

Task 2 – Shopware 6 Plugin

Topic: Loading CSS and JavaScript Efficiently to Increase Page Load Speed (Mobile)

I built a Shopware 6 plugin that improves PageSpeed by **inlining page-specific critical CSS**, **loading the remaining CSS asynchronously**, and **delaying non-essential tracking scripts** while keeping the core storefront JavaScript behavior intact.

Problem statement

Shopware storefronts often suffer from:

- Render-blocking CSS
- Heavy third-party tracking scripts
- Large unused CSS/JS bundles

This negatively impacts:

- First Contentful Paint (FCP)
- Largest Contentful Paint (LCP)
- Total Blocking Time (TBT)

Objective of the plugin

To improve mobile page load performance by **Eliminating render-blocking of CSS & Js**

Solution overview

The plugin introduces three core optimizations:

CSS

- Inline critical CSS (above-the-fold)
- Asynchronously load the full stylesheet

JavaScript

- Keep core JS **deferred** (Shopware default)
- Delay tracking scripts only

All implemented via:

- Twig partial injection
 - Storefront**Render**Event subscriber
 - System Config - Inline critical script and Enable / disable features
 - Page-specific critical CSS files generated via the **critical** npm package
-

Plugin architecture

Execution flow:

- HTTP Request
- ↓
- Storefront**Render**Event
- ↓
- Plugin **Subscriber**
- ↓
- `setParameter()`
- ↓
- **Twig rendering** (`base.html.twig` & `product-detail.html.twig`)
- ↓
- Final HTML output

Key design choices:

- Uses `StorefrontRenderEvent` to inject rendering data
 - Passes variables using `setParameter()`
 - Injects logic into `base_head` (always rendered)
 - Uses `SystemConfigService` for admin configuration
-

Main features

1, CSS optimization (Hybrid - Text area & critical css file)

- Page-specific critical CSS:
 - Homepage / CMS pages
 - Category pages

- Product detail pages
- Inline CSS via:
`<style id="critical-css">...</style>`
- Async loading of remaining CSS using preload replacement

2, JavaScript optimization

- Core JS remains:
`<script src="storefront.js" defer></script>`
- Tracking scripts delayed using:

```
window.addEventListener('load', () => {  
    setTimeout(loadTracking, 3000);  
});
```

Backend configuration

Admin can configure:

- Enable / disable plugin
- Critical CSS content per page type
- Enable / disable tracking delay
- Delay duration (seconds)

Twig integration

Files used:

- `storefront/util/css-js-optimizer.html.twig`
- `storefront/base.html.twig`
- `storefront/page/content/product-detail.html.twig`

Injection:

- `{% block base_head %}`
 - `{{ parent() }}`
 - `{% sw_include`
 `'@YourTheme/storefront/util/css-js-optimizer.html.twig' %}`
 - `{% endblock %}`
-

Rendering comparison

Before

- `HTML → CSS download → render → JS`

After

- `HTML → render immediately`
 - `CSS downloads in parallel`
 - `CSS applied later`
 - `JS executes after DOM`
-

Technical advantages

- Upgrade-safe
 - No core modification
 - Theme-compatible
 - Page-specific optimization
 - Backend configurable
-

Challenges solved

- Correct Twig injection across themes, Twig inheritance.
 - SystemConfigService, I initially forgot to declare the constructor argument in services.xml.
-

Why this approach is correct

- Uses official Shopware extension points
 - Does not break checkout or cart
 - Does not delay core functionality
 - Page-aware critical CSS
 - Fully configurable
 - Production-safe
-

Possible extensions

- Automatic CLI generation of critical CSS
 - Per sales channel configuration
-

This plugin follows Shopware best practices, avoids core modifications, and focuses on measurable improvements in real-world mobile performance without compromising storefront stability.