TRNDii Release 3 Summary

Team members

Name and Student id	GitHub id	Number of story points that member was an **author** on.
Rameen Rastan-Vadiveloo 27191863	rameenrastan	32
Peter Boulos 26671187	Peter0892	32
Jacqueline Luo 26938949	LordRoost	28.5
Michael Mescheder 27202202	michaelgoldfish	32
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Eric Payette 27008058	mosquitodawg	27
Jason Tsalikis 25892120	jason10129	19

Project summary

TRNDii is a group buying website focused on innovative new products. When someone wishes to purchase something, unlike regular online shopping, users will pay to commit to buying a product. Once a predetermined number of committed buyers is reached, the product will then be bought from suppliers at a bulk, discounted price. The savings generated from the bulk discount will be redistributed to the buyers.

Velocity

***Project Total*: 58 stories, 206.5 points over 31 weeks**

Iteration 1 (1 story, 8 points)

In iteration 1, we were mainly focused on meeting with the stakeholders in order to understand the project and to figure out which user stories we would have. In addition, we set up the main infrastructure of our project and completed the login user story.

Iteration 2 (6 stories, 16 points)

Iteration 2 was focused on creating site functionality so that a user could actually use the site and purchase items. In other words, the base buying workflow was implemented.

These were issues such as user registration, the listing of items, the addition of the payment system.

Iteration 3 (7 stories, 16.5 points)

Iteration 3 continued on adding functionality to the site so that it would be usable. These are features such as allowing the user the ability to see and purchase items, and to them see the progress of the items that they have bought. We have also begun working on the messaging aspect of our website, letting users be able to contact TRNDii if they had questions and notifying them by email if their items have reached the threshold. This involved setting up the email infrastructure.

Release 1, Iteration 4 (4 stories, 16 points)
***Release 1 Total*: 18 stories, 56.5 points over 8 weeks**

As we have created much of the main functionality of the site, iteration 4 was focused on the visuals and UI of the site. Thus most of the work was done on the UI, by making the site responsive and usable for desktops and mobile devices. Additionally, we made some mockups and then implemented those designs for certain pages. Finally, we made the site have a cohesive look all around so that it did not look hodge podge.

Iteration 5 (4 story, 10.5 points)

The focus of iteration 5 was handling the main risk of our project, which was the fact that the token system could be too complicated for users to understand. By collecting data on the gamification scheme and meeting with the stakeholder and professor, we concluded that starting with a basic group buying scheme and slowly evolving the website through A/B testing is the best approach. We then restructured our user stories and release plan accordingly.

Iteration 6 (3 stories, 19 points)

One of the main focuses of this iteration was refactoring our architecture. We realized that we were placing too many responsibilities in our controllers (both business and data access logic). Thus, we implemented the repository pattern to isolate data access logic out of the controllers, and placed all data access in the repositories.

Iteration 7 (3 stories, 15 points)

One of the crucial aspects in ensuring that our website could succeed is to make sure that we place an emphasis on logging user actions and system events. In this iteration we began to work on adding logging to the website by logging all user interactions with the website. We also implemented item categories, a crucial feature for users when shopping.

Release 2, Iteration 8 (3 stories, 17 points)

***Release 2 Total*: 13 stories, 61.5 points over 12 weeks**

Iteration 8 was where our Continuous Integration environment was set up, which is crucial in order to provide continuous deployment to the website and ensure that we catch errors in our system early on. We also implemented item search, a crucial feature for users when shopping, and added unit tests to our newly integrated repositories.

Iteration 9 (2 stories, 16 points)

Iteration 9 was where we test up our infrastructure in order to be able to perform A/B testing experiments. This required two concepts to be implemented in our system: A/B testing (being able to divide our user population into two or more segments viewing different variants of the system), and feature toggles (being able to change the behavior of our system without modifying our source code, or being able to turn features on or off). This infrastructure was required in order run an A/B testing experiment on our token system versus the basic system.

Iteration 10 (4 stories, 18 points)

In Iteration 10, we developed the ability to collect and monitor user metrics which, among other things, can be used in our A/B testing experiments to determine which variant of our system performs better to drive our decision making. In addition to this, other important features were added, including shopping carts, allowing users to browse the item catalog as a guest (without being logged in), and allowing the site admins to moderate users by banning and suspending users with abusive behavior.

Iteration 11 (9 stories, 27 points)

A large array of features were added in Iteration 11, including a review and rating system that allows users to review items they purchased and view other user reviews, and allows suppliers to view feedback on their items. Comment threads were also added on item pages to allow users to discuss an item they are interested in committing to. We also began the implementation of the token system by allowing users to gain tokens from item purchases, and spend tokens on items. Finally, we refactored our architecture by adding a domain layer and added a logging platform to aggregate our logs and make them easily searchable.

