Finding the Best Combination of Data Offers Using Conjoint Analysis: A Case of a Telecom Service Provider

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Preamble to the Case Study

"JIO" is a revolution in the Indian telecom sector, which has brought tremendous changes in the services as well as the perception of the customers towards usage of telecom services. The offers given by JIO, after its introduction in 2016, have created a history by capturing 16 million subscribers within a month and crossed 50 million in 83 days since its launch. This has thrown challenges to other service providers to change their offers and introduce new combination of offers, which include reducing the price, free SIM, more internet data, etc. Service providers are in huge loss and few lost their market share to JIO. It has given customers several options ranging from unlimited phone calls, SMS, internet data etc., for minimum price. This along with smart phones, customers have got option to use various apps, increase the frequency of calls, number of times they make calls, send SMS, bank transactions etc. It has created a new world for the customers and gave chances for them to create new usage avenues. For example, usage of payment apps, messaging apps, news apps, etc. An interesting change is, introduction of various apps by businesses to attract the customers and make them available for the customers to download in play stores. Availability of data and speed has made the customers to download the apps and get full benefit of the services being provided by the businesses. Another change JIO has brought is, availability of 4G handsets at cheaper prices and this has open gates for inclusion of rural customers into the market share. All these changes have made the competitors to change their strategies to attract the new customers and retain the existing customers. In spite of several controversies, JIO could spread its services to different parts of the nation and could get 26.40% of market share as on May 21,2019 (https://telecom.economictimes.indiatimes.com/news/jios-adds-9-4-million-customers-in-march-airtel-ABC-idea-lose-trai/69430347, retrieved as on 10.07.2019).

The case writer(s) Srilakshminarayana.G, Associate Professor - Quantitative Methods, SDMIMD, Mysore may be reached at lakshminarayana@sdmimd.ac.in Author(s) have prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of the situation. The case is related to a sector and a specific company. The case is based on the information available in the public domain.

ABC is one such service provider who is fighting to retain its market share and has adopted different strategies to gain their position back in the market. One such decision is acquisition of XYZ to increase their strengths and market share. They have continuously changed their offers to attract the customers and retain their position in the market. This time they have decided to give the best offer that will be different from others and increase the subscribers. For this, they have decided to take help from SAM analytics, one of the leading analytics firm in the market. ABC wishes to get the offer-combination after doing a research on the customers and get their requirement. They also want to find the usage-combination from the customers. Taking these two as the critical requirement, ABC has started their association with SAM. The questions here is, how should SAM design the research to get the required data, identify a method to analyse the data and give a solution to ABC?

About JIO and Its Growth

Reliance Jio Infocomm Limited, d/b/a Jio, wholly owned by Reliance Industries, has its headquarters in Mumbai, Maharashtra, India. It operates a national LTE network with coverage across all 22 telecom circles. The beta version of JIO is launched on 27th December, 2015 and is available for public from 5th September,2016. As on 31st May,2019, it is the largest mobile network operator in India and third largest mobile network operator in the World with over 322.99 million subscribers.

In the year 2017, it has launched JIO prime membership for its initial JIO customers with unlimited benefits for a nominal fee of RS 99 and within a month 72 million JIO customers have signed for the prime membership. It has handled the transition from paid services to free services in a smooth way and this has attracted more customers to subscribe for the same. JIO has started international roaming and announced that it is observing 110 crore GB data traffic per month and 220 crore voice and video minutes a day.

https://telecom.economictimes.indiatimes.com/news/reliance-jio-witnessing-largest-migration-from-free-to-paid-services-in-history-mukesh-ambani/58344281 retrieved as on 31.07.2019

- Reliance Jio has doubled its customer base since the last Reliance AGM. It has now crossed the 215 million mark within the 22 months of its initiation, a gigantic feat that no other technology company has achieved till date, as per Reliance.
- Reliance Jio data usage has grown from 125 crore GBs per month to more than 240 crore GBs per month.

