



# Business Case Engine



by prostoLogic

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# Overview

This mobile app was inspired by SAP business logic and the functional elegance of the HP-12C financial calculator. It is an autonomous part of Prostologic solution facilitating the financial analysis and simulation of business cases. It is designed and carefully engineered to boost the efficiency of business people, financial analysts, managerial accountants and anyone involved in financial assessment.

Most of the info processing (management accounting) can be structured. All structured processing can be transferred to a system, thus reducing flesh&bones in brick&mortar.

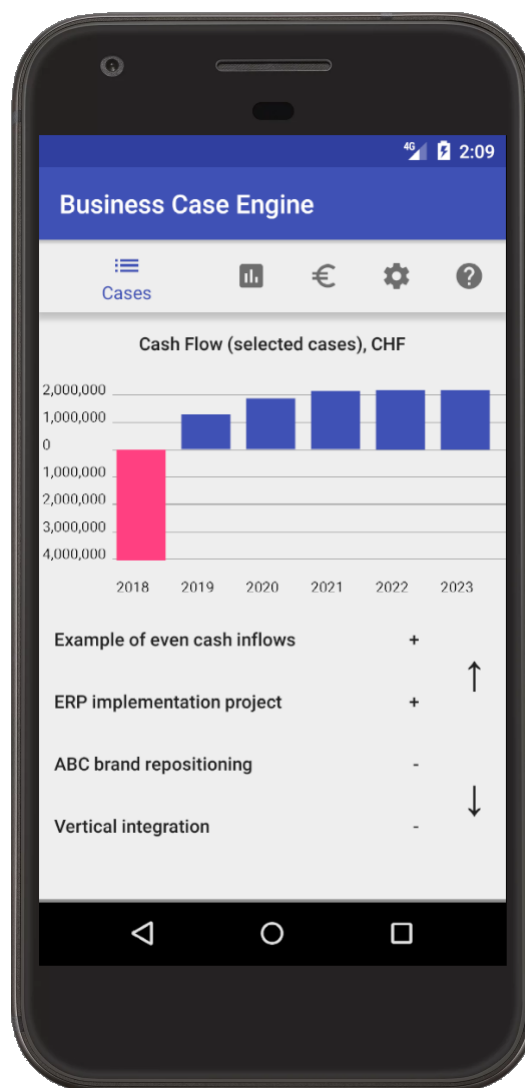
The basic premise is that any business development can be better understood if divided into simpler elements, which we call 'business cases'. These business cases normally are interdependent and might even overlap, but each has its own logic, some unique drivers, a clear starting date, and is represented by a set of fully balanced financial transactions.

Business analysis is divided in three sub-processes: 1) formulating meaningful cases, 2) analysis on a case level and 3) Grouping cases in coherent sets with impeccable narratives. The first sub-process is automated by 'DB crawler'. The 'Business Case Engine' or 'Ngn12' as its mobile version handles the second sub-process. 'Prostologic ANN' handles the third one.

Business cases tend to be complex, evolving in scope and time, with tricky interdependencies. Even the simplest business case consisting of a single investment with evenly increased sales volume as a return, when simply re-phased by a few months, creates variances all over the financials, impacting Revenue, COGS, Inventory, Operating Profit, Trade Receivables and Cash Flow with FX everywhere.

In this app, the project can be re-phased in one click and the tool will carefully pick all these variances for selected business cases versus any other reporting period and versus any other scenario. All data input is reduced to the absolute bare-bones minimum.

Version 1.0 is available on the Google Play Market under the names 'Business Case Engine' and 'ngn12'.



## Navigation

The no-frills smart-phone interface is carefully engineered for maximum convenience, efficiency and consistent performance on a broad range of Android devices.

All navigation is done by single clicking on words, numbers, icons or charts. There are no drop-down menus. Selection from a list of items is done by multiple clicking. For example, the selection of a desired currency is done by clicking on a displayed currency until it is as required.

All lists are revolving. Clicking ↑ or ↓ pushes the list by one line up or down.

The top bar options lead to the main domains:

- 'Cases' to review or edit individual business cases
- 'Analysis' to run variance analysis for a selection of business cases
- 'Rates' to maintain currency exchange rates
- 'Setup' to manage master data, e.g. change reporting currency, chart of accounts, currencies, etc.

- 'Help' brings up a relevant section of this user guide

Most changes after a single click are immediately recorded in the data base and instantly impact the entire application as all processing is on-line (OLAP).

There are two exceptions performed in two clicks due to their broad impact: 1) change of reporting currency and 2) re-set of the data base to original 'as purchased' data.

There is no un-do button - all changes are irreversible. However, the application is designed in a way that any changes other than the two described above, have a limited scope, so while they cannot be un-done, they can be relatively easily re-done.

## Business Cases

### List of Business Cases

'Cases' on the top bar opens a list of business cases (pre-filled with a few examples).

Clicking on a case will open it for review and editing.

On the right-hand side, '+' means that the case is included in the Analysis, clicking on it will exclude the case. The chart displays total cash flow for all cases included in the Analysis, i.e. with, '+' or '-' on the right-hand side.

A business case cannot be deleted directly from the list. Deleting is done on scenario and item level. After all items in all scenarios are deleted, the case will be deleted automatically. If all cases are deleted, then there is a 'back to original set-up' option in the 'Settings'.

To delete a business case, click on it and then go to the 'delete' option of the bottom menu.

A new business case can be created only by copying an existing scenario, which can be then completely re-designed.

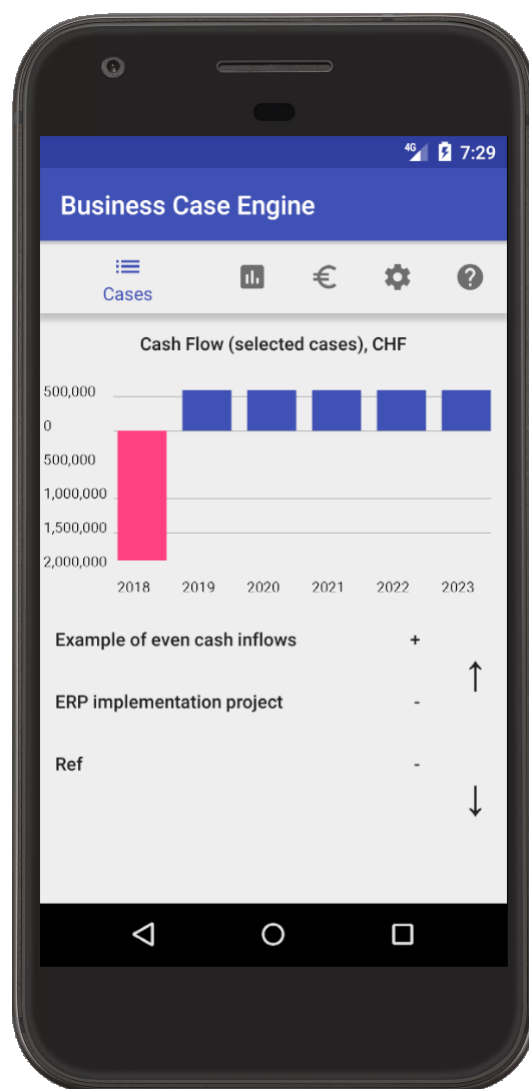
To create a new business case, click on any of the existing cases, then go to the 'copy' option of the bottom menu, pick a desired scenario and click 'NEW CASE'.

To rename a business case, click on it and then go to the 'copy' option of the bottom menu.

Application is pre-filled with two cases:

1. 'Even cash inflows' with two scenarios – Apr-2018 and May-2018.
2. 'ERP implementation' with Mar-2018 scenario.

Clicking on a case opens it for review and editing with the following bottom bar options: Ratios, Financials, Edit, Copy, Delete.



## Ratios

NPV and IRR calculations are performed strictly on a cash basis with arithmetic as in Excel, e.g. 2,000,000 CHF investment followed by 5-year 600,000 CHF revenue corresponds to IRR of 15.2% and 597,686 CHF NPV at a 5% discount rate over a 6-year period (5 revenue years plus a year of investment).

Similarly, the pay-back period is the period when the cumulated total of cash flows becomes zero:

- 2,000,000 CHF in July 2018.
- 50,000 CHF a month from January 2019 to December 2023, therefore 40 months to earn 2,000,000 CHF, i.e. the break-even period is April 2022.
- April 2022 - July 2018 = 3 years + 9 months.

IRR over 60% is indicated as '> 60 %'.

IRR below 0.01% is indicated as '< 0.01 %' if positive and as 'N/A' if negative.

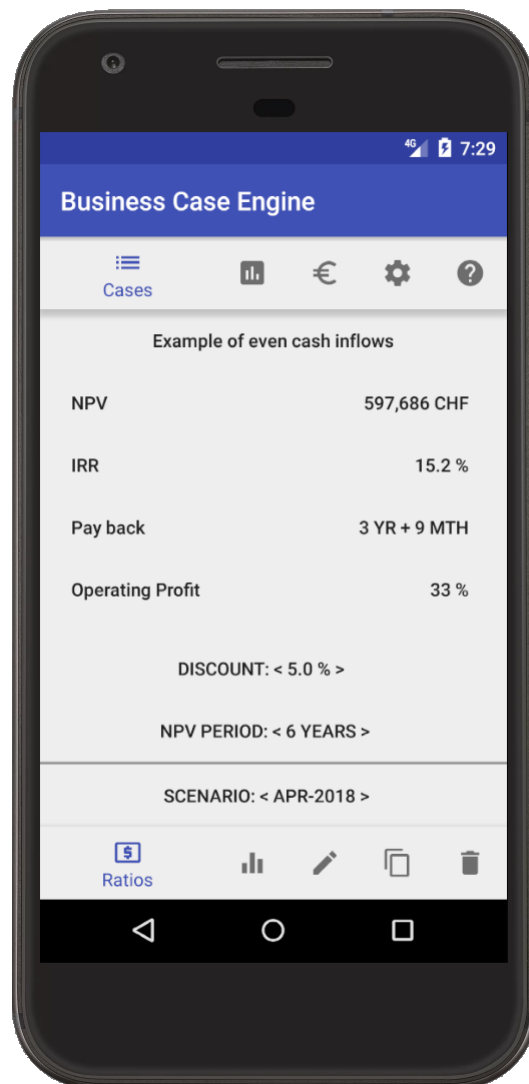
A pay-back period over 10 years is indicated as '> 10 YR'.

