# PERSONAL FINANCE MANAGER

**DOCUMENTATION** 

**Last Modified:** 26/11/2016

**Author:** JM

Version: 1.1



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# 1 Context

# 1.1 Changes

Date	Author	Description		
06/11/2016	JM	Creation of the document.		
26/11/2016	JM	Adding requirements D_01, U_03, BP_01.		
		Updating requirements MET_01, MET_02.		
		Removing requirements AUD o1.		
		Updating screenshots for section Getting Started.		
		Updating Technologies used.		

# 1.2 Environment

The application has been tested on Google Chrome on a Windows 10 environment.

# 1.3 Goals

- Registering the expenses on a bank account of a user and report them into a dashboard for analysis.
- Using technologies for learning purpose.

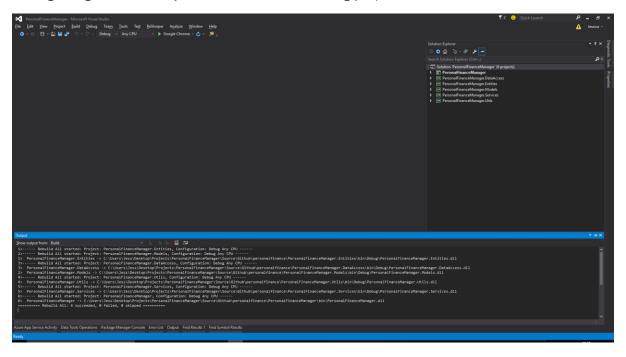
# 1.4 Technologies

USAGE	TECHNOLOGIES
MAIN	.NET Technologies, C# Language
WEB	ASP. NET MVC
	HTML Razor Syntax
	JQuery
	Bootstrap
DEPENDENCY INJECTION	Ninject
DATA ACCESS	SQL Server 2014
	Entity Framework (Code first approach)
SOURCE CONTROL	GIT / GitHub / TortoiseGIT
WEB SERVER	IIS

# 2 Getting Started

# 2.1 Start point

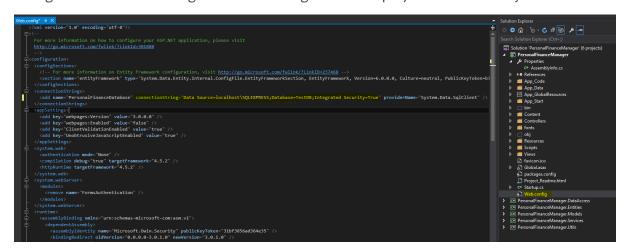
After getting the sources, you should see the following project and be able to build.



# 2.2 Database setup

The database will be built from the project but you need at least a SQL Express instance running on the server.

Change the connection string in the Web.config of the web project so it matches your DB server:



In **Package Manager Console**, make sure the PersonalFinanceManager.DataAccess project is selected and enter:

Add-Migration InitialCreate

```
PM> Add-Migration InitialCreate
Scaffolding migration 'InitialCreate'.
The Designer Code for this migration file includes a snapshot of your current Code First
migration, then you can re-scaffold it by running 'Add-Migration InitialCreate' again.
```

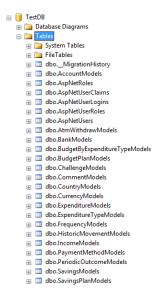
#### Then, enter:

#### Update-Database

```
PM> Update-Database

Specify the '-Verbose' flag to view the SQL statements being applied to the target database. 
Applying explicit migrations: [201611050702109_InitialCreate]. 
Applying explicit migration: 201611050702109_InitialCreate. 
Running Seed method.
```

#### Result in DB:



The only prepopulated table is **dbo.PaymentMethodModels** as this is a static enum type.

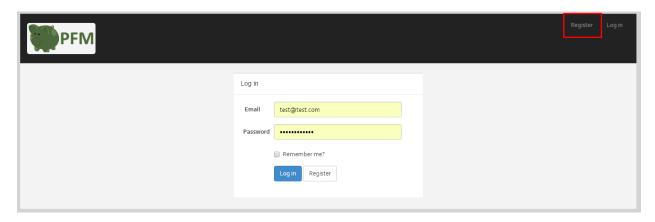


All other tables are empty at that point.