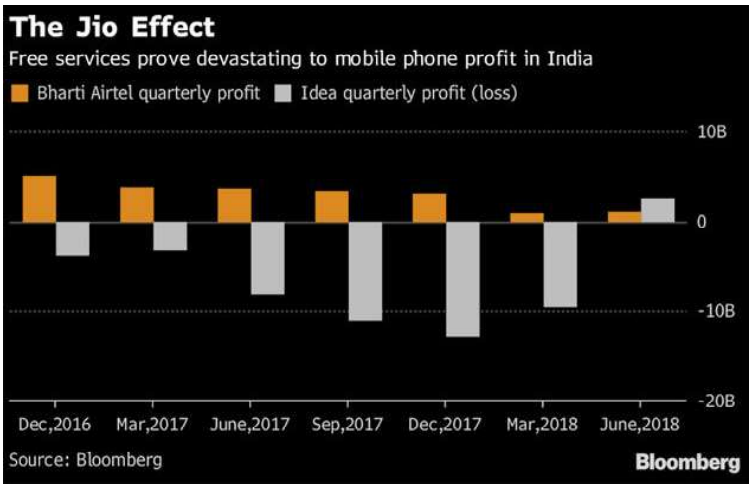
- Jio has widened the gap between itself and its competitors as the world's largest mobile data network, a position it had achieved last year.
- Voice usage on the network has grown from 250 crore minutes per day to more than 530 crore minutes per day.
- The amount of video consumption has grown from 165 crore hours per month to more than 340 crore hours per month.
- Customers are actively engaged with Reliance Jio for more than 290 minutes per day on an average.
- On track towards achieving a target of 99% population coverage with 4G-LTE.
- Jio has doubled its Network Capacity over the past 12 months.
- Even after serving the 215 plus million customers, the capacity utilization of the Jio network is less than 20 percent. Which means, that Jio can multiply its customer base without additional investment.
- Fastest network in India as attested by the TRAI speed-test data for each and every month of the past year.
- A total of 25 million JioPhone users in India.

https://www.news18.com/news/tech/reliance-jio-growth-in-numbers-just-how-much-has-jio-grown-in-one-year-1801733.html Retrieved as on 31.07.2019

Impact of JIO on other players

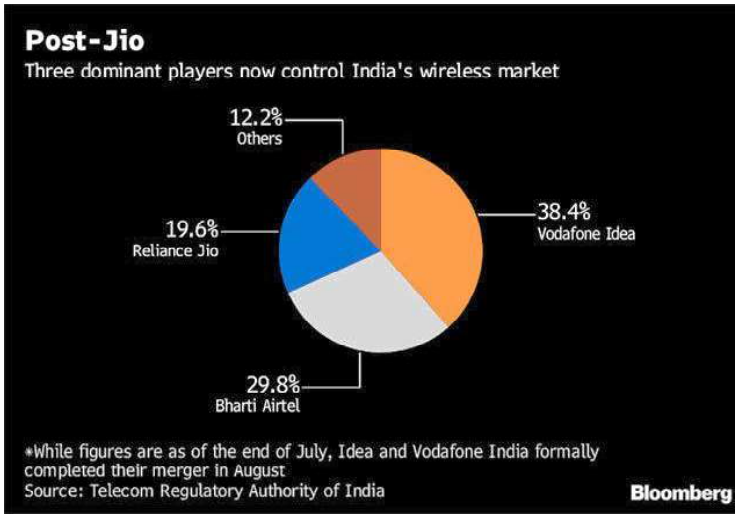
The following figures talk about the impact of JIO on other players

