

*REVISED & EXPANDED*

# **QUANTIFYING CUSTOMER EXPERIENCE**

*The DART Group details how the Process, Layout,  
Metrics Model helps retailers quantify customer  
experience*



**AUBURN**  
RFID LAB

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## FORWARD

There's an old saying in retail that customers will "vote with their wallets" which is a catchy way of claiming that customer insights come in the form of revenue.

While this isn't untrue, it discounts the invaluable insights that happen before the transaction. In many cases, the most valuable insights for a retailer actually come from understanding why a customer comes into the store and does not transact with us. These are also some of the most challenging insights to gather.



Prior to my current role at Best Buy, I was responsible for the vending machines selling electronics in airports called "Best Buy Express". It was a good business with strong revenue in highly visible, highly trafficked areas. While we made many merchandising decisions based on sales, the insights that contributed most significantly to our growth were the ones we gained through observation of the customer experience. We would spend hours in airports just watching customers interact with the machines. We already knew what customers were purchasing but what we learned was why they weren't purchasing. We heard things about product categories or brands we hadn't considered but the two most valuable insights were ones that had nothing to do with what we were selling. In other words, insights we never could have possibly learned from our revenue numbers.

The first was price perception. We heard many people make comments about how the product was likely "much more expensive because everything is more expensive at the airport" which in fact, was completely untrue. We used the same price feeds from our retail stores in our kiosk. A very simple aesthetic change to the machine by way of a shiny new 'Same price as our retail store' sign that led to an immediate 20% increase in sales. The second insight came from a group of young adults walking by. One stopped to browse some headphones at the kiosk while another encouraged him to keep walking, he could grab them closer to their gate since "these things are like McDonald's, I'm sure there's one in every terminal". We lost that sale, because we in fact did not have them 'in every terminal' but after that observation, we were able to look across the network and add more kiosks that drove completely incremental sales even though they were close in proximity.



In the Best Buy Express examples above, we proved significant value in observing the way customers navigate our physical shopping environments which is relatively simple when you're dealing with a 6x4 foot box. In a big box, however, this becomes much more complex to identify actionable insights.

Moreover, with the unprecedented channel shift in retail today, it is even more critical for retailers to focus on improving the "shopability" of their physical stores to meet rapidly evolving customer preferences. A retailer website has no shortage of clicks reporting and conversion data, but in physical retail spaces, it is much more difficult to understand how customers are navigating our stores and what we need to do to make it our stores as frictionless and enjoyable as possible. To further complicate the matter, like many retailers, Best Buy is evaluating the impact several store formats and layouts on customer experience which is challenging for several reasons. Qualitative metrics like "customer experience", are difficult to analyze and draw concrete conclusions. Interpreted by five different analysts and you could get five variations of conclusions. Also, because we're dealing with humans, bias is inevitable, and they won't always be able to tell us the "truth". If a retailer "asks" a customer what they think or what they want, they may have the best intentions in providing valuable information, but still not be able to fully anticipate what they would do or what they would want. Similar to if Henry Ford would have asked his customers what they wanted, they may have said "a faster horse" because they simply didn't know automobiles were an option.

As retailers continue to reinvent physical spaces to improve the customer shopping experience, quantifiable customer experience data becomes critically important. With the digital tools, the DART group at Auburn University has developed to quantify customer problems the conclusions become much clearer and more actionable.

FOREWORD PROVIDED BY

**Betsy Maus**

Digital, Analytics and Technology Director at Best Buy



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## EXECUTIVE SUMMARY

Quantifying brick-and-mortar customer experience has been a challenge daunting retailers and brands alike. Recognizing this, The DART Group has developed a toolset that quantifies customer experience and observes alterations of consumer behavior when integrated technology solutions are implemented. By visiting brick and mortar stores, evaluating aspects of customer experience, and constructing a Process, Layout, and Metric (PLM) Model, the identified knowledge gap for a retailer can be closed. The PLM Model shows in-store processes with correlating layouts, in a 2D, 3D, or VR format. These layouts show physical changes used to enhance customer experience, ultimately addressing metrics desired by the retailer.

## WHO IS THE DART GROUP?

Much like a dart is used in fashion to tailor a garment to be more flattering on an individual's body, The DART Group's mission is to tailor technology integration to make it most effective for various retailers. DART aims to close the knowledge gap and identify solutions to yield higher brand involvement by:

**D**etermining the present  
**A**cknowledging friction  
**R**ecognizing opportunities  
**T**ailoring solutions



# CUSTOMER EXPERIENCE

Customer experience is frequently the top priority for retailers and brands alike. Customer experience is an outcome of a brand's digital strategy, in-store experience, social media, and omnichannel engagement. All of these contribute to the overall perception of a brand, either aiding in retention or resulting in churn. Our team focuses on in-store experience and the respective touchpoints in a brick-and-mortar setting.

Retailers and brands have access to big data analytics to understand customer engagement in digital spaces, such as where they are providing a positive online customer experience and where they are lacking. Leveraging technology to evaluate the digital customer experience has proven to be incredibly valuable across the industry. However, measuring brick-and-mortar customer experience has been more difficult, largely due to the lack of knowledge on how to quantify customers' in-store experience for objective and efficient assessments and comparisons. This presents The DART Group with an opportunity to develop a toolset to innovate how retailers measure their in-store customer experience.

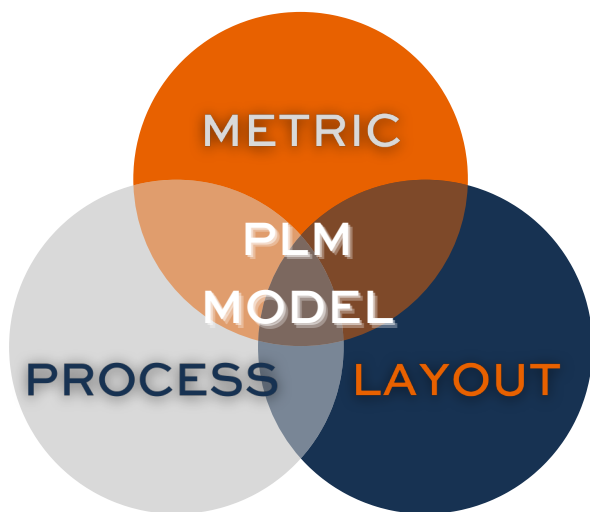
## THE PROBLEM

As e-commerce established itself as a contender within the retail industry, headlines such as "Retail is Dead" and "The End of Brick-and-Mortar" plagued media outlets [1]. However, these assumptions of in-store shopping being obsolete are misleading.



Surprisingly, Gen Z prefers to shop in-store versus online. As their spending power continually increases, this generation constituted 40% of global consumers in 2020 [2]. Parallel to this increase, there is a rise of digitally native brands investing in brick-and-mortar locations- Amazon, Allbirds, Fabletics, and Warby Parker, to name a few. This expansion emphasizes the relevance of in-store shopping. Additionally, brick-and-mortar is the preferred format of Baby Boomers, America's wealthiest generation [3]. Brick-and-mortar should be a central tenet of a brand's operational strategy if aiming to capture the spending from one or both of these generations. Brands need a comprehensive understanding of what these generations want to then implement processes that meet their demands. False demand perception leads to a disconnect between the retailer and its target market according to the well-known Gaps Model (Appendix 1, [4]). In our work, we strive to close the Knowledge Gap, which is the difference between customer expectations and management's perception of those expectations.

## PROJECT OVERVIEW



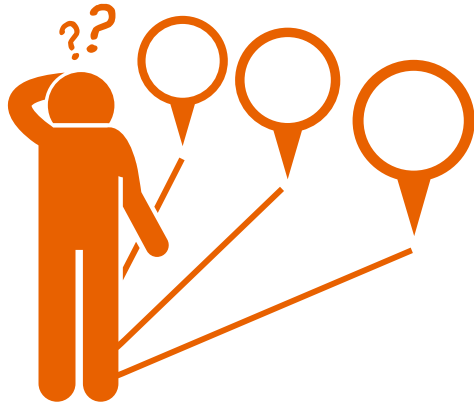
The DART Group developed the Process, Layout, Metric (PLM) Model that engages both retailers and customers, determining practical steps to improve the retail experience for all. Our model diminishes the Knowledge Gap by thoroughly surveying the current in-store experience, gaining insight into current customers, providing feedback to retailers, and then taking actions that better serve customers through the implementation of technology.

When quantifying the customer experience, a process flow is developed to further understand the decisions a customer is making in the physical store. Next, we construct a layout to track these decisions. Finally, metrics for improvement can be drawn. Each step in the PLM model is broken down further in the following pages.





