

ABSTRACT

The main problem faced by cellular operators in Indonesia is the cost of infrastructure investment which is very expensive and must be built by each own operator, another problem is the limited telecommunication resources such as frequency which causes slow network development. Thus, a sharing infrastructure scheme is needed between cellular operators to reduce the capex and opex that very expensive. In previous studies, many adaptive and custom sharing schemes have been offered, starting from the type of resource to be shared (spectrum, capacity, hardware), sharing Radio Access Network (RAN), MOCN (Multi Operator Core Network) and sharing schemes (cost sharing and revenue sharing).

The challenge is capacity and coverage. The problem of capacity can be solved by sharing frequency, while the problem of coverage can be solved by sharing Radio Access Network (RAN). However, the main obstacle faced in Indonesia is the network conditions that very heterogeneous, there is a potential for interference between active transmitters and the resource load has increase.

In this thesis, the author has examined the feasibility of a 5G infrastructure sharing scheme for cellular operators in Indonesia using three aspects, namely technology, economy and regulation. From the technological aspect, the writer has analyzed the capacity approach and coverage approach. The economic aspect is carried out to test the business feasibility of this RAN-frequency sharing scheme from the cellular operator's point of view. Meanwhile, regulatory analysis is used to determine the extent to which regulations have been implemented in Indonesia regarding infrastructure sharing. The research has conducted in 2 types of areas, urban area (Banjarmasin City) and suburban area (Banjarbaru City) for 7 years ahead (2022-2028).

Based on capacity and coverage planning, Banjarmasin city need 84 gNodeB and Banjarbaru city need 71 gNodeB. The results of the study show that the implementation of the RAN-spectrum sharing scheme can reduce Capex costs 50-67%. The most feasible scenario to be implemented from economical point of view is sharing 3 operators for economic parameter Net Present Value, Internal Rate of

Return and Payback Period. Sensitivity Analysis show that the most sensitive parameter is Opex and the least sensitive parameter is interest rate.

Keywords: sharing infrastructure, techno-economy, cost efficiency, mobile network operators, 5G