Figure-1 : Quarterly Profit and Bharti Airtel and Idea



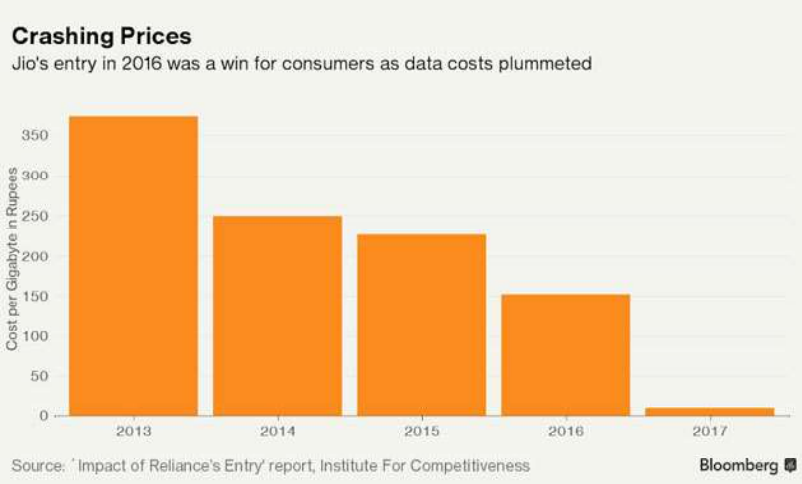
Source:https://economictimes.indiatimes.com/industry/telecom/telecom-news/how-mukesh-ambani-shook-up-the-phone-industry-in-charts/articleshow/66254901.cms?from=mdr

Figure-2 : Share of wireless market in India



Source:https://economictimes.indiatimes.com/industry/telecom/telecom-news/how-mukesh-ambani-shook-up-the-phone-industry-in-charts/articleshow/66254901.cms?from=mdr

Figure-3 : Crashing Prices per GB in Rupees



Source:https://economictimes.indiatimes.com/industry/telecom/telecom-news/how-mukesh-ambani-shook-up-the-phone-industry-in-charts/articleshow/66254901.cms?from=mdr

Comparison of plans between JIO and Others

PREPAID PLANS UNDER RS 200

ABC

ABC has introduced plans offered at Rs 121, Rs 129, Rs 139, Rs 159, Rs 169, Rs 178, Rs 189, and Rs 199. Among these plans, Rs 129, Rs 139, Rs 169 and Rs 199 packs offer unlimited calling for 28 days. Plans offered at Rs 129 and Rs 139 have combination of 4G/3G data with unlimited calling, while plans offered at Rs 169 and Rs 199 are from ABC come with a combination of unlimited local and STD calls with free roaming, along with 1GB and 1.5GB 4G/3G data per day, for 28 days.

JIO

Jio has offers at Rs 149 with a combination of 1.5GB data per day over a 28-day validity period. There are also two more similar plans priced at Rs 98 and Rs 198 with a combination of prepaid plan, 2GB data for a month and 2GB data per day for a month, respectively. So essentially, the Rs 198 plan from Jio gives users a total of 56GB data for the month. With the Rs 98 Jio plan, subscribers get 300 free SMS for the validity period, while with the Rs 198 prepaid plan one can send 100 free messages per day.

Airtel

Airtel offers three recharge options under Rs 200. The first one is priced at Rs 129 and come with 2GB data, unlimited calls and 100 SMS per day for 28 days, while the Rs 169 prepaid plan from Airtel offers 1GB 4G data per day with unlimited calls and 100 daily SMS for 28 days. Then, the last prepaid recharge under Rs 200 by Airtel is priced at Rs 199 and it credits 1.5GB daily data to a user, along with unlimited calling and 100 SMS per day for 28 days.

PREPAID PLANS BETWEEN RS 200 - RS 299

ABC

ABC has two plans in this price segment. The first one is priced at Rs 209, and the second one is priced at Rs 255 and users get 1.6GB and 2GB data per day respectively, for 28 days. Additionally, free national voice calls with roaming is valid on both the plans, along with 100 SMS per day.

Jio, on the other hand, offers only one plan in this category, which is priced at Rs 299 and offers 3GB daily data with unlimited calls and 100 SMS per day for 28 days.

Airtel also has one plan priced at Rs 249 here and it comes with 2GB data and other benefits as the Jio's Rs 299 plan.

PREPAID PLANS PRICED BETWEEN RS 300 - RS 500

ABC

ABC has the offers priced at Rs 399, Rs 349, Rs 396, Rs 458, or Rs 479 prepaid packs. With the Rs 399 plan, one gets 1GB 4G/3G data per day, unlimited calling and 100 SMS per day for 84 days. Rs 349 plan gives more data for lesser time from ABC with combination 3GB data per day, along with free unlimited calling and 100 sms for 28 days. Prepaid plan Rs 396 comes with 1.4GB daily data for 69 days, while the Rs 458 and Rs 479 packs will credit 1.5GB and 1.6GB 4G/3G data per day for 84 days.

