Chapter 14
Prospects of Open Source Software for Maximizing the User Expectations in Heterogeneous Network

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ABSTRACT

This article focuses on the prospects of open source software and tools for maximizing the user expectations in heterogeneous networks. The open source software Python is used as a software tool in this research work for implementing machine learning technique for the categorization of the types of user in a heterogeneous network (HN). The KNN classifier available in Python defines the type of user category in real time to predict the available users in a particular category for maximizing profit for a business organization.

1. INTRODUCTION

Free and open source software (FOSS) is one of the effective tools that can be easily utilized in business, research and academia. FOSS is a movement started way back in 1980 to provide reliable software at low cost/free of cost to the users (FOSS A General Introduction, 2018). These softwares could be used, modified, redistributed without any permission required. FOSS insists on ethical and moral importance of users' freedom and hence has strict norms on how to aggregate free and proprietary software together. Open Source Software has a pragmatic view on this matter and allows proprietary software to be easily aggregated with open source software. These two terms (free and open source) are used for the unique development model and innovative distribution policy of software. The software can be mostly free,

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but not open source and can also be open source but not free. FOSS provides both free and open source software for the use of people. FOSS has drawn the attention of people from various backgrounds who have labelled it as an opportunistic software development model (Umarji, Sim & Lopes, 2008).

The FOSS developers can modify the software to make it trustworthy for the future users. Today FOSS is growing with the large number of open source software projects and the amount of open source code in the world at an exponential rate. The total amount of source code and the total number of projects double about every 14 months (Deshpande & Riehle, 2008).There are various example of FOSS product such as Linux, KDE, GCC, Android, Apache, MySQL, Perl, PHP and Python, etc. These FOSS' products are changing the shape of the current digital world. Python become very popular and get no. 1 position in all other parallel and similar solutions. Python is an open source and free to use even for commercial applications because of its high regard and ubiquitous nature (Srinivasa & Deka, 2017).

A HN provides integration of WLAN, WMAN and WPAN-adhoc peer-to-peer networks. These standards operate on a different set of service parameters such as data rates, distance (signal range), bandwidth, frequency band, and modulation technique (Simek et al., 2007). However, the concept of HN requires the whole network to operate in an efficient and seamless manner. As each standard supports different types of data rate as mention in Table 2, a mobile user can select any of the available networks as per his need from the set of HN.

As there are approximately 7.2 billion mobile devices /customers worldwide (Okeleke, Rogers & Pedros, 2017). The QoS experience of a customer is crucial for a service provider to retain its existing customers. Nowadays adding a new customer to its base is a difficult and costly affair than to retain an existing loyal customer (Jain, 2005; Sanchez, 2003). Here customer loyalty is a subjective term which can be defined by the segment of mobile user according to their payoff toward the service provider or a profit received by the customer in terms of service provider perspective and may differ case to case as per the subject. The customer retention is defined as the intention to stay with the current network provider quantified in terms of time span, whereas customer loyalty is defined as the intention to maintain the business relationship with the current service provider (SP) measured in the revenue acquired by the SP. Many research papers have been reported to define the term customer loyalty in different aspects and parameters. It is important to understand that why should a customer be loyal to service providers. Taking a general view a customer will continue with the same service provider if he is getting the value of its money and its experience is good with this, the customer will develop a faith of trust towards that provider.

FOSS provides liberty to individual, researchers and developer to design its own program for the beneficiary of their own business. Thousands of companies have placed open source software at the center of their business (Igor Faletski, 2013). This paper focus to identify the suitability of open source technologies as a tool to optimize a formulated problem and establishes its potential. A problem statement to identify the loyal customer based on the revenue generated or other parameters as per the case and provides them the uninterrupted network services to gain the customer trust and subsequently increase the revenue of the service provider. This research work introduces to predict the category of customer for the service provider and the telecom industry is used as a case study.

The paper is organized with following section. After the introduction, Section 2 discusses about the related works and section 3 gives the problem formulation in conventional programming and introduced the requirement of python with KNN classifier. Next section uses python for the classification of customers as a proposed framework with result and discussion. The next section discusses the application