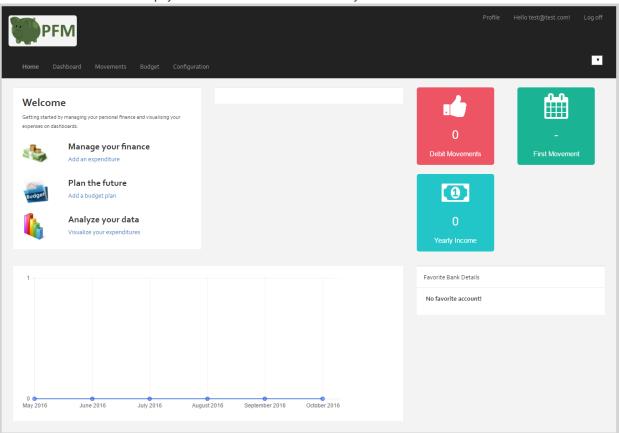
# 2.3 Metadata setup

Run the web project

First you need to register:

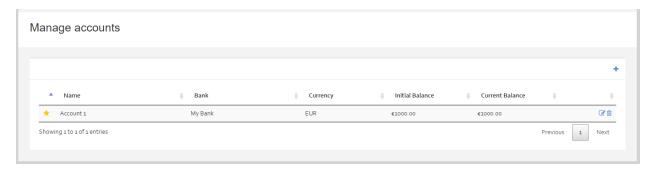


The list of accounts is empty as no data has been created yet for this user.



You should populate the settings in this order:

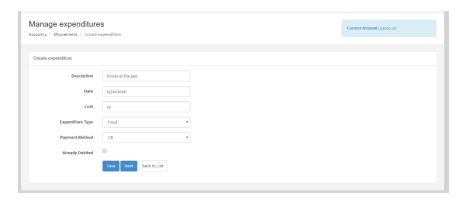
- Create a user profile
- Create a country
- Create a currency
- Create a bank
- Create an account and set up as favorite



Next stage is to define the expenditure types you want to manage:



Then you only need to add some expenditures and have a look at the dashboard!



# **3 Functional Requirements**

# 3.1 Requirement Definition

The use cases are described by a code according to the following descriptions:

- **U\_XX**: Related to security including user account (authentication and authorization) and user profile.
- MET\_XX: Related to metadata of the system (accounts, currencies, countries...).
- **EI\_XX:** Related to entering expenses and incomes to the system.
- **D XX**: Related to visualizing dashboards.
- BP\_XX: Related to budget plan.

The use cases are more or less detailed depending of the complexity of the functionality.

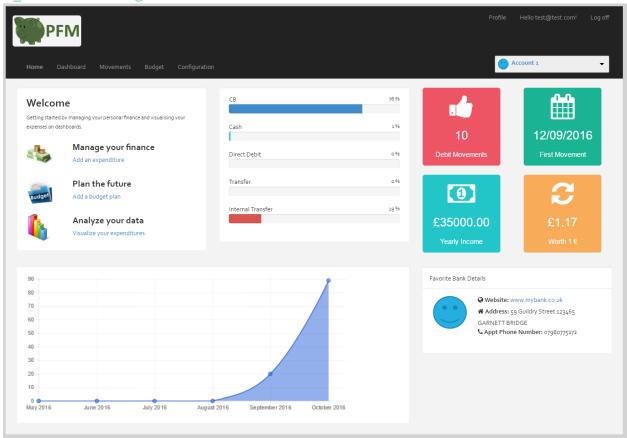
# 3.2 Requirement Overview

Use Case	Name	Description			
D_01	Welcome Page	Be able to show a user-specific home page.			
D_02	Expenditure Dashboard	Be able to visualize the expenditures for an account in a dashboard.			
U_01	User Registering	Register a new user so he can start to use the application			
U_02	User Authentication	Be able to log in a user so he can start to use the application			
U_03	User Profile.	Be able to get some information about the user.			
MET_01	Account Management	Be able to list, create, update and delete accounts for the authenticated user			
MET_02	Bank Management	Be able to list, create, update and delete banks for the authenticated user			
MET_03	Country Management	Be able to list, create, update and delete registered countries for the authenticated user			
MET_04	Currency Management	Be able to list, create, update and delete registered currencies for the authenticated user			
MET_05	Expenditure Type Management	Be able to list, create, update and delete categories of expenditures for the authenticated user			
MET_06	Payment Method Listing	Be able to list, create, update and delete categories of expenditures for the authenticated user			
El_01	Incomes Management	Be able to list, create, update and delete incomes for an account			
El_02	ATM Withdraw Management	Be able to list ATM withdraws for an account			
EI_03	Expenditure Listing (Common Features)	Be able to list and filter expenditures for an account.			
EI_04	Expenditure Management (Common Expenditure Strategy)	Be able to create / update / delete an expenditure, for CB Direct Debit and Transfer expenditures.			

