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Retail Relay (A)

The last-mile delivery cost kills most home-delivery businesses. I knew we could find a better way.

—Zach Buckner, CEO of Retail Relay

During the summer of 2007, Zach Buckner, the 31-year-old founder and CEO of Retail Relay, was again confronted with an ongoing frustration of daily suburban life. After his third trip to a local hardware store to get supplies for the same home improvement project, Buckner realized that a one-day project had now effectively become an all-weekend affair. He had spent more time shopping than installing new wiring in his 1930s-era house. Buckner had studied electrical and systems engineering and completed many consulting assignments for companies looking to improve their business operations. He drew on that knowledge and experience to come up with the concept of Retail Relay (**Figure 1**). And a new paradigm for online shopping was born.

Figure 1. Retail Relay's delivery trucks, which also served as moving billboards.

Source: Case writer photograph.

Although online retailing was certainly not a new concept, Buckner's approach was unique. His overall objective was to provide a solution to a problem faced by all Americans: time wasted, inefficiencies, and costs caused by the daily need to run errands. His initial concept was to provide an online means for consumers to order and purchase goods from a variety of local retailers (i.e., grocers, hardware stores, clothiers), minimizing the burden of making trips to individual stores. Although the obvious solution was to provide convenient delivery service to customers' homes, Buckner soon realized there was no way to make this economically feasible.

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Many online businesses that had entered the home-delivery market had failed. Perhaps the most spectacular of these early failures was Webvan, a grocery home-delivery service that at its height operated in 10 metropolitan areas in the United States. Webvan built a billion-dollar order-processing, warehousing, and delivery infrastructure. Its revenues and profits never came close to covering its capital outlay, however, and in 2001, it filed for bankruptcy protection.

But not all these home-delivery businesses had failed. Bolstered by substantial growth in both online retailing and the market for fresh, organically produced food items, Long Island food purveyor Fresh Direct had enjoyed considerable success.[1] Founded in 1999, this online grocery business was built on offering custom-prepared groceries and meals for its customers. By sourcing food items directly from local farms, dairies, and fisheries and preparing meats, breads, and so on in an on-site warehouse facility, Fresh Direct was able to reduce transit time and improve the quality and freshness of its products, while also reducing costs by eliminating the need for a middleman. In that sense, Fresh Direct acted in many ways like a traditional grocery retailer, buying direct and carrying inventory. Though its delivery area was still limited mainly to Manhattan, Brooklyn, and Queens, there were plans to expand.

Buckner was determined not to repeat the mistakes of others. To make Retail Relay successful, it would be imperative to cut out "last-mile delivery costs" and to minimize up-front working capital requirements. Last-mile delivery costs greatly reduced operating margins. Getting a truckload of products to a single neighborhood or workplace location was not nearly as costly as paying for drivers and trucks to bring products to individual homes. Likewise, a simple initial distribution system would not require the kind of "Willy Wonka operation" that had strained the financial viability of so many other businesses.[2] Fresh Direct had been able to make its more expensive warehouse and home-delivery system work, but it operated in a densely populated area of New York City. Buckner wanted to find several locations that were convenient for many customers, both in location and in ease of order pickup. These pickup locations would be the "relay" point for the grocery items on their journey from farm or store to the customer's home. If these cost-reduction measures were successful, they would allow Retail Relay to provide this service to customers without charge, which effectively meant customers would pay the same price for these items as if had they had shopped at the retailers' stores themselves.

Although the original plan was to sell much more than grocery-type items, initial sales feedback confirmed that local, natural, organic, and healthy foods and household items were by far the best-selling categories. The custom leather belts did not sell. Neither did electrical wiring. Retail Relay soon narrowed its business concept, becoming a grocery- and farm-product retailer.

