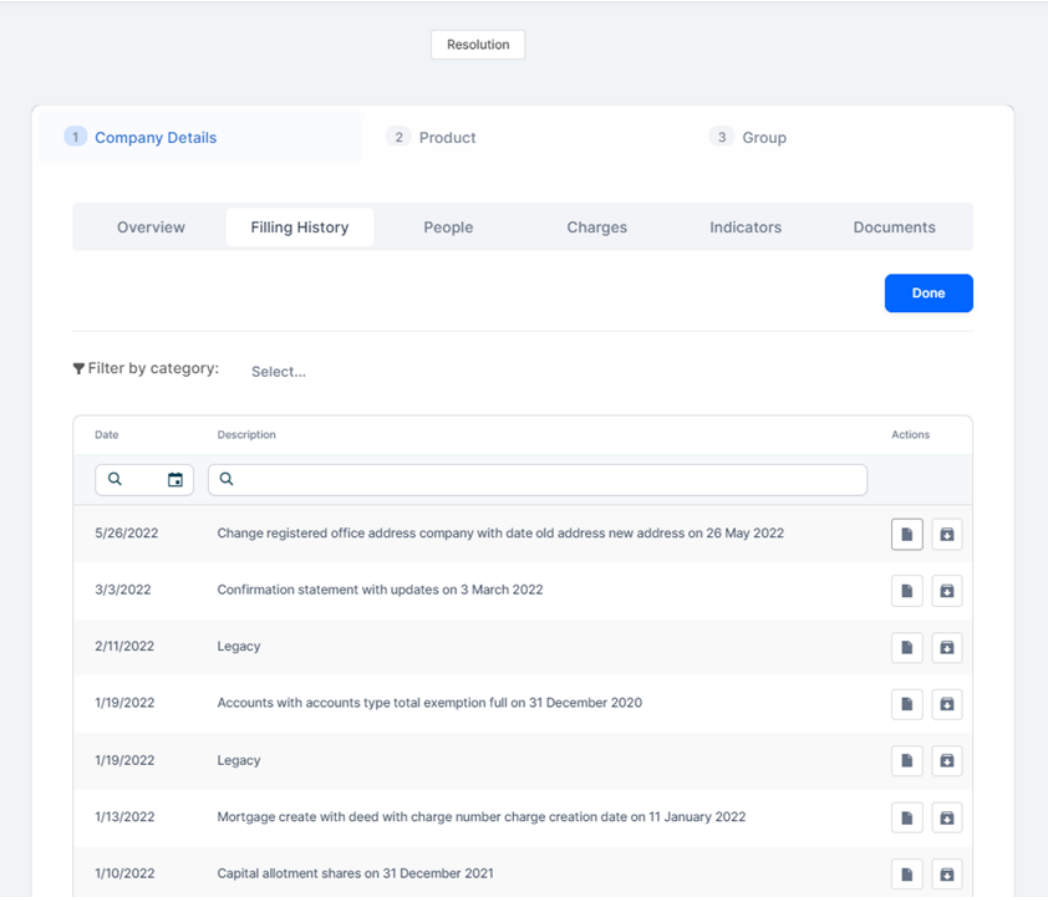
You can see the high-level company details in the **Company Details** > **Overview** tab, such as Office Address, Company status, Company Type, Incorporation Date, Accounts next made up to, Accounts next due, Last accounts made up to, Confirmation statement last made up to, Confirmation statement next due, Confirmation statement next made up to and Sic Codes.

The data is brought from Companies House Connector. Review it to ensure it is correct and fill or edit the missing fields to continue the application, then click **Done.**

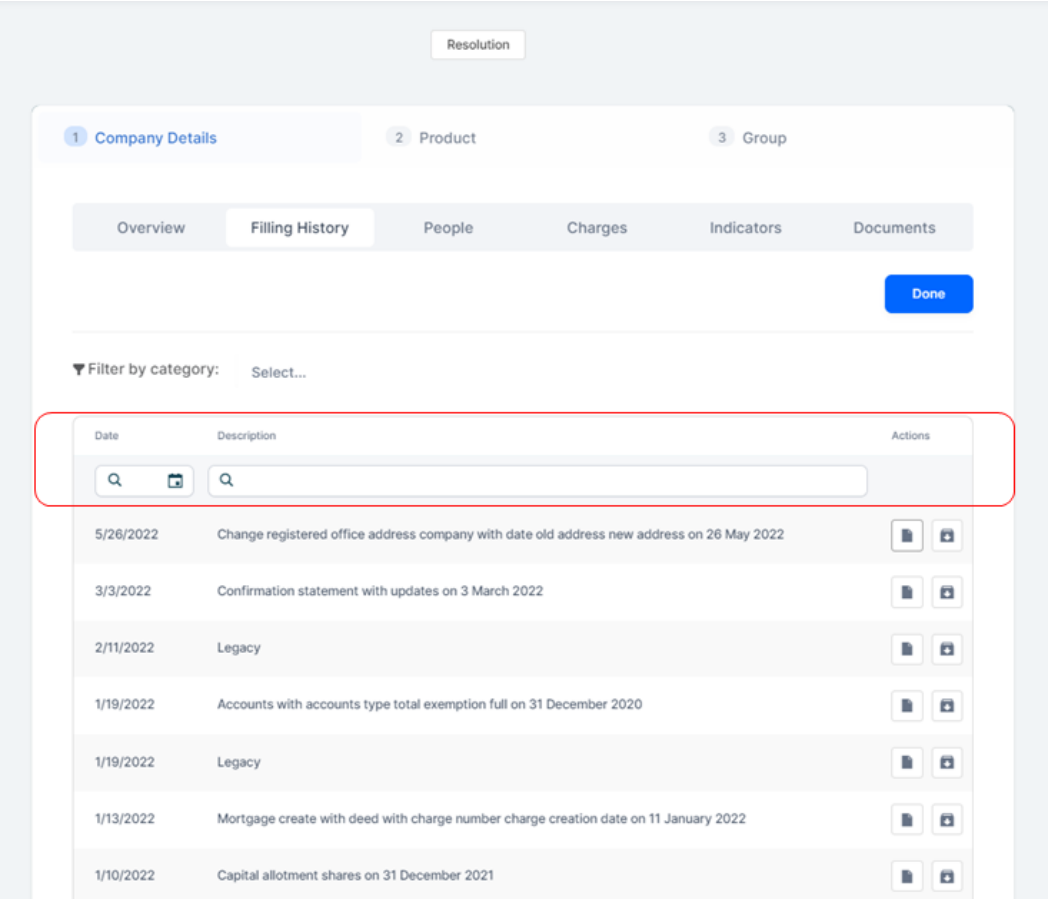



# Checking Filling History

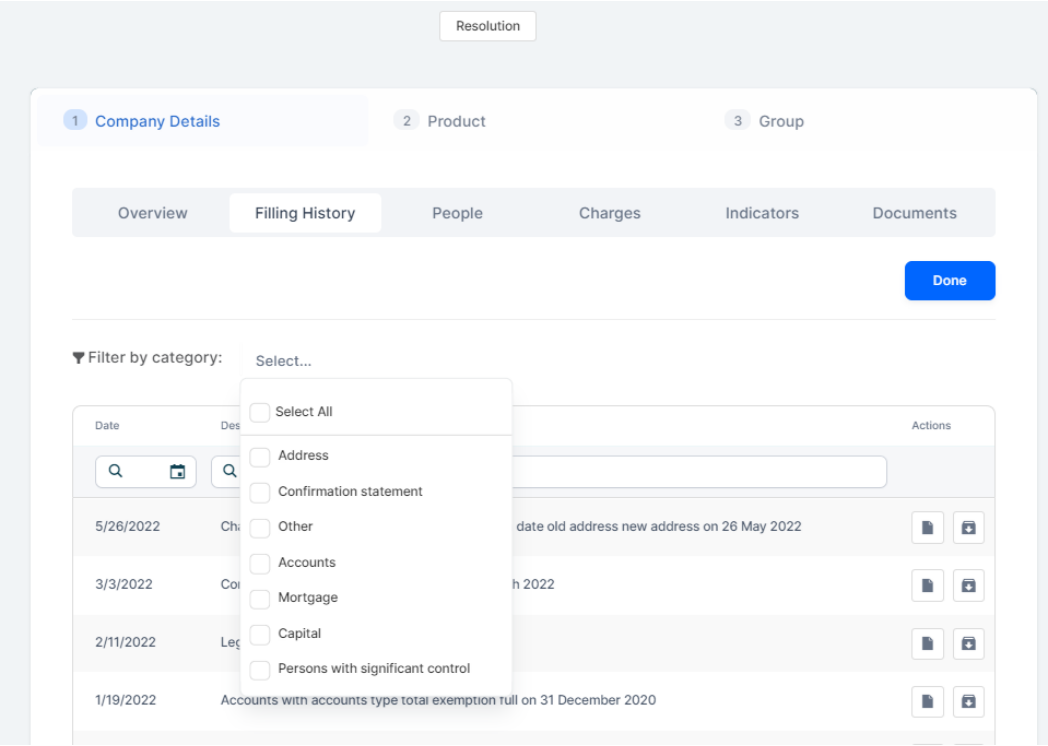
Check the company's documents available in the **Company Details** > **Filling History** tab to ensure that all required documents are provided. The documents are brought from the integration with the Companies House Connector.




Click the view or the download button to see or download the documents. Filter the documents by date (this is the date of sending the document) or by description (this is a description of the document).




Or, sort the documents displayed using the **Filter by category** option.

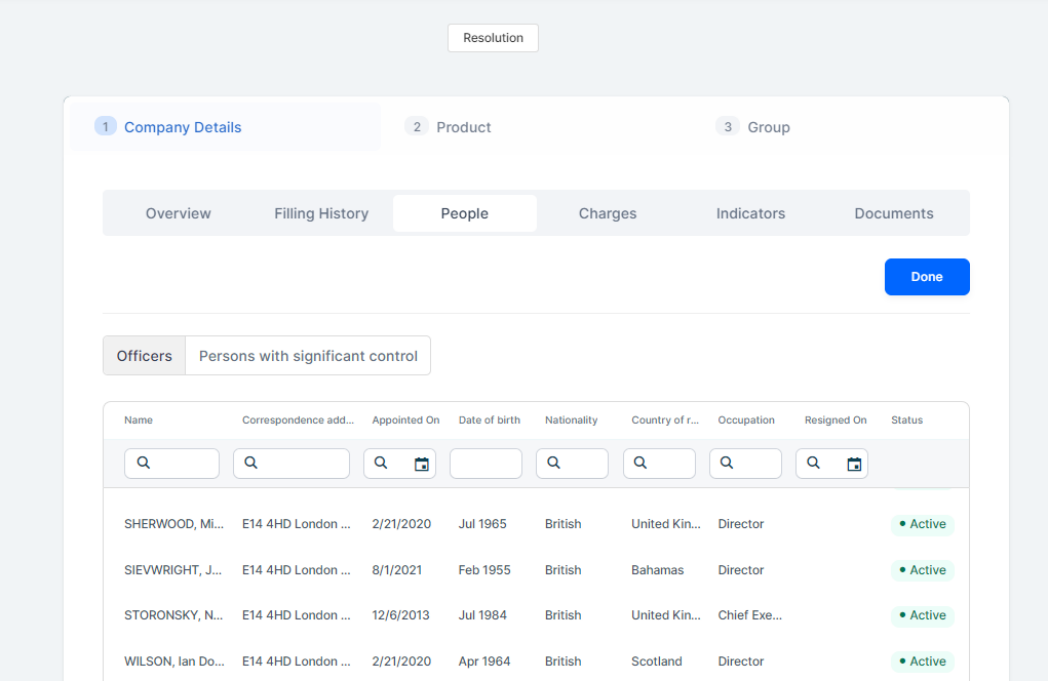



The filter options are those categories available in the API response specific to the selected company.

