SoliGity

# White Paper

March 2020

## Executive Summary

There are many benefits of working on open-source projects. However, discovering interesting projects to work on and getting rewarded and recognized have been challenging for a number of entry-level developers.

We introduce SoliGity – a web application that creates a win-win situation by allowing users to easily discover open-source projects and allowing the owner of a project reward participating contributors using Blockchain technology.

This whitepaper outlines the design philosophy of SoliGity and illustrates the rewarding mechanism behind the workflow.

## Problem Statement

Research has found that open-source projects play an important role in university students' success [1]. Especially for those who major in EECS (Electrical Engineering and Computer Science), working on open-source projects help them gain practical technical exposure that can potentially benefit their career development.

However, a number of students in their first or second year find it difficult to discover and identify the projects that interest them; even for those who do find an interesting project, 62% of them found it hard to stay motivated [2]. More importantly, the contributors of open-source projects suggest they deserve more recognition for their work [3].

We argue that there is a lack of a unified, purposeful platform that provides an end-to-end experience to help developers discover open-source projects to work on and get rewarded and recognized. We attempt to solve the problem by leveraging web technologies, Git source control, and decentralized application (DApp) SoliGity to establish a closer connection with repository owners and contributors.

## Solution

SoliGity aims to provide easy-to-use experience in between the owner of the project owner. The process can be summarised in four steps. The final product might have minor differences due to implementation limitations, but we will make sure the core functionalities align with the design as much as possible.