JIO

Jio also has plans for recharge in this price range. It has unlimited free calling and 100sms per day with every plan mentioned here. Other offers are priced at Rs 349, Rs 399 and Rs 449 with a combination of 1.5GB data per day for 70 days, 84 days and 91 days, respectively. If one wants 2GB per day, they can go for the plans priced at Rs 398, Rs 448 or Rs 498, which have a validity of 70 days, 84 days and 91 days respectively.

Airtel

Airtel has four prepaid plans over Rs 300 and under Rs 500 and all of them offer different amounts of data and come with varying validity. The telco also offers free calling and 100 SMS per day with all plans in this range. Airtel's Rs 349 prepaid plan credits 3GB data per day for 28 days, while the Rs 399 pack offers 1GB data with a longer 84-day validity. The Rs 448 plan offers 1.5GB data per day for 82 days, while the Rs 499 plan will get you 2GB 4G data for 82 days.

PREPAID PLANS BETWEEN RS 500 AND RS 1000

ABC

ABC offers six plans to select from, with combination free calling and 100 SMS per day. Rs 509 pack comes with a combination which offers 1.5GB of daily data for 90 days. With the Rs 511 and Rs 569 pack, one gets to avail 2GB and 3GB of high-speed data per day respectively, for 84 days. Rs 529 plan is slightly higher that offers 1.5GB daily data for 90 days, while the Rs 549 plan credits 3.5GB data per day for 28 days. Finally, there's a Rs 799 pack that has a 28-day validity and 4.5GB daily data.

JIO

In the same segment, Jio offers 4GB per day a 5GB data per day plans priced at Rs 509 and Rs 799. Both the options come with 28-day validity. There is also one long term plan by Jio priced at Rs 999, which bulk credits 60GB 4G data to a user's account for 90 days.

Airtel

Airtel has four recharge plans in this price segment, all with different data and validity benefits. The Rs 509 plan credits 1.4GB daily data for 90 days, while the Rs 558 plan features 3GB of daily data for 82 days. With Rs 597 recharge plan, one will get to avail 6GB of data for 168 days, while the long validity 336-day plan of Rs 998 will credit 12GB of data.

PREPAID PLANS ABOVE RS 1,000

Limiting choices but keeping it simple, both ABC and Airtel have a single prepaid plan priced above Rs 1,000. Both the telcos offer a Rs 1,699 plan with which one will get to use 1GB data per day for 365 days. This plan comes with the benefits of unlimited calling and 100 SMS per day. On the other hand, Jio offers 1.5GB daily data for 365 days with its Rs 1699 prepaid recharge. Jio also offers a long-term packs priced at Rs 1,999 that credits 125GB data to a user's account for 180 days.

https://www.digit.in/news/telecom/reliance-jio-vs-airtel-vs-ABC-idea-comparing-the-new-and-updated-unlimited-prepaid-plans-47703.html retrieved as on 31.07.2019

About SAM Analytics* (* Created by the author. A Fictitious company)

SAM Analytics is started in the year 2010 with an objective of providing consultancy services to organizations in building their business strategies. Soon they got fame in the market as a consulting firm that provides the best suggestions and strategies to organizations. Also, has become a brand in understanding the clients' requirements in the best possible way and proposing the best possible solutions to the clients' problems. Their team is a combination of three statisticians, two IT experts and two management experts. The team is cohesive and has good coordination and cooperation between themselves. They have a system that gives clients an opportunity to express their problems openly and get initial suggestions from the team. If they are convinced with the suggestions, then they get into an MOU for further discussions. In case they are not convinced, then the clients can meet the second team that takes-up the issue to give them a convincing suggestion. The statistics team comes into the picture when the client's requirement is related to building statistical models, analysing data, or advanced statistical analysis. Together with the IT and management experts, statistics team works to link the results to the requirements of the clients and convert them to solutions. IT team is very active in building algorithms for data retrieval and storage. The management team works on linking the results obtained by the statistics team in building business solutions and strategies. This system has made them unique in the market and gain the confidence of the clients. Their main focus has been the IT sector, FMCG sector, NGOs, etc. They also have successfully completed several assignments related to the government of INDIA.