DISCOUNT: Clicking on '<' / '>' will increase / decrease the NPV discount rate by a minimum step of 0.05% until the discount rate is 0%. Multiple clicking increases the step to 0.5%.

NPV PERIOD: Clicking on '<' / '>' will increase / decrease the NPV discount rate by one year until it is 11 years maximum or 1 year minimum.

SCENARIO: Clicking on '<' / '>' switches among existing scenarios if there are several of them.

To go back to the list of Business Cases, just click 'Cases' on the top bar.



## Financials

Clicking on this option displays the trial balance of the business case.

Clicking ↑ or ↓ will rotate entire chart of accounts. Individual accounts can be excluded from the report (still remaining in the data base) and reporting currency can be changed as explained in the section 'Settings' below.

There are five sub-totals:

- 'Cost of goods sold' – from 'Sales' to 'Other COGS'
- 'Trading Profit' – from 'Sales' to 'Other trading'
- 'Operating Profit' – from 'Sales' to 'Other operating'
- 'Profit before taxes' – from 'Sales' to 'Financial expense'
- 'Profit for the period' – from 'Sales' to 'Taxes'

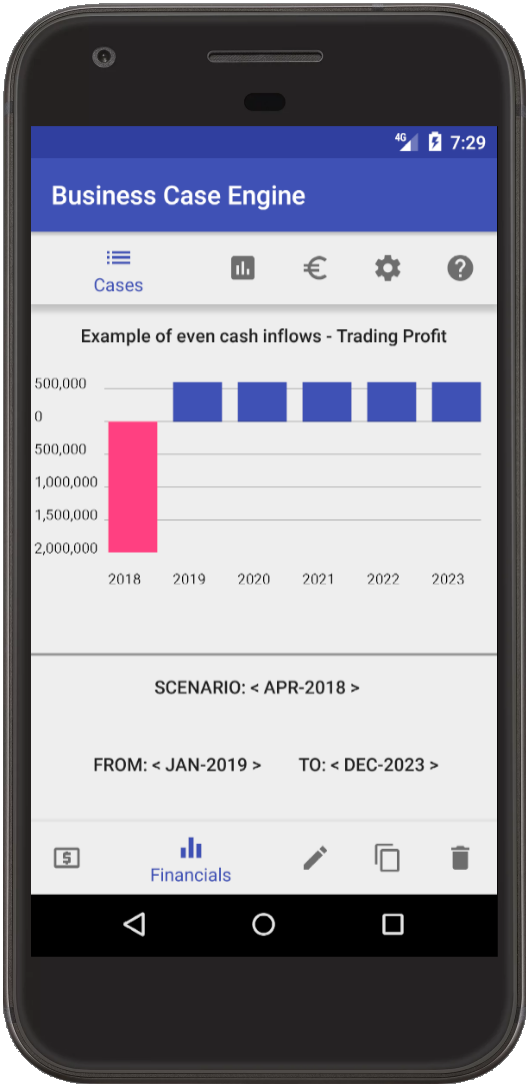
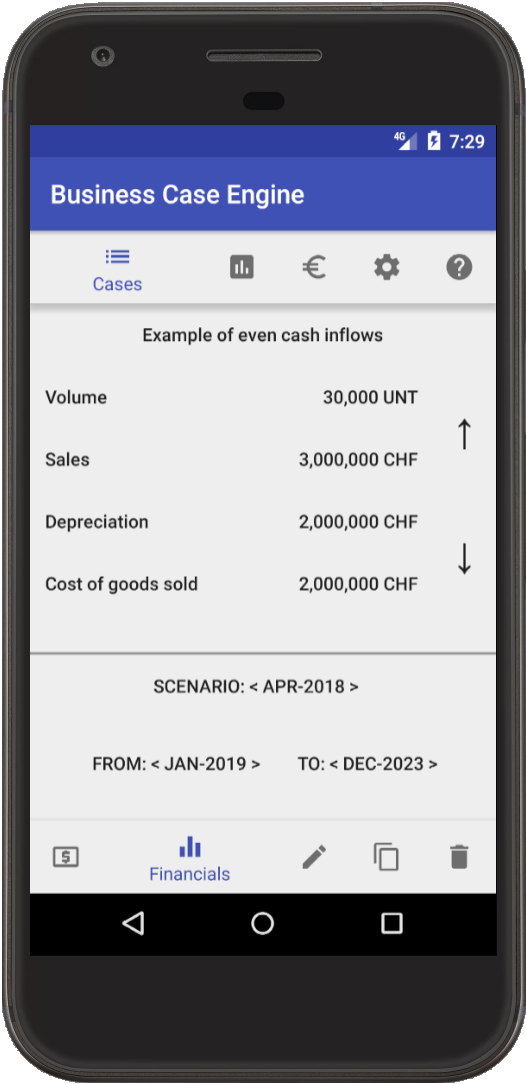
'Sales', 'Trading Profit', 'Operating Profit', 'Profit before taxes' and 'Profit for the period' are reported with reversed signs, i.e. if they are Cr, they are displayed as positive amounts and vice-versa.

SCENARIO: Clicking on '<' / '>' switches among existing scenarios.

FROM and TO changes the time basis for the displayed values. For efficiency of navigation, the first few clicks change a period by one month, then it is accelerated to a quarter and then to a year. Naturally, the system prevents 'TO period' getting smaller than 'FROM period'.

Clicking on any account line opens a chart view for that account with yearly, quarterly or monthly scaling depending on the length of the selected period range.

Clicking on the chart brings back the trial balance.



## Items

A business case can be maintained on the 'header', 'scenario', 'item' and 'sub-item' levels. All changes after a single click are immediately recorded in the data base.

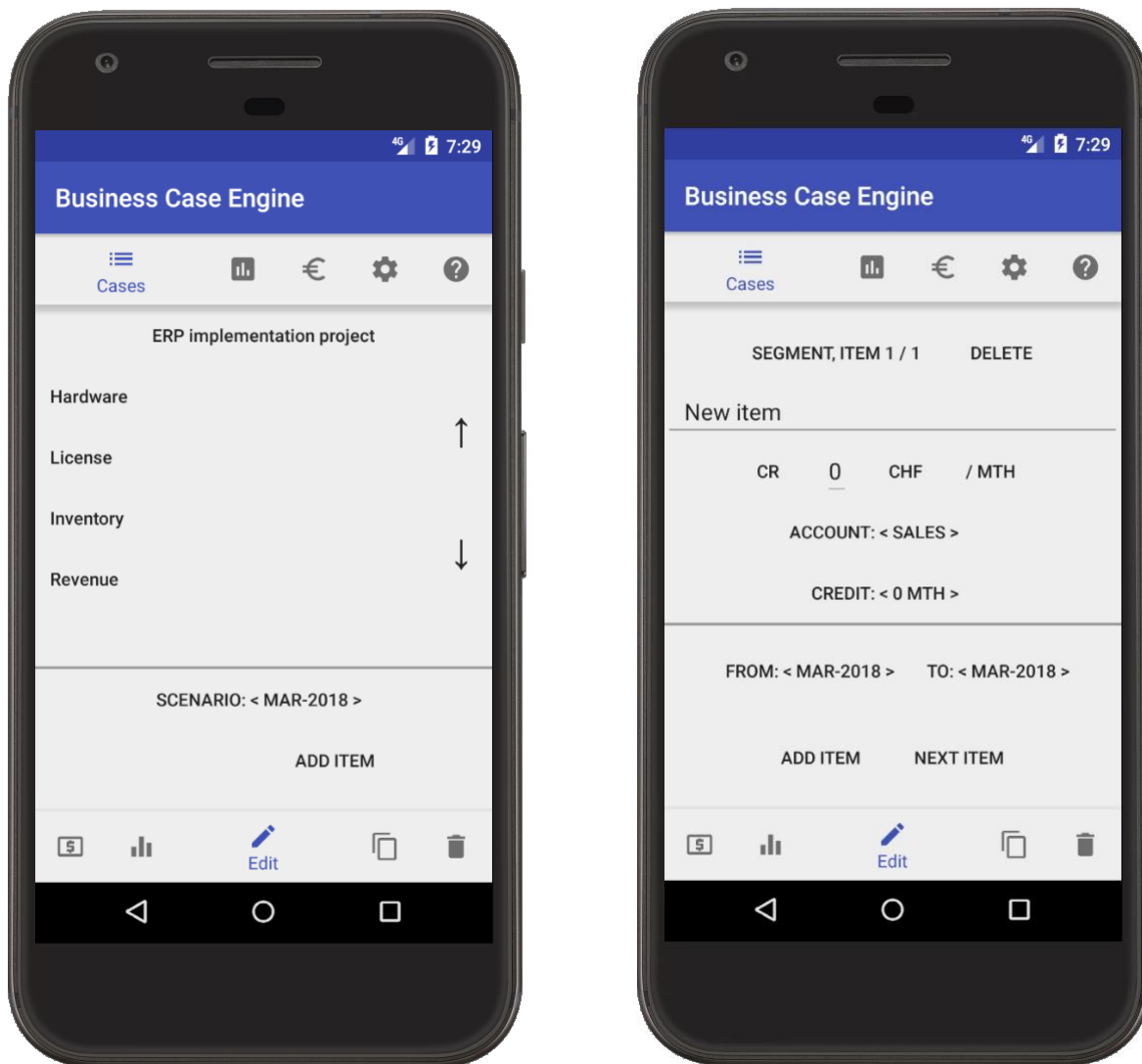
Generally, a business case consists of several items, for example an ERP implementation project might include:

1. Hardware (asset)
2. Recurring license maintenance (expense)
3. Inventory reduction (expense)
4. Sales increase (segment) - includes revenue, GOGS and other subitems

Clicking on an item displays the first sub-item assigned to this item and enables re-naming of the item.