EI_05	Expenditure Management	Be able to create / update / delete an expenditure,
	(ATM Withdraw Strategy)	for Cash expenditures.
EI_06	Expenditure Management	Be able to create / update / delete an expenditure,
_	(Internal Transfer Strategy)	for Internal Transfer expenditures.
BP_01	Budget Management	Be able to create / update / view a budget plan
		and start/stop it.

# 3.3 Detailed Requirements

# D 01 - Welcome Page



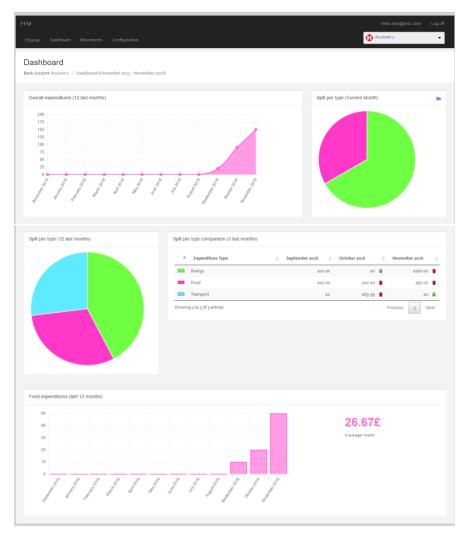
# From left to right, top to bottom:

- Shortcuts on main functionality
- Cost of all registered debit movements compared to the total registered debit movements.
  - Notes: Does not convert to the main currency.
- Number of registered debit movements.
- First Movement
- Yearly Income
- Conversion rate (IN DEVELOPMENT)
  - Currency is your favorite account currency
  - o Base currency: randomly chosen amongst your currencies
- Costs of registered debit movements over 6 months
  - o Notes: Does not convert to the main currency.
- Favorite Bank details:
  - Bank Branch details of the favorite account

# D 02 - Expenditures Dashboard

Five visualizations are available in this dashboard:

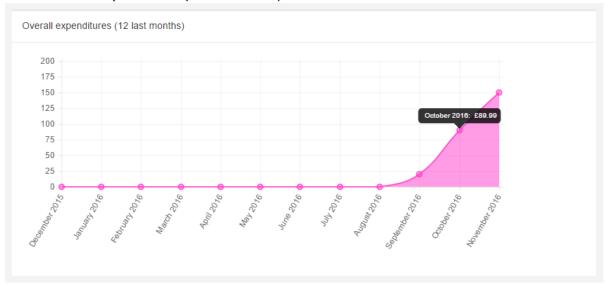
- 1. Overall expenditures (12 last months)
- 2. Split per type (Current Month)
- 3. Split per type (12 last months)
- 4. "Type" expenditures (12 months)
- 5. Split per type comparison (3 last months)



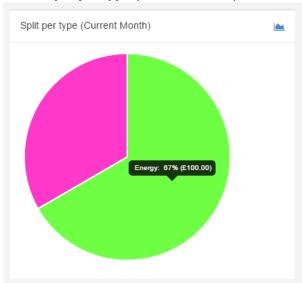
When the data is analysed for over a year, we take 12 months including the current month. For example, in November 2016, we want to see the data from 1<sup>st</sup> of December 2015 to 30<sup>th</sup> of November 2016.

- Start Date: first day of the current month 11 Months
- End Date: last day of the current month

Row 1: Overall expenditures (12 last months)



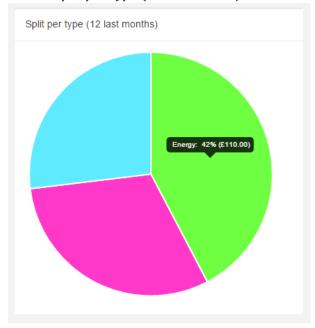
Row 1: Split per type (Current Month)



# Action available:

• Button 🛎 will open Row 2

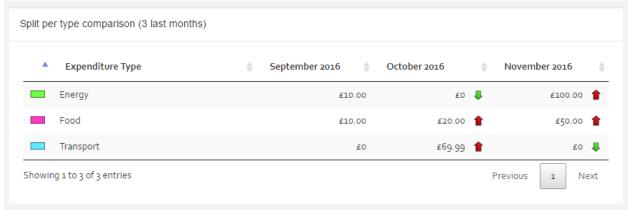
Row 2: Split per type (12 last months)