In the recent times they have expanded their services to other sectors like telecom, manufacturing, airlines, education etc. The recent project they have completed is related to an airlines service provider, where they have a challenge on giving the best combination of offers to the passengers during festive season. The team has work hard and designed several experiments to find the best combination of offers for the airlines. Due to this, the business of the airlines has increased and could get the maximum returns that quarter. This has made SAM analytics to get into designing experiments and could get success in most of the cases. This is one area where other analytics firms could get low success rate. The success rate of SAM is 80% and now they are building a team that exclusively works on design of experiments. In the process they also have mastered in several analytical methods that are very advanced and this has made SAM to become the top analytics firm in the market.

This month they had a new assignment from a telecom service provider who is facing new challenges from the newly introduced JIO offers in the market.

About Telecom Service Provider's Challenge

With introduction of JIO into the market, several telecom service providers have to change their offers and give multiple options to the customers. They are forced to reduce their pricing and give additional internet data, talk time etc. Also, introduction of multiple offers at reduced price have made customers to use the data for different purposes like watching movies, trading, usage of apps for transactions, usage of apps for messaging, advertising, video calls etc. Customers have started expecting a change in the offers for every month, quarter and this has opened gates for new challenges for the service providers on deciding the best offer to retain the existing customers. Among all others, the critical challenge ABC has is, to retain the existing customers and increase the market share. The following are the challenges.

1. What combination of offers have to be released into the market?
2. Which of the attributes of the offers have been given more importance by the customers?
3. Can we find the cluster of customers who opt for the combination?
4. Can we find the purpose and the way the data or services are being used by the customers?
5. Can we cluster the customers based on the way they use the data or services?

These are the questions for which the service provider wishes to find the answers. From the recent experiences, the ABC's research team has understood that a market research may not accurately give answers to the questions. Hence, they have decided to approach SAM for a solution.

Discussion with SAM's team

Mr. James, head of the research wing of the service provider along with his team has decided to meet the statistics team of SAM for a solution. SAM's team is also excited to meet Mr. James team. Mr. SLN the chief statistician of SAM along with his team decided to meet the team and find a solution to the problem. Both the teams have decided to meet at a mall where the service provider's outlet is located. This is to observe the behaviour of the customers on selecting the service provider and also understand their queries on offers. The teams have started observing the customers who are visiting the outlet for knowing new offers and also started questioning on why the new offers do not have those that are being offered by JIO. The outlet manager had to explain them the reasons and differences between them and JIO. Few customers understood,

few argued with them on the same, and others have started discussing among themselves on shifting their service provider to JIO. After observing the customers for few hours, both the teams have decided to discuss about the customers behaviour and, how a best offer can be designed. Note that, the team has few of their members in the disguise of the customers and have entered into discussion with the regular customers on several aspects related to the services. Though only few customers have responded to their conversations, they could engage them for substantial time

SLN: Good afternoon Mr James. Happy to meet your team.

Mr James: Good afternoon Mr SLN. Excited to meet your team. Let us analyse the behaviour of the customers and understand the key aspects of their behaviour. You are aware of our requirement and I reiterate that we need to find the best offer-combination and usage-combination. It is very critical for us to increase our subscribers this quarter, relatively and increase our share in the market. The following are our observations of the behaviour of the customers and their queries on the offers. Also, their discussions on usage of the offers.

1. A customer who walks into the outlet mainly focuses on internet data and his/her usage is mainly of regular phone call, messaging using WhatsApp, video calls, browsing etc.
2. He/she asks for new offers, and, looks for more data and validity of the offer.
3. Looks for alternative service provider, if they are not satisfied with the answers given by the outlet managers.
4. During the discussions, the team members have understood that customers want an offer that is different from the other service providers and look for more options.
5. They wish to continue to be with ABC but wishes to have better signals at places where they travel.
6. Interesting aspect is, majority of the customers look for changing their service provider only for fun and under the influence of their friends, relatives etc.
7. Amongst the customers who visit the outlet, students are the frequent visitors and change the offers more frequently.
8. Most of the students have two or more SIMs and wish to have different service providers.
9. Those students who have female friends tend to ask queries related to new offers.

