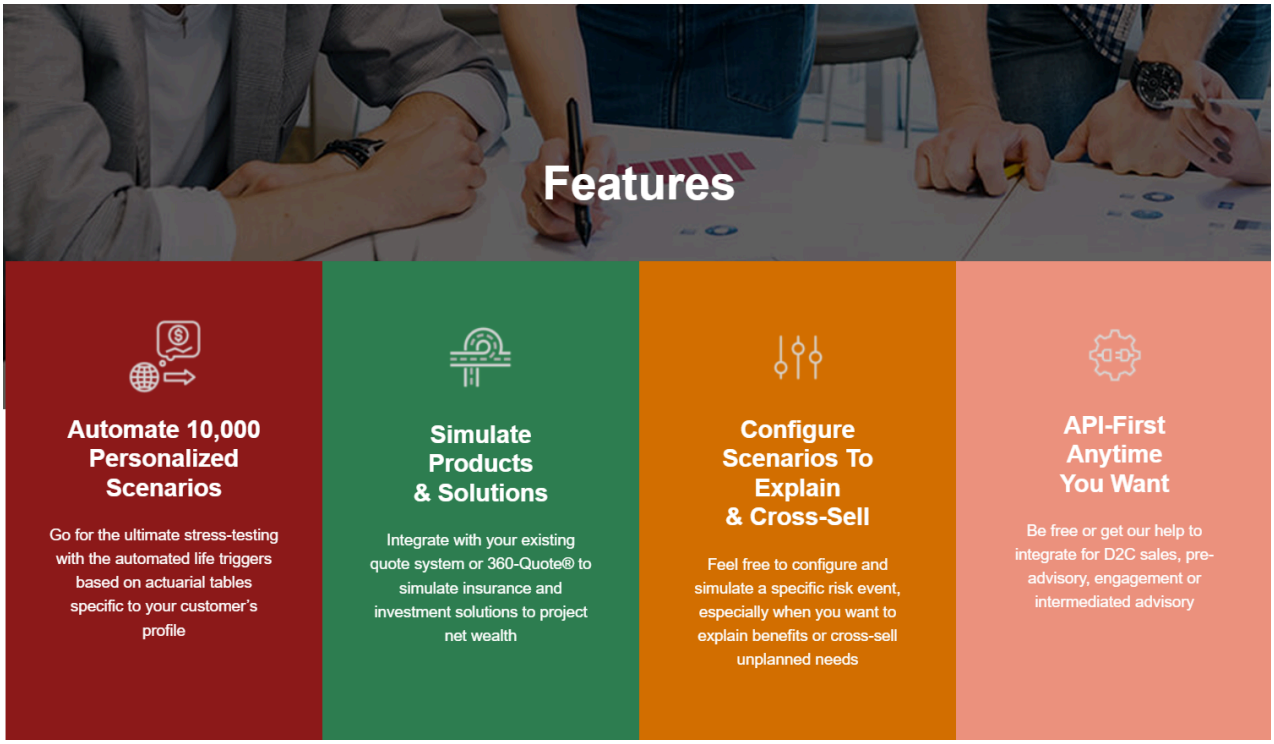
360-ScenarioVisualizer®

This page give a brief introduction about the product and it's USP.

360-ScenarioVisualiser® is a multi-risk stochastic simulator and recommendations explainer that prepares your insurance and investment recommendations for real environments through robust and exhaustive simulations.



Product Features

The page outlines the product features for 360-ScenarioVisualizer®. These features are categorized into Core Components and Configurations.

Introduction

360-ScenarioVisualizer® is a wealth visualization tool. It displays expected future wealth accumulation of a customer based on the customer's current demographic and financial situation. It takes various financial incidents into consideration in cashflow generation process, and projects the financial position of the customer each year in the future. It also illustrates how much a customer can benefit from an insurance and investment product(s) by comparing the net wealth with and without given product(s). It provides multiple views of financial situation:

360-ScenarioVisualizer® Views

Expense Funding

Year-on-year view of how the future expenses are funded by various financial resources.

Cashflow

Year-on-year cash inflow and cash outflow.

Savings Line

Year-on-year accumulated value of cashflow including liquid assets.

Net Wealth

Year-on-year accumulated value of cashflow including liquid assets & illiquid assets.

It consists of a set of configurable modelling assumptions, such as inflation and savings account interest rates. Some assumptions can be configured from the end user on the Front End to better fit personal requirement, others can be provided through Back End.

Core Components

Core Components are default product features in out-of-the-box Microservices, excluding custom client-specific front-end requirements.

- Factfind Integration
- Expense Funding Chart
- Cash Flow Chart
- Net Wealth Chart
- Savings Chart
- Stress Scenarios
- Chart with Product Recommendation

Configurations

Configurations are client-adjustable assumptions, parameters, or scenarios inherent in out-of-the-box Microservices, readily accessible for utilization.

- Configurations

FactFind Integration

Asset, Liability & Existing Insurance

These includes investment possessions, financial obligations and life insurance coverage which impacts the net wealth of the customer.

Asset

It refers to the possessions or investments that hold economic value and contribute to their overall net worth of the customer. They are further divided into:

- Liquid Assets: It refers to a readily convertible and easily accessible asset, typically in the form of cash or assets that can be quickly converted into cash without significant loss of value, providing financial flexibility and immediate access to funds.
- Illiquid Assets: It refers to an asset that is not easily or quickly convertible into cash without incurring significant costs or time delays, limiting immediate access to funds and potentially reducing financial flexibility.

Customer can also declare assets information, including asset type, amount and expected return rate. All assets are assumed to be hold till perpetuity and will not be liquidated if not specified elsewhere. Assets are accumulated according to its return rate every year. Balance in any social security system is considered as an illiquid asset.

Liability

It refers to the financial obligations or debts owed by the customer, which reduce their net worth.

Existing insurance

It refers to insurance policies that are currently in effect and provide coverage against specified risks or events, offering financial protection and potential compensation in case of unforeseen circumstances. It can be of protection or savings in nature. It will take premium amount, premium payment term, insurance benefit payout and withdrawal into consideration.

Needs / Goals

360-ScenarioVisualizer® will take customer declared needs and goals into consideration for their financial planning. Customer may also tag their asset(s) to needs and goals. One asset can be tagged to at most one protection need and one investment goal.

If an asset has been tagged to an investment goal only, then asset shall be liquidated at the target year of the investment goal.

If an asset has been tagged to a protection need only, the asset will be liquidated at the year when the incident happens.

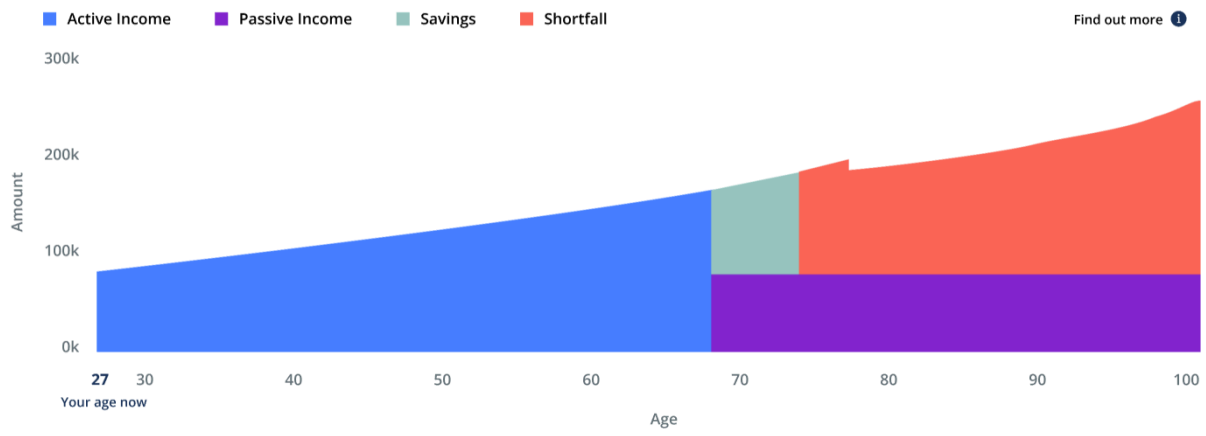
If an asset has been tagged to both protection need and investment goal, the asset will be liquidated depending on whichever event happens earlier. The asset will be fully liquidated regardless of the asset’s future value and the target amount of the need/goal.