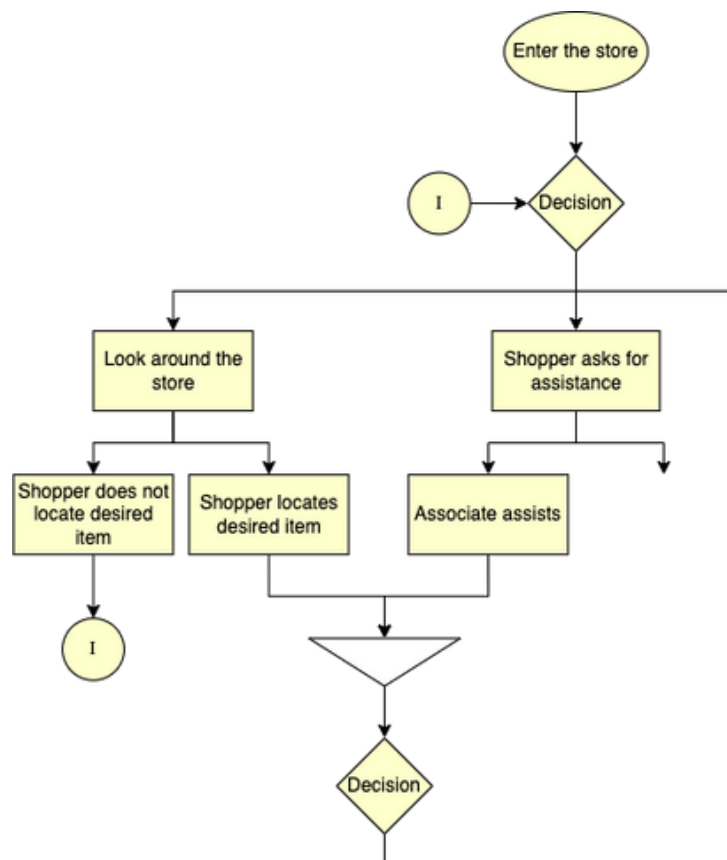
## PROCESS



We use process flow diagrams to outline the decisions and subsequent actions a customer takes while in-store. Customer decisions include choosing to abandon a product, asking for assistance, selecting a different size/color/style, etc. Subsequent actions include looking around the store, locating the desired item, walking to checkout, etc. When collaborating with partners, The DART Group aims to capture all decisions and subsequent actions specific to their retail model.

### EXAMPLE SECTION OF PROCESS FLOW:

Naturally, decisions and actions vary among retailers, but at the core of all process flows is a look, find, buy feedback loop [5]. This is a constant cycle for all customers serving as the foundation of our process flow construction. In our model, look, find, buy is represented as “looking around the store,” “shopper locates item,” and “shopper collects item” respectively.



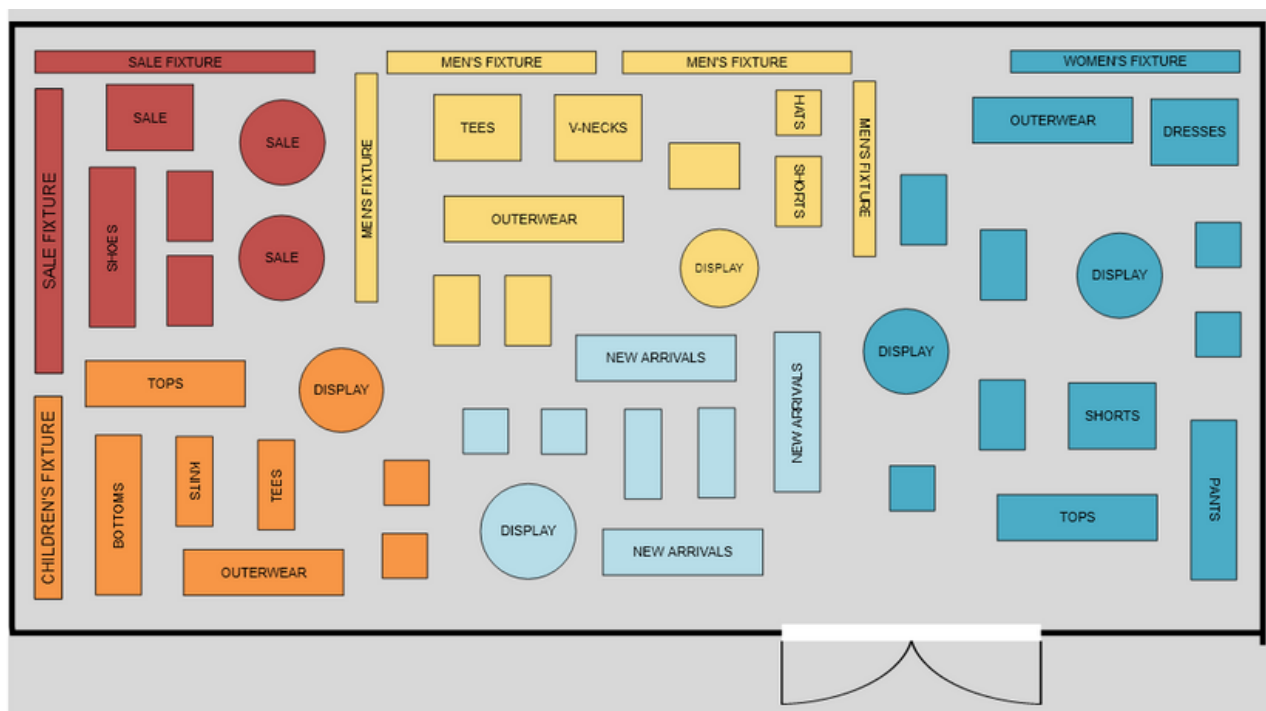
## LAYOUT

Layouts, the next piece of the model, reflect the physical retail space and are an estimate of each brick-and-mortar store. Layouts act as a general guide rather than a detailed map and point to the physical location in which the decisions in the process flow are being made. This allows us to understand



customer movement during their shopping experience. Below is a 2D layout created by The DART Group. The example layout is not reflective of a specific retailer.

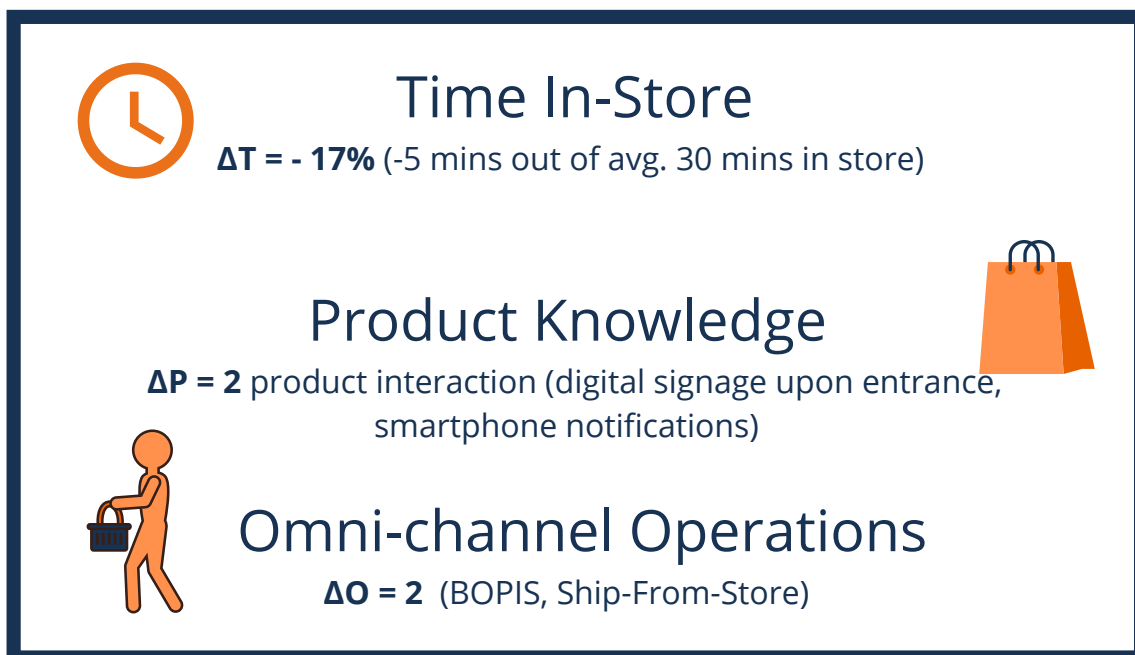
### EXAMPLE LAYOUT:



## M E T R I C S

The last piece of the PLM Model involves identifying metrics for improvement. Metrics are quantifiable measurements that track changes in a particular business process. These changes will be driven by implementing an integrated technology solution or other strategies deemed necessary. When a company adopts our proposed solution, we expect positive change. There is an infinite number of areas a company could seek to improve; however, the most prominent are customer satisfaction, customer loyalty/retention/churn, brand advocacy/reputation, brand quality/operations, and employee engagement [6].

