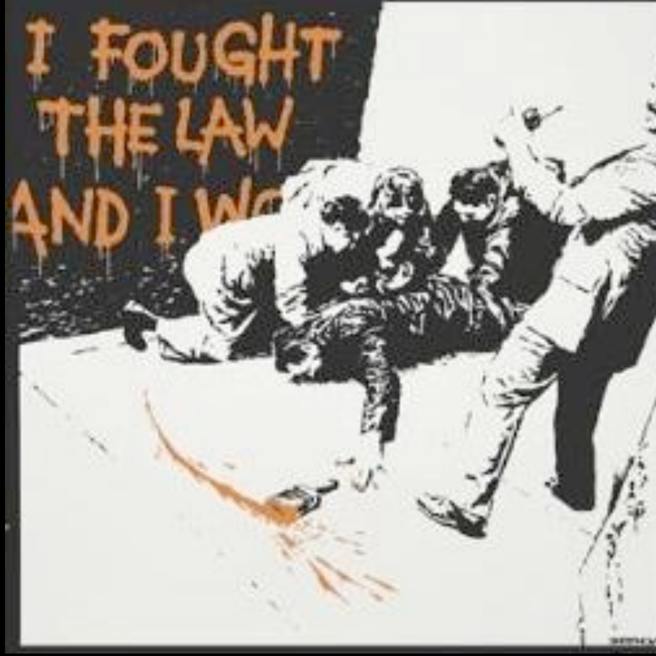
ONLY FRIDAYS
@XMLPRAGUE PRECONF



TODAY LIVE XML PUNK ROCK:

TEMPLATING IN EXIST

WE FOUGHT THE LAW

AT THE QUERIES: WOLF

"XFRONT"-MAN IN THE BACK: LARS

The Story

Motivation

- We do <3 Open Data
- More than1.5K federal Law Books published by German Ministry of Justice
- Common pitfalls in enterprise XML apps
- Let’s query the law

Collateral Damages

- XML != XML
- Flat XML <norms/> for books, paragraphs, articles...
- 010 (1), 010010020010 (1.1.2.1), 010020030 (1.2.3), 040020 (4.2)
- XSLT / XQuery for the win!