Expense Funding Chart

Expense Funding

Expense funding is how overall expenses are funded by various financial resources. There are 3 types of financial resources: active income, passive income & liquid assets. The order is also the priority that these resources are assumed to be used. Active income and passive income have been calculated in Cash Flow Chart, and liquid assets have been calculated in FactFind Integration. If all the financial resources have been used but it's still insufficient to fund the expense in any year, then the remaining part is categorized as shortfall for the year.

A prototype of expense funding can be seen in the graph below. Year-on-year expense funding breakdown is displayed in the graph.



Cash Flow Chart

Cashflow

After gathering personal details, current financial situation and needs & goals, 360-ScenarioVisualizer® calculates future cashflow, including cash inflow and cash outflow. Cashflows are projected as output, as well as used in further calculation. Current financial situation and future financial planning are the determinants of cashflow.

Cash Inflow

These includes all the cash inflows that customer is expected to receive year-on-year until life expectancy. They are further divided into:

- Active Income: It refers to income that is earned as a result of actively performing services or engaging in a specific job or occupation. This includes salary, bonuses. They are expected to grow each year at the income growth rate.
- Passive Income: It refers to income generated from sources that require minimal active involvement or ongoing effort. After retirement, active income will stop while passive income still continues to generate income. It includes rental, investment income, social security retirement plan payout, life insurance policy payout, etc.

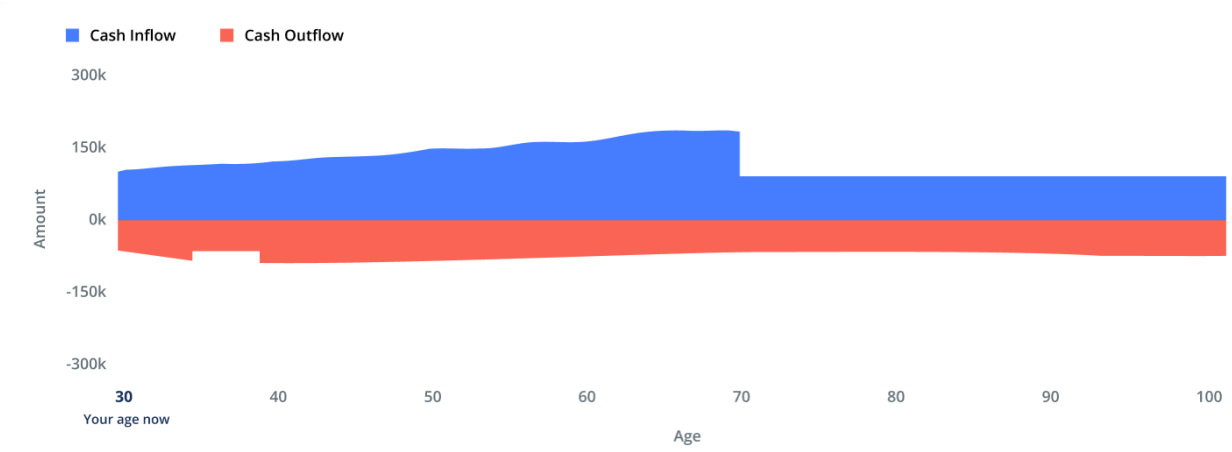
Cash Outflow

These includes all the cash outflows that customer is expected to pay year-on-year until life expectancy. They are further divided into:

- Regular Expense: It refers to recurring financial obligations, such as living expenses, mortgage payments, insurance premiums, loan repayments, and other predictable expenses that occur on a regular basis. Living expenses are expected to grow each year with inflation.
- One-time Expense: It refer to non-recurring or occasional expenses that do not happen on a regular basis, such as buying a car or home appliance, home repairs, medical expenses, or vacations.

Customer can provide the amount, frequency and target year for the cashflow components.

A prototype of cashflow view can be seen in the graph below. Year-on-year cash inflows and cash outflows are displayed. Savings Chart is optional to be stacked on top of Cash Flow Chart, providing a more informative view.



Net Wealth Chart

Net Wealth Calculation

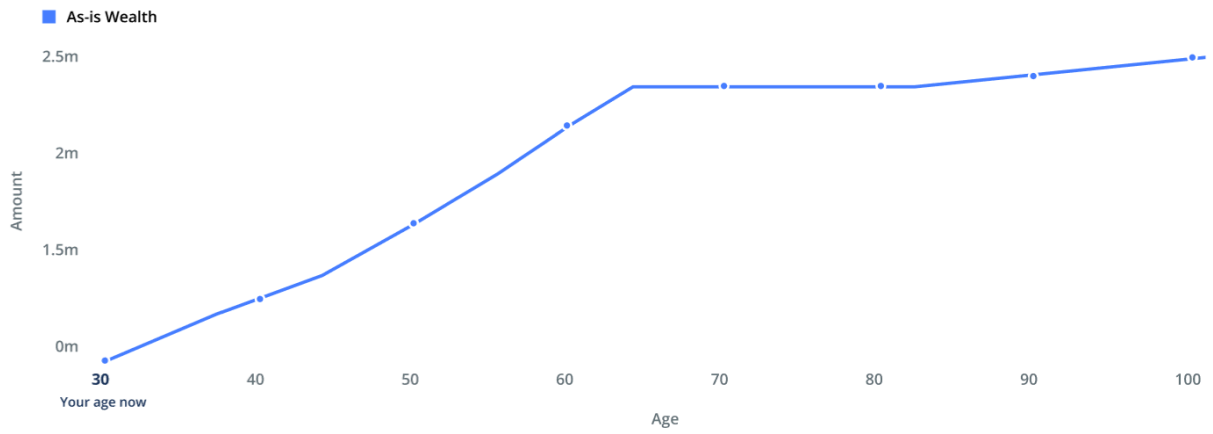
360-ScenarioVisualizer® calculates net wealth as the accumulation of wealth after deducting liabilities and adding insurance payout, if any.

In Net Wealth Chart, wealth includes assets and the surplus of cash inflow minus cash outflow, assumed to be deposit in bank and earn savings interest rate.

If any insurance product is recommended, the net wealth with and without such insurance will be displayed together to showcase how the insurance product benefits the customer when an event triggers.

A prototype of net wealth view can be seen in the graph below. A dot-line chart is drawn to illustrate year-on-year net wealth. Generally, net wealth keeps increasing before retirement and starts to drop after retirement. If any need or goal happens during the wealth accumulation process, it will be reflected in net wealth view.

If no recommended insurance product is selected, only the as-is net wealth line is displayed. If any recommended insurance product is selected, both the as-is net wealth and the to-be net wealth are displayed.

