

Research Project Report

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Title of the research:

HKU-TDLEG website development

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Research Background:

Developing a website all by yourself can be hard, but tools make the process easier. There are many website development tools on the Internet, and *Cryogen*, a static website development tool based on Clojure, is one of them. Although it may not be very famous, it is a mature tool for website development. As a website is needed for recording the progress of all HKU-TDLEG projects, I tried to build one and explored the features and advantages of *Cryogen* through the process.

Research Methodology:

- Learn *Cryogen* from its official documentation.
- Search for relevant materials (tutorials, forums, examples, etc.) online.
- Try different settings by myself and observe their influence.
- Ask for help from an experienced *Cryogen* developer.
- Integrate my understanding of website development while developing the website.

Research Finding:

Cryogen has the following advantages:

1. The tool itself provides three well-designed themes that developers can directly use. This makes *Cryogen* a beginner-friendly tool (no need to design a website from scratch).
2. It converts Markdown files into web pages/posts. Developers do not need to know about HTML coding and can simply use markdown.
3. *config.edn* file is where all key configurations are stored. Developers can easily find and modify it.
4. After installing Leiningen or Clojure CLI, developers can generate the website locally at *localhost: 3000* using the command “lein serve” (in Leiningen) or “clojure -X: serve” (in Clojure CLI). By using this feature, developers can check the changes of the website without influencing the deployed one on the Internet.
5. Appearance settings (CSS, HTML, JavaScript) are centralized in the */themes* folder and can be modified easily. Different parts of the layout (menu, page, base, etc.) are recorded in a different file, so developers will have a clear idea of what they are changing.

However, *Cryogen* also has some disadvantages:

1. Although the tool converts Markdown files into web pages/posts, it cannot recognize the *MathJax* math formula, which Markdown can recognize. Developers have to use formula images or import JavaScript codes to show a properly rendered math formula.
2. The automatically generated date information is shown in the developers' system language and cannot be changed. This makes it inconvenient for developers to develop a website with a different language from their system.
3. The tool is not very flexible. For example, the name shown in the navbar must be the same as the page title. This is a shortcoming of all beginner-friendly tools: they help you finish many jobs but may not be in the way you want to. Of course, developers can solve this problem by looking into the generated HTML codes and modifying their relevant parts. Another example can be that the structure of a *Cryogen* website is predetermined, and any folders (e.g., */pdf*) added outside the structure cannot be recognized. Developers have to add the folders they need to the generated website manually.

Research Limitation:

As I'm new to *Cryogen* (and there is only limited information about it online), I may miss some critical features in the short two months. Furthermore, I have not used any other website development tools before, so the "advantages and disadvantages" summary may not fully demonstrate *Cryogen*'s unique characteristics. Some problems I considered as difficult ones might not be the case for an experienced developer.