Even though the company abandoned the idea of selling a vast selection of nongrocery items early on, it was still important to offer customers a wide selection of grocery items. A narrow selection would not achieve the goal of reducing the amount of time customers spent grocery shopping because they might still have to stop at a store to pick up items Retail Relay did not offer. Customers wanted to buy free-range chicken and freshly picked English peas, but they also wanted to buy paper towels and laundry detergent—and, if possible, they wanted to avoid a supermarket trip entirely. While signing up large grocery retailers as suppliers had the advantage of quickly producing a large available assortment, these large retailers had little to gain and potentially much to lose by acting as Relay's suppliers. Sales through Relay might cannibalize their own in-store sales. For this reason, the initial push for suppliers focused on smaller, boutique-type retailers, restaurants, and local farms. For smaller retailers and farms, Relay offered a promising new vehicle through

[1] U.S. sales of organic foods stood at about $6.2 billion in 2009, after several years of growth rates exceeding 20% per year.

[2] Zach Buckner used the phrase "a Willy Wonka operation" in reference to the movie *Willy Wonka and the Chocolate Factory* as a way of implying a highly elaborate and automated system.

which to reach a previously untapped consumer market with its goods, and their risk of cannibalization was small.

When putting forth proposals to local businesses, Retail Relay experienced overwhelming acceptance, with a 100% positive response rate from the retailers it approached with this collaborative opportunity. Retail Relay enlisted more than 40 unique suppliers, covering a wide assortment of grocery items. Large supermarkets such as Whole Foods, however, were not used as suppliers.

Retail Relay Operations

Retail Relay set up initial operations in Charlottesville, Virginia, a city that had a population of 50,000 and that was home to the University of Virginia as well as several other large private and government employers. Although pockets of poverty existed in Charlottesville, significantly more than the average number of residents could be described as having a high level of income and/or a high level of education.[3] It also had an unusually high proportion of residents who were interested in local and organic food. Retail Relay's management team believed that Charlottesville was an ideal location in which to test its concept.

The typical customer order and product pickup process followed six discrete steps:[4]

1. Customers submitted orders and paid for them online at RetailRelay.com, selecting from what evolved into an assortment of mostly grocery and home products. Customers wanting to pick up their orders the next day had to place them by midnight the night before.
2. Orders were downloaded by Retail Relay immediately after midnight and were then broken down and transmitted to participating retailers.
3. Retailers used these orders to pack and sort bags by customer number.
4. Orders were picked up by a Retail Relay driver the following morning and returned to the warehouse, where they were manually re-sorted.
5. Orders from multiple retailers were re-sorted by customer and repacked onto the truck in the appropriate temperature zone (shelf-stable, refrigerated, frozen) (**Figure 2**). Any one customer might have bags from several retailers and multiple bags from a given retailer.
6. Finally, orders were transported to the customer pickup location in a Retail Relay truck.

[3] "Demographics," City of Charlottesville, http://www.charlottesville.org/Index.aspx?page=576 (accessed July 21, 2011).
[4] Retail Relay did offer a fee-based home-delivery option, but this constituted a small part of its business.

Figure 2. Retail Relay driver loading the truck and waiting at a pickup location.

Source: Case writer photographs.

Although not as cost prohibitive as home delivery, collecting, sorting, and delivering products to the pickup location cost money. Because individual suppliers removed ordered products from their own shelves and had them ready for the Retail Relay driver near the front of the store, it took drivers very little time to collect merchandise from individual suppliers. It took very little time for the driver to move from one supplier to the next during the collection process because the community was relatively small. Overall, the costs associated with collecting merchandise from suppliers were negligible.

Sorting products by customer and distributing them to customers was costly. Because this sorting process was very labor-intensive, an individual worker could sort only about $400 of product per hour. The cost of labor, both for workers who sorted and for truck drivers, was about $15 per hour. Unlike product collection, distribution was not a quick process. Drivers had to drive to the pickup location and wait for three to four hours while customers came by to pick up their orders. On average, a driver would spend about five hours transporting product from the warehouse to the pickup location, setting up at the location, waiting for customers to pick up their orders, and then returning to the warehouse. A fully loaded truck could carry about $3,200 of merchandise and made deliveries about 200 days per year. The trucks themselves were utilitarian, lacking the comforts of longer-haul vehicles. They were also inexpensive to operate. Retail Relay estimated that the total cost of a truck, including maintenance and fuel, was about $3,000 per year.

