

# Challenges of Developing Full-Stack Components as a Library

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# Life Insurance Products Evolve

## Old

Retirement Age

65

Monthly Investment

200 €

Submit

## New

Retirement Age

65

Monthly Investment

200 €

Guarantee Level

80%  90%  100%

Ratio Risky / Safe Investment

30% / 70%  50% / 50%  70% / 30%

Risky Asset Portfolio

33% ▾

MSCI World All Countries ▾

33% ▾

FTSI ▾

33% ▾

DAX 40 ▾

Ratchet

Submit

# Industry-specific Challenges

**Highly Regulated** IT organization busy implementing regulatory changes

**Strong data protection**

Reluctant to 3rd parties processing data  
Avoid backend-integration

**Little architecture standardization** Very different environments from client to client

**Demand for modern UX**

Customers expect polished user interfaces and an online-only option

# Widgets to the Rescue

## Choose a strategy

Choose one of our strategies as the base for your portfolio. All strategies were created for you by Munich Re investment experts.

[START TUTORIAL](#)

**Global Capital**

Global capital (by ~80%)

**Actively Managed Top Stars**

SRRI - Risk Class: high

Portfolio of five name brand, actively managed funds

**Sustainability ESG Balanced**

SRRI - Risk Class: high

Sustainable portfolio with equity share of ~50%

**100% Equity Emerging Markets**

SRRI - Risk Class: high

Portfolio of funds, which invest in companies in the emerging markets

**Individual Custom**

SRRI - Risk Class: high

Create your own variety

**ESG Balanced** Current Year 1 Year 3 Years 5 Years 10 Years Max [learn more](#)

% Share	Fund name	Return
100%	Total	+2.1%
25%	DJE GoldPort Stabilitätsfonds P	+3.5%
25%	Carmignac Patrimoine A	-0.6%
25%	Jyske Invest Balanced Strategy EUR CL	+3.7%
25%	DWS Concept Kaldernorgen VC	+1.5%

SRRI - Risk Class: high (5/7)

--- Benchmark: DAX

**Sectors**

- 8.4% Communication
- 5.7% Energy
- 9.2% Industrials
- 8.4% Corporate Bonds
- 12.1% Government Bonds
- 56.2% Others

**Top Holdings**

- Berkshire Hathaway 12.0%
- 3M 6.4%
- Linde 5.4%
- Nestle 4.2%
- Alphabet 3.5%

**Regions**

- 17.5% Europe
- 15.8% Asia
- 15% North America

[CONTINUE](#)

# Use Cases

Explain

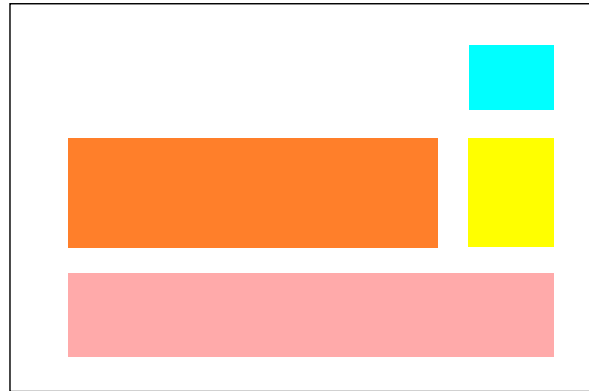
Configure

Monitor

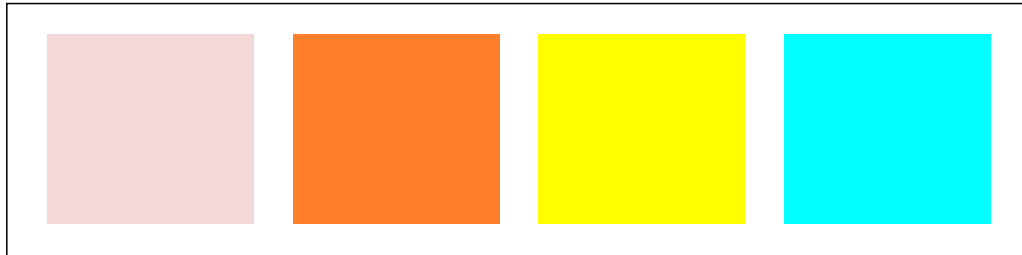
Adjust

# Microfrontends

Frontend /Website



Backend



# Technical Goals

- Easy, frontend-only, integration
- Usable as part of a complex workflow
- Extensive customization and styling options
- Automatically apply existing theme if possible
- Respect separation of responsibilities at the client
- Painless upgrades

TUTORIAL STARTEN

## Strategie auswählen

Wählen Sie eine unserer Strategien als Basis für Ihr Portfolio. Alle Strategien wurden von den Investment-Experten der Munich Re für Sie erstellt.