Goals

- Clean separation of concerns
- Support team cooperation
- Improve maintenance

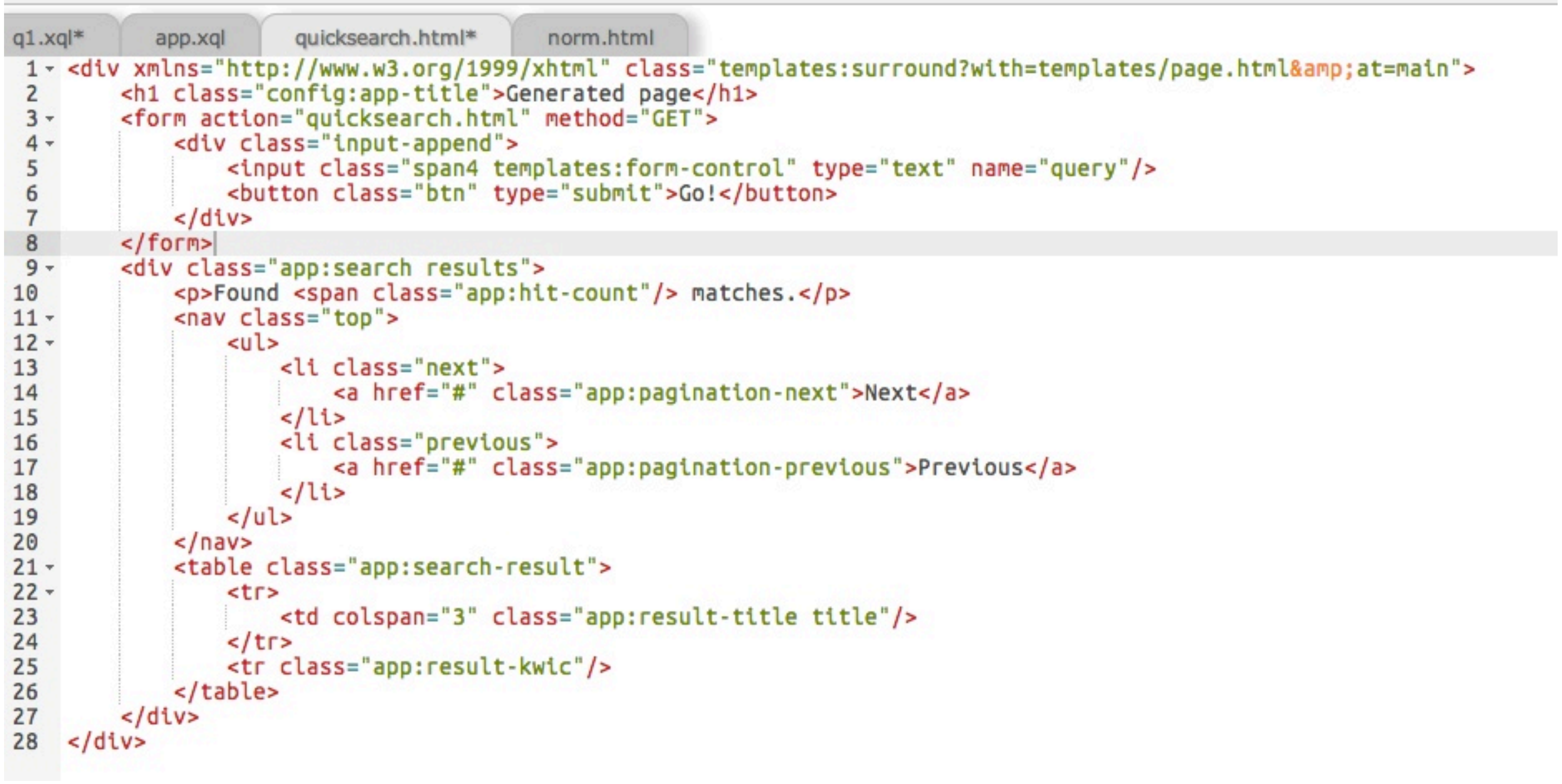
Part 1: The View

The Idea

- Generate as little HTML from XQuery as possible
- Application logic: XQuery module functions
- Template parameters map to function parameters

