

# Customizing IG Publisher templates

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# Who am I

- Name: Lloyd McKenzie
- Company: Gevity
- Background:
  - One of FHIR's 3 initial editors
  - Co-chair FMG & FHIR Infrastructure
  - Co-chair HL7 Modeling & Methodology
  - Heavily involved in HL7 and healthcare exchange for last 19 years
    - v2, v3, CDA, etc.
  - Have created 10+ IGs for various projects using HL7 tools
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## Context

- Focus is on HL7's IG Publisher (not Simplifier)
  - Can be relevant to Trifolia
  - In principle, could export Simplifier and use IG Publisher too
- This presentation is going to get “Techie”
  - HTML, CSS, ANT, XSLT, etc. 😊
- Architecture of the IG Publisher is changing
  - We'll talk about old and new approaches

## Why customize an IG's appearance?

- Adjust to 'brand' of IG publisher
- Creating a different 'kind' of IG/targeting a different type of user
  - Need to present information in a different way
  - E.g. regulatory requirements
- You're better at UI than HL7's volunteers 😊
- Some examples

## Current IG Publisher approach

- If you wish, create your own template
- Most implementers start by starting with an existing IG
- Two major frameworks within HL7
  - Eric's (Hass) or Lloyd's (me)
  - Other organizations may create their own
- In practice, multiple subtle variations, often out-of-date

## New approach: Templated IGs

- All of the “template” stuff managed as a separate Git project
- Referenced using NPM
- Multiple IGs can point to the same ‘template’
- Templates can, in principle, build on other templates
  
- Easier to maintain – increases the chances of consistency
- Changes to template managed through pull requests, everyone gets them

## What languages/tools are used?

- Java – Needed to run the IG Publisher
- Jekyll (and Ruby) – Produces website
- Liquid – Templating language used by Jekyll
- Ant – Used to manage steps around publication
  - In ‘current’ approach, optional (can use other scripting languages)
  - In template approach, mandatory – called from IG Publisher
- HTML, CSS, JavaScript
- XSLT?, Python?, Others?

# What does a template control?

- Where files are found
  - And what they're called (partly)
- Where the output goes
- General look and feel
  - Headers, footers, color-scheme
- 'Generated' pages
  - Table of Contents, Index, etc.
- Artifact appearance



## IG Publisher steps

1. Load & parse source artifacts
2. Validate artifacts
3. Create artifact 'fragments'
4. Create cross-resources 'fragments'
5. Process Jekyll templates
6. Generate static web content
7. Validate web pages
8. Package everything up

# What are 'fragments'?

This structure is derived from [Questionnaire](#)

## Summary

Mandatory: 5 elements  
Must-Support: 18 elements

## Structures

This structure refers to these other structures

- <http://hl7.org/fhir/uv/sdc/StructureDefinition/>

## Extensions

This structure refers to these extensions:

- <http://hl7.org/fhir/StructureDefinition/>
- <http://hl7.org/fhir/uv/sdc/StructureDefinition/>

### 1. Questionnaire

Definition	Sets minimum expectations for questionnaire support for SDC-conformant systems, regardless of the type of questionnaire.
Control	0..*
Alternate Names	Form, CRF, Survey

#### N Invariants



#### Defined on this element

- dom-2:** If the resource is contained in another resource, it SHALL NOT contain nested Resources.
- dom-3:** If the resource is contained in another resource, it SHALL be referred to from elsewhere on the same path (either an immediate child of the parent, or a child of any child at any depth) or descendants().where(reference = '#').exists() or descendants().where(as(canonical) = '#').exists()).not().trace('unmatched', id).empty()
- dom-4:** If a resource is contained in another resource, it SHALL NOT have a meta.versionId that is not null.
- dom-5:** If a resource is contained in another resource, it SHALL NOT have a security label (: securityLabel.exists()).
- dom-6:** A resource should have narrative for robust management (: text.div.exists())
- que-0:** Name should be usable as an identifier for the module by machine processing applications (e.g. via the href or id attributes of the link element).
- que-2:** The link ids for groups and questions must be unique within the questionnaire (: designNote.id.unique()).