SCENARIO: Clicking on '<' / '>' switches among existing scenarios with their individual lists of items.

ADD ITEM: When clicked, adds a 'New item' to the list.



There are three types of items:

- 'Segment' broadly corresponds to SAP profitability segment and is normally structured around sales volume
- 'Asset' broadly corresponds to SAP real internal order with a settlement to an asset
- 'Expense' represents any other financial transactions

## Sub-items

On the list of items, clicking on an item displays the first sub-item assigned to this item and enables re-naming of the item.

A new item is of 'Segment' type by default. If there is only one sub-item (header: ITEM 1/1), the document type can be changed by clicking directly on the current document type: 'SEGMENT', 'EXPENSE' or 'ASSET'. If there are more than one sub-item, the document type cannot be changed.

Document types define different processing as described below. This section covers common features.

DR / CR: The displayed amount is always positive – actual signage is managed by clicking on DR or CR (except for Volume that is always positive). The proposed default option is configured in the 'Settings'.

An item can include sub-items in various currencies. The selection of a desired currency is done by clicking on a displayed currency until it is as required.

Clicking on MTH will display the amount multiplied by 12, representing the full year. It doesn't change the record in the data base, which is always per month, rounded to the currency units without any decimals. 1000 CHF / YR will be recorded as 83 CHF / MTH, which corresponds to 996 CHF / YR.

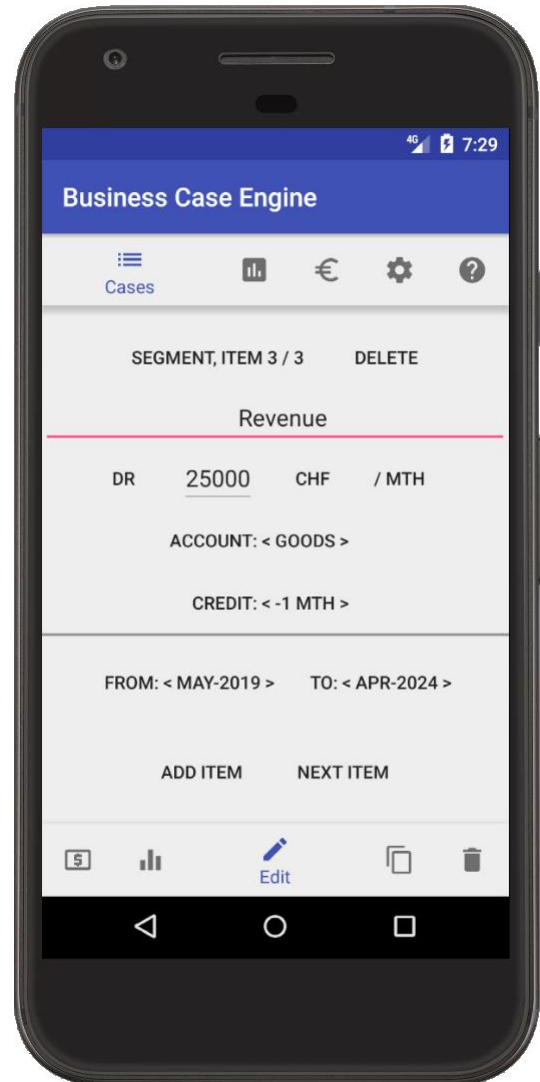
DELETE: deletes the sub-item. When the last sub-item of the item is deleted but there are other items in the scenario, the application opens the item list. If there are no more items in the scenario, the application opens the case list.

ACCOUNT ('Segment' and 'Expense' types): Posted values are assigned to the selected account and to the off-set account configured in the 'Settings'. Different sub-items within the same item cannot be assigned the same account. No sub-item can be assigned directly to the 'Cash' account or any sub-total (e.g. 'Operating Profit') account.

CREDIT period ('Segment' and 'Expense' types): There will be another posting to the off-set account and to the Cash account. The off-set account will not be cleared - an FX variance (if any) will remain on the off-set account.

NEXT ITEM: displays the next sub-item if there is any.

ADD ITEM: When clicked, creates a new sub-item with zero amount assigned to the next account and displays it for further editing.

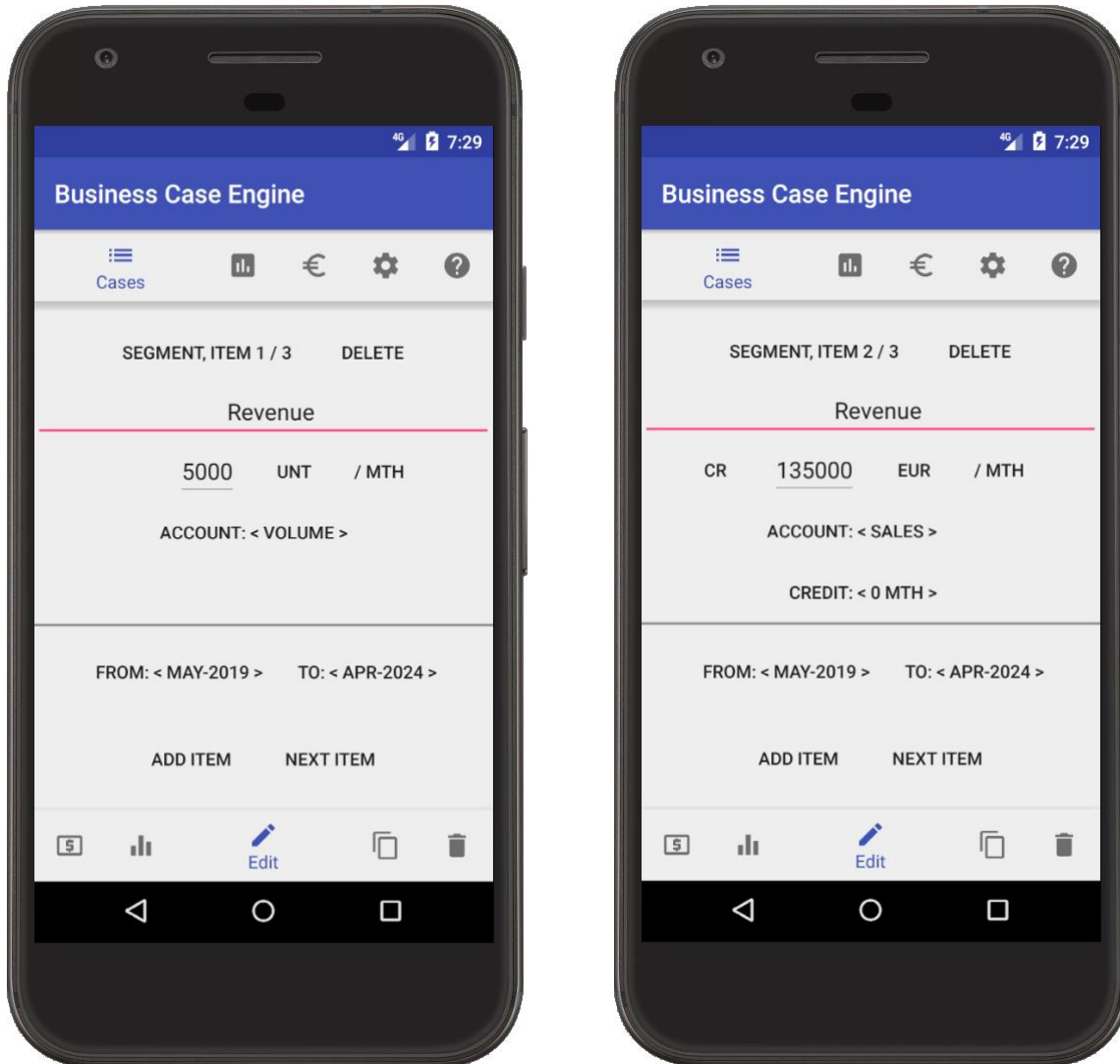




## Segments

'Segment' normally includes volume, sales, cost of goods sold, promotion sub-items with their respective credit periods for cash collection. E.g. 2m EUR sales with 1m EUR cost and 2 months credit period in January-December will result in the same year in 24m EUR sales, 12m profit and 10m cash flow.

A 'segment' can include sub-items in various currencies, e.g. in the above example, cost might be in CHF or GBP while sales is in EUR.



For a 'segment', periods FROM and TO are maintained on an 'item' level, so changes in any of the sub-items are automatically applied to all other sub-items.

Volume changes (by the factor less than 10) are considered 'organic growth' and automatically trigger proportional increase in the amounts on other sub-items of the same item. For example, if the VOLUME of 5000 UNT gets increased to 5050 UNT, the SALES amount will be automatically increased from 135000 EUR to 136350 EUR. Volume increase/decrease by the factor of 10 or more are considered too big for 'organic growth' and don't trigger amount recalculation.

Volume is always positive, so there is no DR / CR option. If there is no explicitly defined Volume, in the calculations it is assumed being 1. Deleting the Volume sub-item doesn't impact other sub-items.

