

# TouchCart: Essential Product Definition Tools

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## 1. PRODUCT VISION

For large supermarket chains struggling to leverage technology in improving labor productivity and in-store customer experience, TouchCart is an integrated hardware-software solution that allows their customers to find their groceries and check-out faster. Unlike competitors that sell machines which are expensive, stationary and single-purposed, TouchCart distinguishes itself by building a cost-effective, mobile solution around recycled smartphones, capable of supporting additional feature development.

## 2. PRODUCT OPPORTUNITY ASSESSMENT

### A) VALUE PROPOSITION

#### BACKGROUND:

During shopping peak hours, supermarkets must pull additional employees from their original duties to help out with check-out operations such as bagging and scanning shoppers' items. In addition, when customers are unable to find their items, they have to disrupt supermarket employees for help. This is a problem on two levels: first, employees take longer to finish their original duties such as stocking and inventory count, and second, employees have to be cross-trained in several functions within the store, increasing the amount of time and money required to onboard new employees.

#### VALUE WE PROVIDE:

- a) Improve labor productivity by directing customers to our mobile solution instead of employees and thus freeing employees to do other tasks
- b) Enhance customer experience by reducing the unnecessary time spent by customers on searching for items and waiting for checkout
- c) Create a technology-savvy and environmentally-friendly brand image by building a technology solution around recycled smartphones

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### B) TARGET MARKET

Though grocery shoppers define our product users, our target market is large supermarket chains. There are three supermarket archetypes that we believe would benefit the most from TouchCart: There are three supermarket archetypes that we believe would benefit the most from TouchCart:

- a. **Open to technology:** In 2010, Kroger partnered with QueVision to use hidden infrared cameras with body heat trackers to track the number of shoppers at any given time to manage redeployment of workers to cash registers as needed<sup>1</sup>. In 2012, Whole Foods partnered with technology firm Chaotic Moon to prototype a grocery cart equipped with a tablet and Microsoft Kinect device<sup>2</sup>, and in this same year Walmart rolled out its Scan & Go program<sup>3</sup>. These companies are willing to experiment with how technology can be incorporated into their store operations.
- b. **Employee- and customer-centric:** Trader Joe's is a grocery market that prioritizes its employees by offering

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<sup>1</sup> <http://www.informationweek.com/strategic-cio/executive-insights-and-innovation/kroger-solves-top-customer-issue-long-lines/d/d-id/1141541>

<sup>2</sup> <http://articles.latimes.com/2013/sep/08/business/la-fi-grocery-tech-20130908/2>

<sup>3</sup> <http://theweek.com/articles/472687/walmarts-scan-iphone-app-future-shopping>

competitive wages, good health insurance, and high potential for advancement<sup>4</sup>. Consistently ranked in Forbes' Top 25 Companies to Work For, Trader Joe's is also known as a fun place to shop and work, and continually aims to improve their customer and employee experience.

- c. **Socially responsible:** Whole Foods is a leading grocery chain that emphasizes corporate social responsibility. On top of promoting environmental stewardship, organic farming, seafood sustainability, whole trade, and animal welfare, Whole Foods wishes to maintain its commitment to society and brand image<sup>5</sup>.

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### C) MARKET SIZE

In order to implement our solution, it is important to estimate how many carts TouchCart can be installed on. Given an average of 250 carts per supermarket, there are approximately 10 million carts across the U.S. To begin with, we aim to target 5 supermarket stores with 30 carts each for our free pilot program within the Bay Area (3 from open-to-technology, 1 from employee-customer-centric and 1 from socially responsible) within the first 3 months. By proving our value proposition, we hope to get buy-ins from more stores within their respective parent chains, increasing the total number of stores to 25 within the first year with 50 carts each, which is less than 0.07% of the market. The goal for subsequent quarters would be to expand our footprint within the West Coast before moving on to the Northeast, Midwest and South regions of US.

We believe these estimates are reasonable for the following 3 reasons:

Firstly, on a typical day, 34 million American adults shop at the grocery store, which is about 1 in every 7 adults. Shoppers spend 38 minutes on weekdays in store compared to 45 on weekend days. This shows Americans spend a considerable amount of time grocery shopping, and supermarkets can capitalize on this by shortening shopping times to improving customer satisfaction<sup>6</sup>.

