Grab and Go Groceries

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Project Objective

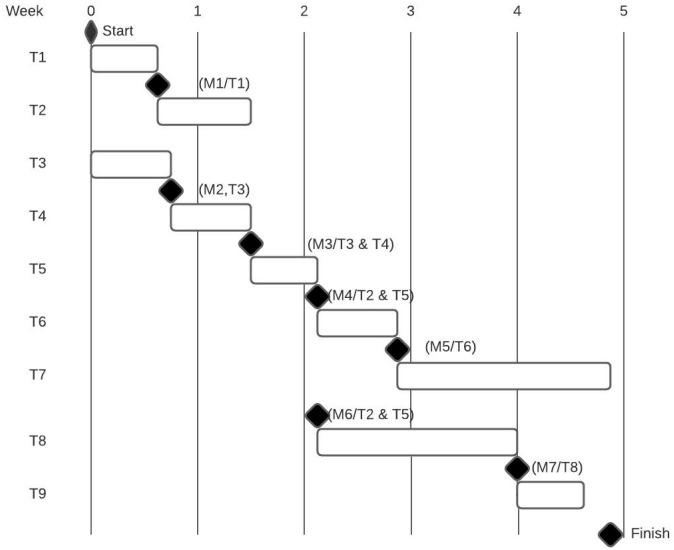
We will be designing an app that takes from different grocery stores databases, to enable customer searches for items over multiple stores. The customer should select a store then search for an item. The app then finds where the item is in the store and outputs the location to the user. The app will give the location to the user in the form of a map of the store with a guide to the item.

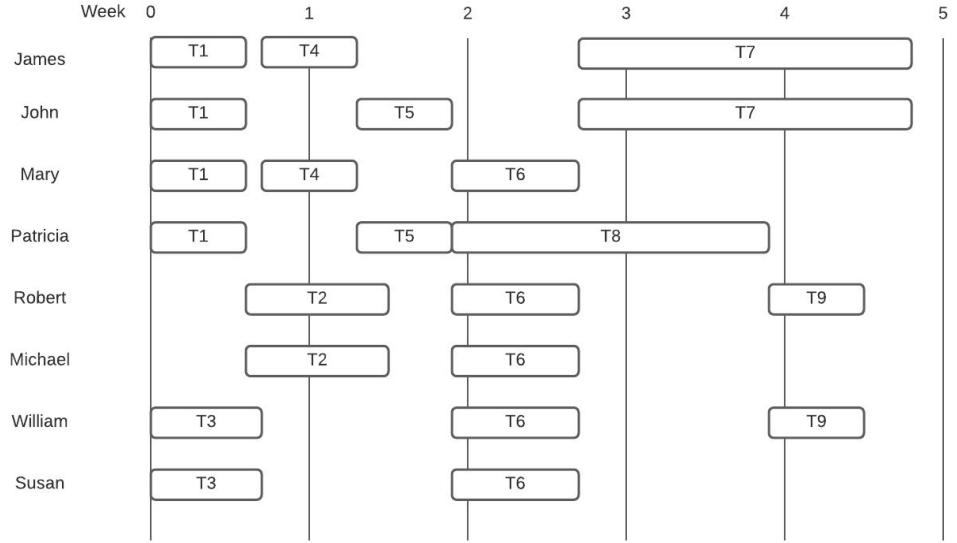
[16]

[15]

Project Timeline

Name	Task	Effort (person-days)	Duration (days)	Dependencies
T1	Database	21	4	
T2	Server Handler	13	7	T1
T3	Item	10	5	
T4	Shopping List	13	4	T3
T5	Store	13	4	T3, T4
T6	Map Retriever	26	6	T2, T5
T7	Route Generator	18	14	T6
T8	Client Handler	13	13	T2, T5
T9	UI	16	4	T8





Function Point Cost

	Function Category	Count	Complexity			Count x Complexity	Total
			Simple	Average	Complex		
1	Number of User Input	9	3	**4**	6	9x4	36
2	Number of User Output	9	4	**5**	7	9x5	45
3	Number of User Queries	3	3	**4**	6	3x4	12
4	Number of Data Files and Relational Tables	4	7	**10**	15	4x10	40
5	Number of External Interfaces	2	5	**7**	10	2x7	14
						GFP	147

