shnip.it

Who? F. Hu J. Kay F. Johnson R. Saunders J. Warburton

When? 2014-04-10

Project Infrastructure

Planning

Redmine

- Well-known, established Free project-management software
- Very customizable
- VCS integration
- . . . but kind of a pain to set up!

Backlogs

- Scrum support for Redmine
- Group tasks into sprints
- Nice burndown charts
- Only thing we found that works with our Redmine version ☺

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- Good for informal conversations

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Collaboration

git

- Lets us work without stepping on each others' toes
- Keeps track of work put into the project via the commit log
- Write-up using TEX; can be put in git too!
- Mature, stable infrastructure. . .

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- Also provides communication services like an issue tracker or code comments (but we didn't use these)

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Concept

Domain

- **Snippets** are pieces of code in a particular language that somebody might want to insert into their program.
- **Boards** are organizational objects used to group snippets into semantically related sets, and apply permissions (to allow the system to be used with sensitive codebases).

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Requirements

Market Research

Features

- Code-oriented features like syntax highlighting and line numbering
- Ease of sharing
- Plausibility of editor integration

Competitors

- **GitHub Gists**, as well as pastebin sites like **pastebin.com**, are code-oriented and can be shared, but provide no API for editor integration.
- **Google Docs** can be shared, but is not designed for code, and has no friendly API for integration.
- **yasnippet** and similar snippet tools are integrated with the editor (often only one editor, and can't be reused between editors), but provide no means of sharing.

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Functional Requirements

Research

To get an idea of what users would want from such a system, if at all, we produced a **questionnaire**.

Formulation

Since we used Scrum, we found it easiest to specify our functional requirements directly as **user stories**. This also helped us verify our functional tests.

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Non-Functional Requirements

These were imposed on us by

- The university, the team, and the nature of the task
- The possibility that we might store sensitive data

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Implementation

Front-End

- We decided to create a Web-based user interface using **HTML5/CSS3/JavaScript** for ease of deployment
- **jQuery** was used for some special effects
- **Backbone.js** for communicating with the server when loading or storing data dynamically

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Back-End

- **Python** since it is already familiar to everyone in our group and has some good tools for rapid Web development
- **Django**, a well-respected MVC Web framework, provided an assortment of useful development tools
- **Django REST Framework**, for exporting a RESTful API from an application
- **PostgreSQL** is the most standards-compliant Free database we found
- But we also used **SQLite** for distributed development — Django makes the choice of SQL server mostly transparent

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Development Model

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Scrum

- Divide project up into flexibly-scheduled sprints — suits university schedule (exams &c.)!
- Respond rapidly to changing requirements as we discovered them

TDD

- Constantly check our code for errors
- Particularly important in Python, as we have no type system to guarantee invariants

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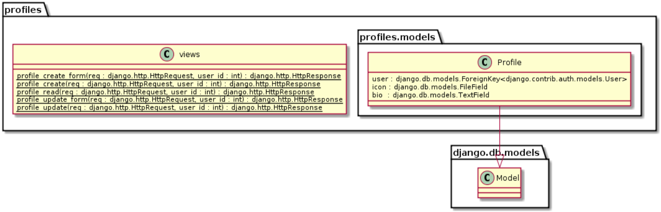
Design

Class Diagrams



views

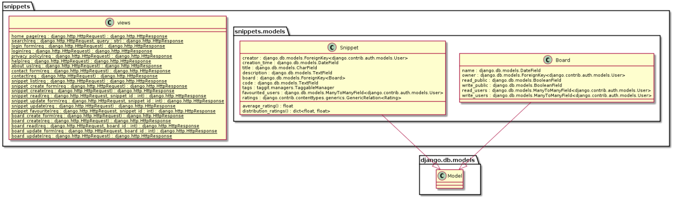
profile_create_form(req : django.http.HttpRequest, user_id : int) : django.http.HttpResponse
profile_create(req : django.http.HttpRequest, user_id : int) : django.http.HttpResponse
profile_read(req : django.http.HttpRequest, user_id : int) : django.http.HttpResponse
profile_update_form(req : django.http.HttpRequest, user_id : int) : django.http.HttpResponse
profile_update(req : django.http.HttpRequest, user_id : int) : django.http.HttpResponse