### 2. Questionnaire.id

Definition	The logical id of the resource, as used in the URL for the resource. Once assigned, this value does not change.
Control	0..1
Type	id
Comments	The only time that a resource does not have an id is when it is being submitted to the server for creation.

id	0..1	string
prefix	0..1	string
text	0..1	string
type	1..1	code

Path	Conformance	ValueSet
status	required	PublicationStatus
resourceType	required	ResourceType
questionnaireItemType	required	QuestionnaireItemType
questionnaireAnswerCodes	example	QuestionnaireAnswerCodes

#### & Constraints

## Template injection points

- The new template process allows the ‘template’ to intervene at multiple locations in the publication process:
  - **onLoad** – allows changing the IG resource prior to processing
  - **onGenerate** – allows creation/editing of resources prior to fragment generation
  - **onJekyll** – allows editing/manipulation of fragments before generating pages
  - **onCheck** – allows manipulating generated HTML before validation/packaging

## 'Easy' customizations

- Color scheme, fonts, etc.
  - Edit the global CSS, or add a reference to a new one
- Header, Footer, panel sizes, etc.
  - Edit the 'include' files that define the standard header/footer for all pages
- Pre-process input files
  - Use Ant scripts (before IG Publisher launch, or within)
- Add additional pages
  - Use Ant scripts (before IG Publisher launch or within)
- Post-processing packaging
  - Use Ant scripts(after IG Publisher launch or within)

# Influencing IG Publisher behavior

- Old way: ig.json
- New way: parameters within an IG
- Determines:
  - IG metadata
    - URL, version, id, etc.
  - File locations
  - What fragments get created
  - Other behavior
    - e.g. SNOMED CT version, inactive codes allowed, etc.

# Jekyll templates

- Each represents a ‘page’ in the IG
  - Sometimes tabs are separate pages
- Can use Liquid to enable/disable content, iterate through content
- Defines what headings, boiler-plate text and fragments appear
  - And in what order/what style
  - Can ‘import’ other fragments based on artifact id to include custom content

## Considerations when customizing

- Keep in mind what implementers are used to
- Take advantage of web-based navigation, but don't go crazy
  - What information is it reasonable to need to click to see?
- Be aware of limitations when viewing content on different devices, with different rendering engines
  - Even within the same browser version, different settings (e.g. JavaScript availability) can cause different behaviors
- HL7 defines 'good practices' for IGs and sets minimum standards for HL7-published IGs
  - [http://wiki.hl7.org/index.php?title=FHIR\\_Implementation\\_Guide\\_Publishing\\_Requirements](http://wiki.hl7.org/index.php?title=FHIR_Implementation_Guide_Publishing_Requirements)

## ‘Complex’ customizations

- Change how resources are rendered
  - Modify Jekyll templates
- New fragments
  - Use Ant scripts (before IG Publisher launch or within)
  - Make pull requests against the IG Publisher
- Add rules for rendering additional artifacts
  - Add Jekyll templates
  - Modify IG file/ig.json file



## CI Build environment

- HL7 supports publishing GitHub-based IGs in a “Continuous Integration” environment
- To use the CI environment, HL7 must vet and approve the publishing template used
  - Primarily to manage security risks, manage resource consumption

## What's coming?

- Template approach moving from 'alpha' to only supported mechanism
- 'Standard' HL7 template
- 'Standard' templates created by other organizations too (e.g. IHE)
- Improved documentation, sample templates

## To learn more

- IG Publisher:
  - [http://wiki.hl7.org/index.php?title=IG Publisher Documentation](http://wiki.hl7.org/index.php?title=IG_Publisher_Documentation)
- IG Templates:
  - [http://wiki.hl7.org/index.php?title=FHIR IG publisher templates](http://wiki.hl7.org/index.php?title=FHIR_IG_publisher_templates)
- Samples:
  - Lloyd – <https://github.com/HL7/sdc>
  - Eric – <https://github.com/Healthdata1/IG-Template2>
- IG Publication (and publisher) discussion
  - <https://chat.fhir.org/#narrow/stream/179252-IG-creation>

# Questions?

- [lmckenzie@gevityinc.com](mailto:lmckenzie@gevityinc.com)
- (or better yet, ask on the chat.fhir.org channel...)