# Let's Completely Change How Templates Work!

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C. Scott Ananian, Wikimedia Foundation
Wikimania Stockholm, 16 August 2019

# Wikitext Templates are the best thing to happen to Wikipedia

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"**[Templates](), or custom messages, have grown from humble beginnings as an afterthought in a localisation feature. They are now used in almost 10% of pages in the English Wikipedia database. The 1.3 release brings several changes in recognition of this new role...**"

**2004-08-11**

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# Wikitext Templates are the Worst!

So let's change everything about them.

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# Some bad things.

- Surprising start-of-line rules
- Inconsistent quoting
- Unstructured inputs
- Unstructured output
- Mixing code/data/layout
- Problematic localization
- See "Templates are Dead!", Wikimania 2015

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# What to do?

1. **Incremental fixes**
2. **Alternative mechanisms**
3. **Deeper changes**

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Incremental Fixes

# Incremental 1: Balance

```
{{{!}}
{{!}} cla{{1x|ss}}=fo{{1x|o}} {{!}} Hello {{!}}{{!}} '''world
{{!}}}
```

<table>

<tr>

<td class="foo"> Hello </td>

<td> <b>world</b> </td>

</tr>

</table>

# Incremental 1: Balance

{{{!}}} ❓
{{!}} cla{{1x|ss}}=fo{{1x|o}} {{!}} Hello {{!}}{{!}} '''world ❓ ❓
❓{{!}}}} ❓ ❓ ❓

<table>

<tr>

<td class="foo"> Hello </td>

<td> <b>world</b> </td>

</tr> ❓
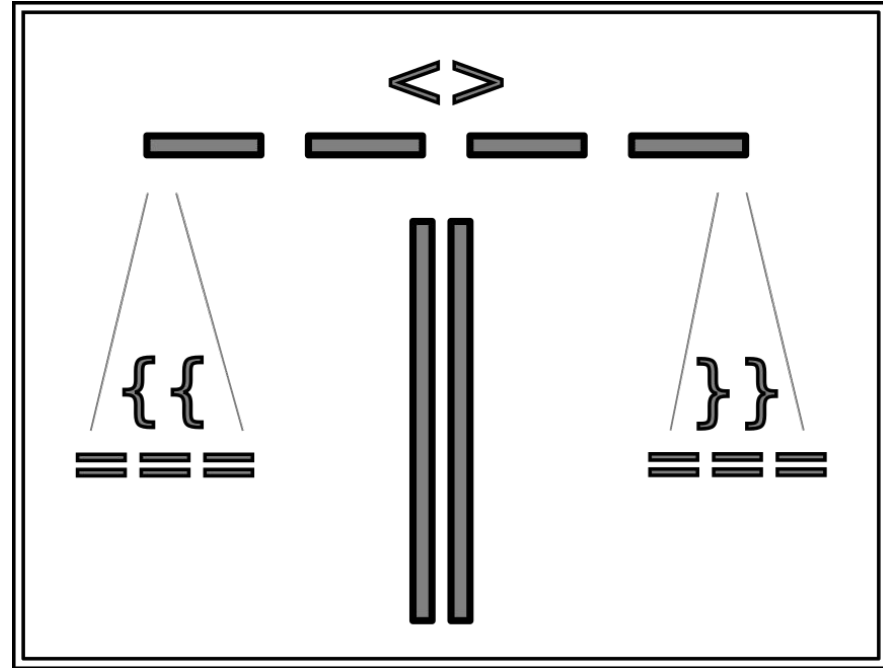
</table>

# Incremental 1: Balance

Opt-in with **{{#balance}}**

- {{#balance:block}}
- {{#balance:inline}}

Tidy to enforce balance
Prevent leaky templates
Increased parse/render speed

[T114445](#)

