

UP-Drive

Automated Urban Parking and Driving

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PU	Public	X
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EXECUTIVE SUMMARY
<p>This deliverable corresponds to Task 3.1: <i>Setup of project-wide development infrastructure</i>. It documents the Gitlab CE and Leanlabs Kanban infrastructure that has been selected and implemented as source code development repository, issue/task tracking and wiki functionality.</p>

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1 Introduction

This deliverable corresponds to Task 3.1: Setup of project-wide development infrastructure. It documents the selected and implemented instances of source code development repository, issue tracker and wiki. It furthermore describes the access authentication and user/account management practices adopted.

Measures for Success: Source code development repository, issue tracker, and wiki available and functional.

2 Source Code Management, Wiki, and Task/Issue Tracking System

A functional and effective source code management (scm) system, project wiki and task/issue tracker forms a basic need of any project spanning multiple parties and collaborators. Consequently, there is a plethora of both open source and commercial offerings catering to various needs.

It is hence important to list requirements and desirable features to guide an appropriate selection. For the UP-Drive project, these have been identified as follows.

2.1 Requirements

- Intuitive web-based UI for non-expert users
- Online (server side) and offline (client side) operation
- Document level version control; character level version control desired.
- Support for concurrent editing of documents
- Tight integration among scm, wiki and task/issue tracking system
- Self-hosted at IBM location

2.2 System Selection & Overview

Based on the above requirement list, the self-hosted version of the Gitlab CE infrastructure has been selected due to its tight integration of source code management, wiki and issue/task tracking functionality, while also fulfilling all other requirements to an adequate degree. This includes a slick and intuitive web-based UI supporting most of the functionality available via command line. It also includes version control at an atomic level thanks to the underlying git version control system. The solution is not without downsides, however: client side git-based workflow, while powerful, has a certain learning curve. Similarly, select other wikis allow for seamless concurrent editing of documents (e.g., Google docs), but that requires a server-side only, and usually non self-hosted, paradigm. Git has great functionality for merging concurrent edits, but in case of a merge conflict, non-expert users may become overwhelmed. Due to the technical user base within UP-Drive, paired with the intuitive web-based UI, these concerns are deemed to be adequately addressed.

While Gitlab CE offers full functionality and support of an issue/task tracking system, we decided to offer users an additional process-based view on the fully integrated Gitlab based solution. This is achieved via the Leanlabs Kanban board.

The Gitlab CE and Leanlabs Kanban infrastructure is hosted at IBM Research GmbH at its Ruschlikon, Switzerland site.

2.3 System Access

Access to the scm, wiki, and task/issue tracker functionality is handled via the *wiki.*, *git.*, and *tasks.up-drive.eu* subdomains, respectively. Access is authenticated via https (using a wildcard certificate tied to the project's top level domain <https://up-drive.eu>). For convenience and account handling, a single sign-on site for all three services has been set up. The sign on site is depicted in Figure 1.

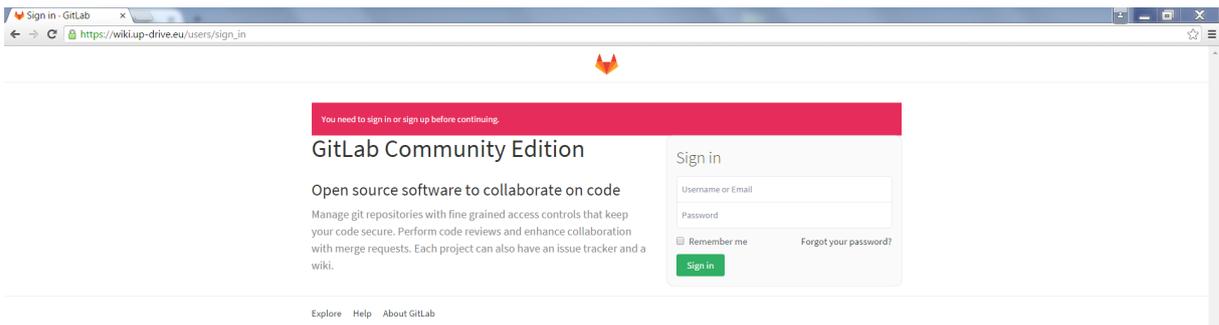


FIGURE 1: Gitlab CE single sign-on page.

2.4 Source Code Management Functionality

The scm is provided to host partners' code that is released as UP-Drive internal open source. This mainly concerns the interfaces between partners' proprietary modules released as binaries (in an artefact store). Scm is organized along projects, which are further collected into groups. Currently, the top-level UP-Drive default group contains a single project hosting the wiki. As the project progresses, this is expanded as needed.

The underlying git version control system supports the tracking of code changes and code merges seamlessly. As opposed to subversion and related products, git offers full decentralization in that each client obtains a full copy of the entire repository history.