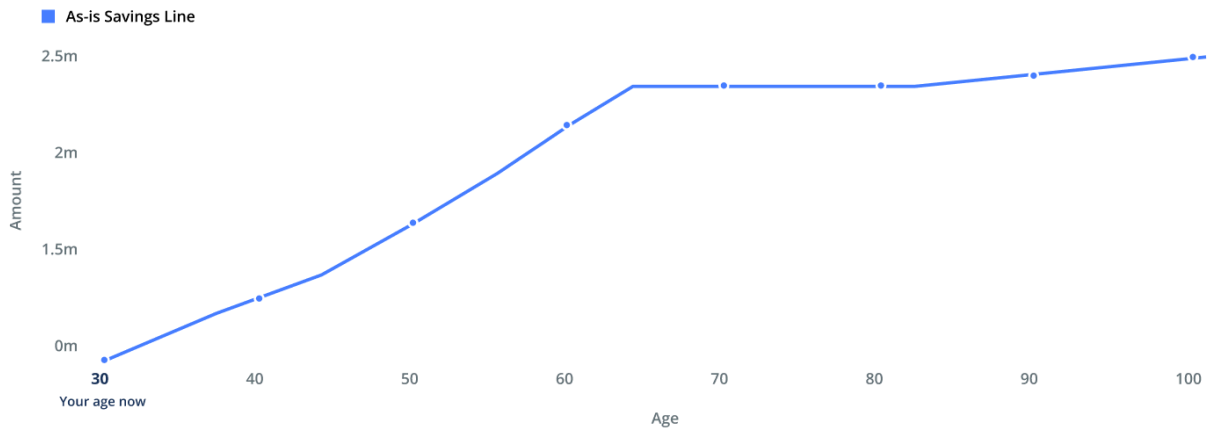


Savings Chart

Savings Line

Savings line illustrates the net wealth ignoring illiquid assets. As social security is also considered as illiquid asset, it will be excluded as well. Hence, if any asset is declared as illiquid, its value will be ignored in savings line. But any cashflow generated by that asset is still included in cashflow calculation.

A prototype of savings line view can be seen in the graph below. A dot-line chart is drawn to illustrate year-on-year savings, on top of cashflow view. Generally, savings keep increasing before retirement and starts to drop after retirement. If any need or goal happens during the wealth accumulation process, it will be reflected in savings view.



Stress Scenarios

Stress Scenario

360-ScenarioVisualizer® also supports to add manual events, called stress scenario, in order to evaluate their financial impact. User can add multiple stress scenarios, edit and delete stress scenarios, subject to some basic validation rules. User can also add impact on income, expense or asset. Each type of stress scenario can be only added once, while impact on income, expense and asset can be added multiple times. Basically, the target year when stress scenario will happen can be configured. In addition, there are some customized assumptions of each type of stress scenario which can also be configured. 360-ScenarioVisualizer® supports the following stress scenarios:

360-ScenarioVisualizer® Scenarios

Death

A Death event means permanent loss of active income and one-time final expense when the event is triggered.

Critical Illness

A Critical Illness event means lump sum medical expense and a decrease of active income in the next few years.

Permanent & Total Disability (PTD)

A PTD event means a lump sum medical expense and permanent loss of active income.

Dismemberment

A Dismemberment event means a lump sum medical expense and permanent loss of active income.

New Born

A New Born event means an annual raising child expense lasting for 18 years.

Inflation Shock

An Inflation Shock event means inflation rate will be increased by a significant percentage in future several years.

Unemployment

An Unemployment event means temporary loss of active income for several years.

Market Crash

A Market Crash event means a sudden drop of asset values.

Marriage

A Marriage event means active income and regular expense are increased by a percentage. A lump sum wedding expense is also intended.

Divorce

360-ScenarioVisualizer® cancels any income or expense provided if it belongs to spouse. If no income or expense of spouse is provided, active income and regular expense are reduced by a percentage. Value of properties and other assets are decreased by 50%.

Chart with Product Recommendation

The 360-ScenarioVisualizer® is capable of integrating recommended insurance products into its calculations, demonstrating the potential benefits of insurance for a customer's financial health. It can analyze and include multiple policies simultaneously, rather than being limited to a single policy.

Insurance Products Illustrated by 360-ScenarioVisualizer®

Protection Product

Protection products offer significant benefit coverage when financial health is at risk due to specific stress events, requiring only a relatively small premium payment throughout the premium payment term or until the event occurs. The 360-ScenarioVisualizer® can seamlessly integrate with the 360-BenefitVisualizer® to clearly illustrate the benefits these protection products can provide.

The following features of protection product will be included in 360-ScenarioVisualizer® calculation:

- Sum assured of various benefits
- Premium
- Policy term
- Premium payment term

Similar as existing insurance, the premium of recommended product is regarded as an expense and is paid within premium payment term.

If stress scenario of the event which is covered in the benefit of protection product is generated within policy term, the sum assured will be paid out as a one-time cash inflow, and the policy will be terminated.

Investment/Savings Product

Investment/savings products offer the advantage of wealth accumulation from premiums while potentially providing coverage for certain stress events. The 360-ScenarioVisualizer® can be integrated seamlessly with the 360-BenefitVisualizer® to clearly illustrate the benefits these investment/savings products may bring.

The following features of investment/savings product will be included in 360-ScenarioVisualizer® calculation:

- Expected cash value
- Benefit structure, in terms of lump sum maturity value, annuity payment etc
- Projection at various interest rate scenario
- Sum assured of various benefits
- Premium
- Policy term
- Premium payment term

Similar as existing insurance, the premium of recommended product is regarded as an expense and is paid within premium payment term.

Typically upon end of policy term, the maturity value will be paid out as a one-time cash inflow, and the policy will be terminated. However, this would follow the benefit structure under the product.

Impact on Charts

Impact on Expense Funding Chart

Once the recommended product is added, the expenses displayed in the expense funding chart will automatically include the expenses associated with the premium. These additional expenses will be covered by designated financial resource(s) determined by the 360-ScenarioVisualizer® calculations.

There's a toggle to generate the expense funding chart with or without the recommended product.

The sample chart below illustrates a case with critical illness product and critical illness stress event. For illustration purpose, a lump sum medical expense is assumed to be charged upon critical illness, resulting in the expense on age 60 much higher than other years. Critical illness insurance pays out the sum assured, so the medical expense is fully funded by insurance payout, which is regarded as passive income by 360-ScenarioVisualizer®. Without such insurance, the person has to fund the medical expense by themselves, and is likely to run out of savings in earlier year.

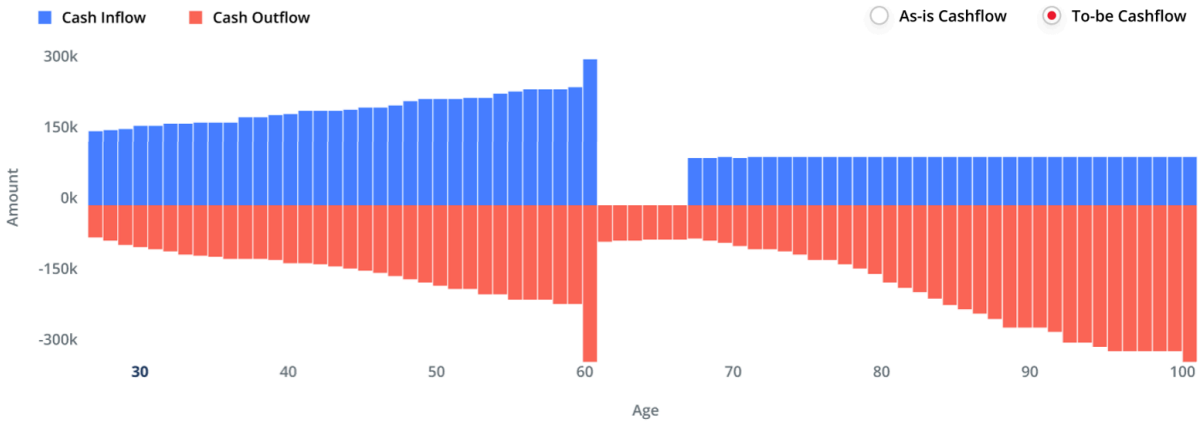
Impact on Cash Flow Chart

Once the recommended product is added, the cash outflow shown in the cash flow chart will automatically include the additional expenses associated with the premium.