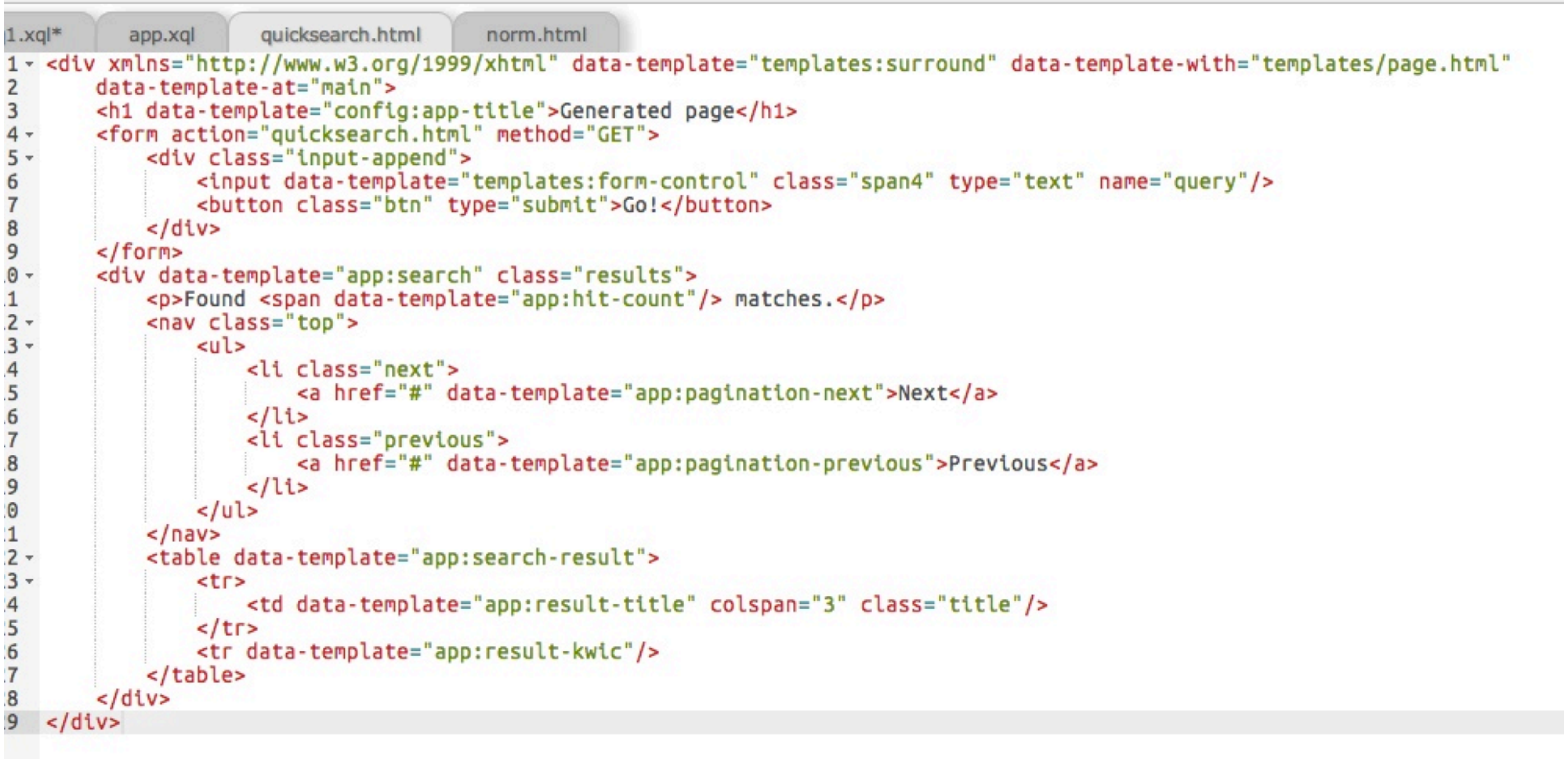
How to Connect HTML and XQuery?

Method 1: Class Attributes



```
<div xmlns="http://www.w3.org/1999/xhtml" class="templates:surround?with=templates/page.html&amp;at=main">
    <h1 class="config:app-title">Generated page</h1>
    <form action="quicksearch.html" method="GET">
        <div class="input-append">
            <input class="span4 templates:form-control" type="text" name="query"/>
            <button class="btn" type="submit">Go!</button>
        </div>
    </form>
    <div class="app:search results">
        <p>Found <span class="app:hit-count"/> matches.</p>
        <nav class="top">
            <ul>
                <li class="next">
                    <a href="#" class="app:pagination-next">Next</a>
                </li>
                <li class="previous">
                    <a href="#" class="app:pagination-previous">Previous</a>
                </li>
            </ul>
        </nav>
        <table class="app:search-result">
            <tr>
                <td colspan="3" class="app:result-title title"/>
            </tr>
            <tr class="app:result-kwic"/>
        </table>
    </div>
</div>
```

Method 2: HTML5 Compliant



```
<div xmlns="http://www.w3.org/1999/xhtml" data-template="templates:surround" data-template-with="templates/page.html"
    data-template-at="main">
    <h1 data-template="config:app-title">Generated page</h1>
    <form action="quicksearch.html" method="GET">
        <div class="input-append">
            <input data-template="templates:form-control" class="span4" type="text" name="query"/>
            <button class="btn" type="submit">Go!</button>
        </div>
    </form>
    <div data-template="app:search" class="results">
        <p>Found <span data-template="app:hit-count"/> matches.</p>
        <nav class="top">
            <ul>
                <li class="next">
                    <a href="#" data-template="app:pagination-next">Next</a>
                </li>
                <li class="previous">
                    <a href="#" data-template="app:pagination-previous">Previous</a>
                </li>
            </ul>
        </nav>
        <table data-template="app:search-result">
            <tr>
                <td data-template="app:result-title" colspan="3" class="title"/>
            </tr>
            <tr data-template="app:result-kwic"/>
        </table>
    </div>
</div>
```