After checking the filling history, click **Done.**

# Viewing People

On the **Company Details** > **People** tab, click the available sections to view the **Officers** and the **Persons with significant control** who have a connection with the company that applies for the credit facility. The data is brought from the integration with the Companies House Connector.

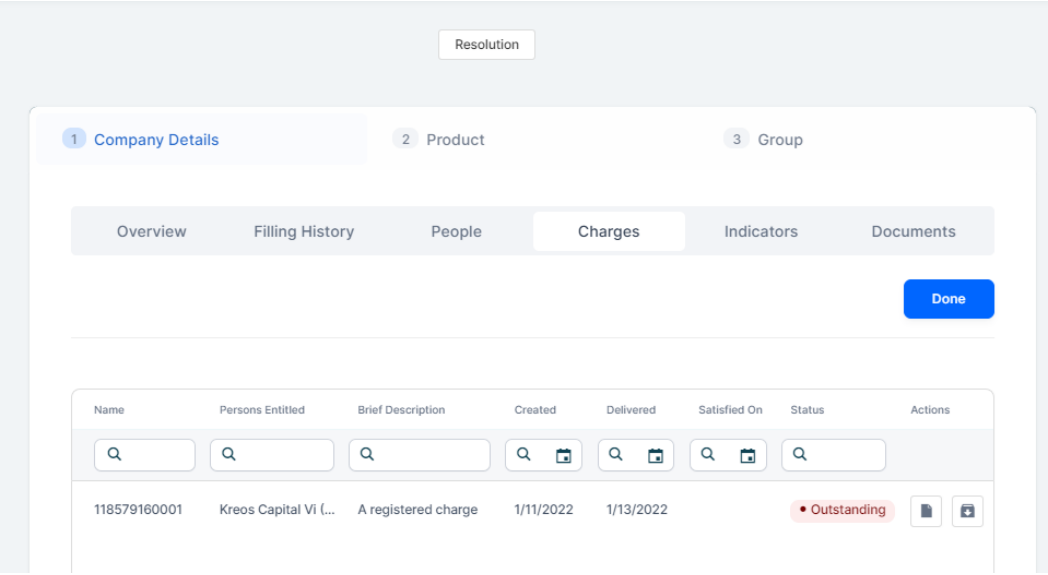



The following details are displayed: Name, Correspondence address (it consists of postal code, locality, addresses and premises), Appointed on, Date of birth, Nationality, Country of residence, Occupation (this column is displayed only in the Officers tab), Type (this column is displayed only in the **Persons with significant control** tab), Status (Active or Resigned for Officers and Active or Ceased for persons with significant control in the company), Resigned On (this column is displayed only in the **Officers** tab) and Ceased On (column displayed only in the **Persons with significant control** tab).

After you review and verify all this information that is important in the underwriting stage, click **Done.**

# Viewing Charges

Details about the SME's applicant charges are displayed in the **Company Details** > **Charges** tab: Name, Person Entitled, Brief description, Created, Delivered, Satisfied On and Status (the charge status). The charges are brought from the integration with the Companies House Connector.




You can view or download the pdf documents for each charge.

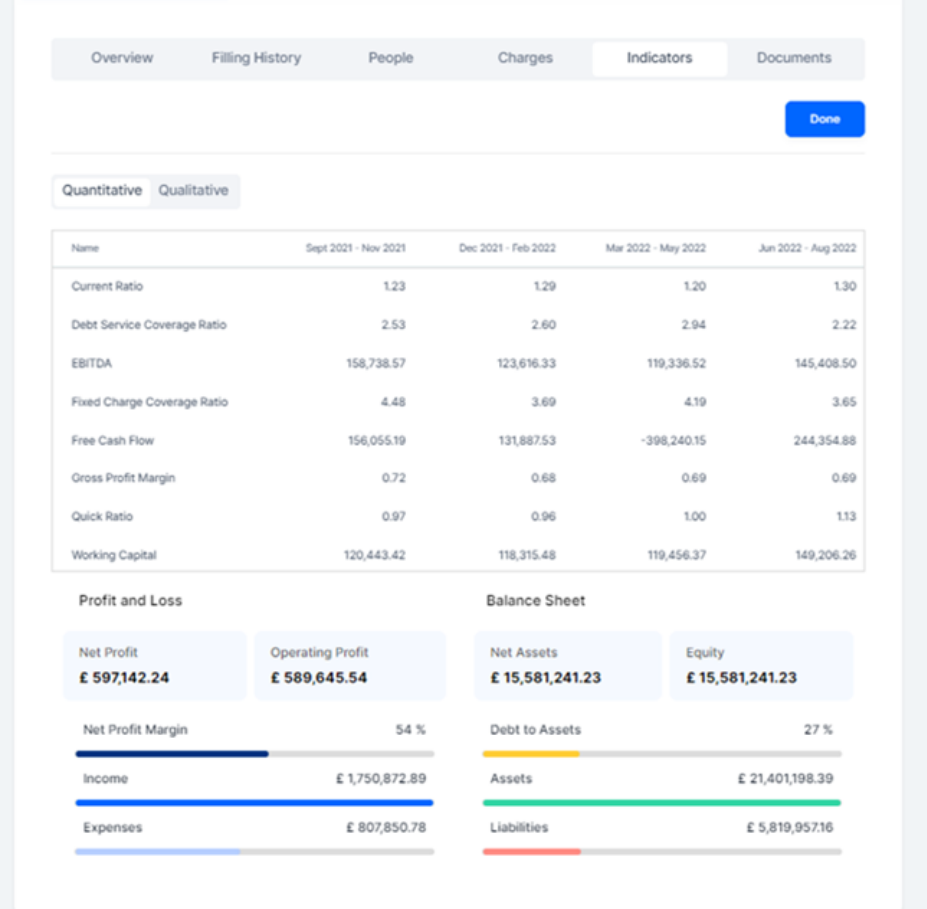
> **NOTE**
> Every charge has one or two documents attached. When you click the view or the download button, the most recent document is displayed or downloaded.

Also, you can filter every column to find easily the charge you are searching for.

After viewing the details about the SME's applicant charges, click **Done.**

# Managing Indicators

## Check Quantitative Indicators




A set of pre-calculated ratios and metrics used to assess the company's performance are displayed in the **Company Details > Indicators > Quantitative** tab. Review the company's financial indicators to ensure that the SME applicant is suitable for the credit line. The information is displayed from the integration with Codat.

1. Check the following indicators displayed in 4 columns and see the formula used to calculate each category (hover over the indicators, and a tooltip appears).

Quantitative | Qualitative

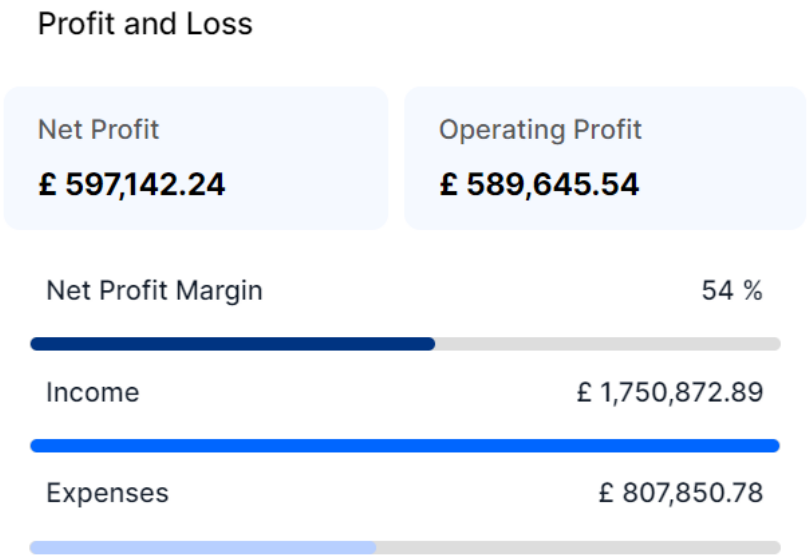
| Name | Sept 2021 - Nov 2021 | Dec 2021 - Feb 2022 | Mar 2022 - May 2022 | Jun 2022 - Aug 2022 |
|---|---|---|---|---|
| Current Ratio | 1.23 | 1.29 | 1.20 | 1.30 |
| Debt Service Coverage Ratio | 2.53 | 2.60 | 2.94 | 2.22 |
| EBITDA | 158,738.57 | 123,616.33 | 119,336.52 | 145,408.50 |
| Fixed Charge Coverage Ratio | 4.48 | 3.69 | 4.19 | 3.65 |
| Free Cash Flow | 156,055.19 | 131,887.53 | -398,240.15 | 244,354.88 |
| Gross Profit Margin | 0.72 | 0.68 | 0.69 | 0.69 |
| Quick Ratio | 0.97 | 0.96 | 1.00 | 1.13 |
| Working Capital | 120,443.42 | 118,315.48 | 119,456.37 | 149,206.26 |

- **Gross Profit Margin**: Gross Profit / Net Sales.
- **EBITDA**: Net Income + Interest + Tax + Depreciation + Amortization.
- **Debt Service coverage ratio**: Net Operating Income/Total Debt Service. Where the Total Debt Service = Loan Interest + Principal.
- **Current Ratio**: Current Assets / Current Liabilities.
- **Quick Ratio**: (Current Assets - Inventory – Prepaid Expenses) / Current Liabilities.
- **Free Cash Flow:** Net Income + Depreciation and Amortization (non-cash expense) - Working Capital Variation - Purchases of PP&E (CAPEX). Where the Working Capital Variation = Stock + Account Receivable (trade and others) – Account Payables (trade and others).
- **Working Capital Variation:** Stock + Account Receivable (trade and others) – Account Payables (trade and others).
- **Working Capital:** Current Assets – Current Liabilities.

- **Fixed Service Coverage Charge:** (EBIT + Fixed charge before tax) / (Fixed charge before tax + Interest).

2. Check the **Profit and Loss** section containing details about the **Net Profit, Operating Profit**, **Net Profit Margin**, **Income**, and **Expenses** of the company.

   The formula used to calculate the **Net Profit Margin** indicator is the `(Income-Expenses)/Income`, shown in percentages.

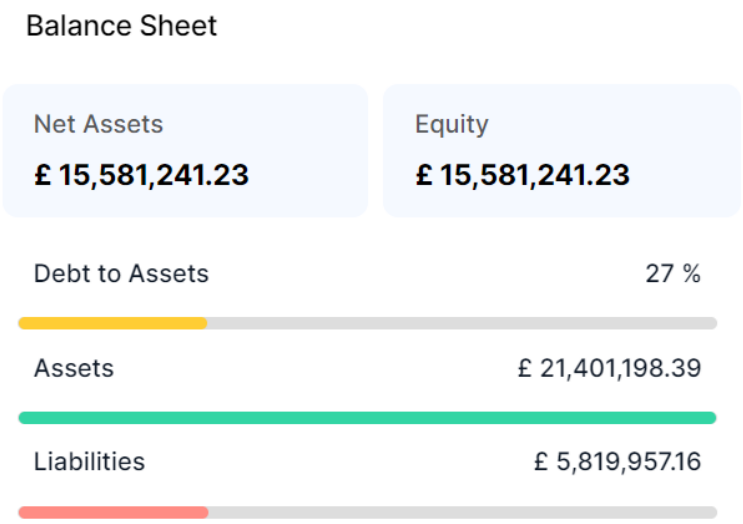



   The longest line will correspond to the maximum (Income or Expenses), it could be Income or Expenses the maximum amount.

