A browser-side-dynamic website framework for annotated Indic texts

Vishvas Vasuki
Dyugaṅgā, Beṅgaḷūru
https://sanskrit.github.io/groups/dyuganga/

Abstract

Perusing Indic classics on the web is an increasingly popular activity. However, serving and maintaining feature-rich websites involves significant costs, knowledge and effort. We present an easy to use website framework to solve mitigate these drawbacks. Besides being simple and low-cost, the proposed solution is rich in features particularly useful for presenting Indic language classics - including easy transliteration, navigation aids, annotation support, dynamic content inclusion and more.

1 Motivation

The advent of internet, personal computers and mobile devices have radically changed the way we consume literature. We can now carry an entire library in our pockets. Besides access to simple text, digital readers are able to utilize features such as text-to-speech, embedded multimedia, easy navigation and dictionary lookup.

On the production end - publishing on the web is far simpler and cheaper than publishing paper books. Yet, doing it well (i.e. with the dynamic features digital readers expect) still involves significant costs, knowledge and effort. Furthermore, for highly structured texts - like originals with series of commentaries and translations - content management becomes non-trivial.

We present a framework to publish annotated Indic language texts, providing the following features:

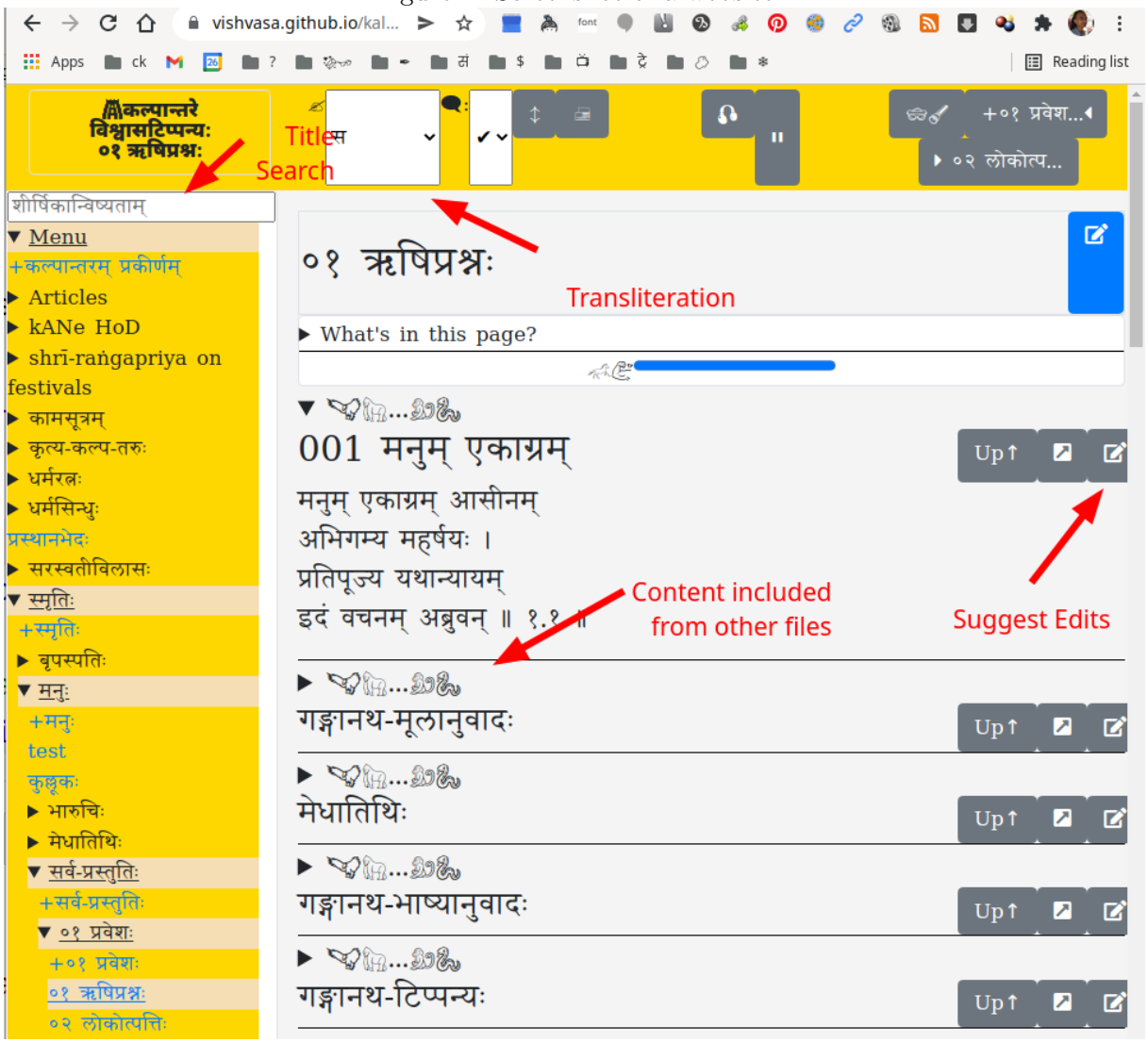
- **Content management**
  - "Suggest edits" links, which work when the content is stored in an online Github-like repository.
  - Basic ability to include contents from another page using the same theme within another.
  - Inline annotation
  - It's easy to copy or export the underlying content.
  - Version control is available when backed by a GitHub-type online repository.
  - Very low operating costs [1] - only a simple web server is needed - no database server is required.
- **Navigation**
  - Collapsible "accordion" sidebar with automated directory listing.
  - Collapsible "accordion" table-of-contents for each page.
  - "Next and Previous" page navigation buttons.
- **Search**
  - JSON based title/ url search
  - Search engine optimization markup and indices - which you would use with various search engines.

