Hyperledger Mentorship Project Presentation

November 2021

Extend secure DID Registry for Hyperledger frameworks on GitHub/GitLab

› **Introduction**

  › **Name**: Wei Yao

  › **Location:** Newark, New Jersey, U.S.

  › **University:** New Jersey Institute of Technology

  › **Mentor(s):** Mr. Vinod Panicker, Mr. Arun Prakash

  › **Hyperledger Project**: Hyperledger Aries, Ursa, Indy and Fabric.

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› **Project Description**: Develop the **DID Registry Manager (DRman)**, a command line utility that can create a secure **DID Registry** on GitHub or GitLab. **DID registry** is a type of **verifiable data registry** that can be simply referred to as a role, a system performs to mediate the functionalities like create, verify, update, and deactivate the decentralized identifiers. The project aims to automate the process of **creating** a secure DID Registry on GitHub/GitLab, facilitating easy **on-boarding** of new organizations and enabling easy management.

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› **Project Objectives**:

  › Obj 1: Creation (of DID Registry): Function to **create** a DID Registry (**Verifiable Credential Registry**) for an organization on GitHub named **GVCR**. GitHub Organization can have multiple repositories, same is the case with DID Registries.

  › Obj 2: Onboarding: Function to **add enable/restrict access** to members of an organization to a repository (GitHub repository users can be made members of an Organization, with different roles and privileges).

  › Obj 3: Manage: Function to list **APIs** that are needed to add/update/revoke access DID's or (DID Documents) saved as files on the repo.
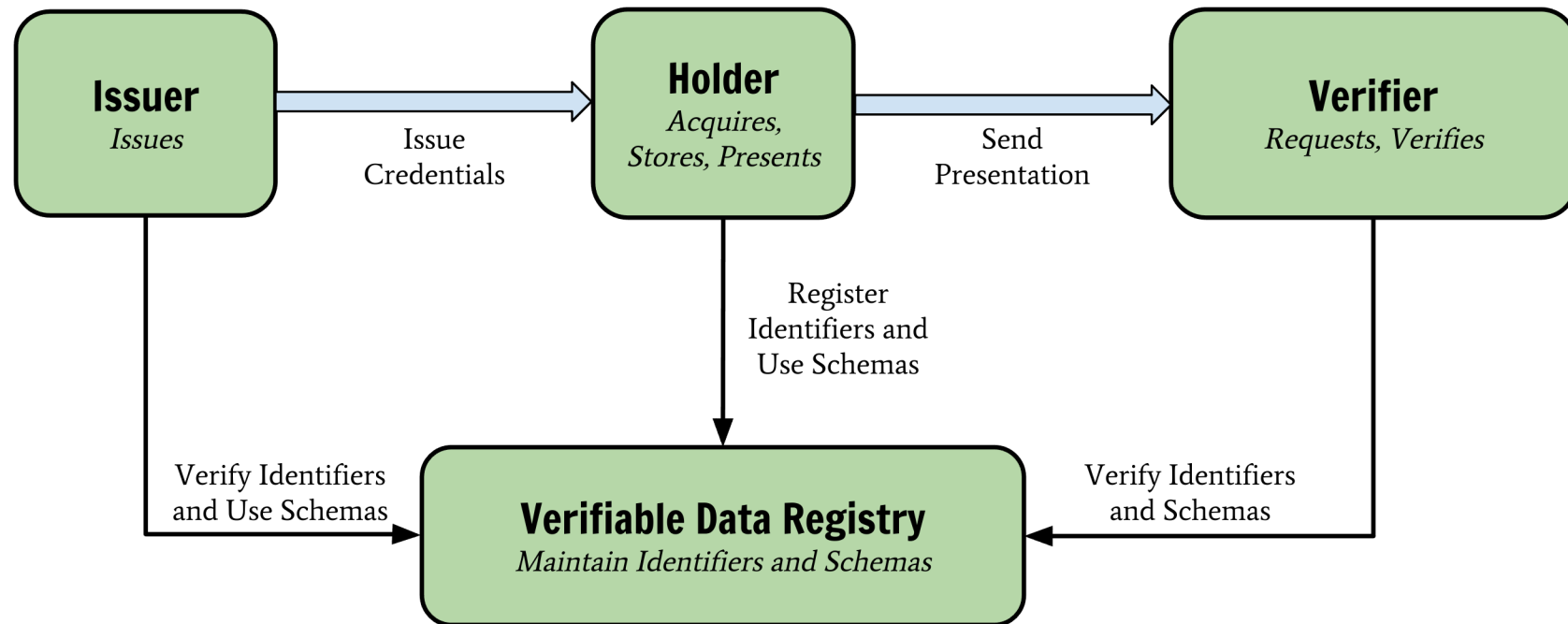
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› **Project Deliverables:**

