

# Open Source Implementation (Test Bed) for India-Specific Scenario

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# Introduction

- Telecom sector is in the midst of a transformation, with inclusion of open source
- Networking solutions, of high quality are being introduced for open source networking
- The role of the Indian ecosystem and of Indian standards bodies such as TSDSI in the adoption of Open-Source in 5G is important
- Essential for achieving the goals of agility, quality and speed

# Cellular Infrastructure in India

- India- Second largest telecom sector with regards to subscriber base
- Total subscriber base stands at 1178.41 million, in Dec 2021
- Liberal and reformist policies of the Government of India have been instrumental along with strong consumer demand in the rapid growth in the Indian telecom sector
- Over the next five years, rise in mobile-phone penetration and decline in data costs will add 500 million new internet users in India, creating opportunities for new businesses
- By 2025, India will need ~22 million skilled workers in 5G-centric technologies such as Internet of Things (IoT), Artificial Intelligence (AI), robotics and cloud computing
- Recently launched the Indigenous end-to-end 5G Test Bed

# Indigenous 5G Test Bed

- Developed by leading academic institutes of the country (IITM, IITB, IITD, IITH, IITK, IISC), along with research institutes of India (SAMEER and CEWiT)
- A Government of India funded project, which was carried out for about three and a half years
- Comprises of the gNB, core, edge components
- System is available in both sub-6 GHz and 26 GHz bands
- Supports applications including drone delivery, autonomous cars, IoT use cases, smart meters
- The Hardware and Software developed in the project are available to entities that would like to make commercial use of the IPs through flexible licensing models as per policies of the concerned Institutes

# Road towards OAI

- While network simulation software has evolved significantly over the years, it still cannot capture the complex real world environment well, and real/field experimentation is still considered essential, especially at the later stages of technology development
- There is need for an open and flexible 4G/5G experimentation platform

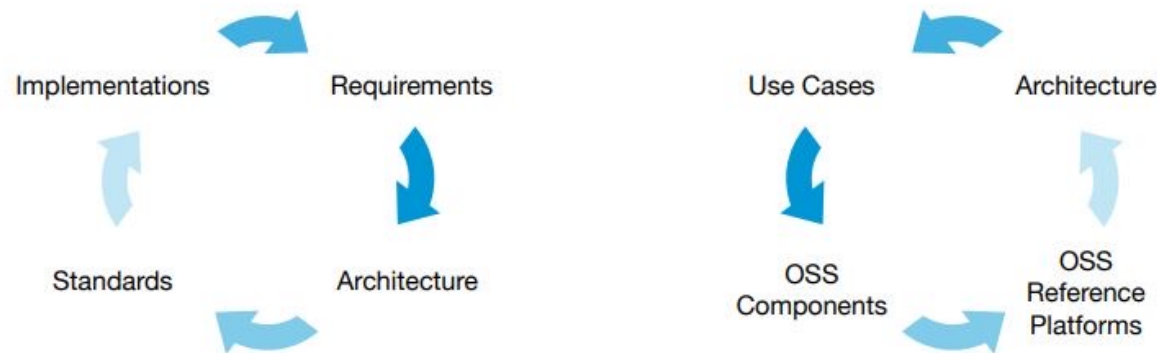


Fig. 1. (a) Traditional Methodology

(b) Evolved Methodology

# Open Source and Standards

- Standardization bodies and Open Source Efforts have a strong relation
- Common objectives of both:
  - Foster interoperability
  - Increase industry cooperation
  - Obtain convergence on common platforms
- Various Telco Standard bodies have been pushing a standards and Open Source blend
  - Open Source MANO by ETSI
  - OpenDaylight by Linux Foundation, driving standardization of APIs

# Comparison of Current Architecture and OAI

Feature	Current Architecture	OAI
Hardware and Software	Large number of proprietary elements	Software running on general purpose processors
Cost	High	Low
Flexibility	Limited	High
Time-to-market	Less	Accelerated with the use of OAI

# Benefits of Open Source

- Mobile Operators: Faster innovation, vendor independence, lower capital costs
- Vendors: Reduced development costs, reduced time-to-market
- Start-ups: Risk elimination, reduction of development cost and time
- Governments: Witness robust eco-system, independent system set-up,