If any protection product is recommended and stress scenario of the same event is generated within policy term, the cash inflow shown in cash flow chart will include the sum assured. If any investment product is recommended, the cash inflow shown in cash flow chart will include the cash value/maturity benefit.

There's a toggle to generate cash flow chart with/without recommended product.

The sample chart below illustrates a case with critical illness product and critical illness stress event. For illustration and simplicity purpose, a lump sum medical expense is assumed to be charged upon critical illness, resulting in the irregular pattern of cash outflow on age 60. Critical illness insurance pays out the sum assured, which is regarded as cash inflow and is the only income source after critical illness happens. The bar of cash inflow and cash outflow on age 60 has almost the same height, which validates the fact that medical expense is fully funded by insurance payout.



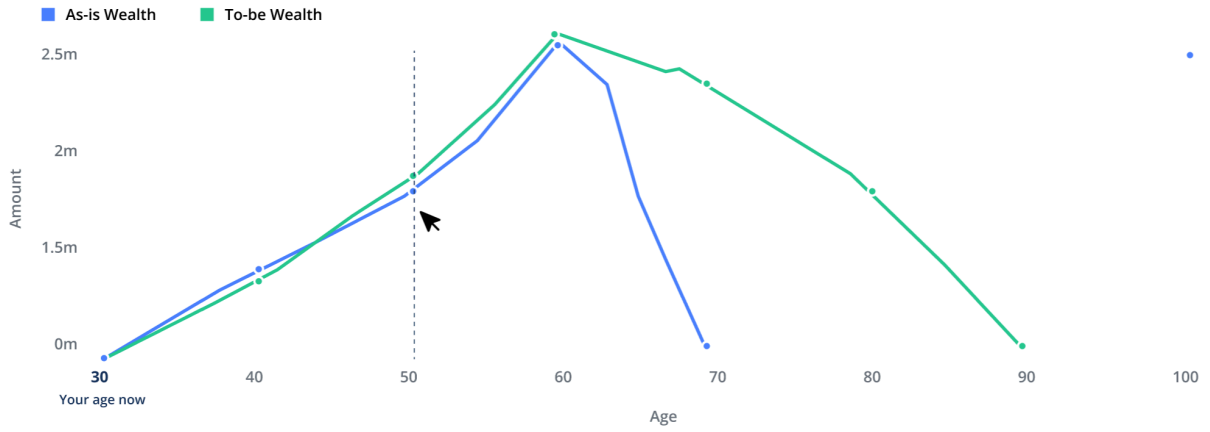
Impact on Net Wealth Chart

Once the recommended product is added, the additional expenses associated with the premium will affect the wealth accumulation process. Therefore it has an indirect impact on net wealth chart.

If any protection product is recommended and stress scenario of the same event is generated within policy term, the sum assured will be paid out and impact the net wealth, after deducting any one-time expense configured in stress scenario. If any investment product is recommended, the maturity benefit will be paid out and involved in net wealth at maturity date. Any expected cash value before maturity, if projected by 360-BenefitVisualizer®, will be added to net wealth to illustrate the expected policy value transparently.

Both the net wealth line with recommended product and without recommended product will be displayed on the chart simultaneously, in order to visualize the impact of having recommended product.

The sample chart below illustrates a case with critical illness product and critical illness stress event. For illustration purpose, a lump sum medical expense is assumed to be charged upon critical illness, so there's a sudden drop in as-is wealth line. Since the critical illness policy pays out the sum assured, it offsets the medical expense, so the to-be wealth lasts much longer.



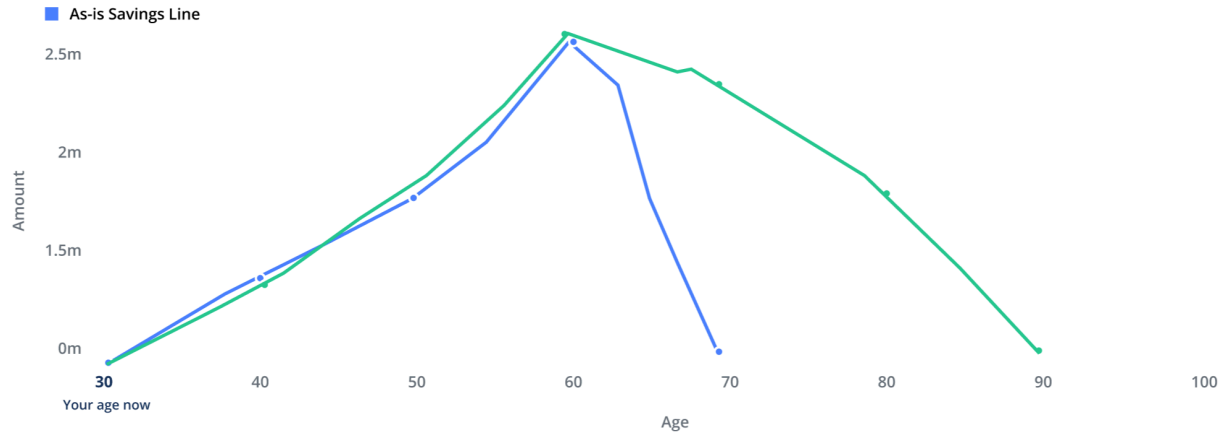
Impact on Savings Chart

Once the recommended product is added, the additional expense associated with the premium will affect the wealth accumulation process. Therefore it has an indirect impact on savings chart.

If any protection product is recommended and stress scenario of the same event is generated within policy term, the sum assured will be paid out and impact the savings, after deducting any one-time expense configured in stress scenario. If any investment product is recommended, the maturity value will be paid out and involved in savings at maturity date. Since insurance is considered as illiquid asset, cash value before maturity will not be added to savings chart.

Both the savings line with recommended product and without recommended product will be displayed on the chart simultaneously, in order to visualize the impact of having recommended product.

The sample chart below illustrates a case with critical illness product and critical illness stress event. For illustration purpose, a lump sum medical expense is assumed to be charged upon critical illness, so there's a sudden drop in as-is savings line. Since the critical illness insurance pays out the sum assured, it offsets the medical expense, so the to-be savings lasts much longer.



Out of Scope

360-ScenarioVisualizer® only considers base product when product recommendation is added. Any benefit defined by riders will be excluded.

Configurations

Content coming soon!

