

RadBid - A Blockchain-based E-Auction System

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Features

Core of it - **Decentralized Auction** Application

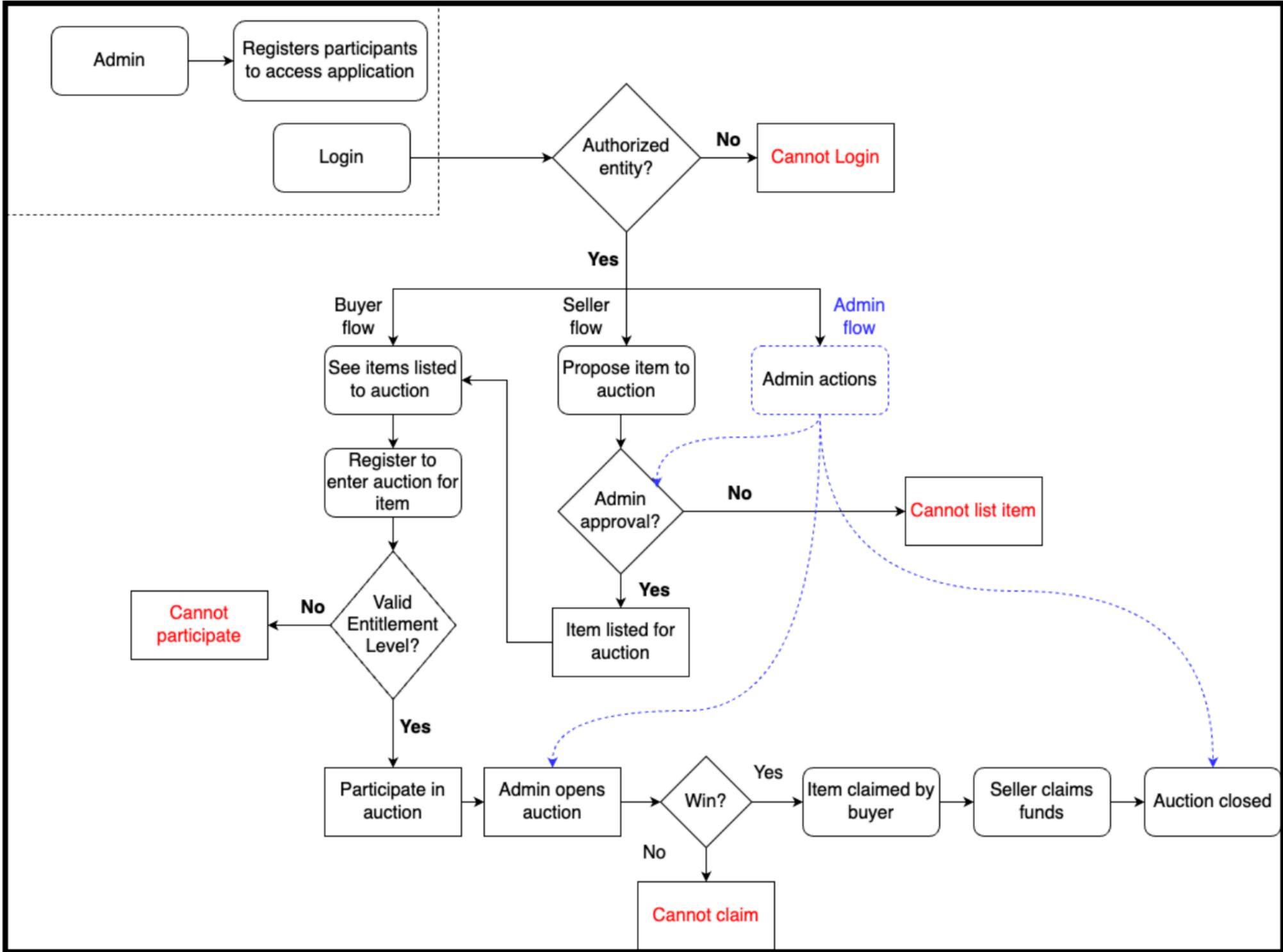
- English-type auction application with an open bid system
- Actors in the system - **Admin and Participants** (Buyers/Sellers)
- Authorized access - Only registered participants can access the application
- Managing User Entitlements - **Access Control** using **Badges**
- Register an auction item for listing and place quick bids as participants (buyers)
- View the list of available and sold-out auction items with a purchase log for Admin and Participant

Tech Stack

What did we use?

