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Retention Modeling at Scholastic Travel Company (B)

As David Powell progressed with building various models, he shared the results with one of the analysts at Scholastic Travel Company (STC), Emily Glenn. In particular, his models thus far were approximately 75% to 80% accurate—meaning they were correctly predicting which customers would return on their own and which would not in 75% to 80% of the cases. In the remaining cases, the models were making mistakes: either incorrectly predicting that customers would be retained when they had not been, or incorrectly predicting that customers would not be retained when they actually had been.

Glenn and Powell grabbed a coffee and had a quick chat. She was generally impressed with the initial results. "Quite a bit better than just guessing!" Glenn said. She also pointed out, however, two potentially valuable kinds of data that Powell had not been using thus far.

First was the net promoter score (NPS) data. NPS was a common metric for measuring customer satisfaction. The customers were asked, "How likely are you to recommend STC to a colleague?" The possible responses ranged from "extremely likely," which was awarded the score of 10, to "not at all likely," which was awarded the score of 1. To calculate the number of net promoters, one took the number of those who responded with 9 or 10 (referred to as "promoters") and subtracted the number of those who responded with 5 or less (referred to as "detractors"). The "score" was then the proportion of net promoters among the number of respondents. STC started collecting customer answers to the NPS question in 2008, but initially it did little to enforce customer responses. This changed over time, and so there had been more data in recent years. Second was the data on group formation. As Glenn explained, under the "teacher organized, parent paid" model that most groups followed, STC monitored the registration of the parents/students on its website, and therefore it knew when each group reached a certain size. A size of 20 to 35 was considered healthy, and the belief was that the schools that were able to put together groups of large size were more likely to be retained.

"Do you think these would be helpful?" wondered Glenn.

"Of course!" Powell sounded excited. "I would need to think about how to deal with the missing values, but beyond that, these data should only improve the accuracy. Do you have access? Can you send them to me?"

"We were actually looking at these just last week," Glenn replied, "so I have all the data in one place. I can send them to you almost right away."

"Perfect! Thank you so much—glad I spoke to you. Looking forward to working them into my models."

"Done deal; it was nice chatting with you too, David," said Glenn, as she turned to walk up to her floor.

A few minutes later, Powell received a file from Glenn (see **Exhibit 1**).

This disguised case was prepared by Anton Ovchinnikov, Distinguished Faculty Professor of Management Science and Operations Management and Scotiabank Scholar of Customer Analytics at the Smith School of Business, Queen's University, Canada.

Exhibit 1

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Sample of NPS and Group-Formation Data, and Corresponding Data Dictionary

ID	NPS 2011	NPS 2010	NPS 2009	NPS 2008	>= 3 FPP Date	>= 10 FPP Date	>= 20 FPP Date	>= 35 FPP Date
1	10	10	10	10	6/6/2010	6/18/2010	8/17/2010	8/30/2010
2	9	10	10		12/15/2009	1/20/2010	5/31/2010	
3		10	10		6/9/2010	6/9/2010	10/26/2010	
4	10		10		1/6/2011	1/6/2011		
5	10		10		5/13/2010	5/24/2010	5/27/2010	6/1/2010

Note: This table only presents the first five rows of data.

Data source: Company data, adjusted by author.

Data Field Name	**Example**	**Description**
NPS Score - 2011	10	This is the answer given to the traditional net promoter score (NPS) question: "How likely are you to recommend STC to a colleague?" 10 being "extremely likely" and 1 being "not at all likely."
NPS Score - 2010	10	This is the answer given to the traditional NPS question in 2010, if any.
NPS Score - 2009	10	This is the answer given to the traditional NPS question in 2009, if any.
NPS Score - 2008	8	This is the answer given to the traditional NPS question in 2008, if any.
>= 3 FPP Date	22/03/2010	This is the date on which at least three full-paying participants (FPPs) had been registered for the group. It can be subtracted from the departure date to see how early the group started to form, whether it was in the spring or the fall before the trip, etc.
>= 10 FPP Date	02/06/2010	This is the date when the number of registrants in the group exceeded 10. This is often viewed as the minimum amount ("critical mass") for a group to successfully travel. Groups this small will be combined with other smaller groups to make a more efficient program in the field.
>= 20 FPP Date	18/05/2010	This is the date when the number of registrants in the group exceeded 20. This is often viewed as a healthy group size. Groups this small will still be combined with other smaller groups to make a more efficient program in the field.
>= 35 FPP Date	26/05/2010	This is the date when the number of registrants in the group exceeded 35. This is often viewed as a large group. Some groups can get up to 200 FPPs, but the general gist is that groups of 35+ retain at a much higher rate than smaller groups.

Data source: Company data, adjusted by author.