Secondly, according to the Bureau of Labor Statistics, there were 37,716 supermarkets with over 3.4 million employees across the United States in 2014<sup>7</sup>. Accounting for 3.4 million employees, supermarkets face negative externalities from low wages such as absenteeism, high employee turnover, bad morale, and bad customer service, which lower sales<sup>8</sup>. By providing a solution to improve labor allocation, supermarkets capitalize on making that 3.4 million employee labor force more efficient by cutting costs and improving the employee experience.

Thirdly, there is a sufficiently strong financial case for supermarkets to pay for TouchCart if we were to price our solution appropriately - for a medium-sized supermarket operating 15 hours a day with 10 checkout cashiers, it is common to spend on average 20 man hours per day pulling employees from other functions to help out for checkout operations. There is also potentially 15 man hours per day spent on helping customers with ad-hoc requests on finding items. By introducing TouchCart, we estimate that we can increase labor productivity by 80% and reduce the need for such manpower reallocation during peak hours. This translates to over 750 man hours and around \$7,500 of cost savings per month. In the future, if the solution is implemented effectively, the number of cashier stations can be reduced by 50%, generating up to \$20,000 more savings. Given how margins are around 2-5%<sup>9</sup> for supermarkets, cost savings will make a significant impact on the bottom line.

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### D) COMPETITIVE LANDSCAPE

We categorized our competition into 3 main categories: scan-and-go apps, in-house supermarket apps, and self-checkout machines. Then, we evaluated their market positioning using these two criteria: scope of features implemented and ease of customer acquisition.

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<sup>4</sup> <http://www.investopedia.com/articles/investing/061115/best-5-grocery-companies-work.asp>

<sup>5</sup> <http://www.wholefoodsmarket.com/blog/john-mackey-blogs/rethinking-social-responsibility-of%C2%A0business>

<sup>6</sup> <http://timeuseinstitute.org/Grocery%20White%20Paper%202008.pdf>

<sup>7</sup> <http://www.fmi.org/research-resources/supermarket-facts>

<sup>8</sup> <http://www.pbs.org/newshour/making-sense/the-high-cost-of-labor-efficiency-and-the-good-jobs-alternative/>

<sup>9</sup> <http://retaileconomics.com/store-productivity/>

### 1. Scan-and-go apps, such as ShoppinPal

Scan-and-go apps target customers who want a faster shopping experience by allowing customers to simply scan their goods while grabbing them before quickly checking out at the cashier<sup>10</sup>. Some of these apps also include in-store mapping, which make the scan-and-go apps our closest competitor in terms of features.

Benefits they offer:

- a. Mobile
- b. Saves customers' time by speeding up checkout process
- c. In-store mapping

Compared to TouchCart:

- a. Scan-and-go apps offer same benefits as TouchCart
- b. Scan-and-go apps are pure software solutions, requiring voluntary installation on customers' personal devices. TouchCart provides its own software and hardware solution that attaches onto the cart itself.
- c. Scan-and-go apps might provide cheaper prices since they do not include hardware costs.

### 2. Apps developed by supermarkets, such as the Target app

These apps include features like goods locator, shopping list, and even online shopping. However, most do not include any scan-and-go features to speed up the checkout process. They also face the same problem as mentioned above as they are pure software solutions.

Benefits they offer:

- a. Mobile
- b. Developed by the chain itself, thus having its brand recognition and trust

Compared to TouchCart:

- a. Most in-store apps do not have TouchCart's scan-and-go feature
- b. In-store apps are pure software solutions, requiring voluntary installation on customers' personal devices. TouchCart provides its own software and hardware solution that attaches onto the cart itself.
- c. In-store apps are authentic and official products of the supermarket themselves, whereas TouchCart would be a third-party vendor in partnership with the supermarkets.

### 3. Self-checkout machines

Self-checkout machines cut down the need for multiple cashiers and allow better labor efficiency by allowing one employee to oversee multiple checkout stations. However, these machines are more limited in scope when compared to TouchCart since they lack the software flexibility of adding or improving features such as. Nonetheless, this solution is becoming increasingly popular<sup>11</sup>, with big chains such as Target adopting it.

