System Frame Erasure Rate and its Relationship to Perceived Call Quality in a Wireless Network: A Quantitative Investigation

Mike Irizarry, US Cellular, Chicago, IL, USA
Mary Lind, North Carolina Agricultural and Technical State University, Greensboro, NC, USA

ABSTRACT

This study demonstrates the relationship between customer perceptions of call quality and actual, objective call quality. This is important because the wireless industry invests substantially in network assets in the hopes of adding new wireless subscribers and retaining existing wireless subscribers. This research has contributed to a deeper understanding of the call quality / customer perception relationship demonstrating the need for wireless service providers to continually improve the network quality to increase customer satisfaction and customer loyalty.

Keywords: Frame Erasure, Network Quality, Packet Loss, Quality of Service (Qos), Service Quality

INTRODUCTION

The focus of this research is to understand the relationship between customer perceptions of call quality and actual, objective call quality. This is important because the wireless industry invests substantially in network assets in the hopes of adding new wireless subscribers and retaining existing wireless subscribers. Developing a deeper understanding of this relationship will enable the wireless service providers to better invest capital in the network to improve customer satisfaction and increase customer loyalty.

BACKGROUND AND LITERATURE REVIEW

Woo and Fock (1999) found of the four factors that consumers consider important (transmission quality and network coverage, pricing policy, staff competence, and customer service) that transmission quality and network coverage account for 35 percent of the variance in customer satisfaction. Hence this highlights the importance of focusing wireless on call quality from an objective and subjective perspective. The purpose of this research is to explore one aspect of service quality in the wireless industry,
specifically wireless voice quality, and how it impacts overall customer perceptions of service.

Gronroos (1984) proposed a service quality model with three components: technical quality, functional quality, and image. Technical quality is what the customer actually receives when they interact with the company. Functional quality is how the customer receives the technical outcome. In the general case of service quality, functional quality is the customer’s interaction with staff in the store or the employee in the call center; technical quality is the actual service delivered, such as a replacement product, a billing credit, etc. Using this description of functional and technical call quality, in the specific case of wireless service quality or call quality, functional quality is the call set up time; calls blocked, and dropped calls. Technical quality is the actual quality of the voice call delivered. Lastly, image is what the company stands for in the marketplace and is critical to setting the proper expectations with the customer. While this is a solid model, it is overly simplistic in its treatment of each of the three components and their impact on service quality. The technical quality component of this model is relevant to this research as it represents what the customer experiences when they interact with the wireless network, making and receiving calls and specifically the quality of the voice call when interacting with the wireless network. While image is a factor in the model, this research is only focused on technical quality, specifically the quality of the voice.

The attribute service quality model was developed by Haywood-Farmer (1988) and is based on three components: behavioral aspects, physical facilities and processes, and professional judgment. Professional judgment comprises competence, advice, honesty, discretion, flexibility, and knowledge. Behavioral aspects encompass timeliness, speed, communication, courtesy, problem solving, dress, and attentiveness. Lastly, physical facilities and processes include location, layout, décor, size, and range of services offered. This model is well designed for the retail environment where a customer goes in to purchase some type of product or good and the model tends to focus on that aspect of the customer experience. Nevertheless, it can be applied to the measurement of the wireless network experience. The physical facilities and processes component is relevant to this research as it includes the range of services offered, which apply to wireless. The behavioral aspects of this model are particularly relevant to the retail environment and concern how the staff in the store and call centers interacts with and treats the customers; not the interaction the customers have with the network.

Cronin and Taylor (1994) argued that prior models such as the one developed by Parasuraman, Zeithaml, and Berry (1985) confounded satisfaction and customer attitude. They proposed a new model call SERVPERF. This model measures service quality by customer perceptions only. It does not include customer expectations. Similar to the SERVQUAL model, the tangible attribute can be used to measure customer satisfaction with the performance of the wireless network and specifically the quality of the call. Mattsson (1992) developed a model that puts more focus on the negative disconfirmation process. This model postulates this phenomenon is the major determinant of customer satisfaction. In general the model advocates for more attention to the cognitive processes associated with the customer. Many researchers believe disconfirmation is the difference between pre-consumption and post-consumption. When the post-consumption equals or is greater than pre-consumption, the customer’s expectations are met or exceeded and basically confirmed.

Dabholkar (1996) has developed a model specifically for self-service based technology options. The model takes a cognitive approach and is based on consumers’ feelings towards the use of the self-service based technology. Some of the factors considered in this model are: expected speed of delivery, expected ease of use, expected reliability, expected control, attitude towards the technology, and need for interaction with service employees. As wireless networks and their associated end user devices are very technology centric, this model is applicable to understanding service quality in the wireless area. More specifically, this model has
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