Technical Specification

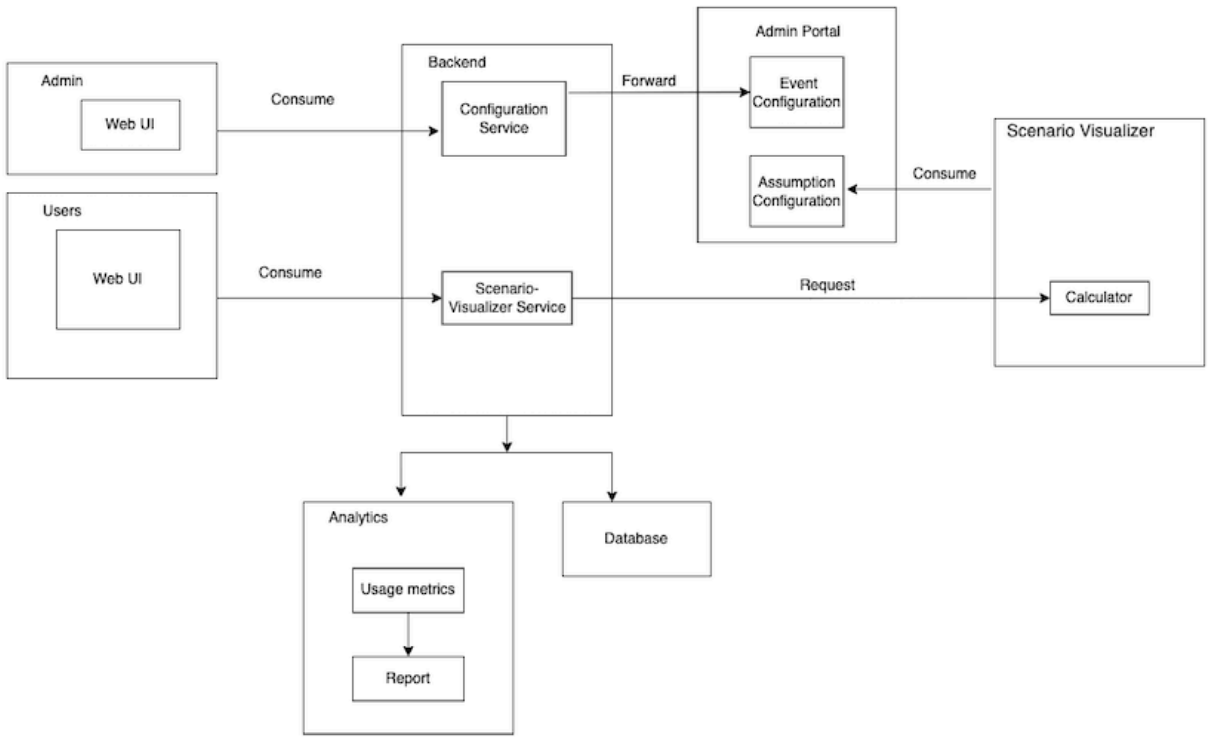
Terms and Definitions

<List any abbreviations, acronyms or terms that are defined in 360F terminology>

Term	Description
JS	JavaScript
API	Application Programming Interface

Architecture

Technical Architecture



Targeted Platforms

360-ScenarioVisualizer can be using on both desktop web browser and mobile web browser

Browsers supported :

Browsers	Windows	Mac OS	iPhone	Android
Google Chrome	X	X	X	X
Microsoft Edge	X			X
Mozilla Firefox	X			X
Apple Safari		X	X	

Software Components

The sections below describe the various components of 360-ScenarioVisualizer ® system.

Overview

The 360-ScenarioVisualizer® system consists of a few parts:

- The Admin Portal for management of assumptions e.g. inflation rates, income growth rate, saving rate, and administrative activities.
- The UI application that runs on browsers.
- The 360-ScenarioVisualizer® API that is provided performs the cashflow calculations on the server-side.

Front-end

As we are using React.js as the framework, the following table outlines the key dependency libraries.

Name	Path	Purpose
MUI	https://www.npmjs.com/package/@mui/material ↗	
react-final-form	https://www.npmjs.com/package/react-final-form ↗	
chalk	https://www.npmjs.com/package/chalk ↗	
lerna	https://www.npmjs.com/package/lerna ↗	
jest-dom	https://www.npmjs.com/package/@testing-library/jest-dom ↗	
react-dom	https://www.npmjs.com/package/react-dom ↗	
styled-components	https://www.npmjs.com/package/styled-components ↗	

Back-end

The Back-end service of 360-ScenarioVisualizer ® system.

Technology

The main programming language is still Javascript, but the difference from FE is that BE uses the following framework:

- Express.js

List some of the library dependencies that the Back-end is using:

- babel : https://www.npmjs.com/package/@babel/runtime ↗

- mysql2: https://www.npmjs.com/package/mysql2 ↗

- redis: https://www.npmjs.com/package/redis ↗

- sequelize: https://www.npmjs.com/package/sequelize ↗

- tcomb : https://www.npmjs.com/package/tcomb ↗

- async : https://www.npmjs.com/package/async ↗

and more ...

Database

The database used for the application is MySQL version - 8.0.11.

Testing

Please contact the 360F representative for access to the sandbox environment for your testing requirements

Key Configuration Options (Core, Country and Client)

Admin Portal (i.e. Core configuration)

The Admin Portal provides a list of configuration capabilities for the needs calculations. Please refer to the Admin Portal specifications for more details.

Default configurations are provided for each tenant as a starting point, and each client is expected to review the configurations before go-live.

Extensions or Plugins (i.e. Country level or Client level customizations)

Each Scenario Visualizer and its calculations are documented in the functional specifications. If a need's calculation is to be customized, we would offer a country-level or client-level plugins that is to be deployed together with the base version.

Any other calculation changes can be overridden by the client's development team. Please contact the 360F representative for more details on obtaining the source code for extensibility.

Build Configurations (i.e. Client level customizations)

Several build configurations can be configured for a client as they are not available on the Admin Portal. These configurations are typically related to the build and deployment configurations such as the path where the JavaScript Library is made available, etc.