Iteration 12 (12 stories, 27.5 points)

Iteration 12 involved finalizing the implementation of the Token System by allowing users to get cash back from tokens, and allow users who didn't spend tokens on an item to enter a lottery to get a free full refund. Other features and updates were added, including search

filters, a dynamic front page showing the most popular and most recent items, and allowing suppliers to extract shipping data of their items as a CSV file. The payment charging process was changed so that users are charged immediately upon committing to an item, and are refunded if the threshold is not reached by the end date in order to eliminate issues associated with credit cards expiring or failing when the threshold is reached.

Release 3, Iteration 13 (0 stories, 0 points)
***Release 3 Total*: 27 stories, 88.5 points over 11 weeks**

As we front-loaded many of our features in Iteration 11 and Iteration 12, no new features were added in Iteration 13. Instead, Iteration 13 was used to polish existing features and fix any discovered bugs. Also, our Continuous Integration was updated and tested in order to be able to run our unit tests, and unit tests were added and modified.

Overall Arch and Class diagram

Architectural Changes

A fundamental problem that was present in our first two releases was that the controllers were taking on too many responsibilities. Our controllers were handling both user requests (as they should), but were also processing a lot of the business logic in our system. To alleviate this, and restrict the controllers to a single responsibility, we developed a Domain package containing different classes that handle different business logic processes.

