



CowChips4Charity

sdmay20-16

<http://sdmay20-16.sd.ece.iastate.edu/>

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Client: Ken Johnson / Boo Radley Foundation

Advisor: Lotfi Ben Othmane

Project Plan



High Level Overview



- Boo Radley Foundation
- At halftime college football games, participants at the game will have the chance to play Cow Patty Bingo
- Our project includes two components:
 - Admin panel
 - Interactive web application game





Problem Statement



- Current implementation of Cow Patty Bingo is physical
 - Physical game has various issues
 - Weather
 - Real grid & cow
 - Winner confusion
 - Digital game is needed in order to avoid these issues
- Admin Panel Website has visuals but no data analytics for the user to see



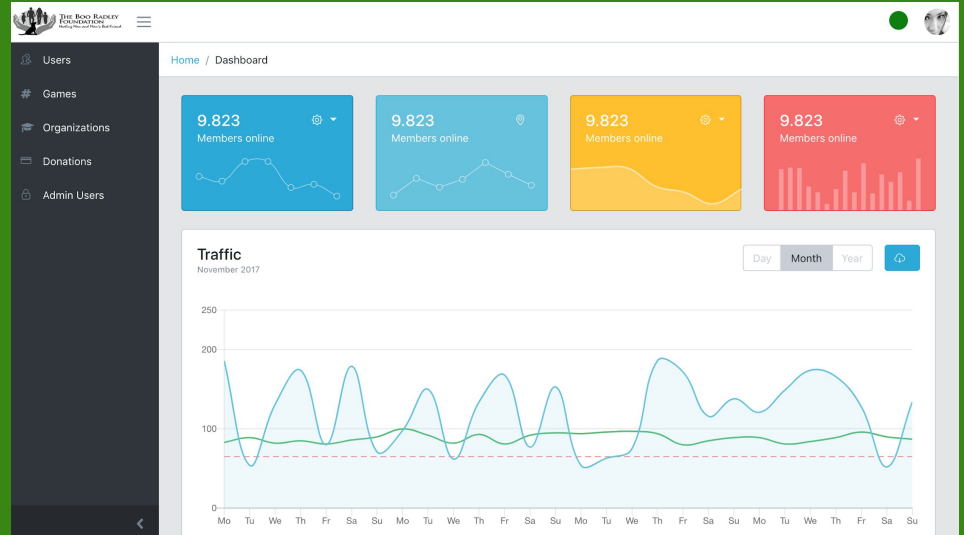
Conceptual Sketches



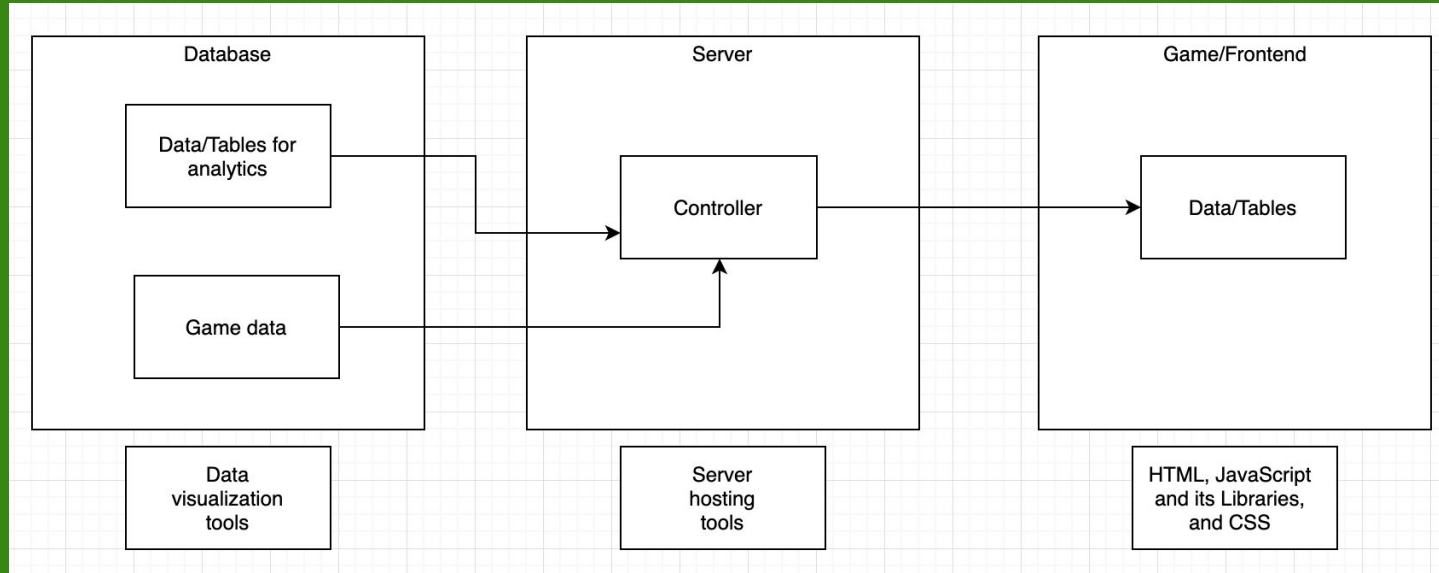
Colorful circles: B (red), I (orange), N (yellow), G (green), O (blue), ! (purple)

