

Product Design

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Architectural Overview

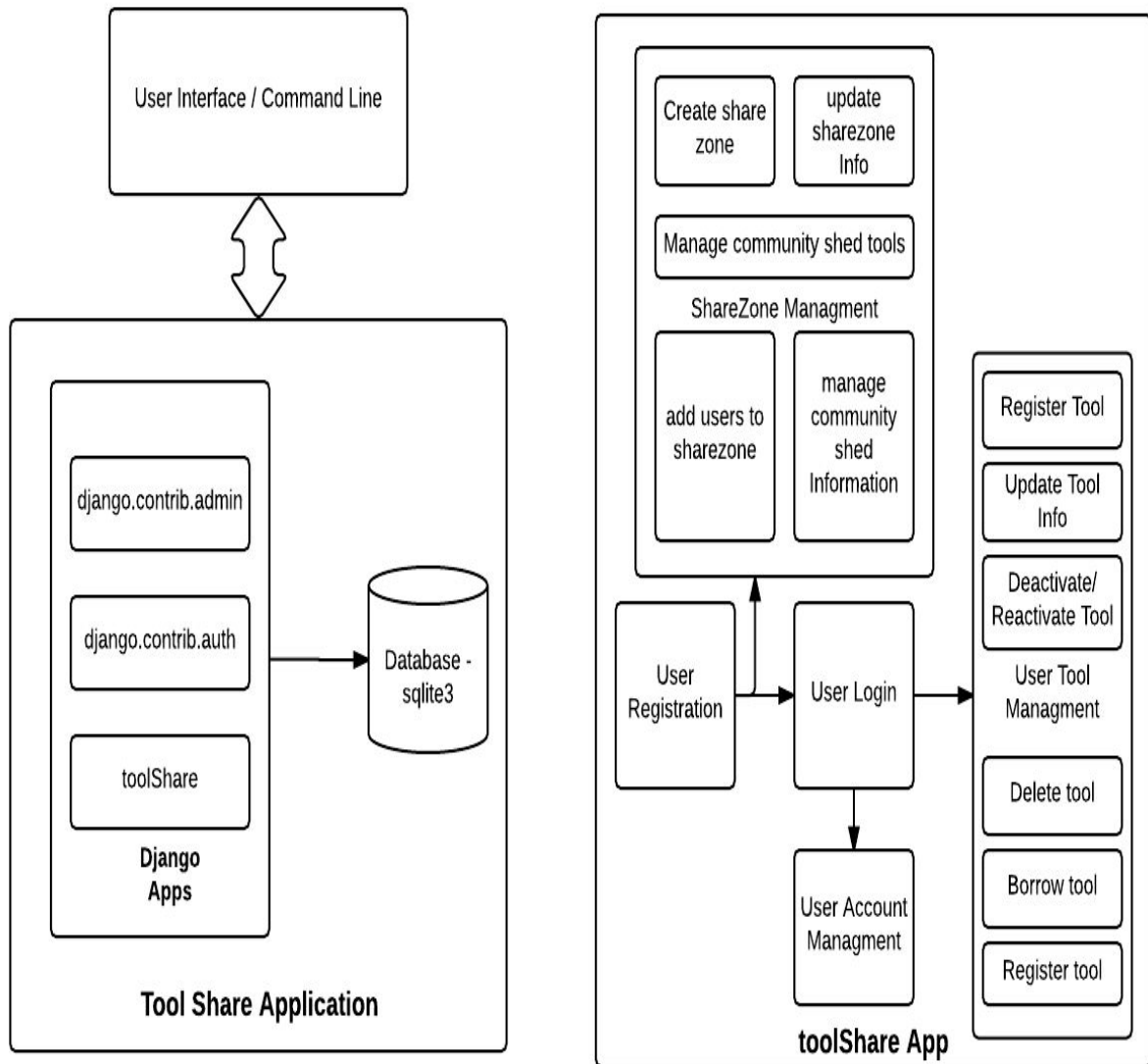


Figure 1 - Tool Share Architecture Overview Diagram

Components and Functions

User Login	<p>User Login State</p> <ul style="list-style-type: none">• The username and password for a user are required for the user login. <p>User Login behavior</p> <ul style="list-style-type: none">• The username and password are validated if they belong to a registered user.• If the validation is successful, the user is directed to the home page.• User login is required for the User Account Management and User Tool Management.
User Registration	<p>User Registration State</p> <ul style="list-style-type: none">• The user registration information such as username, first_name,last_name,email, password, address, and zipcode are required for successful user registration. <p>User Registration behavior</p> <ul style="list-style-type: none">• The system verifies if the input for password and the confirm-password fields match each other.• The system verifies if the username already exists and in case it does exist, the user is asked to enter a new username.• The fields "username,email,password,zipcode,first name, last name" are mandatory. Without entering these fields the user is not allowed to register.• User registration is required for the User login component.

User Account Management	<p>User Account Management State</p> <ul style="list-style-type: none"> • The user specifies the details such as name, address, default E-Mail address, password • The user also specifies preference details such as E-Mail reminder frequency, mode of notification and pickup arrangements. <p>User Account Management Behavior</p> <ul style="list-style-type: none"> • On successful registration and login, the user can make modifications in the user account section. User can modify the basic information such as name, e-mail address, password and physical address which was given at the time of registration. • If the zip code is updated, the sharezone will be updated based on the availability and the user will be notified. • User can also make modifications in the user preferences to modify the e-mail reminder frequency, notification type and pickup arrangements.
User Tool Management	<p>User Tool Management state</p> <ul style="list-style-type: none"> • The user specifies the details like name, image, condition, availability status, etc. of the tool that s/he wants to share. <p>User Tool Management behavior</p> <ul style="list-style-type: none"> • On successful registration of the tool, the user can edit the information provided previously. • User can change the availability of the tools being shared.
Share Zone Management	<p>Share Zone Management state</p> <ul style="list-style-type: none"> • ShareZone contains information details such as zipcode, list of users, community shed details and administrator information. <p>Share Zone Management behavior</p> <ul style="list-style-type: none"> • The system creates a new ShareZone when a user belonging to a new zip code registers for the first time. • Whenever a new user registers whose zip code belongs to an already existing sharezone, the user is added to the existing sharezone. • An admin can modify the community shed details belonging to a share zone.