Benefits they offer:

- a. Built in-store and does not require any installation efforts from the customer's side
- b. Improves labor efficiency by allowing one employee to man multiple checkout station

Compared to TouchCart:

- d. Self-checkout machines are stationary, whereas TouchCart is a mobile attached to the cart.
- e. Self-checkout machines do not offer additional features beyond scanning and paying, whereas TouchCart offers item-finding and future features development.
- f. Self-checkout machines cost an average of \$60,000 apiece<sup>12</sup>. TouchCart uses recycled smartphones, which cost about \$25 apiece (source: Sprint).

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## E) DIFFERENTIATOR

<sup>10</sup> <http://www.shoppinpal.com/>

<sup>11</sup> <http://web.mit.edu/2.744/www/Project/Assignments/humanUse/aychen/>

<sup>12</sup> <http://www.bizjournals.com/baltimore/print-edition/2011/12/09/the-cost-of-self-checkouts.html>

### **Cheap, cost-effective solution**

TouchCart's main differentiator is in our cost-effective price. The hardware component of TouchCart consists of recycled smartphones, unused by any other competitor, that cost \$25 each (source: Sprint), compared to self-checkout machines that cost on average \$60,000 apiece. Thus, including integration, replacement, and maintenance costs, in the long run our solution is still magnitudes cheaper than competitor hardware solutions.

### **Comprehensive and scalable mobile solution**

TouchCart offers a comprehensive mobile solution that also allows for future features to be tailored to each individual supermarket. Because most competitor apps do not include the scan-and-go feature along with item-finding as TouchCart does, TouchCart's integration of these two specific features into one platform is rare in the market.

Furthermore, most competitors only offer a set list of features, but TouchCart is purposely built to allow for future features development. Thus, TouchCart's software solution is tailored from the start to work seamlessly with each supermarket's specific database or system structure instead of simply importing information from their database.

### **Environmentally-friendly**

TouchCart is environmentally-friendly. TouchCart is the only solution on the market to use recycled mobile devices rather than fabricating our own hardware and creating more waste. This will help businesses build better brand images that appeal to more environmentally-conscious shoppers or organic grocery shoppers. Furthermore, supermarkets may qualify for additional tax savings<sup>13</sup>.

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### F) ACHILLES HEEL

TouchCart faces three groups of competitors: (1) scan and go apps, (2) self-checkout machines, and (3) stores' own apps.

The key advantage scan and go apps have over TouchCart is the elimination of hardware costs, because these apps rely on shoppers' own smartphones. Having no hardware allows them to avoid charging for installation, maintenance costs for broken smartphones. In addition, no hardware poses less of a threat since hardware may be stolen or pose threats to safety if the hardware should break. Our plan to mitigate this issue is to keep hardware costs at a minimum by using recycled smartphones, which only cost \$25 apiece. Additionally, integrating our hardware-software device onto the shopping carts which all shoppers use allows us to provide a much higher customer adoption rate since scan and go apps require users to actively download and open the app.

Now onto self-checkout machines. Since they are already established among major chains, they have the strength of being well-known, tested, and trusted by both supermarkets and shoppers. This firstly helps ensure that supermarkets have time to collect data on the value which these machines bring to the business, and makes it hard for an upstart to convince the supermarkets to reinvest in a new set of technology. Secondly, people have had enough time to learn how to use the machines and for the machine-makers to fix the bugs - this means that the usability bar is set a lot higher for any product which is poised to replace the self-checkout machine. These are obstacles which are not easy to overcome for us, but we hope that by providing a free pilot program for selected supermarkets, we can incentivise them to try our product and in so doing, allow us to prove our value proposition and improve our usability. Another mitigating factor is that we are building our solution on the smartphone platform, and this will help us be more responsive in pushing out new software updates to fix any usability bugs.

Finally, stores' own apps have the advantage of being the official store app and would naturally enjoy some competitive advantages: first, supermarkets might not be willing to adopt our solution if they see us as a competitor to their own app; second, chains may be reluctant to partner with us if they see us as a third party that may also service their competitors, and they may ask for an exclusivity agreement. We hope that our pilot program will be mitigate these risks: at the start, we can position ourselves as a white-label product to reduce the concern of brand dilution for the supermarket's current app. Our medium to long term strategy will involve building features which might directly compete with the existing supermarkets' app, but we hope that by then we would have shown the value which we can generate for the supermarkets and make them reduce any special preferences which they have for their in-house app.

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<sup>13</sup> <http://www.businessinsider.com/the-top-10-benefits-of-convincing-your-company-to-care-about-sustainability-2012-3>

## G) MARKET WINDOW

Now is the best window of opportunity for TouchCart's release, based on four factors.