   The second line will be represented as a percentage calculated as follows: `min value/max value * longest line.`

3. View the **Balance Sheet** section containing details about **Net assets, Equity**, **Debt to Assets, Assets,** and **Liabilities**.

   The formula used to calculate the **Debt to Assets** indicator is `Liabilities/Assets,` shown in percentages.

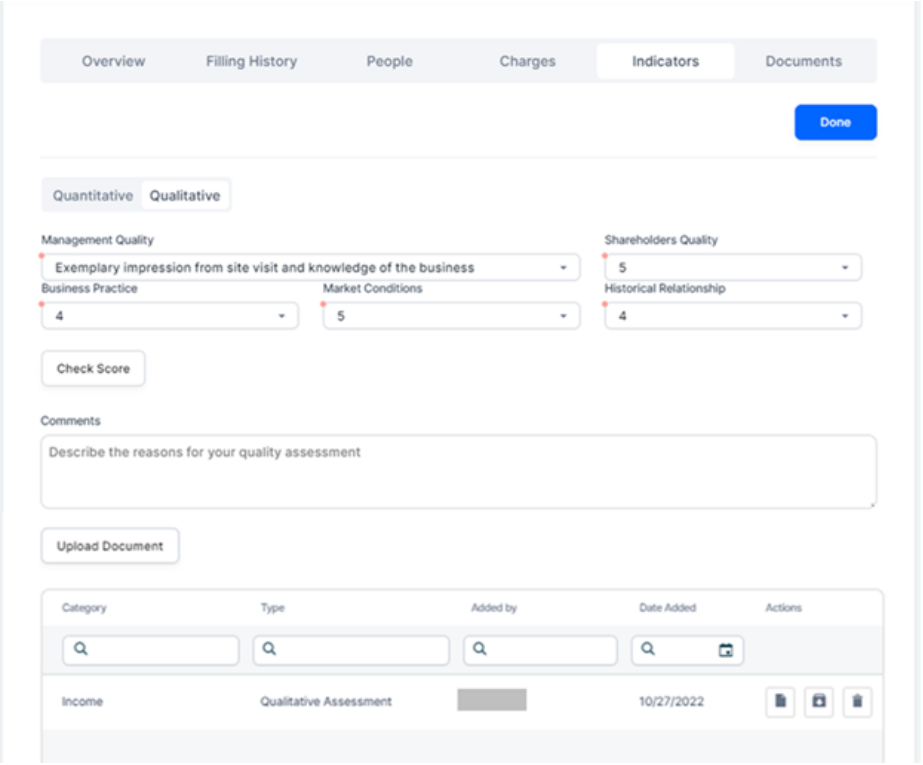



The longest line will correspond to the maximum (Assets, Liabilities), it could be Assets or Liabilities the maximum amount.

The second line will be represented as a percentage calculated as follows: `min value/max value * longest line`.

4. Click **Done.**

# Set Qualitative Indicators




Collect information about the quality indicators of the company applying for the credit facility and check whether or not you can submit the application.

1. In the **Qualitative indicators** tab, select a rate for the **Management quality.** The following values are possible:
    - Exemplary impression from site visit and knowledge of the business.
    - Exemplary presentation with strong knowledge of the business.
    - Good impression from the site visit sufficient knowledge of the business.
    - Sufficient impression from the site visit and sufficient knowledge of the business in a key area.

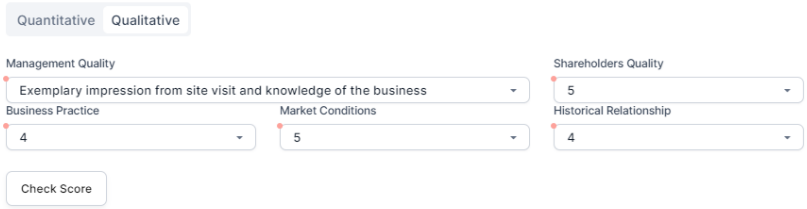
- Insufficient knowledge of the business in several key areas.

2. Select a rate for the **Shareholders quality, Business practice, Market conditions,** and **Historical relationship**.

   The possible values are: **5, 4, 3, 2** or **1.** Below you can see an explanation for each rate:

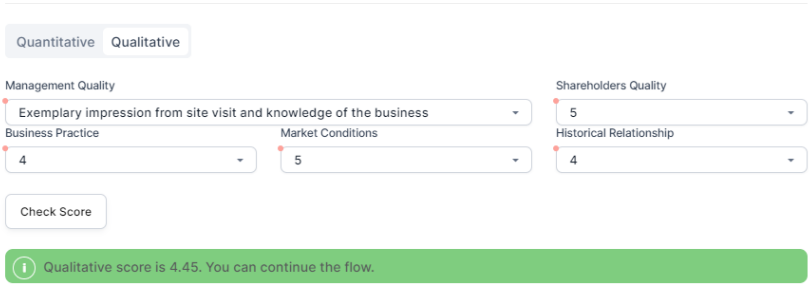
   - **5:** exemplary impression from site visit and knowledge of the business.
   - **4:** exemplary presentation with strong knowledge of the business.
   - **3:** good impression from the site visit sufficient knowledge of the business.
   - **2:** sufficient impression from the site visit and sufficient knowledge of the business in a key area.
   - **1:** insufficient knowledge of the business in several key areas.

3. Click **Check Score** to see the qualitative score corresponding to the configured indicators.

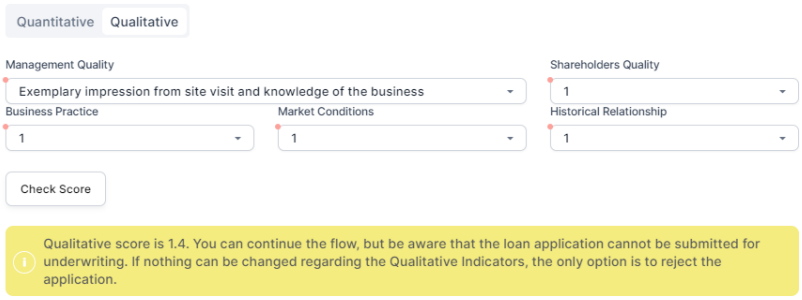



After checking the score, a message is displayed informing you about the quality score and whether or not you can apply the Resolution step.

If the quality score >=3, then a message is displayed informing you about the calculated score and that you can continue the flow. See an example below:




If the quality score <3, then a message is displayed informing you that you can continue the flow, but the loan application can't be submitted. See an example below:

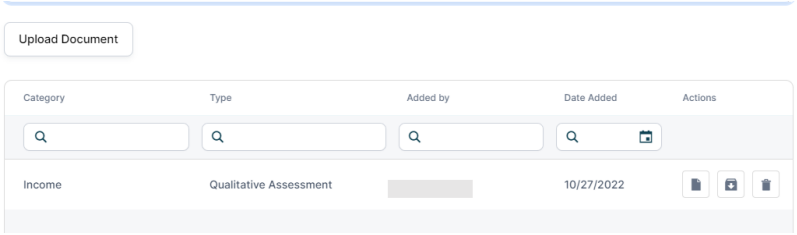



> **NOTE**
> The calculated qualitative score is used when you submit the application for the SME customer. If the qualitative score is <3 then you can't submitt the loan application.

4. Add a comment in the **Reasons for the Quality Management** box to justify the rates for the **Management quality, Shareholders quality, Business practice, Market conditions,** and **Historical relationship**.
5. Optionally, click **Upload Document** to add a document as an additional argument for the decision.

6. In the displayed side bar, select the category and the type of the document you want to upload.
7. Click **Add file** to upload the file, or drag and drop it into the **Upload Document** section, then click **Save**.

   The document is added to the list, and you can see the following details:



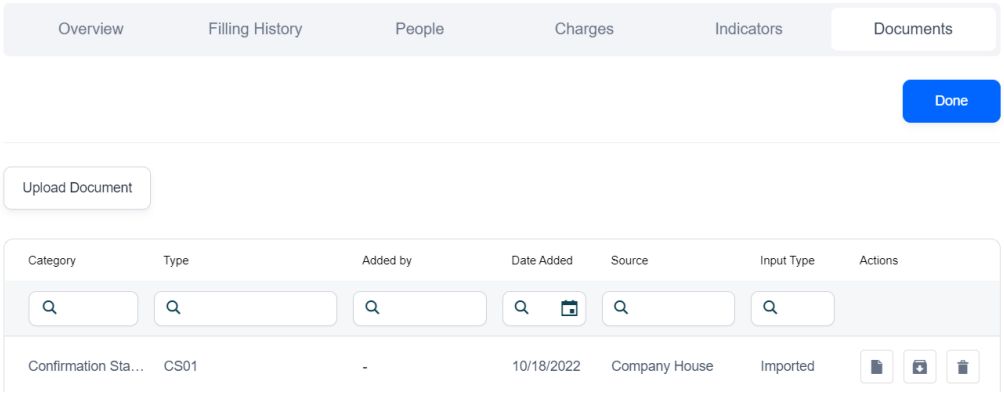

   Also you can view, download or delete the document.

> **NOTE**
> Although different types of documents can be added in this screen, only those of the **Qualitative assessment** type can be viewed.
>
> The uploaded documents are also available in the **Documents** tab.

8. Click **Done.**

# Managing Documents

The documents provided by the applicant or brought automatically from other external sources (Companies House and Codat) are stored in the **Documents** tab.




The following details are displayed for each document:

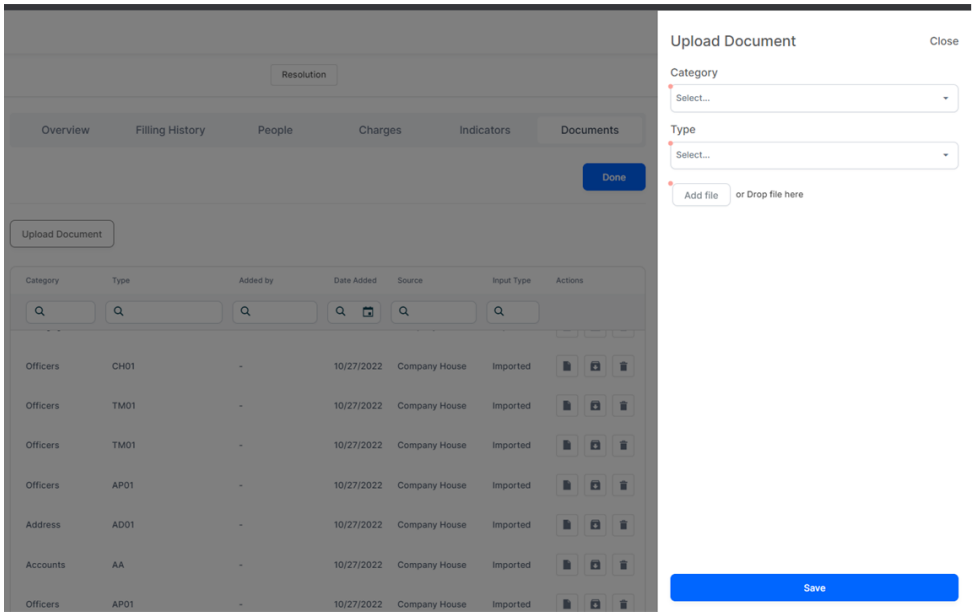
- **Category:** This is the category selected when the document was uploaded, or the category set by the source system if the file was imported. E.g., Companies House source or Codat.
- **Type:** This is the type selected when the document was uploaded, or the type set by the source system if the file was imported. E.g., Companies House source.
- **Added by:** This is populated only if the document is added manually.
- **Date Added:** This is filled with the date the integration was triggered (for imported documents) or the date the document was added manually.
- **Source:** This is populated with the name of the external sources if the file is added automatically, or with the Flow value if the document is added manually.
- **Input Type:** Manually or Imported.

