Meisam Nejazinia

APA and Purdue

مثل یک مقاله می‌خواهم درست کنم ←⊙

my main problem: names
1. a / an / s, the → singular, plural
2. adjective name compatibility → singular plural
3. Consistency in Comma
4. $\bigcirc$ & $\bigotimes$ = $\bigotimes$ $\bigcirc$
   ↑ true

- apostroph problem in latex

5. bullet > 3
6. periods — oxford
7. when two   no Comma
   before and
8. including   does not need
   such as
   Comma , unless sentence
   Continue next
9.   with
   Comma if propositional phrase
   sentence starts

Title: Social Network Structure Effect on Consumer Purchase Decision and Churn

PhD Student: Meisam Hejazinia

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Supervisor: Professor Ernan Haruvey

Executive Summary

Consumer churn is among the top five concerns of telecommunication firms. Most of the churn methods take into account the characteristics of the services given to consumers, consumers' complaints, and consumers' demographics, yet they overlook consumer interactions. Similar to influential users in social networks playing an important role in generating revenue for service providers, the structural characteristics of telecommunication networks play an important role in reducing churn and providing targeted promotions. In this project, we analyze telecommunication network structure, and derive measures of tie strength, exposure, and degree of connections to find their effect on consumers' decisions.

We will model the consumer decision in two stages. In the first stage, the consumer decides whether to stay with the current firm or switch to a different network. In the second stage, the consumer decides which voice, message, and data package to use. We will separate the effect of intrinsic preference for the service from the social effect of selecting telecommunication network. Our study will determine: (1) the extent of effect of influential users in telecommunication networks on other consumers' choices (2) how influential users affect their neighbors' choice (3) how influential users make their own choice (4) how targeted promotional policy will affect consumers' decision to churn and consumers' decision to select a package. These four findings will allow managers to reduce cost of promotion and increase consumer retention.

Projected Time Frame: 6 months

Deliverables

- Result of analysis based on effect of social network structure on churn
- Promotion plan based on the consumer's position in telecommunication social network

Extra Deliverable

- High-level analysis on the subject of interest of the firm, as an extra delivery, based on analysis of given data, free of charge

Element of data

1. Sample should have size of 10,000, and it should include all on-net, off-net, international call details for 12 month period.
2. Sample should be representative of telecommunication network
3. Sample should include A-party number and B-party number or trackable primary key that masks them. (refer to Data Policy section)
4. Sample should include number of minutes, date, time and cost of each call
5. Sample should include daily balance and daily usage of consumers
6. Sample should include promotion information
7. Sample should include service records of call center, and any data that shows customer satisfaction level: e.g. disconnection complaints, payment complaints, etc.
8. Sample should include demographics of parties, including gender, age, ethnicity, location and activation date
9. Sample should include monthly consumer's churn and monthly consumer's account balance
10. Sample should include package of data, voice, and message or any complementary service that consumers could have used, such as ring back tone(RBT) or location-based service (LBS) with their call service

Data Policy

- The data usage would be done under non-disclosure agreement (NDA).
- Based on the company's policy, we add or remove the name of the company in the research paper.
- For confidentiality of consumers, phone numbers (MSISDN) could be masked with unique keys.

[handwritten top margin: 12pt font]

Title: Social network structure effect on consumers purchase decision and Churn

PhD student: Meisam Hejazinia *[handwritten: #610 write out]*

University of Texas at Dallas

Contact: mxh109420@utdallas.edu

Supervisor: Professor Ernan Haruvey

Executive Summary *[handwritten: is]*

Consumer churn has long been among top 5 concerns of telecommunication firms. Most of the churn methods take into account the characteristics of the services given to consumer, consumer complaints, and consumers' demographics, yet they miss a big portion of the story which is consumer interactions. Just like in social networks that influential users play important role in activity of consumers and revenue generation of social network service providers, in telecommunication networks the structural characteristics of social networks (consisting of calls between different subscribers) can play significant role in reducing churn and providing targeted promotions. *[handwritten: new paragraph]* In this project we try to analyze telecommunication network structure, derive measures of tie strength, exposure, and degree of connections to find their effect on consumer's decision. We will model the consumer decision in two stages. In the first stage the consumer decides whether to stay with the current firm or switch to different network. In the second stage the consumer decides which voice, SMS, and data package to use. We will try to separate the effect of intrinsic preference for the service from the social effect of selecting telecommunication network. Our study will try to figure out *[handwritten: determine]*: (1) the extent of effect of influential users in telecommunication network on other consumers choice (2) how influential users affect their neighbors' choice (3) how influential users make their own choice (4) how targeted promotional policy will affect consumers' decision to churn, and consumers' decision to select a package. These three *[handwritten: four]* findings will allow managers to reduce cost of promotion, and increase consumer retention.

