

## Q4: Ethical & Governance Analysis

### 1. Potential Algorithmic Fairness Concerns

- ✓ **Bias in Data and Models:** Algorithms trained on historical socio-economic data often reflect existing inequalities in society. Imbalanced datasets, biased labels, and the use of proxy variables such as education or occupation can cause models to unfairly disadvantage certain groups based on gender, race, age, or socio-economic status.
- ✓ **Disparate Impact and Discrimination:** Even when sensitive attributes are excluded, algorithmic systems may produce outcomes that disproportionately harm specific groups. In income classification or credit scoring, this can result in higher rejection rates or less favorable decisions for women, minorities, or informal-sector workers, thereby reinforcing existing inequalities.
- ✓ **Lack of Transparency and Explainability:** Many machine-learning models operate as black boxes, making it difficult to explain how decisions are made. This lack of transparency limits accountability, prevents individuals from contesting outcomes, and makes regulatory auditing more challenging.
- ✓ **Contextual and Sociotechnical Factors:** Algorithmic fairness is influenced by social, institutional, and cultural contexts. Fairness definitions vary across societies, and technical fixes alone are insufficient without considering local labor markets, informal employment structures, and governance norms.

### 2. Governance, Privacy, and Data Use Challenges

- ✓ **Data Quality, Consistency, and Accessibility:** Socio-economic data often suffers from inconsistent indicators, differing measurement standards, and limited availability of high-resolution data. These issues reduce comparability and weaken the reliability of BI analysis and impact assessments.
- ✓ **Privacy and Ethical Risks:** Socio-economic data is highly sensitive, raising concerns about consent, misuse, and unauthorized reuse. Without strong ethical safeguards and legal protections, BI systems may violate individual privacy and erode public trust.
- ✓ **Fragmented Governance Structures:** Data governance involves multiple actors, including governments, private organizations, and civil society. Differences in interests, standards, and power dynamics create coordination challenges and weak oversight.
- ✓ **Technical and Methodological Pitfalls:** Biases in data collection, population coverage, and modeling assumptions can distort analytical results. Overly narrow governance approaches that treat data purely as an economic asset may neglect broader societal and equity considerations.