**Bachelor Thesis**

**Frameworkagnostic Design Systems**

**What restrictions do Web Components impose on an Angular & Tailwind Design System?**

Submitted in partial fulfilment of the requirements for the degree of:

Bachelor of Science in Computer Science

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**Attention - these titles are only exemplary!**

**The declaration of academic integrity is not listed in the table of contents. It is always on the last page.**

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# Abstract / Management Summary

# Introduction

Your text, your text

## [Subtitle]

Your text, your text

### [Second order subtitle]

Your text, your text

## [Subtitle]

Your text, your text (Last name, year of publication, p. XY)

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# Theory

## Technical Limitations

### Bundlers: Webpack vs EsBuild

In the Angular space are currently two Bundlers to build sourcecode. With both bundlers a Storybook instance with Angular Libraries can be served within an NX MonoRepo (see the attached examples vite and webpack respectively).

However, Hot Module Reloading (HMR) was only achievable with Vite, thanks to the Contribution of Brandon Roberts to AnalogJs <https://analogjs.org/docs/integrations/storybook>, in which he made a working vite plugin for storybook that allows it to render Angular Components via the @analogjs/vite-plugin-angular package.

Configuring Storybook with the Package allows for HMR out of the box, allowing for a smooth developer experience.



### Prettier

For Code-Formatting prettier is used within Bühler. This works out of the box across all technologies, as this example shows a change within a prettier config getting changes across all file-types and technologies.



### Static Code Analysis

### Syntax Highlighting

Syntax Highlighting is checked with the two Editors used at Bühler VSCode and WebStorm. Without installing any Plugins WebStorm offers out of the Box Support for WebComponents as well as LitElements.



VSCode offers support as well however in order to get Syntax-Highlighting inside the Lit-HTML Tag a Plugin is required. The plugin used in the following image is lit-html <https://marketplace.visualstudio.com/items?itemName=bierner.lit-html>



## Tailwind

<https://jordanbrennan.hashnode.dev/8-ways-to-style-the-shadow-dom>

4 Ways to have external styles

1. Inherited Styles (e.g. css variables), watch out for all:initial
2. :root properties
3. ::part 
4. Global Stylesheet imports via @import

<https://medium.com/@yesmeno/css-resets-and-global-styles-in-web-components-c71fcea86dbd> Rollup Import

### Approach Load global tailwind into different web-components

## Environment

* Storybook hot reloading does not work
  + Web Components are loaded, but cannot be unloaded thus the page needs to be refreshed
* Syntax Highlighting
  + Works as it’s also typescript
  + Disables template checking when using CUSTOM\_ELEMENTS\_SCHEMA
* Typing
  + <https://github.com/angular/angular/issues/12045> CUSTOM\_ELEMENTS\_SCHEMA extension
  + <https://github.com/angular/angular/issues/58483> LSP extension



## Limitations of Writing Components

In order to better understand the technical limitations when writing components three components are written with a variety of patterns to see how they can be implemented in Lit.

### Button Component

* Simple dumb component
* Everything works as expected when writing it in Lit or in Angular.

### Accordion Component

* View Children
* Statemanagement Between Components
  + ForwardRef
  + Subsribe Pattern

Findings:

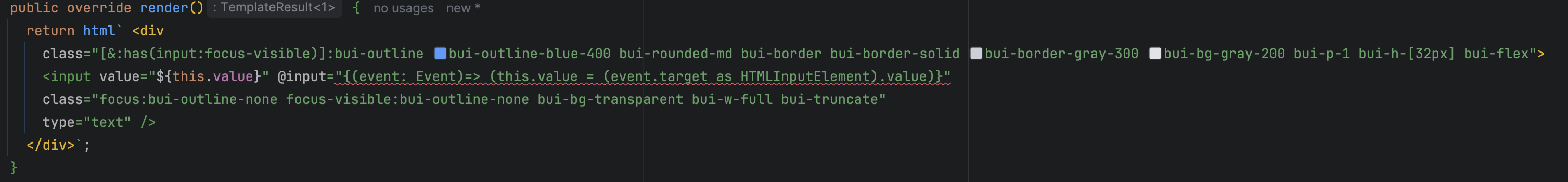
* title can not be the name of a property as it would overwrite the HTML title attribute. Thus the title property had to be renamed to accoridonTitle
* Sharing the state between elements can be done via Lit context, or via just getting a list of the elements.

### Form-Field

* Integration Angular Reactive Forms
* ValueAccessors

## IDE

* GoTo Declaration doesn’t work.
* Sometimes LSP is confused between similar Syntax of LitElements and Angular



# Method

This chapter is necessary for empirical studies.

# Analysis / Results / Findings

# Conclusion

# References

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# List of Figures & Tables

## Figures

## Tables

# Appendix

If necessary, Appendix with additional information and materials. If there are several appendices, these can be titled either with Appendix A, Appendix B etc. or with Appendix I, Appendix II etc. and each with a content description.

Declaration of Originality

I hereby declare that this assignment is my own work and that I have completed this work without the assistance of others. I have acknowledged all literature and sources used and have cited these in accordance with academic citation conventions. I have documented the use of AI tools transparently.

I have not previously submitted this assignment, or parts thereof, for credit on another course, unless this has been expressly agreed with the relevant instructor.

I am aware that this work may be checked for plagiarism and AI-generated text passages and works – including through the use of relevant software. I hereby specifically authorise Kalaidos University of Applied Sciences to perform such checks.

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Place, date First name, Surname

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Signature

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