

Benjamin D Tinsley
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Project Proposal

Project Overview

At the start of Fall 2024 semester, I pitched decx.press, a blockchain-based way to store and transmit digital content, to my peers in the CSPB program. This was part of an initiative aimed at grouping students together to build a large-scale team project based on their shared interests. In total, decx.press received 6 votes, myself included. Since then, we have slowly been working towards defining the requirements and building it out.

With this class, I will dedicate more focus on this project and get a basic MVP of its functionality accomplished by semester's end.

Related Links

- [Pitch for decx.press](#) (8 mins)
- [decx.press repo](#)

Vision Statement

With decx.press, I aim to build a scalable and efficient blockchain-based system that simplifies content storage, ensures perpetual availability, and empowers creators to own and monetize their content transparently, fostering a digital world where every word has weight and value.

Motivation

Working on decx.press comes from a combination of technical curiosity, personal values and a desire to make a practical impact on how digital content is stored and shared.

I enjoy solving complex problems and tackling innovative challenges. Building a scalable, efficient and perpetual content storage system requires me to explore many technologies and gain hands-on experience in new areas to reach my goal.

As a team project, decx.press highlights a personal value in collaboration. It allows me to learn from the unique skills of my teammates while offering my own to them, all while building something we all believe in.

Ultimately, I believe decx.press has the potential to redefine content storage and communication. It's an opportunity to create a platform that fosters freedom, equitability and transparency in a practical and meaningful way.

Specific and measurable goals

1. *Week 1-2: Foundation and Planning*

Objective

Define the high-level plan of what I want to accomplish with decx.press over the next 16 weeks.

Tasks

- Create a project proposal which includes a timeline
- Discuss my plans with the decx.press team

Deliverables

A project plan for my semester

2. *Week 3-4: Smart Contract Development*

Objective

Develop/refactor and test foundational smart contracts for decx.press and ensure deduplication and gas optimization.

Tasks

- Refactor Solidity contracts for handling character-to-hash contracts and hashes-to-hash contracts
- Integrate a Hash Registry for deduplication across units
- Write unit tests for contracts and aim for 90% coverage
- Outline and fill out basic project wiki

Deliverables

- Deployed smart contracts of local blockchain
- Passing test suite that adequately tests all smart contracts with 90% coverage or greater

3. *Week 5-6: Deployment Infrastructure*

Objective

Set up deployment processes and integrate with testnets along with a pipeline for deploying and upgrading contracts.

Tasks

- Use Hardhat Ignition to manage contract deployments
- Deploy contracts to a testnet, such as Goerli or Sepolia
- Write scripts for automated deployment and interaction

Deliverables

- Contracts deployed to a testnet
- Deployment scripts tested and documented

4. *Week 7-8: Backend Functionality*

Objective

Integrate all smart contracts into a cohesive backend system with logic for managing and traversing the data structure.

Tasks

- Build backend methods for pressing content and retrieving hashes in the decx.DAG data structure
- Develop minimal API for CLI interaction using Express.js, Flask or Swagger/OpenAPI
- Test backend functionality with sample data

Deliverables

- Working backend capable of handling content pressing and retrieval
- API exposed for CLI integration

5. *Week 9-10: Basic CLI*

Objective

Develop Command Line Interface (CLI) functionality for pressing and retrieving content.

Tasks

- Develop CLI commands for pressing content and retrieving content with Commander.js, argparse or other tool
- Integrate CLI with backend API and smart contracts
- Write tests to validate CLI functionality

Deliverables

- Functional CLI with minimal setup requirements
- Documentation for CLI

6. *Week 11-12: Testing and Optimization (stretch goal)*

Objective

Thoroughly test edge cases with perceived real-world scenarios and optimize gas costs.

Tasks

- Perform end-to-end testing for pressing and retrieving content
- Optimize smart contracts for gas optimization
- Stress-test the decx.DAG on testnets with large datasets

Deliverables

- Generate test reports with gas cost and scalability metrics
- Optimized contracts ready for production deployment

7. *Week 13-14: Documentation and Community Building (stretch goal)*

Objective

Finalize documentation and make it public!

Tasks

- Write comprehensive documentation for developers and users and define contribution guidelines
- Create a website with Docusarus or similar documentation platform

- Engage potential users, contributors or influencers through applicable online communities

Deliverables

- Fully documented website living at <https://decx.press>
- Community outreach plan

8. Week 15-16: Finalization and Demo (stretch goal)

Objective

Collect feedback and determine next steps.

Tasks

- Conduct a project retrospective to identify strengths and areas for improvement
- Create a demo video showcasing the functionality of decx.press
- Collect feedback from collaborators and users

Deliverables

- Finalized codebase with documentation, plus release
- Demo video and project showcase material

Risks to project completion

Looking at the above, it seems like I'm biting off more than I can chew. But let me assure you, I believe I can get through all of this. Some of the work in the first 3 sprints have been folded into the prior semester, so I am confident the timeline can work.

With that being said, here are the tangible risks I foresee:

1. Fundamental misunderstanding of how blockchain technology works as it pertains to costs, common operations, culture/best practices. It may be incredibly expensive to deploy this code onto Ethereum. It may be incredibly expensive to press content.
2. Fundamental misunderstanding of mentioned or similar technologies described above. Time commitment dedicated to learning it if it requires expertise.
3. In a team setting, being able to work patiently with others, despite them not feeling the same constraints of this course's requirements.
4. In a team setting, being able to change directions, update project plans and communicate accordingly.

Mitigation Strategy

1. If costs are indeed too high, I can always deploy my contracts purely on a testnet as a proof-of-concept instead of MVP.
2. In all of my usages for technologies, it's either within my area of expertise (Docusaurus, Javascript libraries) or only requires a cursory usage of functionality (CLI tools, API tools). Fortunately, I also have a team to leverage as well as online resources and language models, such as ChatGPT, to help me accomplish the specific goal I set out to accomplish.
3. This will all come down to my skills as a team member and conveying my minimal and maximal needs from them to be sure I am hitting the requirements of this course.
4. Similarly, communication will be key and ensuring we have several ways to discuss any needed changes to the direction. We currently hold a standup-ish meeting on Sunday nights every other week. I think we could integrate other weekly milestones, such as **PR Mondays**, in which we agree to check any PRs by the end of every Monday; **Open Hours**, where we have a standing hour-long open zoom call and pair through someone's problem for whoever shows up for an hour once a week; **Demo Day** on Fridays, where we show off any new features we are working on or almost finished with; **Retrospectives** where every other standup on Sunday, we discuss what has worked and hasn't worked for the team in the last period.

Project Assessments

In order for my time to be viewed as successful, there are only 3 main features I will view as a success for this:

1. Developed, well-tested and deployed smart contracts for pressing content
2. Developed and well-tested API to retrieve content
3. Developed and well-tested CLI to press and retrieve content

I've given myself until sprint 5 to complete these features, with an additional 3 sprints to create marketing materials and an outreach campaign. While I do feel these are important steps in the holistic view of decx.press, I realize they do not have to happen within the scope of this semester.

Project portfolio link

I own the URL <https://decx.press> where I will eventually post documentation and marketing materials specific to the delivered product, however my weekly progress will be featured at <https://bentinsley.dev/blog>