Process Complexity	
Does the system require reliable backup and recovery?	3
Are data communications required?	5
Are there distributed processing functions?	1
Is performance critical?	4
Will the system run in an existing, heavily utilized operational environment?	3
Does the system require online data entry?	5
Does the online data entry require the input transaction to be built over multiple screens or operations?	3
Are the master files updated online?	5
Are the inputs, outputs, files, or inquiries complex?	3
Is the internal processing complex?	3
Is the code designed to be reusable?	1
Are conversion and installation included in the design?	4
Is the system designed for multiple installations in different organizations?	5
Is the application designed to facilitate change and ease of use by the user?	5
PC	50

- Process Complexity Adjusted = 1.15 = 0.65+(0.01*50)
- Function Points = 147 * 1.15 = 169
- Assume they can do 10 points per week
  - 169/10 = 16.9 weeks
- And then if we have 8 workers the total time would be approximately:
  - 16.9/8 = 2.1125 weeks

This assumes no scheduling conflicts.

Cost of Personnel

- Using the estimate of 537.5 LOC/pm[1]
- Cost of outsourcing developers from India $35 an hour, with them working around 40 hours a week, so 5,600 a month[2]
- Cost per line of code is 5600/537.5 = $10 per line of code
- 10 * 2,750 = $27,500 total estimated project cost
- 2,750/537.5= 5.1 persons-month
- With 8 developers the ETA will be .6375 months
    - (assuming everything can be done concurrently)
- Cost per month for 8 developers is 5,600*8= 44,800
- Since our project is only going to last .6375 months or .7 months 44,800 * .7 = $31,360 will be the total cost estimation for the project personnel

FUNCTIONS:	LINES OF CODE:
UI/UX	300
ClientHandler	250
Database Management	400
Store	250
Map Retriever	500
ShoppingList	250
Route	350
Item	200
ServerHandler	250
	2,750

Cost of Personnel (continued)

- This LOC estimate does not take into account parts of the project that can not be done in parallel, so the ETA will be longer.
- From project scheduling, the FP method, and the LOC method it would be 2-6 weeks with a minimum price of $22,400 and a maximum price of $67,200
- For a full time developer for maintenance, it would cost $107,510 per year[3].
- IT would be outsourced, therefore it would cost $1000-$2500 per month[4].
- Therefore, the cost of personnel for our first year will be $204,710

Cost of Hardware

- We will need to utilize a server for our program
- In the short term it would be better to rent a server. By renting a server, we would not have any upfront costs and would not have to worry about maintenance costs
- For our purposes, a mid-size server would be our best option, with room to upgrade later if necessary
- According to Servermania, the cost for a mid-size server is $140 per month[5].
- With an initial test of 1 year, the total price of the server would be $1680[5]. At that point, we could decide whether to switch or keep the current server plan
- Since we are outsourcing the coding and deployment, we would not have to provide any equipment or computers for employees

Cost of Software

APIs:

To get access to store data and to a mapping framework, we will need to pay monthly for access to APIs for stores we plan to service and to Google.

Deployment:

Because we are creating our own server, we need to acquire licenses for the software we plan to host.

Distribution:

There are costs involved with distributing an app on various platforms. Majority of this cost comes out of our revenue.

Breakdown:

API Access		
	Target	$ 50 / Month
	Walmart	$ 150 / Month
	Google Maps Backend	$ 70 / Month
	Total	***$ 270 / Month***
Deployment Software		
	Windows Server	$ 550
Distribution		
	iOS Developer License	$ 99 / Annually
	iOS / Android Publishing Costs	30% of Revenue

