A STUDY OF THE EFFECT OF SUBSCRIBER CHARACTERISTICS TOWARDS THE DEMAND FOR MOBILE COMMUNICATION

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INTRODUCTION

Since its inception, wireless mobile communication has been embraced by many. The ability to roam around while being connected has been an attractive characteristic in mobile communication. Furthermore, the added features like short messaging, mobile internet and many other value added services over the mobile communication framework have been fertilizing this demand (De Silva, 2009).

Compared to other developing countries, Sri Lanka has been having a very high growth rate in its mobile communication industry. This growth has been such that by the year 2012, the number of mobile units in the country was equal to its population, resulting in a 100% penetration (TRCSL, 2013). In a Sri Lankan context, the mobile phone has been transformed from a luxury item to an essential tool, over the last 15 years.

Meanwhile, many telecommunication service providers have identified this demand for mobile communication in Sri Lanka and have entered the competition to win a portion of the subscriber base. In this process, identification of different factors affecting the telecommunication demand has been of highest importance as it helps to steer the services and coverage enhancements in the correct direction (Lee, 1988 & Valentin, 2005). Moreover, the demand affecting factors based on the subscriber characteristics are of importance. This identification would allow the service providers to design, implement and expand their mobile networks to match the subscriber requirement; and hence would win a larger portion of the subscriber base. At the same time a service provider would be able to predict the future demands and make adjustments by having a complete knowledge of the relationships (Skouby, 1991).

The objective of this study is to investigate the relationship between the mobile communication demand in Sri Lanka and different considered subscriber related factors.

METHODOLOGY

This study was carried out in the urban areas of Nawala, Koswaththa, Narahenpita, Polhengoda and also in Kuliyapitiya, Narammala, Dambadeniya, Nikaweratiya and Giriulla rural areas. A random sample of mobile subscribers was selected comprising 202 from the urban areas and 163 from the rural areas to respond to a survey questionnaire. The survey questionnaire was targeting to test the relationships between the demand for mobile communication in terms of daily usage and 11 demand dependent factors shown in Table 1. These can further be grouped into to customer characteristics, customer perception, purpose of cellular network usage and social impact of mobile phones. It is important to note that most of the technology related factors which determine the demand are beyond the objective of this research, and hence not investigated.

The questionnaire consisted of 24 questions where the responses were mapped to numerical scales corresponding to different demand dependent factors. For the subscriber perception based factors, a Likert Scale (Bertram, 2013) was used for this mapping and the Likert scale was so selected that the most unfavorable response was assigned the value 0, the most favorable response was assigned a value 1 and the inter-response gap in the scale was

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constant. At the same time, responses to the other questions were also mapped to scales

between 0 and 1 with inter-response gaps in the respective scale being constants. As an example, in the mapping for the parameter "Gender", "female" is assigned a value 0 and "male" a value 1. Similarly in scaling the "age" parameter, age group "below 18" was assigned a value 0 and "above 50" was assigned a value 1 while other middle aged groups were assigned intermediate fractional values.

In this mapping, some parameters were addressed by more than one question, in order to have a complete coverage on the same parameter in different angles. Therefore in such instances, the responses from multiple questions were combined with unit weights to calculate a single numerical value to represent the response of each subscriber to each parameter.
The daily demand/usage data of each and every subscriber was too captured via the same questionnaire.

Moreover, based on a preliminary analysis of the results, it was observed that the rural and urban mobile subscribers behave differently; hence the mapping and grading were carried out for urban and rural sectors separately.

The numerical data were then analyzed with Matlab software tool to test for linear correlation between the usage and the considered factors.

RESULTS AND DISCUSSION

The correlation between the daily demand/usage and the considered eleven factors are as shown in Table 1. From Figure 1 and considering the scaling scheme used, the following can be observed.

1. There is a considerable correlation between usage and gender in urban areas while this correlation is negligible in rural areas. Furthermore, there is a tendency for the female population to have a higher mobile usage.

2. Usage greatly depends on age. In urban areas lower age groups have a high mobile usage while in rural areas it is totally the opposite.

3. Demand depends on the profession in rural areas where businessmen and self employed group dominate the usage. In urban areas, there is not much dependency on the profession as the mobile telephone is no more a luxurious or a business class item in urban areas.

4. In urban areas, the demand has a high correlation to the service requirement or the purpose of using a mobile telephone. In rural areas it is not significantly related.

Table1: Linear correlation between different factors and the mobile usage

Demand Dependent Factors	Linear Correlation Urban	Linear Correlation Rural
1.Gender	-0.22917	-0.04431
2.Age	-0.39345	0.392545
3.Profession	-0.19973	0.346147
4.Service requirement (purpose)	0.311494	0.104512
5.Quality of service expected	0.077261	-0.10268
6.Coverage expected	-0.06742	-0.00172
7.Tariff	0.037098	0.327916
8.Time of phone usage	0.096097	-0.063
9.Customer Perception	0.013357	0.307501
10.Social Beliefs	-0.07593	-0.1673
11.Promotional offers	0.236384	-0.11413

