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BEHAVIOURAL ANALYSIS OF CONSUMERS' TOWARDS SELECTION OF MOBILE NETWORK SERVICE IN ASANSOL-DURGAPUR INDUSTRIAL REGION

Subhendu Sengupta*

Abstract: *Mobile phones have become a part of our daily life. India has the second-largest telecom network in the world. Mobile based Internet is a key component of Indian Internet usage, with seven out of eight users accessing Internet from their mobile phones.*

In present scenario, it has become very important to analyse the dynamics of consumer behaviour in the telecom industry, as the industry has got ample opportunity to grow in near future also. This analysis may be vital for different companies, in order to improve and modify their existing marketing model.

This study aims to gain knowledge about key factors that influence consumer behaviour in telecommunication sector. Keeping this in mind, the paper aims to study whether the mobile phone consumers are price conscious or rendered for good network & service. In this study, we have conducted our survey from retail outlets to common consumers within various age groups as well as various income groups in Asansol-Durgapur industrial region (a selective industrial area) of West Bengal. The survey period was from July 2015 to December 2015 (six months). The intention of our research is to know how the Indian telecom network & service providing companies satisfy the consumers and also to get a clear idea about the satisfaction levels, trends and what modification/improvement they would like to bring in their marketing strategy to fulfill Indian telecom consumers' real demand.

Keywords: *Jamming, Net-charge, Teledensity, Reliability*

INTRODUCTION

Today, mobile phone market is one of the fastest growing technological product markets. Almost every year mobile phones with latest developments are offered into the market place. Similarly, cut-throat competition among the telecom operators is also increasing. Each telecom company offers various schemes and packages (Klemperer, 1987). But, today's consumers are harder to please. They are price conscious (Armstrong & Vickers, 2001), more demanding, less forgiving, and searching for equal or better offer (Gans & King, 2000). Retailers are now focusing more to the customers and giving values to their opinions. Now consumers are not ready to pay a premium just for a brand name (Hoernig, 2012a). So, study of consumer behaviour is utmost essential for designing a marketing strategy (Birke & Swann, 2005).

Indian telecom industry underwent a high pace of market liberalisation and growth since the 1990s and now has become the world's most competitive and one of the fastest growing telecom markets. The market has been showing signs of maturity and continues to grow from strength to strength. The government is working to integrate the whole country in one telecom circle

Govt. of India (GOI) allows 100 percent foreign direct investment (FDI) in telecom sector. The decision on trading and sharing of spectrum has been taken. Spectrum has been de-linked from licenses; and unified licensing policy has been adopted. These attract mega telecom companies to make a hyper-competition that effecting to drop the call prices. As a result, India becomes one of the cheapest call tariffs in the world. Rates across 2G, 3G and 4G spectrums have been reduced drastically; more convenient options are taken across network services. Moreover, telecom companies register their subscribers, after strict customer information norms are imposed. The average revenue per user and net realisation has been increased. A plan has been taken to introduce the nationwide cell number portability on cards, free roaming etc.

According to Department of Telecommunication (DOT), GOI, the telecom sector has witnessed a commendable growth over the past few years. There is a tremendous growth of telecom sector from 2000 to 2015 (22.15% increase of

* Academic Counsellor, IGNOU & Visiting Professor of Carreograph Institute of Management Studies, Kolkata, West Bengal, India. Email: subhosengupta08@gmail.com

total FDI inflows in that period). In Indian telecom sector FDI inflows for 2014-2015 is Rs. 173,718.22 million (US$ 2,894.94 million). The total revenue for the 2014-2015 year stood at Rs.2.20 lakh crore (US$33 billion). The industry has grown over twenty times in just ten years from, under 37 million subscribers in the year 2001 to over 846 million subscribers in the year 2011. With a huge subscriber base, the wireless segment (97.36 percent of total telephone subscriptions) dominates the market. Rural India is the key target market likely to drive the next round of growth, particularly for voice based network & service. 3G and BWA are expected to reinvigorate the maturing urban markets and help in bringing balanced growth of economy. The aggressive growth observed by telecom facilities is yet to be replicated in case of broadband service. The government has a vision to provide telephone connection and broadband facilities on demand across the country at an affordable price and it strives to achieve the same.