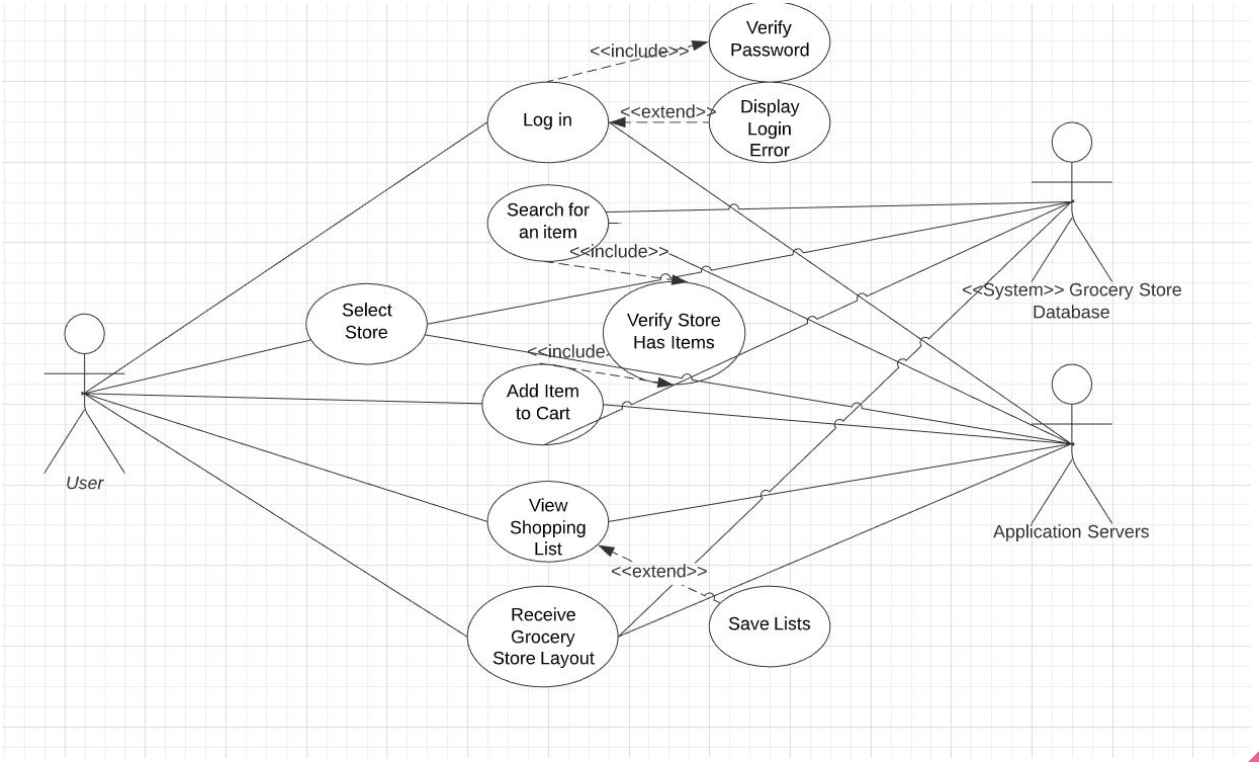
Functional Requirements

- The users and stores should be able to create, edit and delete their account
- The user should be able to select item(s) from a grocery store and have its locations displayed within an accurate map of the store's layout
- Each store must be individually identifiable within the application based on its address and distance from the user
- The user should be able to intuitively search for any item offered by the store and have its price, stock and location information displayed
- The user should be able to send their grocery list to a specified store and get pricing, stock and location information displayed for that specific store
- Stores must be able to set and update item locations in their layout