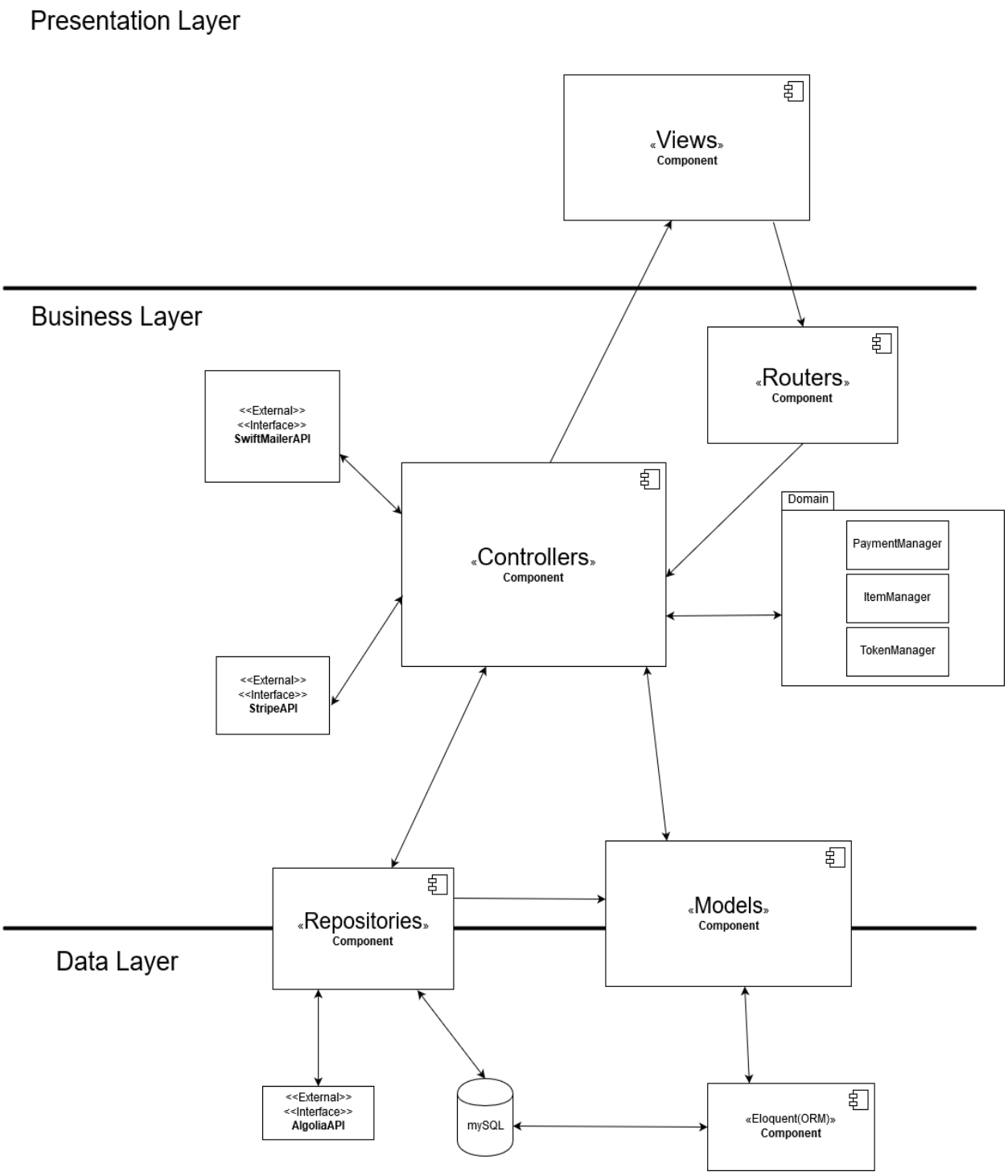

Diagram 1: Layers of the System

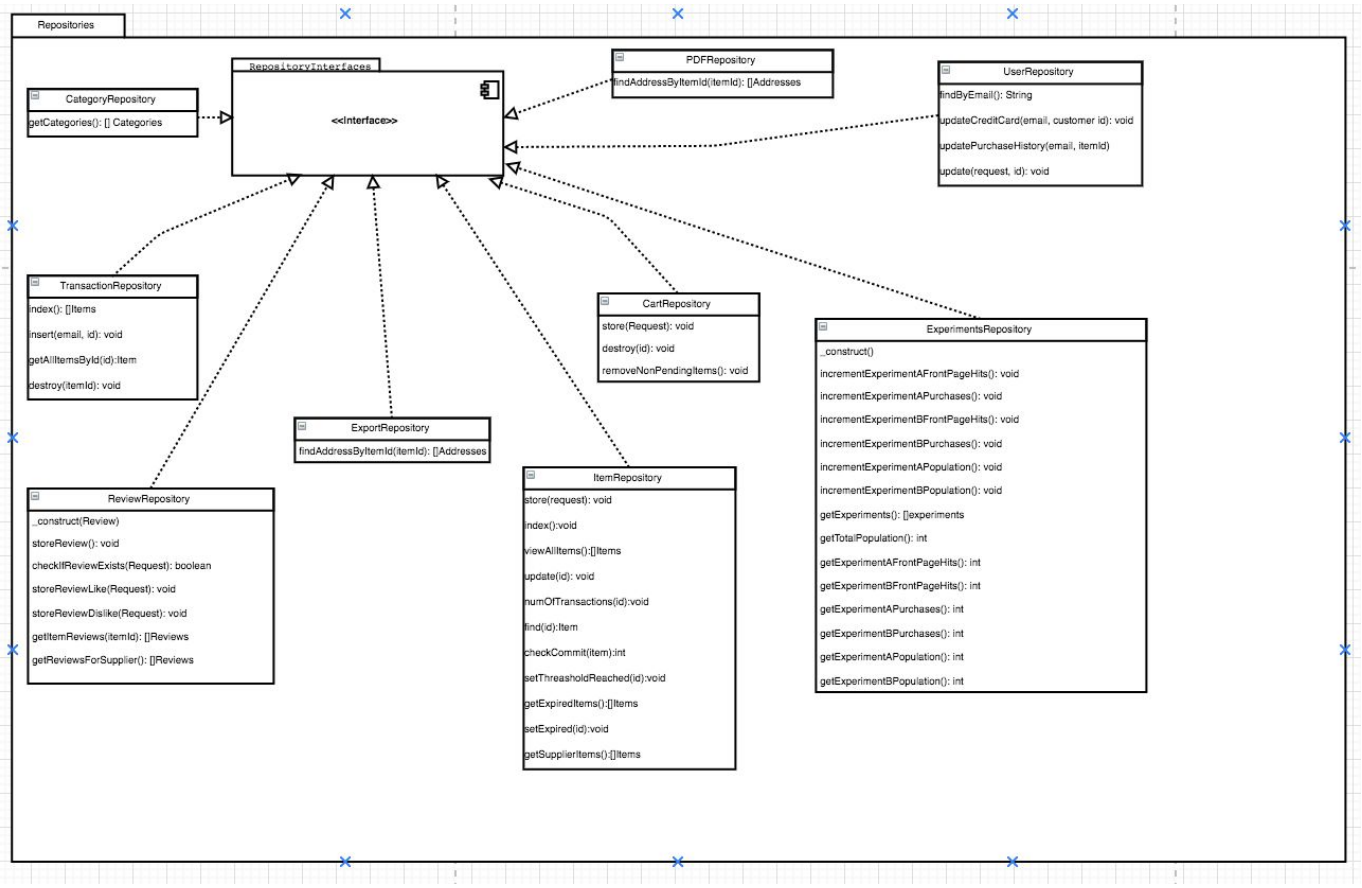

Diagram 2: Repository Package

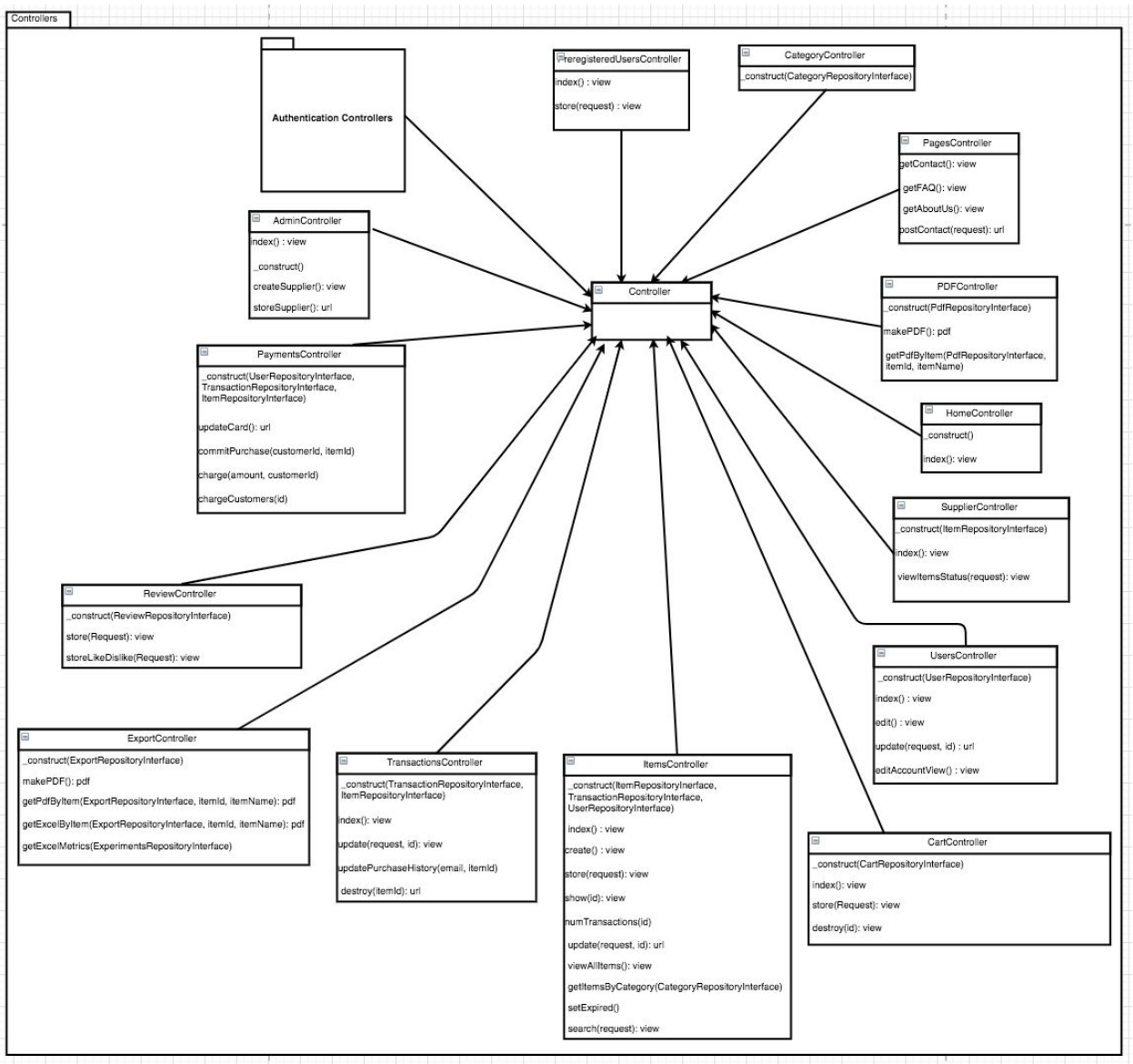

Diagram 3: Controller Package

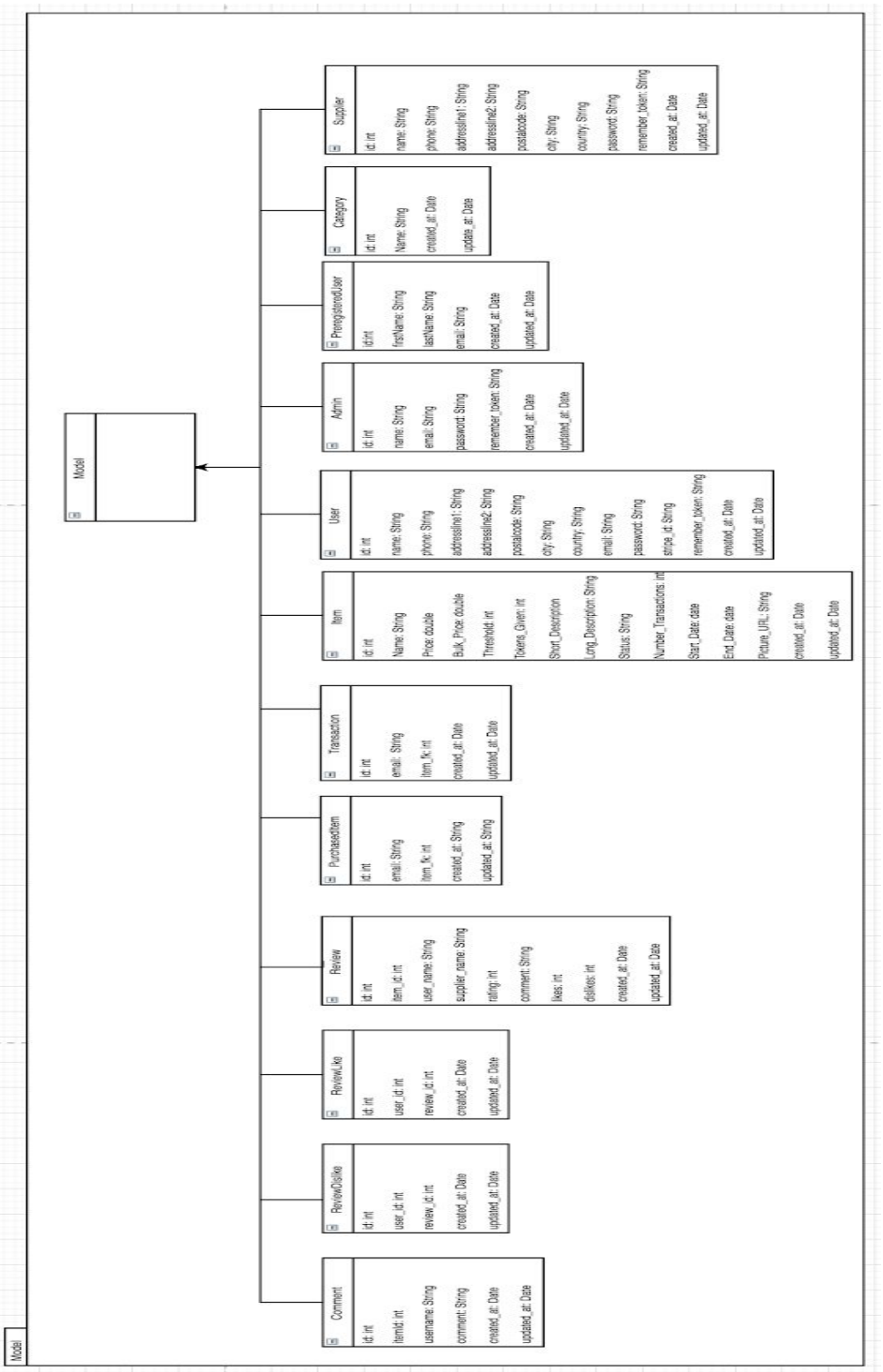

Diagram 4: Model Package

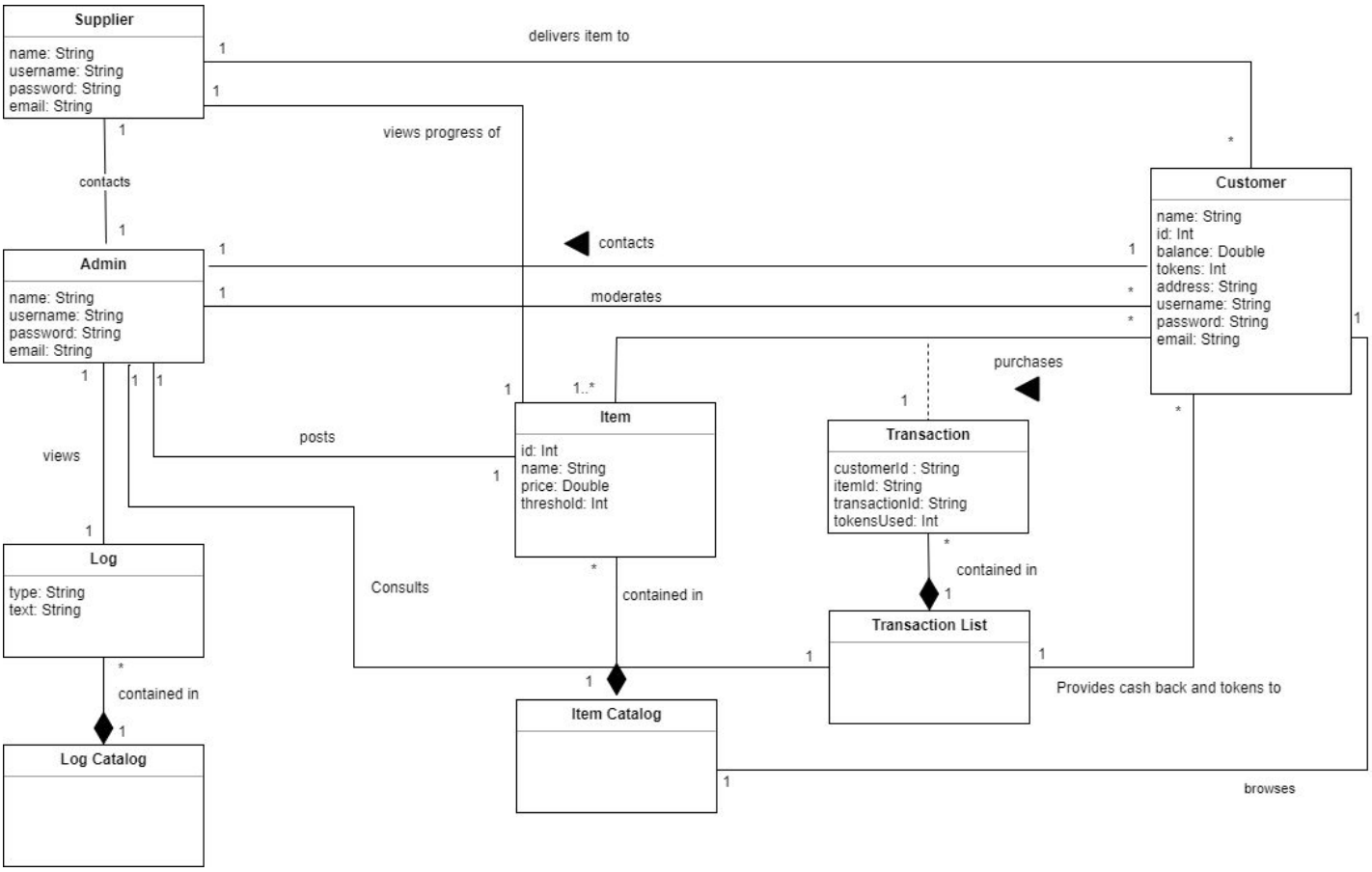

Diagram 5: Domain Model

Infrastructure

Bootstrap
Laravel
PhpUnit
Dusk
MySQL
Vue.js
Stripe

Other Libraries

Laravel Command Scheduler
HTTP Session
Service Container
Cache
Monolog
SwiftMailer
Algolia
Laravel Excel

Name Conventions

For the backend:
PSR-1 - PHP basic coding standards
PSR-2
PSR-4

For the frontend:
Javascript conventions
HTML conventions
CSS conventions

For the server:
SQL naming conventions

Code

File path with clickable GitHub link	Purpose (1 line description)
