*ABSTRACT*

With the increasingly competition in the telco industry in Indonesia, especially for postpaid services, which is indicated by declining postpaid market share in one of telco operator and also a high cellphone penetration rate in Indonesia, this study identifies customer behavior to predict and knowing the important factors of service migration, in order to find out existing potential prepaid customer that will migrate to postpaid in Telkomsel. Next step will be segmentation based on prediction results and customer behavior, so that they can be given the appropriate service offering. Migration services from prepaid to postpaid, is expected to increase revenue for Telkomsel.

The author predicts and analyzes customer segmentation in migrating using hisrotical data record. The dataset consists of several behavioral variables including Length of Stay (LoS), Average revenue per user (ARPU), purchase transaction and recharge. Data were analyzed using machine learning methods with random forest algorithms to predict customer migration and k-means clustering to analyze the prepaid customer segmentation that would potentially migrate to postpaid. For package offerings that are in accordance with the segment, it is conducted through interviews and discussions with expert practitioners.

The results of the migration prediction analysis using Random Forest with 37 input variables and using 515,215 data records, obtained prediction accuracy of 97.9% with the top 5 significant variables, namely the length of day using Telkomsel services, the nominal amount of credit purchases, the total usage and purchase of internet services, the number of total weekend voice service transactions and internet usage. The results of segmentation using k-means, obtained by 5 clusters, Promo Seeker and Internet Savvy, High Value and Heavy Data User, Loyal Traditional User and Early Internet Adopter, Loyal and Advance Data User dan Potential Data User with Combo Service with silhouette value index 0.457 which means the validity of segmentation is in the fair category.

By using the k-means clustering, the prepaid customer segment in Telkomsel which is predicted to migrate to postpaid comes from the promo and internet savvy segment, with an average internet usage reaching 3.1 gigabytes and an average recharge of Rp. 95,224 every month, the number of customers in this segment reaches 160,940 customers with a proportion of 55.9%. It is hoped that these results can provide an overview of the predicted migration results and also the characteristics of prepaid customer segmentation that will migrate, and can also be used to provide special offers and marketing programs that are appropriate to the characteristics of the segment.

***Keywords:*** *Market Segmentation, Customer behavior, marketing strategy, analytical data*