[1] Zero cost if services like GitHub Pages are used.

- **Reading**
  - A layout which automatically adjusts to the user's screen size.
  - Embedding audio and video items. Ability to sequentially play audio tracks within a page.
  - Transliteration dropdown: scripts ranging from devanāgarī to grantha, brāhmī to ISO-15919.
  - Special formatting consideration for fonts which need to be displayed bigger (eg: Devanagari for sanskrit.)
  - Text to speech interface (under development).
  - Disqus for comments.
  - Collapsible detail sections.

This framework has been used in several websites, such as (**?**) and (**?**).

Figure 1: Screenshot of a website



2 Content format

Content is stored in the form of plain text files with Markdown content (**?**) and YAML or TOML metadata headers (**?**).

2.1 Markdown

The advantage of Markdown is that it is very simple and intuitive - while having most basic features (such as sectioning, bold text, italics, lists, footnotes, images). One can edit markdown with just a plain text editor, without the need of special editing software as in the case of TEI [2].

Markdown format is very popular, and is supported by several parsers in popular programming languages, with HTML being most common target language. This makes the content highly portable accross display software (including static website generators).

An example file is as follows:

```
+++
english_title = "001 nārada briefs vālmīki about rāma"
title = "००१ सङ्क्षेपरामायणम्"
unicode_script = "devanagari"

+++
## नारदाय प्रश्नः

तपस्स्वाध्यायनिरतं तपस्वी वाग्विदां वरम् ।
नारदं परिपप्रच्छ वाल्मीकिर्मुनिपुङ्गवम् ॥1.1.1॥

कोन्वस्मिन्साम्प्रतं लोके गुणवान्कश्च वीर्यवान् ।
धर्मज्ञश्च कृतज्ञश्च सत्यवाक्यो दृढव्रतः॥1.1.2॥

चारित्रेण च को युक्तस्सर्वभूतेषु को हितः ।
विद्वान्कः कस्समर्थश्च कश्चैकप्रियदर्शनः ॥1.1.3॥

...
```

2.2 Extensions to Markdown

Basic markdown can be enhanced with HTML code as needed - but we recommend being conservative about it as adding too much HTML almost never necessary, and HTML code can begin to obscure content and reduce plain-text readability. We have found the details tag to be particularly useful to produce collapsible boxes; for example:

```
<details><summary>मूलम्</summary>

क्व सूर्य-प्रभवो वंशः
क्व चाल्पविषया मतिः ।
तितीर्षुर् दुस्तरम् मोहाद्
उडुपेनास्मि सागरम् ॥ २ ॥
</details>
```

Occassionally, we embedding find page-specific scripts useful as well, using the regular <script> tag (for example to open a random verse or stotra upon visiting a certain URL).

2.2.1 Content inclusion

In addition to this, our framework fetches and fills in markdown/ text/ HTML content from other URL-s with tags such as the following:

```
<div class="js_include" newlevelforh1="4" title="Oldenberg" url="/khAdira/1/02.md"></div>
```

We've found such content inclusion to be very useful in managing structured data.

[2] TEI is a popular XML-based format for storing structured Sanskrit texts. With XML, as in the case of HTML, the tags begin to eclipse the content - making plain text editing cumbersome.

- For example, a particular verse may be associated with 10 commentaries - storing them separately - say in numbered files - replicates the advantages of using a database with the simplicity and convenience of a plain file system. One can edit some commentary without being botherd by the clutter of unrelated content.
- Furthermore, the exact same content (example the rk ”tat savitur …” with annotation) may be included in multiple texts (example - rgvēda, yajurvēda, upākarma ritual procedure …). We’re able to avoid having to copy / paste and maintain identical content in multiple locations by efficiently using include directives.