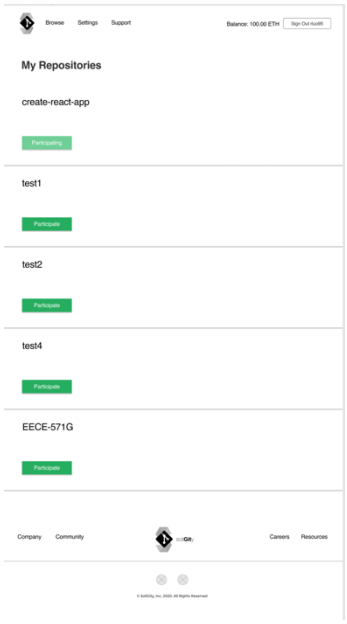


Fig 1a. List of Repositories

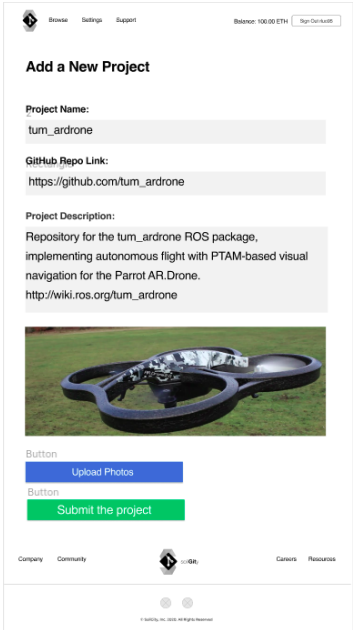


Fig 1b. Repository owner link the repo to SoliGity

## 4-Step Workflow

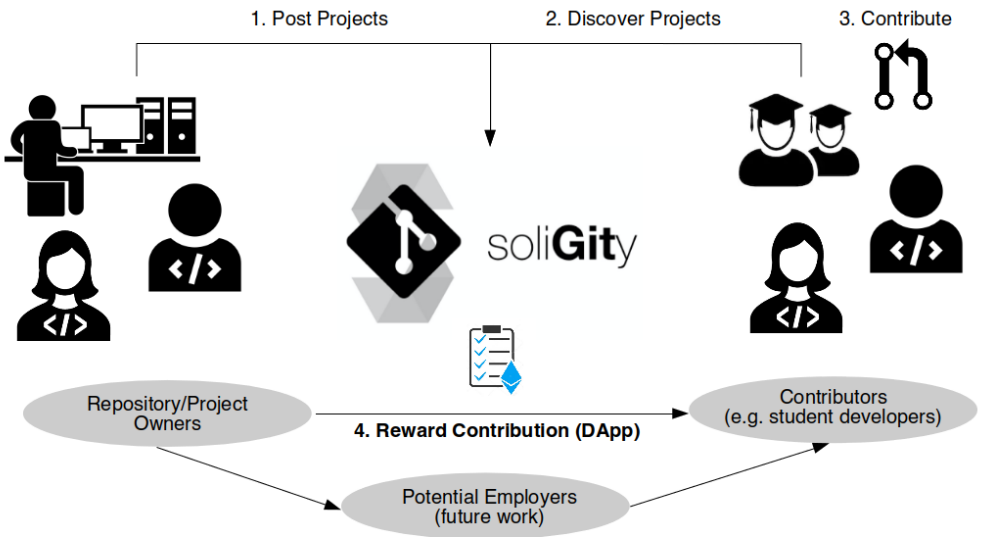


Fig 4. SoliGity Workflow

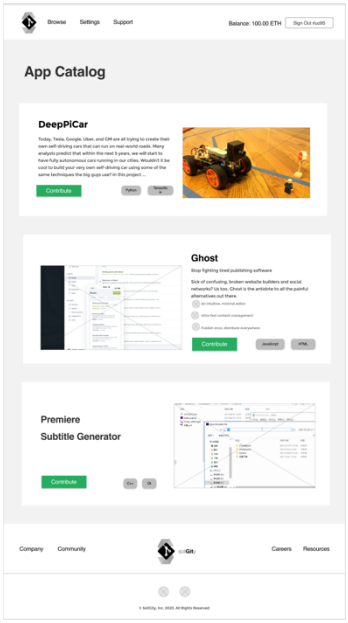


Fig 2a. Project Catalog page

First of all, to have their project being discovered by others, a project owner must link/add their Github repository to SoliGity (Figure 1a, 1b). Then, these projects will appear on a catalog page. The catalog page contains rich information such as the project name, pictures, and languages/framework (Figure 2a). This makes it user-friendly for the user to discover the project just like what they do in the App Store. When one discovers a project that interests them, they can click in the project and browse all the issues created by the project owner (Figure 2b). Note that issues are not limited to bugs associated with the project, it also includes new feature requests.

Each issue comes with a price – the amount of cryptocurrency that the project owner will award to the developer. When a developer claims an issue, he/she works on it on their branch. Once done, a Pull Request (PR) is made for the project owner to review their contribution. If the PR is approved, the reward will be transferred from the project owner to the developer. The transaction is achieved using a smart contract implemented in Solidity (an object-oriented, high-level language for implementing smart contracts). As the activities are in the context of Git workflow, hence our name SoliGity.

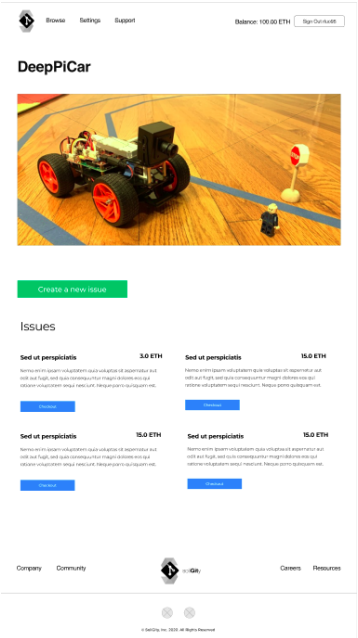


Fig 2b. Detailed project description and list of issues to be solved

## A DApp-based Rewarding Mechanism

Our reward mechanism is essentially a Decentralized Application (DApp) running on top of distributed computing systems. This makes it possible for the transactions to take place without the trust of a 3rd party. Three event status are defined in the smart contract – `help_wanted`, `under_review`, and `approved` – these states are mapped to Step 1&2, Step 3, and Step 4 in the workflow shown in Figure 4. More details will be covered in our project report.

## Benefits

SoliGity provides a user-friendly and powerful platform for developers to discover available open-source projects and make contributions as well as getting rewarded. Doing this also helps the project owner look for help and outsource the work to another party. It creates a win-win situation for both parties.  In our future work, we plan to integrate a referral mechanism so that the project owner can directly refer the contributor to potential employers for job opportunities - if they are satisfied with the contributors' deliverables.

## Conclusion

This white paper provides a high-level overview of SoliGity, a web-based decentralized application (DApp) that makes it easy for software developers, especially those in their early stage of career, to identify open source projects to work on and get rewarded and recognized. The solution envisions a novel rewarding mechanism that takes advantage of the blockchain technology, eliminating the need of the trust from a third party, offering values for project owners, developers, as well as potential employers.

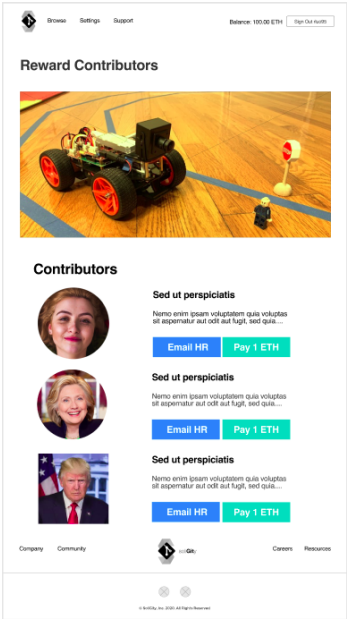


Fig 3. Review and Reward Page

## References


[1] "How to Contribute to Open Source," [Online]. Available: https://opensource.guide/how-to-contribute/. [Accessed 28 3 2020].

[2] T. TOCH and S. HEADDEN, "How to Motivate Students to Work Harder," 3 9 2014. [Online]. Available: https://www.theatlantic.com/education/archive/2014/09/how-to-get-insecure-students-to-work-harder/379500/. [Accessed 15 3 2020].

[3] D. Herron, "How to recognize your open source project contributors and grow your community," 3 12 2018. [Online]. Available: https://www.freecodecamp.org/news/how-to-recognize-your-open-source-project-contributors-and-grow-your-community-3eaa472344ab/. [Accessed 15 03 2020].




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