### EXAMPLE OF DETERMINED METRICS:

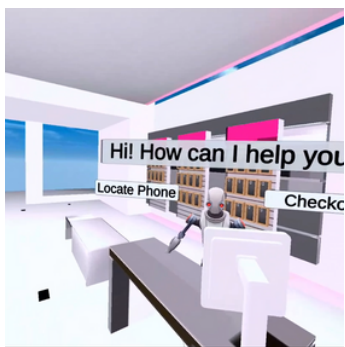


Once The DART Group collaboratively determines metrics with retail partners, the process flow is analyzed to determine which steps are impacted due to new technologies. Focusing on creating change regarding metrics will likely change the frequency of engagement at decision points and subsequent actions. A common question is how the metrics retail to return on investment (ROI). This will be addressed in the Opportunities section- on page 19.



## 2023 VIRTUAL REALITY UPDATE

The push to innovate the layout component of the PLM Model from 2D to 3D or VR came from the desire to make data harvesting more innovative and immersive. When working with retailers on PLM Model analysis, The DART Group found that many retailers had little to no knowledge of the frequency of common actions occurring in their stores and would not have been able to collect that information without a technological overhaul. Examples of knowledge gaps include the percentage of customers using the fitting room, leaving the store with no purchase, or asking the associate for assistance. The lack of knowledge in these areas makes process flow decision point weighting impossible resulting in the entire customer in-store journey remaining unknown. The VR simulation provides an avenue for The DART Group to gather information to accurately weight process flow decision points. Once the outputs of an accurately weighted retailer process flow are understood, the impact of in-store changes such as visual merchandising or product placement can be accurately measured and analyzed.



## APPLICATION

Applications for the PLM Model include manual and automated simulations. Manually, we pair decisions made in a process flow to a physical location in a layout, thus showing the link between decisions a customer makes and their movement throughout the store.



By running randomized simulations, areas in the process flow that lead to insufficient or invalid outcomes were detected and corrected. This simulation study built confidence in our predictive capabilities and confirmed sufficient depth and breadth of decision point offerings. Once the validity of the process flow is established, manual simulations are run to mimic potential customer journeys. If we are able to obtain store data, customer actions are weighted to reflect common shopping patterns for that retailer. If store data is not available, actions following a decision are weighted with an even probability. More accurately weighted probabilities will help us build a model for the most probable customer journeys for a specific retailer, with which we can predict the probabilities after introducing an intervention, such as an integration of technology into the store, to understand its impact on the desired metrics

## CASE STUDY

Valuable application for the PLM Model lies in retailers on the edge of innovation. Whether the retailer has already experimented with technological innovation or is looking to start, The DART Group looks at current customer process flows and analyzes where adjustments could be made to shift customer perception from viewing stores as traditional to modern.

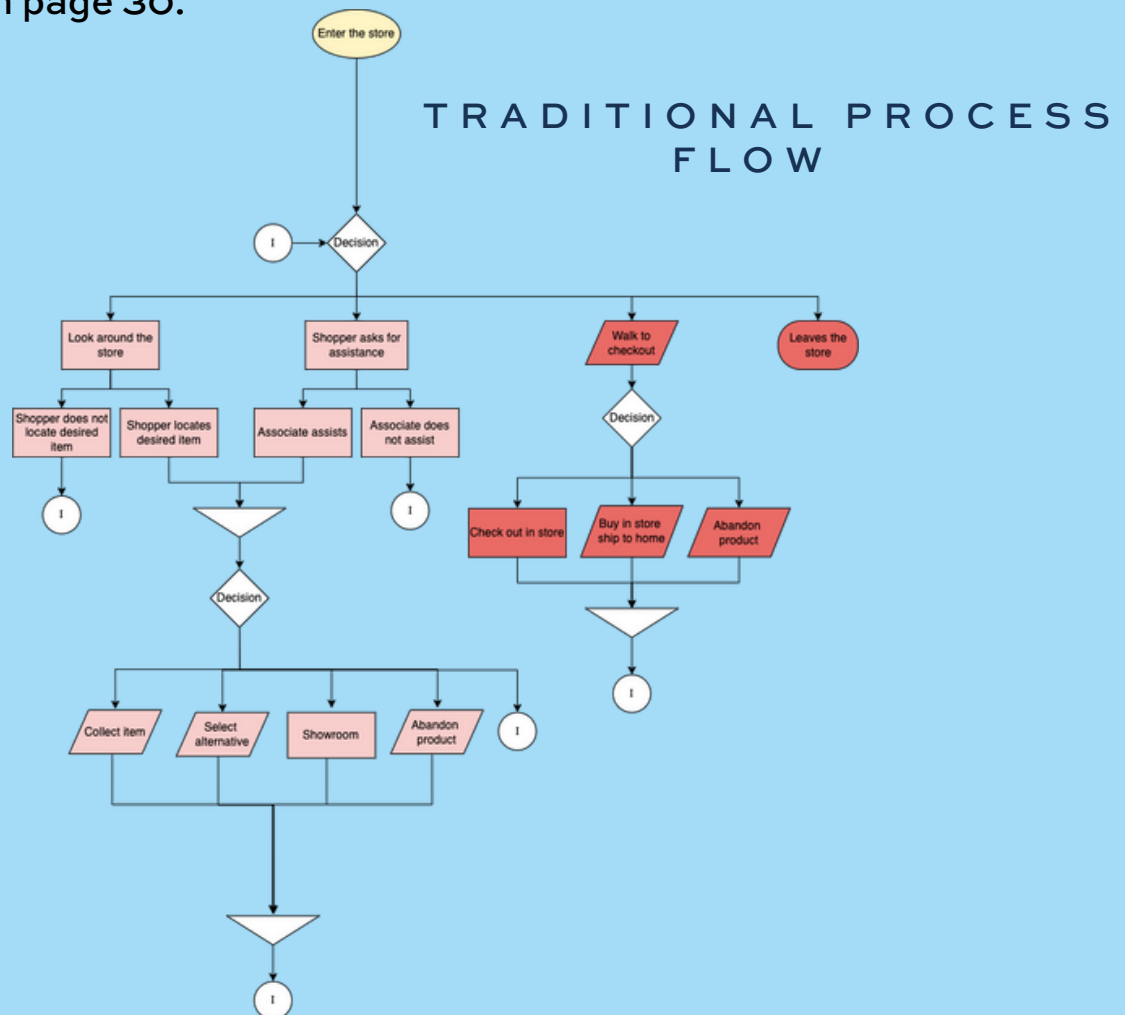
As observed with Amazon Go Convenience, which utilizes Just Walk Out technology, a retailer can make a change that causes a perception shift. From the customer process perspective, only two changes are happening in the Just Walk Out store: customers scan a QR code upon entry and simply walk out with their purchases instead of visiting a POS system.