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# Incremental 2: Heredoc

{{tablestart|class="shiny"}}
| Hello || wiki = x
{{tableend}}

{{table|class="shiny"|
{{!}} Hello {{!}}{{!}} wiki &#61; x
}}

# Incremental 2: Heredoc

{{tablestart|class="shiny"}}
| Hello || wiki = x
{{tableend}}

{{table|class="shiny"|
{{!}} Hello {{!}}{{!}} wiki &#61; x
}}

# Incremental 2: Heredoc

{{tablestart|class="shiny"}}
| Hello || wiki = x
{{tableend}}

{{table|class="shiny"|<<<
| Hello || wiki = x
>>>}}

# Incremental 2: Heredoc

{{cite|id="3242"|<<<
First person plural pronouns in Isthmus-Mecayapan Nahuat:

:''nejamēn'' ({{IPA|[nehameːn]}}) "We, but not you" (= me & them)
:''tejamēn'' ({{IPA|[tehameːn]}}) "We along with you" (= me & you & them)
>>>}}

# Incremental 2: Heredoc

{{cite|id="32412"|<<<
First person plural pronouns in Isthmus-Mecayapan Nahuat:

:''nejamēn'' ({{IPA|[nehameːn]}}) "We, but not you" (= me & them)
:''tejamēn'' ({{IPA|[tehameːn]}}) "We along with you" (= me & you & them)
>>>}}

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# Incremental 2: Heredoc

More regular escape syntax
Makes it easier to write balanced templates
Perhaps can be further extended:

```
* a <<<
multi
line
>>> list item
```

T114432

# Incremental 3: JavaScript

Very briefly: add JavaScript as a Scribunto engine, alongside Lua

Pro: increase uniformity of codebase, leverage worldwide familiarity with JavaScript
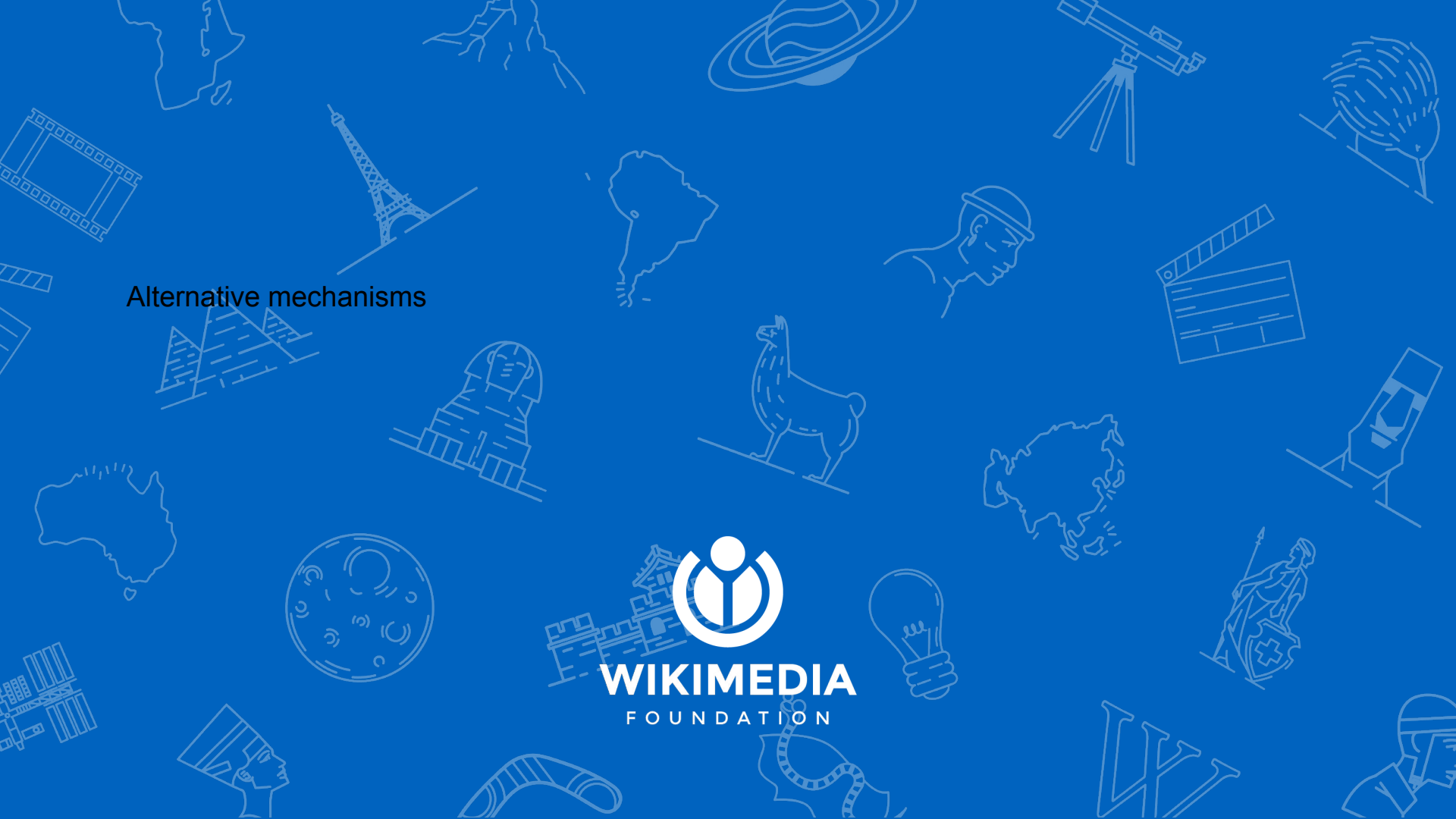
[T61101](#)

