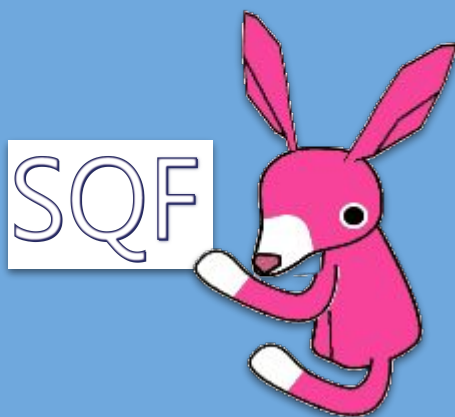


# The Power of Schematron Quick Fixes



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# Overview

- Schematron QuickFix Language
- Use Cases: QA, Efficiency, SQF/Schematron Interactions
- SQF - Second Draft



# What Is SQF?

- Schematron QuickFix (SQF) is an extension of the ISO Schematron standard
- User-defined fixes for Schematron errors


The letters 'SQF' are rendered in a large, stylized font. The letters are white with a thick, dark blue outline, giving them a 3D or embossed appearance. They are centered horizontally in the lower half of the slide.

# SQF History

- XML Prague 2014 – the SQF idea started to take shape
- February 20, 2014 - W3C Community Group "Quick-Fix Support for XML"
- April 2015 - First Draft
- March 2018 – Second Draft



# Schematron Quick Fixes Spec



## Schematron Quick Fixes Specification

Quick-fix support for XML Community Group – Draft  
March 2018

**This version:**  
[schematron-quickfix.github.io/sqf/spec/SQFSpec.html](https://schematron-quickfix.github.io/sqf/spec/SQFSpec.html)

**Latest version:**  
[schematron-quickfix.github.io/sqf](https://schematron-quickfix.github.io/sqf)

**Editors:**  
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### Abstract

Schematron QuickFix is an extension of Schematron (standard [ISO/IEC 19757-3:2016](#)). Schematron QuickFix enables developers to define QuickFixes for Schematron errors. QuickFix implementations should present these QuickFixes for the reported Schematron errors to the user. The user can then decide which QuickFix fixes the error in an acceptable way.



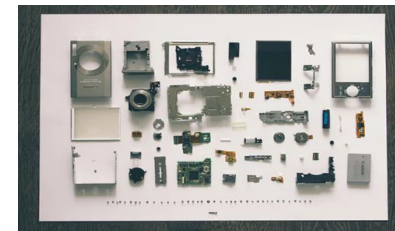
[www.w3.org/community/quickfix](http://www.w3.org/community/quickfix)



[schematron-quickfix.github.io/sqf](https://schematron-quickfix.github.io/sqf)

# Used in Multiple Domains

- Financial
- Insurance
- Government
- Technical publishing



# Use Cases





# 1. Quality Assurance

topic id="topic\_dxc\_pzp\_4gb"

Topic ID must be equal to file name

title XPath Preferences title

body p Oxygen allows you to customize the following options:

All entries should have an id

p dl dentry dt Unescape XPath expression dt

dd If selected, the entities of an XPath expressions are unescaped during their execution. For example, the expression:

screen //varlistentry[starts-with(@os,'s\*x73;')] is equivalent to:  
//varlistentry[starts-with(@os,'s')] screen dd dentry

You should not use screen element

dentry dt XPath Default Namespace dt

dd You can choose between the following four options:

ul

- li No namespace - If selected, unprefixed element names are considered as belonging to no namespace. li
- li Use the default namespace from the root element (default selection) li

Consecutive lists are not allowed

ul

ul

- li Use the namespace of the root - If selected, unprefixed element names are considered as belonging to the same namespace as the root element of the XML document you are querying. li
- li This namespace - use the corresponding text field to enter the namespace of the unprefixed elements. li

ul dd dentry dl p body topic



# Users

- **Content Writer** – A subject matter expert, but doesn't know XML very well
- **XML Expert** – Knows XML structure, but doesn't know much about the actual content

Using the quick fixes created by the **XML Expert** the **Content Writer** can correct the problem

# Example

Topic ID must be equal to file name

Set the file name as the topic ID



All entries should have an id

Add id to the current entry

Add id to the all entries from document

You should not use screen element

Replace screen with codeblock

Consecutive lists are not allowed

Merge lists into one

Add a paragraph after first list

## 2. Efficiency

No keywords are set for the current topic

### Adding Video, Audio, and Embedded HTML Resources

You can insert references to media resources (such as videos, audio clips, or embedded HTML frames) in your DITA, DocBook, or XHTML topics. The media resources can be played directly in **Author** mode and in all HTML5-based outputs.