Part 2: XQuery

The XQuery Function

```
<p>Found <span data-template="app:hit-count"/> matches.</p>
```

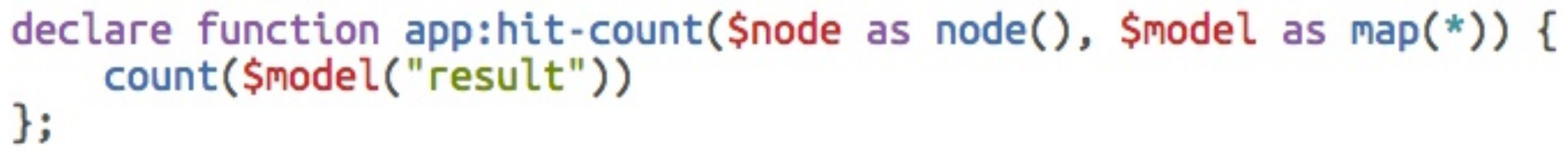
$\Big\downarrow$ Maps to

```
declare function app:hit-count($node as node(), $model as map(*)) {
    count($model("result"))
};
```

Mapping

- Template searches known modules for function matching app:hit-count
- Lookup is based on XQ3 HoF
- Function needs to take 2 default parameters (but may take more)

Function Signature



```
declare function app:hit-count($node as node(), $model as map(*)) {
    count($model("result"))
};
```

$node	the HTML element containing the template call
$model	any data passed in from outer templates or empty map

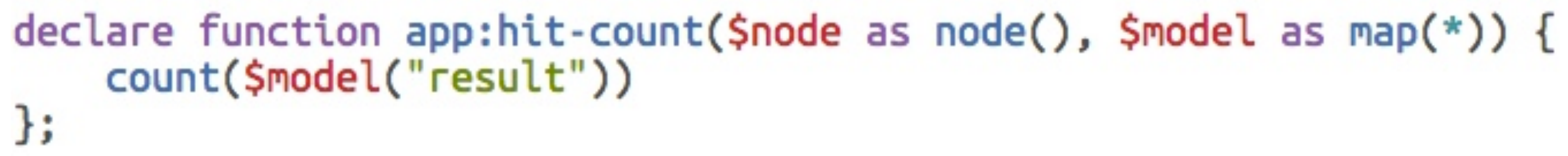
Return Value

- The function may either return:
  - the empty sequence
  - a sequence of nodes or atomic values
  - a map
- Returned value replaces HTML content of template (unless it is a map)

Nested Templates

- Function returns a map:
  - Merge returned map into current model
  - Proceed processing any inner HTML

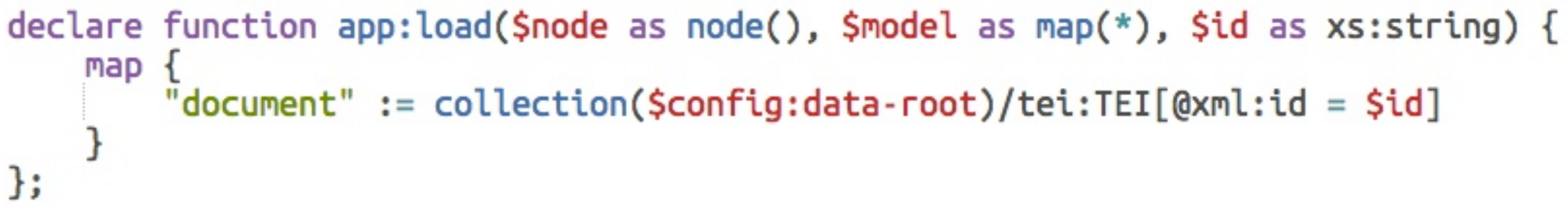
Using the Model



```
declare function app:hit-count($node as node(), $model as map(*)) {
    count($model("result"))
};
```

$model(„result“) was set by outer template!