Alternative mechanisms

# Alternative 1: Glossaries

Word-based conversion dictionaries can get large and accumulate topic-specific entries.

Chinese wikipedia uses [templates](#) and a [custom gadget](#) to add new conversion rules.

Improve support by bringing this into core as article [glossaries](#).

[T484](#)

**[[Glossary:Harry Potter]]**

-{en-uk:Sorceror;
  en-us:Philosopher}-
-{en-uk:Minister for Magic;
  en-us:Minister of Magic}-
-{en-uk:sherbet lemon;
  en-us:lemon drop}-

# Alternative 2: Reduce!

Instead of using templates for everything, perhaps look for ways to remove templates?

- Replace Infobox/Navbox templates with
  - General header/footer mechanism?
  - Specialized dynamic builder extension?
- Instead of `{{citation needed}}`, `{{subst:afd1}}`
  - build specialized tools for certain tasks.
  - Community Tech team, original Flow idea

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# Alternative 3: Annotations

{{cite|id="32412"|<<<

First person plural pronouns in Isthmus-Mecayapan Nahuat:

:''nejamēn'' ({{IPA|[nehameːn]}}) "We, but not you" (= me & them)
:''tejamēn'' ({{IPA|[tehameːn]}}) "We along with you" (= me & you & them)
>>>}}

## Maybe this shouldn't be crammed into a template at all?



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# Alternative 3: Annotations

Come to my talk
"A General Annotation Service"
Sunday 1230!

Also [[:en:User:cscott/Ideas/Amazing Article Annotations]]

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Deeper Changes

# Deeper 1: Global templates

- Reduce duplication among wikis using a system similar to how "instant commons" works for media
- Implementation started with "Shadow namespaces" (T91162)
- Ran into difficulties and is currently stalled (but there is a bot which copies templates between wikis)
- Main problem is….