First, the competitiveness among supermarkets continues to be cutthroat, forcing their profit margins to be razor-thin, if not already extremely low. In addition, labor costs are their largest expense outside of cost of goods sold<sup>14</sup>. Thus, TouchCart's benefits provide much needed cost savings and increased profit margins.

Second, nearly two-thirds of Americans, or 184.2 million individuals, own smartphones in 2015<sup>15</sup>. This is expected to grow to 198.5 million by 2016, and 220 million by 2018<sup>16</sup>. Thus, most supermarket shoppers are already familiar with the smartphone technology TouchCart will use, so customer adoption of our product is favorable right now and in the future.

Third, one billion smartphones are produced each year<sup>17</sup>. Of this one billion, 150 million are discarded<sup>18</sup>. Since TouchCart reuses old smartphones and not much repurposing or reuse of these old smartphones is done as of right now<sup>19</sup>, TouchCart has more than ample supply of hardware to obtain and repurpose as of this moment. Furthermore, since more smartphones are produced each year to meet the growing number of users, this provides TouchCart with a steady flow of old smartphones to continue to use and repurpose.

Fourth, with sustainability gaining more and more attention in today's society<sup>20</sup>, TouchCart plays into this role by recycling used smartphones. Thus, by partnering with TouchCart, supermarkets are choosing to use TouchCart's environmentally-responsible devices over competitors' newly manufactured devices. This allows supermarkets to enhance their Corporate Social Responsibility and brand image, attract more environmentally-conscious customers, and most importantly, qualify for tax incentives that exist at this moment because of massive awareness sustainability has garnered at this moment<sup>21</sup>. Furthermore, the benefits of using TouchCart right now are two-fold since this initiative allows companies to reap cost savings due to tax incentives for sustainability efforts and build a larger customer base by attracting the increasing amount of environmentally conscious consumers in today's world<sup>22</sup>.

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## H) SUCCESS CRITERIA

To gauge TouchCart's success or failure, there are three measures for three stakeholders: (1) for supermarkets, labor cost savings (2) for customers, user adoption (3) and for TouchCart as a company and its investors, customer lifetime value.

First, our product must deliver cost savings for supermarkets. TouchCart is valuable to supermarkets through its promise to be cheaper than cashiers, so comparing cost savings is an important metric for success. This will be measured by dividing the number of items bought by the number of cashier manhours. TouchCart wants to increase this metric -- that is, increasing the number of items a worker can process in the same time.

Second, TouchCart can get an indicator of its usability and value to shoppers by tracking how many shoppers choose to use TouchCart. TouchCart's goal is not necessarily to reach 100 percent adoption, as some customers will always prefer the old fashioned way, but to increase user adoption quarter over quarter.

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<sup>14</sup> [https://iue.libanswers.com/data/answers/files/429173/grocery\\_stores\\_and\\_supermarkets\\_march\\_2012.pdf](https://iue.libanswers.com/data/answers/files/429173/grocery_stores_and_supermarkets_march_2012.pdf)

<sup>15</sup> <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>

<sup>16</sup> <http://www.statista.com/statistics/201182/forecast-of-smartphone-users-in-the-us/>

<sup>17</sup> <https://www.causesinternational.com/ewaste/e-waste-facts>

<sup>18</sup> [http://www.nytimes.com/2013/05/05/opinion/sunday/where-do-old-cellphones-go-to-die.html?\\_r=0](http://www.nytimes.com/2013/05/05/opinion/sunday/where-do-old-cellphones-go-to-die.html?_r=0)

<sup>19</sup> <http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/envirobmobilelifecycles.pdf>

<sup>20</sup> <http://www.forbes.com/sites/susanmcperson/2014/03/18/stylish-and-sustainable-how-brands-are-getting-it-right/>

<sup>21</sup> <http://www.businessinsider.com/the-top-10-benefits-of-convincing-your-company-to-care-about-sustainability-2012-3>

<sup>22</sup> [http://www.sustainablebrands.com/news\\_and\\_views/behavior\\_change/pablo\\_barros/consumer\\_awareness\\_wont\\_save\\_world\\_we\\_need\\_businesses\\_ca](http://www.sustainablebrands.com/news_and_views/behavior_change/pablo_barros/consumer_awareness_wont_save_world_we_need_businesses_ca)

Third, TouchCart as a company needs to be financially feasible, so it needs to measure customer lifetime value, or the average revenue per account over the average length of subscription. The higher a customer's lifetime value the better, because this means the supermarket client is subscribing to TouchCart longer and/or paying more per quarter. TouchCart's goal is to constantly move this metric up, to ensure it brings in healthy sales. This metric is also informative for how much TouchCart can spend acquiring a new client -- new user acquisition should always be cheaper than the customer lifetime value to ensure its net worth to TouchCart is positive.