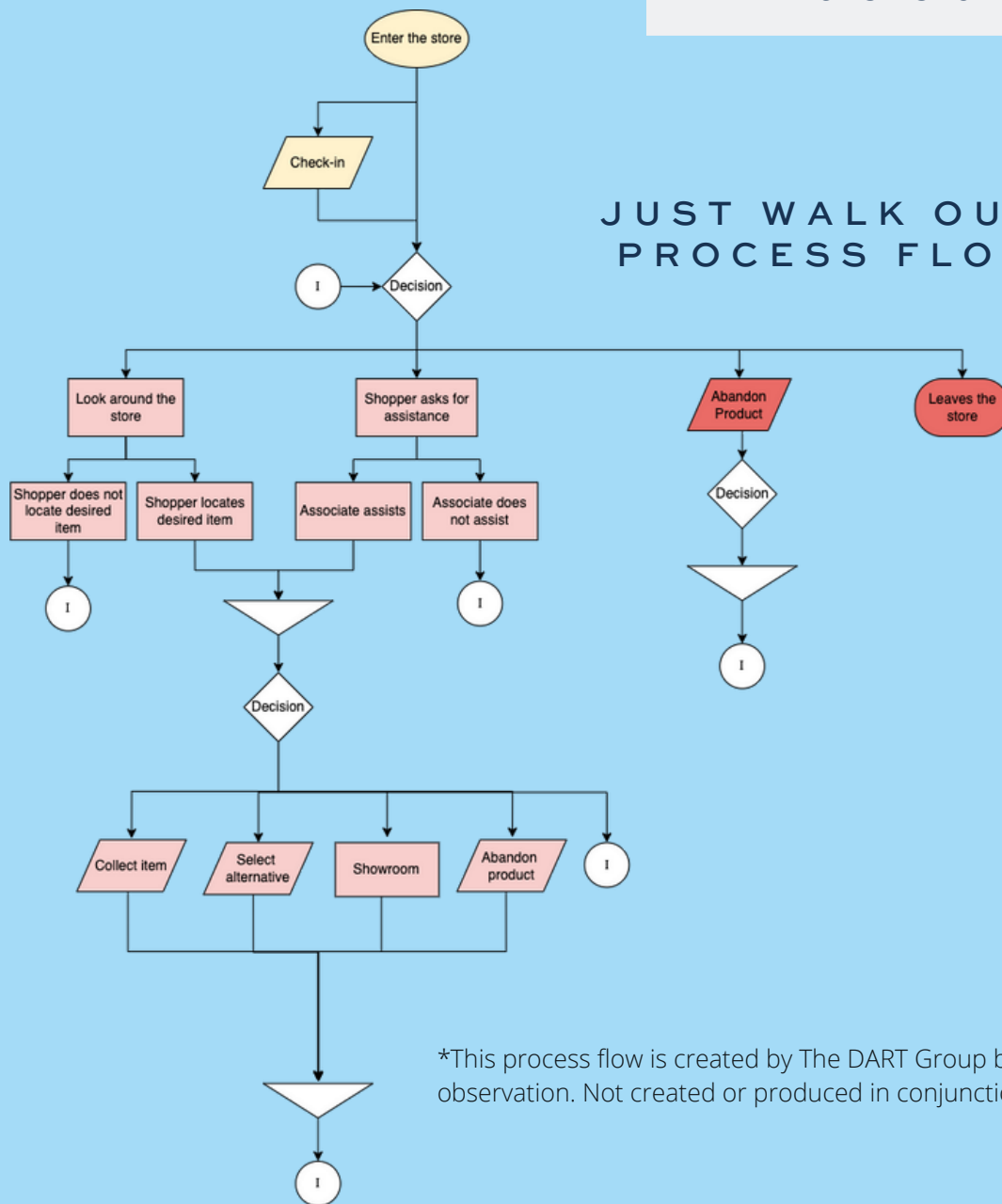
While there is a technological overhaul that includes product scales, facial recognition, biometrics, RFID, and cameras, customers do not recognize the depth of this processing. Rightfully so, customers focus on their experience, not the heavy technological integration that makes their experience possible.

## PROCESS

Differences in the customer journey for traditional and Just Walk Out stores are detailed in the following process flows. As demonstrated, “check-in” at the turnstile adds one additional step, but in turn, customers subtract several steps in their exit process, resulting in net time saved. For a larger view of differences in process, please visit Appendix 2 on page 30.



\*Larger image of Traditional Grocery Process Flow can be found in Appendix 3 on page 27.

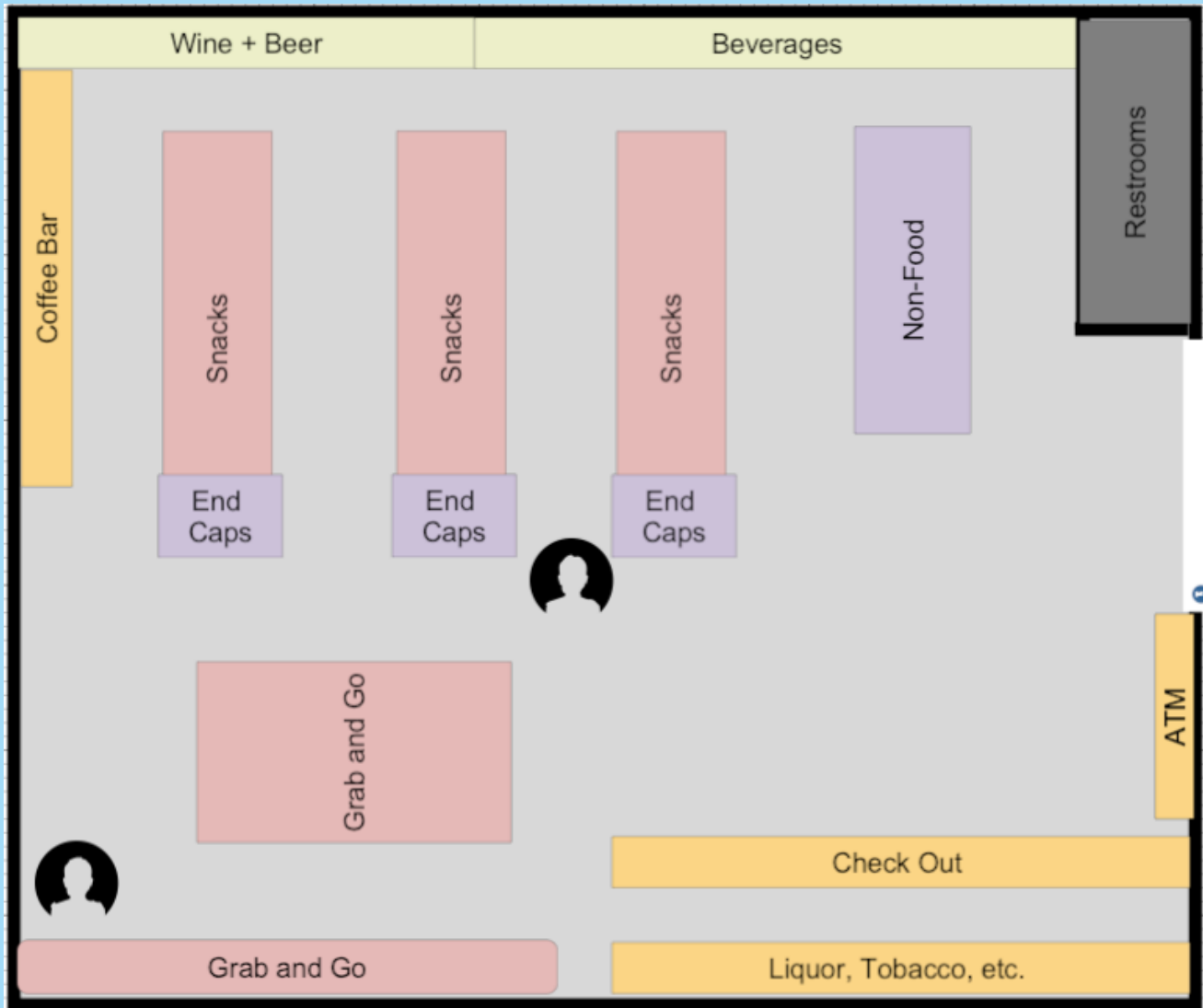


\*This process flow is created by The DART Group based on academic observation. Not created or produced in conjunction with Amazon.