 › Deliverable 1: An architecture of GVCR in Verifiable Credential Model ecosystem.

 › Deliverable 2: Design documents for the internal workflow of the GVCR.

 › Deliverable 3: GVCR implementation: DRman command for creation/updating GitHub repository

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› **Project Execution & Accomplishments:** Verifiable Credential Data Model

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› **Project Execution & Accomplishments**: Using cryptographic open-source resources to realize the verifiable credential registry
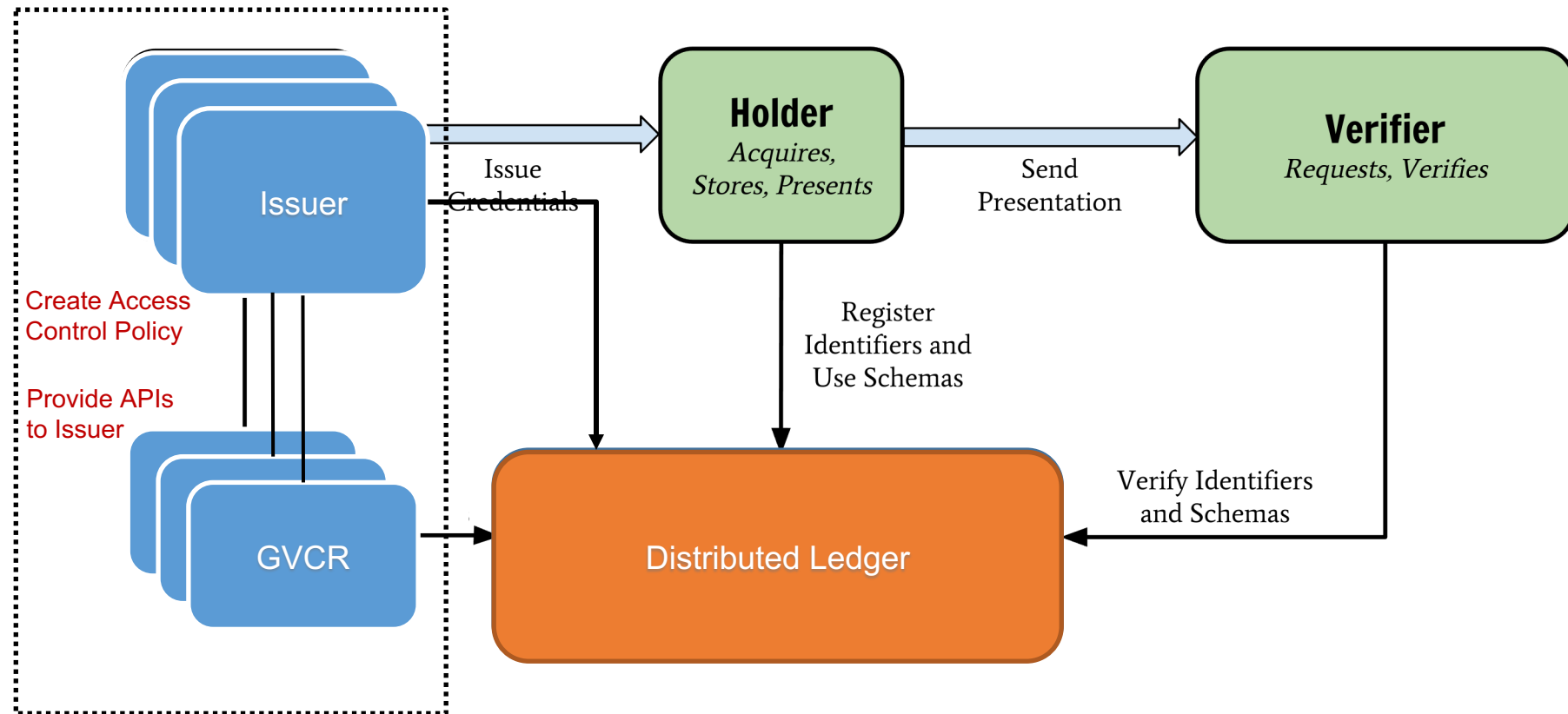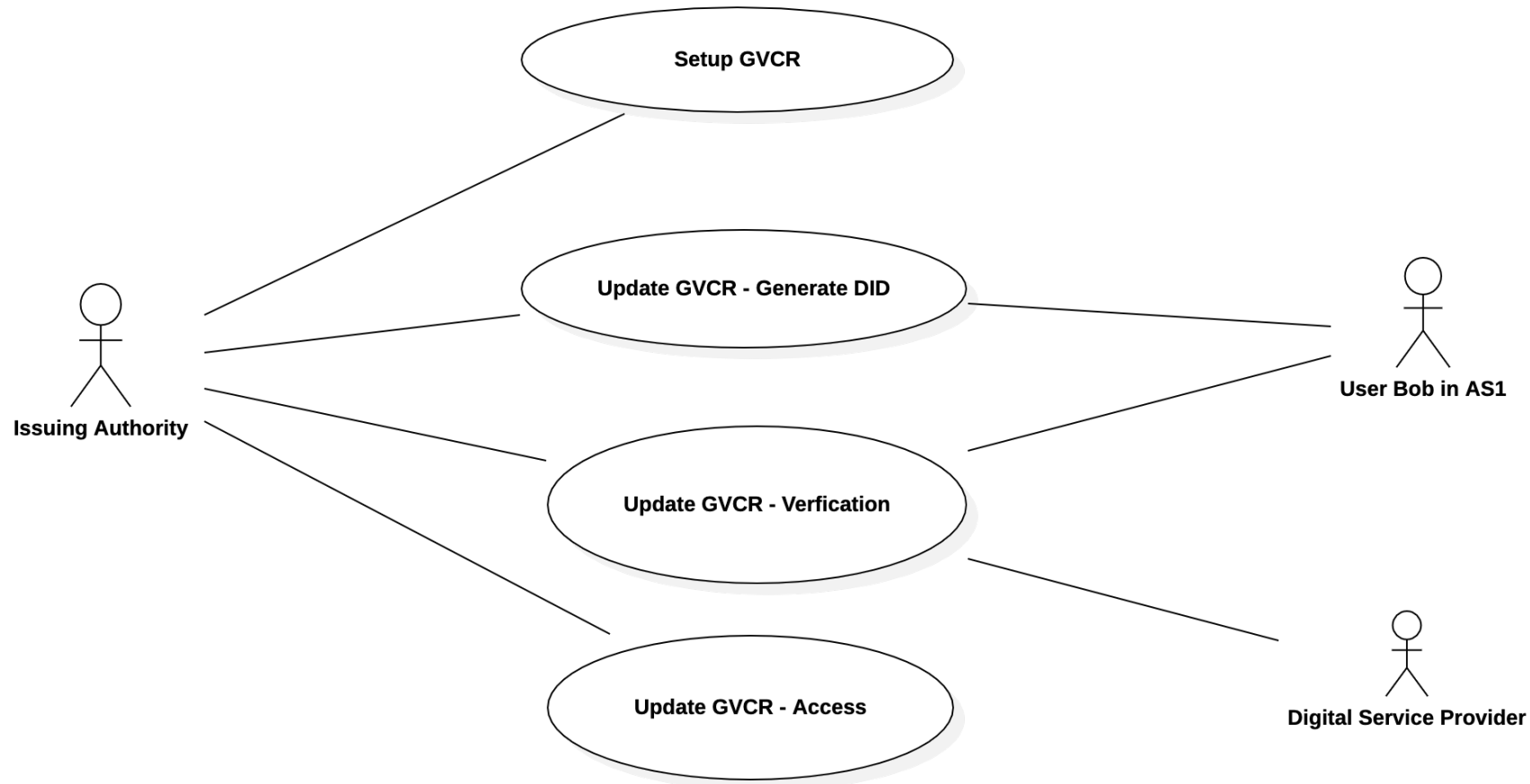
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› **Project Execution & Accomplishments**: What are the problems that the GVCR can solve:

