

Liquid Democracy for Rating Systems

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Abstract

A project to enhance rating systems with liquid democracy features, focusing on implementing and analyzing various delegation mechanisms within the Votle decision making system.

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Chapter 1

Introduction

Liquid democracy offers significant opportunities for enhancing the quality of collective decisions, particularly within systems that rely heavily on user-generated ratings. This project explores integrating liquid democracy into an existing rating platform to improve user engagement, decision-making accuracy, and the overall reliability of rating outcomes.

1.1 vodle

Vodle is an innovative online platform where users participate in polls to rate various types of content, such as consumer products and academic resources. Each poll presents a set of options, and users provide ratings using intuitive slider controls, allowing them to express their preferences. These ratings are then aggregated to generate results that reflect the collective input of the poll's voters.

1.2 Liquid Democracy

Liquid democracy is a flexible decision-making system combining elements of direct and representative democracy.

In direct democracy, every participant votes individually on each issue. In representative democracy, participants elect representatives to make decisions on their behalf.

Liquid democracy allows users either to vote directly or delegate their voting power to others they trust or consider more knowledgeable. Delegations can be transitive, meaning voting authority can pass through several individuals, forming chains of delegated influence that reflect users' preferences and perceived expertise.

The key advantages of liquid democracy include reducing voter fatigue, increasing participation, and enhancing decision-making by effectively utilising specialised knowledge.

1.3 Motivation

Liquid democracy holds considerable potential, but practical applications face notable challenges. Common issues include delegation cycles, where voting authority becomes circular and unresolved; voter abstention, where users choose not to vote; and disproportionate influence by super-voters.

Current systems rarely implement solutions like ranked delegation (allowing users to specify multiple, ranked delegates) or the ability to allocate voting power across multiple delegates.

This project aims to address these gaps, specifically within platforms like Vodle, to improve rating accuracy and reliability.

1.4 Project Goal

The project's main goal is integrating a liquid democracy system into the Vodle platform, emphasising technical robustness and practical usability.

Key features include ranked delegation, vote splitting, and backup votes. Addressing technical challenges such as delegation cycles and disproportionate

influence is critical to enhancing rating accuracy, increasing user trust, and boosting engagement.

While the project explores theoretical aspects, its primary focus remains practical implementation and technical effectiveness.

1.5 Project Outline

This report is structured to clearly illustrate the project's progression and outcomes:

Chapter 2 provides background, covering existing literature and implementations of liquid democracy.

Chapter 3 details essential design decisions for effectively integrating liquid democracy into Vodle.

Chapter 4 describes the technical implementation, methods, and practical considerations.

Chapter 5 evaluates the implemented solution through rigorous testing and user feedback.

Chapter 6 summarises the project's achievements, identifies its limitations, and suggests directions for future research and development.

Chapter 2

Research

Chapter 3

Design

In this chapter, we describe the overall design of our solution to the problem identified in Chapter 1, building on work described in Chapter 2.

Chapter 4

Implementation

In this chapter, we describe the implementation of the design we described in Chapter 3. You should **not** describe every line of code in your implementation. Instead, you should focus on the interesting aspects of the implementation: that is, the most challenging parts that would not be obvious to an average Computer Scientist. Include diagrams, short code snippets, etc. for illustration.

Chapter 5

Evaluation

Describe the approaches you have used to evaluate that the solution you have designed in Chapter 3 and executed in Chapter 4 actually solves the problem identified in Chapter 1.

While you can discuss unit testing etc. you have carried here a little bit, that is the minimum. You should present data here and discuss that. This might include *e.g.* performance data you have obtained from benchmarks, survey results, or application telemetry / analytics. Tables and graphs displaying this data are good.

Chapter 6

Conclusions

The project is a success. Summarise what you have done and accomplished.

6.1 Future work

Suggest what projects might follow up on this. The suggestions here should **not** be small improvements to what you have done, but more substantial work that can now be done thanks to the work you have done or research questions that have resulted from your work.

Bibliography