Profile

user : django.db.models.ForeignKey<django.contrib.auth.models.User>
icon : django.db.models.FileField
bio : django.db.models.TextField

Model

Class Diagrams



snippets

views

home_page(req : django.http.HttpRequest) : django.http.HttpResponse
search(req : django.http.HttpRequest, query : str) : django.http.HttpResponse
login_form(req : django.http.HttpRequest) : django.http.HttpResponse
login(req : django.http.HttpRequest) : django.http.HttpResponse
privacy_policy(req : django.http.HttpRequest) : django.http.HttpResponse
help(req : django.http.HttpRequest) : django.http.HttpResponse
about_us(req : django.http.HttpRequest) : django.http.HttpResponse
contact_form(req : django.http.HttpRequest) : django.http.HttpResponse
contact(req : django.http.HttpRequest) : django.http.HttpResponse
snippet_list(req : django.http.HttpRequest) : django.http.HttpResponse
snippet_create_form(req : django.http.HttpRequest) : django.http.HttpResponse
snippet_create(req : django.http.HttpRequest) : django.http.HttpResponse
snippet_read(req : django.http.HttpRequest, snippet_id : int) : django.http.HttpResponse
snippet_update_form(req : django.http.HttpRequest, snippet_id : int) : django.http.HttpResponse
snippet_update(req : django.http.HttpRequest) : django.http.HttpResponse
snippet_favourite(req : django.http.HttpRequest, snippet_id : int) : django.http.HttpResponse
board_create_form(req : django.http.HttpRequest) : django.http.HttpResponse
board_create(req : django.http.HttpRequest) : django.http.HttpResponse
board_read(req : django.http.HttpRequest, board_id : int) : django.http.HttpResponse
board_update_form(req : django.http.HttpRequest, board_id : int) : django.http.HttpResponse
board_update(req : django.http.HttpRequest) : django.http.HttpResponse

snippets.models

Snippet

creator : django.db.models.ForeignKey<django.contrib.auth.models.User>
creation_time : django.db.models.DateField
title : django.db.models.CharField
description : django.db.models.TextField
board : django.db.models.ForeignKey<Board>
code : django.db.models.TextField
tags : taggit.managers.TaggableManager
favourited_users : django.db.models.ManyToManyField<django.contrib.auth.models.User>
ratings : django.contrib.contenttypes.generics.GenericRelation<Rating>

average_rating() : float
distribution_ratings() : dict<float, float>

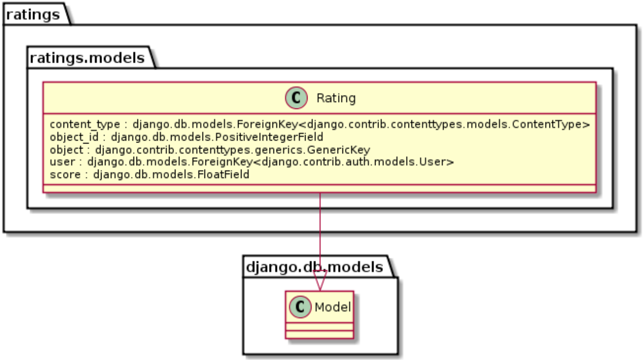
Board

name : django.db.models.DateField
owner : django.db.models.ForeignKey<django.contrib.auth.models.User>
read_public : django.db.models.BooleanField
write_public : django.db.models.BooleanField
read_users : django.db.models.ManyToManyField<django.contrib.auth.models.User>
write_users : django.db.models.ManyToManyField<django.contrib.auth.models.User>