Hence, Indian telecom market has a great importance. In this present scenario, it has become very important to analyse the dynamics of consumer behaviour in the telecom industry; as the industry has got ample opportunity to grow in near future also. This analysis may be vital for different operating companies, in order to improve and modify their existing marketing model (Hoernig, Inderst, & Valletti, 2014).

LITERATURE REVIEW

As described on the above subject, our intention is to undertake this study for bringing together all parts of the consolidating extant research. Thus, we synthesise various research and academic articles into a comprehensive multi-dimensional framework.

Hoernig et al.'s (2014) work is based on a flexible model of telecommunication network competition with non-uniform calling patterns. Here they observed that customers tend to make most calls to a small set of similar people. They have described that the equilibrium call prices are twisted from marginal costs. Jointly profit maximising access charges above termination cost to make as a re-action less strong competition. They have also discussed the impacts for regulated access charges as on-and-off net price discriminations.

The optimal access regulation under three different market configurations which approximate the various stages of the telecommunication market liberalisation has been tested by Lestage and Flacher (2014). The first stage, the regulator has to balance between static efficiency and investment; in the second stage two different outcomes are possible, namely if entrants tend to under-invest, the regulator balances between static efficiency and investment; in the third stage, the regulator may decide to promote the infrastructure duplication and to set the access price above the price in the first stage of market liberalisation.

Wallin and Leijon (2009) have analysed that telecom service providers are confronted with an overwhelming flow of alarms. Using data from the trouble ticketing system as reference it is examined that the relationship between mechanical classification of alarms and the human perception of them, for which a neural network base is suggested.

The impact of the network effects in the use of mobile telephones and the powerful attachment of social networks on consumers' adoption decision have been estimated by Birke and Swann, (2005). Collected from a survey they observed that the consumers strongly assimilate choices of mobile phone operators but did not coordinate the same on the choices of mobile handsets.

Armstrong and Vickers (2001) have studied on the concept of consumer surplus as a function of quantities (rather than prices). Their assumption based on some model firms which are supplying utility directly to consumers. They have also shown that an equilibrium outcome of competitive nonlinear pricing when consumers have private information about their tastes is for firms to offer efficient two-part tariffs. They have discussed on cost-pass-through including cases where optimal prices do not depend on other products' cost.

The influence of mobile network competition on the prices of fixed-to-mobile calls have been examined by Gans and King (2000). They have considered three conditions: (1) unregulated mobile disconnection charges will result in higher than monopoly call prices, (2) regulation of disconnection charges and prices downward will affect mobile subscription rates and may lower these rates, and (3) regulations of any mobile operator's disconnection charges can reduce fixed to mobile prices, but will result in an increase in unregulated operator's disconnection charges. If fixed line consumers can distinguish between the different mobile networks they are calling, fixed to mobile call prices will fall relative to their level under customer ignorance. They have observed that a low cost method of lowering fixed to mobile charges would be to facilitate the identifications of operators by the consumers.

Armstrong (1998), in his work considered two scenarios, the first is a case of symmetric, unregulated industry, second is the case of an industry with an dominant and regulated firm. He has developed two formulae: first formula is, provided there is sufficient product/service differentiation and it is shown that firms agree to set inter-connection charges above associated costs to obtain the joint maximising outcome. In the second formula, for the welfare-maximising interconnection charges is dented.

How 'switching cost' acts as entry deterrent in markets, is nicely expressed by Klemperer (1987) when he carried out his study into different markets where consumers have transaction or learning between functionally undifferentiated brands. He also observed that new entry into such market may be restricted either by large customer bases and/ or large switching cost. A new firm may face challenge, response aggressively either by charging lower price or comparatively higher than otherwise. In that case, the firm may make less profit but over time, he may make a large customer base.

OBJECTIVE OF THE STUDY

Our objective is to find the dynamics of consumer behaviour in present scenario of telecom industry and know how these telecom companies satisfy the consumers and also to get a clear idea about the satisfaction levels, trends and what modifications/ improvements they would like to bring in their marketing strategy to fulfill Indian telecom consumers' real demand in Asansol-Durgapur industrial region.

For fulfilling our above objectives, we have conducted our survey through an extensive search for gathering some quantitative data; which are focused to:

1. Obtain robust estimates of consumer experiences and satisfaction.
2. Quantify the extent to which these experiences are reflected on behaviour.