T121470

# Deeper 2: Template l10n

What needs to be translated?
- All parser functions, magic words, wikitext keywords and flags
- Name of template, names of template parameters, any template keywords or flags, TemplateInfo & documentation
- Scribunto modules, variable names, comments, documentation

First attempt: Yuri's Multilingual Templates and Modules

# Deeper 3: Visual Templates

- Code should manipulate data or structured DOM (not wikitext strings)
- String data is automatically escaped
  - Your function can return "<a>" or "[[Foo]]" and it will appear literally
  - Return $('<a>') or something similar if you want to emit a link
- Data is JSON or a wikidata query, not a wikitext string
- Presentation is editable with VisualEditor
  - Minimal markup, eg Spacebars variant of Handlebars
  - Structured semantics, not string concatenation

T114454

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# Data: Wikidata

**property names in the data context**

| event | gold | silver | bronze |
|-------|------|--------|--------|
| Shotput | USA | GER | MEX |
| Discus | MEX | USA | GER |
| Javelin | GER | MEX | USA |

# Code: Scribunto/JS



**Transformation of data context**

```javascript
export default function(events) {
    // events is an array; each item has event, gold, silver, and bronze props
    var totals = new Map(), countries = new Set();
    function mget(m, key, defaultval) {
        if (!m.has(key)) {
            m.set(key, defaultval);
        }
        return m.get(key);
    }
    function inc(country, color) {
        var old = mget(mget(totals, country, new Map()), color, 0);
        totals.get(country).set(color, old + 1);
        countries.add(country);
    }
    events.forEach( (e) => {
        inc(e.gold, 'gold');
        inc(e.silver, 'silver');
        inc(e.bronze, 'bronze');
    });
    var rows = Array.from(countries).sort( (a,b) => {
        var aa = totals.get(a), bb = totals.get(b);
        var c = aa.gold - bb.gold;
        if (c!==0) { return c; }
        c = aa.silver - bb.silver;
        if (c!==0) { return c; }
        c = aa.bronze - bb.bronze;
        return c;
    }).map( (c) => totals.get(c) );
    return { row: rows };
}
export function caption() { return document.createTextNode("caption"); }
```

**Additional block helpers**

# Presentation: VisualEditor



"row" is from data context

Block helper invocation

Handlebars-style placeholders

# An aside: Multilingual programming languages

"[Coding Is for Everyone—as Long as You Speak English](#)" (Wired) presents a very short list of multilingual programming languages:

- [Scratch](#) (I'd add [eToys](#) as well)
- [Blockly](#)
- [Excel](#) [formulas](#)
- Wikitext

Scoped variables and comments relatively easy to localize.
OO APIs are harder; strong type system makes things easier.
*(Perhaps Scribunto/[TypeScript](#) might be just enough type system to identify, and thus localize, invoked APIs, while still executing in a v8 runtime.)*

# But wait there's more!

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# Three axes of change

**How to invoke a template**
- Heredoc, Splat, etc

**How to author a template**
- Scribunto/JS
- Visual Templates
- Perhaps l10n and global templates too

**How templates fit together**
- Output data types
  - ~~Wikitext string~~
  - (Balanced) DOM
  - Structured data
- Input data types
  - (Wikitext) string
  - Structured data (T156876)

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# Gratuitous wikitext

```
{{#ifeq:{{{inline|yes}}}|yes<!--
|<!--span
-->{{#tag:span|{{{2|}}}|{{Lang/attribs|<!--
-->|lang={{{language|{{{lang|{{{1|}}}}}}}}}<!--
-->|dir={{{direction|{{{dir|}}}}}}<!--
-->|font={{{font|}}}{{{fonts|}}}<!--
-->|style={{{style|}}}<!--
-->|extra={{{attr|}}}<!--
-->}}}}<!--
|<!--div
-->{{#tag:div|{{{2|}}}|{{Lang-attribs|<!--
-->|lang={{{language|{{{lang|{{{1|}}}}}}}}}<!--
-->|dir={{{direction|{{{dir|}}}}}}<!--
-->|font={{{font|}}}{{{fonts|}}}<!--
-->|style={{{style|}}}<!--
-->|extra={{{attr|}}}<!--
-->}}}}
```

# THANK YOU

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