



A STUDY OF USAGE BEHAVIOUR OF FREE WI-FI HOTSPOT SERVICES: WITH SPECIFIC REFERENCE TO COMMUTERS AT THE FOUR MUMBAI LOCAL RAILWAY STATIONS

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ABSTRACT

KEYWORDS:

Wi-Fi hotspot, Google, face book, wireless, CSPs, petabytes, online socialization

The thrust of getting connected is immersing as a new popular trend through a new mode, the free Wi-Fi hotspots, in the digital India. Wireless Fidelity Networks “Wi-Fi” technology and is growing as a mode of easy connectivity and it has emerging as a modern life style need. Being connected has slowly emerging and its need is realized irrespective of the place, even it is felt at home, in the offices, in the colleges, at the railway stations, bus stops, cafes or airports. Literately millions worldwide latch on daily to both paid and free Wi-Fi hotspots to surf the Net on their mobile devices.

Users are connecting to Wi-Fi at a public places like an airport, coffee shop, library or a hotel by using an open Wi-Fi network, with open and public wireless access are called wireless or public Wi-Fi hotspots. There are over 31,000 public Wi-Fi hotspots installed in India. It is estimated that public Wi-Fi hotspots are bound to grow to 340 million by 2016 globally, amounting to 1 hotspot for every 20 people, as against the current ratio of 1 hotspot for every 150 people. Globally, the Wi-Fi hotspot market size was estimated to be over \$1.5 billion in 2015, with over 47 million public hotspots deployed. France, the US and the UK led the deployment of public Wi-Fi hotspots with 13 million, 9.8 million and 5.6 million installed hotspots, respectively, till year 2016.

This paper discovers the usage behaviour and tries to recognize their intensions about this new service, and traces the motivators and drivers behind adoption of this new service. It will help the service users to find a more focused precise way to use it for advertising there products as a new means of marketing communication.

1. INTRODUCTION

According to industry estimates, and the number of free Wi-Fi hotspots is expected to grow beyond 2, 02,000 by 2018. However, for India to match the current global average of one public Wi-Fi hotspot per 150 people, an additional 8, 00,000 hotspots need to be deployed.

Global internet tech companies such as Google Inc. and Facebook Inc. are tapping this segment in India, by providing Wi-Fi and public hotspots as a preferred route to deploy broadband networks in India. Google (in partnership with RailTel, as backhaul provider) is aiming to enable 400 railway stations in India with public Wi-Fi hotspots (with 13 already deployed and being used by over two million people daily), Facebook recently announced plans to set up community public Wi-Fi hotspots in rural India, in partnership with Bharat Sanchar Nigam Ltd. The primary objective of both these companies is to attract new Internet users and expose them to the world of possibilities enabled by high-speed connectivity.

It is self-indicative that India has a potential to expand its Wi-Fi facility progressively, countries like France, USA & UK had 13 million, 9.8 million and 5.6 million Wi-Fi hotspots respectively as compared to only 29,205 Wi-Fi hotspots in India. Globally there is 1 Wi-Fi hotspot for every 150 people. In India, 8 lakh additional hotspots have to be installed to have one Wi-Fi hotspot for every 150 people. India as a country represent one sixth of the world population and India's share in Wi-Fi hotspot is less than 1/1000 (Data as of 2014).

The Indian National Telecom Policy, 2012 recognized telecom service, including broadband connectivity, as a basic necessity like education and health services and aimed to work towards the “Right to Broadband”. Thus, provision of internet services through the public Wi-Fi system will help the government in achieving its policy objectives and will go a long way in providing a seamless experience to users (NTP, 2012).

India is ranked at 108th position globally in terms of affordability of fixed-line broadband services and at 97th

position for mobile broadband services. Thus, there is a need for better proliferation of Wi-Fi networks that offers an affordable, versatile & flexible method for scaling up of Internet Access. Presently, the public Wi-Fi hotspots in India are segregated on the basis of its locations such as Hotels 12856, Cafes 13,967, Retail 4,435, Municipalities 150, and Airports 108 and at Flight 2 (as of 31st March, 2016).

Currently, most of the Indian telcos provide enterprise Wi-Fi solutions through custom deployments in IT and business parks, educational institutes (campus Wi-Fi), hospitals, etc. They have not ventured into community Wi-Fi networks or urban location-aware services.