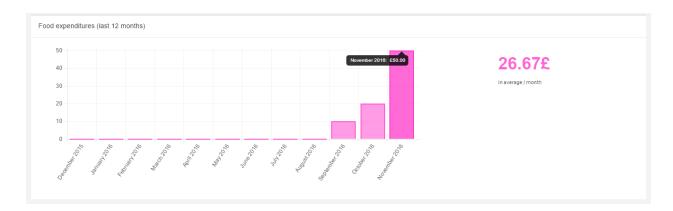
# Action available:

• Click on pie chart split will open the Row 3

Row 2: Split per type comparison (3 last months)



Row 3: "Type" expenditures (12 months)



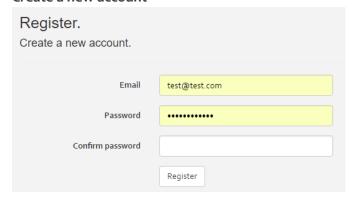
The average is computed from the moment we started registered the expenditures, not before. For instance, we show the data from December 2015, but our first expenditures registered in the system was in September 2016. The average is then computed from September 2016 and the zero values are ignored from December 2015 to August 2016 are not considered in the computation.

# U\_01 - User Registration

# Description

It uses the integrated authentication mechanism proposed in the ASP.NET MVC template project.

# Create a new account



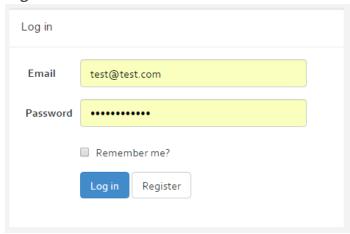
Property	Type	Description	Required	Size	Other constraints
Email	Text	Email	Yes	256	
Password	Text	Password	Yes		At least one character, one number and one special character. At least one uppercase.
Confirm password		Password			

# U\_02 - User Authentication

# Description

It uses the integrated authentication mechanism proposed in the ASP.NET MVC template project.

# Login



# U\_03 - User Profile

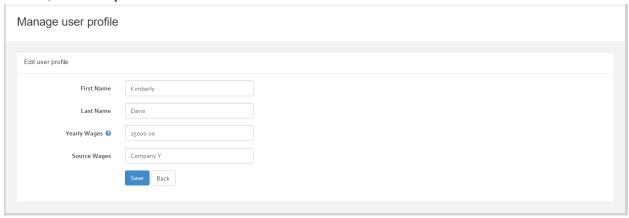
# View

Manage user profile								
View user profile								
First Name	. Kimberly							
Last Name	Davis							
Yearly Wages	2500.00							
Source Wages	Company Y							
<b>3</b>								

# Actions available:

- Create: if not profile is not created yet.
- Update

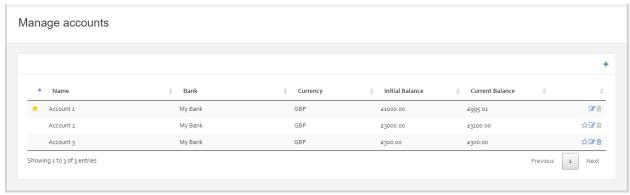
# Create / Edit user profile



Property	Туре	Description	Required	Size	Other constraints
First Name	Text		Yes	50	
Last Name	Text		Yes	50	
Yearly Wages	Decimal	Currency used is the currency of favorite account.	Yes		
Source Wages	Text	Company name	Yes	50	

# MET\_o1 - Account Management

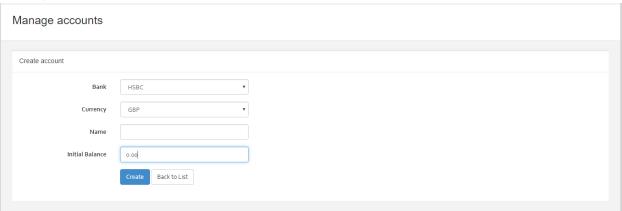
#### List



# Actions available:

- Sort
- Create
- Update
- Delete (with confirmation): disabled if the account is used by at least one expenditure, income or ATM withdraw.
- Set as Favorite

# Create / Edit account



Property	Туре	Description	Required	Size	Other constraints
Bank	List	List of available banks in the system.	Yes		
Currency	List	List of available currencies in the system.	Yes		
Name	Text	Account name	Yes	50	Unique.
Initial Balance	Decimal	Initial balance	Yes	(10, 2)	Can't be changed in edit mode.