Prices and Promotions

The basic contract with suppliers stipulated that suppliers had to sell products to Retail Relay at 15% less than their in-store shelf price. The retail price to customers was set to the current shelf price at the supplier's brick-and-mortar establishment. Suppliers were required to enter their own product prices—using in-house-developed iPhone, BlackBerry, and Android applications—into Retail Relay's ordering system. While it was possible for Retail Relay to audit its system to make sure its prices were indeed the same as an individual supplier's regular shelf prices, it was more difficult to know whether every deal price offered at a supplier's store was passed through to Retail Relay customers. As a practical matter, management believed that some suppliers were more diligent than others in making sure their Retail Relay price matched their true shelf price.

Retail Relay engaged in a limited amount of price promotional activity. New customers generally received a coupon for 10% off their next purchase, printed on the receipt of their first purchase. On the second

purchase, they received a 5% discount coupon for a third purchase. The redemption rate of these coupons on qualified purchases was high, around 80%. The rationale behind these first- and second-purchase coupons flowed from two studies that Retail Relay did involving purchase data from customers. The first, a small pilot study, tracked the purchase activity of 81 randomly chosen customers who had made their first purchase with Retail Relay before June 2009. In constructing the pilot study, management wanted to be sure it could track these individuals over a period long enough to observe many purchase occasions. The company was growing very quickly, and many of their customers were new and, as such, had made only a small number of purchases. Given that the average interpurchase interval for individuals in this sample was approximately three weeks, and that the end of the time frame for analysis was February 2010, it seemed reasonable to restrict the pilot group to those who had made their first purchase at least nine months earlier. Descriptive statistics for this pilot study are provided in **Exhibit 1**.

Two things stood out in the results of this pilot study. First of all, many people seemed to be purchasing from Retail Relay once and not returning to make another purchase. Of the 81 customers who tried Retail Relay, 32% never returned to make a second purchase. Second, the average size of the basket of goods purchased increased once an individual became experienced in dealing with Retail Relay. The average size of an individual's first purchase was $49.51, whereas someone who had ordered from Retail Relay frequently made an average purchase of $92.91 on their 20th purchase occasion. Both of these findings suggested to management that offering promotions for the second and third purchase occasion to get new customers "over the hump" might be an effective way to retain those customers.

Once the results of the pilot study were known, Retail Relay conducted a more extensive study using 587 randomly selected customers and choosing them regardless of when they had made their first purchase. The managers hoped this new, much larger sample size would provide more reliable results than those of the pilot study. Descriptive statistics for this study can be found in **Exhibit 2**. Indeed, the more extensive study showed an even larger attrition rate between the occasion of the first and second purchase—45%—a worrisome number for management. The results of the more extensive study were not convincing to everyone on the management team. In particular, some were concerned that using a sample containing many individuals who had only recently become customers would bias the analysis because management would not be able to observe anything other than their first few purchase occasions. Whether the pilot study or the larger study provided a more accurate depiction of customers' purchase patterns was an open question.

Retail Relay tested the value of home-delivered flyers as well, distributing 2,000 of them to homes in a Charlottesville subdivision. The flyers contained a coupon for 10% off the total price of a Retail Relay order. The cost of this door-to-door program, including printing, transportation, and labor, was approximately $1,200 and produced a total of seven uses, all of which were new customers.

Retail Relay also tested coupons inserted in Valpak "blue envelopes"—mailers that contained coupons and promotional offers from many companies, most of them local. Retail Relay's coupon offered $5 off any purchase of $25 or more and $15 off a purchase of $100 or more. An example of the Valpak insert can be found in **Exhibit 3**. Purchasing insert coverage across three separate mailings at a cost of $1,100, Retail Relay was able to reach approximately 60,000 homes in the greater Charlottesville area. Based on coupon redemptions, which required customers to input a promotional code when they submitted their online order, and previous purchase data, management determined these Valpak inserts were redeemed by 58 new customers and 10 existing customers.