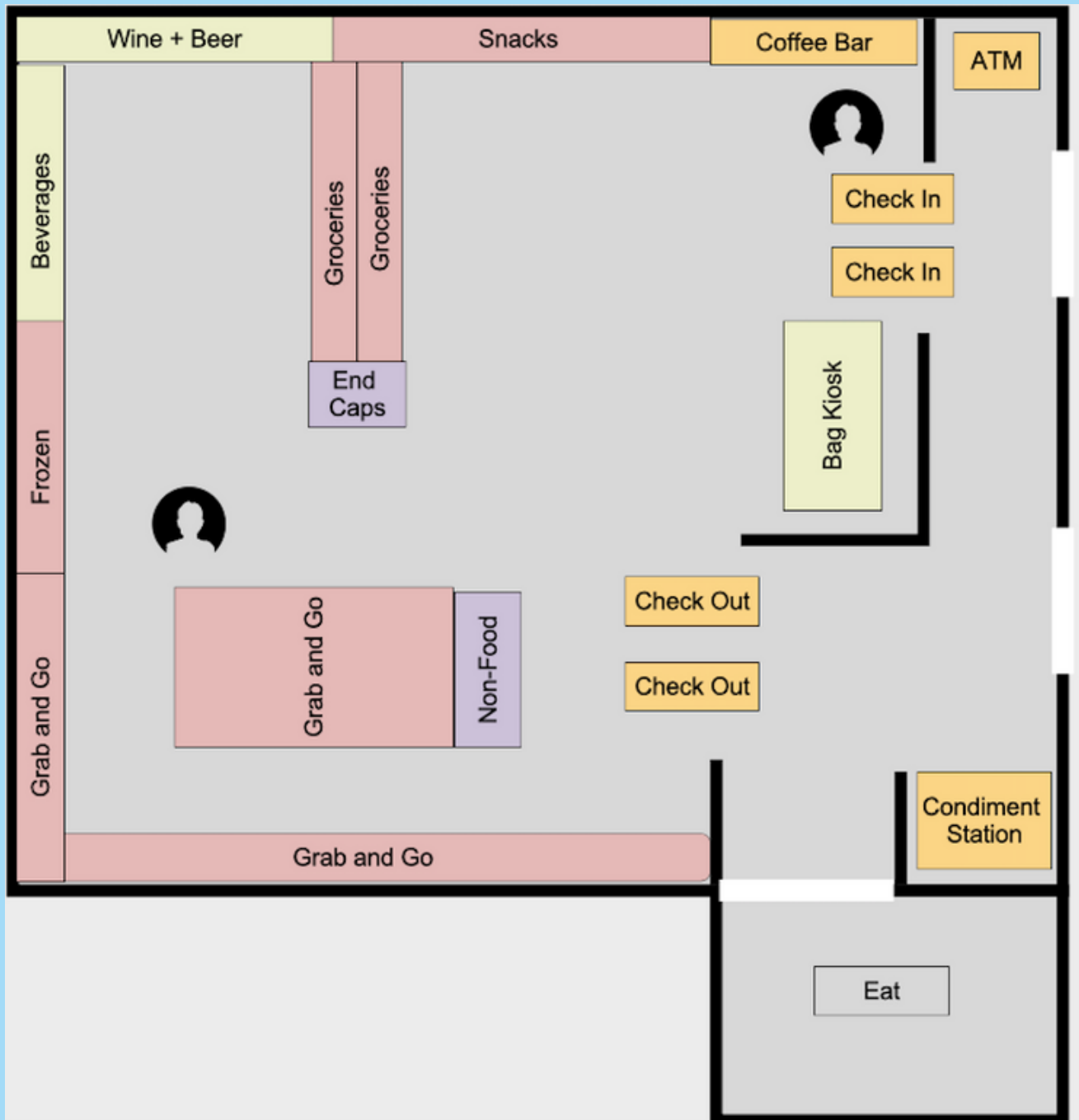
## LAYOUT

Amazon Go convenience store layout is similar to other compact stores, except for alterations to the entrance and lack of POS systems. The collection of customer information by the turnstile in combination with monitoring customer movement allows for the removal of POS systems. Additionally, in some Amazon Go models, there is a designated area to eat items purchased from the Grab and Go station. In a traditional convenience store model, there is also a restroom for customers to use.



TRADITIONAL CONVENIENCE  
STORE LAYOUT



JUST WALK OUT CONVENIENCE  
STORE LAYOUT

\*This layout is created by The DART Group based on academic observation. Not created or produced in conjunction with Amazon.



# M E T R I C S

Based on observed outcomes of the Just Walk Out store, The DART Group pinpointed three metrics: customer time in-store, product handling, and customer independence. While we recognize there could be other metrics besides those previously stated, The DART Group narrowed the possibilities down to three for this case study. The model decreases time in-store by eliminating the checkout process, resulting in greater efficiency. The average checkout time is about one minute of the average convenience trip total of 4 minutes [7]. By eliminating the checkout process, there is approximately a 33% reduction in time in-store. Likewise, product handling is also more efficient. Just Walk Out enables a reduction of two product touchpoints: cashier scanning items and bagging item(s) following a purchase. If a customer utilizes self-checkout the touchpoints eliminated are: self-scanning items, employee interception upon kiosk prompting, and bagging items-post purchase. The last metric researched is customer independence. We found there is no net change in customer independence as Just Walk Out technology adds the step of scanning a QR code upon entry and eliminates the checkout process in the end. While there is no actual change, we found that customers still feel more independent and autonomous.



## Time In-Store

$\Delta T = -33\%$  (-1 mins out of avg. 3 mins in store)

## Product Handling

$\Delta P = -2$  touchpoints (cashier scanning items, bagging items following the purchase)



## Customer Independence

$\Delta O = 0$  interaction (+1 interaction at turnstile, -1 interaction at checkout)



## CASE STUDY CONCLUSION

Through The DART Group's application of the PLM Model, we have discovered retailers often think about innovation through what is perceived as operationally possible first, and then push the boundaries for brick-and-mortar innovation. We infer Amazon reversed this process, first delineating how to create an experience



customers desire, followed by technological development to make it happen. As a result, Amazon Go convenience has seen great success. If brands reverse their thought process to put customer experience first, then think operationally, innovations could be more audacious and future-oriented.

## METRICS AND ROI

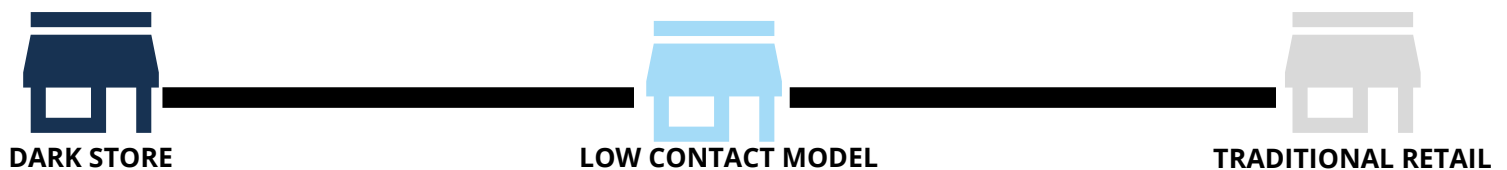
The DART Group recognizes the importance of converting the PLM Model to a positive ROI. The analysis is done by selecting quantifiable metrics, reviewing the changes in performance, then offsetting the cost of technology. It is rare ROI comes from a single metric. Multiple metrics contribute, which can be more deeply understood with the help of a retailer's finance team. The case study above is a rather extreme example, and it is not always necessary or appropriate to fully automate a store. There is no one-size-fits-all solution to selecting metrics that result in a positive ROI. As mentioned, the PLM Model eliminates the need for total technical overhaul, thus reducing R&D costs for brick-and-mortar retailers.

## OPPORTUNITIES

The PLM Model has many opportunities for academic and retail industry advancements. We are creating an objective, academic process by which retailers can evaluate the current and potential future state of their stores. As The DART Group establishes more retail partnerships, we will be able to streamline our store visit report process and complete reports with more efficiency and ease.



Most recently, The DART Group has been researching an innovative brick-and-mortar model that capitalizes on consumer demand for efficiency. As a result of utilizing the PLM Model, we recognized an opportunity for layout innovation. This launched the development of the Low Contact Model (LCM): a retail format halfway between a dark store and traditional retail. The LCM expands back-of-house (BOH) operations to optimize SFS and BOPIS fulfillment models while prioritizing the in-store customer experience.



The Low Contact Model decreases customer contact interactions to a single displayed sample of each SKU that customers are welcome to scan with smart devices. Another innovative characteristic of the model is the relationship between BOH and front-of-house (FOH) operation; inventory moves around the BOH to mirror the decisions a customer is making via their smart device. Limiting customer interaction with merchandise through a streamlined fitting room experience and designated collection space decreases shrinkage, resulting in greater inventory accuracy. These high-tech fulfillment structures lend to the omnichannel purchasing of today's consumers.

The need for this model was recognized in 2020 with the expectation that brands lower customer contact with products and associates; the LCM model lowers this by utilizing interaction with one's smart device, in turn, decreasing interaction with merchandise and shared surfaces. Turns out, this model proves to be sustainable beyond pandemic times. Additionally, introverts or customers who don't want to search through dozens of racks and sizes appreciate this direction retailers are headed in, among others.

#### Short Term:

- Lower customer contact with products and associates

#### Long Term:

- Enhance SFS and BOPIS functions
- Maximize small scale fulfillment centers
- Create future-oriented shopping experience

Now more than ever, retailers recognize the importance of SFS and BOPIS services. By enhancing BOH operations, the LCM equips stores to operate as small-scale fulfillment centers while simultaneously providing a future-oriented shopping experience for in-store customers. Retailers have begun to optimize SFS and BOPIS services, some of the core tenets of the LCM, with industry predictions these practices will continue to evolve. This means the model has validity and is desirable for a retailer today. Through the Low Contact Model, DART is eager to spearhead the new standard for customer experience excellence, ultimately shifting the retail industry in a future-oriented direction. Furthermore, the PLM Model demonstrates the differences between what the consumer perceives as traditional compared to a highly innovative store format. This analysis expects to reveal the stores deemed as “advanced” actually have little operational difference from those that are perceived as “outdated” by the customer. An updated store layout can lead a customer to believe they are experiencing a highly-innovative shopping experience, but in reality, the process is nearly identical to a traditional shopping experience.