By these above two quantitative phases, we have tried to reach at our decision that whether the mobile phone consumers are price conscious or preferring for good network & services.

HYPOTHESIS

We have drawn two hypotheses:

H_0: Consumers prefer those telecom companies who can provide clear network access.

H_1: Telecom companies are preferred by the consumers on the basis of low call charges.

RESEARCH METHODOLOGY

After considering the nature of the issue to be studied, a systematic approach was adopted. Keeping in mind the research objective, a statistical survey method of research was identified as a suitable method of sampling, data collection and interpretation. Primary data was collected through face-to face interaction & interview with mobile phone users (students, businessmen, service holders, professionals etc) of Asansol-Durgapur industrial region. Secondary data was also used as per the scope of the study. In our study, we have used stratified random sampling. On the basis of this sample, we have tried to determine the dynamics of consumer behaviour towards some of the telecom companies.

Data Collection Procedure

For collection of primary source of data, a survey method was adopted for the present study. Questionnaire was used as an instrument for gathering data, which was constructed by keeping in the mind of the objectives of the study. Thus meeting with the mobile phone users in personal and distributing the questionnaire, data was collected. Eight close-ended questions were asked from 324 respondents in Asansol-Durgapur industrial region.

Here we have also gathered secondary data as per the scope of the study. For the collection of secondary source of data, we have collected average per day sales of top-up Cards, power cards/ magic cards, dongle (for Internet use) from 129 retail outlets in Asansol-Durgapur industrial region. The data collection period fell between July to December 2015. The survey focused on consumers' behaviours, their experiences and trends towards their preferences.

Market Analysis

The market share of the telecom companies in Asansol-Durgapur industrial region is given in Table 1.

Table 1: Market Share of the Telecom Companies in Asansol-Durgapur Industrial Region

	Telecom Companies							
	Airtel	**Reliance**	**Vodafone**	**BSNL**	**Aircel**	**idea**	**MTS**	**Tata- Docomo**
Top-up + Power/Magic + Dongle per day Sales (In Rupees)	35516	30380	23644	23100	13500	7238	6925	6388
In (%)	24.21	20.71	16.12	15.75	9.20	4.93	4.72	4.35

Source: Compilation of secondary data

Data in Table 1 demonstrates the comparative market share of different companies. Airtel Company dominates 24% of this market; whereas Reliance captures nearly 21%, Vodafone 16%, and BSNL almost 15%. These companies are major players in the market. 23% of the market is captured by other companies including Aircel, Idea, MTS, Tata Docomo etc. Hence, from the above data it is assumed that Airtel provides best services compared to others.

Beside this above, for Internet connection through cable network a sizable number of people uses BSNL (broadband and Data-One).

Table 2: Demographic Profile of Consumers in Asansol-Durgapur Region

Category	Group	Total Respondents Number (%)	Male Number (%)	Female Number (%)	Total
Age	Below 25 years	86 (26.54)	57 (27.80)	29 (24.37)	(Male= 205 + Female= 119) 324
	25-40 years	124 (38.27)	86 (41.95)	38(31.93)	
	40-60 years	107 (33.02)	57 (27.80)	50(42.02)	
	Above 60 years	7 (2.16)	5 (2.44)	2(1.68)	
	Total	324	205 (63.27)	119 (36.73)	
Occupation	Professionals (Doctor/CA/Lawyer)	156 (48.15)	97 (47.32)	59 (49.58)	(Male= 205 + Female= 119) 324
	Academicians (Professor/Teacher)	35 (10.80)	18 (8.78)	17 (14.29)	
	Businessmen & Others	43 (13.27)	38 (18.54)	5 (4.20)	
	Service Holders (Includes service in Public and Private sectors & NGOs)	41 (12.65)	25 (12.20)	16 (13.45)	
	Students (Genl./Mgt./Engg./Law)	49 (15.12)	27 (13.17)	22 (18.49)	
Qualification	Literate	11 (3.40)	7 (3.41)	4 (3.36)	(Male= 205 + Female= 119) 324
	10 Std./12 Std. +	41 (12.65)	35 (17.07)	6 (5.04)	
	Engg. Diploma/ B.Tech/ Graduate	204 (62.96)	129 (62.93)	75 (63.03)	
	Post Graduate	49 (15.12)	22 (10.73)	27 (22.69)	
	Doctorate	19 (5.86)	12 (5.85)	7 (5.88)	
Income (Per annum)	Rs.1Lac-3Lac	37 (11.42)	23 (11.22)	14 (11.76)	(Male= 205 + Female= 119) 324
	Rs.3Lac-5Lac	84 (25.93)	53 (25.85)	31 (26.05)	
	Rs.5Lac-9Lac	196 (60.49)	125 (60.98)	71 (59.66)	
	Rs.9Lac-14Lac	7 (2.16)	4 (1.95)	3 (2.52)	
Internet + mobile talk time use in Rs. (Per month)	Rs.100/- to Rs.300/-	78 (24.07)	49 (23.90)	29 (24.37)	(Male= 205 + Female= 119) 324
	Rs.301/- to Rs.500/-	212 (65.43)	134 (65.37)	78 (65.55)	
	Rs. 501/- to Rs. 750/-	89 (27.47)	57 (27.80)	32 (26.89)	
	Rs. 751/- to Rs.1000/- and above	23 (7.10)	14 (6.83)	9 (7.56)	