Usage of internet for being connected has grown with the advancement of improved technologies specifically with the advancement of hi-tech and more built in memory phones, in India.

Consumption of mobile data continues to grow. It is estimated that by 2019 over 112 exabytes of data will be delivered via mobile networks every month including 89 exabytes from Wi-Fi networks alone. In response to this clear trend, Communication Service Providers (CSPs) and other high-tech companies are aggressively expanding small-cell technologies, and are looking to overcome the limitations of unlicensed spectrum in order to monetize their networks in new ways. As this expansion occurs, more focus will be placed on establishing and maintaining a consistent customer experience.

The ambitious railway Wi-Fi project has come a long way since September 12, 2015, when Indian Railways announced its partnership with Google. After starting with Mumbai Central, it was, in January 2016, became the first railway station in the country to offer free Wi-Fi facility. The railways continued connecting other busy stations such as Bhubaneswar, Bengaluru, Howrah, Kanpur, Mathura, Aligarh, Bareilly and Varanasi with the free Internet service. At last count, 115 stations across the country have been covered under this scheme. The target is to reach 400 stations by the end of year 2017 (Financial Express, April, 16, 2017, Kunal Doley). Railway is the primary mode of transportation for a majority of Indians. Every year, over 8.1 billion passengers travel on trains. That roughly translates to over 22 million passengers a day. As per Google, over five million people in the country are latching on to its free Internet service every month (about 1.7 lakh people every-day). Out of this, 15,000 people are accessing the Internet for the first time in their lives every-day.

The free Wi-Fi is used more in smaller cities than in larger ones, because of the poor connectivity of high-speed broadband outside of the major metropolitan centers. The free Wi-Fi is much faster than 3G Internet that is most widely used in India at present, by an average, users of the free railway-station Internet Wi-Fi. Despite being in transit and being limited to one hour of usage per person per day they are utilizing 15 times more data than they would consume on 3G in a day.

This project 'Railwire Saathi' operates on 'Google's Fiber' technology, through which the company (Google) provides free Internet services with a speed of 1 Gbps. 'Google Fiber' was launched in 2010 and the service is available only in the US at the moment.

Meanwhile, aiming to provide connectivity in remote areas, Indian Railways is setting up free Wi-Fi hotspot kiosks at about 500 stations and help people to access an array of online services, including various government schemes.

2.LITERATURE REVIEW

Wi-Fi technology has evolved as a unique method for constantly offering customers a secure, wireless, and mobile access to the internet and it is evolving in terms of technological advancements such as 4G, and LTE i.e. Long-Term Evolution (Ullah, 2012). The quality of Wi-Fi service depends on these types (Bradwell, 2005). Speed and security are imperative parts of using Wi-Fi service other than accessibility, ease of use, and continuity, (Demarez, Evens, Schnurman and Yerleye, 2010). The speed offered and the easiness of Wi-Fi access has elevated it from being a customer's luxury to a daily necessity (Berezina, Bilgihan, Cobanoglu, & Nusair, 2012).

It is an estimate that in India mobile data traffic is bound to grow by 12-fold from 2015 to 2020 and mobile data traffic will reach 1.7 Exabytes per month by 2020 from 148.9 Petabytes in 2015. Therefore, mobile network infrastructure should be so designed, to handle this spur in the use of data which can be achieved only by connecting the users by Wi-Fi hotspots. (Cisco VNI, 2016). Wi-Fi networks are bound to be popular since, often offers it faster speeds compared to mobile data, allowing users to access more data-intensive applications and content (Telecom Regulatory Authority of India, Consultation Paper No. 14/2016).

The importance of public places in modern civilization is multifaceted and it is used for purposes like individual interactions, it cultivates a sense of identity and it propagates a sense of belongingness in the regular inhabitants through various forms of transactions pertaining to nature of commerce, occasions of social interactions, individual to individual interactions, local events, public demonstrations/ performances and these places are key in production of culture (Carr, Francis, Rivlin, & Stone, 1992). Specifically in busy cities the public spaces lubricate the urban flows by facilitating various roles like providing shelter, place for relaxation and place to socialize (Whyte, 1980). It is revealed in some earlier researches that these public spaces are crucial for democracy and social change, affording visible political expression through protest and activism (Mitchell, 2003, Low and Smith 2006). More specifically Public spaces are also the product of inequitable power relations, which they serve to reproduce by enabling forms of social stratification (Tonkiss, 2005). In short, socially diverse and respectful public spaces have a variety of goals delivered to every individual laterally supported by the usage of free Wi-Fi (Low, Taplin, & Scheld, 2005).

