A Customer Centric Best Connected Channel Model for Heterogeneous and IoT Networks

Pushpa Singh, Department of Information Technology, Accurate Institute of Management and Technology, Greater Noida, India
Rajeev Agrawal, Department of Electronics and Communication Engineering, G.L. Bajaj Institute of Technology and Management, Greater Noida, India

ABSTRACT

This article describes how the Heterogeneous and IoT networks are the most sought solutions to significant coverage and connectivity to the users. This article suggests a model for a heterogeneous and IoT network comprised of grading of the users based on their movement pattern, usage, and applications. Users are then given preferential possible access to the best connected network on the basis of their loyalty factor. The proposed model is customer centric and provides a best suited network to their loyal user on different aspects of the usage. Simulation studies were carried out to establish the suitability of the proposed work. The work also presents a scheme to retain the loyal customers in their network by providing them better services.

KEYWORDS
Channel Assignment, Heterogeneous Network, IoT, Loyalty, Utility Function

INTRODUCTION

During recent years, mobile communication and wireless technologies have changed the world of Information Technology (IT). IT infrastructure is characterized by a high level of heterogeneity in term of network, devices, application and service providers. Heterogeneous network is a future mobile network in which multiple users are connected to numbers of wireless networks such as WLAN, cellular, adhoc, sensor and personal area and other network at the same time. Application heterogeneity includes Voice over IP (VoIP), Live streaming, voice /video conferencing, remote access other than the general applications. Device heterogeneity referred to various types of such as mobile phone, smart phone and tablet, laptop or any other device which can communicate with other devices and is referred as Internet of Things (IoT). Reports and recent trends show that there will be 16 billion connected devices by the year 2020 (Sundmaeker, Guillemin, Fries, & Woelfflé, 2010). To provide a global connectivity at any time, any place, all the above networks will be part of a group and exist as a collection of a heterogeneous network. In terms of IoT the devices will communicate...
within themselves. However, to access any service outside their network they are dependent on the heterogeneous networks (Atzori, Iera & Morabito, 2010; Han et al., 2013).

Coexistence of underlying network is the basic need of telecom and IT Industry, this leads to an open competition among the service providers. To survive in the market, telecom operators are investing heavily to retain their consumers rather than acquiring new consumers. Further, the business will only grow as long as a service provider can hold their old consumers in their network and add new into their system. This is only possible if the loyal customer/user is satisfied with the services provided by the operator. For service providers, retaining the customer in their network is a great challenge, and they always work on different schemes, strategies, ways, models and business plan to retain their customers (Jain, 2005). It will be interesting to understand that what would make a customer walk away from the network (service provider). Generally, the basic and foremost reason is poor network coverage, high service charges and availability of seamless services. Among these the poor connectivity is a major issue which supersedes other issues, as customers are being charged for the services they are using.

As a customer or user one would always like to be connected to a best available network so as to maximize their utilization and that too in a minimal service cost. This result is a min-max problem in terms of the user perspective. However, in today’s time, the user can select any service provider based on his or her experiences. If user is not satisfied at any point of time with the services, user can port to any other service provider. This becomes a game between the service providers and the customer.

Nowadays users access different type of services such as voice calling, video conferencing, streaming and many others, and expect their link to be fast, easy to connect and flexible as far as possible. However, service providers can only serve a limited number of customers, as per the available resources at any instant of time, and arrival of customers is a random process. Service providers would definitely like to give preference to those customers who are valuable to them by offering best network amongst the available group of networks which are heterogeneous in nature.

One can also take into consideration the location profile of a user and its usage pattern in a particular location and all locations where user roams. Based on this author proposed a location centric profile of an individual user. To better understand it is obvious that the customer is mobile and its location keeps on changing with respect to time. It’s important to note that for every location customer’s preference of data usage is not constant with respect to time and location. Time and location are random variables for every customer. Consider, a scenario where a person prefers only messaging during 7 am to 10 am as he is at home, prefer to take or send voice calls from 11 am to 5 pm during office hour and access online movie and other video applications during the leisure or off period. In such scenario it is clear that the bandwidth and QoS requirement of a user is not static throughout the day.

This motivates authors to create a business model based on such real information about a customer. As discussed earlier service providers will always want to maximize his minimum gains and minimize his maximum losses in order to generate a high degree of revenues.

The proposed work suggests a new model to categorize the customer in terms of their loyalty and provide the best network services to such customers. The model suggests how to rank the customer and allocate the best channel through a distribution mechanism.

**LITERATURE REVIEW**

In the year 2018 India is expected to raise its mobile phone users by 775.5 million. After the launch of Reliance Jio in 2016, India is witnessing a fierce competition between service providers in the voice tariffs and data pricing. With Jio providing the free data and call services for six months to their user the number of users in India’s using Internet services has grown exponentially. The aggressive strategy of Jio has created a threat within the service providers how to retain their current customers. The service provider has to think new ways to ensure effective utilization of
End-User System Development: Lessons from a Case Study of IT Usage in an Engineering Organization
www.igi-global.com/chapter/end-user-system-development/18188?camid=4v1a

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