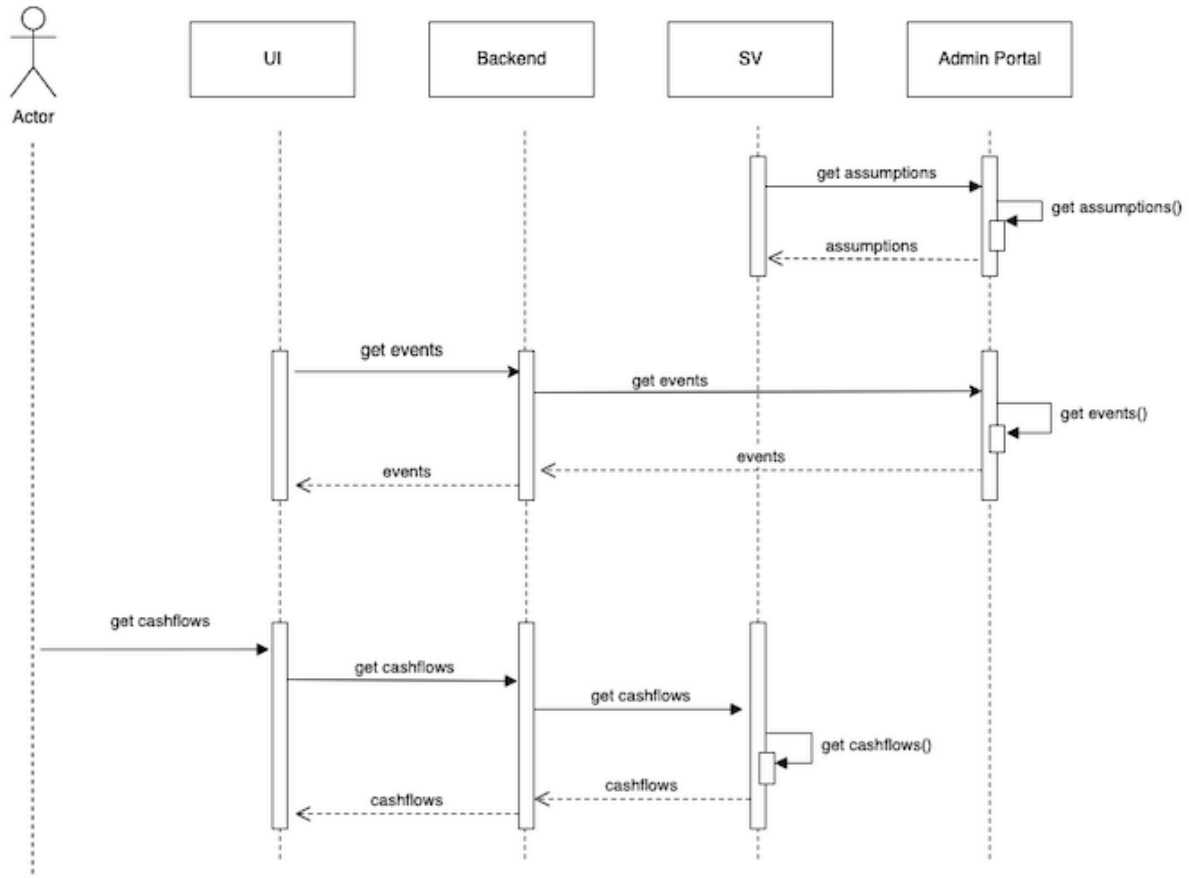
API

The list of APIs:

- Get events config: /api/v1/pb/scenario-visualizer/get-events

- Get cashflows: /api/v1/pb/scenario-visualizer/get-cashflows

Sequence diagram:



Cloud Services Requirements

360-ScenarioVisualizer® API is optionally available to be deployed in the client's private cloud environment. We support Amazon Web Services, and Microsoft Azure with reference architectures on their deployments.

For example, the following services are required in Microsoft Azure:

- API Management
- Azure Kubernetes Service
- Storage Account
- Azure Database for MySQL servers

Recommended Sizing and Deployment

Sizing Estimates

Service	Type	Quantity	Remark
API Management	Standard	1	
Azure Kubernetes	F4s v2	2	
Storage Account	P10 Disks	1	
MySQL	General Purpose – Gen5	1	

Non-Functional Requirement

Security

360F-Scenario Visualizer API

360-ScenarioVisualizer API uses SonaQ to scan for security risks of node.js libraries. And, the services of Scenario Visualizer at back-end are deployed on k8s, therefore the risk of hacking is reduced. In addition, during deployment on Github, the docker container image scan process is added for scanning docker image vulnerabilities.

360F-Scenario Visualizer Javascript Library

360- **ScenarioVisualizer®** JavaScript Library uses webpack to package 360-ScenarioVisualizer® 's modules and then publish them to the GitHub registry, avoiding code disclosure as well as code injection from the outside.

Performance

360-ScenarioVisualizer API also uses loadtest powered by Jmeter to test the API's performance.

API Documentation

On Post

`POST` `/api/v2/scenario-visualizer`

Authorizations

APIKeyHeader

Query parameters

`tenant_id` `string · min: 3 · max: 36` optional

Default: `helium`

Body

application/json

`sessionId` `string · uuid` optional

`noDeathFlag` `boolean` optional

Default: `true`

`numSims` `integer · min: 10 · max: 10000` optional

Number of simulation

Default: `10`

Example: `10`

manualEvents any of[] optional

Default: `[]`

Example: `[{"flag":true,"eventType":"Death","year":17,"config":{"funeralExpense":20000}},`
`{"flag":false,"eventType":"CI","year":0,"config":{"medicalCost":200000}},`
`{"flag":false,"eventType":"PTD","year":0,"config":{"medicalCost":444000}},`
`{"flag":false,"eventType":"Disability","year":0,"config":{"medicalCost":444000}},`
`{"flag":false,"eventType":"MarketCrash","year":0,"config":{"marketShock":0.4}},`
`{"flag":false,"eventType":"Newborn","year":0,"config":{"oneTimeCost":30000}},`
`{"flag":false,"eventType":"Marriage","year":0,"config":{"oneTimeCost":50000}},`
`{"flag":false,"eventType":"Unemployment","year":0,"config":{"length":5}},`
`{"flag":false,"eventType":"Inflation","year":0,"config":`
`{"inflationRate":0.1,"length":5}},`
`{"flag":false,"eventType":"Income","startYear":10,"endYear":15,"measurement":"amount","am`
`ount":100000},{"flag":false,"eventType":"Expense","startYear":0,"endYear":0,"amount":0},`
`{"flag":false,"eventType":"Asset","startYear":13,"endYear":13,"measurement":"amount","amo`
`unt":-300000},`
`{"flag":false,"eventType":"Liability","startYear":0,"endYear":0,"amount":0}]`

modelParameters object · ModelParameters optional

personalDetails object · PersonalDetail[] required

needCalculatorOutput object · NeedCalculatorOutput[] required

Example: `[{"type":"N_INC","result":`
`{"funeralExpense":20000,"totalShortfall":1287029.712126821}},{"type":"N_RET","result":`
`{"retirementAge":60,"durationOfRetirement":23}},{"type":"N_EDU","result":`
`{"fundsNeededYear":2036,"totalShortfall":165873.80698769633}},{"type":"N_CRI","result":`
`{"totalShortfall":450000}}]`

recommendedInsurance object[] optional

Insurance product recommended with data structure of 360-BenefitVisualizer

Example: `[null]`

Responses

200 Successful Response application/json

Response object · SVResponse

400	Bad Request	application/json
422	Validation Error	application/json

POST `/api/v2/scenario-visualizer` HTTP

```
POST /api/v2/scenario-visualizer HTTP/1.1
Host:
Ocp-Apim-Subscription-Key: YOUR_API_KEY
Content-Type: application/json
Accept: */*
Content-Length: 3544

{
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  "manualEvents": [
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      "year": 17,
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    },
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      "eventType": "PTD",
      "year": 0,
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      "year": 0,
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        "length": 5
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    },
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      "eventType": "Income",
      "startYear": 10,
      "endYear": 15,
      "measurement": "amount",
      "amount": 100000
    },
    {
      "flag": false,
      "eventType": "Expense",
      "startYear": 0,
      "endYear": 0,
```

```
        "amount": 0
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      {
        "flag": false,
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        "endYear": 13,
        "measurement": "amount",
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      {
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        "startYear": 0,
        "endYear": 0,
        "amount": 0
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    "modelParameters": {
      "ignoreIlliquidAssets": false,
      "showExpenseFunding": false,
      "inflationRate": 0.02,
      "incomeGrowthRate": 0.03
    },
    "personalDetails": [
      {
        "dateOfBirth": "1989-11-30",
        "gender": "Male",
        "age": 1,
        "isSmoker": true,
        "ageOfRetirement": 62,
        "riskProfile": 1,
        "needs": [
          {
            "needId": "N_EDU",
            "type": "N_EDU",
            "priority": 5,
            "targetYear": 2036,
            "taggedAsset": {
              "id": "af97e1e1-51c0-11ec-ae85-8b18a71772fb"
            },
            "region": "R_SGP",
            "lifestyle": 2
          },
          {
            "needId": "N_RET",
            "type": "N_RET",
            "priority": 3,
            "targetYear": 60,
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        "ageOfRetirement": 60,
        "taggedAsset": {},
        "region": "R_SGP",
        "lifestyle": 2
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        "type": "N_INC",
        "existingSumAssured": 100000,
        "priority": 4,
        "numYearDependents": 25,
        "taggedAsset": {
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        "region": "R_ASI",
        "lifestyle": 1
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        "needId": "N_CRI",
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        "priority": 5,
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        "region": "R_ASI",
        "lifestyle": 1
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    "cashFlows": {
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          "type": "I_SAL",
          "absoluteValue": 14000,
          "frequency": 1
        },
        {
          "type": "I_BNS",
          "absoluteValue": 20000,
          "targetYear": 2035,
          "frequency": 2
        },
        {
```