You can view, download, delete or add new documents to ensure the customer has provided all the necessary documents regarding the credit application since missing documents are one of the main reasons for the rejection of a credit application.

Also, you can filter every column to find easily the document you are searching for.

To add a new document, follow the steps below:

1. Click the **Upload Document** and a side bar opens.

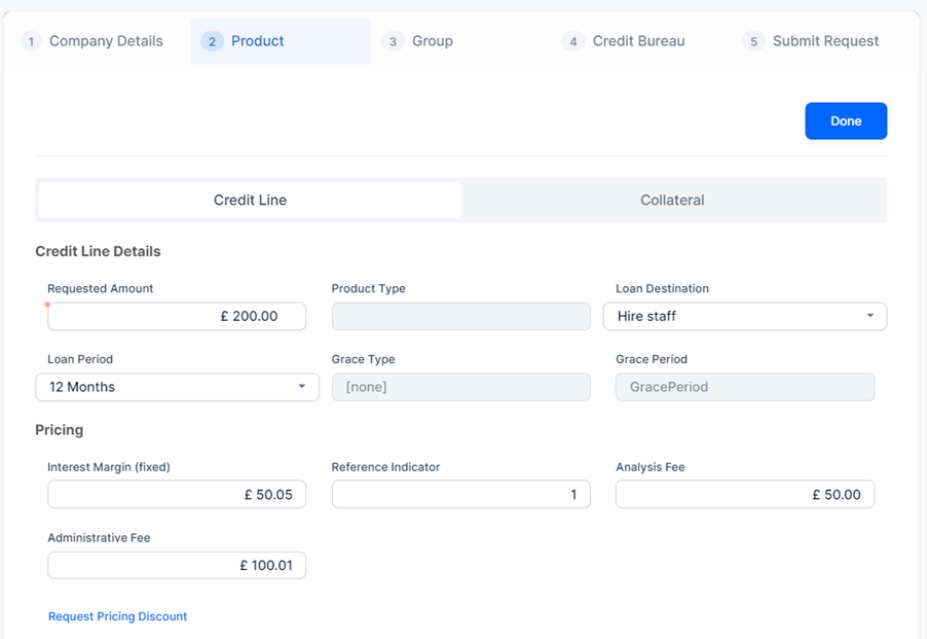



2. On the sidebar page, select the category and the type of document you want to upload.
3. Click **Add file** to upload the files, or drag and drop them into the **Upload Document** section.
4. Click **Save** and the documents are added in the **Documents** tab list.
5. Click **Done.**

# Adding Product Details

Configure the characteristics of the credit line and add or remove details about the guarantees brought by the customer in the following tabs:

## Configure Credit Line

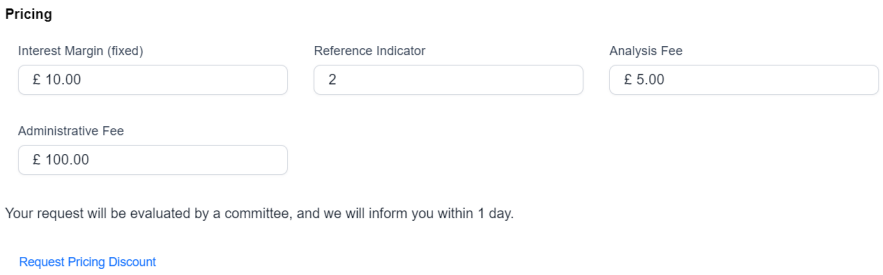



1. Set information about the credit line in the **Credit Line Details** section. Fill in the following fields:
    - **Requested Amount:** Enter the requested credit line amount. You can enter a value between £10,000 and £500,000. This field is mandatory.
    - **Product Type:** This field is set at banking product level and it is read-only.
    - **Loan Destination:** Select the loan destination. This field is mandatory, and the following options are available: `Bill or Tax payment`, `Cashflow headroom`, `Debt Refinancing`, `Equipment Purchase`, `Facilities improvement`, `Seasonal Trading`, `Stock Purchase`, `Relocation`, `Marketing`, `Hire staff`, and `Bridging loan`.
    - **Loan Period:** Select the credit line period. You can select a period between 4 and 18 months. This field is mandatory.

- **Grace Type:** This field is set at banking product level and it is read-only.
- **Grace Period:** This field is set at banking product level and it is read-only. The grace period is the amount of time that the bank can offer to a customer at the beginning of the contract without repayments of principal or principal + interest.

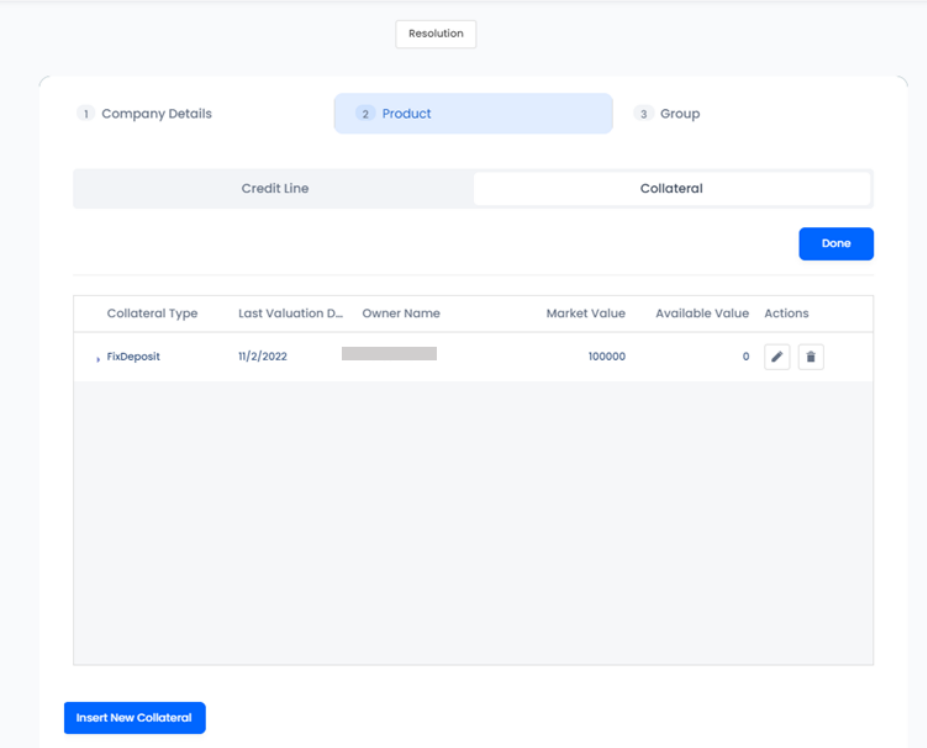
2. Set details regarding the characteristics of the credit line in the **Pricing** section to request a pricing discount. Fill in the following fields: **Interest Margin (fixed), Reference Indicator, Analysis Fee,** and **Administrative Fee.**

> **NOTE**
> If you click the **Request Pricing Discount** button, then the fields available in the **Pricing** section are mandatory. You can see the message displayed informing you that the application is being evaluated by a committee.




3. Click **Done**.

# Add Collateral




1. Click the **Insert New Collateral** button to add collateral to the credit line application.
2. In the newly displayed **Add/Edit Collateral**, select the **Collateral type** and set the **Last valuation date (Last Valuation Date<=Current Date), Owner name, Market value**, and **Description** fields.
3. Click **Save** to store the information about the added collateral.
4. After saving the collateral, you can view all the details displayed.
5. Optionally, you can remove the collateral by clicking the **delete** button, or you can edit the collateral by clicking the **edit** button.
6. If you click the **edit** button, the sidebar is displayed again, and you can make the necessary changes.

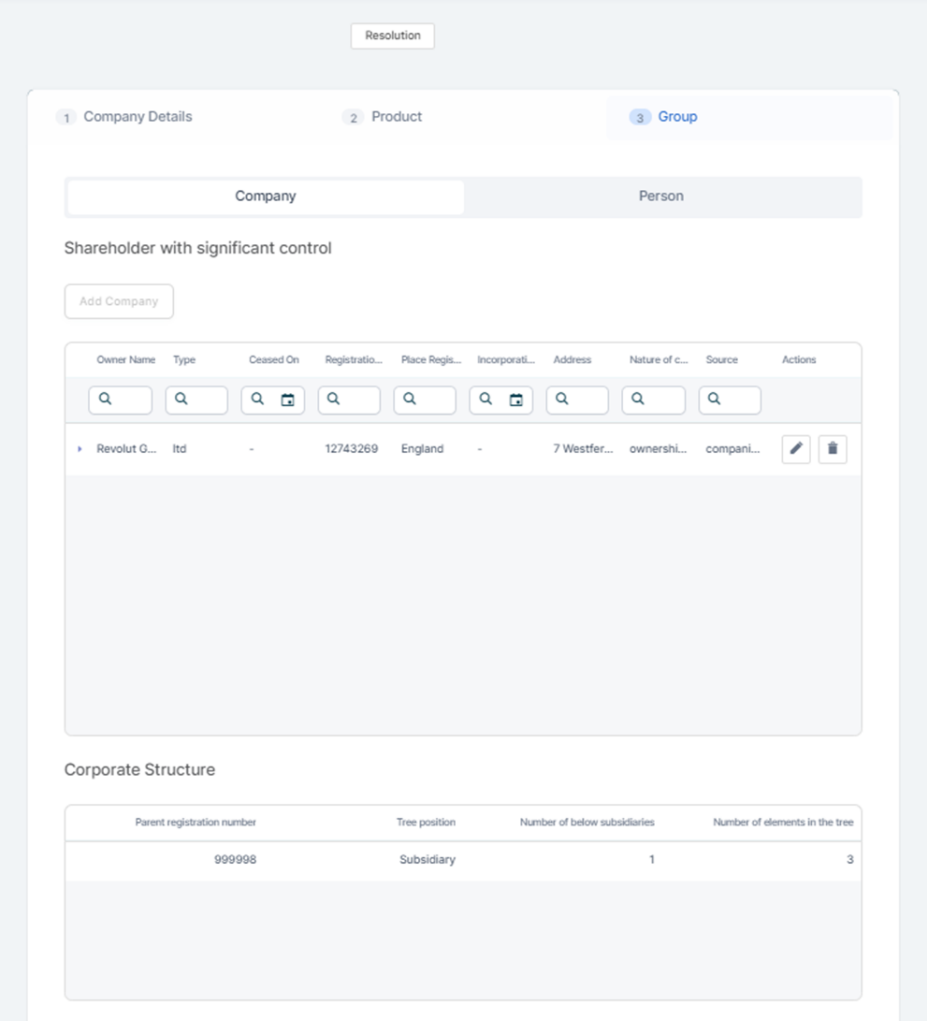
7. If you want to add a specific document for collateral, expand the collateral from the displayed list, and click the **Upload Documents** button.
8. In the newly displayed **Add Collateral Document** page, select the **Category** and the **Type** of the added collateral document.
9. Click **Add file** to upload the document.
10. Click **Save**, and view the document displayed in the list with the following details: Category, Type, Added by, Date Added, Source, and Actions.
11. Click **Done.**

To see the uploaded document, go to **Company Details > Documents** tab.

