

ABSTRACT

The explosive usage of electronic devices such as smartphones makes the desire to stay connected wherever and whenever it becomes increased, including on the aircraft. It turns out that providing broadband connectivity on the aircraft has a significant impact on increasing the level of satisfaction of passengers in the aircraft, which in 2015 reached 3.3 billion passengers. Not only for the international flight routes but also domestic flight route. That is why the provision of connectivity on airplanes or what is known as In-Flight Connectivity (IFC) has recently attracted significant research attention from both industry and academics. So far, some airlines have used satellite as a source of in-cabin connectivity. However, high transmission latency is still a weakness. Another solution is now coming from Direct Air-to-Ground Communication (DA2GC) technology that provides the connection by connecting directly to the ground base station. By cutting the latency, this alternative technology expected to have better Quality of Service (QoS). Compared to the satellite, DA2GC has many advantages such as relatively more low cost.

The number of connected aircraft kept growing, including from Indonesia's airline. Many surveys prove that Indonesia has a bright future in the aviation industry. As a big country, Indonesia has a chance to build an independent DA2GC network that covers the entire territory of Indonesia into something that makes sense from a technical and business calculation. That is why this research conducted a comprehensive evaluation used DA2GC technology as an alternative technology for the deployment of IFC in Indonesia. This research will used capacity and coverage analysis to know how many sites to cover the chosen area in Indonesia. After that doing the economic analysis to know if this DA2GC technology will being feasible or not, by using business feasibility and sensitivity analysis. All of mentioned above will be execute based on existing regulation, so the result can produce new recommendation for the new DA2GC regulation for Indonesia.

The results show that to cover route of Jakarta-Surabaya-Denpasar with DA2GC, it will need 8 ground stations with radius cell 75 km and Tx power 33,5 dBm. Meanwhile, the business feasibility analysis about DA2GC business in that route considered feasible. By offering free IFC service during 30 minutes at the beginning of the flight, the payment for IFC service that used in this research Rp.15,000 is bundle to the ticket. The value of the feasibility test indicators are as follows: NPV Rp24,958,296,514; IRR 20.38% and PI 1.151. This research also finds that with ancillary revenue in the form of IFE advertising, the payback period can reach 5 years 5 months. Based on sensitivity analysis, the most influential parameters in DA2GC business is the number of users and revenue allocation.

Keywords: Direct Air-to-Ground Communication (DA2GC), In-Flight Connectivity (IFC), Techno-Economic Analysis, Aircraft