/trndiiapp/app/Domain/PaymentManager.php	Handles business logic relating to payments.
/trndiiapp/app/Http/Controllers/ItemsController.php	Handles user requests relating to items.
/trndiiapp/app/Http/Controllers/TransactionsController.php	Handles user requests relating to transactions.
/trndiiapp/app/Domain/TokenManager.php	Handles business logic relating to the Token System.
/trndiiapp/app/Repositories/ItemRepository.php	Handles data access logic relating to items.

Testing and Continuous Integration

List the **5** most important test with links below.

Test File path with clickable GitHub link	What is it testing (1 line description)
/trndiiapp/tests/Unit/ChooseFreeRefundWinnerTest.php	Tests that a user is selected for a free refund among users who spent 0 tokens.
/trndiiapp/tests/Unit/PaymentManagerTest.php	Tests methods in Payment Manager, i.e. business logic related to payments.
trndiiapp/tests/Unit/CalculateTokenMoneyPoolTest.php	Tests that the total savings for the token money pool is properly calculated.
/trndiiapp/tests/Unit/UserRepositoryTest.php	Tests various functions in the User Repository.
/trndiiapp/tests/Unit/CalculateCashBackFromTokensTest.php	Tests that user receives correct cash back value from spending tokens.

Continuous Integration (CI) environment

Link to our Jenkins CI server:
http://ec2-13-59-227-206.us-east-2.compute.amazonaws.com:8080

Username: trndii
Password: trndii123

Our continuous integration server of choice is Jenkins, which we deployed on an Amazon EC2 instance. The Jenkins server is alerted every time a push is made on the master branch of our github repository via a deploy key and webhook on our github repository. When Jenkins is alerted of a new push on the master branch, it starts a new build. Currently, each

build runs our unit tests and provides continuous deployment on our web server. This means that every time a build succeeds, the web server will pull the changes made on the master branch, thus automatically and continuously updating our live website with changes we make to our shared repository. It also verifies that all our unit tests are passing on the new build and, if not, results in a build failure.

Logging

We use Loggly as our logging platform. This allows our logs to be aggregated and viewed via a web interface. It has tools to search through logs efficiently, filter logs, view charts and dashboards of different logging metrics, and create log alerts.