- Frontend - **React.js**
- Backend/Middleware - **Node/Express**
- Ledger - **Radix as a ledger**
- Smart Contracts - **Scrypto**
- Local Simulator - **Resim**
- Live Network - **Radix Babylon Alphanet**

FUNCTIONALITY FLOW



High-level working of the auction application

Smart Contracts

Authorization

Blueprint - Authorization		
Struct	Parameters	Description
UserBadge	username: String	Approved members of the protocol
UserAuth	admin_badge_address: ResourceAddress	Given to admins to make permissioned method calls
	temp_badge_address: ResourceAddress	Given to participants requesting to be authorized to access the application
	component_badge_vault: Vault	Badge stored in vault of this component to mint or burn tempbadge and userbadge NFTs
	pending_users: HashMap<String, NonFungibleId>	Record of pending users for approval. String-username
	approved_users: HashMap<NonFungibleId, NonFungibleId>	Record of approved users.
Methods	Arguments	Description
instantiate_user_auth	ComponentAddress, Bucket	Makes Component addressable and returns admin badge via Bucket
approve_user	username: String	Approves user
claim_user	temp_badge: Bucket	Approved user to claim minted UserBadge NFT
request_user	username: String	Requests being an user

Smart Contracts

Participants

Blueprint - Participants		
Struct	Parameters	Description
Participants	username: String , firstname: String , lastname: String , middleinitial: String , title: String , email: String , phone: String , dob: String , gender: String , tag: UserBadge Non Fungible ID , items_bought: NonFungibleId , items_sold: NonFungibleId	Capturing additional details of users through a form
Related Functions		
get_list_of_approved_users	Get list of all approved users from the Users Vault	
get_list_of_pending_users	Get list of all pending users from the Users Vault. This list will allows admins to approve pending users into the system	
get_particular_user	Fetch details of a particular approved user to generate their user profile page or so	

Smart Contracts

Auction Listings

Blueprint - Auction Listings		
Struct	Parameters	Description
Auction Item Registration	item_name: String , Tags: String , Status: Enum ("Sold", "Active", "Cancelled") , date_listed: String , date_sold: String , expiry_period: String , sold_price: Decimal , last_bid_price: Decimal , activeListing: Bool	Capturing details of the item to be listed for auction
Related Functions		
get_all_listings	List down all the auction items	
get_particular_item	Get a particular auction item	
update_particular_listing	Update a particular auction item such as changing status	