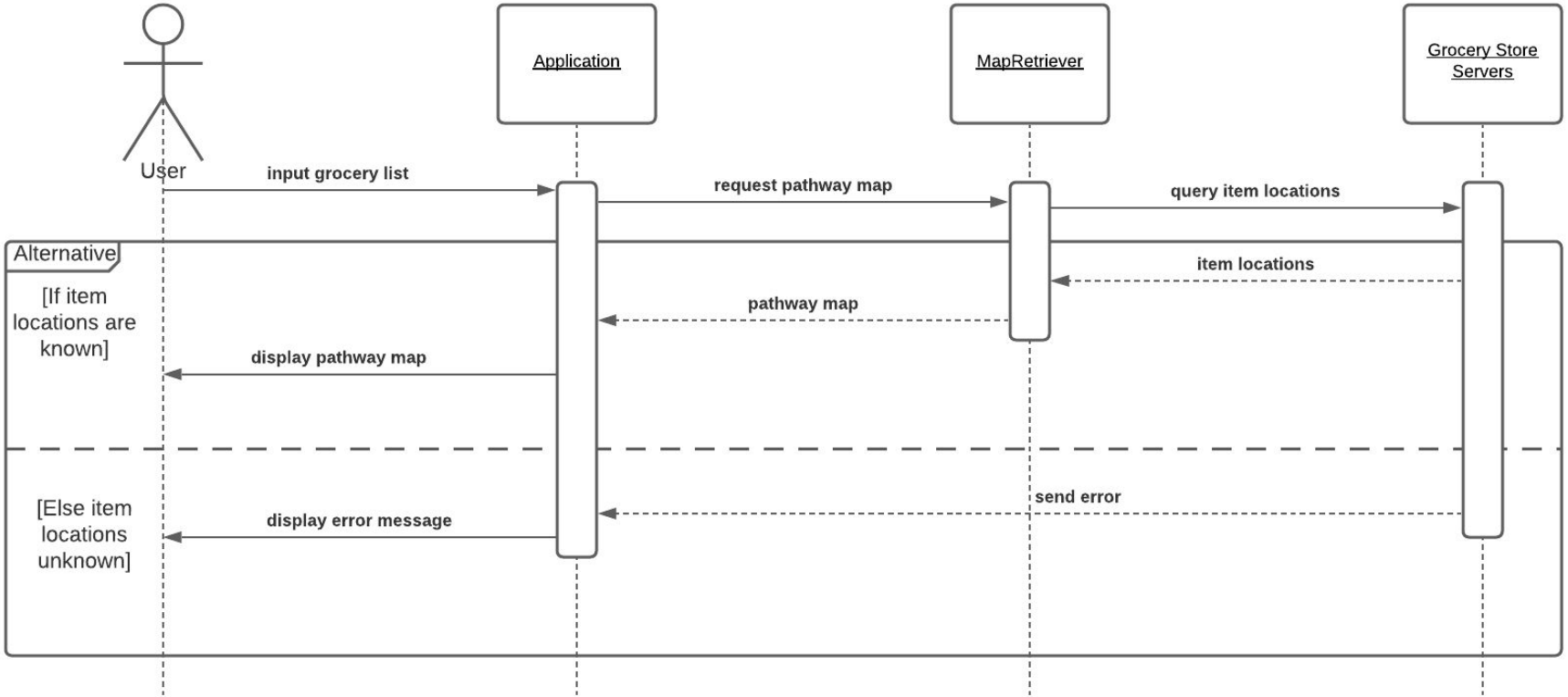
Non-Functional Requirements

- Users of all ages should be able to use the application intuitively
- Servers should maintain 99.9% uptime
- Customers can see the data we are storing from their device usage through a transparency program
- Our application shouldn’t hinder the experience of other customers
- The application will be developed in Java, because it is low cost and portable.
    - Must be ported to swift for IOS
- Users should be able to access the applications on both android and IOS platforms

