ENCWG4-06.2

Paper for Consideration by ENCWG

Use of Github for change management and publication of S-58 test datasets

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Executive Summary:	Use of the Github open source change management tool has been made in the development of the revision to IHO S-58. This paper shares those experiences and the potential for expanding use of such a tool in the IHO HSSC community.
Related Documents:	
Related Projects:	S-58, S-64

Background

As part of the baselining and review of the S-58 test datasets, use of the Github change management tool has been researched in an effort to put the tests under a more formal and controlled change management environment. Github has been used by other IHO working groups, most notably the S-100WGs Github site which holds the current S-100 XML schemas:

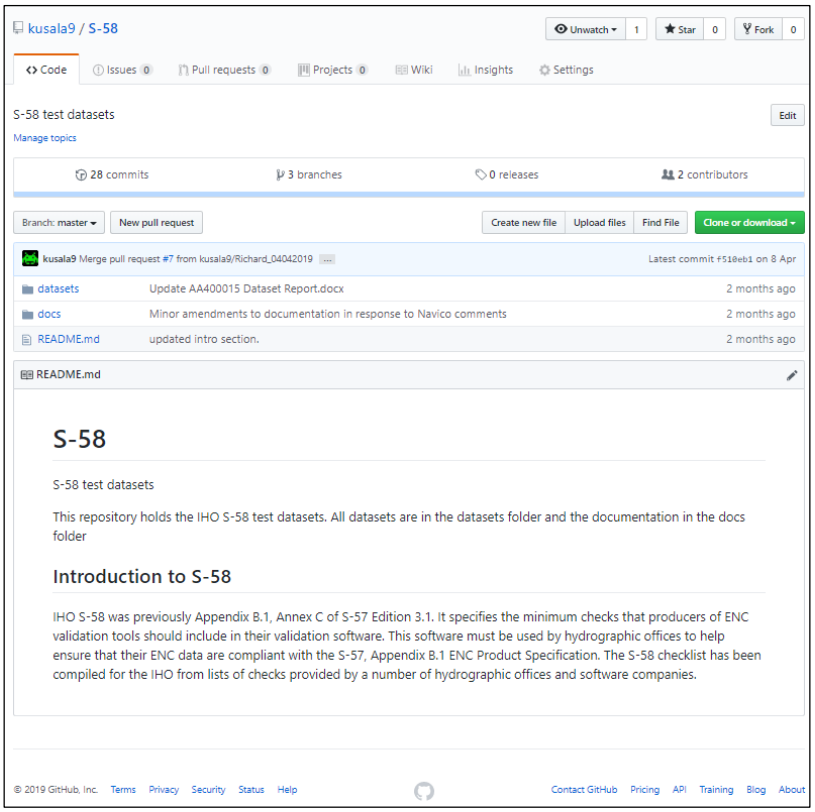
https://Github.com/IHO-S100WG/S100-Schemas

Github is a ubiquitous tool in the software engineering world, and since 2008 has amassed 28 million users with 57 million code repositories worldwide. It is used by many open source development projects. It is also used as the default change control mechanism within the OGCs standards development programme – OGC use github to control source code development as well as document construction and release. In 2017 Github was acquired by Microsoft. The current tool is open source and free to use although there is a cost for use by enterprises and for the hosting of private respositories where access is controlled by users.

Use of Github for IHO S-58 development.

The S-58 development and review effort has been using Github to host the test datasets in the last phase of the project for the following reasons:

1. It is free and open to use. A repository has been created at the following address: (https://Github.com/kusala9/S-58)



2. The site enables change management for all files it hosts, at the moment and complete copy of all the dataset files comprising the revised S-58 tests are within the repository along with documentation and review notes.
3. The facilities offered by Github allow for multiple branches holding iterations of the dataset files undergoing development, wiki access for documentation in a simplified html-like formatting and issue registration and tracking.
4. By using the branch/pull request and merge facilities in Github full overall control of the repository's contents is preserved whilst allowing for open access and easy editing of draft changes for submission to the main repository
5. The repository allows for easy access to the most up to date, authoritative versions of the complete S-58 edition as well as access to branches still under development and the accompanying documentation.

A simple desktop tool "Github Desktop" has been evaluated to synchronise local copies of complete repositories and submit changes via branches to the main central repository. This tool is freely available and works in the familiar Windows interface. Github was used in the latter review stages of the S-58 revision and the experience was a positive one, although it requires a certain amount of training to become acquainted with the change control mechanisms, the accessibility for end users and the ability to easily produce notes and guidance documentation is a distinct advantage for projects of this nature.

IHO working group working practices

IHO working group working practices vary between various groups and although there is no one set methodology for change control (aside from the overall 2/2007 update and baselining method) where a standard is accompanied by an extensive test dataset (as is the case for IHO S-64 as well) it is often difficult to maintain a coherent view across an entire revision, particularly where documents and datasets need to be kept in step with each other. Use of mechanisms like Github puts a high degree of rigour, traceability and openness on the entire change process and makes the revision control process easier to manage.

Currently many revisions are done by a long series of annotated documents and use of email lists which is prone to error and omission. This solution is not necessarily suitable for all IHO revisions but those where a portion of the standard is supported by test datasets, schemas etc would be particularly suitable. In particular a wider view should be taken of the potential for modernising the revision control practices using such tools alongside the established protocols.

Conclusions.

This paper shares the experiences of using Github for development of a revision to a particular standard, S-58. IHO S-64 is another obvious example and one where some preliminary work has been done to explore the potential. IHO S-100 is already using Github to manage changes to XML Schema documents and many product specification development efforts could benefit from the facilities and rigour for the non-documentary parts of the assets they create.

In the S-101 context some suggestions could be

1. Hosting, management and change control to the feature catalogue. Additionally, hosting of e.g. portrayal catalogues could be accomplished in a centralised S-101 Github site.
2. Auto-generation of DCEG tables from the feature catalogue and auto-generation of DCEG documentation from text and feature catalogue content
3. Revisions of IHO S-58 and IHO S-64 where a substantial amount of non-document text is generated and undergoes substantial change management

Recommendations.

ENCWG is asked to note the contents of this information paper, feedback on the experiences so far and if there is sufficient interest an informal discussion with interested parties could lead to a more formal proposal across the HSSC working groups.