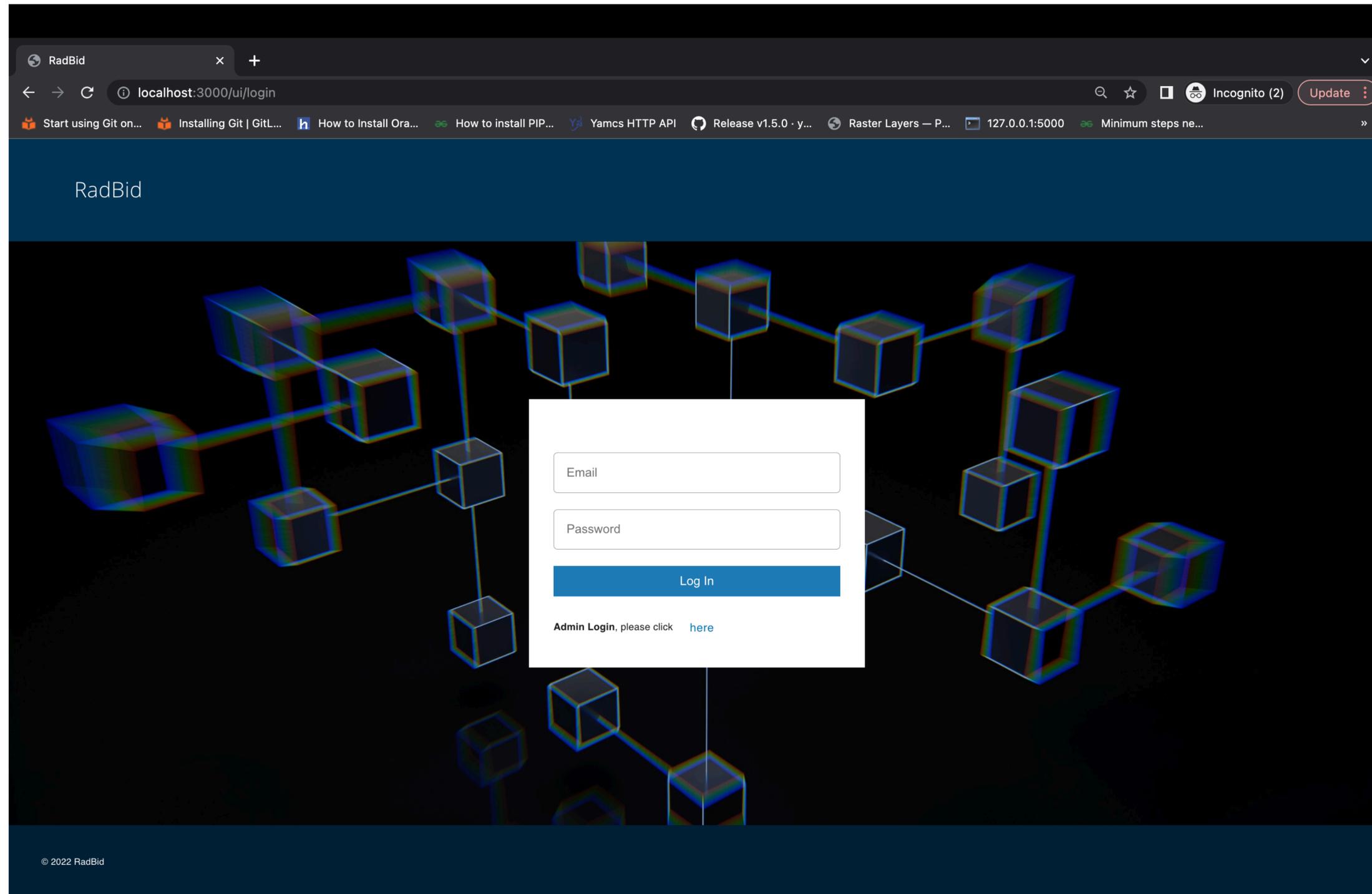
Smart Contracts

Auction Process

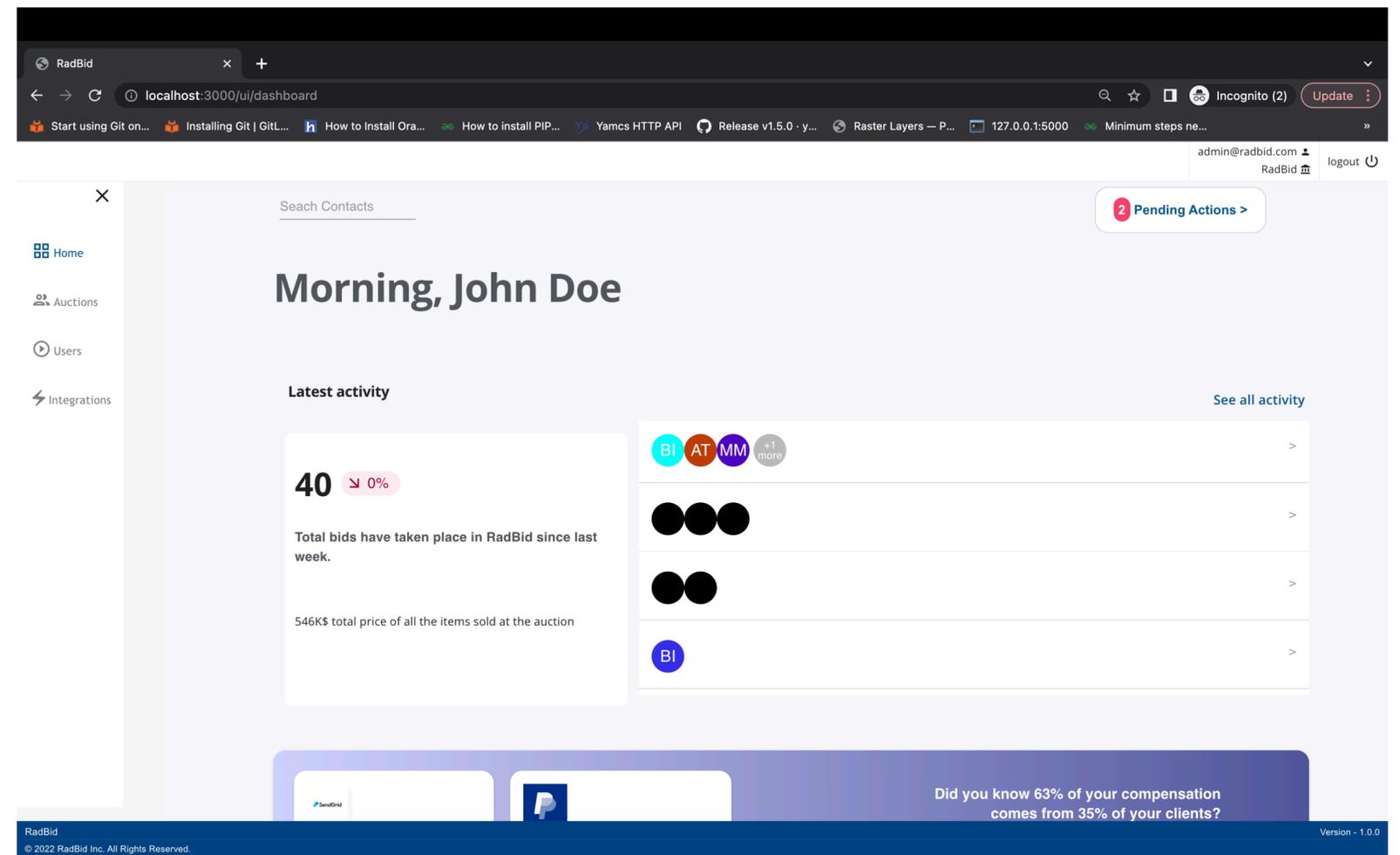
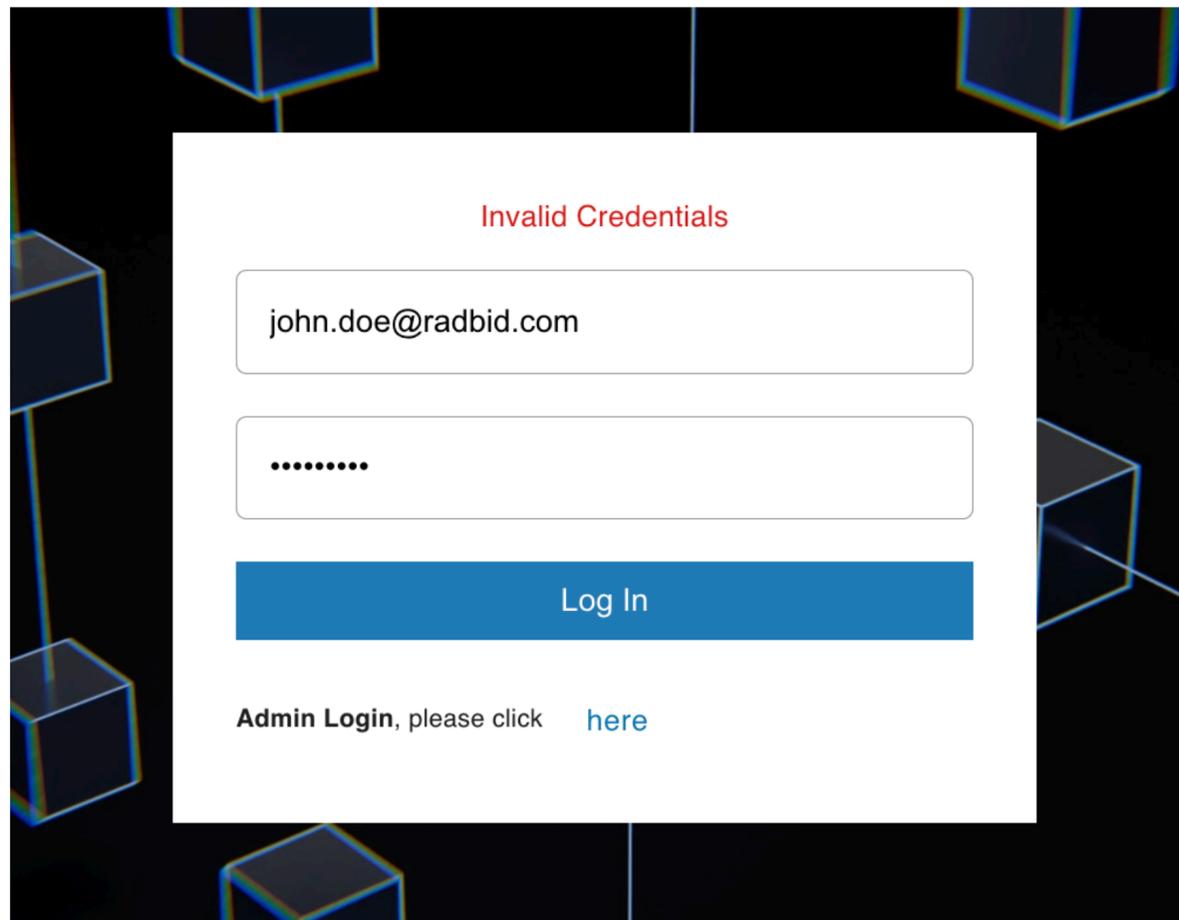
Blueprint - Auction Process		
Struct	Parameters	Description
Start Auction	items_vaults: HashMap<NonFungibleId, Vault> , bid_vaults: HashMap<NonFungibleId, Vault> , payment_vault: Vault , bidders_badge: ResourceAddress , auction_time: u64 , state: Enum ("Active", "Inactive", "Cancelled")	Blueprint to start an english auction
Functions		
instantiate_auction	Instantiates a new english auction for the passed items. Returns ComponentAddress and Bucket .	
bid_auction	Allows a participant to bid in this auction	
increase_bid	Increases the bid price of the item once a participant raises bid	
cancel_bid	Cancel bid. Ensure conditions such as auction settlement, state of the auction are checked before cancellation	
claim_funds	Claim NFTs from the component post auction settlement	
check_auction_settlement	Check function to ensure auction is settled. Called before cancelling auction	

