A Requirement Traceability Tool

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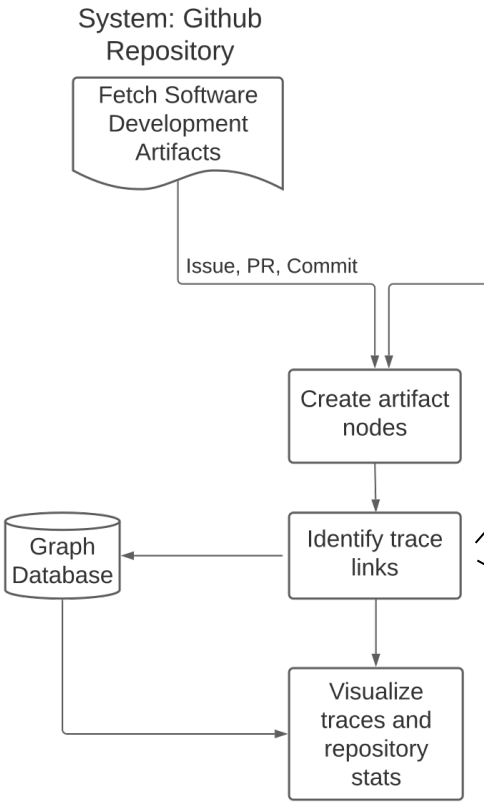
Problem Statement

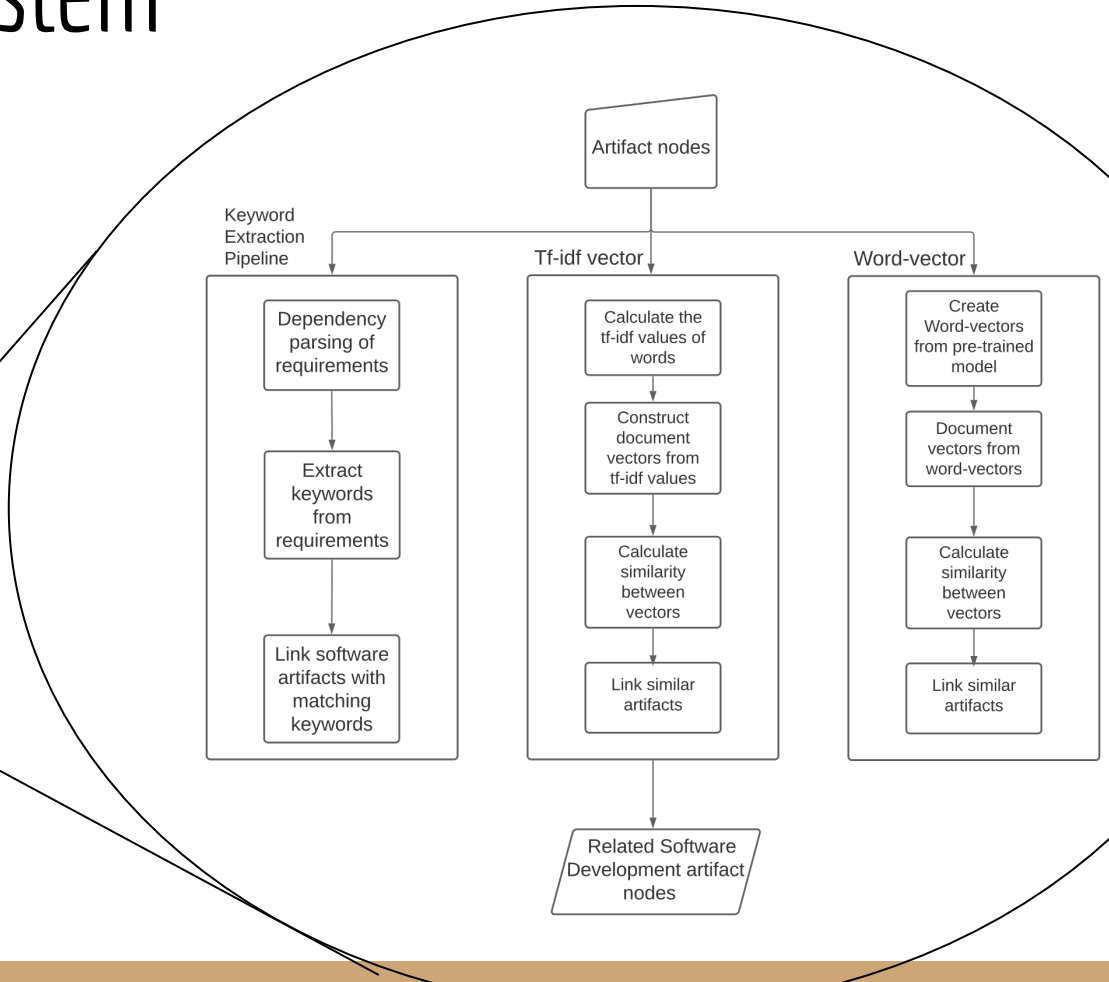
To design and implement a tool that identifies and visualizes the trace links for a software project given the requirements and software development repository.