The **Current Balance** is not visible from the creation screen, it is initialized with **Initial Balance** at creation time. It is going to be updated when expenditures, incomes and ATM withdraw are created.

# MET\_02 - Bank Management

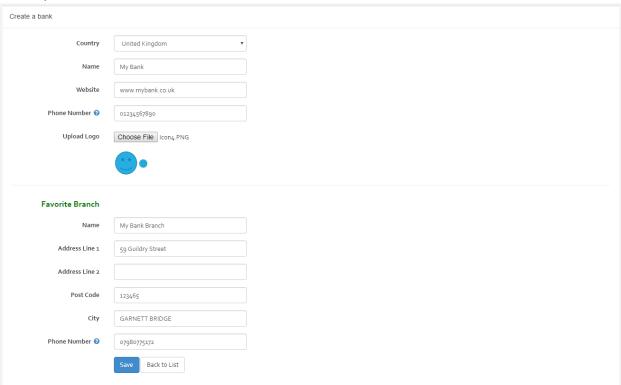
#### List



# Actions available:

- Sort
- Create
- Update
- Delete (with confirmation): disabled if the bank is used by at least one account. Delete the favourite branch object too.

# Create / Edit bank



Property	Туре	Description	Required	Size	Other constraints
Country	List	List of available countries in the system.	Yes		
Name	Text	Bank name	Yes	50	Unique.
Existing logo	Text + Preview	If a logo has been already uploaded (Edit or Failed Validation on Create after uploading), then we display the icon filename and we preview the image.	Yes		Field displayed Under Conditions.
Upload logo	Image Upload + Preview	Upload button + Preview of the uploaded image. If an existing logo exists, a button will be available to upload a new file.	Yes		Field displayed Under Conditions.  The file should not empty. A file must have been selected. The file should not exceed 200000 bytes. A file must have a unique name.
Website	Text	Website	Yes	255	
Phone Number	Text	Phone Number (General Enquiries / Customer Services). Without extension number.	Yes	11	Pattern 00000000000

# **Favorite Branch Properties**

Property	Type	Description	Required	Size	Other constraints
Name	Text	Name	Yes	50	
Address Line 1	Text	Address Line 1	Yes	255	
Address Line 2	Text	Address Line 2	No	255	
Post Code	Text	Post Code	Yes	10	
City	Text	City	Yes	255	
Phone Number	Text	Phone Number (Appointment booking). Without extension number.	Yes	11	Pattern 00000000000

# MET\_03 - Country Management

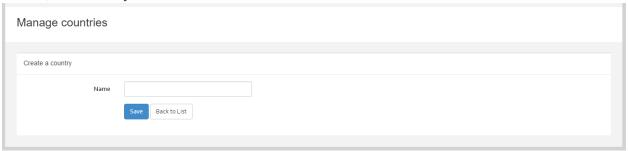
# List



# Actions available:

- Sort
- Create
- Update
- Delete (with confirmation): disabled if the country is in used by an account.

# Create / Edit country



Property	Type	Description	Required	Size	Other constraints
Name	Text	Country Name	Yes	50	

# MET\_04 - Currency Management

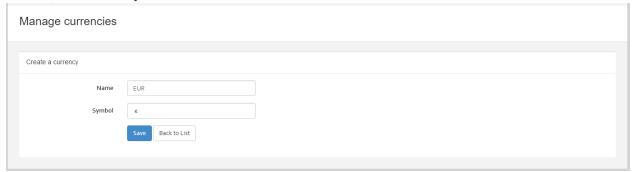
# List



# Actions available:

- Sort
- Create
- Update
- Delete (with confirmation): disabled if the currency is in used by an account.

# Create / Edit currency



Property	Type	Description	Required	Size	Other constraints
Name	Text	Currency Name	Yes	3	
Symbol	Text	Currency Symbol	Yes	3	

# MET\_05 - Expenditure Type Management

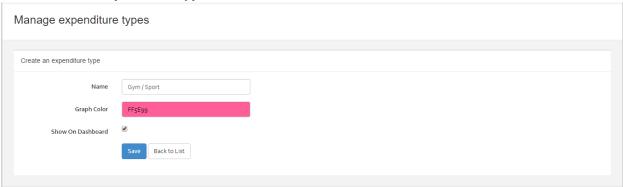
#### List



# Actions available:

- Sort
- Create
- Update
- Delete (with confirmation): disabled if the expenditure type is used by at least one expenditure.