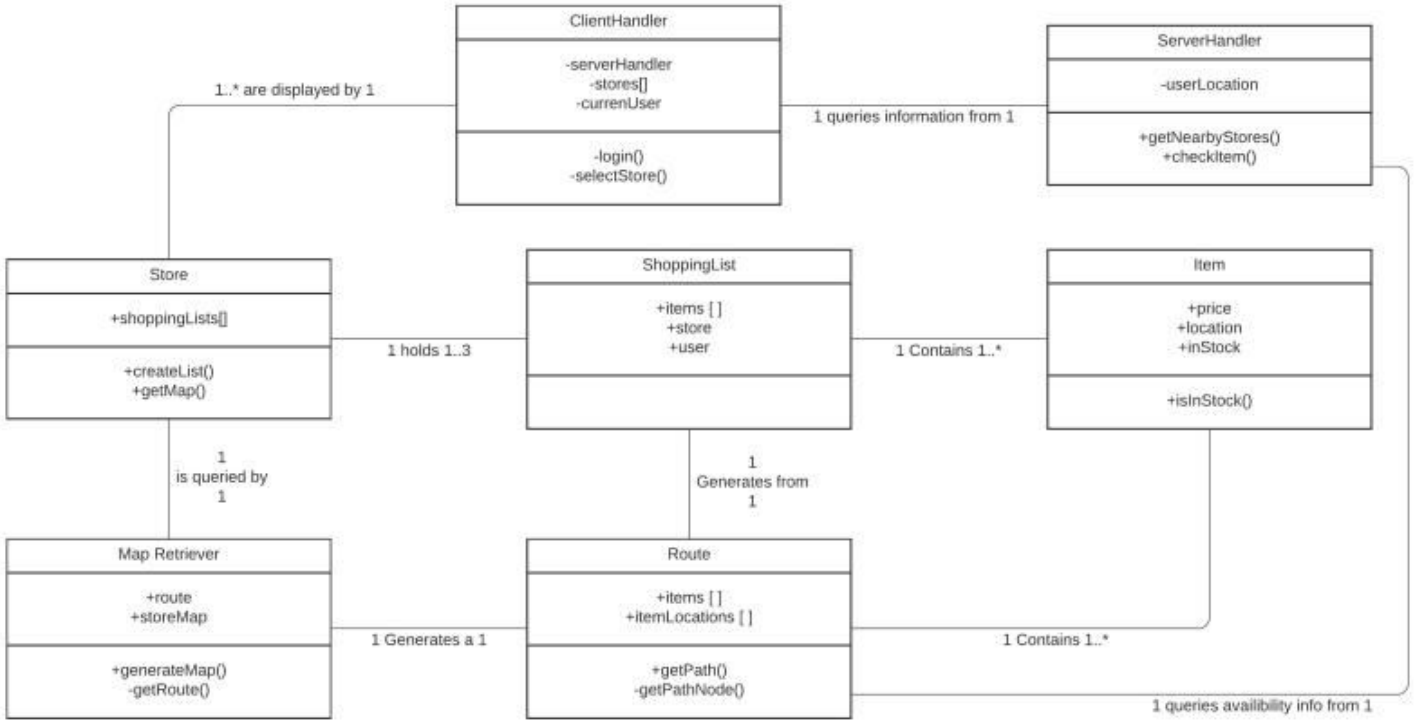
Use Case Diagram



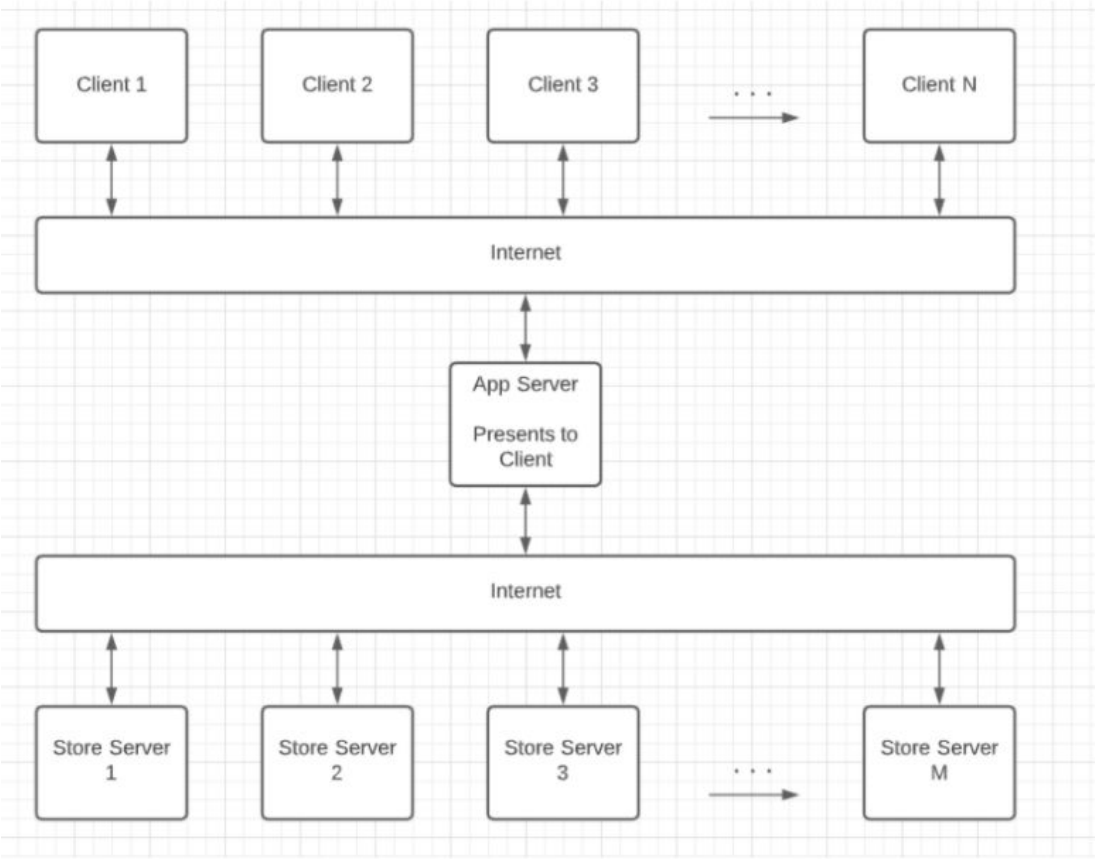
Selected Sequence Diagram (Input Grocery List)