django.db.models

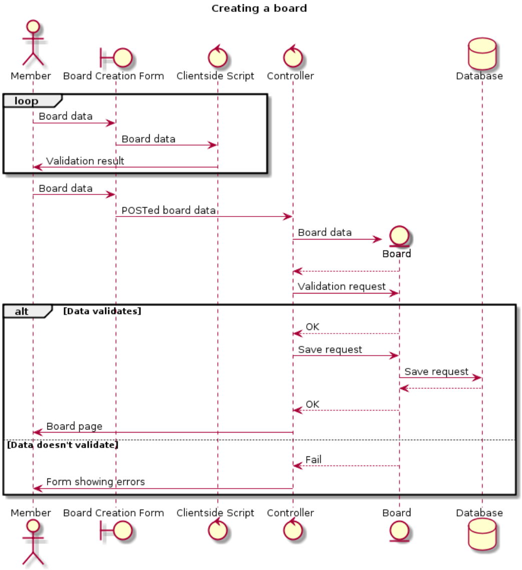
Model

Class Diagrams

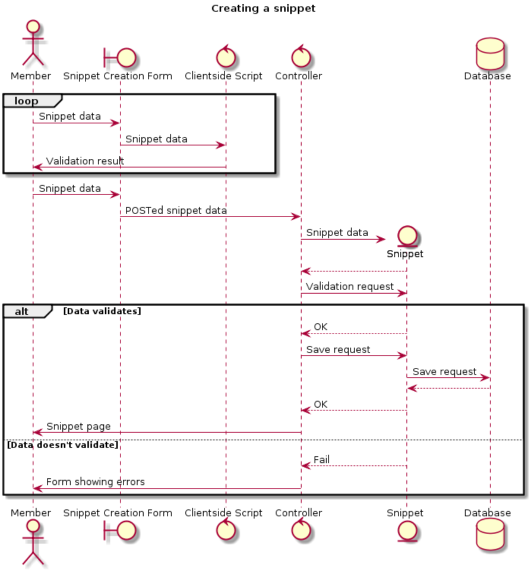


content_type : django.db.models.ForeignKey<django.contrib.contenttypes.models.ContentType>
object_id : django.db.models.PositiveIntegerField
object : django.contrib.contenttypes.generics.GenericKey
user : django.db.models.ForeignKey<django.contrib.auth.models.User>
score : django.db.models.FloatField

Sequence Diagrams



Sequence Diagrams



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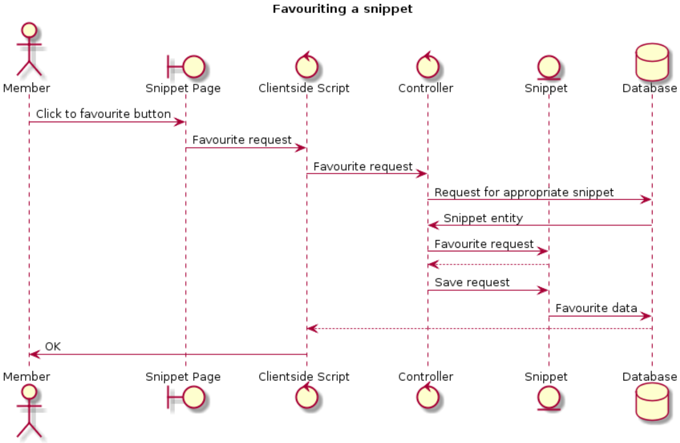

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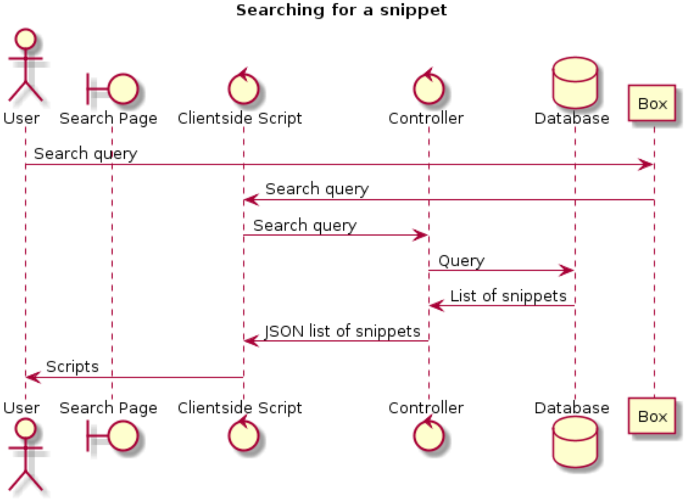