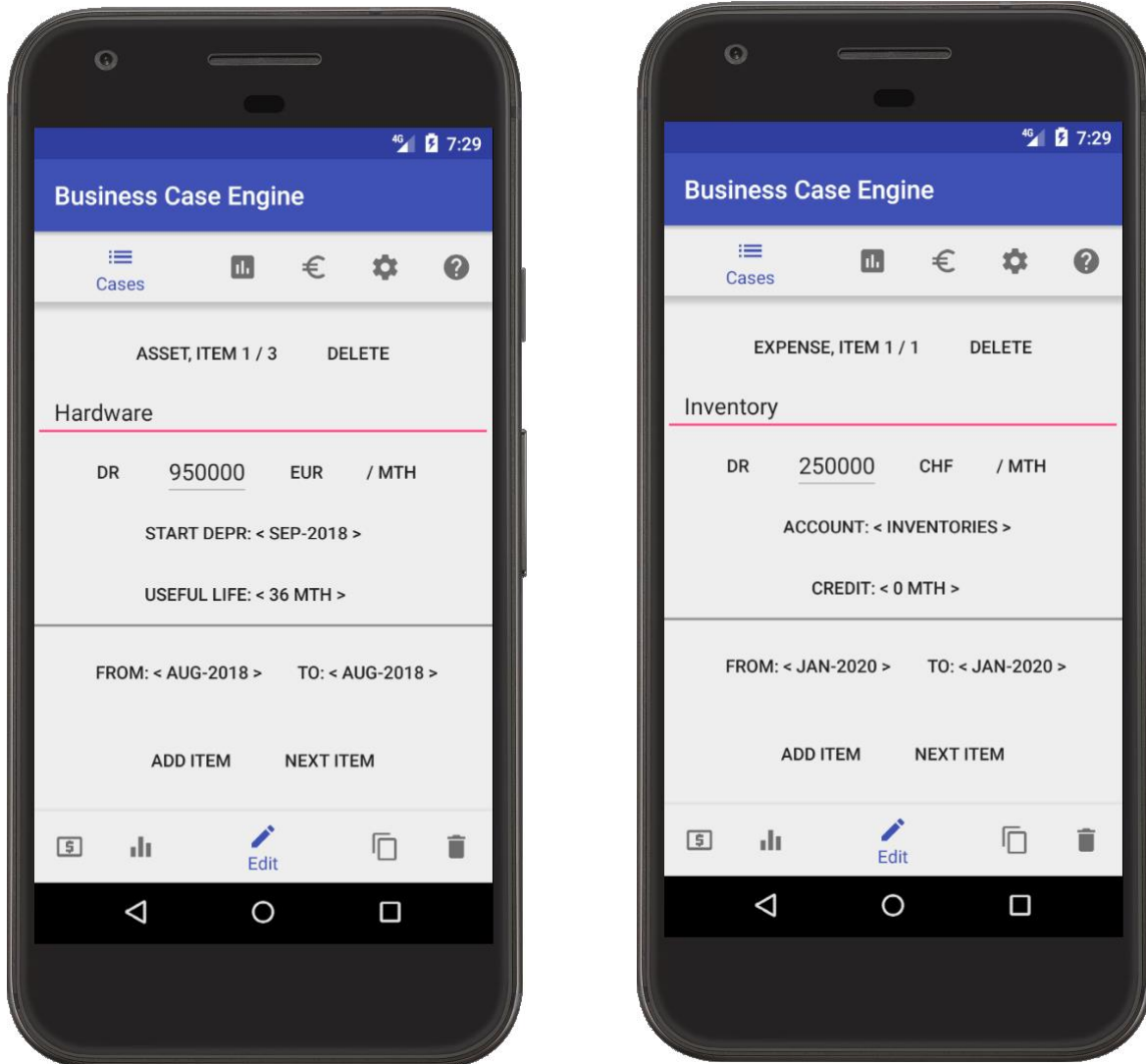
In addition to '/MTH' and '/YR', in case of 'segment', the amount can also be entered and displayed per unit, 10 units or 100 units.

## Assets and Expenses

'Asset' item is to enter amounts that will be assigned to the 'Fixed Assets' account (off-set is 'Cash') and then depreciated as a single asset. FROM/TO periods are defined on a sub-item level

An investment can be done over several periods and can include sub-items in various currencies.

For an 'asset', START DEPR (depreciation) and USEFUL LIFE are maintained on an 'item' level, so changes in any of the sub-items are automatically applied to all other sub-items. Posted accounts ('Fixed Assets', 'Cash', 'Depreciation', 'Accumulated Depr') are hard-coded and cannot be changed. Any adjustments to the posting logic have to be done through 'Expense' item.



'Expense' item represents any other transactions, including a one-off or recurring procure-to-pay process with a selection of account (except for 'Volume'), currency of transaction, credit period and FROM/TO periods on a sub-item level.

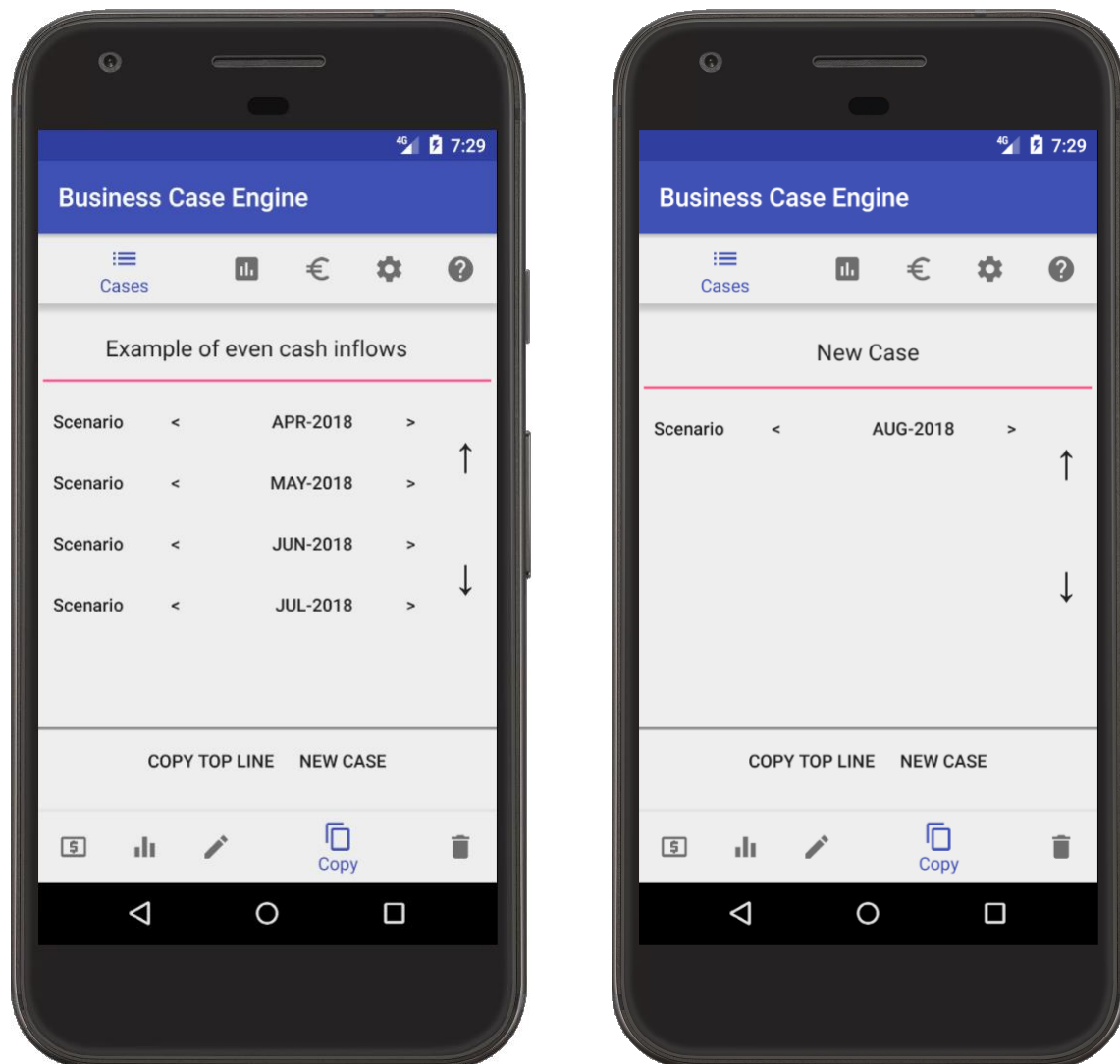
## Copy, change and delete scenario, create new business case

Scenarios can be changed, copied within the same business case or copied to a newly created business case. Also, 'copy' option of the bottom menu enables re-naming of the selected business case.

Clicking '<' / '>' shifts the scenario by one period if that period is vacant.

COPY TOP LINE makes a copy of the top scenario to the same business case, assigning it to the next period slot if it is vacant.

NEW CASE creates a new business case and makes a copy of the top scenario to that case. It is the only way of creating a new business case – it can be created only by copying an existing scenario of an existing business case, which can be then completely re-designed.



A business case normally evolves in time. For example, the capex amount in the Feb-2018 scenario was CHF 50,000 while in the May-2018 scenario it was estimated more precisely at EUR 46,500.

Also, in the earlier scenario, the capex was expected in Sep-2018, but it was later advanced to Aug-2018.

In this example, the May-2018 scenario would be created as a copy of the Feb-2018 scenario with the three changes in the 'Capex' item: amount, currency and period.

Deleting is done on scenario and item level. After all scenarios are deleted, the case will be deleted automatically. If all cases are deleted, then there is a 'back to original set-up' option in the 'Settings'.