Management wanted to determine the profitability of these promotions. An important part of this analysis would be the determination of customer lifetime value (CLV), a metric that assigned a dollar value to a potential new customer. A CLV analysis of its customer-level data would allow Retail Relay to answer the question, "If I acquire a new customer, on average how much money is that customer really worth?" The

Appendix provides a description of how to apply CLV analysis to the data contained in the supplemental Excel spreadsheet accompanying the case (UVA-M-0784X).

New Customer Acquisition and Retention

Aside from its limited foray into direct-to-consumer price promotions, Retail Relay employed several tactics to recruit new customers and retain existing ones. It set up informational booths at various community functions around Charlottesville (e.g., Discovery Museum Fair, Vegetarian Festival, and Virginia Festival of the Book), and management was available for local talk radio programs that catered to Retail Relay's target audience. But by far its largest promotional investment, in terms of both time and money, was its e-mail and social media campaigns. Beginning each Sunday, promotional Retail Relay e-mails were distributed to thousands of existing customers as well as to others whose e-mail addresses had been obtained during other promotional activities. E-mail delivery was staggered to ensure that existing customers would receive messages one day prior to their regular order day to serve as a reminder as well as to offer special information in a timely manner.[5] A sample promotional e-mail can be found in **Exhibit 4**. To further promote awareness through this medium, Retail Relay established partnerships with large local employers who sent e-mail blasts out to its employee base, offering exposure to an expanded group of potential customers. Individuals could also become fans of Retail Relay on Facebook, and its Facebook page was regularly updated with new information on suppliers, recipe suggestions, and comments on what produce was starting to come in season.

Through all this activity, Zach Buckner and his recently hired new president, Arnon Katz, a 2009 graduate of the Darden School of Business, wondered if the customer acquisition and retention activities were really worth what they cost the business in time, money, and aggravation. As the customer base grew, perhaps they should simply allow word-of-mouth advertising from existing customers to filter through the rest of their target audience. Retail Relay's growth rate was robust, averaging 25% per month over the previous six months, and ramping up the home-delivered flyers or Valpak mailers did not seem to be a great use of time and money, particularly in the small market of Charlottesville.

The Richmond Expansion

In its Charlottesville birthplace, Retail Relay was enjoying robust and profitable growth, but Buckner and Katz had already made plans to expand to other locations. On the immediate horizon was a planned expansion in summer 2010 into the Richmond, Virginia, market. Katz was put in charge of making plans for the expansion, and there was much to consider.

The City of Richmond anchored a metropolitan area of approximately 1.2 million people; the population of the city proper was slightly more than 200,000. The city and surrounding metropolitan area were more economically diverse than Charlottesville. This market would present its own set of challenges. New pickup locations would have to be selected, a new sorting facility established, and—because Richmond was 70 miles from Charlottesville—a new supplier base developed. As Katz assessed the situation, he considered whether to enter the market with an aggressive customer acquisition effort, spending the profits the Charlottesville market had generated on promotions designed to gain rapid market penetration. He asked himself how much money a new customer was really worth and what the most effective promotional ideas for reaching new customers were.

[5] Customers often developed a regular pattern in their orders whereby it was possible to predict the most likely day of the week for their purchases.

On the flip side, Retail Relay could start with just a couple of pickup locations and let the business grow through the same word-of-mouth advertising that had previously been successful. Katz looked over the sizable amount of purchase and promotional data he already had and thought about how he could use this information to better market the company's products in Richmond. If Retail Relay had worked well in Charlottesville, then perhaps it would work well anywhere.

