ABSTRACT

The demand of data services such as internet, video-call, video-conference, and voip have been increasing in UMTS network. Thus high speed data rate is needed in order to cover the demand of those services. The HSPA (High Speed Packet Access) system which is consisted of HSDPA (Rel.5) and HSUPA (Rel.6) can increase the data rate significantly compared to WCDMA (Rel.99) system. Theoretically HSDPA technology can offer data rate in downlink side up to 14.4 Mbps, and HSUPA technology can offer data rate in uplink side up to 5.7 Mbps.

This final project discuss about the process of UMTS network planning based on HSPA (HSDPA/HSUPA) on Jakarta Pusat area. Jakarta Pusat is an area with high potential of data services using, because this area is consisted of business areas, office buildings, apartments and shopping areas. Thus planning the UMTS-HSPA network in Jakarta Pusat area is convenient. The planning will be focused in designing the HSDPA/HSUPA node-Bs which are the base stations of UMTS-HSPA network.

In this planning, a software will be assembled for measuring MAPL, number of subscribers, number of cells required by using Matlab 7.1. Cells will be visualized by using MapInfo. The planning will start with the link budget calculation for measuring the maximum pathloss in the area, thus the cell radius will be obtained based on the pathloss. Cell radius obtained from pathloss calculation is 1.4255 km, and number of cells (node-Bs) required is 12 cells (node-Bs). Next step, the traffic forecasting is performed to predict the number of subscribers and to measure the throughput demand of subscribers. Number of subscribers is predicted to be 77,478 subs in the 4^{th} year, with the throughput demand up to 468.98 Mbps. After that, the planning will design the number of cells (node-Bs), cell coverage, and optimum node-Bs location based on traffic and capacity, which obtains 11 cells (node-Bs) with 1.499 km cell radius.

From result analysis : recommend to plan the network based on traffic and capacity, since the design is more optimum, efficient, and can cover the traffic demand of the subscribers until the 4^{th} year.