# Variance Analysis

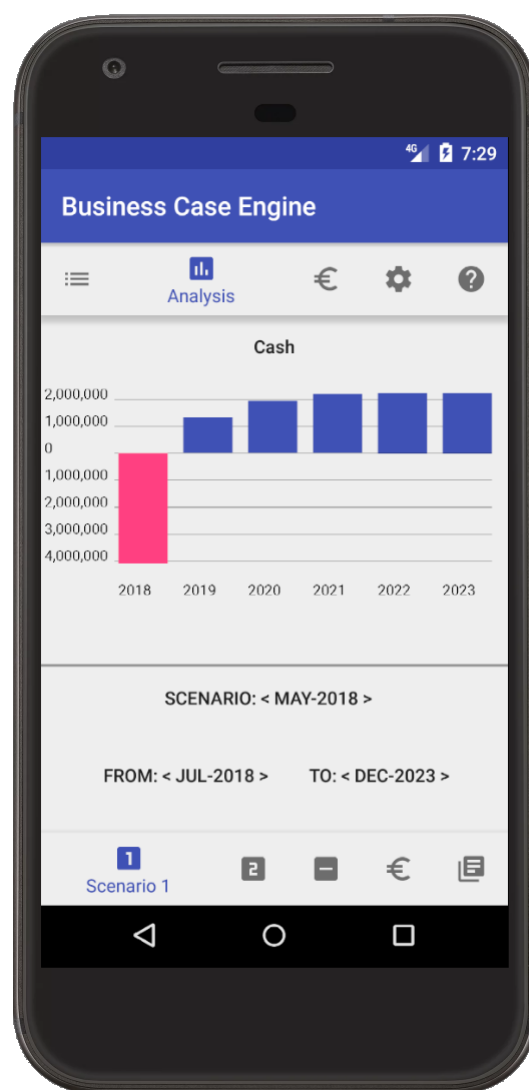
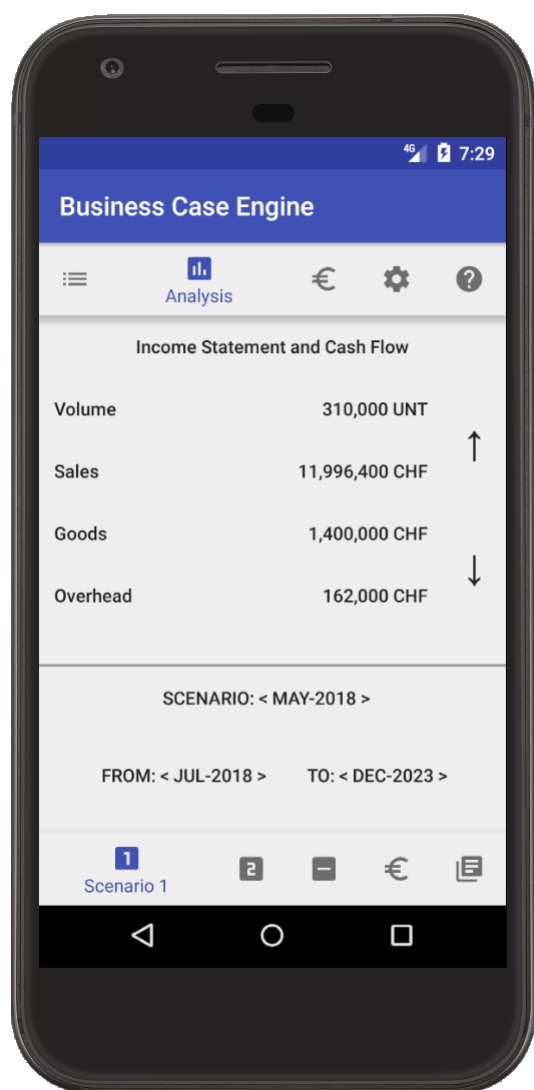
The financials include all selected business cases.

There are two key parameters: Scenarios and Periods.

Time is measured in months (periods). 'Period from' and 'Period to' are conveniently inter-dependent.

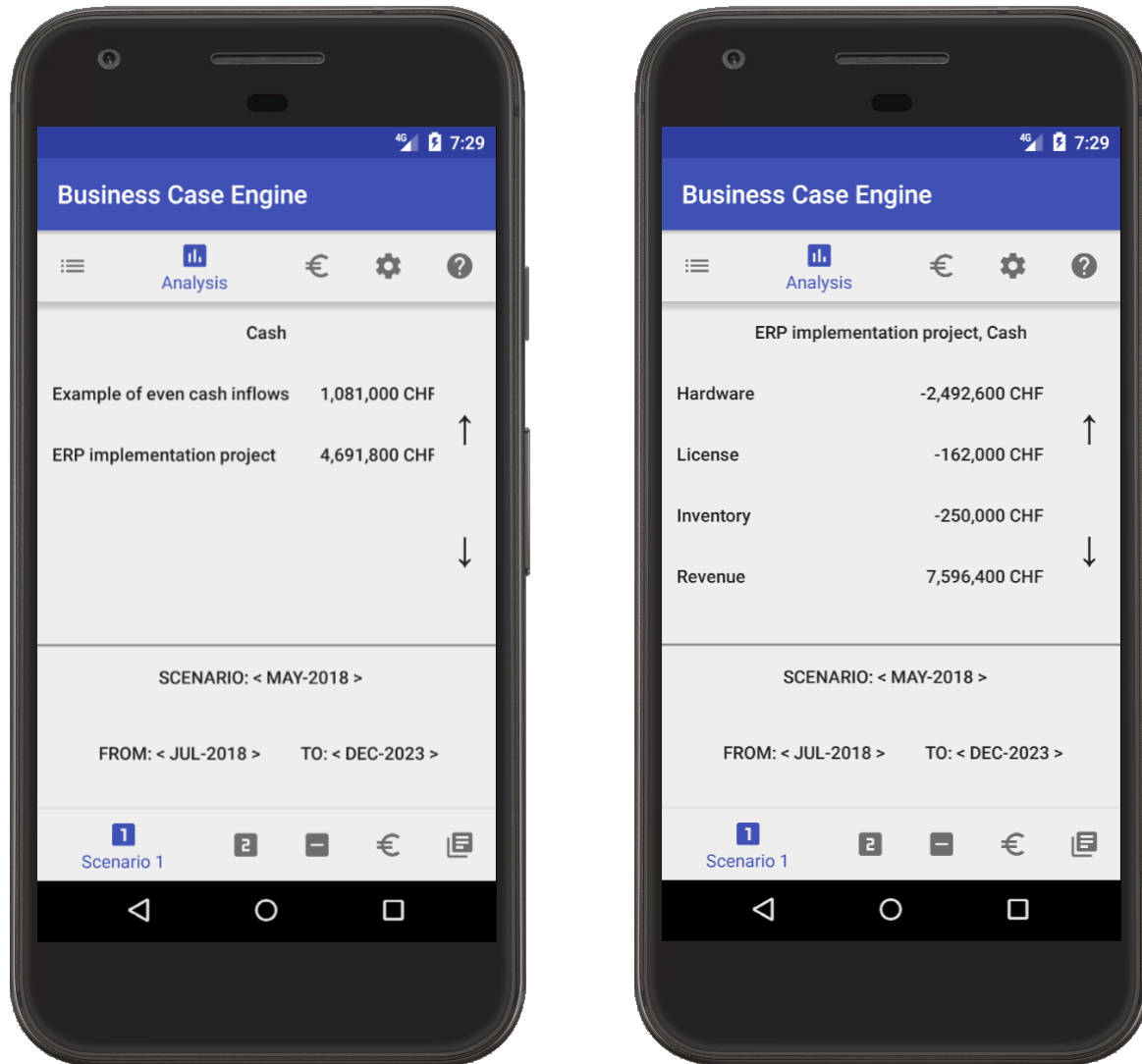
1. When changing 'Period from', the system will change 'Period to' in locked step.
2. 'Period to' cannot be earlier than 'Period from', so 'Period from' will be adjusted automatically.
3. Changing Scenario 1 'Period to' will change Scenario 2 'Period to' in locked step so the compared period ranges are of the same size.

Clicking on an account (first column) opens a chart view for the selected account. Clicking on the chart returns the table view.



Clicking on an amount drills it down per business case.

Further clicking on an amount drills it down by item.



A scenario derives the latest XR preceding the scenario. For example, if there are three rates with validities Feb-2018, Apr-2018 and June-2018, then the May-2018 scenario will use the first two rates, but not the third one.

Variance analysis compares two scenarios: scenario 1 versus (minus) scenario 2.

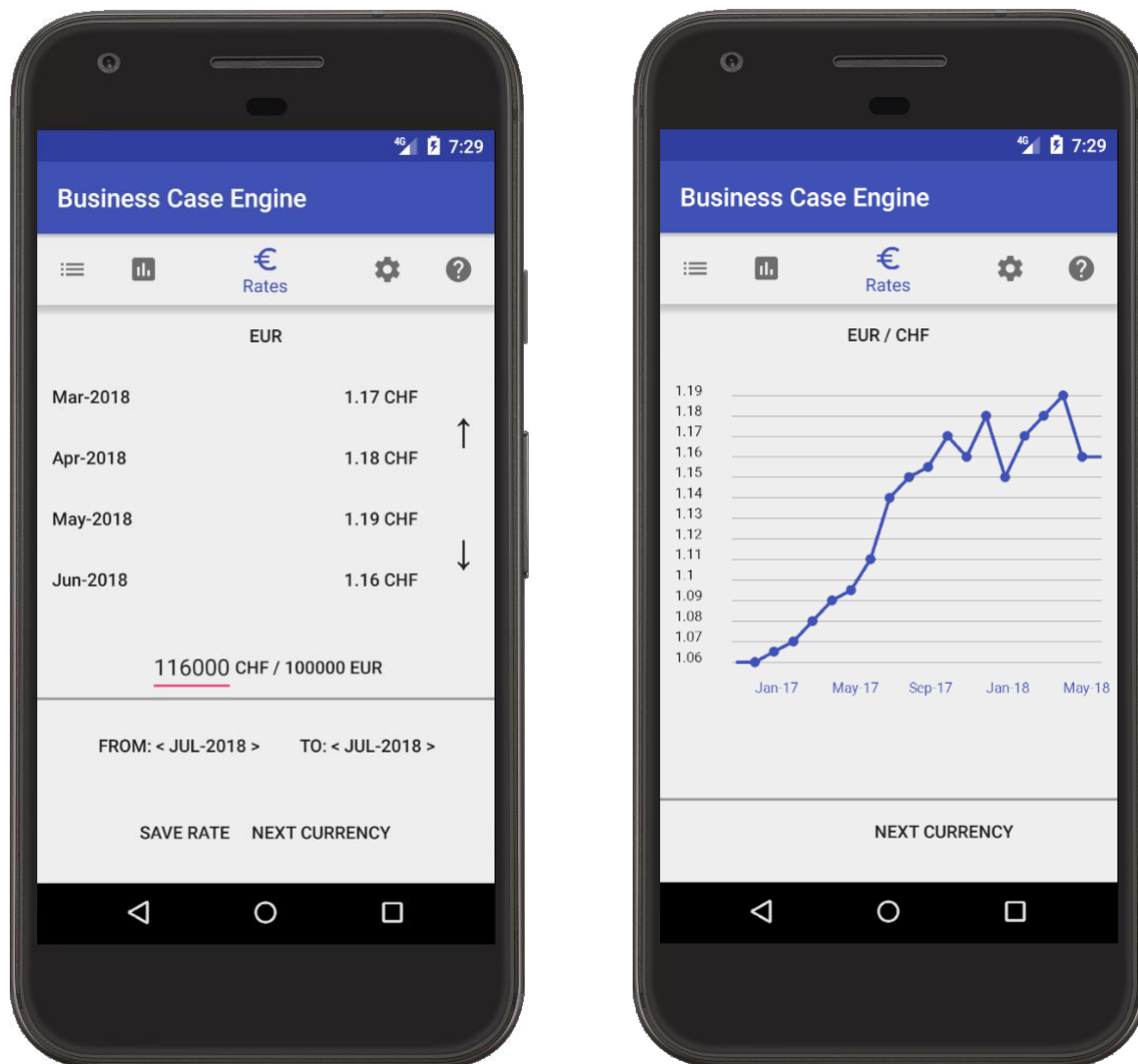
FX variance compares scenario 1 at scenario 1 currency rates to scenario 1 at scenario 2 currency rates.