# Viewing Group Details

In the following tabs, you can check detailed information about the shareholders or the structure of the group. These details help you understand the SME applicant's financial relationship with other entities, which is useful in the underwriting process.

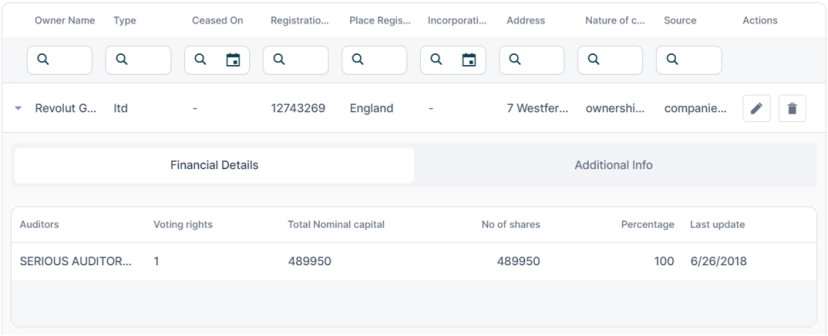
## Check Corporate Shareholders Details




1. View detailed information about corporate shareholders with significant control in the **Group > Company** tab. The following details are displayed, and the data is brought from the integration with Companies House Connector.
    - **Owner name:** The name of the company with significant control.
    - **Type:** The type of the company.

- **Ceased On**: The date that Companies House was notified about the cessation of this person with significant control.
- **Registration Number:** The registration number of the corporate entity with significant control.
- **Place Registered:** The place the corporate entity with significant control is registered.
- **Incorporation Date:** The date when the company was created.
- **Address:** The address of the company with significant control.
- **Nature of control:** Indicates the nature of control the person with significant control holds.
- **Source:** The data source: Companies House.

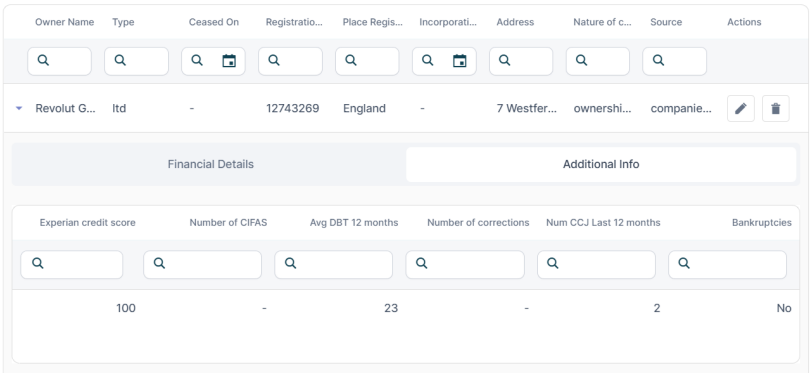
2. Click a record in the displayed table to see detailed information about each of these corporate shareholders. The data is brought from the integration with Experian.




3. Once you expand a record, the following details are displayed in the **Financial Details** tab.

- **Auditors:** The name of the auditor.
- **Voting rights:** The indicator showing whether this Share Capital has voting rights.
- **Total Nominal capital:** The calculated Total Nominal Capital for Shareholding.
- **No of shares:** The number of shares.
- **Percentage:** The calculated Percentage Total Capital for Shareholding.
- **Last update:** The date the limited company data for this block was last updated.

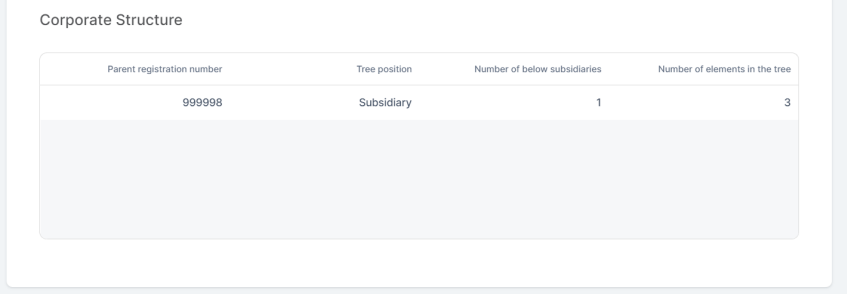
4. Also, an **Additional Info** tab is displayed once you click a record, and it contains the following details:




- **Experian credit score:** The current Commercial Delphi score for the limited company.
- **Number of CIFAS:** The number of CIFAS records in the last year and not expired.
- **Avg DBT 12 months:** The average number of days beyond terms for payment over the previous 12 months for the limited company.

- **Number of corrections:** The number of Notices of Correction.
- **Num CCJ Last 12 months:** The number of County Court Judgements with a Judgement date within the last 12 months.
- **Bankruptcies:** Possible values: Yes or No.

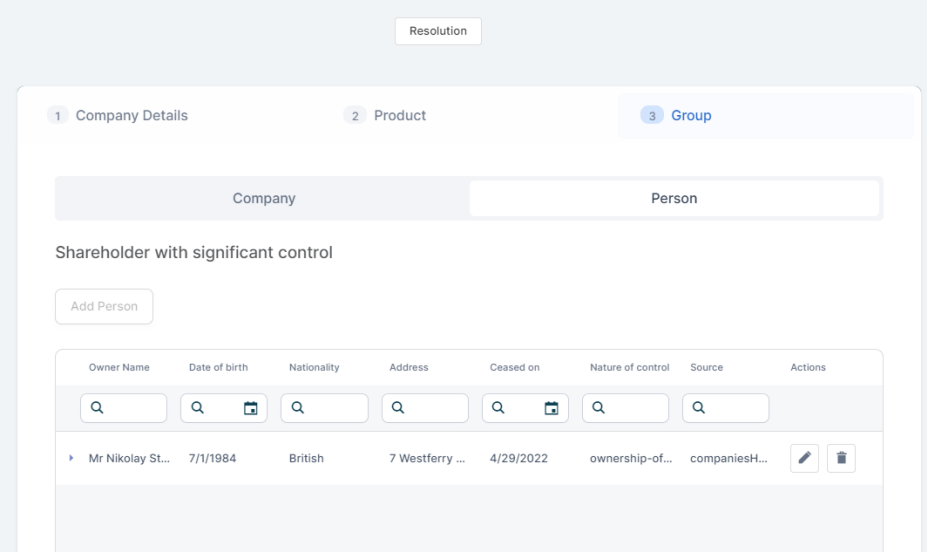
5. View the corporate structure of the SME company (the one which applies for the credit facility) with the following details in the **Corporate Structure** section. The data is brought from the integration with Experian.




- **Parent registration number:** Parent company registered number.
- **Tree position:** Position of the limited company in the corporate tree. The following values are displayed: 1 = Independent company; 2 = Subsidiary; 3 = Parent; 4 = Intermediate parent; 5 = Top of tree.
- **Number of below subsidiaries:** Number of subsidiaries in the corporate tree below the limited company.
- **Number of elements in the tree:** Total number of elements in the corporate tree.

All these details helps you request additional details about the corporate shareholders if needed in order to submit or reject credit line application.

# Check Personal Individual Shareholders Details




1. View detailed information about private individuals shareholders with significant control in the **Group > Person** tab. The following details are displayed, and the data is brought from the integration with Companies House Connector.
    - **Owner Name:** The name of the person with significant control.
    - **Date of birth:** The date of birth of the person with significant control.
    - **Nationality:** The nationality of the person with significant control.
    - **Address:** The address of the person with significant control.
    - **Ceased on**: The date that Companies House was notified about the cessation of this person with significant control.
    - **Nature of control:** Indicates the nature of control the

person with significant control holds.

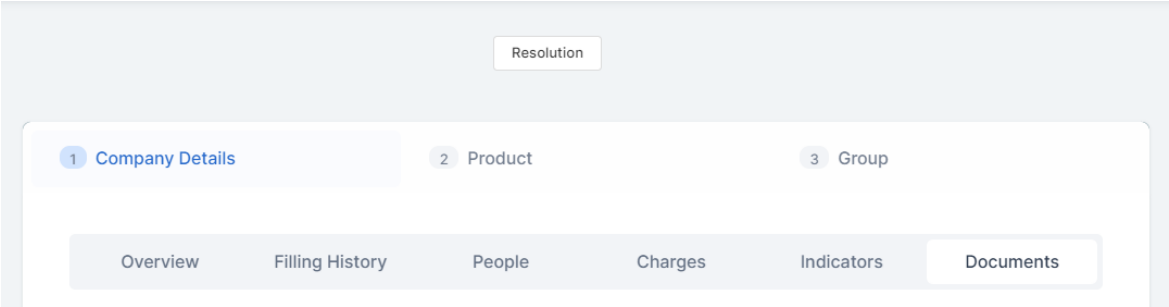
- **Source:** The data source: Companies House.

2. Click on a record in the displayed table to see detailed information about each of these personal individual shareholders. The data is brought from the integration with Experian.
3. Once you click on a record, the following details are displayed:
   - **Voting rights:** The indicator showing whether this Share Capital has voting rights.
   - **Total Nominal capital:** The calculated Total Nominal Capital for Shareholding.
   - **No of shares:** The number of shares.
   - **Percentage:** The calculated Percentage Total Capital for Shareholding.
   - **Last update:** The date the limited company data for this block was last updated.

   This helps you request additional details about the personal individual shareholders if needed to submit or reject credit line applications.

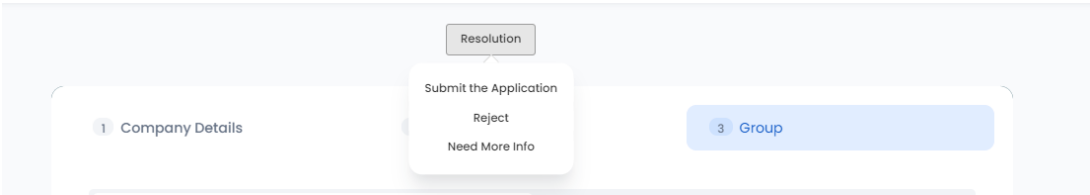
# Submitting or Rejecting an Application

After you review and complete all information regarding the SME applicant and the application, you need to establish a resolution on the application.