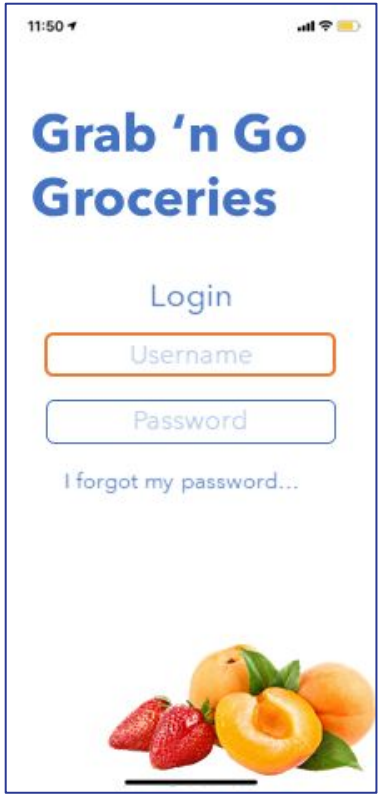
Class Diagram

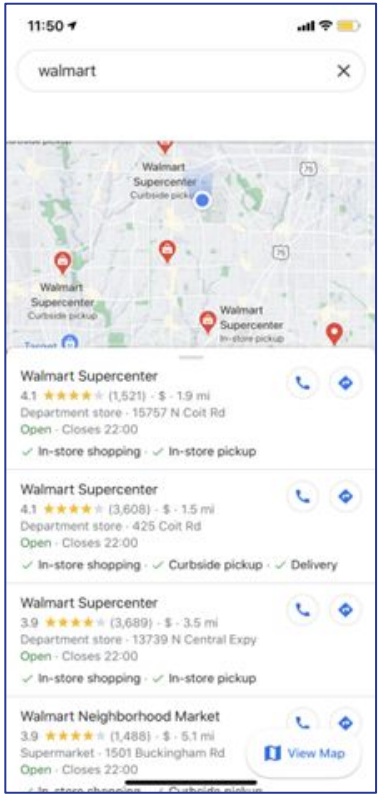


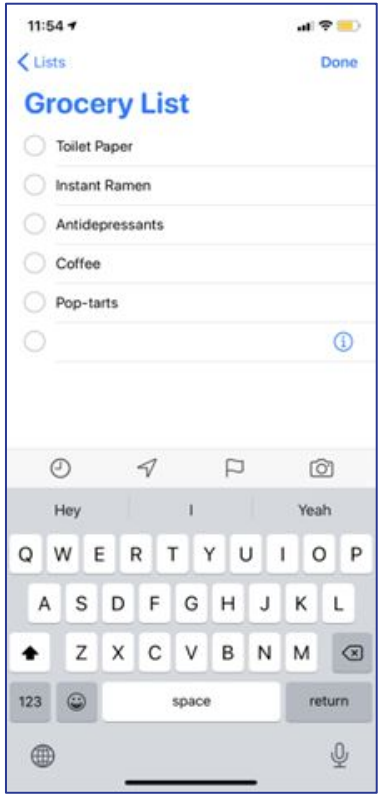
Architectural Design



User Interface







Conclusion

- We were very adamant on the “Grab and Go Groceries” idea because it was something that we all felt like we’d use ourselves
- We wanted to create something that we saw value in creating, instead of something that had already been done before
- Our team had some different ideas about where the project should end up going at the beginning
- Eventually we all settled on one idea and this idea became the foundation of Grab and Go Groceries

[17]

Thank you!

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