2.2.2 Embedding data and media

We can embed tables from - say TSV or TOML files - as spreadsheets using the directive shown below:

Similarly, for embedding multimedia:

<div class="audeoEmbed" src="http://www.xyz.com/raghuvaMsha1.mp3"
caption="Recitation by Kuṭumbaśāstrī">
<div class="videoEmbed" src="https://www.youtube.com/watch?v=TDNkBFbp9Pk"
caption="Abhinaya by Padmā">

For figures with caption:

{{< figure src="../images/khanjar.jpg" title="The khanjar dagger" class="thumbnail">}}

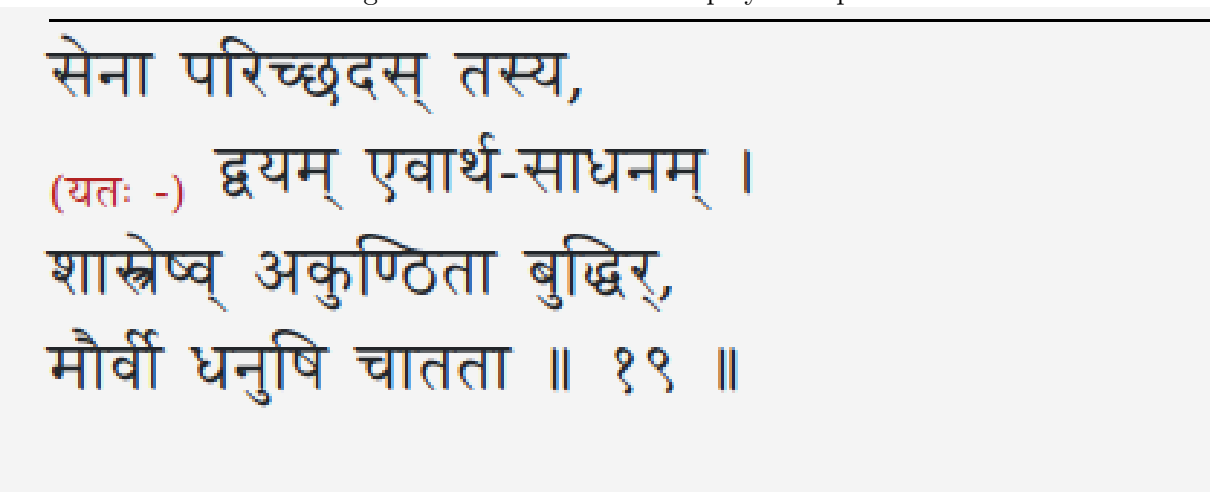
3 Inline comments

A favorite reading practice is to insert one’s comments in the middle of some text. With our framework, this can be done as shown below:

सेना परिच्छदस् तस्य,
+++(यतः -)+++ द्वयम् एवार्थ-साधनम् ।
शास्त्रेष्व् अकुण्ठिता बुद्धिर्,
मौर्वी धनुषि चातता ॥ १९ ॥

This can be made to yield:

Figure 2: Inline comment display example



3.1 File metadata

Metadata is stored in TOML or YAML format at the top of the file, as shown in an example earlier. The most important metadata for a given file is it's title. That apart, specifying the script used in the content is important for transliteration and display.

3.2 Mechanical content management

Content files are often hand crafted. Others are the generated mechanically from pre-existing content. For example:

- It may be desirable to split a large content file with multiple sections into multiple different files for ease of navigation and speed. Or one might want to join multiple files into a single file.
- One may want to generate markdown files from pages scraped off some preexisting website.
- One may want to pre-include content within the include directives (mentioned earlier) so as to facilitate proper indexing by search engine crawlers.
- One may want to transliterate content, or add a few commentaries for each verse.

For such cases, we have developed an open source python library (**?**).

4 Generating HTML pages

The content is ultimately presented to the user via a web browser. Hence, HTML pages are generated from content markdown files efficiently. This process can be automated with simple "Continuous Integration" scripts on hosts such as GitHub (**?**). For the most part, we use Hugo - a popular static site generation framework (**?**) together with UI templates we've designed as part of our Hugo "theme" (**?**). [3]

For faster builds, enable some markdown files to be served without parsing them into HTML [4]. They are parsed into HTML on the browser.

5 Browser side dynamism

[3] We initially used (**?**) Jekyll (**?**), which is orders of magnitude slower.

[4] This is accomplished by keeping them within the static folder in case of Hugo.