Technical Design Document

# Merrill Edge Home Page - Retirement Calculator: Investment Chart Module Integration (Final)

## 1. Task Reference

Jira ID: CFSSCDWARS-1081

Title: Merrill Edge Home Page - Retirement Calculator Updated Functionality Analysis Technical Design

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Target Fix Version: 2025.PI.02

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## 2. Overview

This document outlines the finalized technical implementation of the Investment Chart module as part of the Merrill Edge Retirement Calculator feature. The component is created as a Sparta module using Web Components and Highcharts, registered via `homepage.json`, and rendered in the Bootstrap module using the <investment-chart> tag.

## 3. Functional Objective

To provide users with a visual representation of projected investment vs savings growth based on user-controlled monthly contributions. This helps users plan their retirement strategy more effectively.

## 4. Updated Architecture & Flow

- A dedicated module `investment-chart-module` is created under `@sparta.wealth-shared.modules`.  
- The Web Component logic is embedded within this module using native Shadow DOM and custom element API.  
- The module is defined and registered in `homepage.json` as:  
 - location: "investmentChartModule"  
 - moduleName: "@sparta.wealth-shared.modules/investment-chart-module"  
 - moduleKey: "investmentChartModule"  
- The module is consumed in the Bootstrap module by rendering the <investment-chart></investment-chart> tag in the template.

## 5. Technical Implementation

- Web Component class `InvestmentChart` is defined and registered using `customElements.define(...)` inside `registerInvestmentChart()`.  
- The module class `InvestmentChartModule` calls this registration function inside `init()`.  
- Highcharts is dynamically loaded from CDN within the Web Component.  
- A slider allows dynamic adjustment of monthly contributions, triggering real-time updates.  
- Chart content is drawn using Highcharts with 30-year projection.

## 6. Sample Configurations and Usage

From homepage.json:

{  
 "location": "investmentChartModule",  
 "moduleName": "@sparta.wealth-shared.modules/investment-chart-module",  
 "moduleKey": "investmentChartModule",  
 "enableBackup": false  
}

In Bootstrap .hbs template:

<div class="investment-chart-wrapper">  
 <investment-chart></investment-chart>  
</div>

## 7. Benefits of This Design

- \*\*Encapsulation\*\*: Shadow DOM ensures no leakage of styles or conflicts with other DOM elements.  
- \*\*Reusability\*\*: The Web Component can be reused across different modules.  
- \*\*Separation of Concerns\*\*: Logic, rendering, and configuration are cleanly split between shared module and consuming module.  
- \*\*Dynamic and Lightweight\*\*: Uses CDN for Highcharts and avoids large bundle dependencies.

## 8. Acceptance Criteria

- The module is properly registered in `homepage.json` and shows up in the Merrill Edge homepage.  
- The Web Component renders using <investment-chart> in the Bootstrap module.  
- User can interact with the slider and see live updates in chart values.  
- Shadow DOM works as expected and prevents style bleeding.