Velo.com Case

.Rmd Template | Data

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Case Description

Velo.com is a large UK-based online retailer of bikes and biking equipment. Started in 2016, the company already has customers around the world. Its business model is to facilitate extensive product customization at discount prices: customers are able to configure bikes to their exact specifications from a wide selection of parts such as derailleurs, brakes, handlebars, seats, frames, and wheels.

About a month ago one of the company's data scientists, Sarah Swan, noticed that customers seemed to be dropping off during the checkout process, especially when attempting to purchase complicated and potentially expensive custom bikes. She observed that such customers often visited the website multiple times to configure their bikes. Given that investment of time and effort, she expected to see a relatively lower non-purchase rate for these customers. She was surprised to discover that they actually had a *higher* non-purchase rate compared to customers with fewer visits.

Sarah was concerned. She reviewed data on the checkout system carefully, modeling the checkout process modeling to try to identify a problem. There seemed to be a constellation of issues with the cart system. Customers were able to save the contents of their carts, but it appeared that sometimes a revision to the cart caused all the items to be erased, especially for customers completing complicated orders with multiple items using their mobile devices. These customers would have to start over, and, in frustration, some apparently didn't. Customer service reported sporadic complaints. The data showed only indirect evidence of the problem. It was, moreover, hard to pinpoint the exact engineering flaw since cart erasure seemed to happen only occasionally, and only some customers responded by giving up.

Sarah raised the issue with Mark Fowler, the Director of Analytics, who invited her to give a short presentation to Velo's management team later that day. In the conversation after the presentation the company's CTO, Melissa Strike, remained skeptical.

Melissa Strike: "Haven't mobile purchases *always* been somewhat lower? Without clearer data we really have no way of knowing whether that has been caused by a broken checkout system or is just typical behavior for this customer segment."

Mark Fowler: "That's a good point, Mel. How does the phrase go? Absence of evidence is not evidence of absence. Sarah, do you have ideas for where to go from here?"

Sarah Swan: "I tend to think that our mobile sales *should be* overtaking computer, based on industry trends. But I agree that the evidence is not conclusive so far. I would recommend that we do an experiment to get a definitive answer. We could conduct an A/B test on two different versions of the checkout system. There would be significant upside revenue-wise if it turns out that there really is a problem and we are able to fix it."

Engineering a new checkout system for the A/B test would be a fairly expensive and lengthy process, of course. Melissa Strike was reluctant at first, but eventually agreed to have her team undertake the project after Mark Fowler offered to share the expense out of his analytics budget. The meeting adjourned.

The engineering team took about a month and a half to complete work on the new checkout system. Once they were done Sarah designed the experiment. The A/B test she had proposed would run for one month. After logging in, customers would be randomly assigned to either the original checkout system (the control group) or the revised system (the treatment group). Then, for every subsequent visit, customers would be presented with the same system they had used on their first visit. Random assignment would

guarantee that each customer would have an equal chance of being placed in either group, thereby eliminating at the outset of the experiment any systematic differences between treatment and control groups. (In particular this experimental design would remove any seasonal influence. Velo.com's business is, after all, highly seasonal, with increased sales in spring and summer. Because customers would be using the new and old systems simultaneously, during the same month, any difference in spending between the two groups should be unaffected by such seasonality.) The outcome of interest would be customer spending. Any statistical difference in spending between groups for the month of the experiment could then be attributed to the checkout system.

At the end of the experiment Sarah had plenty of data to analyze. She needs to recommend definitively whether to switch checkout systems. Note that the cost to switch systems would be negligible at this point since the new system has already been developed; these are sunk costs. What should she recommend?

Appendix. Description of the Data

Rows consist in purchase and spending information during the month of the experiment for velo.com customers who purchased at least 1 item. (Site visits without purchases are not included.) There is one row per customer. Some demographic characteristics of customers are included.

- *customer id*. Unique customer identifier.
- *country*. Customer country of residence.
- *gender*. Customer gender.
- *spent*. Aggregated amount customer spent during the experiment, in dollars, not including shipping.
- *purchases*. Number of items purchased during the experiment.
- *device*. Device most frequently used to make purchases: computer or mobile.
- *checkout_system*. Randomly assigned experimental group: treatment (new) or control (old).

Explore Data

Show 10 entries Search:

	customer_id	checkout_system	device	country	gender	purchases	spent
1	8968	old	computer	ESP	F	3	2217.78
2	36687	new	mobile	GBR	F	4	4304.56
3	42232	new	computer	DEU	F	4	396.59
4	82931	old	mobile	MEX	M	4	360.66
5	7010	old	computer	USA	M	4	2597.86
6	83252	new	mobile	GBR	F	4	1458.12
7	51631	new	mobile	FRA	F	4	1703.34
8	38122	old	computer	ESP	M	4	1910.86
9	29745	old	mobile	USA	M	5	1702.61

	customer_id	checkout_system	device	country	gender	purchases	spent
10	1151	old	computer	FRA	M	2	1937.69

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