  › An underlying system or network used to store/record DIDs.

  › An underlying system support returning data necessary to produce DID documents.

 › Utilizing existing cryptographic open-source data storage solution as trusted data storage, such as GitHub/GitLab.

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› **Project Execution & Accomplishments**: Use cases diagrams for our DIDman,

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› **Project Execution & Accomplishments**: GVCR workflows,
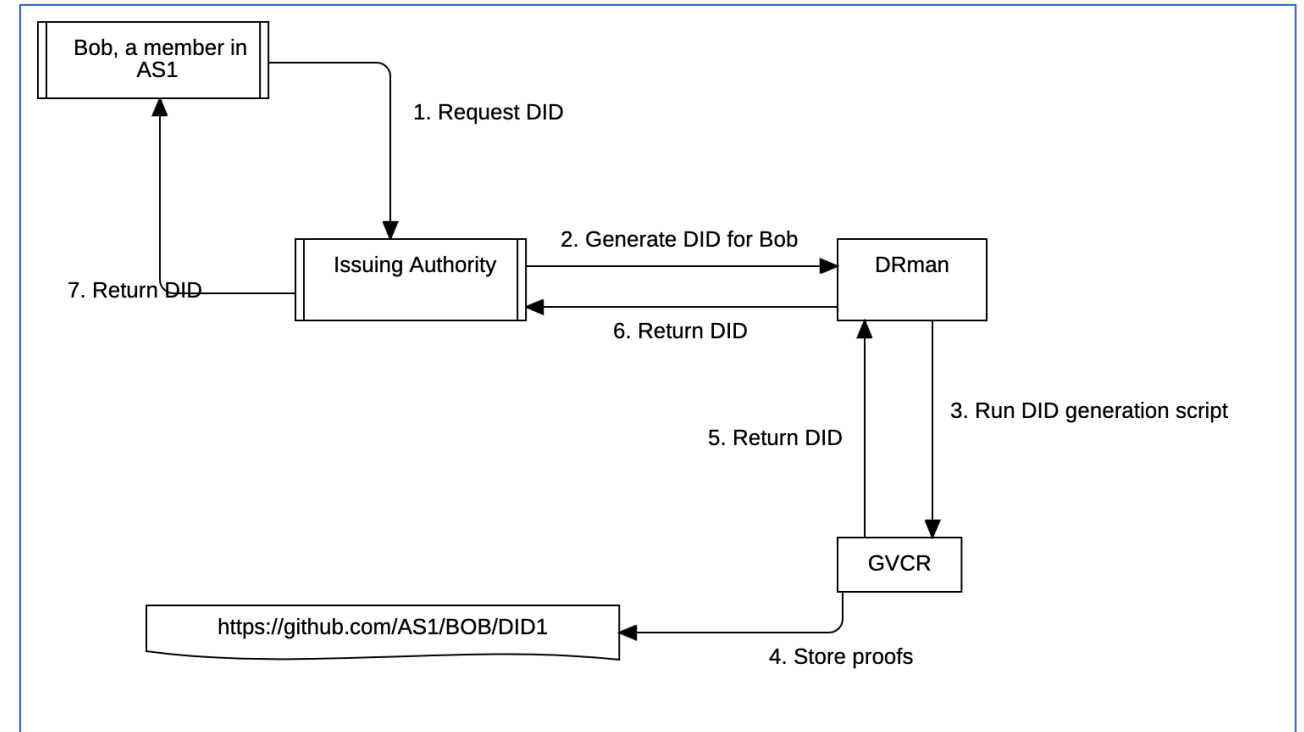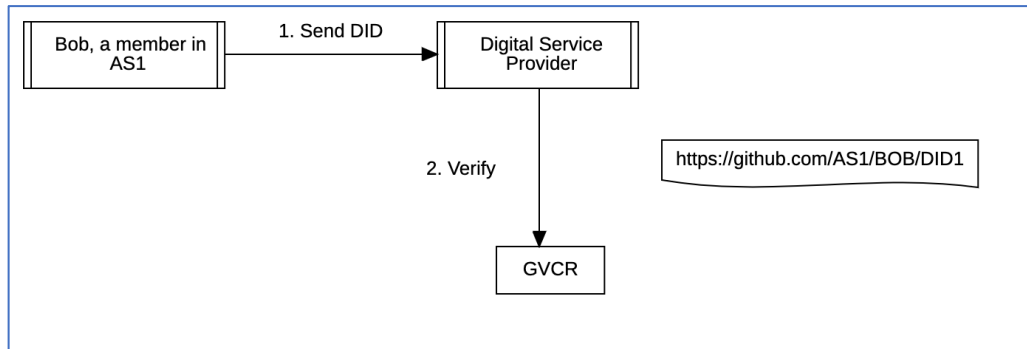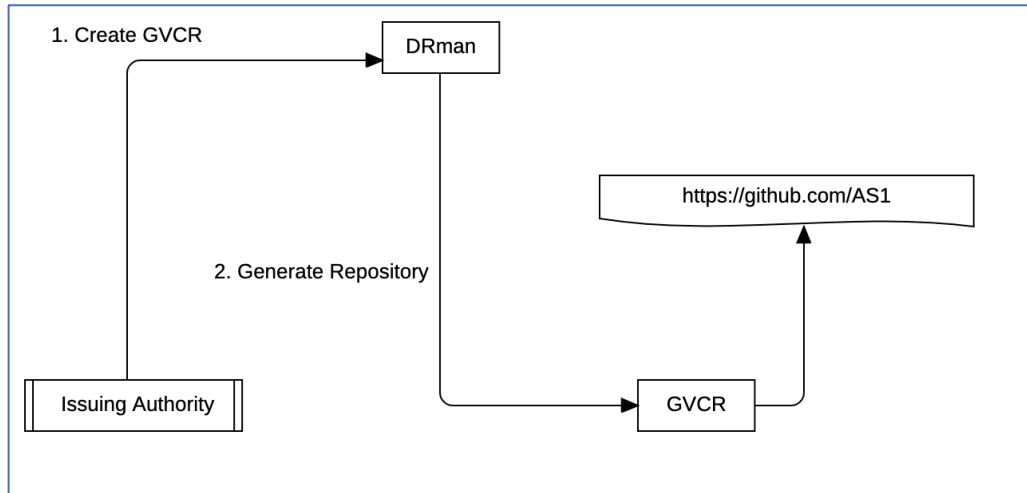
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› **Accomplishments**