2.5 Wiki Functionality

The project wiki is accessed via *wiki.up-drive.eu*. It consists of a flat hierarchy of interlinked pages written in markdown (.md) syntax. Figure 2 illustrates the main entry page that links to the growing set of content. Figure 3 demonstrates the

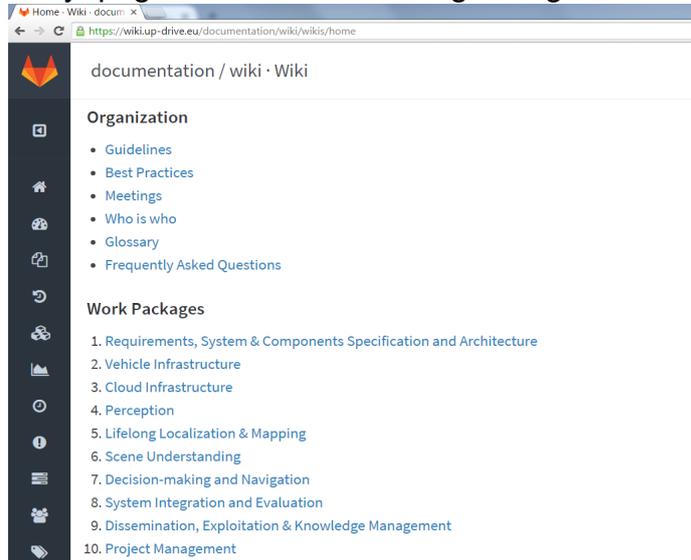


FIGURE 2: Wiki start page.

workflow of editing a page written in .md syntax via the graphical UI. Individual pages are version controlled. This is handled as part of a git repository. Hence, besides the server-side graphical interface, wiki pages can also be edited on users' computers offline. The Gitlab CE wiki supports binary attachments. In the web GUI they can be attached to pages via drag and drop. Attachments are stored outside of the git repository within a server side object store.

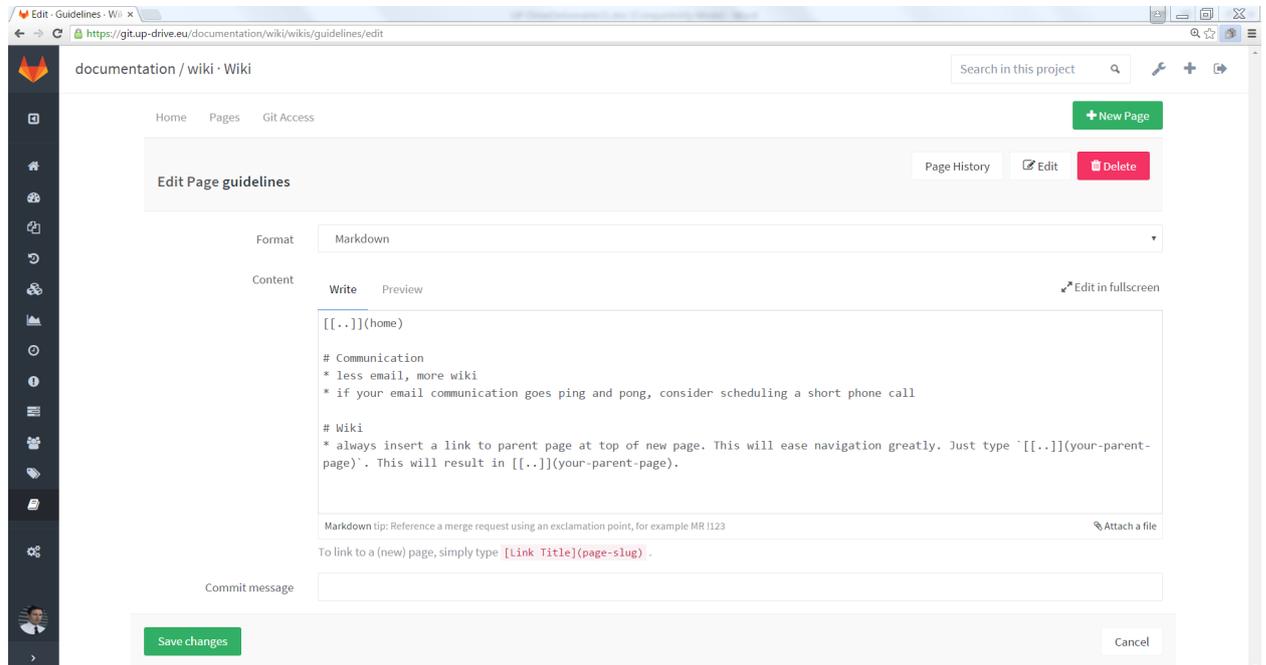


FIGURE 3: Page creation and editing.

2.6 Task / Issue Tracker Functionality

The task and issue tracker is accessed by *tasks.up-drive.eu* via a web-based GUI environment implemented using Leanlabs Kanban. Leanlabs Kanban, illustrated in Figure 4, facilitates a process-based view on the fully integrated Gitlab-provided issue tracker solution. The tasks created within Leanlabs Kanban are thus tightly integrated with the Gitlab wiki project and can, among other things, reference wiki pages and source code directly.