Three motivations were discovered specifically for adopting the free Wi-Fi facilities such as, willingness to break free from telecommunications companies, a spirit of sharing between community members, and learning benefits (Auray et al. 2003). Some earlier research work had proposed a list of motivations such as creating a cooperative spirit, to gain prestige in the community, to challenge telecom firms and to promote free communication (Schmidt and Townsend, 2003). A motivation for undermine telecommunications companies' services by encouraging members for adopting free Wi-Fi services had been discovered as one of a prominent motivation by bringing prestige by bringing mutual cooperation among users (Schmidt and Townsend, 2003). A number of reasons related to free Wi-Fi usages can be classified in-to social, psychological, hedonic, or utilitarian motives (M. Bina, George M. Giaglis, 2006).

The usage is also due to a mix of intrinsic motivations (it is enjoyable or satisfies needs of competence, autonomy and

relatedness), obligation-based motivations (to abide norms of reciprocity or other community shared values) and extrinsic motivations (explicit rewards, external pressure, self-esteem, ego involvement, personal connectivity needs, human capital, career prospect, altruism and ideological aspirations) (Deci and Ryan, 2000).

It is established that free Wi-Fi is mainly used for four main usages viz. Supportive use, Entertaining use, Productive uses, Social uses (Hampton, Livio, & Goulet, 2010).. The social use is further classified as Online Sociality and Co-located Sociality and Serendipitous sociality (Lambert et al. 2013).

3. RESEARCH METHODOLOGY

- Utilitarian motivations (like getting connectivity with other members, getting economical software/apps);
- Psychological motivations (like feeling good through sharing, contributing to some idealistic goals such as promoting education/child care etc.),
- Social motivations (like getting in contact with other members or feeling part of a community);
- Intrinsic motivations (like enjoyment in doing an interesting activity, learning or applying technical skills)

Since, this paper's focus is to assess the usage of free Wi-Fi services at prominent railway stations at Mumbai and suburban city areas; the comparative usage preference is measured by the frequency of Wi-Fi usage. Since the services are provided at specific local railway stations, current study has measuring usage behaviour only at the four prominent locations, with respect to the frequency and duration and motivation of using the Wi-Fi facility.

The respondents were asked to answer each question on a scale, for every day usage. The core part of the indicators had been, adopted from the questionnaires of the World Internet Project (UCLA Center for Communication Policy 2001). Subsequently, the researcher developed additional indicators to measure engagement in the emerging Internet activities, for instance, online content creation (Pruulmann-Vengerfeldt et al. 2008).

3.1 Measurement & Coding:

For measuring level of education, a single number indicator of the number of years in education was asked. The information about income it is measured by asking the respondents to indicate monthly income on a predefined categorical scale.

The questionnaire consisted of nine questions, developed to serve the research purpose, asking the respondents to indicate on a possible 4 options and at some questions fifth option was also provided. Question 2 was incorporated as main qualifying question and those respondents who has a choice as 'yes' were advised to explore further questions. This was planned to avoid the imaginary replies.

3.2 Primary Data

Primary data was collected randomly through a structured questionnaire in Mumbai city using convenience based random sampling. The questionnaire was administered at four railway stations, located in the Mumbai local train network viz. Chatrapati Shivaji Maharaj Terminal i.e. CSMT, Dadar, Thane and Panvel. To capture the various time lags the data was collected on various time schedules in a day at all the above locations. The data had been collected in a span of a month from 10th May, 2017 to 10th June, 2017, selected randomly by a mode of face-to-face interaction.

3.3 Sample Size

The study was limited to those participants who willingly elected to complete the instruments in their entirety. There were a total of 196 respondents.

3.4 Sample Design

The researcher relied upon convenience based random sampling technique, considering the research methodology and research type as per guidelines. A caution was exercised during the study that the respondents who did not show an inclination to be a part of the study were not insisted for.