Motivation

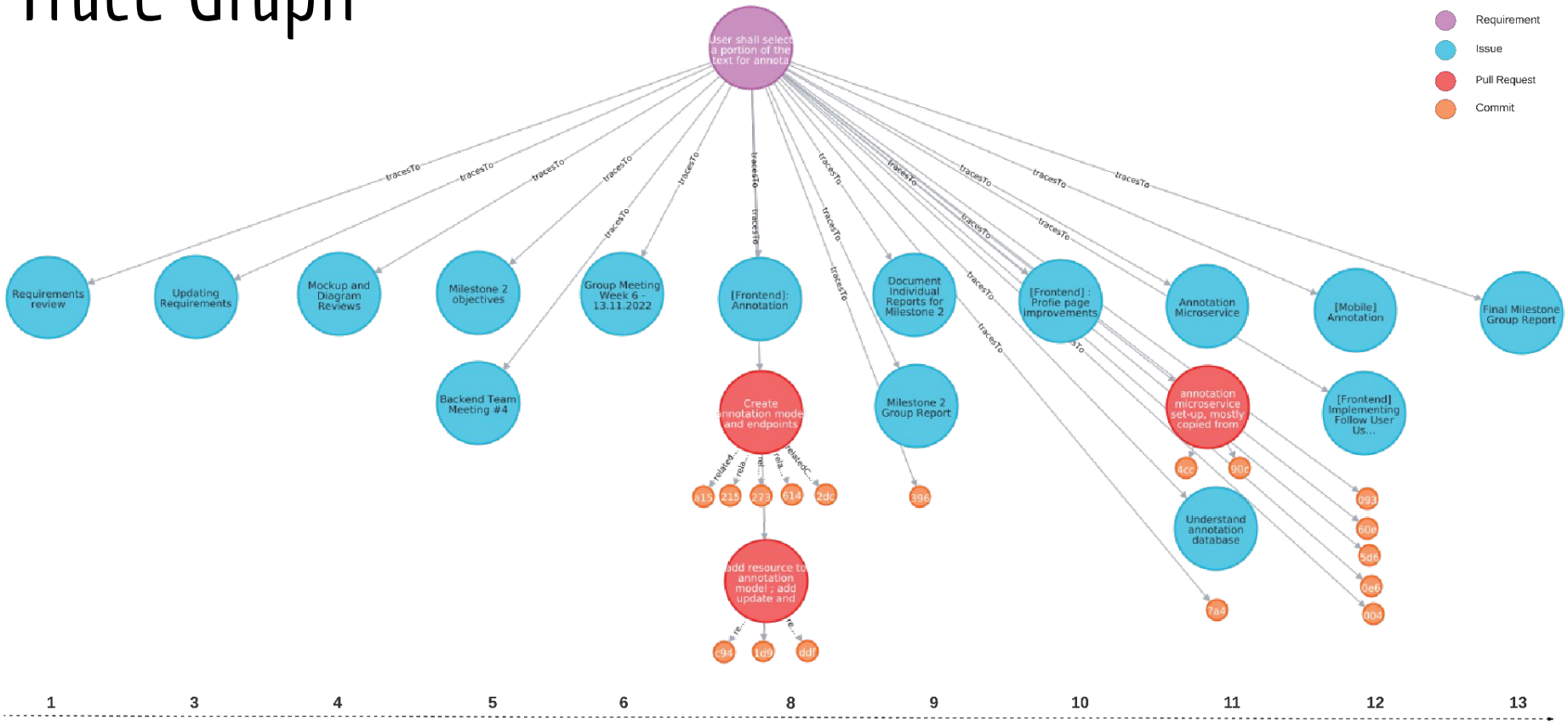
Traditional methods to recover traceability links necessitate significant human effort, particularly as the project scale grows.
By offering automated traceability and comprehensive visualization, our tool aims to enhance the management of requirements and to demonstrate their lifetime.