## CASE STUDY II



Below is a case study The DART Group developed to apply the PLM Model to an LCM developed and implemented by Reformation's “tech store.” These stores are located in a handful of major U.S. cities. Reformation was the first, and still one of few, to utilize an LCM concept; we predict this retail concept will become more widespread,

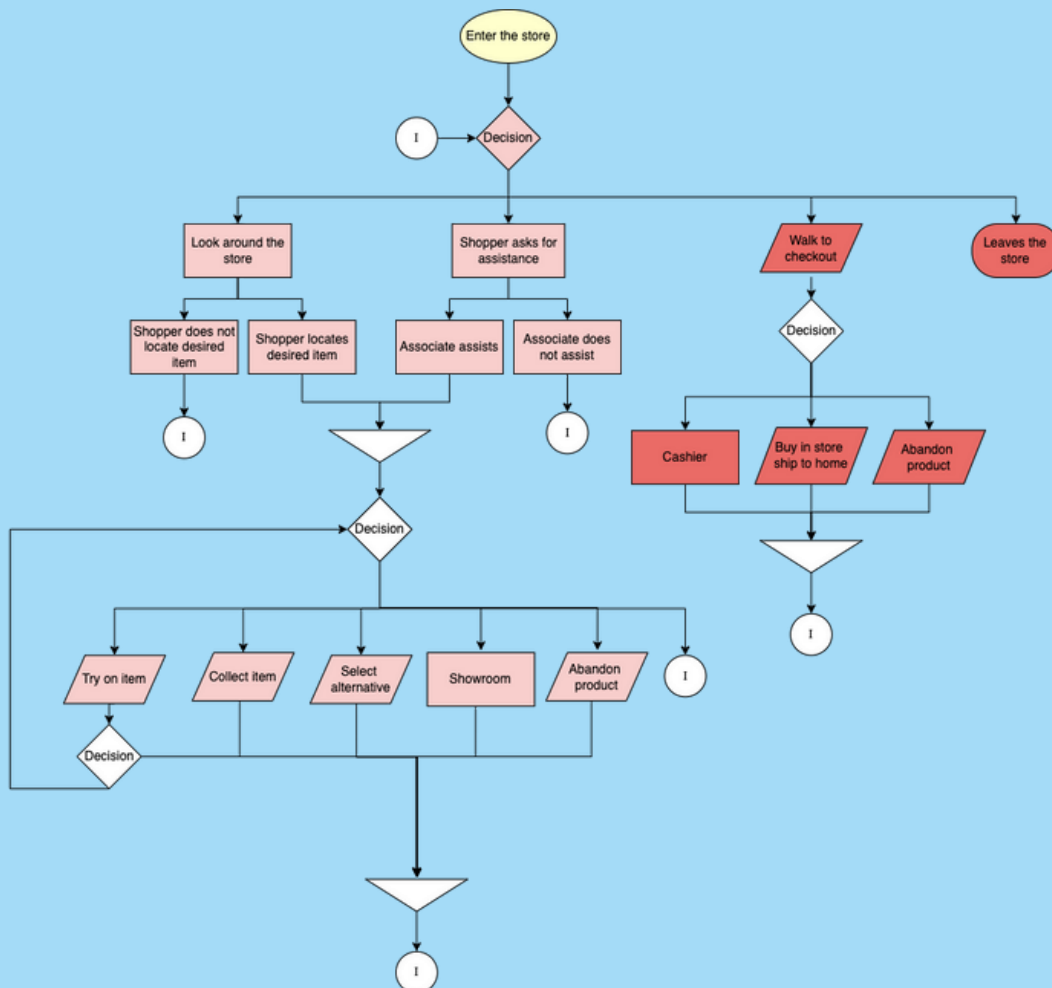
as Reformation was ahead of the curve when launching this retail model. The DART Group analysis can not definitively conclude if Reformation uses their BOH for ship-to-store fulfillment as put forth by the LCM, but it is apparent that their tech store is in line with retail innovation.



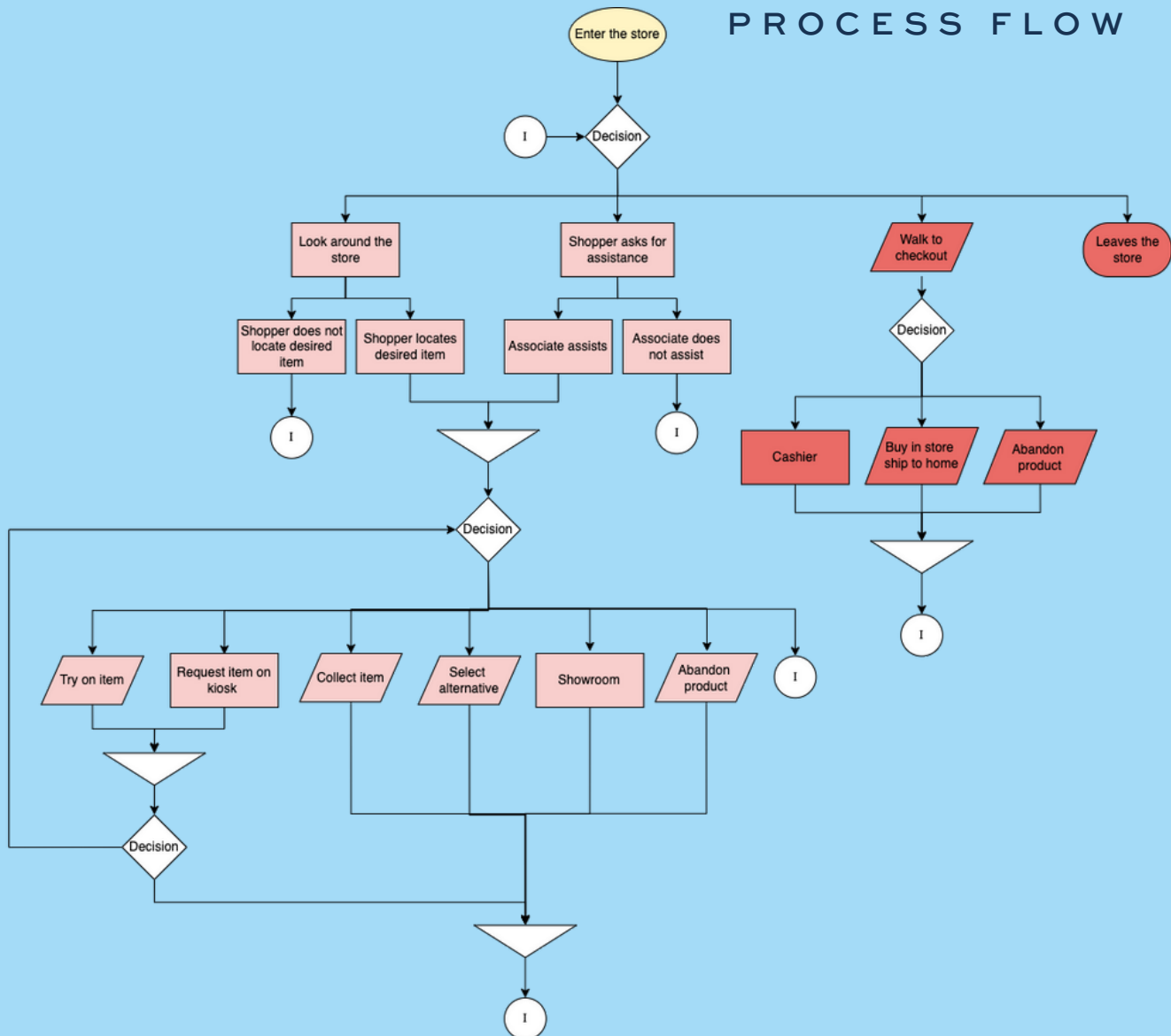
# PROCESS

Differences in the customer journey for traditional and Low Contact Model stores are detailed in the following process flows. As demonstrated, “Request item on kiosk” is now included with the Low Contact Model. While there is not a structural change in the LCM process flow, the frequency of fitting room utilization and try on item decisions are expected to substantially increase due to the changes in the retail blueprint. Customers rely on store associates to place requested SKUs into the threshold attached to each fitting room as the customer goes through the try-on process.