Populating the Model



```
declare function app:load($node as node(), $model as map(*), $id as xs:string) {
    map {
        "document" := collection($config:data-root)/tei:TEI[@xml:id = $id]
    }
};
```

- Look up document by id and put it into model
- BUT: where does $id come from?

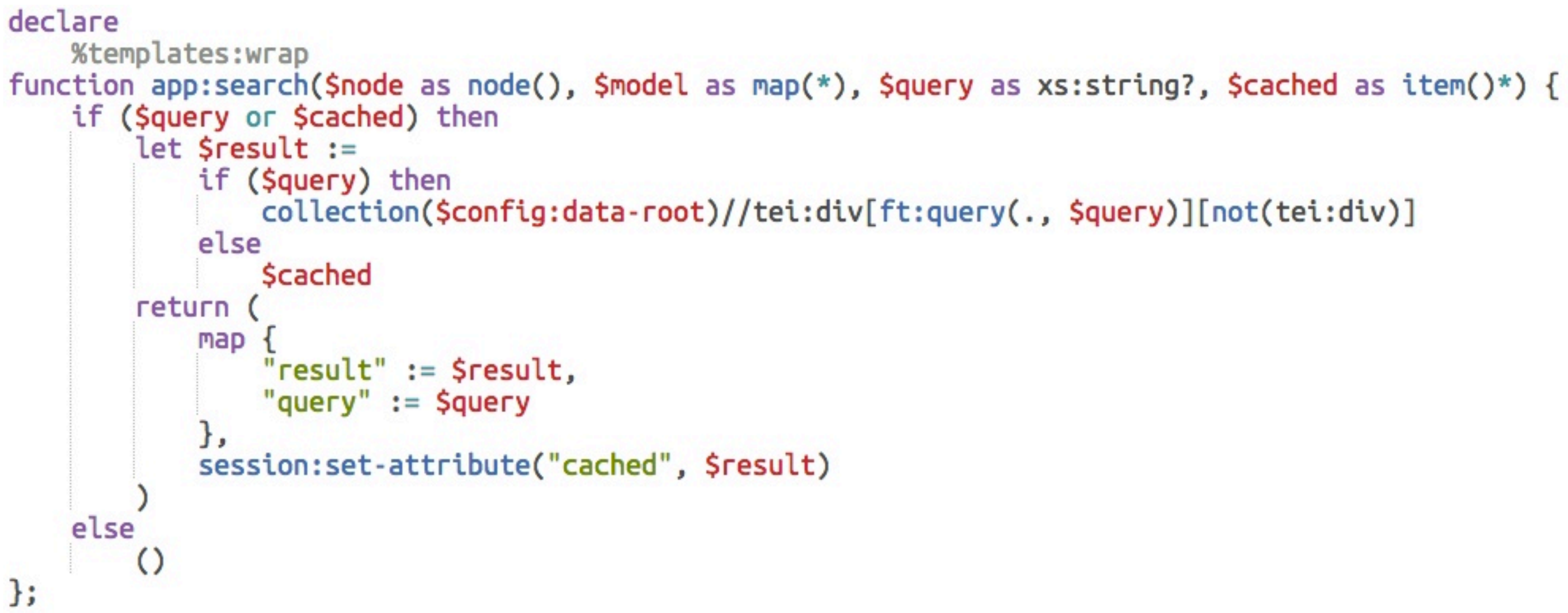
Based on Convention

- Templating is based on convention!
- Framework tries to make a best guess about how to fill in parameters

Parameter Injection

- Search parameter in:
  - HTTP request parameters
  - HTTP session attributes
  - Static template parameters
- Automatic type conversion!