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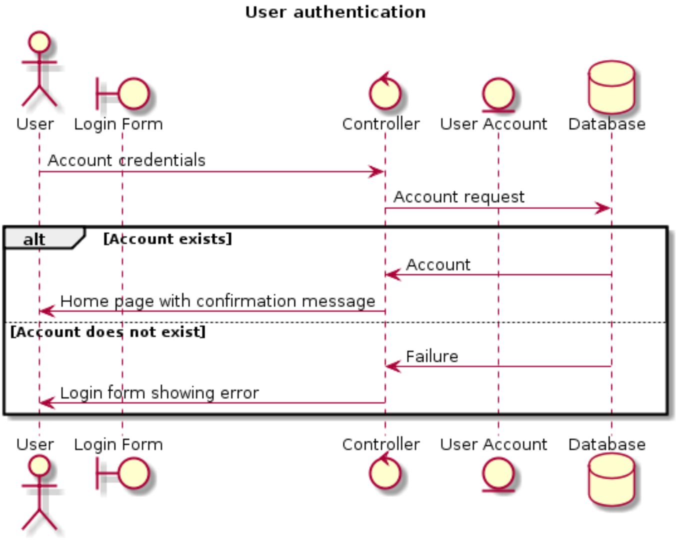

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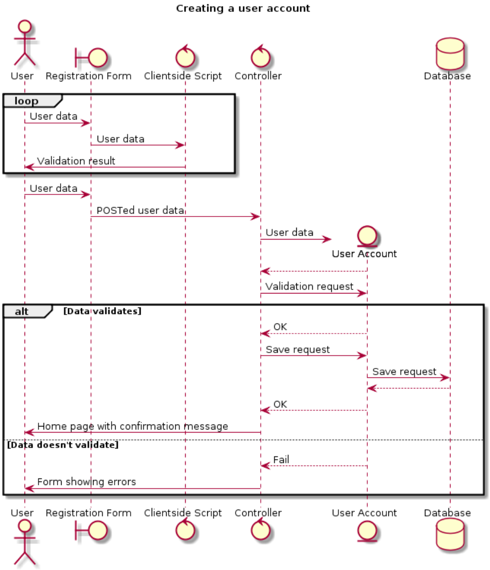
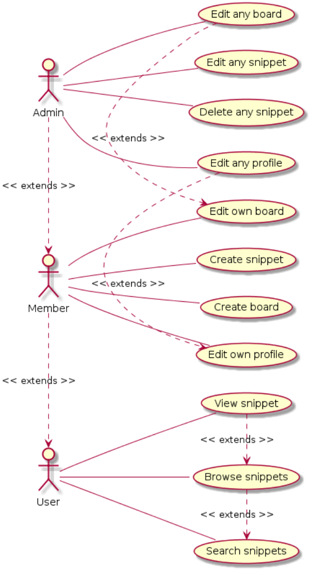
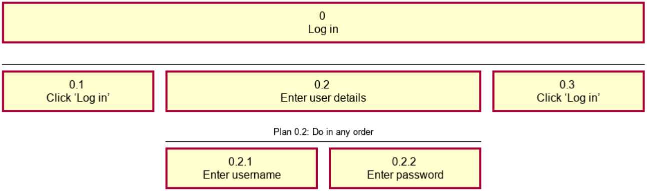


Use-Case Diagram



Hierarchical Task Analyses

Log In



0
Log in

0.1
Click 'Log in'

0.2
Enter user details

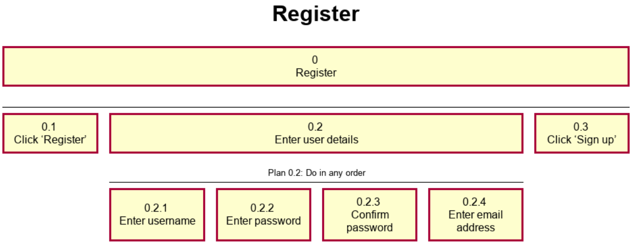
0.3
Click 'Log in'

