Establishing a Governance Framework to Leverage Artificial Intelligence in Forecasting TB Medication Demand

Lalu Lian Hari Wangi[1], Febrina Damanik[1], Richard Holman Matanta[1]

[1]JSI Research and Training Institute

Introduction

Efficient drug forecasting is crucial to optimize tuberculous (TB) care. However, in Indonesia, drug forecasting has relied on a labor-intensive process of manually estimating drug demand using historical data. To improve efficiency and accuracy of forecasting, USAID's Country Health Information Systems and Data Use (CHISU) program partnered with the Ministry of Health's (MOH) Center for Data and Information Technology (Pusdatin) and NTP to develop an artificial intelligence (AI) prototype using machine learning. A governance framework that addresses both social and technological dimensions of drug forecasting is foundational to this approach to effectively predict TB medication demand.

Methodology

Developing the AI Prototype

1. Identify user needs
2. Map the business processes, parameters, and variables currently used in drug prediction
3. Collect and process data
4. Train machine learning model
5. Analyze results and outcomes

Developing the AI Governance Framework

1. Review existing evidence on governance frameworks for implementing AI models.
2. Adapt and develop a socio-technical governance framework
3. Document findings of applying governance framework during prototype development

Results

The AI prototype leveraged patient-level data from Indonesia's TB information system to predict the annual demand for fixed-dose combination drugs for drug-sensitive TB patients up to district level. Through the process of developing the prototype, the following AI governance framework was defined:

Social

- **Capacity Strengthening:** Engage in knowledge transfer to strengthen the MOH staff capacity to develop, apply and maintain AI forecasting models.

- **User-Centered Solution:** Place MOH/NTP as the central user when gathering requirements for the AI solution.
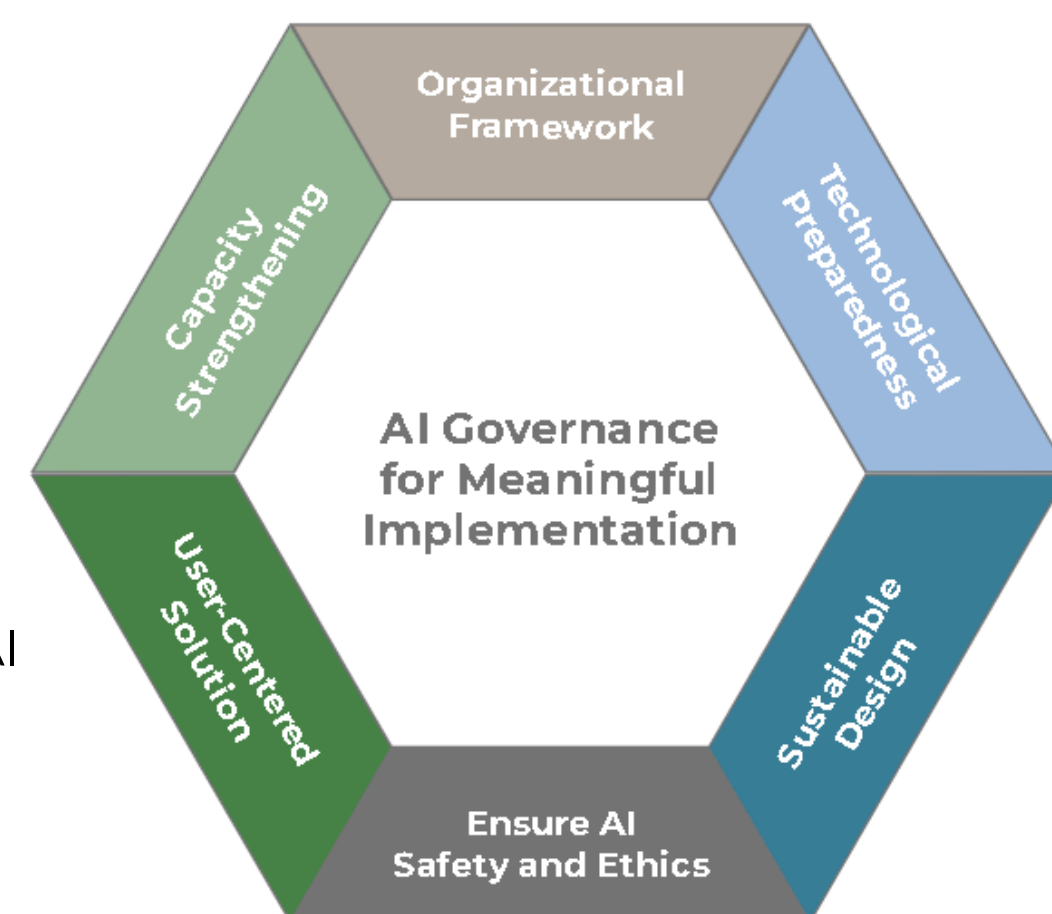
Technical

- **Technological Preparedness:** Prepare the MOH/Pusdatin infrastructure to host the AI service.

- **Sustainability Design:** Develop web service for future adaptability in data sources.

AI Governance for Meaningful Implementation — Capacity Strengthening, Organizational Framework, Technological Preparedness, Sustainable Design, Ensure AI Safety and Ethics, User-Centered Solution

Conclusion

As part of the AI model development phase, the AI Governance Framework served as an important reference in development and testing. In the future, **organizational standard operating procedures** to implement, maintain, and monitor the AI model, and **AI safety and ethics**, need to be reinforced before the AI model can be fully implemented in forecasting the TB medication demand.

Contact

Lalu Lian Hari Wangi
lian_wangi@id.jsi.com

Taufiq Sitompul
taufiq_sitompul@id.jsi.com

Leah McManus
leah_mcmanus@id.jsi.com