Exhibit 1

Retail Relay (A)

Descriptive Statistics of Customer Purchases Conditioned on How Many Times An Individual Has Ordered from Retail Relay (Pilot Study)

Order Number	Total Number of Observations in the Data	Conditional Probability of Observing Purchase Occasion *t + 1* in the Data if Occasion *t* is Observed*	Average Dollar Amount of Purchase
1	81	NA	$ 49.51
2	55	55 ÷ 81 = 68%	$ 62.28
3	44	44 ÷ 55 = 80%	$ 57.01
4	34	77%	$ 62.03
5	31	91%	$ 63.06
6	28	90%	$ 72.90
7	23	82%	$ 60.30
8	21	91%	$ 63.68
9	20	95%	$ 72.04
10	19	95%	$ 67.89
11	17	89%	$ 70.07
12	17	100%	$ 82.48
13	16	94%	$ 82.17
14	15	94%	$ 61.12
15	14	93%	$ 65.79
16	13	93%	$ 82.29
17	13	100%	$ 65.32
18	13	100%	$ 99.20
19	13	100%	$ 73.74
20	12	92%	$ 92.91
21	10	83%	$ 59.57
22	10	100%	$ 75.69
23	9	90%	$ 60.33
24	9	100%	$ 84.83
25	8	89%	$ 87.55
26	7	88%	$ 60.99
27	7	100%	$ 87.95
28	7	100%	$ 99.33
29	6	86%	$ 77.30
30	6	100%	$ 99.70

* For example, in the pilot study, if a customer makes two purchases, the probability that we would observe a third purchase is 80%.

Data source: Retail Relay.

Exhibit 2

Retail Relay (A)

Descriptive Statistics of Customer Purchases Conditioned on How Many Times An Individual Has Ordered from Retail Relay (Full Study)

Order Number	Total Number of Observations in the Data	Conditional Probability of Observing Purchase Occasion *t + 1* in the Data if Occasion *t* is Observed	Average Dollar Amount of Purchase
1	587	NA	$ 46.71
2	322	322 ÷ 587 = 55%	$ 56.71
3	240	240 ÷ 322 = 75%	$ 57.93
4	188	78%	$ 56.87
5	156	83%	$ 58.26
6	127	81%	$ 66.90
7	103	81%	$ 63.62
8	89	86%	$ 70.27
9	73	82%	$ 63.03
10	62	85%	$ 62.60
11	56	90%	$ 71.81
12	52	93%	$ 76.76
13	44	85%	$ 78.14
14	39	89%	$ 65.65
15	33	85%	$ 74.84
16	30	91%	$ 81.11
17	29	97%	$ 72.08
18	28	97%	$ 87.30
19	27	96%	$ 71.94
20	23	85%	$ 75.44
21	19	83%	$ 70.35
22	17	89%	$ 72.86
23	14	82%	$ 66.68
24	11	79%	$ 79.90
25	9	82%	$ 93.91
26	8	89%	$ 61.08
27	7	88%	$ 94.16
28	6	86%	$ 100.40
29	4	67%	$ 77.89
30	3	75%	$ 99.70

Data source: Retail Relay.

Exhibit 3

Retail Relay (A)

Valpak Insert

Source: Retail Relay. Used with permission.

Exhibit 4

Retail Relay (A)

Sample Promotional E-mail

The Eyes of a Farmer

As Relay gears up for a great season of local food vendors, this week we roll out two new farms, each with a story to tell. The folks at Babes in the Wood refer to their pigs as **forest-fed**—which helps to explain the incredible taste of their pork products.

Likewise, writer and former technology guru, **John Kiser**, is a truly interesting soul (those are his eyes!). He began selling lean, pastured pork to his friends from Meadow Green Farm in beautiful Rappahannock County ten years ago. Try his bacon—you will realize the connection between local and *taste* in a fundamental way.

Just So You Know Dept: We've just received a new shipment from your favorite local beef provider, John Whiteside, of Wolf Creek Farm. It's all part of our spring farm market, coming soon, which will be featuring locally grown produce, cheese, and meat from our region's **Buy Fresh, Buy Local** vendors.