## Submit the Application

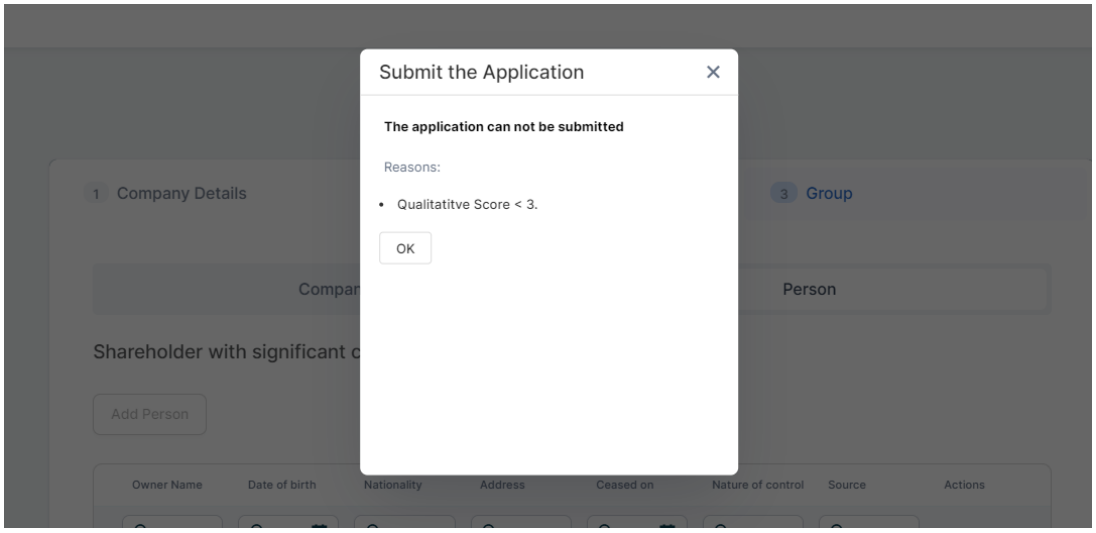
1. Click the **Resolution** button and then click **Submit the Application.**



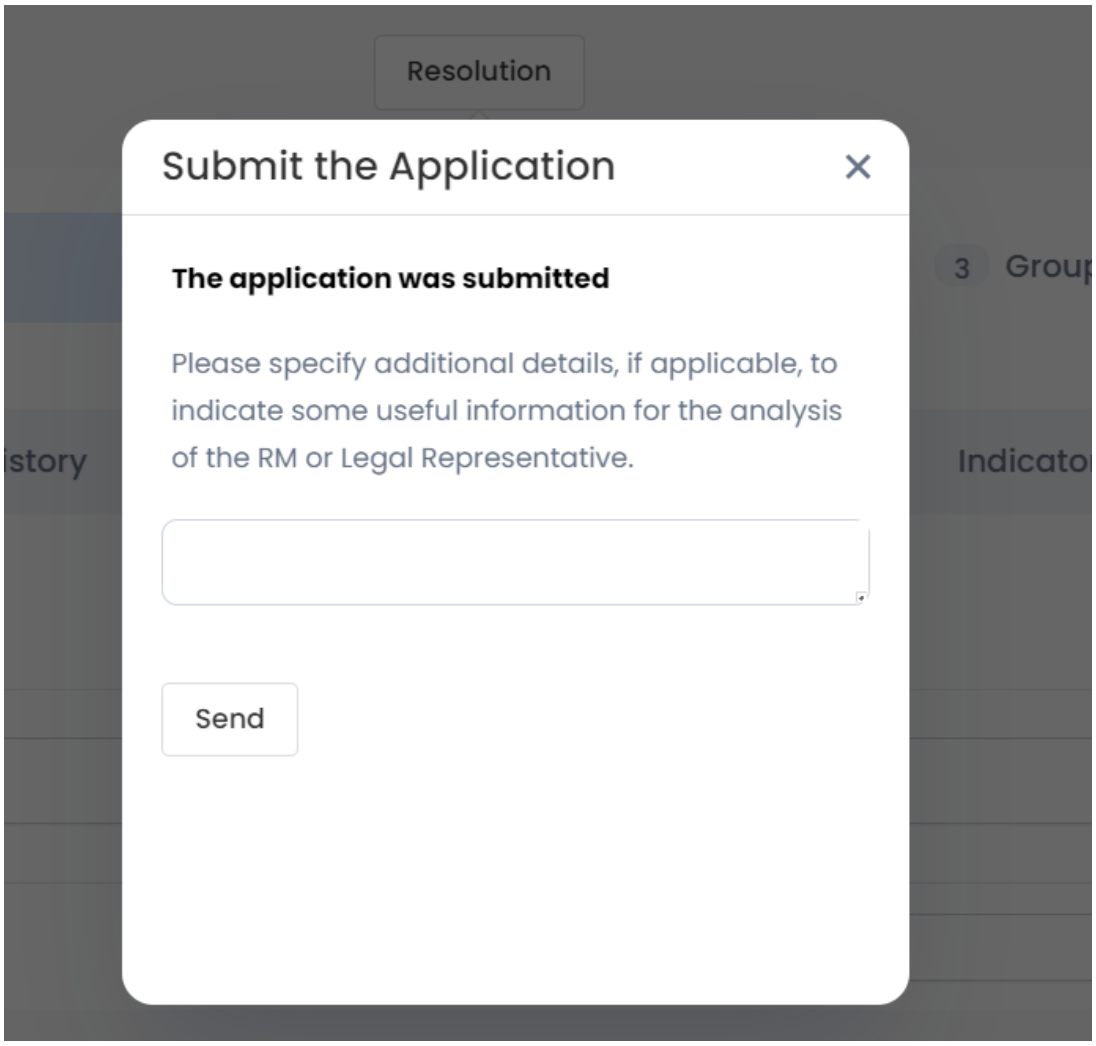

2. When you click the **Submit the Application** button, additional automatic checks perform as follows (the OR condition applies):
    - An application for which the quality score is <3 can't be submitted. This score is calculated in the Indicators > Qualitative tab.
    - An application that has Net Profit<=0 in the last year can't be submitted. This value is used from the Codat integration. If not available, then the value is used from the Experian integration.

- The solution uses the LexisNexis integration for evaluating compliance. If the score brought from the LexisNexis integration is >=95 for records with type=20, then the application can't be submitted.

3. If the validation rules are not met (at least one), the following error message is displayed together with the reason: *"The application cannot be submitted!"* and you can't approve the application. See the example below:



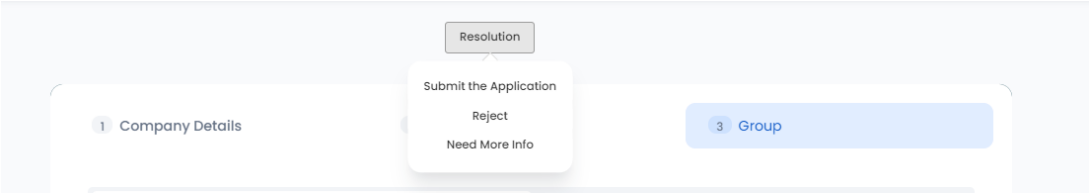

4. If one of the validation rules is met, then a confirmation screen is displayed.



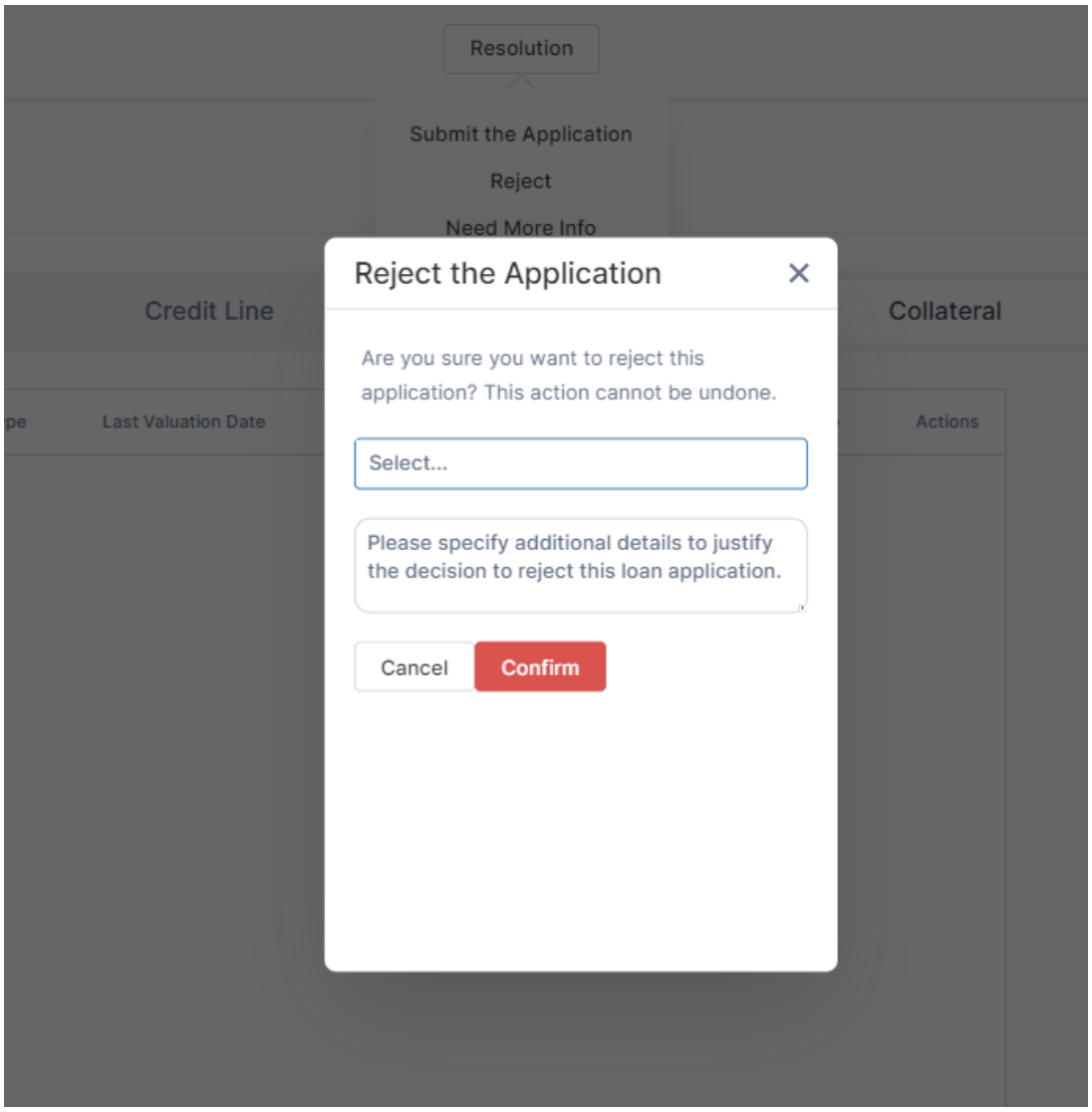

5. Enter a comment and then click **Send**. The application is submitted.

# Reject the Application

1. Click the **Resolution** button and then click **Reject** if the application does not meet the minimum requirements.




2. Select a reason or multiple reasons for rejecting the application and add a comment to justify the decision. The following options are available: Low credit score, Insufficient cash flow, Too many debts, Insufficient time in business, Incomplete papers, Lack of guarantees, Risky business/industry, Criminal records associated with business owners, Unrealistic business plan, Distribution of customers, General economic concerns, CCJ issues, Qualitative score, NetProfit, Banckruptcy, Not Eligible.




3. After adding the information above, click **Confirm.** The application is rejected.

# Solution Customization

The following chapter of this guide is meant to explain the automation processors used to build the product, as well as technical details of how to modify and extend the solution.