Cells are missing

#### Supported Media Types

colspecs...

| Media          | Description                                |        |                |
|----------------|--|--------|----------------|
| mp3            | Moving Picture Experts Group Layer-3 Audio | audio  |                |
| wav            |  |        |                |
| pcm            | audio                                      | Width  |                |
| embedded video | Embedded Iframe Code                       | iframe | Width & Height |

#### Adding a Media Resource

To insert a media resource in a document, use the following steps:

Ordered lists are not allowed

- Place the cursor at the location where you want the media resource.
- Select the Insert Media Resource action from the toolbar. A **Chose Media** dialog box appears.
- Select the URL for the media resource and click **Ok**.

Related information:

[Adding Images in DITA Topics](#)

Link should be in a link list

# Example

No keywords are set for the current topic

Add keywords for the current topic

Cells are missing

Add enough empty cells on each row

Ordered lists are not allowed

Convert ordered list to unordered list

Link should be in a link list

Create a link list with the current link



### 3. Ignoring in Schematron

- Schematron has errors, warnings, informations
- Warnings are like Schrödinger's cat:
  - If you don't look at it, they are good and bad at the same time
  - Good warning needs to be marked  
→ **Ignoring**



Source: <https://www.leifiphysik.de/>

- Ignoring in Schematron is not a big deal:
  - Mark the context with a PI or a specific attribute
  - Exclude marked nodes from your tests.

# Ignoring in Schematron

- Example from our XSLT styleguide

```
- <sch:pattern id="p_01_unused_items" xmlns:d2t="http://data2type.de/">  
  <sch:rule context="*[@d2t:ignore = 'p_01_unused_items']"/>  
  
  <sch:rule context="xsl:template[@name]">  
  
    <!-- Check template usage -->  
    <sch:assert test="..."/>
```

- Elements with the `d2t:ignore` attribute and the value `p_01_unused_items` will be ignored.
- For convention the value is equal to the pattern ID.
- With the specific namespace `http://data2type.de/` name conflicts are avoided



# Ignoring in Schematron

- Problem in practice: the user has to know a lot:
  - That it is possible to ignore the warning
  - That you have to ignore with an ignore attribute.
  - The **exact** URL of the specific namespace
  - The **exact** pattern ID of each Schematron warning
- ➔ Ignoring with pur Schematron is not practical

# Ignoring with SQF

- SQF makes ignoring practical
- A simple QuickFix helps:
  - ```
<sqf:fix id="ignore_p_01_unused_items">  
  <sqf:description>  
    <sqf:title>Ignore this warning</sqf:title>  
  </sqf:description>  
  <sqf:add match="." target="d2t:ignore" node-type="attribute"  
    select="'p_01_unused_items'"/>  
</sqf:fix>
```
  - The user has just to use the QuickFix, to ignore the warning

# Ignoring with SQF

- Remarkable:
  - QuickFix is not used to fix the document
  - SQF and Schematron interacts
    - Schematron checks the document
    - QuickFix makes a manipulation
    - On next validation circle Schematron reacts depending on that manipulation
- Door opener for new ideas

## 3. Guided Development

- Example XSD guide
  - Multiple ways to express the same thing in XSD
  - Inexperienced users has problems to follow a design pattern (google based development)
  - The XSD guide leads the user through XSD based on a selected design pattern.
  - The XSD guid is based on Schematron, SQF and XSLT only

# XSD Guide – Demo

<https://github.com/octavianN/thePowerOfSQF/Samples/xsdguide/>

# Guided Development

- How does it works?
  - Interaction by `xs:annotation/xs:appInfo/d2t:xsdguide`
  - User input by `<sqf:user-entry>`
    - Edit Content with `@default`
  - Multiple choice selections by:
    - Different QuickFixes
    - Generic QuickFixes (`@use-for-each`)
    - Drop-down menu in User Entry  
(Escali plugin only feature: by `sqf:user-entry/@default` returning a sequence)
  - Complex tasks by using XSLT functions



# Guided Development

- XSD Guide is just an example
- There are other large and confusing standards in the XML world
  - With user without a deep understanding
  - You can provide shortcuts for verbose syntax
  - You may have to work with PIs for interactions

# Library of Quick Fixes

- A library of generic quick fixes, such as:
  - Wrap content in element
  - Unwrap element content
  - Rename element
  - Merge elements



# Abstract SQF

Rename element abstract quick fix:

```
<sqf:fix id="renameElement" role="replace">
  <sqf:param name="element" abstract="true"/>
  <sqf:param name="newName" abstract="true"/>
  <sqf:description>
    <sqf:title>Rename '$element' element in '$newName'</sqf:title>
  </sqf:description>
  <sqf:replace match="." target="$newName" node-type="element" select="node()"/>
</sqf:fix>
```

# Abstract SQF

## Abstract pattern:

```
<sch:pattern id="renamePattern" abstract="true">
  <sch:rule context="$element">
    <sch:assert test="false()" sqf:fix="renameElement">
      Element '$element' not allowed, use '$newName' instead.
    </sch:assert>
  </sch:rule>
</sch:pattern>
```

## Pattern instantiation:

```
<sch:pattern is-a="renamePattern">
  <sch:param name="element" value="orderedlist"/>
  <sch:param name="newName" value="itemizedlist"/>
</sch:pattern>

<sch:pattern is-a="renamePattern">
  <sch:param name="element" value="ol"/>
  <sch:param name="newName" value="ul"/>
</sch:pattern>
```

# SQF Second Draft – March 2018

- Multilingual support for quick fixes
- Generate quick fixes dynamically
- Changed sqf:keep in sqf:copy-of
- Added @flags for sqf:stringReplace
- Redesign the content model of sqf:fix
- ...