## TRADITIONAL PROCESS FLOW



## REFORMATION LCM PROCESS FLOW

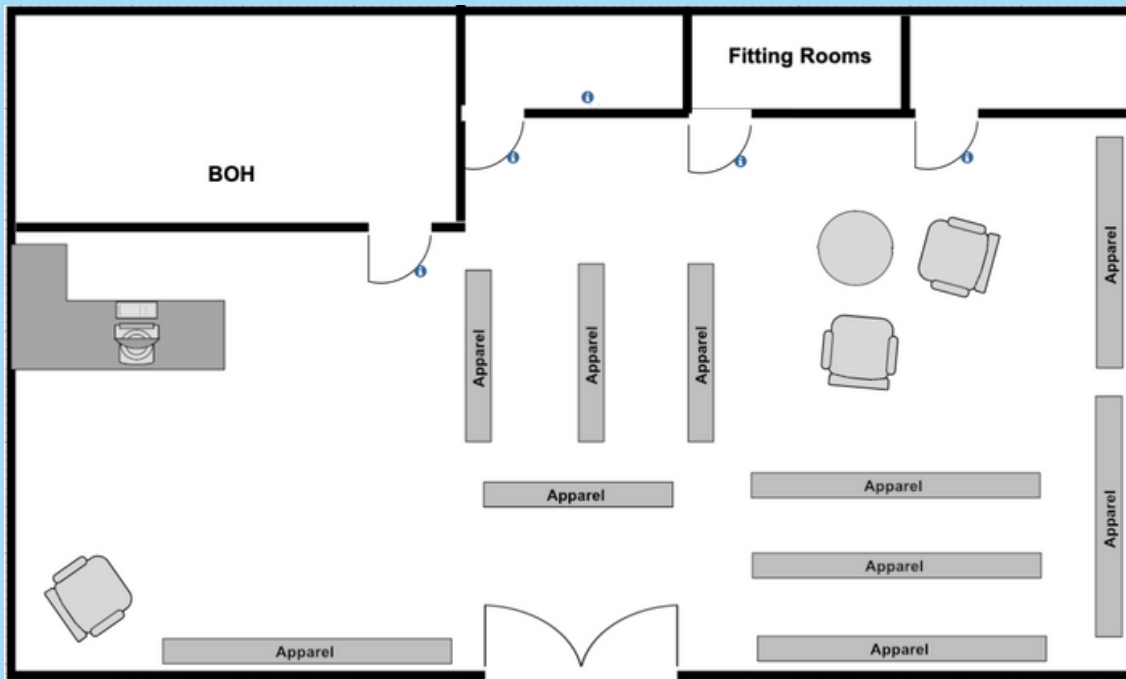


## LAYOUT

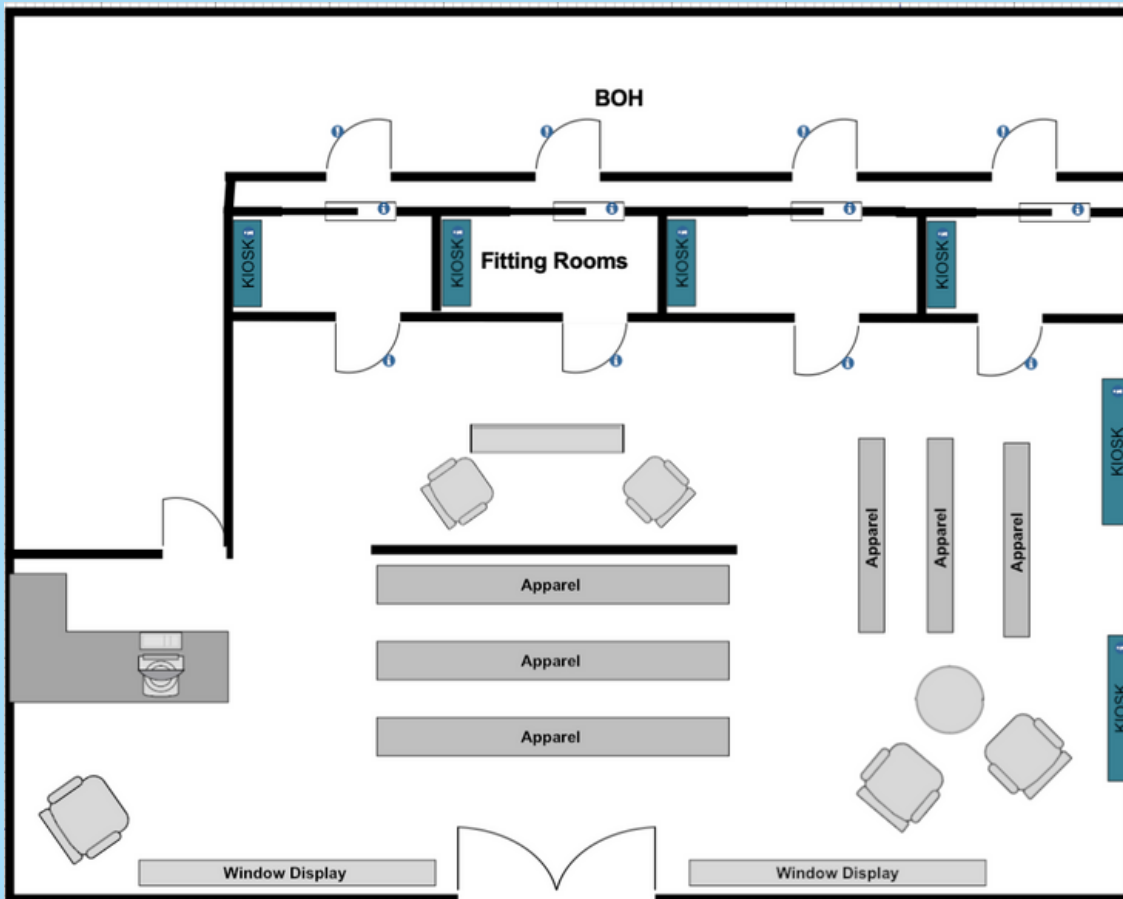
Reformation's LCM layout contains less displayed apparel and a larger BOH area for the majority of the store's inventory. A sample of each apparel item is displayed on the racks. The inventory moves seamlessly from the BOH into the fitting room thresholds by fast-moving store associates per customers' kiosk requests. The BOH connects to the fitting rooms via a sliding room which enables employees to place products in customers' fitting rooms after being requested on kiosks as well as provide them with alternatives once in the fitting room.



## TRADITIONAL BOUTIQUE STORE LAYOUT



## REFORMATION LCM STORE LAYOUT





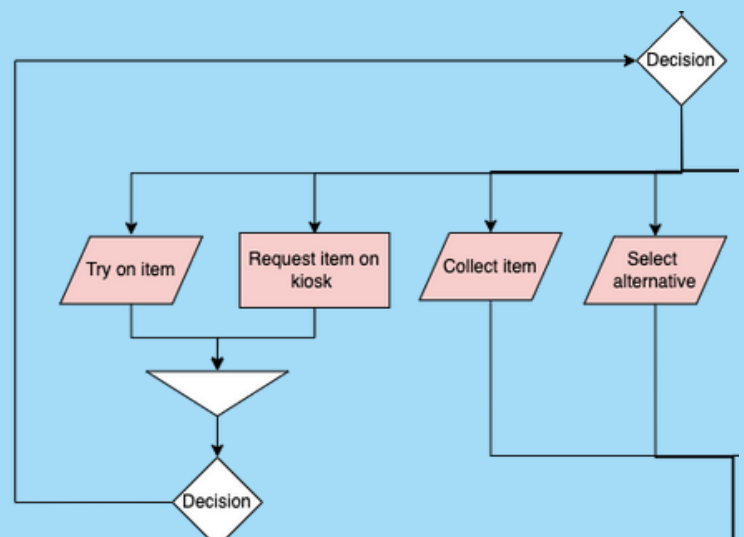
## M E T R I C S

Based on observed outcomes of the LCM Reformation Store, The DART Group pinpointed two metrics: dressing room utilization and store associate product knowledge. While we recognize there could be other metrics besides those previously stated, The DART Group narrowed the possibilities down to three for this case study.

### DRESSING ROOM UTILIZATION ( $\Delta D$ )

If a customer enters a traditional retail store, there is an industry benchmarked statistic that there is a 25% chance the customer will utilize the fitting room [8]. Because the Reformation LCM has the floor display strictly sample sizes of each style, there is limited access for customers to get a true feel of the item without requesting to try it on.