   › Went through a learning roadmap of self sovereign identity (SSI) system. Decentralized Identifiers (DIDs) v1.0 → DID Specification Registries → Verifiable Credentials Data Model v1.1

   › Deployment, integration, and testing on existing open-source Hyperledger projects: Hyperledger Aries, Hyperledger Ursa, Hyperledger Indy, Von-network and OrgBook by Bcgov.

   › Architecture Design and system design of GVCR

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› **Next Step and Pending Activities**

  › Rest of the development

  › API spec version 0.1 for GVCR

  › Markdown tutorial documentation

  › Swagger API documentation

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› **Project Output or Results**:

   › An example of structured path for trusted data storage, with committed DID document in the GVCR built by DRman .
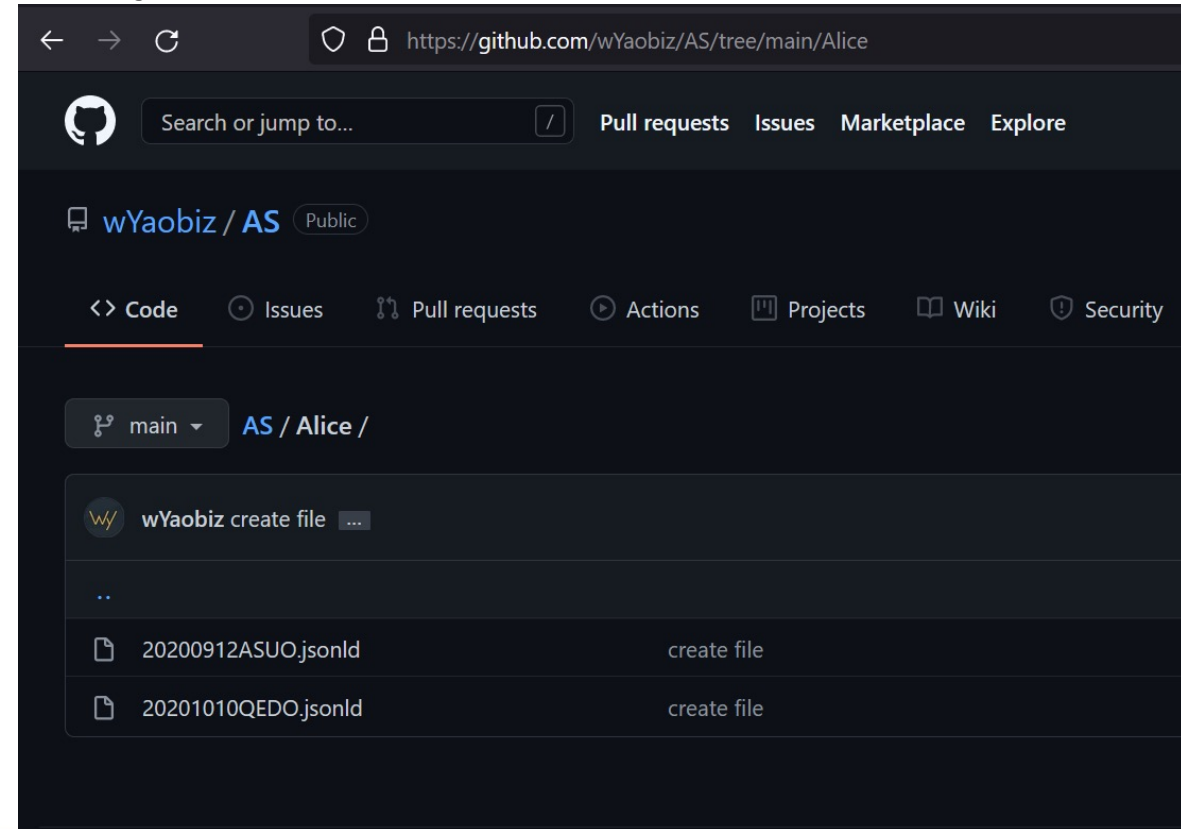
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› **Recommendations for future work (project scope):**

  › The main architecture, framework, and external/internal workflows of this project are worked out. The CLI command implementation developed by shell script needs to be extended.

  › Extend the design to accommodate other Git providers, such as GitLab.

  › Seeding as a Hyperledger project.

  › Seeking the opportunities to be a project as part of the Hyperledger Labs

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› **Recommendations for future work (personal scope):**

> › I'm planning to continue this project for improvement, documentation, and integration to other platforms (some potential opportunities, such as any blockchain ledger, a universal DID generator/resolver, other cryptographic libraries, etc.).

> › Consider to enhance the features, do research to check whether the DID revocation function and decentralized key management system are feasible to be integrated into this project.

> › I also noticed some research opportunities in this area, and hopefully, my mentors can continue advising me on this area.

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› **Insights Gained:**

    › Do your research first. Always check official documentations and use internet and community resource to find the answer.

    › Never afraid to ask questions. Mentors and other people in the community are willing to help you.

    › Get your hands dirty!

    › Have fun to join the big family!

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THANK YOU!