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            "type": "I_RNT",
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            "type": "I_OTH",
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            "frequency": 0
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            "absoluteValue": 7000,
            "frequency": 1
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            "absoluteValue": 500000,
            "targetYear": 2040,
            "frequency": 0
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          {
            "type": "E_OTH",
            "absoluteValue": 20000,
            "targetYear": 2035,
            "frequency": 2
          }
        ]
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```


200 Successful Response ⌄⌄


```
{
  "success": true,
  "data": {
    "preWealth": [
      10000,
      212343,
      424149,
      645762,
      878878,
      1122615,
      1377359,
      1643509,
      1921480,
      2211697,
      2514603,
      2830653,
      3160321,
      3504094,
      3863816,
      3418023,
      3399351,
      2880105,
```



```
      "liabilities": {
        "loans": [],
        "tax": {
          "value": 0
        }
      },
      "assets": [
        {
          "id": "text",
          "type": "A_SAV",
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          "interestRate": 0,
          "recurringContribution": {
            "value": 1,
            "frequency": 1,
            "duration": 1
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```

```
      "isLiquid": true,
      "proportion": 1
    }
  ],
  "socialSecurity": {
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    "ageStartPayout": 65,
    "cpfInitialBalanceOA": 0,
    "cpfInitialBalanceMA": 0,
    "cpfInitialBalanceSA": 0,
    "cpfInitialBalanceRA": 0
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  "existingInsurance": [
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      "criticalIllness": 0,
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      "premiumTerm": 0,
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      "regularPremium": 0,
      "totalPermanentDisability": 0
    }
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  "needCalculatorOutput": [
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      "type": "N_INC",
      "result": {
        "funeralExpense": 20000,
        "totalShortfall": 1287029.712126821
      }
    },
    {
      "type": "N_RET",
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        "retirementAge": 60,
        "durationOfRetirement": 23
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    },
    {
      "type": "N_EDU",
      "result": {
        "fundsNeededYear": 2036,
        "totalShortfall": 165873.80698769633
      }
    }
```


Test it ▶

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    { 486375,
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      0"result": {
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    } 0,
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```

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      1377359,
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      2211697,
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      3504094,
      3863816,
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    "postPositiveCashFlow": [
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  ],
  "postNegativeCashFlow": [
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    -125480,
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    -172405,
    -175853,
```

```
        -179370,
        -182957,
        -186616
      ]
    }
}
```