The Search Function



```
declare
    %templates:wrap
function app:search($node as node(), $model as map(*), $query as xs:string?, $cached as item()*) {
    if ($query or $cached) then
        let $result :=
            if ($query) then
                collection($config:data-root)//tei:div[ft:query(., $query)][not(tei:div)]
            else
                $cached
        return (
            map {
                "result" := $result,
                "query" := $query
            },
            session:set-attribute("cached", $result)
        )
    else
        ()
};
```

Annotations

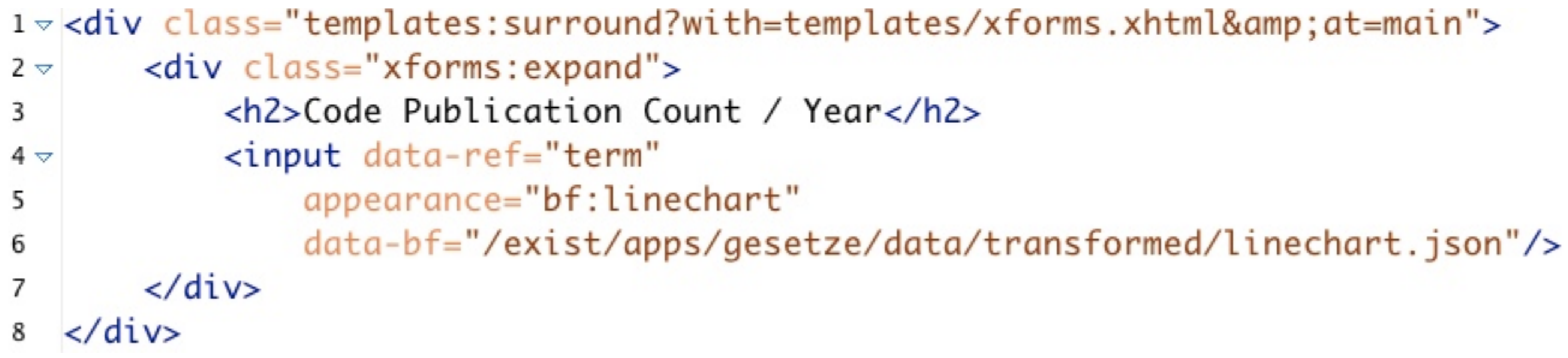
%templates:wrap	preserve wrapping HTML element
%templates:default	fallback value if parameter is undefined

Predefined Templates

- templates:surround
- templates:include
- templates:form-control
- templates:each
- ...