Additionally, you can modify the user interface to fit your brand. For more details, see Digital Experience Portals. However, if you need advanced modifications, edit the Style Sheet found by accessing **Innovation Studio > Digital Experience > Digital Journeys > Form Driven Flow** > the record you need to modify > **General** and scroll down to the field Style Sheets. You can find this in **Innovation Studio > Advanced > Style Sheets.** The solution also uses the new Standard FintechOS theme, which is defined in the custom files (custom.css) and the custom-dbk.css file.

Consult the following pages to read more on the internal set-up of the solution:

**Configuring the Banking Product** ..... **71**
**Configuring the Business Formulas** ..... **74**
Business Formulas ..... 74
**Configuring the Digital Flow Processing** ..... **76**
**Configuring the Email Templates** ..... **77**
**Working with Server Automation Scripts** ..... **78**
**SME Digital Lending and Underwriting System Parameters** ..... **87**
**Configuring Connectors** ..... **89**

## Configuring the Banking Product

After installing the SME Digital Lending and Underwriting package on your environment, together with its prerequisites, a banking product is already configured, and available in **Innovation Studio, Product Factory > Banking Products.**

| Product Code | Name | Class | Subclass | Category |
|---|---|---|---|---|
| CL | Credit Line | Corporate | SME | Loan |

You can make further configurations to the banking product depending on your business needs. Read more about all features in the Banking Product Factory Guide.

> **NOTE**
> To modify the existing product, you must create a new version and modify it since the product is in `Active` state.

# Details

The Grace Period, Loan Period and Grace Type displayed in the **Product > Credit Line** tab are configured in **Product Factory** > **Banking Products** > **Credit Line product** > **Details** tab. Here you can modify the Grace Period (edit the Product Grace field), Loan Period (edit the Period Type field) and Grace Type (edit the Grace Type field) according to your needs.

Also, you can modify the **Collateral type** displayed in the **Product > Collateral** tab. To do so, in the **Product Factory** > **Banking Products** > **Credit Line product** > **Details** tab, edit the **Allowed Guarantee Type** field.

For more details on how to configure the availability, see Banking Product Factory > Add Details section.

# Availability

You can modify the credit line **Requested Amount** displayed in the **Product > Credit Line** tab according to your needs. Access **Product Factory** > **Banking Products** > **Credit Line product** > **Availability** tab, and edit the **Minimum Amount** and **Maximum Amount** fields.

Also, you can modify the loan period displayed in the **Product > Credit Line** tab. Access **Product Factory** > **Banking Products** > **Credit Line product** > **Availability** tab, and edit the **Minimum Period** and **Maximum Period** fields.

For more details on how to configure the availability, see Banking Product Factory > Configure Availability section.

# Dimensions

The questions available in the Eligibility step are configured in the Banking Product Questions List in Innovation Studio. To add more or modify them, access **Product Factory > Banking Product Dimensions > Questions** section. For more details, see the Banking Product Factory Guide.

In addition, financial institutions can modify the logic for the calculation of the answers as they are used in the eligibility process. For details, see the FTOS_DBK_CheckEligibilityQuestions formula.

After the bank representative clicks **Continue** in the **Eligibility** step, the answers to the predefined questions are saved in the database, and a check is performed to determine whether or not the SME customer can continue with the application process. For details, see FTOS_DBK_CheckEligibilityAnswers.

# Documents

The GDPR, Marketing, Relative, Information, Affiliates and Business agreements documents used in the Company Representative step are configured using the Digital Documents processor. To access these documents, go to Innovation Studio and click **Main Menu > Automation Blocks > Digital Documents**. For more details on how to configure the documents, see the Digital Documents processor Guide.

After the configuration, they are linked to the banking product, in the **Documents** tab. To add more or modify them, access **Product Factory** > **Banking Product Dimensions** > **Documents** tab. For more details on how to add the documents to the Banking Product, see the Banking Product Factory Guide.

# Origination Elements

The **Loan Destination** displayed in the **Product > Credit Line** tab is configured in **Product Factory** > **Banking Products** > **Credit Line product** > **Origination Elements** > **Product Destination Types** section. Here you can modify the loan destination according to your needs.

For more details on how to configure the loan destination, see Banking Product Factory > Manage Origination Elements section.

# Configuring the Business Formulas

Business Formulas process different inputs from your solution in order to generate desired outputs. By inserting arguments and using them in steps, the system creates complex calculations to be triggered in a flow. The formulas can be modified and extended to fit business requirements for any financial institution.

## Business Formulas

In order to inspect the SME Digital Lending and Underwriting formulas, access **Innovation Studio** > **Automation Blocks** > **Formulas** and a list with all the formulas are displayed:

## FTOS_DBK_CheckEligibilityQuestions

The **FTOS_DBK_CheckEligibilityQuestions** formula is used in the Eligibility step and validates the answers to the displayed questions. The input arguments for the formula are: behindTaxPayments, countyCourtJudgements, declaredBankrupt, failedBusiness, overdraftOverLimit, personalDefaults,unpaidItems.

Example of input parameters for formula:

```
{
behindTaxPayments: 0,
countyCourtJudgements: 0,
declaredBankrupt: 0,
failedBusiness: 0,
overdraftOverLimit: 0,
personalDefaults: 0,
unpaidItems: 0
}
```

The loan application can continue only if all the answers are “No”.

> **NOTE** The questions available in the Eligibility step are configured in the Banking Product Questions List in Innovation Studio. For more details, see the Configuring the Banking Product > Questions section.

# FTOS_DBK_CheckAgreementsAnswers

The **FTOS_DBK_CheckAgreementsAnswers** formula is used in the Company Representatives for Application step and determines whether the applicants can continue the process depending on what they select on terms of the agreements. The solution contains six agreements whose approval logic can be altered by editing the **FTOS_DBK_AgreementsAnswers** formula. By default the application process can continue only if the company representative agrees with the GDPR, Information and Business Agreements. The input arguments for the formula are: gdpr, marketing, relative, information, affiliates, business.

# FTOS_DBK_QualitativeIndicators

The **FTOS_DBK_QualitativeIndicators** formula is used in the **Company Details > Indicators > Qualitative** tab to calculate the qualitative score.

The formula for calculating the qualitative score is `W1*FirstImpression + W2*Shares HoldersQuality + W3*Business Practice + W4*MarketConditions+W5*HistoricalRelationShip.`

The value of the weights are configurable in the **FTOS_BASME_NewRequest_QualitativeIndicators** data set, but for this implementation purpose is the following:

- W1=10%
- W2=15%
- W3=25%
- W4=20%
- W5=30%

Formula Input:

```
{
businessPractice:businessPractice,
historicalRelationsip:historicalRelationsip,
managementQuality:managementQuality,
marketCondifions:marketCondifions,
shareholderQUality:shareholderQUality
}
```

# Configuring the Digital Flow Processing

This menu part of Innovation Studio is used to build processors used in the journey for specific actions that are triggered, such as application number settings, Codat data settings, resolution accepted values and configuration for the allowed types of documents.

It is easy to modify any parameter of the processor by accessing the dedicated processor settings and changing the value from the key-value pair.

Access **Innovation Studio > Digital Experience > Digital Flow Processing > SMELoan.**

The following processor settings are used:

## ApplicationNumberSettings

It contains the settings for the application number displayed on the Dashboard. You can modify it according to your needs.

## codatDataSettings

Configure the data fetched from Codat and how it is achieved.

## ResolutionAcceptValues

It contains the configuration for the minimum values accepted when submitting a resolution and the messages displayed when any validation fails.

It is used in FTOS_BASME_NewRequest app data form.

Two attributes are used: type and value. Possible values for type: `gt`, `gte`, `lt`, `lte`, `eq`. They dictate the type of comparison that is made together with the reference value stored in the "value" key.

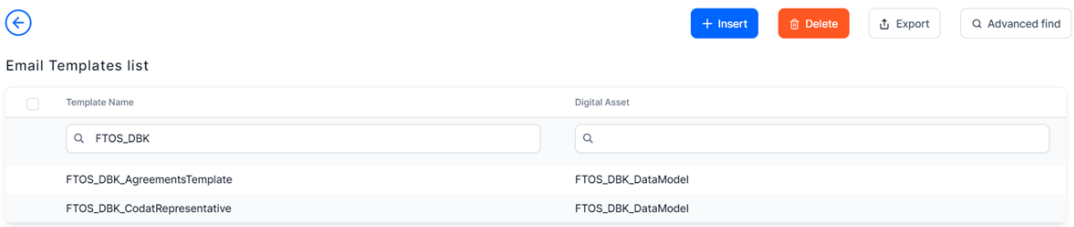
### newRequestForm

Allows for configuration throughout the FTOS_BASME_NewRequest app data form. It includes configuration for allowed types of documents and how they are displayed.

# Configuring the Email Templates

You can customize the emails sent to the Customer Representative. These emails are used to obtain the consent and to permit the connection to the Codat platform. To make the necessary changes according to your business needs, follow the steps below:

1. Log into **Innovation Studio.**
2. From the main menu, click **Admin > Email Templates** and search the following email templates used in the SME Digital Lending and Underwriting solution: **FTOS_DBK_AgreementsTemplate** and **FTOS_DBK_CodatRepresentative.**



3. Double-click on the email template you want to modify and use the text editor features to make the desired changes.

# Working with Server Automation Scripts

Within the Innovation Studio, there are server scripts that execute several actions, which feature business needs such as automated application numbers, the number of applications in progress, etc. On-demand automation scripts are available for being called from any object or context.

## FTOS_EXTD_POST_AddressesSearch

The **FTOS_EXTD_POST_AddressesSearch** script is used in the Company Representative and Business Details pages.

It is called with the following parameter { query: { address: addressLine } }. It represents one the API methods of the Ideal Postcodes Connector.

## FTOS_BASME_WelcomeWidget

The **FTOS_BASME_WelcomeWidget** script gets the bank representative's first name, the number of closed applications, and the number of applications that need a response after reviewing. This script is used to display the details available in the welcome message from the Dashboard.

Input: N/A

Output:

```
{
userInfo : {
    userFirstName: userFirstName,
    closedApps: parseInt(closedApps),
    returnedApps: parseInt(returnedApps)
}
}
```

## FTOS_DBK_GetSMELoanApplications

The **FTOS_DBK_GetSMELoanApplications** script gets information about all the loan applications available in the database. It is used in the Applications section.

Input: var `selectedCulture`

Output:

```
{
    allApps: allApps,
    myApps: myApps,
    myReturnedApps: myReturnedApps,
    allReturnedApps: allReturnedApps,
    allAppsReturnedCount: allAppsReturnedCount,
    myAppsReturnedCount: myAppsReturnedCount,
    appsLength: appsLength
}
```

# FTOS_BARET_SMELoanLinkApplicantData

The **FTOS_BARET_SMELoanLinkApplicantData** script generates an automated application number containing seven unique numbers and the prefix SMEL.

Input: selfLed=true

Output: N/A

You can update the parameters according to your needs. For more details see ApplicationNumberSettings section.

# FTOS_BASME_SearchCompany

If you enter minimum of 5 characters on the Search Company screen, then the system makes a call in the database and returns the list of companies using FTOS_BASME_SearchCompany script. If there is no available data or if the data is older than 5 days, then a call is made to the Companies House API to return the list with the companies.