# Multilingual Support in SQF

- The name and description of a quick fix are defined by sqf:title and sqf:p elements
- The @ref attribute specifies IDs or keys for alternative localization

```
<sqf:fix id="addBone">
  <sqf:description>
    <sqf:title ref="fix_en fix_de">Add a bone</sqf:title>
    <sqf:p ref="fix_d_en fix_d_de">Add a bone as child element</sqf:p>
  </sqf:description>
  <sqf:add node-type="element" target="bone"/>
</sqf:fix>
```



# Localization Using Diagnostics

- Implementation of quick fix localization using Schematron diagnostics
  - A diagnostic element is used for each language
  - The @ref attribute refers diagnostic IDs

```
<sqf:fix id="addBone">
  <sqf:description>
    <sqf:title ref="fix_en fix_de">Add a bone</sqf:title>
  </sqf:description>
  <sqf:add node-type="element" target="bone"/>
</sqf:fix>
....
<sch:diagnostics>
  <sch:diagnostic id="fix_en" xml:lang="en">Add a bone</sch:diagnostic>
  <sch:diagnostic id="fix_de" xml:lang="de">Fügen Sie einen Knochen hinzu</sch:diagnostic>
</sch:diagnostics>
```

# Localization Using Property Files

- Implementation of quick fix localization using Java Property Files
  - A property file for each language  
“fileName\_lang.xml”
  - The @ref attribute refers the property key

```
<sqf:fix id="addBone">  
  <sqf:description>  
    <sqf:title ref="dog.addBone.title" xml:lang="en">Add a bone</sqf:title>  
    <sqf:p ref="dog.addBone.p">Add bone element as child</sqf:p>  
  </sqf:description>  
  <sqf:add node-type="element" target="bone"/>  
</sqf:fix>
```

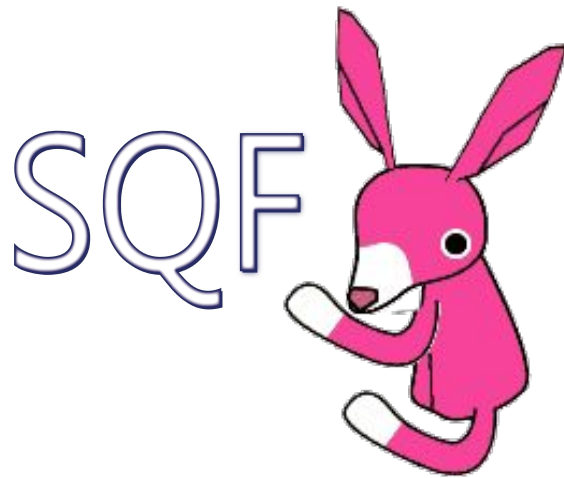
```
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">  
<properties>  
  <entry key="sample.dog.addBone.title">Füge einen Knochen hinzu</entry>  
  <entry key="sample.dog.addBone.p">Der Hund wird einen Knochen erhalten.</entry>  
</properties>
```

# Generate Quick Fixes Dynamically

- Added support to generate quick fixes dynamically using the @use-for-each attribute
- Generate a quick fix for each match of the @use-for-each attribute

```
<sqf:fix id="removeAnyItem" use-for-each="1 to count(li)">
  <sqf:description>
    <sqf:title>Remove item #<sch:value-of select="$sqf:current"/></sqf:title>
  </sqf:description>
  <sqf:delete match="li[$sqf:current]"/>
</sqf:fix>
```

# SQF Became a Powerful Language and Made Schematron More Powerful



# SQF Implementations

- <oXygen/> XML Editor validation engine
- <http://www.oxygenxml.com>
- Escali Schematron engine
- [http://schematron-quickfix.com/escali\\_xsm.html](http://schematron-quickfix.com/escali_xsm.html)
  - Escali Schematron command-line tool
  - Oxygen plugin for invoking Escali Schematron

# Resources

- Schematron Quick Fix specification  
<http://schematron-quickfix.github.io/sqf>
- Schematron Quick Fix site  
<http://www.schematron-quickfix.com/>
- Schematron site  
<http://schematron.com/>
- Schematron specification  
<https://standards.iso.org/ittf/PubliclyAvailableStandards>



# THANK YOU!

**Any questions?**

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