TouchCart should track success criteria like these three and their change quarter over quarter, in order to continuously improve its value, usability, and feasibility for supermarkets, shoppers, and investors.

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## I) RISK ASSESSMENT

TouchCart has identified its four biggest points of risk as (1) end consumer (shopper) adoption of the product, (2) supermarket employee pushback, (3) production and sales of TouchCart phone limited by recycled smartphone availability, and (4) convincing supermarkets that our shopping system effectively prevents shoplifting.

TouchCart hopes to aid their customers, supermarkets, improve labor efficiency by reducing the overall labor needs and distractions. However, this value proposition is only possible if shoppers are willing to try out the TouchCart. To address the question whether or not shoppers would actually find value in a product such as TouchCart, Store Manager Chanaya of Safeway, College Avenue Oakland mentioned that around 50% of her customers are those that want to be in-and-out, and confidently sees that any product that will save them time will be useful. To further mitigate this risk, in the pre-launch stages TouchCart will undergo thorough user testing in order to minimize overall clicks and make the interface as easy and intuitive as possible. We also intend to measure shopper adoption rates as a KPI during the pilot program, and plan on creating further incentives for the users with loyalty programs and vouchers in future feature development.

TouchCart considers another risk to be supermarket employee pushback. Specifically, it is possible that employees will view TouchCart as a threat to their jobs, and resist implementation at a union and corporate level. The mitigation to this problem needs to be a system-wide acceptance. We intend to conduct surveys and focus groups on supermarket employees to assess the potential severity and prevalence of this risk. In addition, we hope to make TouchCart appealing to end consumers, which will generate a bottom-up demand for TouchCart. Lastly, we will market TouchCart as a product that improves productivity, rather than a tool to replace human labor.

Every product that has a hardware component is potentially constrained by manufacturing and availability of source material. Similarly for TouchCart, our production is limited by availability of recycled phones, especially units that are functional enough for refurbishment and repurposement. However, the overall lack of current demand and use for recycled smartphones indicates a relatively low demand, indicating that TouchCart shouldn't have a problem securing a portion of the overall stock. In addition, the pilot program will allow us to gauge and predict overall market demand, allowing better planning and purchasing come official ramp-up to other supermarkets.

Lastly, TouchCart's scan-and-go feature raises potential shoplifting concerns. An example of shoplifting could be when a shopper scans less items than in actuality, and thus pays less than required. As this risk has a human-nature component to it, TouchCart is prepared to address it in a similar fashion - through implementing Costco-style shopping receipt checks at exits. In addition, we plan on further mitigating this risk through developing anti-theft features such as a scale built into the shopping cart that will match the total weight of the product in the cart and total expected weight registered in the application. Any mismatch will raise a red flag and alert supermarket employees.

## 3. PRODUCT IMPROVEMENT CONCEPT AND MVP

TouchCart aims to improve labor productivity and customer experience for supermarkets. To do so, TouchCart offers a faster checkout process (scan-and-go) and item-finding. Building upon these core features of TouchCart, future iterations of our solution will come with the following significant upgrades, which expands upon both core functions and additional convenience features.

**Hardware Upgrade:**

1. To battle theft, the planned hardware upgrade includes the integration of a weight sensor on the shopping cart. As each product is scanned, the TouchCart device then keeps track of the relative increase in weight in the cart that should result. Upon checkout, TouchCart will notify if major or statistically-unlikely weight discrepancies exist between its calculated weight and the current weight in the cart, thereby accounting for accidental mis-scans or attempted theft.