10. Customers who are middle aged (35 to 45) come for recharging the existing the offer and do not ask for new offers.
11. Customers above age group 45 ask for new offers but do not look changing the service providers.
12. Those customers accompanied by family members look for a family offer, where connections have to be given on one address proof.
13. Parents look for a second offer for their children to play games and use education apps. They ask the outlet managers on special offers for children and offers with lesser pricing.
14. Mothers who have children abroad ask for offers related to international calls and video calls abroad.
15. Another interesting aspect is, the outlet manager shows the old offers as new offers to those who are new subscribers and compares with other service providers.
16. Customers wish to pay the bills through apps instead of visiting the physical store and wish to have top-up data towards the end of validity period. This is a new expectation. That is, as the validity period is close top-up data should get automatically added to the account.
17. Post-paid customers expect to have few additional offers that are from other service providers. For example, they wish to have one-year free offer from Amazon Prime video, or trial hotstar plan etc.
18. A recent trend that is prevailing is, to provide an instant offer that is valid for shorter duration as well as an offer that is valid for a year. Interesting point is, those customers who have taken yearly offers wish to change their plan without any additional payments.
19. Few customers argue furiously about the problems with respect to signals, internet connectivity, about new offers, on customer service etc. Few threaten to change their service providers, and few get convinced by the words of the executives.
20. Few customers port from other service providers to ABC and wish that they provide better services to them.

These are some of the observations by the team and we wish to take these and help us in developing a best offer. Please note that the above list is not exhaustive and only those that are commonly recurring statements.

SLN: Your team has done an excellent work. We are excited to see the results of your team's observation. Now, let us discuss on the process of getting a solution to the problem stated by you.

Addressing the Challenges- Solution Proposed by SLN

SLN: Taking your requirement, we propose the following solution.

In order to find the best combination of offers, we have to identify all possible combinations that one can construct. These combinations have to be taken to the customers for their preferences and ask them to rate the combinations. For this, we need to design an experiment and a survey will not work in these cases. In order to design the experiment, we need to have a group of customers who can be shown all the combinations and then asked to rate the combinations on a scale of 1-10. Then, apply conjoint analysis to find the best combination of offers.

Mr James: Can you please elaborate the entire process for us to apply and carry forward the steps suggested by you.

SLN: Sure. The following are the steps and methodology to be adopted to identify the best combination of offers.

Step-1: We need to list all possible combination of offers that you can propose to offer. For this, we need to first understand the market conditions and list out all the offers possible, called as attributes. For example, data, unlimited calls, Free SMS etc. Then, identify the levels for these attributes and design all possible combinations, called as profiles. For example, 1.5 GB data, unlimited calls for 28 days, and 100 SMS free for 28 days is a combination. Design such combinations and take them to the customers for their preferences, to construct a preference matrix. Finally, we have three matrices, 1. Matrix of attributes, 2. Matrix of Levels 3. Matrix of profiles and 4. Matrix of preferences.

Step-2: In order to get the ratings from the customers, select a group of customers and expose them to all the designed combinations. Create a stimulus in the mind of the customers on the available offers and then ask them to rate each of the combinations. By this, every customer selected will be giving rating to every combination shown and these ratings form the preference matrix. In case you have several combinations, then decrease the number of combinations and then conduct the experiment.

Step-3: Use the three matrices and apply conjoint analysis to find the best combination of offers. The following tables give examples for the four matrices.