Thank you for your orders this week! We look forward to serving you again.

What's New:

- Babes in the Wood
- Meadow Green Farm
- Virginia Trout

Exhibit 4 (continued)

Babes in the Wood, Dillwyn, VA
From birth until the time they are taken to a USDA butcher, Babes pigs live happily unconfined in the woods. The sows even raise their young in the woods! They eat nuts and berries and root around like, well, pigs. No hormones or antibiotics. No nonsense. The result is the best quality pork available.

Meadow Green Farm, Sperryville, VA
John Kiser's Yorkshire pigs live in a luxurious 19th century barn when they're not grazing on fescue and clover-rich pasture outside. Pigs are nature's front-end loaders and theirs get their minerals directly from the iron-rich Rappahannock soil rather than antibiotic-laced corn feed. They roam, they dig, and they graze. John lets his pigs be pigs.

Virginia Trout Company, Goshen, VA
Sometimes we find our vendors, sometimes they find us. Bryan Plemmons, of **Casta Line Trout Farms** in Goshen, gave us a call and said he had trout our customers might be interested in. We listened and checked it out. One of the oldest trout farms in Virginia, Casta Line got things going in 1965 and consistently garners Blue Ribbon honors from the Virginia State Fair.

The result is Virginia Trout, which gathers the best from 5 separate Highland County trout farms—each containing pristine mountain spring water. Trout are dressed or filleted immediately upon harvesting and frozen right away to preserve their freshness. Get your Omega 3's from this delicious fish!

Source: Retail Relay.

Appendix

Retail Relay (A)

Customer Lifetime Value

Customer lifetime value (CLV) can be calculated using a number of different methods. The most appropriate method is often governed by the features and restrictions of the data that is being analyzed. For a more complete discussion of methods for computing CLV see the referenced technical note on customer profitability.[1]

The data in the Excel file (UVA-M-0784X) have two important features that affect the way they should be analyzed. First, the data are organized by purchase occasion rather than by time period. Second, we can easily determine the probability that a customer who makes purchase number *t* will go on to make purchase number *t+1*. Therefore, we can also determine the probability that any new customer making his or her first purchase will continue to purchase through occasion *t*. Stated another way, these data allow us to answer questions such as "What is the probability that a new customer will make purchases from Retail Relay on at least 10 occasions?" The data set contains information on 30 potential purchase observations.

Instead of the constant retention rate found in some models of CLV, we have purchase-occasion-specific rates. The CLV expected from a new customer can therefore be calculated by **Equation 1**:

$$CLV = \sum_{t=1}^{30} \frac{r_t M_t}{(1+i)^{(t-1)}} \quad (1)$$

where:

r_t is the probability that an individual will make purchases on at least *t* occasions given that he or she has made one purchase. For the first purchase occasion, $r_t = 1$.

M_t is the dollar contribution margin of a shopping basket at purchase occasion *t*, adjusted for distribution costs and coupon-redemption expenses.

i is the relevant discount rate between any two purchase occasions. Because the average interpurchase time in this data is about 3 weeks, the relevant discount rate can be approximated by dividing the annual rate by about 17. More accurately, the annual rate (*a*) can be converted to the 3-week rate using **Equation 2**:

$$i = (1 + a)^{1/17.33} - 1. \quad (2)$$

It should be noted that the data provided in the Excel spreadsheet do not provide the retention rate (r_t), so some (minor) data manipulation is required. Finally, while the predicted CLV might increase if we had data beyond 30 purchase occasions, 30 is sufficient to provide a reasonably accurate estimate of CLV for the purposes of this case. The case provides data for what roughly a two-year CLV (30 weeks × average interpurchase time of 3 weeks = 90 weeks).

[1] Phillip E. Pfeifer, Paul W. Farris, and Neil Bendle, "Customer Profitability," UVA-M-0718 (Charlottesville, VA: Darden Business Publishing, 2005).