The causal impact of customers' attribute on product retention: A case study on Microsoft Teams collaborative app

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Abstract: Microsoft's customer strategy for on-boarding commercial users to the cloud consists of four main steps: (1) migrate from on-premises to online document and email services, (2) develop cloud collaboration – via email groups, document co-editing and co-authoring, (3) create cloud communities that gather users from the same company who often work together, and finally (4) adopt Microsoft Teams as a platform for modern collaboration and teamwork. Given this on-boarding strategy, we expect that users who are members of cloud communities to retain on Teams App longer. Previous observational studies revealed a strong positive correlation between cloud community membership and retention on Teams. However, the question remained as to whether community membership actually caused greater retention on Teams or whether there was another factor that was causing the observed lift. To understand the true impact of community membership, we must consider all confounding factors including usage patterns across the Microsoft 365 suite, user/company attributes, and behaviors of collaborators/colleagues. Here, we implement causal inference approaches of increasing robustness to validate the current customer on-boarding strategy and estimate the user-level causal effect of cloud communities on Microsoft Teams retention. Retention status was measured not only as a binary variable at different checkpoints in time, but also as a continuous variable expressing the total number of days since the user's first activity on the app. Together, they give a more holistic perspective of user retention that marketers can leverage to make better decisions. We compare the results of an outcome model alone to a doubly-robust framework where users are first assigned a weight computed via inverse propensity scoring. We find alignment and consistency across the training cohorts as well as two distinct test sets. Sensitivity to treatment strength was analyzed by adjusting the community size or collaboration intensity thresholds. This revealed a larger impact of cloud community membership on retention in the case of stronger treatments. This procedure unlocks the possibility for Microsoft 365 business to quantify the causal impact of pre-on-boarding behaviors on Teams' app retention. Not only does it confirm the rationale underlying the marketing strategy described above, it also provides a benchmark against which to assess the success of future campaigns.

Bio: Min Kang is a data scientist at Microsoft. Min has been working on commercial and research projects at Microsoft related to time series analysis and causal inference on commercial and medical data sets. Prior to Microsoft, Min was a data scientist at GE for building predictive algorithms and received PhD and MS from Georgia Tech in Industrial engineering department where she developed algorithms with wavelet transforms and Bayesian statistics for health care applications. Min also holds MS degree in Network and telecommunications from Politecnica de Madrid during her internship at Telefonica research.