Purchase price variance (PPV) is a difference between total variance and FX.

# Foreign currency valuation

Exchange rates are defined versus the Reporting currency (direct method only) on a monthly basis. Reporting currency can be changed in the Settings as explained below.

Clicking on any line opens a chart view. Clicking on the chart brings back the table view.



To change any exchange rate value or create a new record, select the wanted period range (all existing rates within the range will be deleted), input the wanted value per 100'000 units of the reporting currency and click 'SAVE RATE'. The value cannot be below 0,001 (input below 100) or above 1000 (input above 100000000).

NEXT CURRENCY displays exchange rates for the next currency. There might be maintained up to 20 currencies in the system.

A scenario derives the latest XR preceding the scenario. For example, if there are three rates with validities Feb-2018, Apr-2018 and June-2018, then the May-2018 scenario will use the first two rates, but not the third one.

Realized FX is not posted and open items are not cleared.

# Settings

## Chart of Accounts

Account name can be adjusted directly, maximum length – 25 characters.

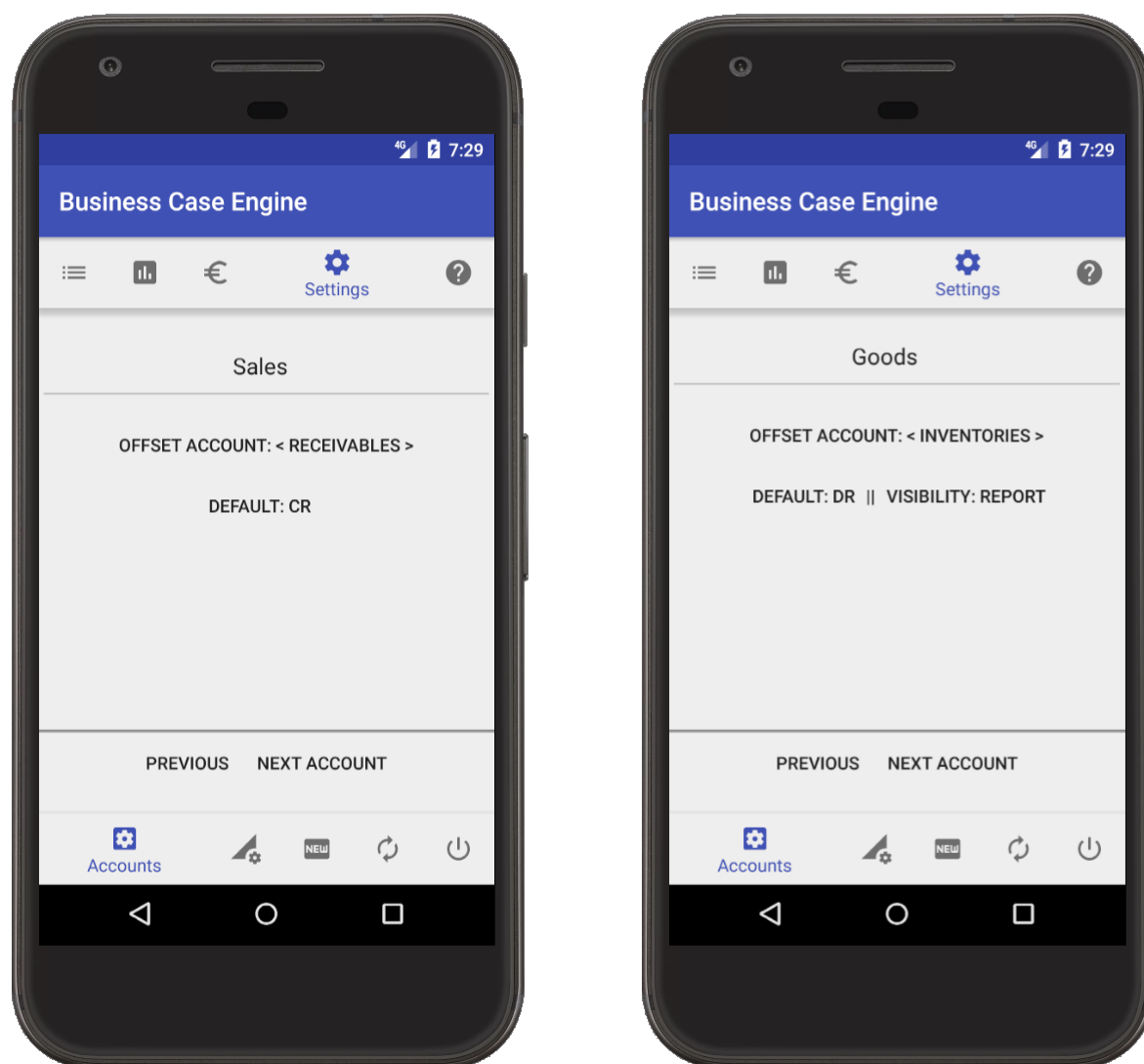
OFFSET ACCOUNT: default offset account. Clicking '<' / '>' will replace the offset account with the previous / next one from the chart of accounts. For 'Sales', a natural offset account is 'Receivables', as maintained in this example.

DEFAULT: DR / CR: Default proposed for a new item. In the example of 'Sales', it is 'CR' as the sales amount is normally on the Cr side. In the case of 'Volume' account, the amount is always positive, so there is no Dr/Cr selection.

VISIBILITY: REPORT / HIDE: Whether the account will be displayed in Financials and proposed for new sub-items and as an offset account. 'Sales', 'Operating Profit' and 'Cash' accounts cannot be hidden.

PREVIOUS: Displays the previous account of the chart of accounts.

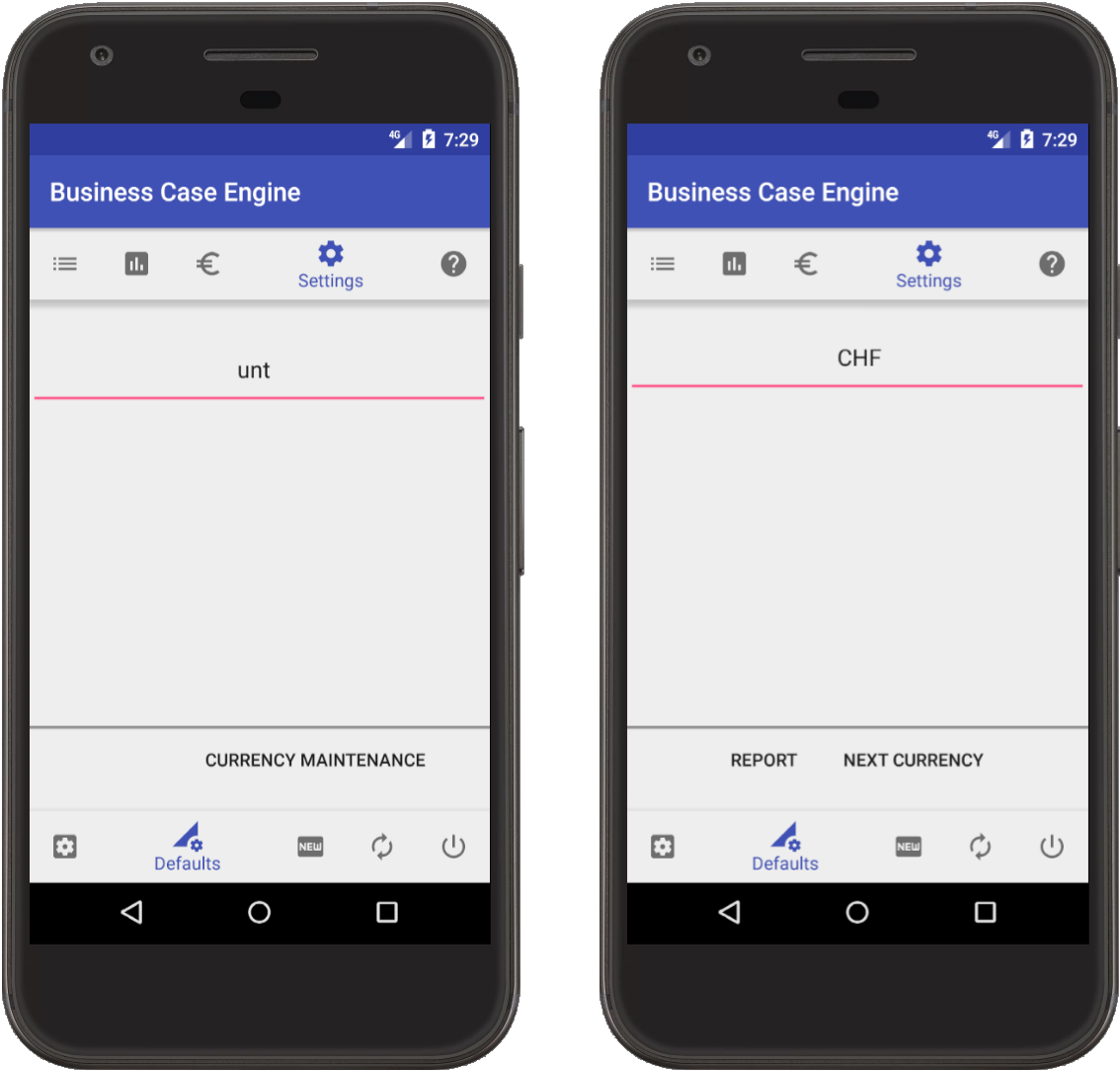
NEXT: Displays the next account of the chart of accounts.