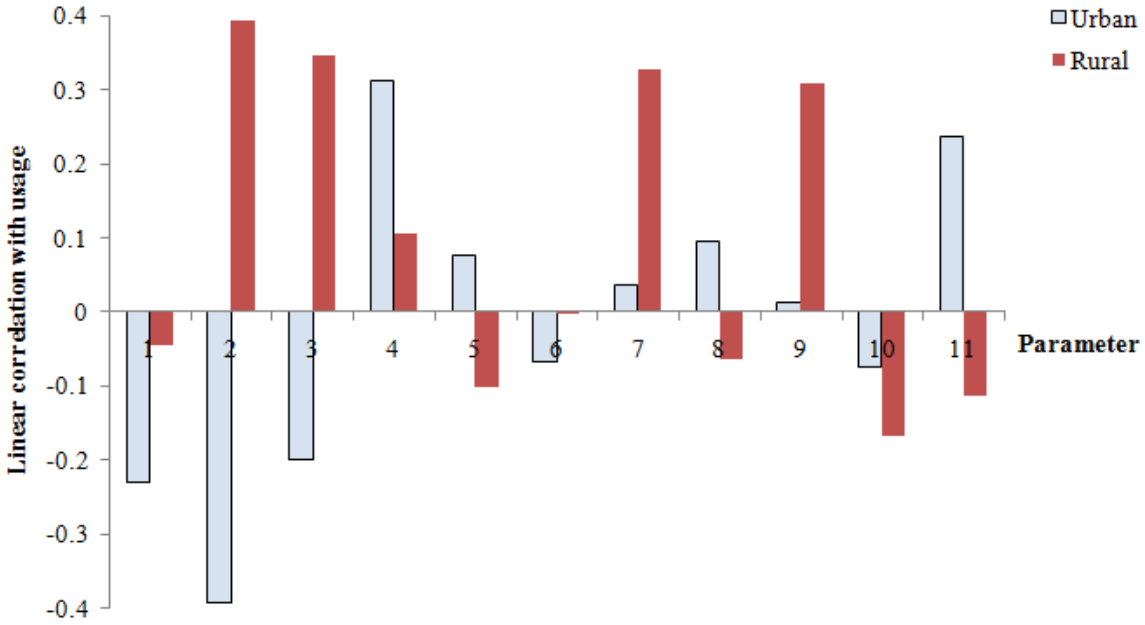


Figure 1: Comparison of correlation in urban and rural areas

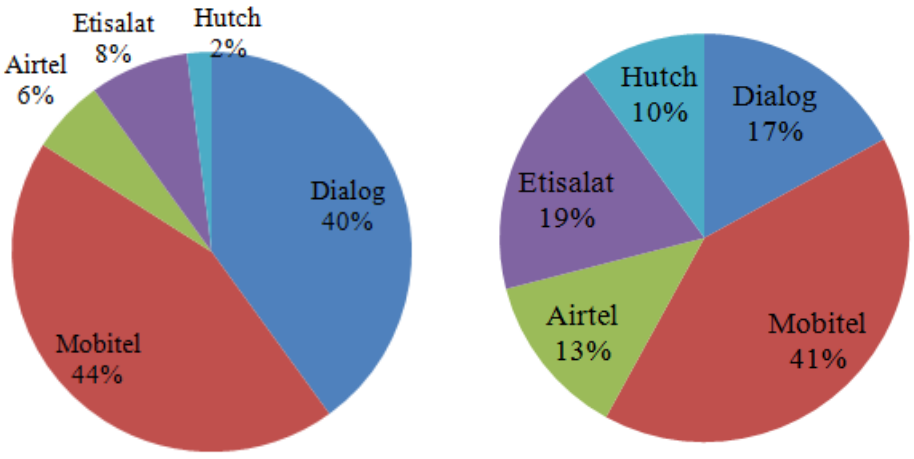
5. Coverage and the quality of service expected do not relate to the demand. This may be due to the fact that with the current technologies, a major part of the country is covered by all the service providers and are also maintaining very good quality standards. Therefore, subscribers are not inneed of any improvements in service quality and coverage.

6. Tariff seems to be not bothering the usage in urban areas while tariff is a concerned factor in rural area's mobile usage. This behavior clearly reflects the economic standards of the urban and rural communities. Moreover, the rural community still believes that using a mobile phone is prestigious while the urban community considers it only as a useful tool.

7. The rural community is more satisfied with the conventional value added services and offers while the urban community has more dynamic demands, and prefers to go for new services with smart phones.

According to the selected random sample, Mobitel is seen to be the most preferred service provider in the selected areas. Dialog and Mobitel collect almost all the subscribers in the considered urban area where as in the rural areas Airtel, Etisalat, Hutch and Dialog have 59% of the subscribers nearly equally divided between them while Mobitel leads with 41% (Figure 2).

Dialog has been in the forefront of introducing new state of the art services like "e-cash" while Mobitel has been maintaining economical tariff plans like "*Upahara"*. This distribution can be a result of the urban subscribers' concern over new value added services which has brought Dialog an almost equal share as Mobitel while in the rural areas Mobitel's economical tariff plans have outperformed in the absence of the rural community's interest towards new value added services. Not been the leaders in either the economical tariff plans or the new services, has led the other four operators to enjoy only a relatively less share.



(a) **(b)**

Figure 2: (a) Urban subscriber distribution (b) Rural subscriber distribution

CONCLUSIONS

Sri Lankan urban and rural mobile subscribers have different life styles and different sociological characteristics, hence different factors contribute to telecommunication demand differently. Age group, service requirement, promotional offers, gender and profession are observed as demand affecting factors in urban areas. Similarly, age group, profession, tariff and customer perception are clearly observed to be the demand affecting factors in rural areas (Figure 1).

The offering of different new services and economical tariff plans by Dialog and Mobitel respectively have earned them larger portions of the subscriber base where the subscribers value these factors. This operator preference behavior has verified the effect of different factors for rural and urban mobile communication demand.

These same results can be well utilized in upgrading the mobile communication facilities by the operators. As an example, the introduction of economic tariff plans will yield a higher usage in rural areas while the promotional offers would attract more subscribers and create more demand in urban areas.

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