# Create / Edit an expenditure type



Property	Type	Description	Required	Size	Other
					constraints
Name	Text	Expenditure name	Yes	50	Unique.
<b>Graph Color</b>	Color	Color which will be displayed in the	Yes		
	Pick	graph in the dashboard for this			
		expenditure type.			
Show On	Yes/No	Determine if the expenditure types	Yes		
Dashboard		will be in the dashboard			

# MET\_o6 - Payment Method Listing

# Description

Depending on which payment method has been selected, a different strategy applies on the expenditure computation. As a result, this entity became static. You can still visualize what payment method are available to you.

# List



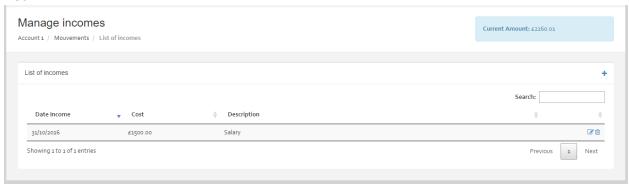
# El 01 - Incomes Management

# Description

An income is an external source of amount like salary, gift...

For an income which comes from an account registered in the system, you can use the expenditure functionality with the payment method option "internal transfer", as it will create both the debit in the source account (expenditure) and credit in the destination account (income). For instance, you have a saving account and you transfer money from your current to your saving account, you won't have to do two actions.

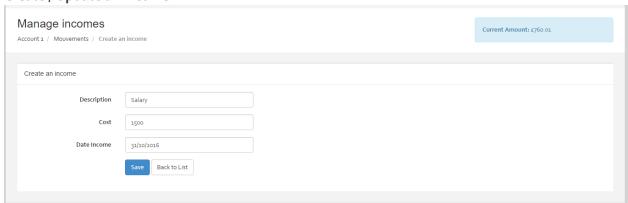
#### List



#### Available actions:

- Sort
- Create
- Update
- Delete (with confirmation).

#### Create / Update an income



Property	Type	Description	Required	Size	Other constraints
Description	Text	Description	Yes		
Cost	Decimal	Cost	Yes		
Date income	Date	Date income	Yes		

The account will be credited and debited again with the new cost.

# Delete

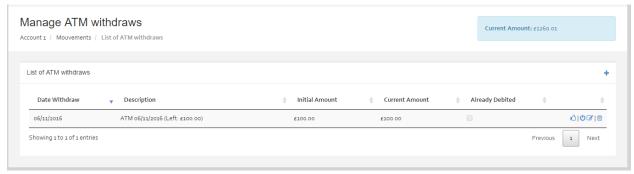
The account will be re-credited.

# El 02 - ATM Withdraw Management

# Description

An ATM withdraw is a special expenditure that won't be shown in the dashboard as it is not split by expenditure type. The cash expenditures attached to it are the ones which needs to be displayed. As the amount can't necessarily be precise for cash expenditures and they might come later after the amount is removed from the account, we define this ATM withdraw object.

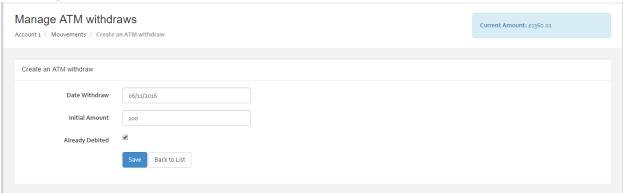
#### List



#### Available actions:

- Sort
- Create
- Update
- Close ATM withdraw.
- Delete (with confirmation). Disabled if used by at least one cash expenditure.

#### Create/Update ATM Withdraw



Property	Туре	Description	Required	Size	Other constraints
<b>Date Withdraw</b>	Date		Yes		
Initial Amount	Decimal		Yes		
Already Debited	Yes/No				

#### **Business rules:**

- When an ATM Withdraw is created, the cost is debited from the account.
- When an ATM Withdraw is updated, the old cost is credited to the account and the new cost is debited from the account.

#### Close ATM withdraw

Closing an ATM withdraw means that we won't be able to take any cash expenditures on it. It might not be zero as the cash expenditures are not precise.

# El 03 - Expenditure Listing (common features)

# Description

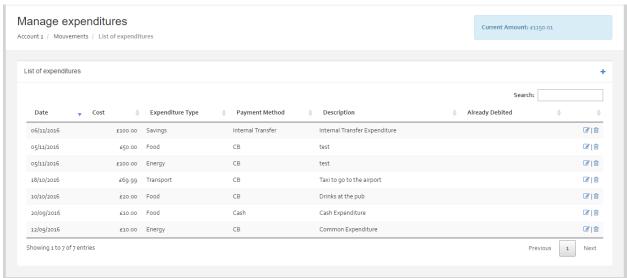
Depending on the payment method, the expenditure management might be different.