## Currencies and Quantity Units of Measurement

This setting enables changing the name of units for Volume account. The name cannot be longer than 5 characters, any longer string will be chopped down to 5 characters.

CURRENCY MAINTENANCE: go to maintenance of currencies.



REPORT or HIDE: Whether the currency will be proposed for sub-items and for XR maintenance.

NEXT CURRENCY: Displays the next currency. The maximum number of currencies is 20.

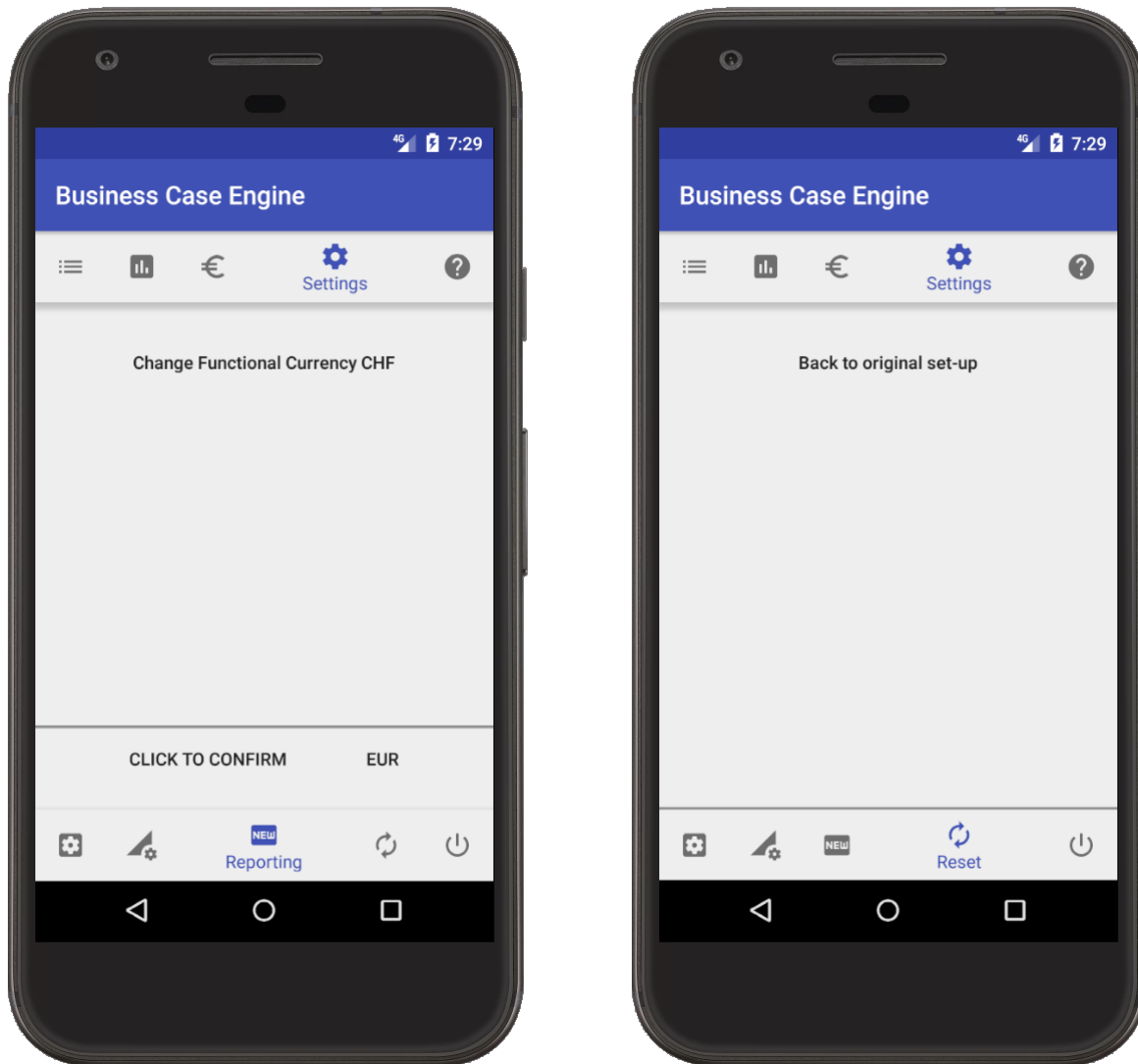


## Reporting Currency

When the Reporting (aka Functional) currency changes, all exchange rates are re-calculated.

The reporting currency is changed in two steps:

1. Select the new reporting currency by clicking directly on the currency.
2. CLICK TO CONFIRM.



## Back to original set-up

Clicking on 'Back to original set-up' deletes the current transactional, XR and other data bases and replaces them with the data supplied at the purchase of the app on Google Play Market. It is irreversible.

## Close application

Simply closes the application.

The same time, it is totally fine to close the application in any other way – no data will be lost even if the smartphone is shut-down or restarted while the application was running.

# Use cases

## Even Cash Inflows in Reporting Currency

Calculate the net present value of a project which requires an initial investment of CHF 2,000,000 and it is expected to generate a cash inflow of CHF 600,000 each year for 5 years. Assume that the salvage value of the project is zero. The target rate of return is 5% per annum. Reporting currency – CHF.

### Solution

We have,

Initial Investment = CHF 2,000,000

Net Cash Inflow per Year = CHF 600,000

Number of Years = 5

Discount Rate per Year = 5%

Net Present Value = CHF 600,000 × (1 - (1 + 5%)<sup>-10</sup>) ÷ 5% - CHF 2,000,000 ≈ CHF 597,686

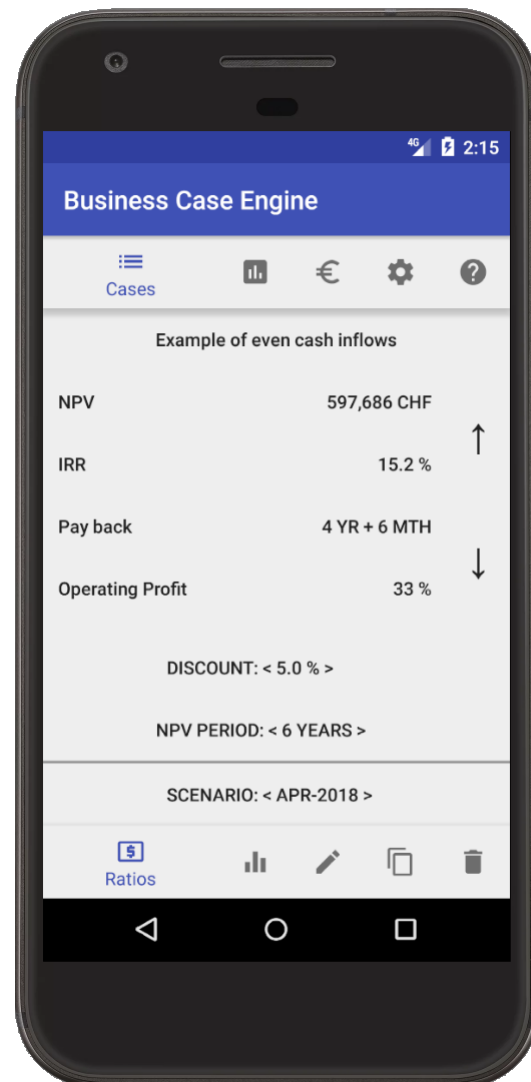
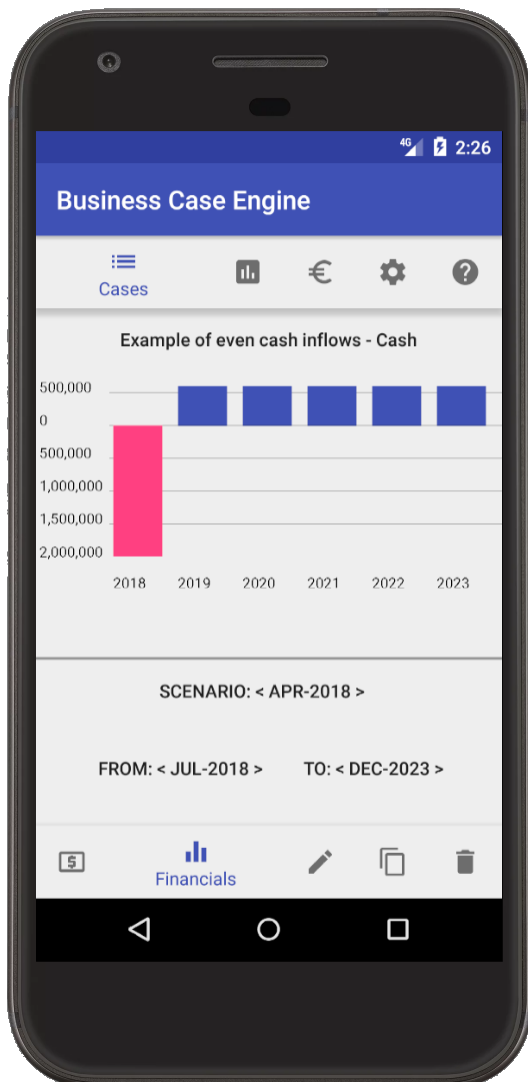
### Engine solution