Plan 0.2: Do in any order

0.2.1
Enter username

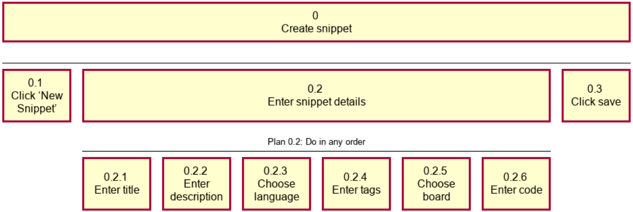
0.2.2
Enter password

Hierarchical Task Analyses



Hierarchical Task Analyses

Create Snippet



0
Create snippet

0.1
Click ‘New Snippet’

0.2
Enter snippet details

0.3
Click save

Plan 0.2: Do in any order

0.2.1
Enter title

0.2.2
Enter description

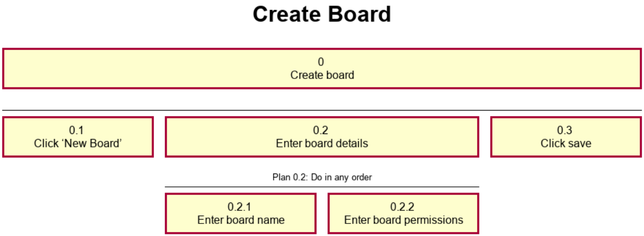
0.2.3
Choose language

0.2.4
Enter tags

0.2.5
Choose board

0.2.6
Enter code

Hierarchical Task Analyses



Create Board

0
Create board

0.1
Click ‘New Board’

0.2
Enter board details

0.3
Click save

Plan 0.2: Do in any order

0.2.1
Enter board name

0.2.2
Enter board permissions

UI Design Elements

- Colour scheme
- Navigation
- Recognition over recall
- Expectation

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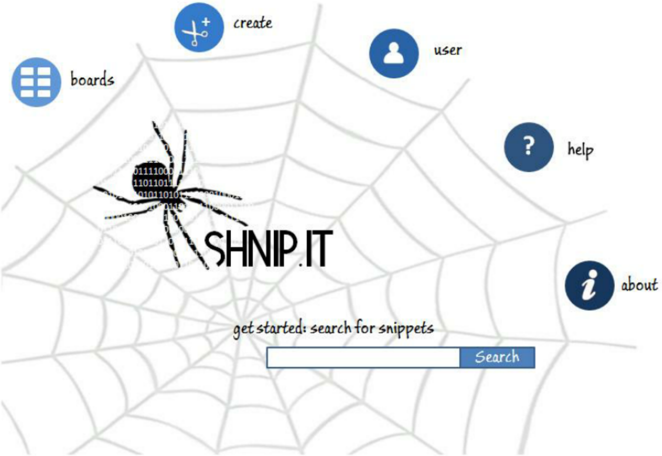
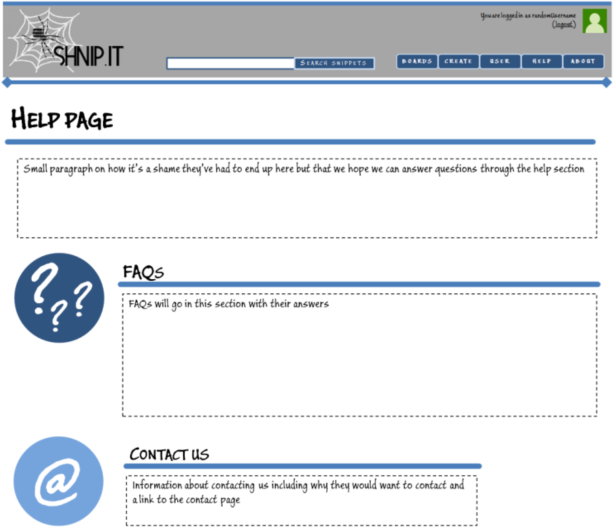
GUI Sketches



GUI Sketches



HELP PAGE

Small paragraph on how it's a shame they've had to end up here but that we hope we can answer questions through the help section