Class Diagram

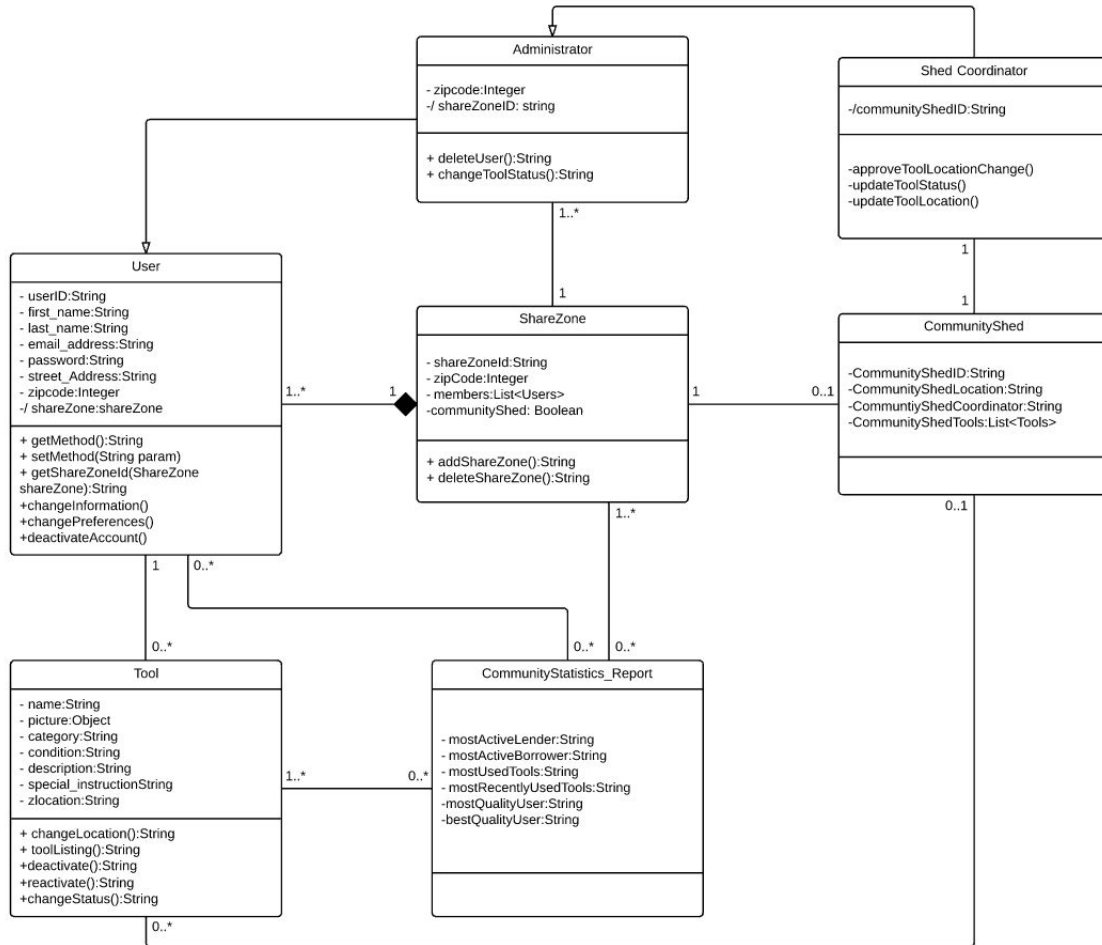


Figure 2 - UML class diagram for different classes

Sequence Diagrams

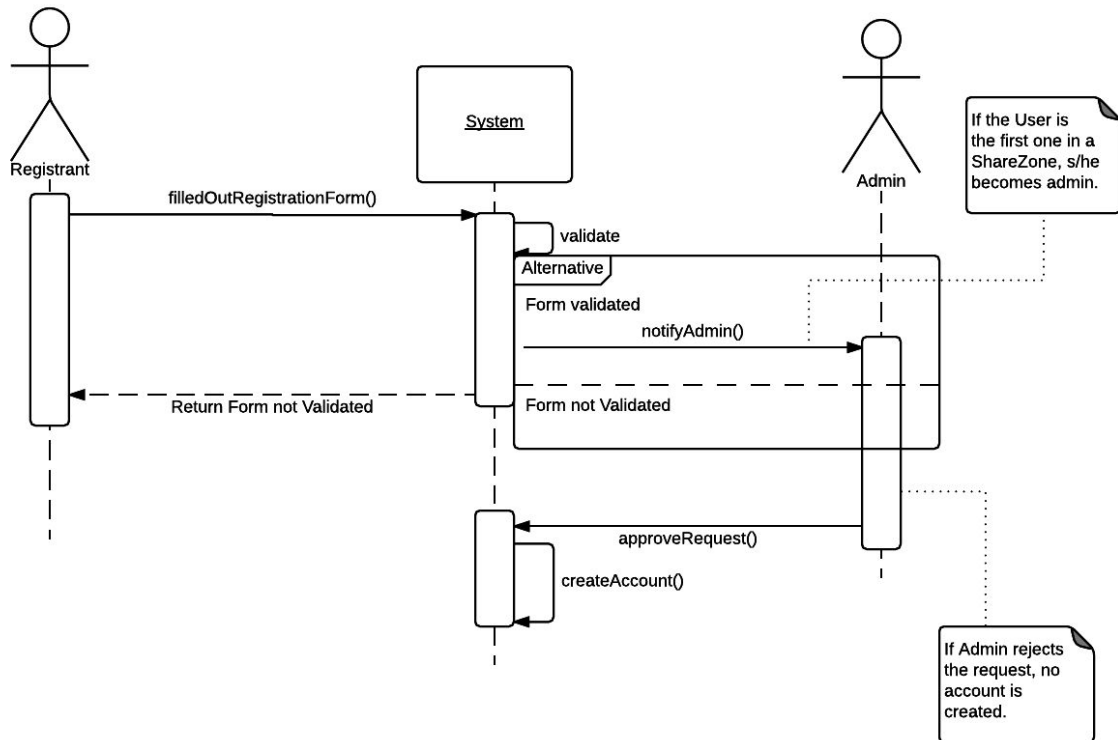


Figure 3 - Sequence diagram for User Registration

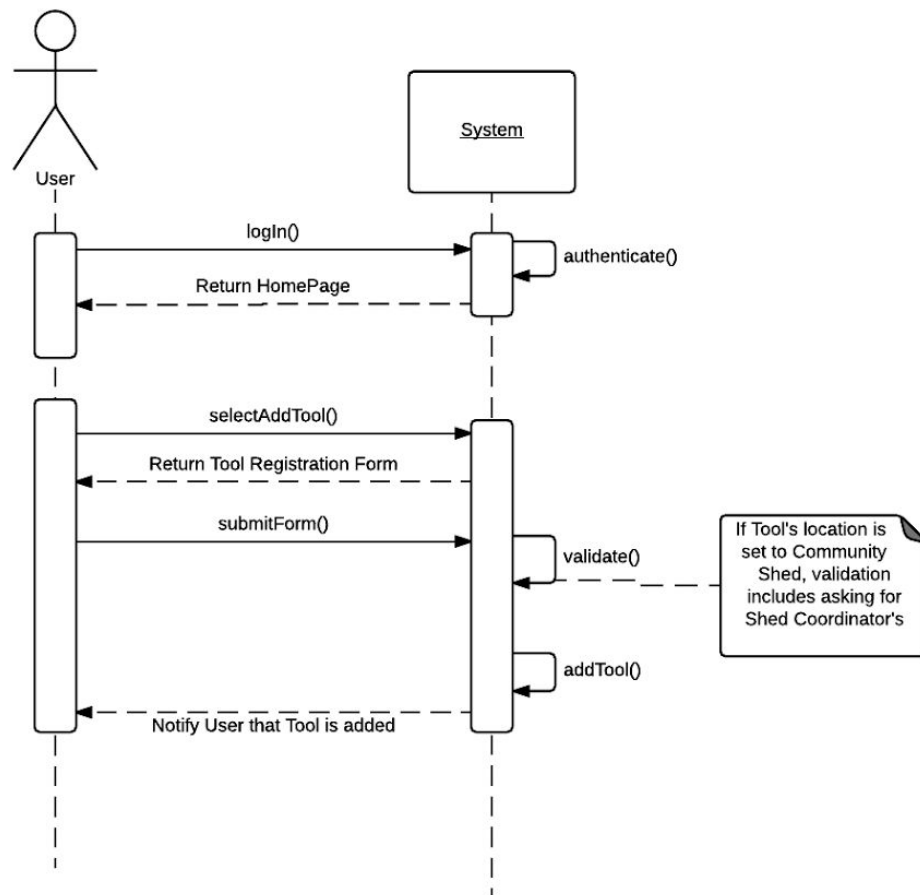


Figure 4 - Sequence diagram for Tool Registration

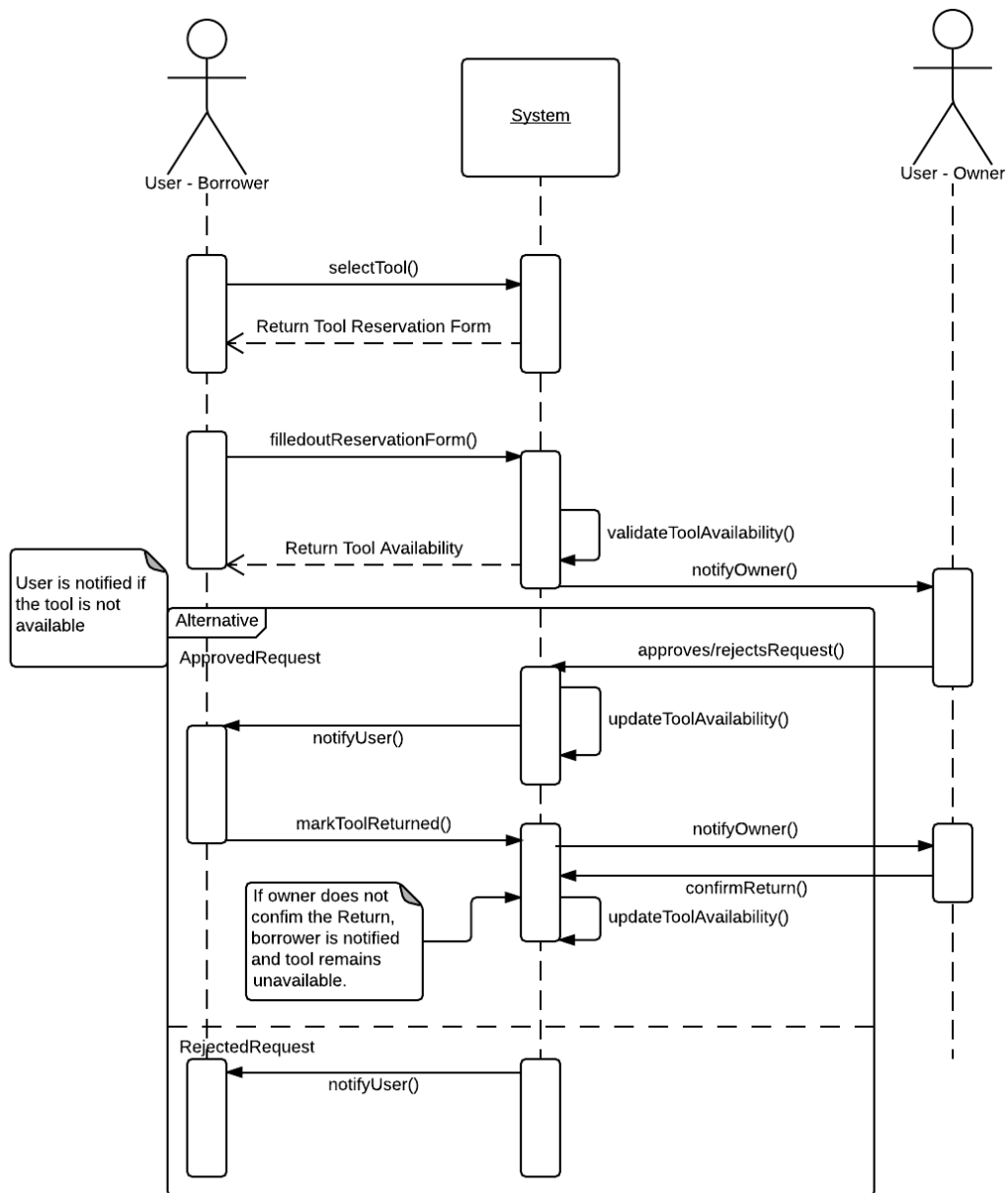


Figure 5 - Sequence diagram for Tool Borrow

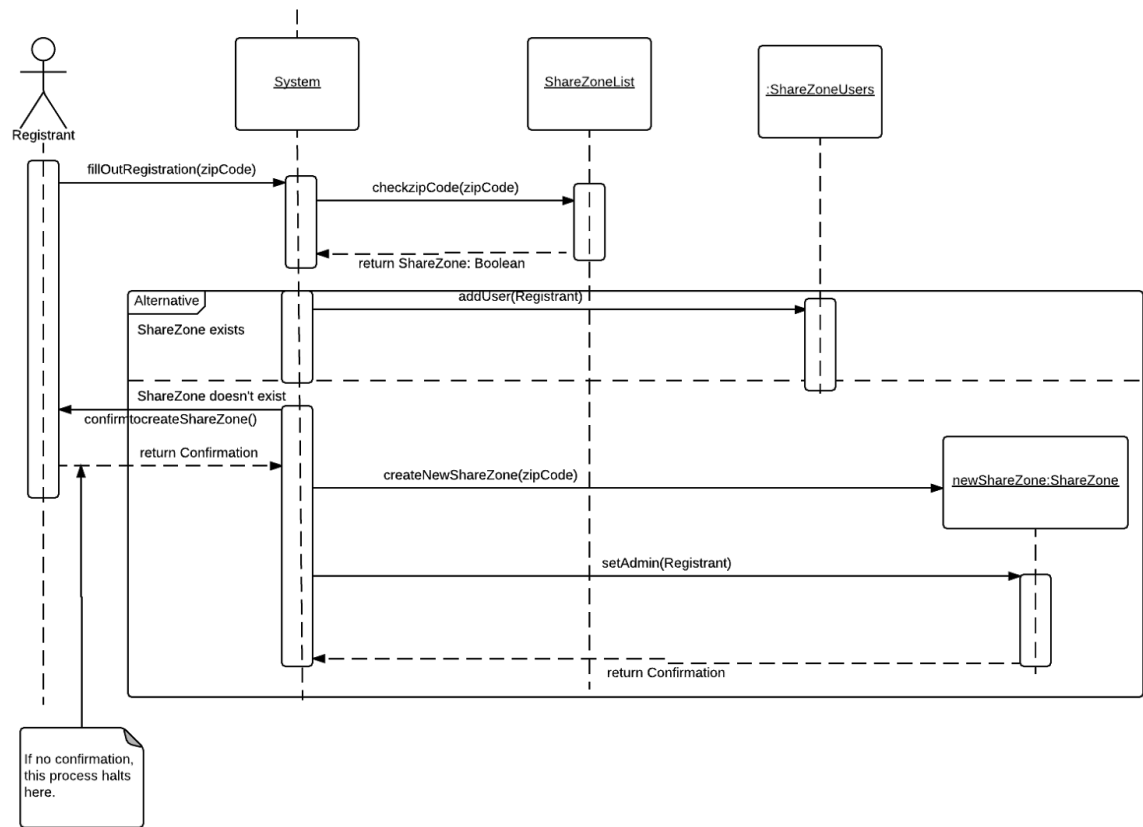


Figure 6 - Sequence diagram for Share Zone creation/Community Shed Creation

Design Rationale

- 1) It was decided to use Django User API for user authentication and storing the user registration details but established a one to one mapping with another table for storing user profile related details. Django offers other abstract classes to achieve this functionality, but as per our requirement we finalized on using association between two tables.
- 2) A new class for ShareZone users was created to keep users separate the Share Zone class. While the Share Zone class will have the information on Share Zones, it will be easier to go through the list of elements there and decide at what Share Zone to put a user when one is registered. The ShareZone Users class will have a complete record of users and their respective Share Zones.
- 3) A Community Shed will be created automatically with the creation of a new ShareZone. It will be kept invisible until the Administrator purposefully creates the Community Shed. This decision was made to facilitate the process of creating a new Community Shed when users are already registered in the Share Zone.
- 4) The User account will be created as soon as the User fills out the registration form. It will be kept invisible until approval/rejection of the Administrator. This was the most efficient way to proceed with the rest of the steps in cases the Administrator approves the request, which is assumed to happen in most of the cases.
- 5) It was decided to keep the functionalities of user setting the tool address same as the home address. If s/he wants to change the location of the tool, the User can do so afterwards. This will make the tool registration process quicker and user friendly.