Source: Compilation of personal data from total respondents

Table 2 shows the compilation of primary data which has been collected with the help of questionnaire, consisting of eight simple questions (based on all available telecom brands operating in Asansol-Durgapur industrial region) (attached in Annexure II), collected from 324 respondents (sample of the personal data sheet is attached in Annexure I).

In Asansol-Durgapur industrial region, there are innumerable Central & State Govt. offices, factories, corporate houses, banks, post-offices, hospitals, NGOs as well as some general degree, management, law & engineering colleges. Though BSNL (as public-public partnership concept) has managed to capture institutional/corporate contract with govt. offices in this region, but Airtel is the most preferred brand in private sector organisations.

In the above region, about 95% consumers are prepaid users. In case of Internet users some postpaid consumers paid their bills through cable TV operators also. In this study, we have observed that the post-paid connections of internet through BSNL are getting low because of the grievances in terms of network service & jamming problem. Among 324 respondents, 46 are using BSNL for Internet purpose.

In Table 3, we have analysed consumer satisfaction level from the survey.

Table 3: Survey Result of Consumer Satisfaction and Dissatisfaction Level (in percentage)

	Telecom companies							
	Vodafone	**Airtel**	**BSNL**	**Reliance**	**Aircel**	**idea**	**MTS**	**Tata Docomo**
Satisfaction	61.38	72.3	42.38	68.31	53.38	56.6	52.2	51.6
Dissatisfaction	38.62	27.7	57.62	31.69	46.62	43.4	47.8	48.4

Source: Compilation of primary data

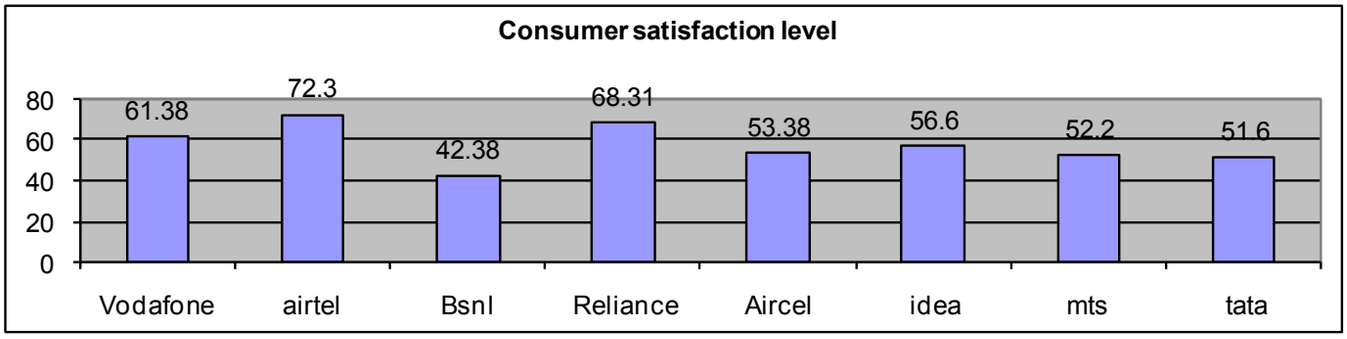

Fig. 1: Bar Chart Showing the Satisfaction Level of Consumers

Source: Compilation of primary data

We have collected primary data from 324 respondents. On the basis of the questionnaire, Table 4 has been prepared.