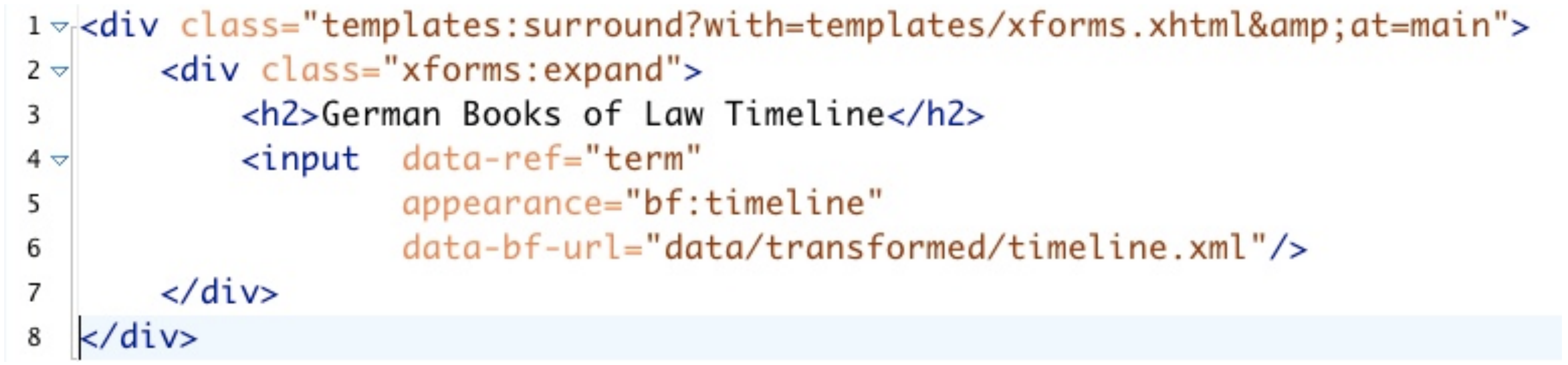
Part 3: XForms

Line Chart



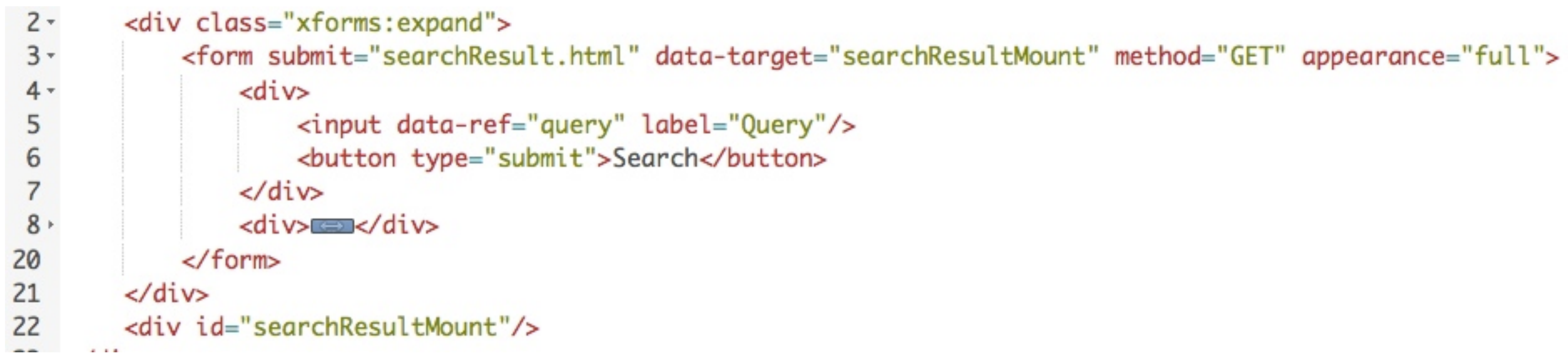
```
<div class="templates:surround?with=templates/xforms.xhtml&amp;at=main">
    <div class="xforms:expand">
        <h2>Code Publication Count / Year</h2>
        <input data-ref="term"
            appearance="bf:linechart"
            data-bf="/exist/apps/gesetze/data/transformed/linechart.json"/>
    </div>
</div>
```