The LCM process flow shows the action of "Request item on kiosk" linking back to a decision diamond that accesses the "Try on item" action. The goal of the LCM is for the try-on process to become more desirable and easier for customers; thus, dressing room utilization would increase. While there is a lack of research available for the true amount of dressing room utilization that occurs for the LCM, retailers would be able to test using the PLM with little technical overhaul. In a non-tech Reformation store, an observer would be able to record the number of people who enter the store and what percent of those shoppers enter the dressing room over a set amount of time. The derived data from the traditional store would be compared to the observed foot traffic and mined data from the kiosks revealing the frequency of fitting room utilization in a tech store. It is important to note that shoppers who use dressing



REFORMATION LCM  
PROCESS FLOW

rooms are 70% more likely to make a purchase versus those who browse the sales floor at 28% based on an industry benchmark, so increasing dressing room utilization is of benefit to retailers [8].

## ASSOCIATE PRODUCT KNOWLEDGE ( $\Delta P$ )

In the Reformation LCM, the employee role involves BOH operations to man the fitting rooms. In a traditional Reformation store, the fitting room attendant has two functions once the customer is in the fitting room: retrieving additional/different SKUs the customer requests and returning the unwanted items from the fitting room. In the Reformation LCM, the fitting room attendant in the BOH has three functions: garnering the requested items for the in-store kiosks, retrieving additional /different SKUs the customer requests once in the fitting room, and returning the rejected items. By continuously interacting with the product the customer is requesting and rejecting at the beginning of the journey, the employee consistently sees which items are successful in regard to fit, quality, and style. Additionally, the kiosk technology stores information on what specific items are being sent to the fitting room, back, and to check out. Employees can leverage this increased level of product knowledge to inform better and assist customers. Moreover, increased product knowledge can be utilized by corporate buying offices as tangible evidence of product success or failure. It is a metric that benefits the overall experience for the customer in a retail model. For example, if an item is being sent back frequently after being tried on, corporate can investigate product development. If an item is seldom sent to the dressing room in the first place, corporate can work to merchandise the item better.

## CONCLUSION

Quantifying customer experience propels us closer to the goal of closing the knowledge gap. The DART Group will continue to aid retailers in enabling systems that better align with customer demands. By partnering with The DART Group, retailers will increase engagement and ease shopping experiences to drive sales.

# CONTRIBUTORS

## PROJECT TEAM

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## ABOUT THE RFID LAB

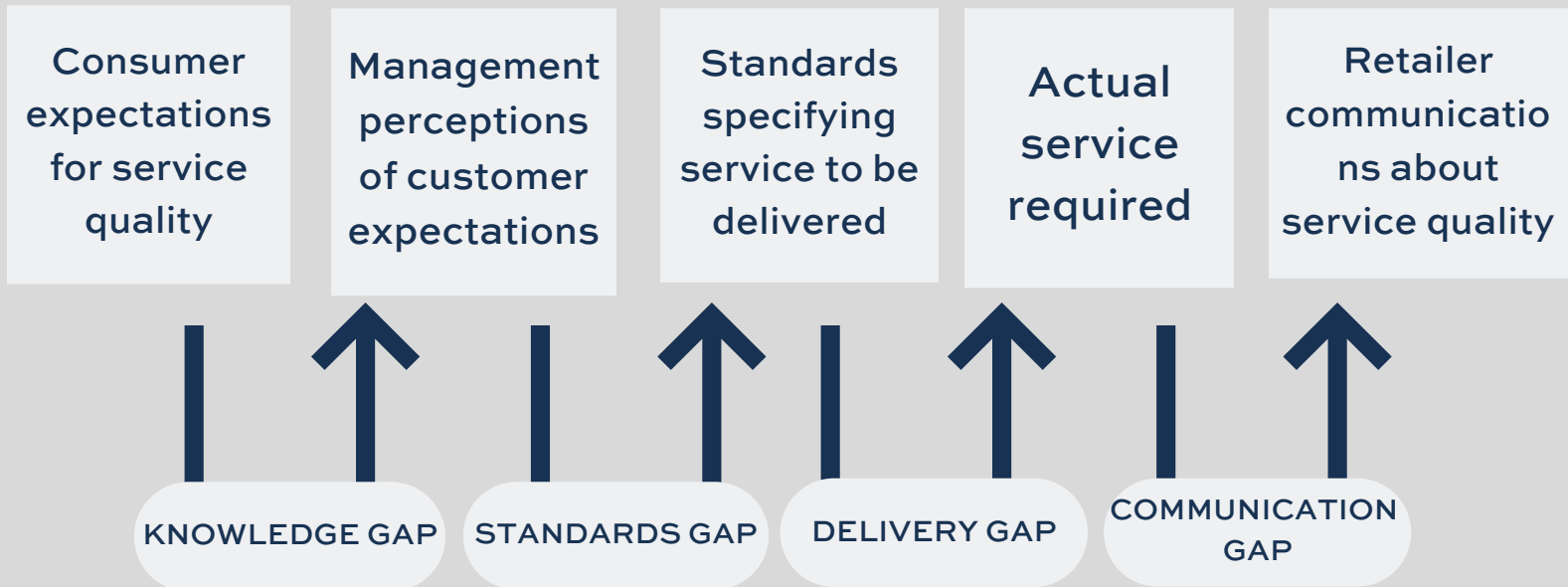
The Auburn University RFID Lab is a research center that focuses on the business case and technical implementation of emerging technologies in the retail, aerospace, pharmaceutical, and manufacturing industries. Since its inception in 2005, the RFID Lab has conducted a series of seminal business value studies that have led to the adoption of RFID and other IoT technologies. Sponsors of the RFID Lab include Avery Dennison, Boeing, Checkpoint, Delta Air Lines, FedEx, GS1 US, Hanes Brands, Kohls, McDonald's, Nike, NXP, PVH, Sensormatic, SML, Tageos, T-Mobile, Walmart, and Zebra Technologies. If you would like to connect with the Auburn University RFID Lab, please contact Justin Patton at [rfidlab@auburn.edu](mailto:rfidlab@auburn.edu) or 334-734-4034.

## REFERENCES

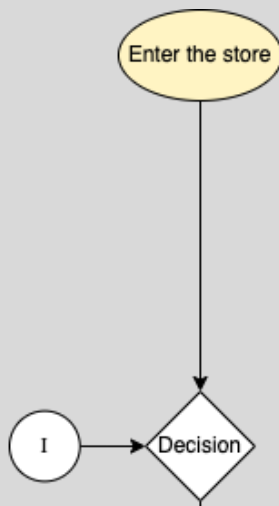
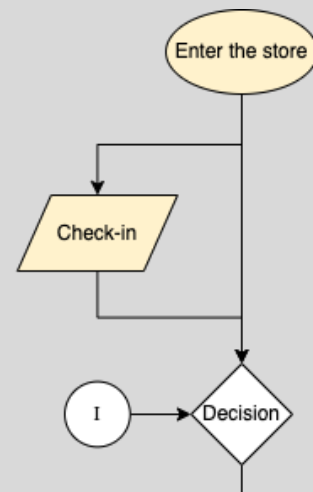
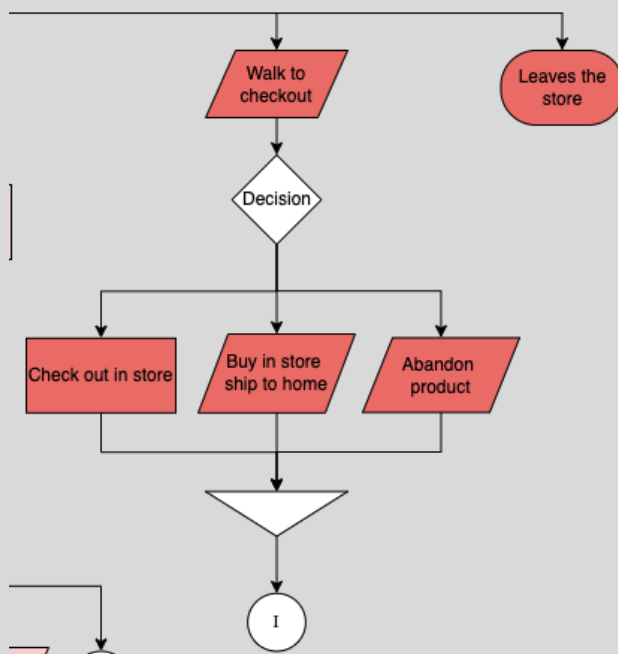
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# APPENDIX 1

## THE GAPS MODEL



## APPENDIX 2

TRADITIONAL  
ENTRANCEJUST WALK OUT  
ENTRANCETRADITIONAL  
GROCERY EXITJUST WALK OUT  
EXIT