Control Flow of the System

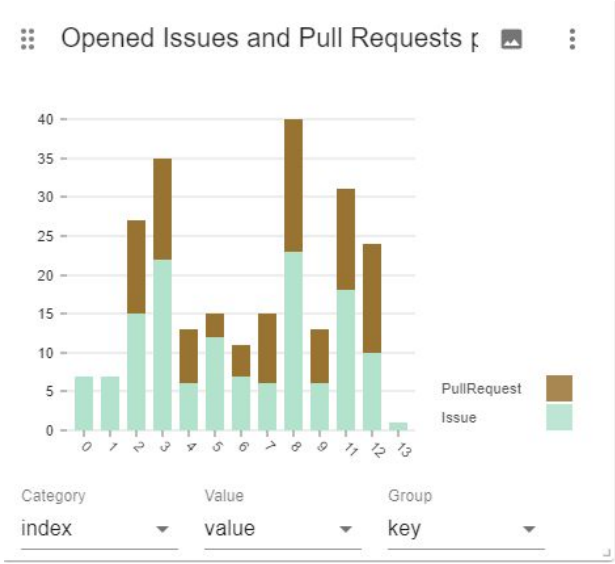


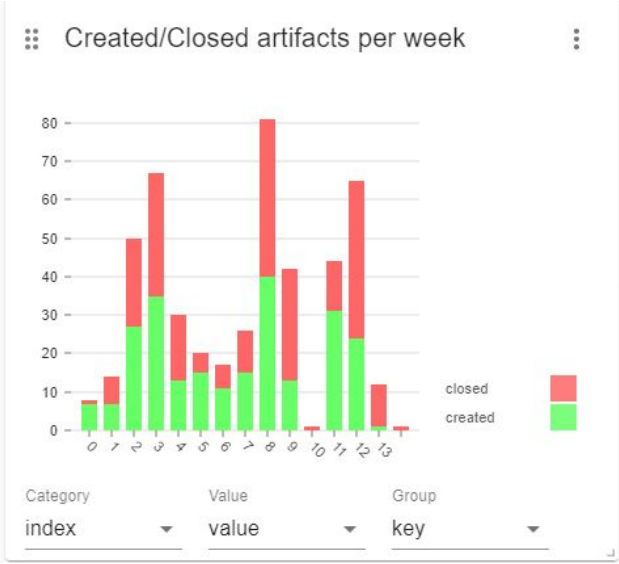


Trace Graph

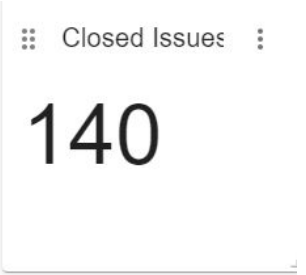

Requirement
Issue
Pull Request
Commit
User shall select a portion of the text for annota
Requirements review
Updating Requirements
Mockup and Diagram Reviews
Milestone 2 objectives
Backend Team Meeting #4
Group Meeting Week 6 - 13.11.2022
[Frontend]: Annotation
Create annotation model and endpoints
a15
215
273
614
2dc
add resource to annotation model ; add update and
c94
1d9
ddf
Document Individual Reports for Milestone 2
Milestone 2 Group Report
396
[Frontend] : Profie page improvements
Annotation Microservice
annotation microservice set-up, mostly copied from
4cc
90c
Understand annotation database
7a4
[Mobile] Annotation
[Frontend] Implementing Follow User Us...
0g3
60e
5d6
0e6
0d4
Final Milestone Group Report
tracesTo
week
1
3
4
5
6
8
9
10
11
12
13

Dashboard

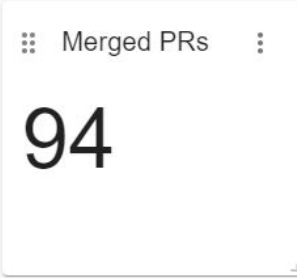

Opened Issues and Pull Requests
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 11 12 13
PullRequest
Issue
Category
index
Value
value
Group
key


Created/Closed artifacts per week
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13
closed
created
Category
index
Value
value
Group
key

