

ABSTRACT

The core business of a cellular company is as a service provider in cellular telecommunication field or fulfilling the cellular telecommunication service. It causes cellular company to concentrate more in the service fulfilling, meanwhile for the building of the physical network infrastructure, the company prefers to do outsourcing to vendor and the contractor dealing with civil engineering. One way from many way to fulfilling the cellular telecommunication service is to improve the telecommunication technology. In this time, a cellular company in Indonesia going to use a **3G** telecommunication technology. A cellular company immedietly do preparation and build a new **Node B** network or upgrade the BTS existing in order to make the customer be able to enjoy the services. It causes 3G services can only be used in 3G service area.

The purpose of this research is to design a Geographic Information System that can determine and view the construction location of Node B with noticing the surrounding area geographic condition and also to design a Geographic Information System that can view the Node B coverage area with noticing the specification of hardware and site propertis that will be used. The information system used is GIS based. GIS function used in this research is for the process of discovering the **dummy coordinate** location with noticing the surrounding area geographic condition, and for the making process of the thematic map for path loss in order to make user be easier in understanding the path loss condition in Node B coverage area and also for the process of Node B prism map making in three dimension form in order to make the user be easier in analysing the condition of node B and the surrounding area.

The Node B location determination is conducted by doing some analyses first. Those analyses are: [1] Geographic aspect analysis, conducted to determine whether Node B exists on the road, building, river, or railway, [2] **Link Budget** analysis, conducted to know the **Maximum Available Path Loss (MAPL)** by noticing on the specification of hardware that will be used. [3] **coverage area** analysis that is obtained by the calculation of the **propagation model COST-231 (welfish-ikegami)**.

This application can view the location and coverage area of the Node B with noticing the specification of hardware, site propertis, and surrounding area geographic condition likes the location of the building, the river, the road, the railway, the Building's high, and the Bandung contour. Several things that can done for the next research are this application can use another map that the geographic's data more complex with the data of the location and high of plant because it can be a obstacle of the signal. And also the next research can use the trafik anlysis and LOS analysis for the comparison.

Keywords : **3G, Node B, dummy coordinate, GIS, Link Budget, Maximum Available Path Loss (MAPL), coverage area, and propagation model COST-231(welfish-ikegami).**