The screenshot shows a horizontal carousel of five strategy cards. The third card, 'Nachhaltigkeit ESG Ausgewogen', is highlighted in blue. Each card displays an SRI-Risikoklasse (SRI-Risk Class) with a scale of 1 to 7, where 5 is selected and labeled 'hoch' (high). The cards contain the following text:

- Management**: Klasse 6 (hoch), die globalen (Quote: ~80%)
- Aktives Management Top Stars**: SRI-Risikoklasse 5 (hoch), Portfolio aus fünf renommierten, aktiv verwalteten Fonds
- Nachhaltigkeit ESG Ausgewogen**: SRI-Risikoklasse 5 (hoch), Nachhaltiges Portfolio mit Aktienquote von 50%
- 100% Aktien Emerging Markets**: SRI-Risikoklasse 5 (hoch), Portfolio aus Aktienfonds, die in Unternehmen aus globalen Wachstumsmärkten investieren
- Eigene Individuelle**: SRI-Risikoklasse 2 (mittel), Erstellen ausgewählte





## Strategie auswählen

Wählen Sie eine unserer Strategien als Basis für Ihr Portfolio. Alle Strategien wurden von den Investment-Experten der Gothaer für Sie erstellt. Tarif: **VarioRent plus-Fonds**

**Auswahl Portfolio**  
Risikoklasse (SRI) 1 2 3 4 5 6 7  
Anzahl ausgewählter Assets Portfolio

**Emerging Markets Zukunftorientiert**  
Risikoklasse (SRI) 1 2 3 4 5 6 7  
sehr hoch  
Portfolio mit Schwerpunkt auf Investitionen in Entwicklungs- und Schwellenländer

**Nachhaltige Unternehmen Nachhaltigkeit**  
Risikoklasse (SRI) 1 2 3 4 5 6 7  
sehr hoch  
Unternehmen aus dem Bereich innovativer und nachhaltiger Technologien, z. B. Wasser, Gesundheitswesen

**Technologie und Umwelt (Zukunfts-) Technologie**  
Risikoklasse (SRI) 1 2 3 4 5 6 7  
sehr hoch  
Technologieunternehmen sowie Zukunftstechnologie im Bereich Energieeffizienz und Umwelt

**Eigene Individu**  
Risikoklasse (SRI) 1 2 3 4 5 6 7  
Erstellen Sie aus Ihren individuellen Fonds Ihr Portfolio

# Widget API

## NPM package

- `index.html`

```
<html>
  <!-- ... -->
  <body>
    <div id="widget-target"></div>
    <script type="module" src="index.ts"></script>
  </body>
</html>
```

- `index.ts`

```
import { renderPortfolioConfigurator, Locale } from '@munichremarkets/portfolio-configurator';

renderPortfolioConfigurator(
  document.getElementById('widget-target'),
  {
    locale: Locale.EnGb,
    // ...
  }
);
```

# Widget API

## Static asset

- index.html

```
<html>
  <head>
    <!-- ... -->
    <script src="https://releases.munichremarkets.com/portfolio-configurator-1.0.0/portfolio-configurator.js">
    </script>
  </head>

  <body>
    <div id="widget-target"></div>

    <script>
      sriPortfolioConfigurator.renderPortfolioConfigurator(
        document.getElementById('widget-target'),
        {
          locale: sriPortfolioConfigurator.Locale.EnGb,
          // ...
        }
      );
    </script>
  </body>
</html>
```