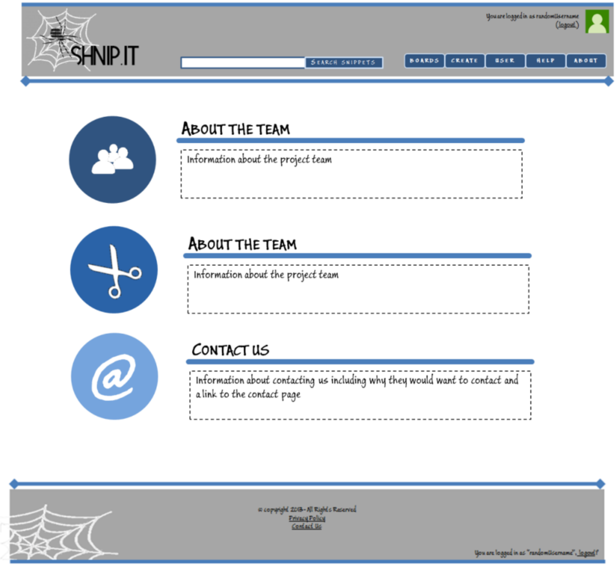
FAQs

FAQs will go in this section with their answers

CONTACT US

Information about contacting us including why they would want to contact and a link to the contact page

GUI Sketches



You are logged in as randomUsername (logout)

ABOUT THE TEAM

Information about the project team

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Information about the project team

CONTACT US

Information about contacting us including why they would want to contact and a link to the contact page

© copyright 2013 - All Rights Reserved
Privacy Policy
Contact Us

You are logged in as "randomUsername", logout?

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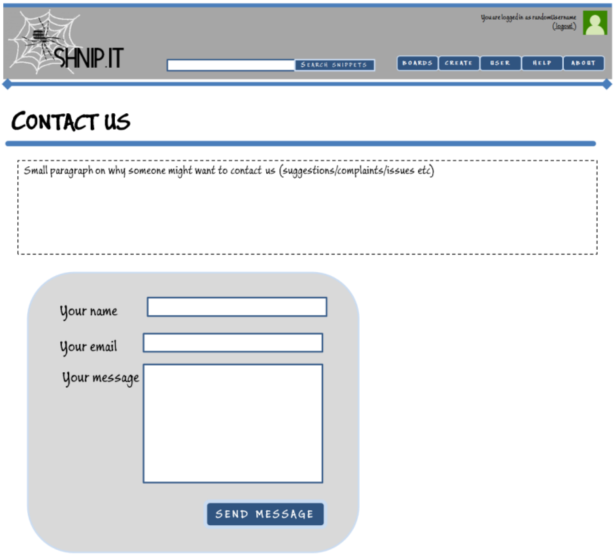

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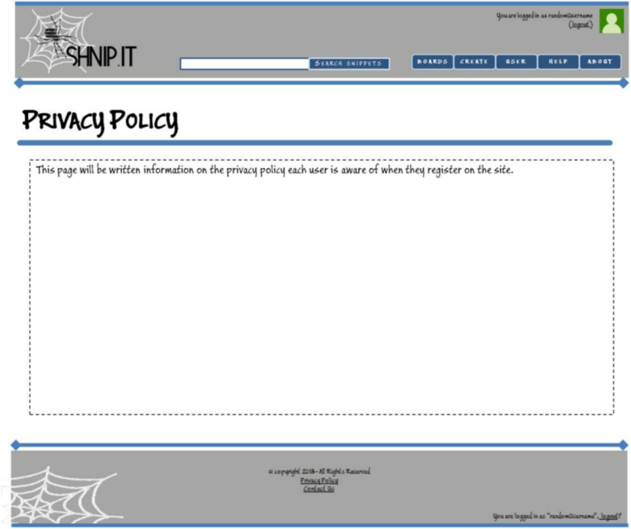
CONTACT US

Small paragraph on why someone might want to contact us (suggestions/complaints/issues etc)