**Software Upgrades:**

1. Regarding software, a potential upgrade that improves upon our value proposition significantly is a pay-as-you-go self-checkout feature that eliminates the need for a cashier at all. Instead of having shoppers scan the products themselves and pay at a cashier, customers will be able to link payment solutions such as their credit card information and pay directly on the TouchCart app.
2. Advanced voice-recognition features will also allow TouchCart to aid less-tech savvy shoppers or those unfamiliar with smartphones through vocal commands. Last but not least, advanced analytics features such as geomapping customer movements can be added to provide targeted marketing opportunities.

Features List: Separating MVP from non-MVP**(MVP):**

- Scan-and-go feature: allows users to scan items using the smartphone before they put it into the shopping cart, speeding up the checkout process when they pay at the cashier
  - A barcode scanner feature which uses the in-phone camera to capture barcodes of items and translates them into numerical digits for item extraction from database
  - A barcode database containing a complete and updated list of grocery items in the supermarket, allowing TouchCart to add the correct item into the shopping cart based on the item's barcode data
  - Generating QR codes which will produce the complete shopping list upon 1 scan at the cashier, facilitating payment
- Item-Search feature: allows users to find the aisle location and price information of the grocery item in the store
  - A indoor-map of the supermarket, which includes the location of all items
  - A search engine to find items in the store database

**(Non-MVP):**

- CAD mapping that charts current location navigates the shopper to the product
- A payment feature that allows shoppers to pay directly through the app, eliminating the need for a cashier altogether
- Anti-theft scale that will be built into shopping carts in order to weigh total items within the cart
- A geotagging feature that will register customer movements within the store, in order to understand shopping behaviors and optimize store layout
- Voice-detection feature so shoppers can verbally voice inquiries rather than typing it into the smartphone
- Data analytics that measure customer behavior (such as preferences for certain brands or products and total time spent shopping) that can improve stocking and design
- Targeted marketing by providing store-specific limited time discount offers for items that may be nearing the end of shelf life, or relevant item which customers search for
- Nutritional and source information displayed about each item, especially at health-conscious groceries like Whole Foods
- Suggested items as customer scans items into cart, allowing groceries to cross-sell items (If the shopper is buying peanut butter, TouchCart can suggest jam.) or push items that are expiring soon
- Loyalty program for returning users, activatable through use of store card / phone number
- Saved shopping list that customers can save and access

MVP Principles:**Use Cases:**

1. As a mother of three kids, I want a quick way to check out and pay for my groceries so that I can pick them up from school on time and be able to make them a snack before sports practice.
2. As the host of my Christmas party, I want to be able to find where the coconut milk is located without walking all over the store or walking to find an available store employee for help, so that I can get back to my party as soon as possible.

**4. MVP Q&A**

- a) How did you arrive at your goal? What broader goals did you consider, were (and how were) the power of ones useful in reducing scope?

The main motivation was to improve the experience in a supermarket given the pain points which we have as customers ourselves. During the initial ideation process, we did consider eliminating the need for customers to frequent supermarkets at all by entering the grocery delivery space, but realized that, despite the advancement of technology, brick-and-mortar supermarkets are not going to disappear<sup>23</sup>. We want to be part of this exciting retail transformation in the supermarket industry and thus decided on developing digitally-enabled solutions which will help these stores enhance the in-person shopping experience for their customers.

From the perspective of customers, there might be several pain points which warrant attention. However, given that our primary client is the supermarket, we have to focus on addressing pain points which are more directly aligned to the supermarket's profit-maximizing objective and would make the greatest impact in the shortest amount of time. To that end, we decided to look at solutions which will maximize labor allocation efficiency for the supermarket and help them serve their customers better during the shopping process.

- b) Given the defined goal and use cases of your MVP, explain why you marked the MVP features as such and eliminated those as NOT MVP?

Our primary goal is to maximize labor productivity in supermarkets, given that this will have the most direct impact on their bottom line. Based on our supermarket manager interviews, we found out that the 2 main problems they face are firstly, bottlenecks at cashier lines which require drawing in additional employee labor and attention; secondly, especially in large supermarkets, the need for employees to help customers find items. This is both distraction and delay for the employee who is stocking or performing another task, in addition to frustration for the customer who wants to find an item quickly. Hence, to determine our MVP features, we focused on the features which generate the labor productivity and customer service delivery improvements - every other feature would be classified as non-MVP.