Create a new business case by copying any existing scenario: Cases → Select → Copy → New Case

Delete existing items

Add item → Asset → 2000000 → CHF → Jul-2018

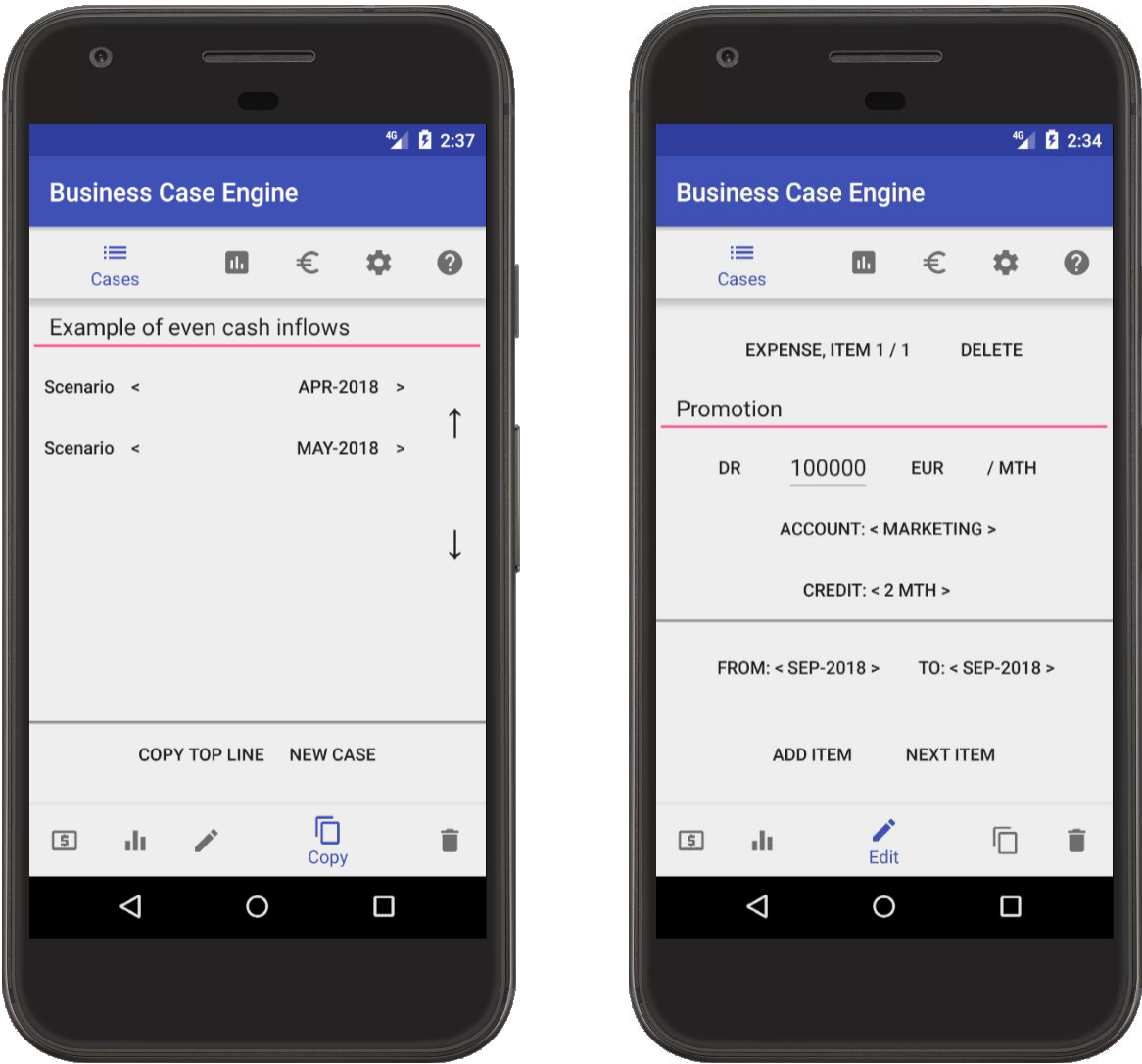
Add item → Segment → 600000 → CHF → /YR



# Flows in Foreign Currency

As a further development of the above scenario, capex was reduced by CHF 200,000 and there was added EUR 100,000 marketing expense.

To track this development, the above was recorded as a new scenario: May-2018.



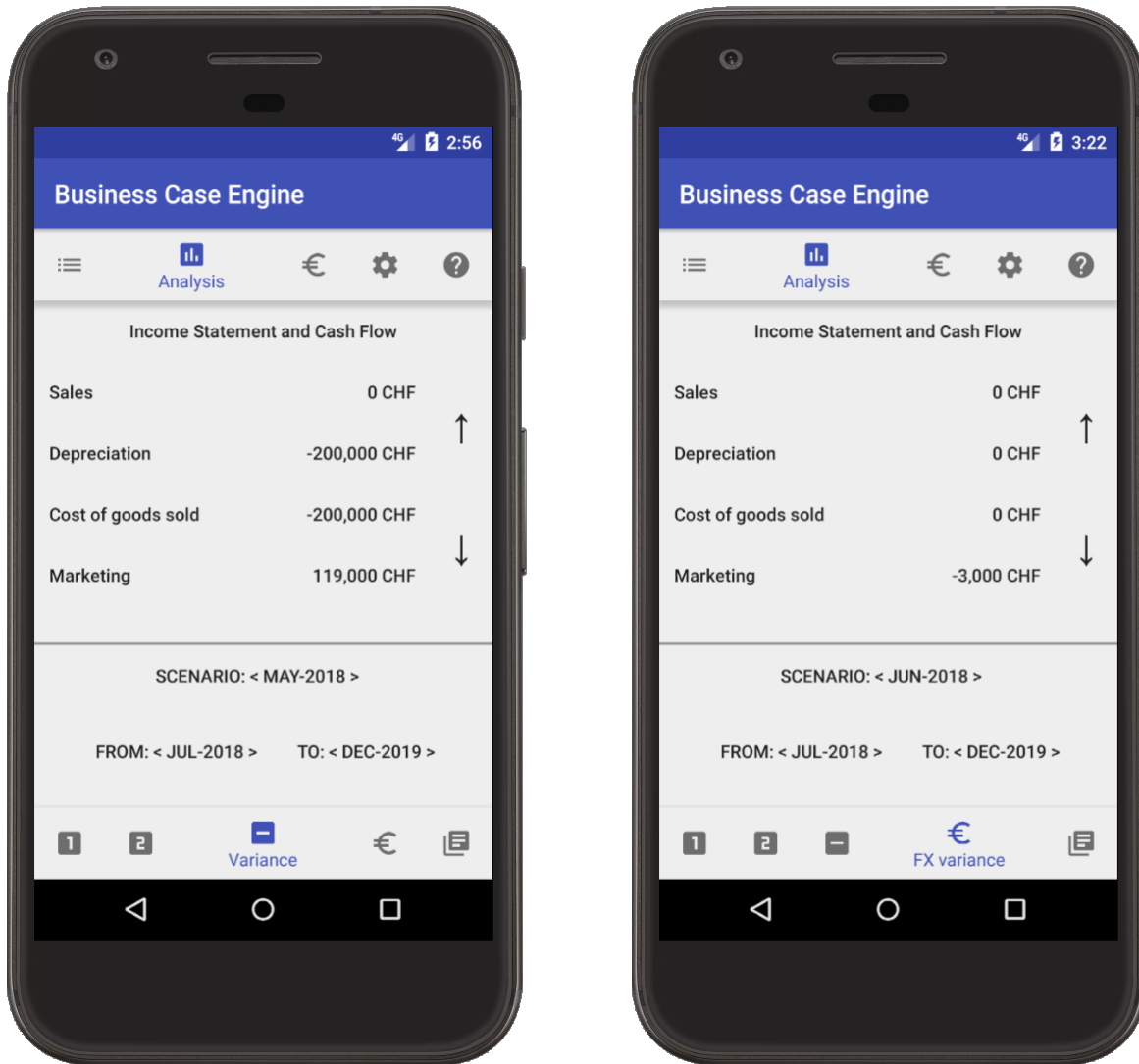
Exchange rates are defined versus the functional currency. When the functional currency changes, all exchange rates are re-calculated.

A scenario derives the latest XR preceding the scenario. For example, if there are three rates with validities Feb-2018, Apr-2018 and June-2018, then the May-2018 scenario will use the first two rates, but not the third one.

Variance analysis can be performed in the reporting currency on account, business case or item levels.

Variance analysis compares two scenarios: scenario 1 versus (minus) scenario 2.

- FX variance compares scenario 1 at scenario 1 currency rates to scenario 1 at scenario 2 currency rates.
- Purchase price variance (PPV) is a difference between total variance and FX.



Please, note that only Apr-2018 and May-2018 scenarios were created, however, the system implicitly extends the most recent scenario to any other scenario applying the appropriate exchange rates, in this case – Jun-2018.

Time is measured in months (periods). 'Period from' and 'Period to' are conveniently inter-dependent.

- When changing 'Period from', the system will change 'Period to' in locked step.
- 'Period to' cannot be earlier than 'Period from', so 'Period from' will be adjusted automatically.
- Changing Scenario 1 'Period to' will change Scenario 2 'Period to' in locked step so the compared period ranges are of the same size.

Forex variance is calculated based on the applicable exchange rates.