47	3	2	1	5	4
9	8	7	6	10	11
12	13	14	15	16	17
19	18	20	21	22	23
24	25	26	27	28	29
30	31	32	33	34	35

A small cow illustration is placed over the number 7 in the grid, and a red heart is placed over the number 14.

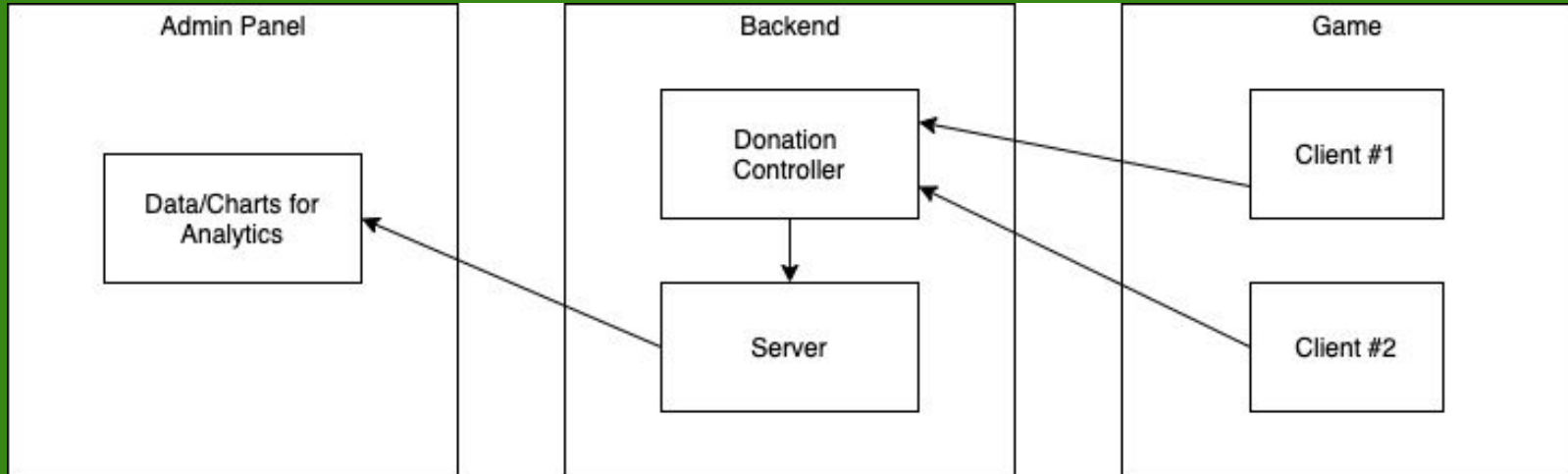


Conceptual Design Diagram





Live Data Analysis Socket Concept Diagram





Functional Requirements



- The User shall be able to choose a square(s) depending on how many squares they bought
- The User shall be able to choose which game to watch
- The User shall be able to watch the game live
- The Game shall be able to choose an unbiased square for every game
- The Game shall inform which square won
- Multiple games should be able to be run at once
- Game time should last between 5-10 minutes
- Game should have a limit to how late a user can choose a square(s)
- The Admin shall be able to see various data in the data panel (donations per game, the number of people who donated, donations per team, etc.)