Our core features ended up being Scan-as-you-go and Item-locator. The scan-and-go feature achieves this by decreasing time to check-out. Faster check-out times result in less cashiers needed, and less of a need to pull other employees to help out at cashiers when it comes to peak hours. Also, the item finder feature reduces the need for shoppers to interrupt employees' from their original tasks to help lead them to the item they cannot find. This allows employees to finish their tasks as fast and efficiently as possible without unnecessary delays. The other features listed such as voice-detection or in-app payment provided additional convenience to the shopper, but did not contribute to improving labor productivity and thus was classified as non-MVP.

- c) Why you believe your stated target customer will find your proposed functionality (the new product improvement) helpful in meeting their objectives (Valuable)?

The Scan-as-you-go feature is valuable because it helps supermarket increase labor productivity. The faster checkout time that results from this feature allows supermarkets to cut down on the number of cashiers needed on hand, which frees up more labor to be allocated to other areas. This speeds up the time it takes to complete non-cashier tasks such as stocking or inventory count, and faster times result in more completed actions and productivity for supermarkets.

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<sup>23</sup> <http://dupress.com/articles/retail-transformation-choice-experience-trust/>



The Item-search feature is valuable because this allows customers to instantly determine an item's location, eliminating their need to pull employees away from their original tasks. This allows employees to complete their tasks without unnecessary delays, achieving maximum efficiency. Supermarkets benefit from maximum efficiency since this allows for the most actions to be completed (such as inventory count for a specific item).

To support the above concepts, from our research, we established that the average supermarket's profit margins are around 2-5%. Since profit margins are extremely thin, a potential large increase in labor productivity would have a great improvement on the bottom line since TouchCart's core "scan-as-you-go" feature promises to cut down the necessary labor cost of manning cashiers. This freed up labor cost can then be allocated to speed up or improve the output of other tasks, achieving more overall store productivity without requiring hiring more costly labor. Secondly, a 2011 study on general customer satisfaction in supermarkets found that service was the second most important criterion with 82% of customers saying that it affects their decision on which supermarket to shop at<sup>24</sup>. TouchCart promises to enhance customer service as well by enabling shoppers to receive self-help for simple queries using the item-search MVP feature. Customers would no longer need to track down employees to inquire about their items, enhancing overall service delivery and customer convenience.

d) What steps would you think of taking to ensure your customers will find the MVP features you develop to be easy & intuitive to use (Usable)?

We understand that not all shoppers are adept at technology, and thus we intend to thoroughly test our MVP features through focus groups during development, and also collect as much data as possible during the pilot program, so as to make the necessary changes to ensure usability. In addition, upon activation of TouchCart, our user interface will provide a quick how-to guide that ensures a user will understand the full capabilities of the application. Users can quickly navigate through the guide through swiping or a "Skip" button. Future iterations of this feature will likely include short video with audio that will walk the user through the scan and search functions. Similar to our core MVPs, the information within the introduction will also be tested through focus groups to determine length and structure. This way, not only can shoppers understand how to use TouchCart, they don't need more than a few seconds to do so.

Lastly, we will primarily develop TouchCart for recycled Android phones first. The Android operating system currently ranks as the United States' most used platform, with an approximate 52% of the total market share<sup>25</sup>. Thus we leverage the statistical probability that most shoppers will be familiar with Android devices.

e) What makes you believe that you can reasonably build your proposed MVP in a short amount of time by a small group of developers using available technology (Feasible)?

We believe Touchcart is feasible as many necessary technologies we will require, such as barcode scanners and store layout maps, already exist. In addition, our hardware choice of used smartphones does not require additional design and manufacturing time and cost.

Described in more detail, our scan-and-go MVP is feasible since most used smartphones come with built-in cameras, all supermarket products are already tagged with barcodes, and there are existing code database with open-source barcode scanning scripts for us to build upon. Thus, the time required to build the feature will not involve "reinventing the wheel". In addition, our item-finding MVP is feasible since search engine frameworks are available to reference from when developing, and supermarkets already maintain a database of all their items. Although we do need to build an adaptable "software API" layer which allows us to pull data appropriately from databases, we can refer to existing literature and online resources to help ease the development process.

Lastly, our team includes members with strong backgrounds in both computer science, engineering, and business, and our Product Manager has had experience in both.

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<sup>24</sup> <http://www.diva-portal.org/smash/get/diva2:428996/fulltext02>

<sup>25</sup> <https://www.comscore.com/Insights/Market-Rankings/comScore-Reports-June-2015-US-Smartphone-Subscriber-Market-Share>