[handwritten: Projected] **Time frame**: 6 month

Deliverables

- Result of analysis of *[handwritten: based on]* effect of social network structure on churn
- Plan to provide targeted promotion to consumers, based on their *[handwritten: the consumer's]* position in telecommunication social network *[handwritten left margin: Promotion Plan]*

Extra Deliverable

- We are willing to provide high-level analysis on the subject of interest of the firm, as an extra delivery, based on analysis of given data, free of charge

Element of data

1. Sample size *[handwritten: should]* of 10,000, with all on-net, off-net, international call details for 12 month period
2. Sample should be representative of telecommunication network
3. A-party, and B-party (Could be masked by primary key) but should be tractable for communication purposes (for detail please check data policy section) *[handwritten: italics]*
4. Number of minutes, date, and time, cost of call per call

[handwritten: Sample should include of]

[handwritten bottom right: APA form]

(*) Sample should have

5. Daily balance, and daily usage of consumers
6. Promotion if ~~exist~~ possible
7. Service records of call center on (or any data that shows the experience of consumer, and its satisfaction level): e.g. disconnection complaint, payment complaint, etc.
8. Demographics of parties: gender, age, ethnicity, location, activation date
9. Churn of consumers, account balance
10. Bolt-on (Package of data, voice, and SMS), or any complementary service that consumer could have used such as RBT (Ring back tone), LBS (Location based system) with ~~his~~ their call service

or

Data Policy

The data usage would be done under NDA. Based on policy of ~~the company~~ the company we can put or remove the name of the company in the research paper. For confidentiality of consumers, MSISDN's could be masked with unique keys.

Similiar to influential users in social networks playing an important role in generating revenue for service providers, the structural characteristics of telecommunica- networks play and important role in reducing churn and providing targeted promotion.

write out (SMs)

bullets

Parallel structure

- verb   noun
- ↓   ↓

Similiar to influential users in social networks playing an important role in generating revenue for service providers, the structural characteristics of telecommunica- networks play and important role in reducing churn and providing targeted promotion.

Butterfly effect in social network: Analysis of Churn Under Network Influence

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The extent of network effect has always been in the top five questions of marketers, yet emerging online social networks facilitated the emprical analysis of social networks for marketers. Although online social networks are magnificent source of network effect analysis, yet due to the lack of sales data the social network effect on sales is still in top ten questions of social network marketers. On the other hand, telecommunication network is grandiose source of social network information due to its neat network structure design, eventhough it has not been extensively analysed for social network, and network effects. What discriminates telecommunication network from other social network is that it is resplendent source of sales data as well. In this paper we will analyze network effect on churn in telecommunication network. We found out that under asymmetric social network market structure, number of calls recieved from churn customer, network degree of people a customer is contact with play significant role in consumer probability of churn. We exerted hazard model of left sensoring to achieve the result. Our findings have interesting implication for managers of social networks, making them cognizant of butterfly effect of unprofitable customers instigating bullwhip effect of high user customer hazard. Based on our study, we can recommend managers to be attentive about unprofitable customers who call high user customers, incentivise them to reduce the churn probability of high value customers, resulting in reduction of churn of all the network base.

Key words: social network, telecommunication network, churn, hazard model

1. Introduction

Question about social network, social contagion, network effect has shifted from whether to how (Iyengar et al. 2012). Although various study of social network in context of online social media has been conducted (Aral 2010, Aral 2012, Iyengar et al. 2012, Iyengar et al. 2012, Lans 2009), the scope of analysis is still very limited due to lack of sales data. On the other hand telecommunication networks due to their extremely organized structure in the form of intelligent network has considerable amount of social network data, from number of SMS sent and recieved to number of minutes of call, date, and the amount that each person is charged. To this point social network litrature lacks analysis of the effect of social network on consumer choice.

In the context of our study when two person has initiated an event between eachother, such as call, or SMS we call them neighbor. In this paper we will investigate the effect of social network on

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Handwritten annotations:

We define the network connectivity and proximity as follows as in telecommunication as a function of # of minute and # of calls between any two individuals in the network

connectivity

the of network proximity industry

Add references

Tie SHeath

Contagion effect

Network connectivity is defined as a binary variable for each two individuals, defined as

Connection intensity is defined as a function increasing in # calls and # minutes.

(JSOM writing lab)

① 30 minute   17 April 2013

② 1.218 / Room → (1.203)

③ double spaced

④ ContactId: 62535520 → manage appointment link

⑤ phone: 972-883 5385

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