Non-Functional Requirements



- The Website shall look aesthetically pleasing
- The Website should be able to work on any device in any browser
- **Security**
 - The entire credit card transaction information will be encrypted
- **Usability**
 - The user shall be able to complete the transaction in one page of the web app
- **Performance**
 - The application shall be able to support scalability for
 - multiple football game users
 - The user shall be able to login to his/her account in less than 15 seconds
 - The winning user shall receive a notification within 12 seconds of the cow finishing
 - The web app shall be able to calculate the entire cost of the donation once the user is checking out within 3 seconds
- **Reliability**
 - The application shall have 100% runtime during football games
- **Operational**
 - The web app will be compliant with all policies and regulations set forth by the Boo Radley Foundation





Technical Constraints/Considerations



- Previous team used Node.js and Vue.js
- Receiving the previous team's code
- Large amount of libraries that have module dependencies





Potential Risks & Mitigation



Risks:

- Pushing to production
 - Adapting to previous teams code
 - Need to understand their structure and development
 - Code contain pre-existing bugs

Mitigation:

- Created a DEV environment on Heroku to test on a non-local environment
- Contacted multiple sources
 - Spent extensive hours setting up their code. Trying to work through/ around the bugs that exist.





Resource/ Cost Estimation



- Heroku Hosting Costs
- Core.ui for Admin Panel
- No further resources or costs were necessary for this project





Project Milestones & Schedule



Game Team:

- Updated website UI
 - 10 pages
- Created game board
- Created cow animation
- Integrated game board and cow animation to website

Admin Team:

- Researched real time analytics/Charts compatible with Vue.js and Express
- Demoed around with Socket.io
- Implemented Socket.io into the admin panel
- Implemented Charts
- Created DEV environment on Heroku



System Design



Functional Decomposition



- Game

- Update UI
- Implement Game
 - Add animations
 - Create assets
 - Responsive to backend data

- Admin

- Add analytics
- Add data visualization
- Support real-time data



Detailed Design

- 3 completely separate modules
 - Frontend (primary user facing)
 - Backend (databasing)
 - Admin Panel (admin user facing)
- Modularization prevents unnecessary node module installations
- Calls across modules done using calls to multiple servers
 - Running on same machine, using different ports
- Model and Controller split for database





Technologies Used



Front End: Vue.js

Live Data:

Socket.io/Socket.io-client

Back End: Node.js/Express

Animation: Photoshop

Database: MongoDB

Hosting: Heroku





Test Plan



Test Driven Development

- CI/CD Pipeline automatically runs tests - powered by Travis CI
- Jest plugin for Travis CI to run backend testing
 - Unit and Component testing
- Cypress plugin for Travis CI to run frontend testing (similar to Selenium)
 - Interface testing
- Predefined use case scripts performed manually
 - System testing and Acceptance testing





Prototype Implementations



- Vue Bootstrap - Graph prototyping
 - Original sample graphs have been adapted and are currently used
- Vue Bootstrap - General UI
 - Initial learning of Vue's capabilities offline helped facilitate learning
- Socket.io - Live data sampling
 - Proof-of-concept of socket events now implemented for Live Data
- HTML + JS --> Vue - Game board
 - Different iterations of the game board using streamlined technologies





UI/UX

THE BOO RADLEY FOUNDATION
Helping Prevent Breast Cancer

Cow Chips 4 Charity

www.cowchips4charity.com

Gertrude Says... Play Cow Patty Bingo to Fight Cancer!