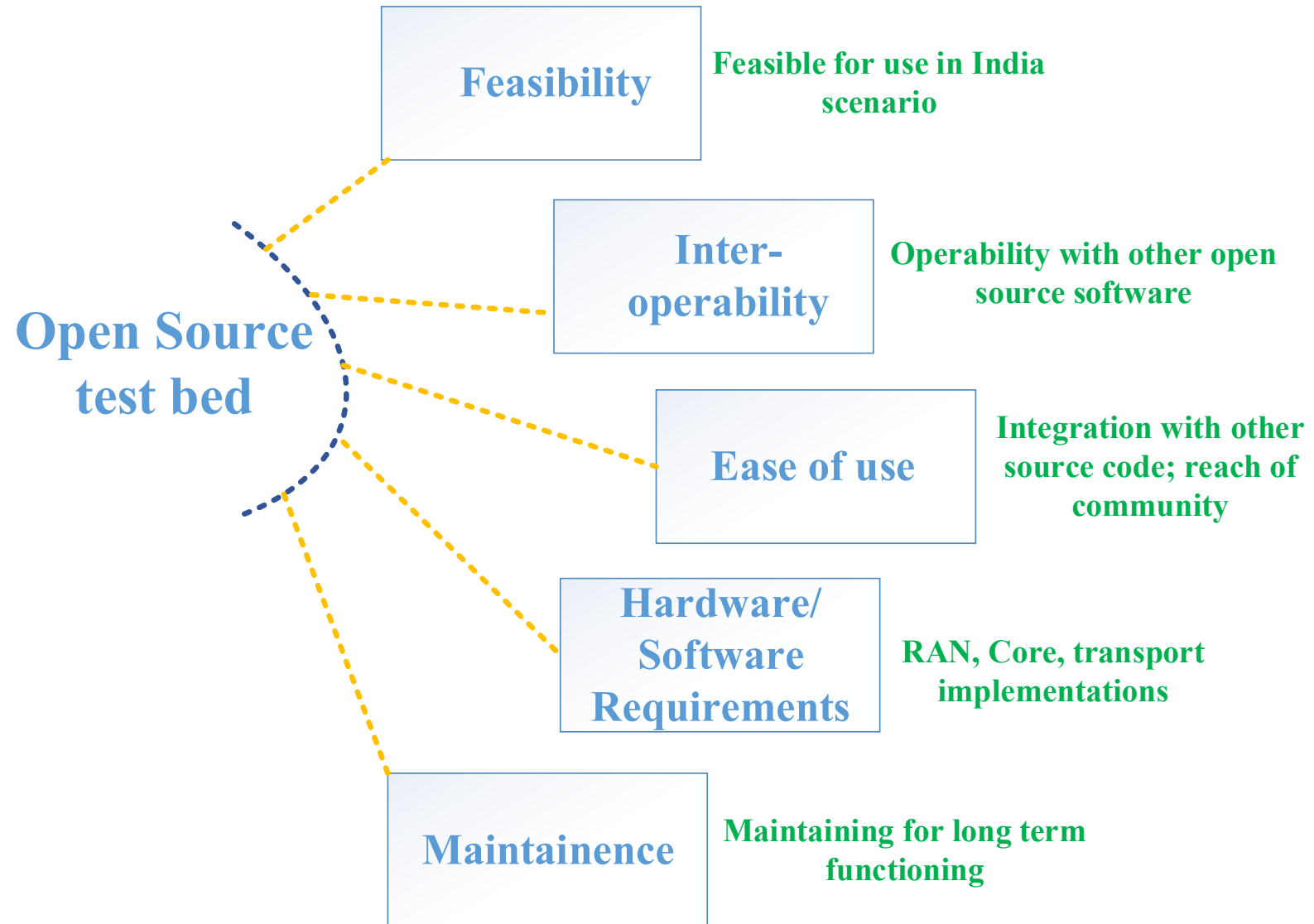
# Components and their Open Source Candidate Teams (India Scenario)

- RAN: Airtel, Sookhta
- Transport: Hughes Systique, Niral Networks
- Applications: Airtel

# Challenges in India Scenario

- Topographical factors
- Digital awareness
- Per-capita income
- Resource availability

# Key Aspects for Test bed set-up



Thank You