We distinguish 3 different expenditure strategies:

- Common expenditures: used for CB, Direct Debit and Transfer. Target is an account.
- ATM withdraw expenditures: used for Cash payment only. Target is an ATM withdraw.
- Internal transfer expenditures: used for Internal Transfer payment only. Source is an account. Target is another account.

In this first user case, only the common features will be described, then the different strategies are described in the following user cases.

#### List

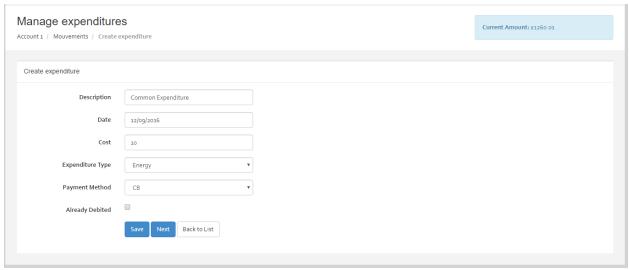


#### Available actions:

- Sort
- Create
- Update
- Delete (with confirmation).

# El\_04 – Expenditure Management (Common Expenditures Strategy)

#### Create



When an expenditure with payment method "CB", "Direct Debit" or "Transfer" is created, the cost is debited from the account.

#### Edit

In edit mode, we can change the payment type and as a consequence, the old target should be refunded before we debit on the new target.

If an expenditure with payment method "CB", "Direct Debit" or "Transfer" is updated to:

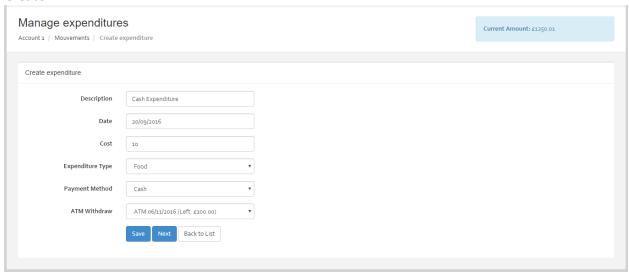
Common (CB, Direct Debit or Transfer)	ATM Withdraw (Cash)	Internal Transfer
Cost Has Changed  EI_04_R1  Current Account is credited by old cost.  Current Account is debited by new cost.	EI_04_R2  Current Account need to be refunded (old cost).  ATM Withdraw need to be debited (new cost).	EI_04_R3  Current Account need to be refunded (old cost).  Income created (Transfer) on Target Account.  Target Account need to be debited (new cost).

#### Delete

Deleting a common expenditure will credit back the current account.

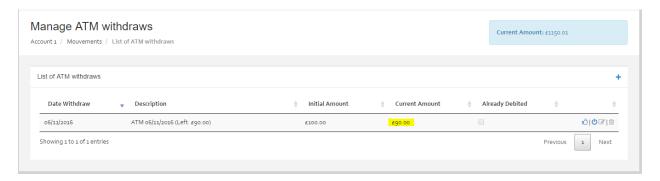
# El\_o5 - Expenditure Management (ATM Withdraw Strategy)

#### Create



When an expenditure with payment method "Cash" is created, the cost is debited from the selected ATM withdraw.

When this expenditure is added, the Current Amount is automatically updated for the selected ATM:



#### **Edit**

In edit mode, we can change the payment type and as a consequence, the old target should be refunded before we debit on the new target.

If an expenditure with payment method "Cash" is updated to:

Common  (CB, Direct Debit or Transfer)	ATM Withdraw (Cash)		Internal Transfer
EI_05_R1  ATM Withdraw need to be refunded (old	ATM Withdraw Has Changed	Same ATM Withdraw, Cost Has Changed	EI_05_R4  ATM Withdraw need to be refunded (old cost).
cost).  Current Account need to be debited (new cost).	EI_05_R2 Old ATM Withdraw need to be refunded (old cost).  New ATM Withdraw need to be debited (new cost).	EI_05_R3  ATM Withdraw is credited by old cost.  ATM Withdraw is debited by new cost.	Income created (Transfer) on Target Account.  Target Account need to be debited (new cost).

# Delete

Deleting an ATM withdraw will credit back the ATM withdraw.

