TESTING AND MEASURING SYSTEMS USED IN WIRELESS MOBILE NETWORKS

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ABSTRACT

The article introduces some measuring and testing systems used in wireless mobile networks, with emphasis on QVoice testing and monitoring system for mobile network GSM.

1   INTRODUCTION

The construction of the wireless mobile network isn't finished process, but occasionally there is a need to rebuild or reconfigurate the network to enable new services for customers.

Utilization of the wireless mobile network capacity is dependent on a time and place (for instance the network capacity is dependent on development of the region and so on). Therefore, the periodical control and service of the system is needed to be held. The mobile providers apply special designed systems for this purpose. In the Czech Republic measuring and testing systems *TEMS* and *QVoice* are widely spread. In the same way Slovak service provider Eurotel has joined (on the 6th of the February 2004) the ever-growing list of providers worldwide who rely on Ascom's *QVoice* solution to monitor and optimise mobile network quality. *QVoice*, which first hits the market in 1993 as the first system able to use real speech for voice quality measurements, nowadays has well over 100 companies in more than 50 countries for example Vodafone, Orange, Hutchison, Swisscom, Eurotel, T-Mobile... *QVoice* is also now leading the way when it comes to testing and monitoring 'third-generation' (3G) networks.

2   TESTING AND MONITORING SYSTEM *QVOICE*

Measuring system *TEMS* developed by Ericsson is used for real time measuring and evaluating, whereas Swiss system *QVoice* is used for post processing evaluating. *QVoice* system for voice measurement is also well designed for data measurement purposes (GPRS). The system was also used in independent comparative measurements executed by Institute of Radio Electronics in recent years. Within the frame of independent comparative measurements data obtained by *QVoice* system on real network were measured and processed. In consequence of these independent measurements is clear, that for proper

functioning of testing system *QVoice* it is essential to set parameters appropriately and follow certain measuring procedure. In other words testing methodology plays an important part in gathering relevant data.

Services offered include voice, SMS and GPRS testing and weak point analysis, and follow standardized *QoS* parameters and methodology.

The *QVoice* system comprises two parental modules. First labeled with QVMS abbreviation (*QVoice Measurement System*) see fig.1 is designed for measuring and storing data. The other, indicated as QVP (*QVoice Presentation*) fig.2, is made for data analysis and presentation results.

Fig. 1:   *QVoice measurement system – mobile part situated in car.*

QVSM records data, so called "markers", relating to setting up and terminating connection, radio communication interface, connection quality, time interval used for connection establishment, mobile station (*QVMS*) position during measuring obtain by using the GPS system and so called "user markers" which are randomly definable by user, for instance at the tunnel drive-in.
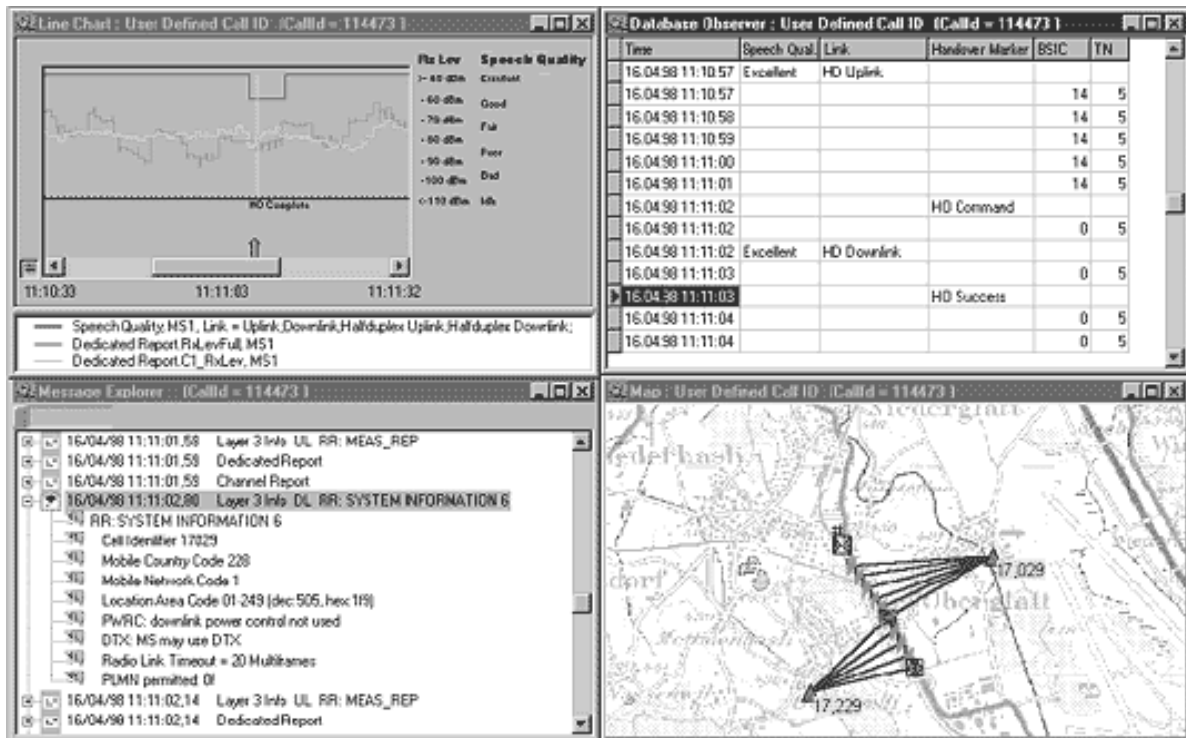
Fig. 2: *QVoice presentation system – analyzing problem with handover.*

Recorded data are stored in SQL database wherefrom *QVP* module allows them to be analyzed and presented. Ascom predefined some SQL inquiries to obtain relevant data from database, but it is within the realms of possibility to create individual inquiries, or to make fit existing.

2.1 PRESENTATION OF THE MEASURED RESULTS

- Measured data display for strict monitoring of connection establishing and call progress.
- Analysed network errors and fails (in fact there is still need to separate *QVoice* errors from network errors).
- Compendium of completed calls, setup fails, break calls, setup time, quality of voice standardized by ASCOM as *PACE*, etc.
- Detection of the quality of coverage, level of the interference, fail handovers, successful handovers, etc.
- Plotting the markers and fails on map enable better imagination to network configuration.
- Statistically processed parameters obtained in competitive networks enable to compare both networks.

3 CONCLUSION

The article deals with problems in wireless mobile network associated with measuring and testing. The author tries to briefly introduce *QVoice* testing system used in contemporary wireless mobile network GSM of the 3rd generation and some characteristic features and abilities of this monitoring system.

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