Table- Matrix of attributes-Example

S.No.	Attribute
1	Data
2	Talk time
3	Validity
4	SMS
5	Type of packs
6	Type of connection

Source: From Mr SLN and James's discussion

Table-2 : Matrix of Levels-Example

S.No.	Levels	Number of levels
1	Data-500MB, 1 GB, 1.5 GB, 2 GB, 3GB	5
2	Talk time- Unlimited, Full Talk time, Limited talk time	3
3	Validity- 91 days, 84 days, 28 days, 10 days	4
4	SMS- 50 SMS, 100 SMS, 200 SMS	3
5	Type of packs- Combo pack, Family pack, Individual	3
6	Type of connection- Pre-paid, Post-paid	2

Source: From Mr SLN and James's discussion

Mr SLN: Note that, total number of profiles is equal to 1080 and the above profile matrix is only a sample of the entire profile matrix. For the final design, one can consider either the entire profile matrix or use only a fraction of it. One can either use the expert advise on the fraction or use fraction factorial designs for the final experiment.

The following matrix gives the sample profile matrix and it gives the ratings given by the customers for each of the profiles. For the final study, one can consider the full data.

Table-3 : Matrix of Profiles-Example

Profile	Data-GB	Talk Time	Validity-days	SMS	Type of packs	Type of connection
1	500	Limited	10	50	Individual	Pre paid
2	500	Unlimited	28	100	Individual	Pre paid
3	1	Unlimited	28	100	Family	Post paid
4	1	limited	28	150	Individual	Pre paid
5	1	Unlimited	84	100	Individual	Pre paid
6	1	Unlimited	91	150	Individual	Post paid
7	1	Unlimited	91	150	Family	Post paid
8	2	Unlimited	84	100	Family	Post paid
9	2	Limited	91	200	Family	Pre paid
10	2	Limited	84	100	Individual	Post paid
11	2	Limited	28	150	Individual	Pre paid
12	2	Unlimited	84	100	Family	Pre paid
13	2	Limited	91	100	Family	Post paid

Source: From Mr SLN and James's discussion

Conjoint analysis will help to find the best combination of offers chosen for the entire segment of customers selected and also find the combination for every customer separately. It also helps to find the importance level given to each of the attributes-levels by the customers. The same process can be adopted to find the usage combination.

Note that, conjoint analysis uses dummy variable regression to find the best combination of offers. You need to understand the dummy variable regression first and then understand the conjoint analysis. Also, need to overcome the challenges faced while designing the experiment on the customers and handling the data errors.

Questions for Discussion

Prof1	Prof2	Prof3	Prof4	Prof5	Prof6
4	1	1	1	1	6
2	2	2	2	4	5
3	3	3	1	7	4
5	4	4	4	8	7
8	5	5	1	9	8
7	2	3	5	6	9
6	3	2	7	5	6
4	6	5	8	8	5
2	8	5	4	7	8
1	4	5	1	8	4
3	5	4	5	9	1
4	2	7	7	8	1
5	1	8	8	7	2
7	4	9	5	4	3
8	2	5	4	5	1
9	3	6	1	6	1
3	6	8	9	7	1
2	4	7	6	8	1
1	7	9	5	9	1
1	1	8	9	8	1

1. What should be the data pack that needs to be offered?
2. How many days needs to be given as a validity period?
3. What should be the pricing? How many free SMS needs to be given?
4. What is the best combination of the offers to be introduced into the market?
5. Find the importance levels given to each of the offers?
6. For what purposes the customers use the data pack and other offers and relative importance of each of them?
7. What should be the attributes and levels for the construction of profile matrix?
8. How should one design the experiment to find the preferences?
9. How dummy variable plays an important role in identifying the best combinations?

10. How can the changes in the offers in later stages can impact the combinations identified?
11. How can a business plan be developed using the combinations identified?

Action Plan for using the case in the classroom

1. The faculty can divide the students into groups, who represent the telecom service providers.
2. They can then present the offers of each of the service provider and defend why their offers are better. The faculty can then create a dilemma amongst the students on the combination of the offers.
3. Inform them about conjoint analysis and encourage them to apply the same for finding the combinations.
4. Each team can design an experiment and take the same to the customers. Collect the necessary data and apply conjoint analysis to find the combinations.
5. The results can be presented and discussed.
6. Finally, the teams can compare their initial presentation with the final presentation and the faulty can inform them the effectiveness of conjoint analysis in decision making.
7. After this, team can think on how the combinations can be used for developing a business plan.

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