3.5 Secondary Data

The secondary information or data was collected from published sources such as journals, magazines, newspapers, Industry reports, internet and other sources. Table No. 1 indicates the details about the sample studied for this research work.

Table No.1

Demographic Variable		Frequency	Percentage
Gender	Male	103	52.6
	Female	93	47.4
Age	Below 20	30	15.3
	21-30	104	53.1
	31-40	53	27.0
	41 +	9	4.6
Employment Type	Self Employed	17	8.7
	Service	179	91.3
Residential Location	Harbor	83	42.3
	Central	90	45.9
	Western	23	11.7
Work Location	Harbor	65	33.2
	Central	76	38.8
	Western	55	28.1
Daily Travelling Time-span	1 Hrs	102	52.0
	1 to 2 Hrs	85	43.4
	2 Hrs & More	9	4.6

(Source: Primary Research)

4. STATISTICAL ANALYSIS

Efficient and effective data analysis is the result of effective data preparation. This was found to be very crucial between the completion of the field work and the statistical processing of the collected data. Data preparation involved transferring the questionnaire into an electronic format which

allowed and facilitated subsequent data processing. Data sheet was prepared directly at Statistical Program for Social Sciences (SPSS) software for further analysis. Each response was assigned code for data entry and data record. Transcribed data sheet was prepared for data analysis. On the basis of data sheet, tables and graphs were prepared for the analysis.

Table-2

Preferential Activities	Access Location				Total (Nos.)	Total (%)
	CSMT	Dadar	Thana	Panvel		
Document/ File Sharing	4	5	0	0	9	5
Video/Movie Sharing	26	8	0	28	62	32
Posting Photo	30	12	16	7	65	33
Voice Calling	9	1	2	21	33	17
Gaming(Playing/Downloading)	10	0	14	3	27	14
Total	79	26	32	59	196	100

(Source: Primary Research)

Table No.2 shows the usage of free Wi-Fi access at the four locations. Posting photos is revealed as the most preferred activity with 33% and file sharing or document viewing is the least preferred activity with just support of 5% of the sample. These preferences are further studied with respect to the role of the locations, by testing the association of the locations and the preferential activities by using the free Wi-Fi services by the users. It is established that the locations and preferential activities are strongly associated with 90.086 Pearson chi square value and 12 degrees of freedom at 5 % level of significance.

These preferential activities were further explored as shown in Table No. 3 with gender of the users. It is revealed that gender as a user characteristic plays a prominent role in the preference. Highest numbers (39.81%) of male users use free Wi-Fi for Video or Movie sharing or viewing purpose. While as highest female users (31.18%) uses free Wi-Fi for posting photos. Document or file sharing is the least preferred activity by both male and females.

Table-3

Preferential Activities	Gender			Female (%)	Total
	Male (Nos.)	Male (%)	Female(Nos.)		
Document/ File Sharing	3	2.91	6	6.45	9
Video/Movie Sharing	41	39.81	21	22.58	62
Posting Photo	36	34.95	29	31.18	65
Voice Calling	13	12.62	20	21.51	33
Gaming(Playing/Downloading)	10	9.71	17	18.28	27
Total	103	100	93	100	196

(Source: Primary Research)

The association according to the user's gender and their preferred activity by using free Wi-Fi service has indicated a strong association. It was measured by parson's chi square

test of association. The chi square value calculated at 11.024 for 4 degrees of freedom at 5% level of significance.

Table-4

Preferential Activities	Age				Total
	Below 20	21-30	31-40	41 +	
Document/ File Sharing	1	3	5	0	9
Video/Movie Sharing	13	42	6	1	62
Posting Photo	6	35	17	7	65
Voice Calling	4	15	13	1	33
Gaming(Playing/Downloading)	6	9	12	0	27
Total (Frequency)	30	104	53	9	196
Total (%)	15.31	53.06	27.04	4.59	

(Source: primary Research)

These preferential activities were further explored as shown in Table No. 4 with the user's age groups. It is revealed that age plays a prominent role in the preference. Highest numbers 42 users of age 21-30 use free Wi-Fi for Video or

Movie sharing or viewing purpose, while 41 and above age group users use very less (4.59%) free Wi-Fi services. Marketers should focus only on the two (21-30 and 31-40) age groups if free Wi-Fi is proposed as advertising channel.

