

ABSTRACT

The telecommunications industry in Indonesia faces myriad challenges in effectively allocating its resources, both capital expenditure (CAPEX) and operational expenditure (OPEX), for network development. These challenges include network complexity, technological shifts, market competition, and customer expectations. To achieve optimal financial outcomes and customer satisfaction, operators must ensure that investments are made at the right time, in the right place, and in the correct manner.

This study aims to analyze the outcomes of network investment portfolio selection using conventional scenario (financial scenario and network scenario) and compared with optimization scenario using Mixed Integer Linear Programming (MILP). Conducted at Telkomsel, Indonesia's largest cellular operator, this research evaluates the portfolio selection among these scenarios based on total portfolio score, portfolio incremental revenue, and portfolio Internal Rate of Return (IRR).

Furthermore, the study employs various financial indicators from each selected site within the portfolio to assess investment feasibility, including Net Present Value (NPV), IRR, EBIT margin, Incremental revenue. It also utilizes network indicators like Red Capacity Indicator related to network capacity and Competitive Customer Experience Indicator that related to customer satisfaction with network quality, such as download throughput, upload throughput, latency, packet loss, and jitter.

Key Words: MILP, CAPEX, OPEX, optimization, telecommunication.