Leanlabs Kanban allows to sort tasks according to their completion status (columns) as well as according to labels/tags (used for e.g., WP and Task marking), milestones (used for setting deadlines) or assignees (rows). Tasks represent interactive elements (see Figure 5) that are assigned to a user, and traverse several stages until task completion and subsequent task archiving. During this process, users involved in the tasks are able to document their progress directly on the task – including automated email notification upon activity.

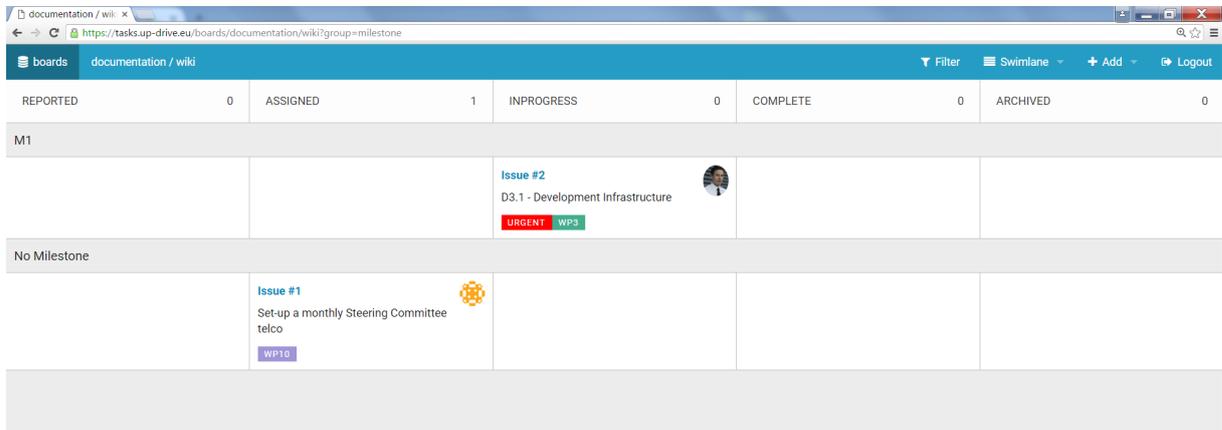


FIGURE 4: Leanlabs Kanban overview pane (swim lanes ordered by milestone)

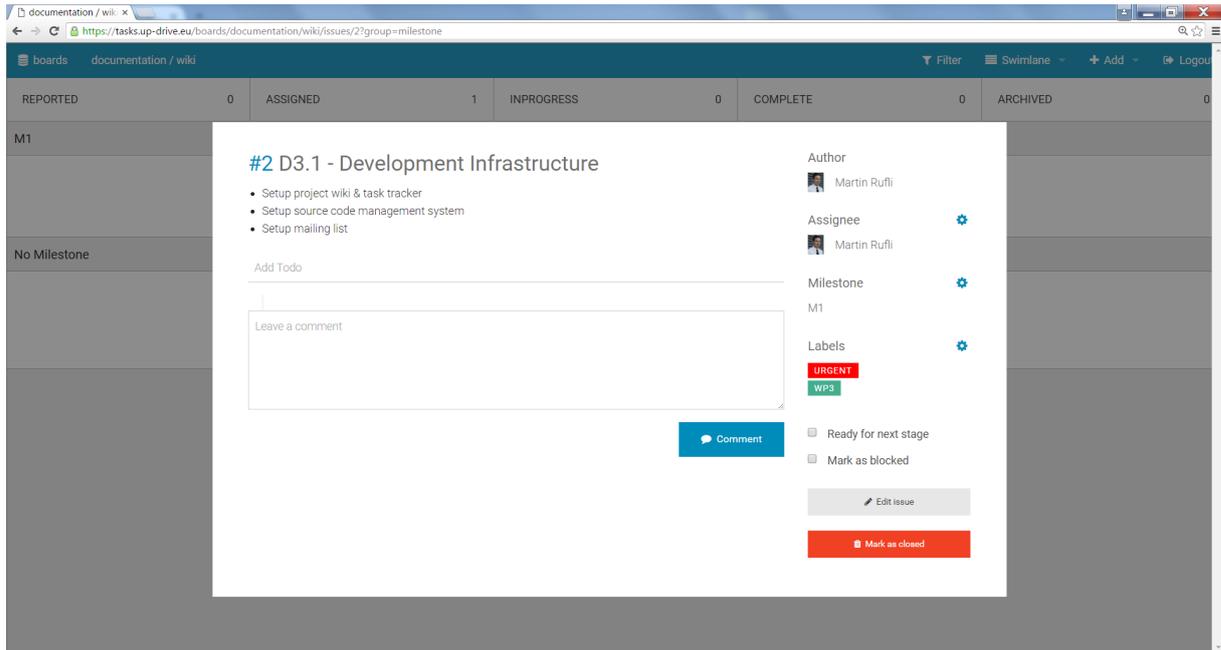


FIGURE 5: Task/issue detail view.

2.7 User Management / Administration

Users are managed by IBM via the administrative interface of Gitlab CE. A policy has been instantiated where two persons at each institution have been appointed as primary contact points, via which all requests for user generation need to be routed. These individuals are also responsible for continuously keeping the current member list for their institution up to date and communicate any changes to the administrators at IBM.