Note that the days are configurable in **Innovation Studio > Admin > System Parameter > FTOS_DBK_General > expirationDays** parameter and represent the validity of the data that was saved from the Companies House.

# FTOS_BASME_GetCompanyDetails

In the Search Company screen, after the company is found, if you click the expand button, then the system makes a call in the database and returns the company details using the FTOS_BASME_GetCompanyDetails script. If there is no available data, then a call is made to the Companies House API to return the company's details.

Input: loanId

methods (personsWithSignificantControl,exemptions, ukEstablishments, officers, insolvency, companyProfile, filingHistory, charges, personsWithSignificantControlStatements, officerAppointments, documents, quantitativeIndicators).

Output: object with requested values

# FTOS_BNKAP_GetCompanyApplicationsNo

The **FTOS_BNKAP_GetCompanyApplicationsNo** script is used to return the number of applications for the selected company. It is used in the Existing Applications page.

# FTOS_DBK_CheckEligibilityAnswers

The **FTOS_DBK_CheckEligibilityAnswers** script takes the answers to the questions, inserts them into the answer entity, and then runs the FTOS_DBK_CheckEligibilityQuestions formula through API. This script is used in the Eligibility step.

Input: an array with response objects

Output:

```
{
ok: bool,
message: "string",
}
```

# FTOS_DBK_GetProductAgreementsMapped

The **FTOS_DBK_GetProductAgreementsMapped** script gets the agreements and it is used in the Company Representatives for Application step.

Input: N/A

Output:

```
{
agreements: [{
'name': 'gdpr',
'displayName' 'GDPR Agreement',
'name': 'marketing',
'displayName' 'Marketing Agreement',
'name': 'relative',
'displayName' 'Relative Agreement',
'name': 'information',
'displayName' 'Information Agreement',
'name': 'affiliates',
'displayName' 'Affiliates Agreement',
'name': 'business',
'displayName' 'Business Agreement'
}]

}
```

## FTOS_DBK_CheckAgreementsAnswers

The **FTOS_DBK_CheckAgreementsAnswers** script takes the answers to the agreements, inserts them into the answer entity, and then runs the FTOS_DBK_CheckAgreementsAnswers formula. This script is used in the Company Representatives for Application step when the **Send email** button is clicked.

Input: an array with the names and values of the attributes considered by the FTOS_DBK_CheckAgreementsAnswers formula.

Example of input parameters for formula:

```
{
gdpr: 1,
marketing: 0,
relative: 1,
information: 1,
affiliates: 0,
```

```
business: 0
}
```

Output: {ok:true/false}

# FTOS_BASME_AgreementNotification

The **FTOS_BASME_AgreementNotification** script sends an e-mail to the SME representative.

The email contains the agreements from the configured banking product (set in a processor setting - Credit Line product) and the **OK** button, which the Customer Representative should click to continue the application. All six documents (static documents) are attached to the e-mail.

Also, the script changes the status of the application from **New** to **Pending Agreements.**

This script is used in the Company Representatives for Application step when the bank representative clicks the **Send Email with Agreements** button.

Input: an array with the names and values of the attributes, email, and FirstName.

Output: sends the email.

# FTOS_DBK_UserAgreed

The **FTOS_DBK_UserAgreed** script determines whether or not the customer representative has clicked **OK** in the email received. It changes the business status of the application in AGREEMENTS ACCEPTED.

This script is used in the Confirm Agreements page.

Input: sessionId

Output: changes the application status in AGREEMENTS ACCEPTED.

# FTOS_DBK_EmailApplicantCodat

The **FTOS_DBK_EmailApplicantCodat** script sends the email to the Customer Representative to allow accounting access. It is used in the obtaining accounting access step.

Input: N/A

Output: sends email

## FTOS_DBK_GetCodatData

The `FTOS_DBK_GetCodatData` script checks if the customer representative has given their consent on the Codat Sandbox.

When a response is received from the `CODAT.checkDataStatus (codetCompanyId)` an insert is made in the `Codat` entity with the following data:

```
codedJobObj= {
retailApplicantDataId: retailApplicantDataId,
loanId: loanId,
codatCompanyId: codatCompanyId,
codatDataType: item.dataType,
codatCurrentStatus: item.currentStatus,
jobStatus: 'New'
}
```

where `item.dataType` is a line retrieved from the Codat answer (eg: access for balanceSheet, access for profitAndLoss, etc.).

This means that for a customer representative with granted access rights to Codat, several records are inserted in the `Codat` entity.

## FTOS_DBK_ProcessCodat

The **FTOS_DBK_ProcessCodat** script receives the accounting data based on the `CodatDataJob` entity records from the Codat integration and saves it to the database.

## FTOS_DBK_NewRequestProductConfig

The **FTOS_DBK_NewRequestProductConfig** script gets the following banking product configurations: product type, grace type, grace period, possible loan periods, possible loan destinations, requested amount constraints, and previously saved values (if applicable).

It is used in the Credit Line configuration step.

Input: N/A

## FTOS_DBK_SaveCreditLineDetails

The **FTOS_DBK_SaveCreditLineDetails** script saves the credit line details and performs validation on the data input.

It is used in the Credit Line configuration step.

Input:

```
{

"model": {
    "requestedAmount": "",
      "loanDestination": "",
    "loanPeriod": "",
    "productType": "",
    "graceType": "",
    "gracePeriod": "",
    "interestMargin": null,
    "referenceIndicator": null,
    "analysisFee": null,
    "administrativeFee": null
}

}
```

Output:

```
{
ok: bool,
message: "string",
}
```

## FTOS_BASME_CheckQualitativeIndicatorScore

The **FTOS_BASME_CheckQualitativeIndicatorScore** script takes the weights from the **FTOS_BASME_NewRequest_QualitativeIndicators** data set and computes the **FTOS_DBK_QualitativeIndicators** formula.

It is used in the **Company Details > Indicators > Qualitative** tab when the bank representative clicks the **Check Score** button.

Input:

```
{
businessPractice:businessPractice,
historicalRelationsip:historicalRelationsip,
managementQuality:managementQuality,
marketCondifions:marketCondifions,
shareholderQUality:shareholderQUality
}
```

Output: qualitative score

# FTOS_DBK_EXP_GetShareholderDetails

**FTOS_DBK_EXP_GetShareholderDetails** is called every time when the user clicks on the expand option of any row of the Group > Company or Group > Persons tabs. The correlation between the Companies House and Experian data for persons is made using the name of the person.

**FTOS_DBK_EXP_GetShareholderDetails** provides in depth details/data fetched from Experian. The data is fetched only once, then it's saved in the database (FTOS_BNKAP_ApplicantDataExt, field experianDetails). It has no expiration date.

Input: personName/companyNumber

Output if the script was called with personName:

```
{

        status: bool,
        shareholderDetails: {
        numShares: "string",
        totalNominalCapital: "string",
        percentage: "string",
```

```
        lastUpdate: "string"

        }

    }
```

Output if the script was called with companyNumber:

```
[{financialData:{
  auditor:"string",
  votingRights :"string",
  totalNominalCapital:"string",
  noOfShares:"string",
  percentage:"string",
  lastUpdate:"string"

} , additionalInfo:{

       comDelphiScore: "string",
       avgDBT12Months:"string",
       numCorrection: "string",
       numOfCCJLast12Months: "string",
       bankruptcies: "string"

}}]
```

# FTOS_DBK_GetGroupStructure

Provides shallow data for all the tables in the Group tab. For the table Corporate Structure, the data is either fetched from Experian or from the database in case it has been fetched before. For the other tables (Company and person shareholders) from the Group tab, the data's origin is Companies House, but it is brought from the database. The data was saved in the database before the Codat integration was performed.

Input:

It doesn't use any input parameters, but it uses the current loanId provided by the context object.

Outputs the following structure:

```
{
    shareholder: [{
        ownerName: "string",
        registrationNumber: "string",
        type: "string",
        ceasedOn: "string",
        placeRegistered: "string",
        incorporationDate: "string",
        address: "string",
        naturesOfControl: "string",
        source: "string"
    }],
    corporateStructure: [{
parentRegNumber: "string",
treePosition: "string",
totalNumbSubs: "string",
totalElements: "string"
}],
    persons: [{
        ownerName: "string",
        dateOfBirth: "string",
        citizenship: "string",
        address:  "string",
        ceasedOn:  "string",
        naturesOfControl:  "string",
        source:  "string"
    }]
}
```

# SME Digital Lending and Underwriting System Parameters

Find below a list of the system parameters used by SME Digital Lending and Underwriting solution, along with their description. If you want to modify them, go to **Innovation Studio >Admin > System Parameters** or Vault Component and search the system parameters below:

## FTOS_DBK_BPMapping

It represents the configuration of the banking product used in the solution. If you change the banking product at the Banking Product Factory level, then you must also change the corresponding FTOS_DBK_BPMapping parameters.

Parameter Value

```
{
  "CL": {
    "bankingProductCode": "CL",
    "bankingProductClass": "Corporate",
    "bankingProductSubClass": "SME"
  },
  "defaultForInsert": "CL"
}
```

## FTOS_DBK_CodatItemsPerCall

It represents the number of items per call when processing data from Codat.

Parameter Value

```
20
```

## FTOS_DBK_DefaultAccountType

It represents a technical value used to avoid hardcoded strings in code, allowing parametrization in case anything changes in the Account Type entity.

It is used when creating a customer via API, before adding collaterals in the **Product tab > Add/ Edit Collateral** sidebar.

Parameter Value

```
Legal person
```

## FTOS_DBK_DefaultCurrencyCode

It represents the currency code used in the solution.

Parameter Value

GBP

## FTOS_DBK_General

The `expirationDays` parameter specifies the number of days after which the loan application expires.

The `allowdTypesPSC` parameter controls the nature of the data saved in the database for the person with significant control API.

Parameter Value

```
{
  "expirationDays": 5,
  "allowdTypesPSC": [
    "individual-person-with-significant-control",
    "legal-person-person-with-significant-control",
    "corporate-entity-person-with-significant-control"
  ]
}
```

# Configuring Connectors

The SME Digital Lending and Underwriting uses data from third parties and enables data collection using the following FintechOS connectors: Companies House, Ideal Postcodes, Experian, Lexis Nexis, and Codat.

To switch a connector used in the solution with another FintechOS connector, the corresponding package must be imported. Depending on the connector, there may be a Web Api Client Library available. If so, it is recommended to use it. Otherwise, a Server Script Library can be created which does the same thing, but programatically. e.g.: FTOS_DBK_CMPH.

In particular, for the connectors which are used by default in the solution, the following configurations are available:

- for Lexis Nexis : **FTOS_EXTD_LEXN_Search** Web Api Client Library. In order to inspect it, go to **Innovation Studio > Ecosystem > Web Api Client Libraries** list.
- for Experian: **FTOS_DBK_EXP** Web Api Client Library. In order to inspect it, go to **Innovation Studio > Ecosystem > Web Api Client Libraries** list.
- for Companies House: **FTOS_DBK_CMPH** Server Script Library. In order to inspect it, go to **Innovation Studio > Advanced > Server Automation Script Libraries** list.
- for IdealPostcodes: **FTOS_EXTD_POST_AddressesSearch_Library** Server Script Library. In order to inspect it, go to **Innovation Studio > Advanced > Server Automation Script Libraries** list.
- for Codat: **FTOS_DBK_CODAT** Server Script Library. In order to inspect it, go to **Innovation Studio > Advanced > Server Automation Script Libraries** list.