Table-5

Duration of Free Wi-Fi Access(daily)	Gender		Total(Nos.)
	Male(Nos.)	Female(Nos.)	
Less than 5 Minutes	22	28	50
6 to 10 Minutes	22	39	61
11 to 20 Minutes	59	26	85
Total	103	93	196

(Source: primary Research)

Table No.5 shows the access duration of the Free Wi-Fi services at the railway stations' under study. The access duration is studied in three different spans of time lengths, i.e. the minimum span is spread of less than 5 minutes and the maximum span is categorized as 11 to 20 minutes. It is found

that highest users i.e. 59 explore the facility of free Wi-Fi daily for a time span of 11 to 20 minutes. Second highest users are females explore it for 6 to 10 minutes daily. Marketers may explore this for reaching male audience with lengthy communication message.

Table-6

Site Types	Age (In Years)				Total (Nos.)	Total (%)
	Below 20	21-30	31-40	41 +		
Pornography	10	49	7	3	69	35.20
Social (Health/Technology/News)	1	6	11	2	20	10.20
Formal Education	0	11	14	0	25	12.76
Business/Commercial	19	38	21	4	82	41.84
Total (Nos.)	30	104	53	9	196	
Total (%)	15.31	53.06	27.04	4.59		

(Source: primary Research)

The test results indicated in table-6 were further analyzed by associating an additional variable 'user's daily travelling time with the type of site they access by using free Wi-Fi services. The commuters who spend more time in travelling

use the least and the less time travelers use the free Wi-Fi more. Table-7 shows the classification according to the daily travelling time and usage of free Wi-Fi services.

Table-7

Site Types	Daily Travelling Time			Total
	Up to 1 Hrs	1 to 2 Hrs	2 & More	
Pornography	34	35	0	69
Social (Health/Technology/News)	10	10	0	20
Formal Education	10	14	1	25
Business/Commercial	48	26	8	82
Total	102	85	9	196

(Source: primary Research)

The commercial activity is further analyzed in table- 8 showing the user's gender and buying through using the free Wi-Fi services at the four locations. The male and female are using it for buying electronic appliances and personal products respectively. Female has shown less (9) purchase inclination of electronic goods through free Wi-Fi services while as males

and female users both has shown equally less (9 & 7 respectively) inclination for Cd, books and E-Books through free Wi-Fi services. Gender of users and purchase preference has tested further for association by Pearson chi square test, and it is standing significance at a 0.05% of significance level, with 4 degree of freedom at 22.817 Pearson test value.

Table-8

Product purchased	Gender		Total
	Male	Female	
Clothing	17	19	36
Beauty	11	23	34
CD/Book/EBook	9	7	16
Personal Product	28	35	63
Electronic/appliances	38	9	47
Total	103	93	196

(Source: primary Research)

5. CONCLUSIONS

Availability of free Wi-Fi is emerging as a necessity in urban India. Recently it is focused as a tool for agitating the social engineering for general and specific purposes like spreading the financial inclusion. It has been assumed that if people were allowed to come closer and establish interpersonal communication by adopting various formats of social media, it will expedite the economic and social transaction. Policy makers projected the facility of providing free Wi-Fi as a social catalyzer in achieving those targets.

Earlier research conducted in advanced economies had indicated no association of the artificial socio-economic boundaries demarcated through individual factors like age and education. But in Indian that also at a metro location which is commercial capital of the country it is emerged as pre-requisites to explore the digital revolution through free Wi-Fi made available and accessible to masses.

Even though it is not within the scope of this paper but it seems that people are slowly personalizing there buying experiences. Free Wi-Fi is successful in its acceptance for purchase virtually anything at any time, while providing producers with direct access by eliminating mediators to a wide range of market. Thus more people will come within the range of benefits to nurture the fruits of financial inclusion.

6. SUGGESTIONS

The relation of travelling time & usage of free Wi-Fi should further be analyzed more critically to provide more options which may attract this potential class of users. 21-40 is aggregate age group representing the higher user (80.10%) category of the free Wi-Fi services. The marketing managers who are planning to adopt advertising campaigns should plan their products and messages for this class to reach perfectly.

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