Demo

# Widget Configuration

```
renderPortfolioConfigurator(  
  document.getElementById('widget-target'),  
  {  
    locale: Locale.EnGb,  
  
    fundBackendBaseUrl: 'https://data.munichremarkets.com/funddata',  
    fundUniverseId: ' ... ',  
    jwt: ' ... ',  
  
    enableProductTour: true,  
  
    onSelectPortfolio: (portfolio: Portfolio) => {  
      // called at the end of the workflow  
    },  
  
    textOverrides: {  
      'widgets.portfolioConfigurator.title': {  
        [Locale.DeDe]: 'Portfoliokonfigurator',  
        [Locale.EnUs]: 'Portfolio Configurator',  
      }  
    }  
  
    // ... and more  
  }  
);
```

Demo

# Styling

## Option 1: Not isolated by default

- Render directly in the host DOM
- ✓ (Possibly) corporate theme out of the box
- ✓ Easy customization via host CSS
- ✗ Host CSS can break widget styling
- ✗ Less predictable styling



Our current choice

## Option 2: Isolated by default

- Render in Shadow DOM or iframe
- ✓ Host CSS cannot break widget styling
- ✓ Predictable styling
- ✗ No corporate theme out of the box
- ✗ Need a way to inject/customize styles

## Questions:

- How to get corporate theme out of the box?
- How to avoid breakage while still allowing customization?

# Styling

Observation: Many insurers use the Bootstrap framework for styling

```
<html>
  <head>
    <!-- From host website: Bootstrap styles with corporate theme -->
    <style>
      .text-primary { color: red; }
    </style>

    <!-- Injected by widget library: Widget defaults, scoped to .widget -->
    <style>
      .widget .widget-greeting { font-size: x-large; }
    </style>
  </head>
  <body>
    <p class="text-primary">Hello from host website!</p>

    <div id="widget-target" class="widget">
      <!-- Rendered by widget code -->
      <p class="widget-greeting text-primary">Hello from widget!</p>
    </div>
  </body>
</html>
```

Hello from host website!

Hello from widget!



# Customization (Bootstrap)

```
<html>
  <head>
    <style>
      .text-primary { color: red; }

      .widget.widget-external .widget-greeting {
        font-size: medium;
        text-decoration: underline;
      }
    </style>

    <style>
      .widget .widget-greeting { font-size: x-large; }
    </style>
  </head>
  <body>
    <p class="text-primary">Hello from host website!</p>

    <div id="widget-target" class="widget widget-external">
      <p class="widget-greeting text-primary">Hello from widget!</p>
    </div>
  </body>
</html>
```

Hello from host website!

Hello from widget!

# Non-Bootstrap host websites

```
<html>
  <head>
    <!-- From host website: Non-Bootstrap styles with corporate theme -->
    <style>
      .my-primary { color: red; }
    </style>

    <!-- Injected by widget library: Widget defaults, scoped to .widget -->
    <style>
      <!-- Bootstrap styles, turned on via config -->
      .widget { --primary: blue; }
      .widget .text-primary { color: var(--primary); }

      <!-- Other styles -->
      .widget .widget-greeting { font-size: x-large; }
    </style>
  </head>
  <body>
    <p class="my-primary">Hello from host website!</p>

    <div id="widget-target" class="widget widget-external">
      <p class="widget-greeting text-primary">Hello from widget!</p>
    </div>
  </body>
</html>
```

Hello from host website!

Hello from widget!

```
<html>
  <head>
    <style>
      .my-primary { color: red; }

      .widget.widget-external { --primary: red; }
    </style>

    <style>
      .widget { --primary: blue; }
      .widget .text-primary { color: var(--primary); }

      .widget .widget-greeting { font-size: x-large; }
    </style>
  </head>
  <body>
    <p class="my-primary">Hello from host website!</p>

    <div id="widget-target" class="widget widget-external">
      <p class="widget-greeting text-primary">Hello from widget!</p>
    </div>
  </body>
</html>
```

Hello from host website!

Hello from widget!

Demo

# Semantic Versioning

1.0.0



Major (potentially breaking) changes

2.0.0

# Semantic Versioning

1.0.0



Minor, non-breaking additions

1.1.0

# Semantic Versioning

1.0.0



Bugfixes, security updates

1.0.1

Q&A