GUI Sketches

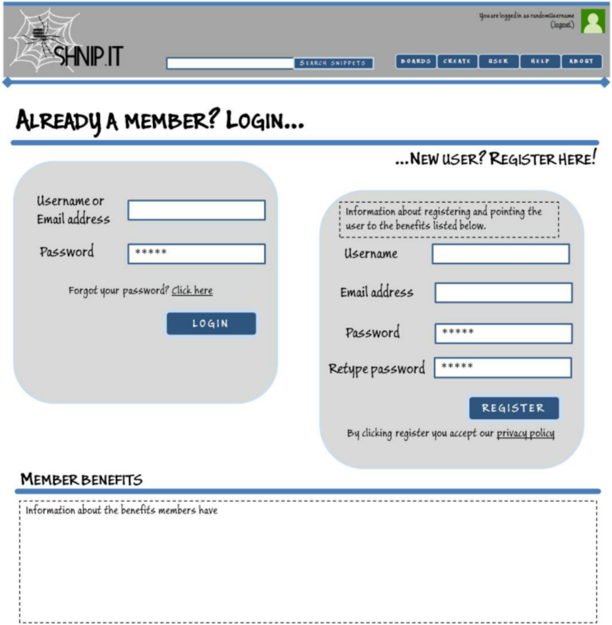

You are logged in as randomUsername
(logout)
SHNIP.IT
SEARCH SNIPPETS
BOARDS
CREATE
USER
HELP
ABOUT

PRIVACY POLICY

This page will be written information on the privacy policy each user is aware of when they register on the site.

© copyright 2013 - All Rights Reserved
Privacy Policy
Contact Us
You are logged in as "randomUsername", logout?

GUI Sketches



You are logged in as randomUsername
(logout)

ALREADY A MEMBER? LOGIN...

...NEW USER? REGISTER HERE!

Username or Email address

Password *****

Forgot your password? Click here

Information about registering and pointing the user to the benefits listed below.

Username

Email address

Password *****

Retype password *****

By clicking register you accept our privacy policy

MEMBER BENEFITS

Information about the benefits members have

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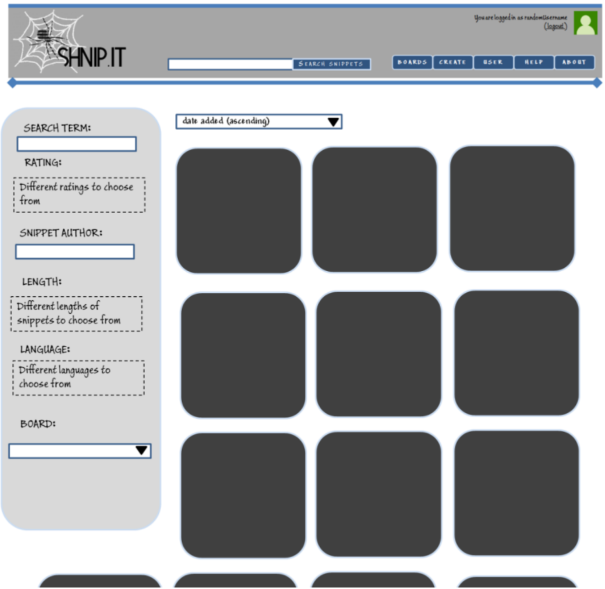
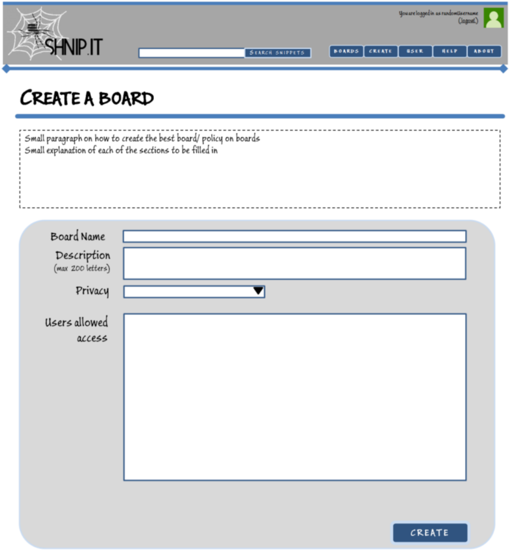

SHNIP.IT
You are logged in as randomUsername
(logout)
SEARCH SNIPPETS
BOARDS
CREATE
USER
HELP
ABOUT
SEARCH TERM:
RATING:
Different ratings to choose from
SNIPPET AUTHOR:
LENGTH:
Different lengths of snippets to choose from
LANGUAGE:
Different languages to choose from
BOARD:
date added (ascending)

