STREET LEVEL CELL PLANING AND DESIGN

Thesis is presented in partial fulfillment for the award of the
Bachelor of Engineering (Hons.) in Electrical
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Praised to HIM alone for HIS endowment that let me to complete this final year project.
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ABSTRACT

A multilayered cellular network is one of the most important cell planning strategies for better traffic distribution pattern. This can be seen being implemented in most of the cellular network operators in order to cope with the increasingly high traffic demand. Basically, there are three imaginary layers in cellular structure. It is know as the umbrella cell, macro cell, micro cell and pico cell. To combat with the network congestion in metropolitan area, these layers are clearly defined based on hierarchical cell structure and microcell is known as the smallest cell shape for street level coverage area followed by macro cell and umbrella cell as the biggest cell shape for more on coverage purposes. Meanwhile, the pico cell is supposed to provide indoor coverage in targeted buildings.

In this thesis, a microcell streetlevel cell planning and implementation is introduced into GSM network. This layer is emphasized so that better traffic and capacity distribution and better frequency planning method can be implemented at the same time. The case study is done in down town Klang Valley area in which all necessary elements are taken into consideration such as the existing traffic trending and forecasting, utilization distribution, TCH congestion, method of frequency planning to be used, and software controlled hierarchical cell structure implementation.

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CHAPTER 1

INTRODUCTION

1.1 General

In fast growing mobile environment usage these days, a lot of tactical and technical approach has been developed by the network operators and venders in order to cope up with highly demands worldwide. The same trend has been happening in Malaysia in which the network capacity has become one of the most important issue that needs to be taken care of. As time involves and as the technological advancements are created and innovated, the cellular business strategies have also been revised and manipulated for optimum result and the cellular network design has become the most important key factor in determining the fate of the cellular business. Apart from this matter, as the radio base station becomes smaller and sophisticated, the cell planning and design becomes even more complicated due to the fact that the available GSM spectrum is limited to the same resource. As the mobile demands increases each day, the cell planning strategies have to be changed to fully utilize the already saturated GSM spectrum due to network congestion. As a result, a multilayered network structure is emphasized into the network with appropriate frequency planning strategy to combat with the network congestion and provide the larger network capacity and at the same time, the overall network quality is maintained and improved.

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