It can be accessed at: trndii.loggly.com

Username: trndii
Password: Trndii123

Additional Links

Capstone Presentation Poster

Capstone Final Release Presentation Slides

Configuration File

README

Appendices

Capstone Appendix 1

SOEN490

Submitted to

Dr. Brandiff R. Caron

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November 2017

Analogical Case Study

TRNDii is an e-commerce site that operates in a group buying manner with a focus on offering innovative new products to its users. The one competitor that is most similar to our project is Massdrop, a group buying website that has polls for what users want to buy. The highest voted item will be put into a "drop"; a sale for a limited time where the more people join a drop, the cheaper its price will be. When the deadline arrives, Massdrop buys the items at a bulk rate and then ship them to the buyers. Massdrop is probably the most well known of the group buying sites that deal with products. According to the web traffic data analytics website Alexa, Massdrop gets more web traffic than TouchofModern, Groupon or SocialLiving. In terms of legality, as with all online shopping websites, there are taxes that come into play. Buyers from California and New Jersey have to pay a sales tax as Massdrop is subject to sales taxes in states where they have a significant physical presence. International (from an American perspective) buyers may have to pay import taxes or customs fees on their orders. Massdrop does also put a limit on how much a person may buy from a single drop. This number is usually five, although certain drops only allow the buyer to buy one item from the drop. This prevents one person from buying up all the stock from a limited run. There are no moral or ethical issues behind the concept of the site. It is the same as if a person got a group to buy things in bulk and split the items between them; Massdrop just helps a person find a group and then manages the splitting. Massdrop does have some issues, mostly stemming from people not realizing that it is a group buying site. They get shocked by the long shipping times, leading them to write negative reviews of the company on consumer protection and review sites. The time it takes from when one commits to a drop and when they receive the product can be quite long, spanning months and even years in rare cases. These delays occur because Massdrop has to wait for a drop to complete, buy from their suppliers, wait for those items to arrive and then ship out each item to the buyer.

TRNDii differs from Massdrop because the items on sale are not voted on by the users. Instead, the owners of TRNDii will curate new and innovative products. This gives TRNDii a more focused direction, targeting not the average online shopper, but instead younger more technologically inclined people who like to buy cool and unique products. Similar to Massdrop, TRNDii also limits how many copies of an item a user may buy. Each user may only commit to an item once since we do not want users to buy these items at a lower price just to then later resell them. Like with Massdrop, TRNDii also has to deal with taxes. The international buyers will possibly be subject to import taxes/ customs fees, if they live in a different location from the suppliers. TRNDii itself never

has the items at their physical location. The site will be built to be easy for item suppliers to get the shipping information of buyers, speeding up the shipping process. TRNDii does have an additional feature that Massdrop does not, which is the token system. It aims to gamify the online shopping loyalty system. Users gain tokens when they shop with TRNDii and then they can spend these tokens on other purchases. When they do, they get a certain amount of money back, depending on how much tokens other users have spent and how much total savings there are. For example, if a user spent 25 tokens and the total amount of tokens is 100, the user will get a quarter of the total saving made from buying in bulk, in cash. In practice, the owners of TRNDii will take a small cut of the savings money in order to keep operating, but the majority will be redistributed to the users. For people who do not wish to spend tokens, each item that completes on the site will have a lottery. Any person who has spent no tokens has a chance of winning the item for free. Since these elements have some parallels to gambling, as the amount of money you get back is not always certain, it could be considered to be ethically gray and it may be negatively received by the average person who is just looking for an online shopping site. That is why TRNDii is not targeted towards the average shopper and more towards people who would be interested in engaging with the token system. Additionally, TRNDii is designed to be transparent and fair. It is impossible for a user to lose their money as they will get the product that they bought, any tokens and money back is extra. All information regarding the token system and how the money is redistributed will be clearly indicated on the site. The gamification of buying can be morally ambiguous, but we strive to make it fair for all users.

Contemporary Practice

As technology and the Internet get more and more entrenched into our daily lives, online shopping has become more and more popular. A 2016 report[1] by United Parcel Service (UPS) and comScore show that shoppers now do 51% of their shopping online, with Millennials being the demographic most likely to purchase things online. Additionally, mobile phones are becoming more and more popular for online shoppers, although the majority still do their shopping on their computers (desktop or laptop).

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1 https://pressroom.ups.com/mobile0c9a66/assets/pdf/pressroom/white%20paper/2016_UPS_Pulse%20of%20the%20Online%20Shopper_white%20paper%20final.pdf

Although there are a myriad of online shopping sites, such as Amazon or Wish, group buying sites are not as numerous. One such example is the previously mentioned Massdrop. Another website similar to ours is Touch of Modern; an e-commerce website that focuses on selling modern and trendy things to men. The site is members only and features things such as knives, ties, watches, etc. Items are listed on the site at a sale price until a specific time. The items only ship once the sale ends because the site actually operates as a group buy behind the scenes. The owners buy the items in bulk and then ship them out to whoever bought a specific item. TRNDii differs from Touch of Modern because the items sold are going to be more innovative and cutting edge type products. Another difference is that Touch of Modern obscures the fact that it is a group buying website by not having a progress bar of committed users for their items while TRNDii is made with group buying at the forefront. Additionally, instead of offering a set discount on items, TRNDii functions on users getting varying amounts of money back.

Another competitor of TRNDii is Groupon. Groupon is an e-commerce marketplace mainly focused on offering tickets or experiences at local attractions and restaurants at a cheaper price. Although they mostly offer things like culinary experiences, group activities or horseback riding they do also have physical items on sale. Groupon also enters into partnerships with local businesses, allowing certain services and products to be featured as sales on their website. TRNDii differs from Groupon because it is focused on products and not experiences. Also, Groupon no longer functions as a group buying site while TRNDii does. Finally, as with Touch of Modern, Groupon does not focus on the current trends popular among young people, as TRNDii does.