Donate About Login Register

Org Select Tile Selection Donation Game

Select an Organization to Support

- Gerald Banks
- Bill Riley
- Johanna Ortega
- Gavin Terry
- Rose Conner
- Austin Norman
- Bettie Strickland

BACK

Org Select Tile Selection Donation Game

6	14	24	36	15	22
27	2	35	7	34	5
4	9	28	3	31	23
26	13	10	20	8	30
21	17	32	16	29	25
19	1	18	11	33	12

Price Per Tile: \$1
Total Price: \$0



UI/UX



←

Name Jane Doe

Amount 0

Card number MM / YY CVC

Pay 50

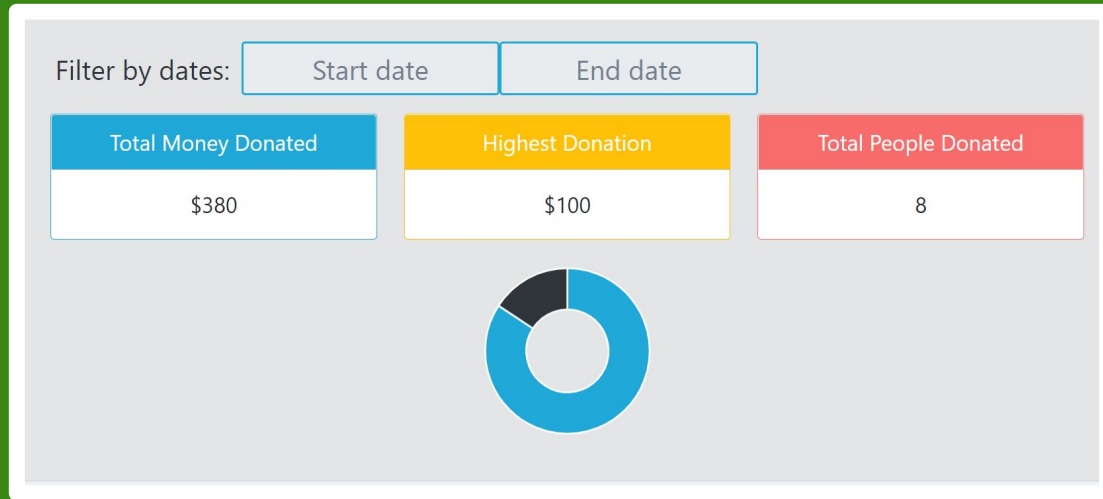
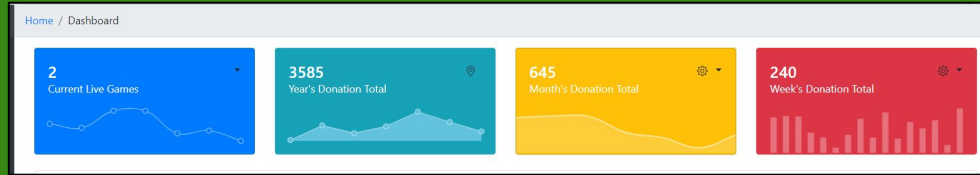
**THE BOO RADLEY
FOUNDATION**
Healing Man and Man's Best Friend

28	39	31	75	119	145
49	59	50	83	116	80
62	71	77	66	81	78
47	43	101	89	132	113
40	54	70	106	135	98
45	56	36	68	121	125





UI/UX





Engineering Standards and Design Practices



- We strived to follow the IEEE Standard Std 829-1998 within our test planning.
- Used Boo Radley Foundation logos and images
- Design constraint: continuing the format of design that the previous team started



Conclusion



Task Responsibility/Contributions of Each Project Member



Meghna Vaidya

Game Team Developer, Updated website pages (Login, Register, About, Account, User Tiles), Helped create game board page

Elizabeth Li

Game Team Developer, Updated website pages (Game, Donation, Login)
Created cow animation

Tyler Bartleson

Game Team Lead, Updated website pages (Home, Organizations, Select Tiles), Created game board page, Helped with cow animation

Justin Lee

Admin Panel/Backend Developer, Socket implementation

Brandon Bui

Admin Panel Developer,
Data visualization chart implementation

Dustin Schultz

Admin Panel Developer,
Client side data interpretation,
Admin dashboard data visualization,
Bug squashing





Future Prospects/Teams



- Improve connection with game and backend / database
- Increase gameplay scalability
- Expand on the cow animations for the game
- More complex features for the Admin Panel





Thank you

Questions?