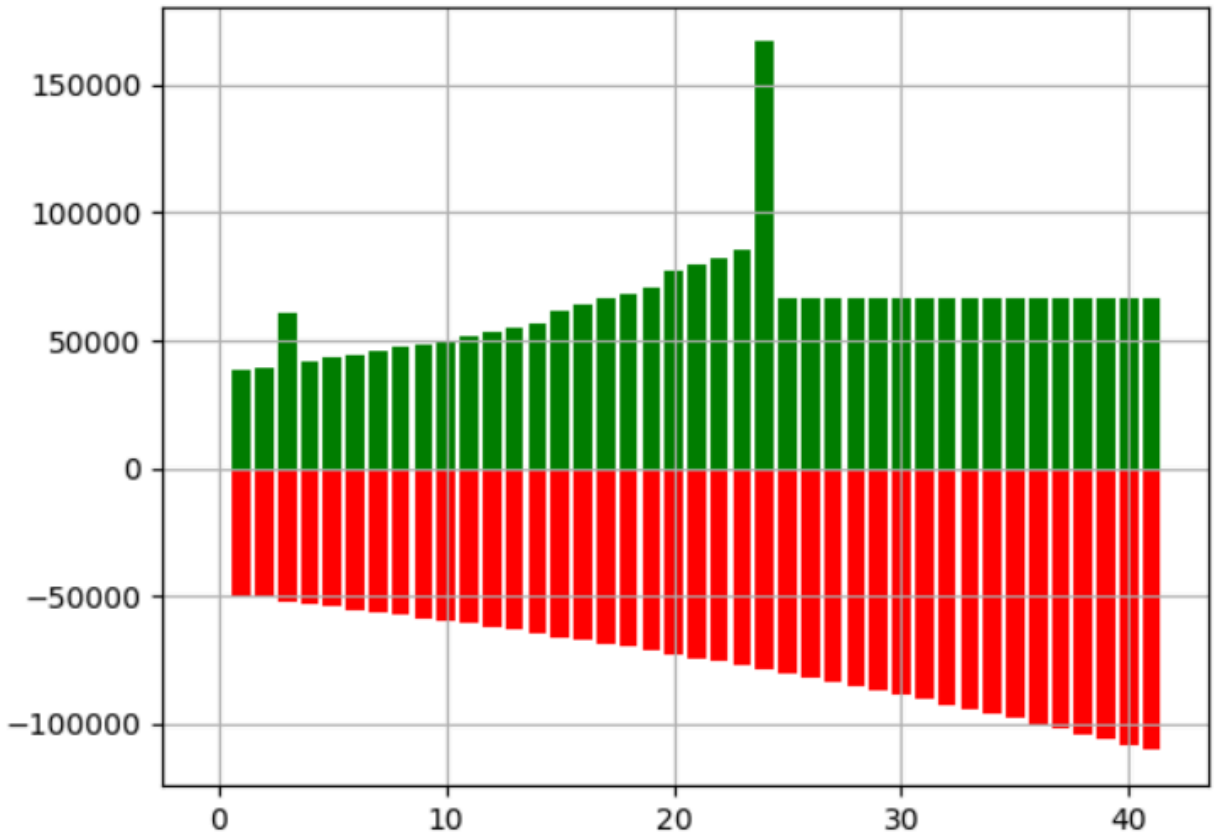
Sample Case

Sample Case

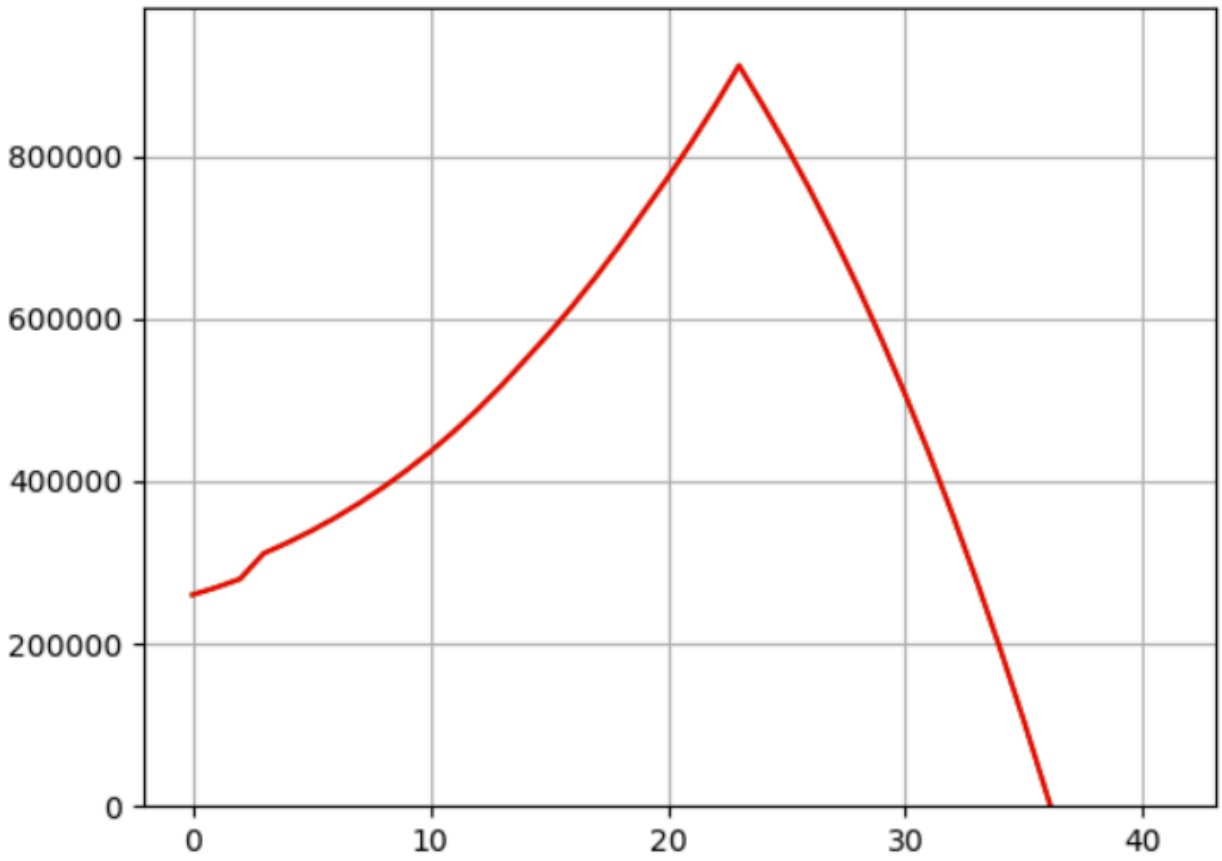
A sample case is created to showcase the general result of 360-ScenarioVisualizer®. This case is based on a 42-year-old Singaporean man with retirement need. He has a property worth of $100,000 tagged to the retirement need, as well as a stock account worth of $100,000. His annual gross income is $48,000 (all are active income), and his annual expense is $50,000. He has one-time income of $20,000 in 2025. He will retire at his age 65.

Please ignore the UI of the graphs, as this is an output from postman and only for illustrative purpose. Actual frontend UI would differ from the graphs seen below.

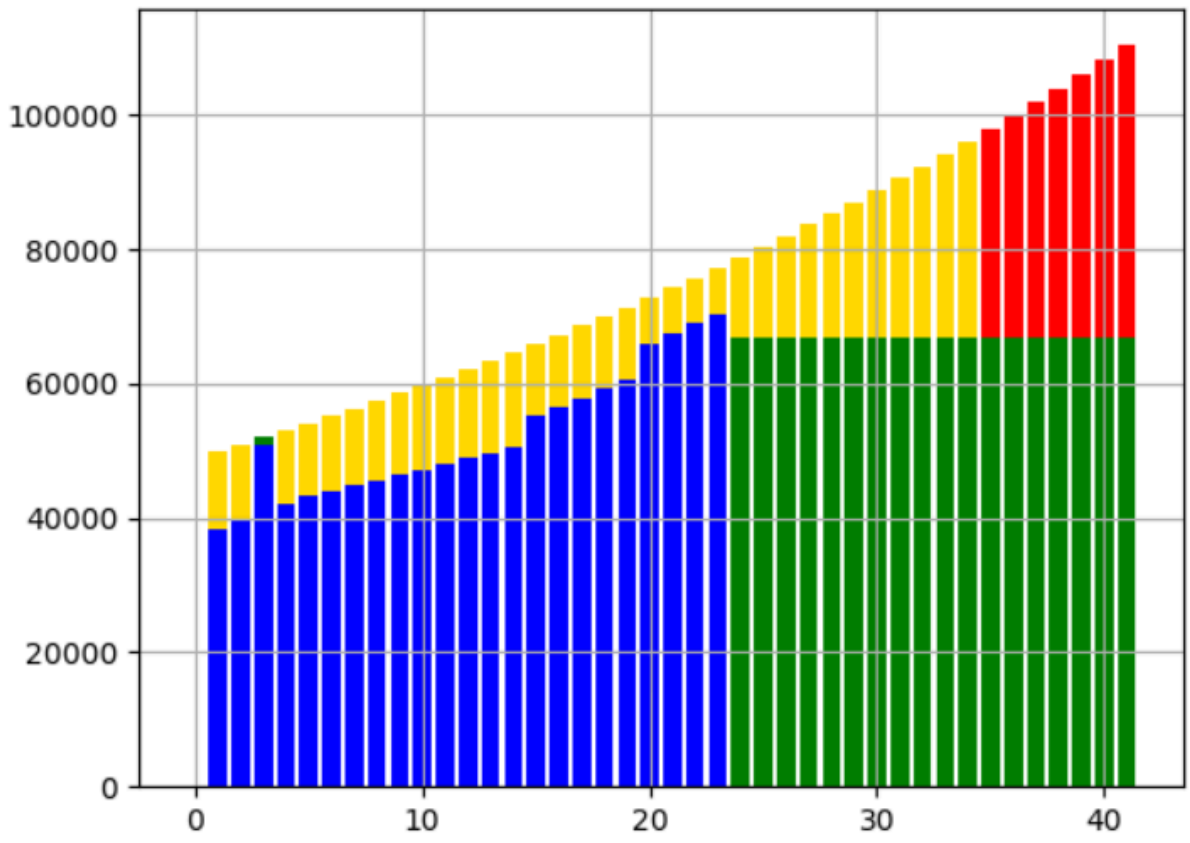
We first take a look at the cashflow view. The green bars indicate cash inflow, and the red bars indicate cash outflow. Cash inflow in the first year is $38,400 because this is his take-home income, i.e., net of social security contribution. Cash outflow in the first year is $50,000. After that, cash inflow grows because gross income grows at income growth rate, and cash outflow grows because expense grows at inflation rate. His one-time income reflects in the chart in year 2025. Upon retirement, he liquidates his property, which becomes a one-time cash inflow. After retirement, he loses his active income and starts to receive social security retirement plan payout.



We then look at the net wealth view. Net wealth starts from $260,000, because he has a $100,000 property, $100,000 of stocks, and his current balance in social security account is $60,000. His net wealth keeps increasing because he earns more than he spends. After retirement, he loses his income so his net wealth starts to decrease. After a few years, he has used up all his financial resources and gets bankrupted.



We finally look at the expense funding view. In this chart, active income, passive income, savings and shortfall are colored as blue, green, yellow and red, respectively. The value of expense each year is exactly the same as cash outflow in the previous page. Before retirement, his active income isn't sufficient to cover all his expense, so he needs to withdraw from his stock asset. Hence each bar is filled in by blue and yellow. After retirement, his annual expense is covered by social security retirement plan payout as well as his cash savings. But finally, after he uses up cash savings, the deficit becomes shortfall.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20000
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0
10
20
30
40

Whats New?

Jul 19, 2024

- Support 360-BenefitVisualizer in 360-ScenarioVisualizer

Dec 18, 2023

- Handle policy term longer than life expectancy

Oct 23, 2023

- Bug fix

Oct 10, 2023

- Bug fix

Oct 5, 2023

- Bug fix

Jul 17, 2023

- Bug fix

Jul 6, 2023

- Add personal event
- Add existing insurance

> **Jul 9, 2023**

- Edit stress scenario assumption, add more configurables

> **Jul 6, 2023**

- Add personal event
- Add existing insurance

> **Jun 1, 2023**

- Bug fix

> **May 29, 2023**

- Bug fix

> **May 17, 2023**

- Release SV v2