Timeline



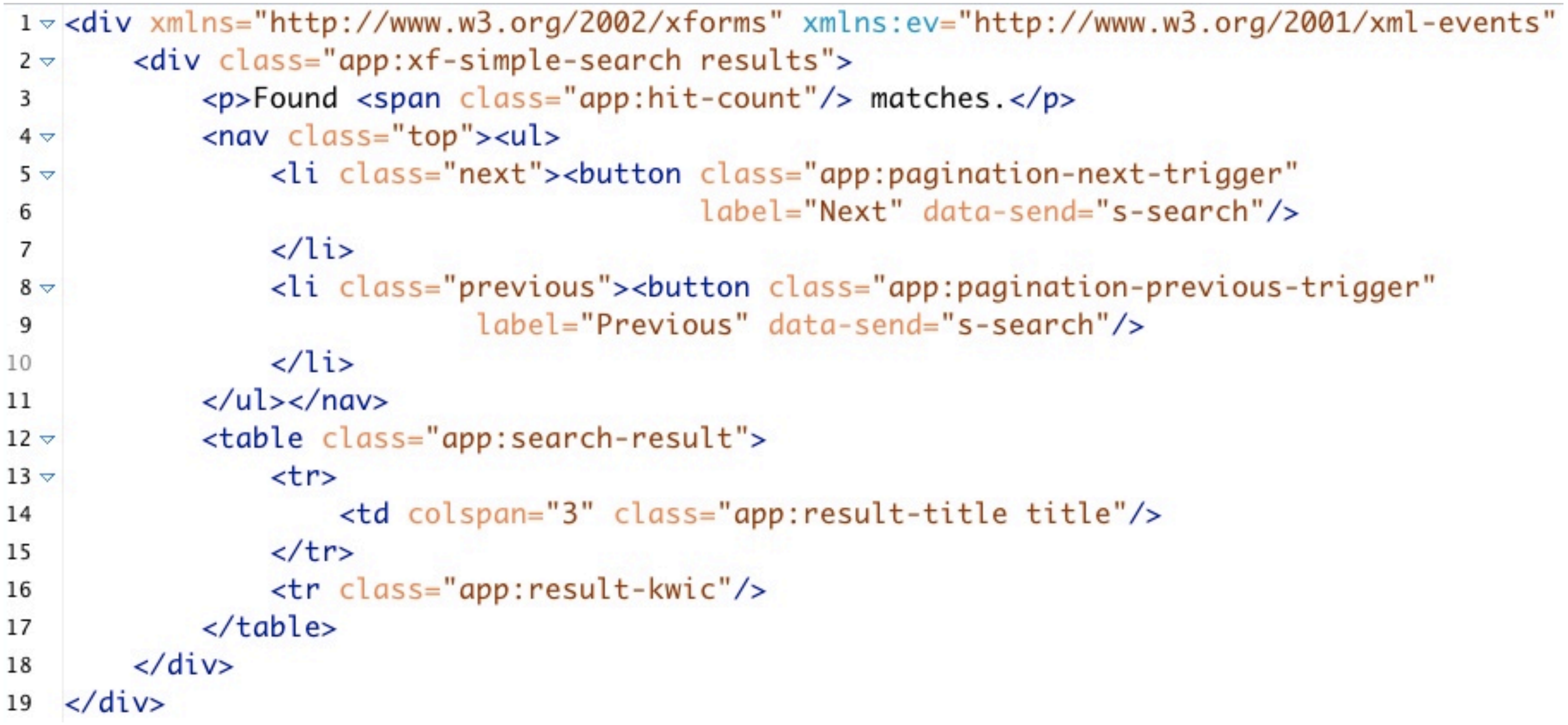
```
<div class="templates:surround?with=templates/xforms.xhtml&amp;at=main">
    <div class="xforms:expand">
        <h2>German Books of Law Timeline</h2>
        <input  data-ref="term"
                appearance="bf:timeline"
                data-bf-url="data/transformed/timeline.xml"/>
    </div>
</div>
```

XForms Quicksearch 1



```
<div class="xforms:expand">
    <form submit="searchResult.html" data-target="searchResultMount" method="GET" appearance="full">
        <div>
            <input data-ref="query" label="Query"/>
            <button type="submit">Search</button>
        </div>
        <div>↔</div>
    </form>
</div>
<div id="searchResultMount"/>
```

XForms Quicksearch II



```
<div xmlns="http://www.w3.org/2002/xforms" xmlns:ev="http://www.w3.org/2001/xml-events"
    <div class="app:xf-simple-search results">
        <p>Found <span class="app:hit-count"/> matches.</p>
        <nav class="top"><ul>
            <li class="next"><button class="app:pagination-next-trigger"
                                     label="Next" data-send="s-search"/>
            </li>
            <li class="previous"><button class="app:pagination-previous-trigger"
                        label="Previous" data-send="s-search"/>
            </li>
        </ul></nav>
        <table class="app:search-result">
            <tr>
                <td colspan="3" class="app:result-title title"/>
            </tr>
            <tr class="app:result-kwic"/>
        </table>
    </div>
</div>
```

XForms.xqm

- HTML => XForms Controls
- XQuery => XForms Functions
- Generate Model instances, bindings & submissions
- and more...

Why use XForms at all?

It’s the model, stupid

XForms Model

- Bindings validate, calculate, relevance, readonly
- Actions & Events
- Submissions

All power to the model

- External Model to support:
  - Security
  - Chained submissions,
  - Complex Actions & Bindings
  - Multiple constraints

everyone does what she does best up to their ability