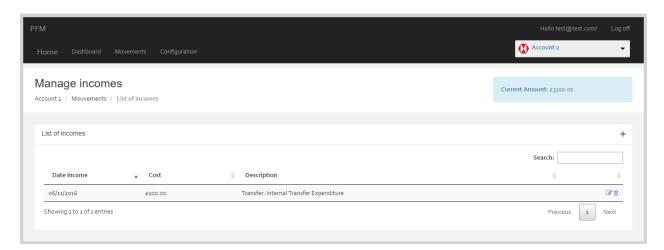
# El\_o6 – Expenditure Management (Internal Transfer Strategy)

#### Create

Manage expenditures  ccount 1 / Mouvements / Create expenditure				Current Amount: £1250.01	
Create expenditure					
Description	Internal Transfer Expenditure				
Date	06/11/2016				
Cost	100				
Expenditure Type	Savings	•			
Payment Method	Internal Transfer	•			
Internal Account	Account 2	•			
	Save Next Back to List				

When an expenditure with payment method "Internal Transfer" is created, the cost is debited from the account and the cost is credited to the selected internal account.

When this expenditure is added, an income is automatically added to the selected internal account:



#### **Edit**

In edit mode, we can change the payment type and as a consequence, the old target should be refunded before we debit on the new target.

If an expenditure with payment method "Internal Transfer" is updated to:

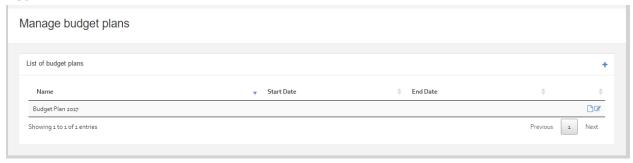
Common (CB, Direct Debit or Transfer)	ATM Withdraw (Cash)	Internal Transfer	
EI_06_R1  Target Account need to be refunded (old	Target Account need to be refunded (old cost).	Internal Account Has Changed	Same Internal Account, Cost Has Changed
cost).  Expenditure created (Transfer Cancel) on Target Account.  Current Account need to be debited (new cost).	Expenditure created (Transfer Cancel) on Target Account.  ATM Withdraw need to be debited (new cost).	EI_06_R3 Old Target Account need to be refunded (old cost). Income removed on old target account. New Target Account need to be debited (new cost). Income created (Transfer) on new target account.	EI_o6_R4  Target Account is credited by old cost.  Target Account is debited by new cost.

# Delete

Deleting an internal account expenditure should cancel the income to the selected target account and credit back the current account.

# BP\_o1: Budget Plan Management

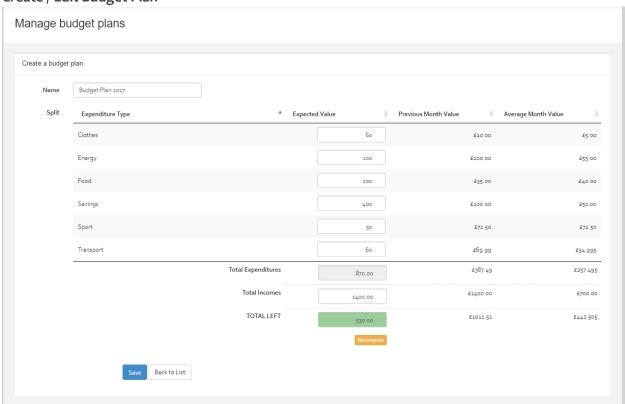
# List



# Actions available:

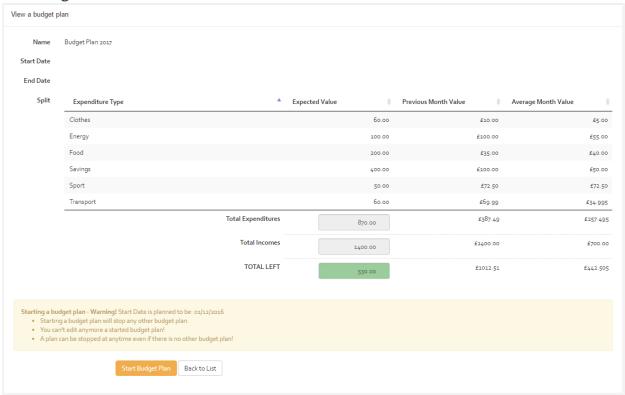
- View
- Edit

# Create / Edit Budget Plan



Property	Туре	Description	Required	Size	Other constraints
Name	Text	Budget Plan Name	Yes	50	
Split	Decimal	Expected Value for each	Yes		
		expenditure types			

# **View Budget Plan**



# Actions available:

- Start a Budget Plan
- Stop a Budget Plan