Table 4: Numbers of Consumers Who Prefer Low Call Charges Vis-à-Vis Consumers Who Prefer Clear Network Service

Telecom Companies	**No of respondent (i.e. users of these brands)**	**In percentage**	**Prefer clear network service (Ignoring high call charges)**	**Prefer Low call charges only i.e. cost Sensitive (May switch over to other brands if call charges increase further)**
Airtel	79	24.38	50	29
Reliance	67	20.68	43	24
Vodafone	52	16.05	32	20
BSNL	51	15.74	33	18
Aircel	30	9.26	22	8
idea	16	4.94	11	5
MTS	15	4.63	8	7
Tata Docomo	14	4.32	8	6
Total	324	100	207	117

Source: Compilation of primary data

DATA ANALYSIS & INTERPRETATION

The following solution has been derived by using SPSS tool for analysing and interpreting the data. We have worked out a t-test for testing the hypothesis which has been shown in Table 5 and Table 6.

T-Test for Testing Hypothesis

Table 5: Summary and Confidence Interval of Preferred Clear Network & Preferred Low Call Charges

Variable	N	Min.	Max.	Mean	95% CL Mean		Std Err.	Std Dev	95% CL Std Dev	
1	8	8.0	50.0	25.87	12.32	39.42	5.73	16.20	10.71	32.98
2	8	5.0	29.0	14.62	6.86	22.39	3.28	9.28	6.14	18.90
Difference (1-2)				11.25	-2.91	25.41	6.60	13.20	9.67	20.83

Note: Variable-1 denotes preferred clear network & Variable-2 denotes preferred low call charges

Table 6: Test for Equality of Variance by Pooled Method

Variable	Mean	Std Dev	df	t state value	Pr > |t|
1	25.87	16.20			
2	14.62	9.28			
Diff. (1-2) Pooled	11.25	13.20	14	1.70	0.11

Note: Two-sample assuming equal variances

Inferences

In this case, t-stat value is 1.70 & p value between two groups is found not to be significant. Since p value is 0.11, which is greater than significant level (0.05), therefore, we do not reject the null hypothesis. Here we found that the consumers preferred those telecom services that can provide clear network access, so H_0 is satisfied.

We have also conducted the test for reliability for proving validity of primary data which has been shown Table 7.

Table 7: Test for Reliability

Cronbach's Alpha (Raw Data)	0.911915
Cronbach's Alpha (Standardised Data)	0.985
Split-Half (odd-even) Correlation	0.971385
Standard Deviation for Test	23.69072

Here also we have used SPSS as Statistical tools. In statistics, internal consistency is usually measured with Cronbach's alpha, which is calculated from the pairwise correlations between items. Cronbach's alpha is a coefficient of internal consistency. It is also considered to be a measurement of scale reliability. Internal consistency ranges between zero and one. A commonly accepted rule of thumb is that an α of 0.6-0.7 indicates acceptable reliability, and 0.8 or higher indicates good reliability. The goal in designing a reliable instrument is for scores on similar items to be related (internally consistent), but for each to contribute some unique information as well. Here in Table 7, we get Cronbatch's alpha as 0.91 based on raw data and 0.98 based on standardised data, that indicate a most reliable dataset and on that basis, we can say consumers who preferred low call charges and the customers who preferred clear network access have relatively high internal consistency.

RESULTS

From above tests, it appears that mobile phone users preferred those telecom companies that can provide clear network access rather than only low call charges, thus H0 is satisfied.

Observations from the Consumer Survey

We have observed some causes for consumer satisfaction or dissatisfaction, which are discussed below.

In Case of Network Coverage and Service

The bar chart in Fig. 1 shows the number of satisfied consumers of different telecom companies. Airtel users have been found to be satisfied with 72.3% strength. They move towards good network service. On the basis of this finding, we may suggest that the company must maintain network service in order to dominate the market. 68.31% respondents who have been using Reliance connection responded that the company provides better network service. They feel that company is providing best services in term of networking coverage. Only 42.38% respondents are found to be satisfied with BSNL networking service of the company. Though BSNL has tried to capture through institutional/ corporate contract in govt. offices but majority of individual consumers have grievances with the network service with the company.