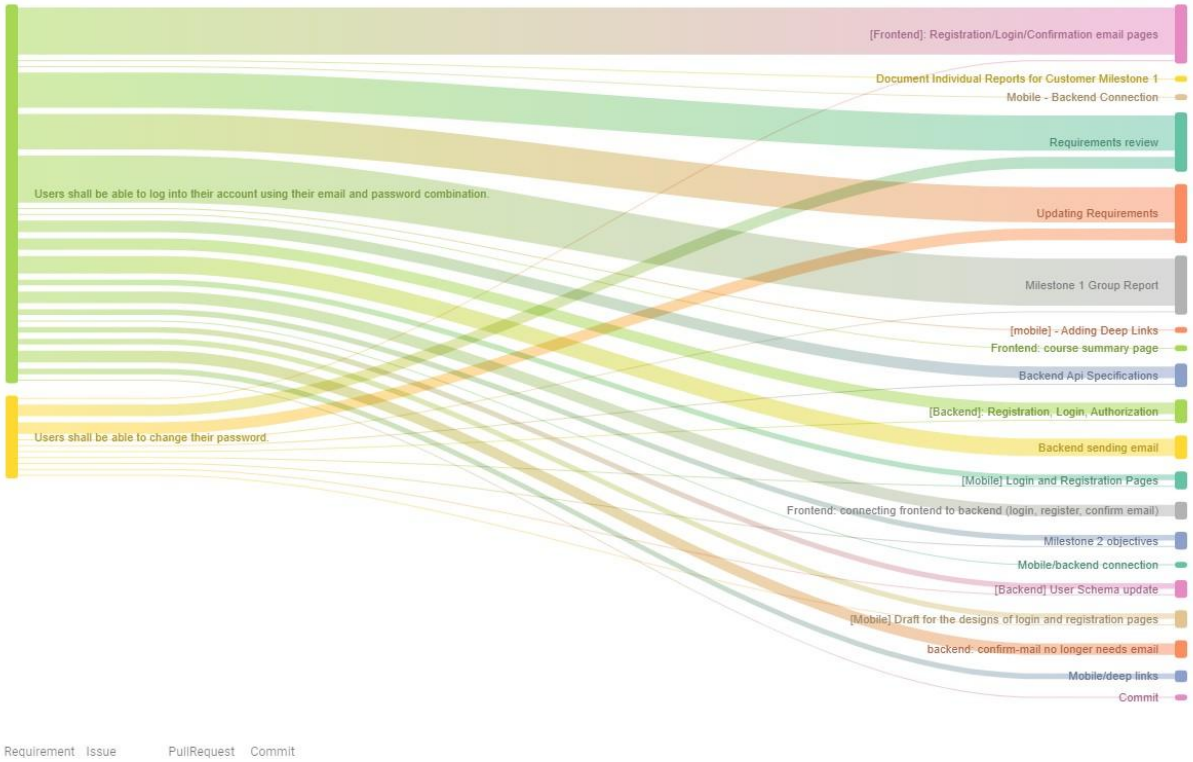
Active Issues
0


Closed Issues
140

Active PRs
1


Merged PRs
94

Trace Chart (Ordered by Artifact creation date)



Requirement 1

Please type to search requirement description.

Users shall be able to change their password.

Requirement 2

Please type to search requirement description.

Users shall be able to log into their account using their email and...

Requirement 1

1.3.10

Requirement 2

1.1.2.1

Limit for trace chart/graph

Number of traces to show.

30

Results

Method	Recall	Precision
Keyword extraction	0.865	0.212

Table 1:Recall - Precision Values of Keyword Extraction Method

	Word-vector		Tf-idf vector	
Sim.Threshold	Rec.	Prec.	Rec.	Prec.
0.05	1.0	0.043	0.839	0.121
0.15	1.0	0.043	0.573	0.256
0.25	1.0	0.043	0.244	0.430
0.35	1.0	0.043	0.095	0.392
0.45	0.965	0.071	0.025	0.125
0.55	0.865	0.100	0.013	0.121
0.65	0.294	0.300	0	0

Table 2:Recall - Precision Values of Vector-based Methods

Challenges

- The lack of open-source project requirement specification documents.
- Creation of ground truth set for evaluation.

Thank you for watching.

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https://github.com/ersoykadir/Requirement-Traceability-Analysis