The problem of some of these sites is that there is little user engagement. Massdrop does have its users vote on which items goes on sale, but Groupon is currently aiming at getting new users in order to make money. TRNDii's token system and gamification aims to make users engaged and loyal to the site. No other group buying site currently has a system like TRNDii's. Additionally, with items that showcase innovative technologies and other interesting gadgets, Millennials should be drawn to these products. As they are the most likely population to shop online and use smartphones, the website is designed to be responsive for desktop and mobile.

Capstone Appendix 2

SOEN490

Submitted to

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April 2018

Public Perceptions of Technology

The average public does not really have much of a perception on our technology. When we did a survey about our site, to get an idea of the general perception of it, most people have not heard of Massdrop and only some have heard of Groupon or the concept of buying in a group to get a bulk discount on a purchase. This leads people to think that our site is new and innovative in that regard. Group buying site Massdrop has been featured in certain tech news sites such as Kotaku, Lifehacker or Gizmodo, but they mainly highlight interesting deals that are happening and would be interesting to their users. Otherwise, Massdrop has also been recently featured in Pcmag and Forbes as a community based site for people of niche interests to combine their purchases in order to save money. It is perceived not merely as an online shopping site, but as a place where people can talk to each other about products that they are interested by and discuss their hobbies, therefore creating a community site that also lets its user buy items for cheaper. More general group buying sites, such as Groupon, have been in the news as well, although mostly to say that they are dying off. This is apparently due to the fact that some deals could not be honored due to overwhelming demand and the fact that many people bought things that they were not particularly interested in and then lost interest in the site.

As with Massdrop, TRNDii also aims to be more than a shopping site and more like a site where users build a community around it and have discussions around the items and purchases and tokens. This has led us to add a comment section on the bottom of each item's page so that users can communicate with each other about that purchase. To prevent the problem where too many people commit on an item and therefore the suppliers are not able to honor their agreement, all items on the site have a limit and once it is reached people can no longer commit to it. An item may later be added onto the site again if suppliers have more stock. The items sold on the site are relatively niche which makes it unlikely that a random person would purchase it and then later be unsatisfied, although this possibility does still exist.

An ethical and social concern, in terms of the media, is the token system. This is because it has elements that resembles gambling, namely the part where you get a variable amount of cash back from spending tokens. With the relatively recent media controversy surrounding gambling in video games and how it is normalizing gambling to younger people, the token system can get negative backlash from the media.

The potential negative perception towards gambling has affected how we have designed and presented the site. Instead of making it seem like users can lose money, which they cannot, it is instead shown as a bonus reward that is more like a loyalty system than the core functionality of the site, which is a group buying shopping site. Additionally, a user is also able to not spend any tokens and just use the site as a regular group buying website and even have a chance of winning the item that they have bought for free. The items will be at market price and therefore the users do not lose out from not using the token system. This will hopefully assuage the public perception of the token system and therefore not have part of the website be viewed negatively. Also, we have set up A/B testing for the website, allowing the stakeholders to try out the site with no mentions of the token system and the site with the token system at the same time. The stakeholders can then later see which version of the site is doing better with the public and keep that version.

Technology Assessment and Choice

We have had to make decisions and change parts of our project due to the real-time technology assessment methodology. For release 2, after the teacher meeting, we had to survey people about how much they understood our token system, the big innovative feature of our site. The survey showed that the majority of people were confused by the system and even felt wary of it; they figured that they might get scammed or they did not want their tokens to be worth nothing, therefore "losing money". Because of this, we did not develop the token system in release 2 as we had originally planned. Instead, we set up an A/B testing system so that the stakeholders of the project could later test and see if users prefer the site with tokens or without. Ultimately, because the clients did want the token system in their product, we ended up developing the token system for the final release, although as a feature that can be toggled on and off by future developers.

A technical part of the project that was affected by the contemporary practice portion of real time assessment is the fact that we made the site responsive and well adapted to both mobile and browser use. The UI is also designed from the start to be mobile friendly. This is due to the fact that we found that the demographic of our users are likely to be doing online shopping using mobile phones, although some may still shop from their desktop computers. Therefore the website loads quickly and resizes depending on what kind of device is used to access it, making it simple and easy to use for all of our users' use cases. Because of this, users are more likely to use the site or to spend more time on the site.

Another part of the site that was affected by technology assessment was the added social and engagement factors, such as the comments and token system. The token system existed at conception and was created in order to have users interact more with the site and not have the site simply be a group buying site. The comments were later added to the system between release 2 and 3 and they also serve to have users interact with each other and therefore create a sort of feeling of community on the site. If people enjoy being on the site, they are more likely to revisit it and therefore spend money, which is good since the site is an online shopping site ultimately.