Advertising Calls and SMS

One of the most sensitive factors of causing dissatisfaction among consumers is unsolicited advertising calls and SMS. If the calls and SMS are repeated in a number of times; then consumers get disturbed. Hence, companies must ensure

to reduce these factors in order to retain and expand their consumer base.

In Case of Sudden Call Jamming

Further, we took into the account the problems of sudden calls jamming. One of the reasons is that in case of network jamming problem, consumers have to make 3 to 4 calls for getting one information and poor network cuts off Internet lines or lowering net speed which is irritable to consumers. We found that Airtel consumers have least problem in terms of sudden call jamming and consumers are free from fear of not having networking problem. On the other hand, Reliance and BSNL have problem of Sudden call jamming. 34.88% of BSNL consumers having the problem of sudden call jamming. Sudden call jamming makes irritation to the consumers. Hence, service provider companies should have a deep look into it.

Weak Response from Customer Care Desk

Some mobile phone users who are using Aircel, idea and MTS network service, are not satisfied with their respective customer care desk. If any complains/ grievances are to be registered through customer care desk, the consumers are getting hardly any response or low response from customer care service desk. As a result the complains/ grievances remain unattended and unsettled. So, there is a chance of losing consumers for those network service providing companies.

CONCLUSION

To get maximum benefit from this research, the telecom companies have to concentrate with quality services such as good connectivity, clear network, less unsolicited advertising calls & SMS etc.

We hope that that there is a great potential to further network management research by working closer with service providers.

FUTURE SCOPE OF WORK

Following procedure will be followed in future to extend the scope of this research.

- Data from these surveys will be organised in a form suitable for statistical modeling.
- Based on the data a statistical model will be developed.
- From this model trend of future markets will be determined.

ANNEXURE I

Personal Data Sheet of Respondents

Name _____

____ Sex _____

Address _____

Mobile No. _____

Category	Group	Please put (√) about yourself
Age	Below 25 years	
	25-40 years	
	40-60 years	
	Above 60 years	
Occupation	Professional (Doctor/CA/Lawyer)	
	Academician (Professor/Teacher)	
	Businessman & Others	
	Service Holder (Includes service in Public and Private sector& NGO)	
	Student (Genl./Mgt./Engg./Law)	
Qualification	Literate	
	10 Std./12 Std. +	
	Engg. Diploma/ B.Tech/ Graduate	
	Post Graduate	
	Doctorate	
Income (Per annum)	Rs.1Lac-3Lac	
	Rs.3Lac-5Lac	
	Rs.5Lac-9Lac	
	Rs.9Lac-14Lac	
Internet + mobile talk time use in Rs. (Per month)	Rs.100/- to Rs.300/-	
	Rs.301/- to Rs.500/-	
	Rs. 501/- to Rs. 750/-	
	Rs. 751/- to Rs.1000/- and above	

ANNEXURE II

Sample Questionnaire

1. According to you, which is your most preferred brand? (Please put a (√) only)

Airtel	Reliance	Vodafone	BSNL	Aircel	idea	MTS	Tata Docomo

2. On what basis you have selected your brand? (Please put a (√) only)

   ☐ For clear network service ☐ For low call charges

3. In your view which brand gives you the experience of poor network or jamming problem?

Airtel	Reliance	Vodafone	BSNL	Aircel	idea	MTS	Tata Docomo

4. According to you if your brand raises the call charges what you will do? (Please put a (√) only)

Accept	
Switch over to other brand	

5. If you face poor network, service or jamming problem in your preferred brand (although it may provide low call charges) what you will do? (Please put a (√) only)

Accept	
Switch over to other brand	
Retain preferred brand and will use another brand	

6. Whether the top-ups, power/magic vouchers and validity vouchers are easily available by you for your preferred brand? (Please put a (√) only)

Yes	
No	

7. According to you which brand provides low charges in calls as well as Internet? (Please put a (√) only)

Airtel	Reliance	Vodafone	BSNL	Aircel	idea	MTS	Tata Docomo

8. How often you have to make a contact with your customer care desk for solving any problem or redressing any grievances? (Please put a (√) only)

   ☐ Very often ☐ Often ☐ Rarely ☐ Not at all

Thank you for your kind cooperation.

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