GUI Sketches

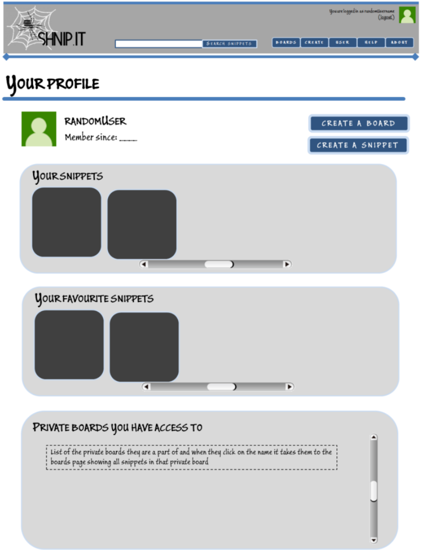


You are logged in as randomUsername (logout)

CREATE A BOARD

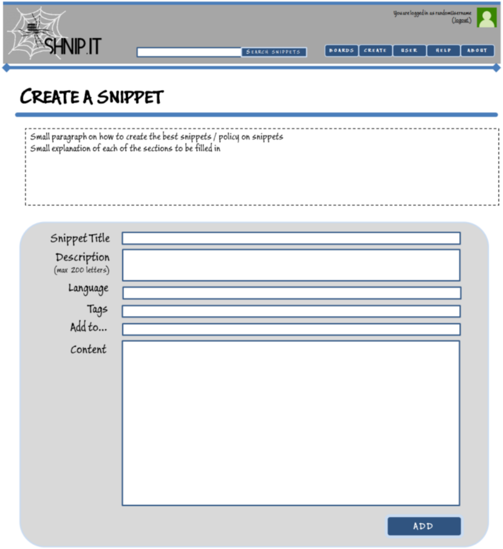
Small paragraph on how to create the best board/ policy on boards
Small explanation of each of the sections to be filled in

GUI Sketches



List of the private boards they are a part of and when they click on the name it takes them to the boards page showing all snippets in that private board

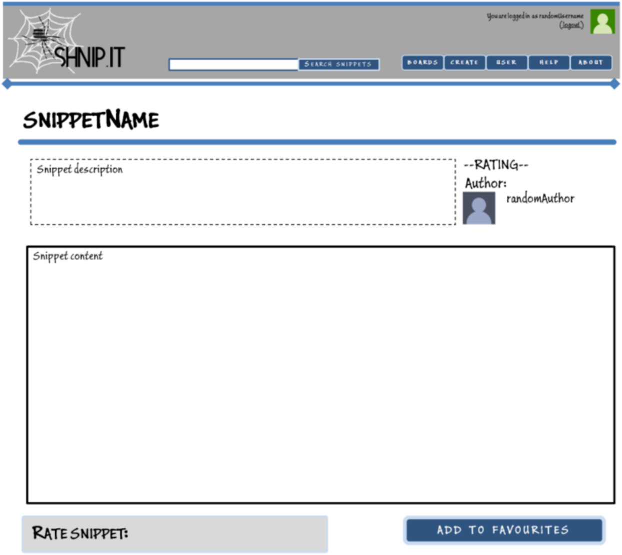
GUI Sketches



CREATE A SNIPPET

Small paragraph on how to create the best snippets / policy on snippets
Small explanation of each of the sections to be filled in

GUI Sketches



Video

Testing

Functional Testing

Formulation

- Derived directly from functional requirements
- Powerful means of validation!

Implementation

- **Django** provides a framework for running tests against a live server instance
- Used the **Selenium** Web driver with the **PhantomJS** headless browser to test through the frontend exactly as the user would see it

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Unit Testing

- **Python** provides a unit testing framework.
- **Django**'s MVC architecture reduces coupling and makes it possible to test individual components separately from the rest of the system.

Evaluation

Empirical Study

Experiment

- Timed task execution
- Think-aloud elements

Tasks

- Create account
- Search for snippet
- Create snippet
- View created snippet

Empirical Study

Experiment

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- Search for snippet
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Results

?

Conclusion

Conclusion

?

Questions?