Running UI Instance - Local

Login Page



Invalid vs Valid Authorization



Auction Items Listings

The screenshot shows a web browser window displaying the RadBid application. The browser's address bar shows the URL `localhost:3000/ui/auctions`. The application interface includes a top navigation bar with the user `admin@radbid.com` and a `logout` button. A left sidebar contains navigation links for `Home`, `Auctions`, `Users`, and `Integrations`. The main content area features a large blue header with the text `Explore the items listed for Auction` and a sub-header `Explore`. Below this, there are filter buttons for `All categories`, `Antique`, `Valuables`, `Real Estate`, and `NFTs`, along with a search input field. The page displays four item listings, each with a placeholder image, a red 'R' icon, and the item name: `Chalice`, `Crown`, `Shirt`, and `Gold`. Each listing also includes a `Description of item` or `Description of Item`. The footer contains the RadBid logo, copyright information `© 2022 RadBid Inc. All Rights Reserved.`, and the version number `Version - 1.0.0`.

Auction Items Listings

The screenshot shows a web browser window with the RadBid application running on localhost:3000/ui/auctions. The application has a dark sidebar with navigation links for Home, Auctions, Users, and Integrations. The main content area features a blue header with the text "Explore the items listed for Auction" and a sub-header "Listings". Below this is a table of auction items with columns for Item Name, Tags, Status, Date Posted, Date Sold, Expiry Period, Sold Price, Last Bid Price, and Actions. Two items are listed: "Crown" (SOLD) and "Chalice" (ACTIVE). The footer contains the RadBid logo, copyright information, and the version number 1.0.0.

admin@radbid.com RadBid logout

Explore the items listed for Auction

Browse through the items listed below. You can explore categorically through the various filters.

Explore Listings

Items	ITEM NAME	TAGS	STATUS	DATE POSTED	DATE SOLD	EXPIRY PERIOD	SOLD PRICE	LAST BID PRICE	ACTIONS
<input type="checkbox"/>	Crown	Valuables	SOLD	10/09/2022	10/10/2022	2 days	900\$	900\$	View Item Quick Bid
<input type="checkbox"/>	Chalice	Valuables High value	ACTIVE	10/09/2022	10/10/2022	2 days	900\$	900\$	View Item Quick Bid

Jump to Page: 1 Total items Per Page: 10 1-2 OF 2

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Users Page - Admin

The screenshot shows a web browser window with the URL `localhost:3000/ui/users`. The page title is "Users". In the top right corner, the user is logged in as `admin@radbid.com` with a "logout" button. A sidebar on the left contains navigation links for Home, Auctions, Users (selected), and Integrations. The main content area features four summary cards: "Total Users" (10), "In Auction" (9), "Idle" (1), and "Never in auction" (9). A "Tag Contacts" button is located below these cards. Below the summary cards is a "My Contacts" table with columns for selection, first name, middle name, last name, title, suffix, email, phone, birthday, gender, tags, status, and actions. Two contacts are listed: Jake Radox and Alex Mathers. The page footer includes the RadBid logo, copyright information for 2022, and the version number 1.0.0.

RadBid

localhost:3000/ui/users

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Users

Add Users +

10 Total Users ⓘ

9 In Auction ⓘ

1 Idle ⓘ

9 Never in auction ⓘ

Tag Contacts

My Contacts

<input type="checkbox"/>	FIRST NAME	MIDDLE NAME	LAST NAME	TITLE	SUFFIX	EMAIL	PHONE	BIRTHDAY	GENDER	TAGS	STATUS	ACTIONS
<input type="checkbox"/>	Jake	jk	Radox	Mr	Ms	jake@gmail.com	50242023223	12/12/2022	Male	General	IDLE	View Profile
<input type="checkbox"/>	Alex	Marshall	Mathers	Mr	Ms	alex@gmail.com	50242023223	12/12/2022	Male	General		View Profile

Jump to Page: 1 Total items Per Page 10 1-2 OF 2

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FUTURE WORK

END