Data &
Insights Unit
@ MoRD

Use of Algorithms in the Public Sector: Decision Support or Control Systems?

Authors: Sanjana Malhotra, Harsh Nisar, Dibyendu Mishra, and Richa Marwah

OVERVIEW:

- We examine how an Algorithm-in-the-Loop (AITL) decision-aid system designed for the Government of India's rural road maintenance program can be perceived as a tool for support or control.
- We use Veeraraghavan's conceptualisation of the digital panopticon in the context of the Indian bureaucracy, Kawakami et al's work on AI in child welfare, and literature on state capacity and bureaucracy as a lens to examine potential sites for deployment.
- We contribute the novel perspective of authors working as practitioners within the government system in a post-colonial bureaucracy in the Global South.

METHODS:

- We draw on action research and auto-ethnography.
- Data collected: field notes from participant observation, artefacts from meetings such as PowerPoint presentations, combined with publicly available government documents.
- Data analyzed through group discussions between authors combining deductive and inductive approaches.
- Key challenge: Dual role of authors as both employees and researchers within a government system.

SELECTED REFERENCES:

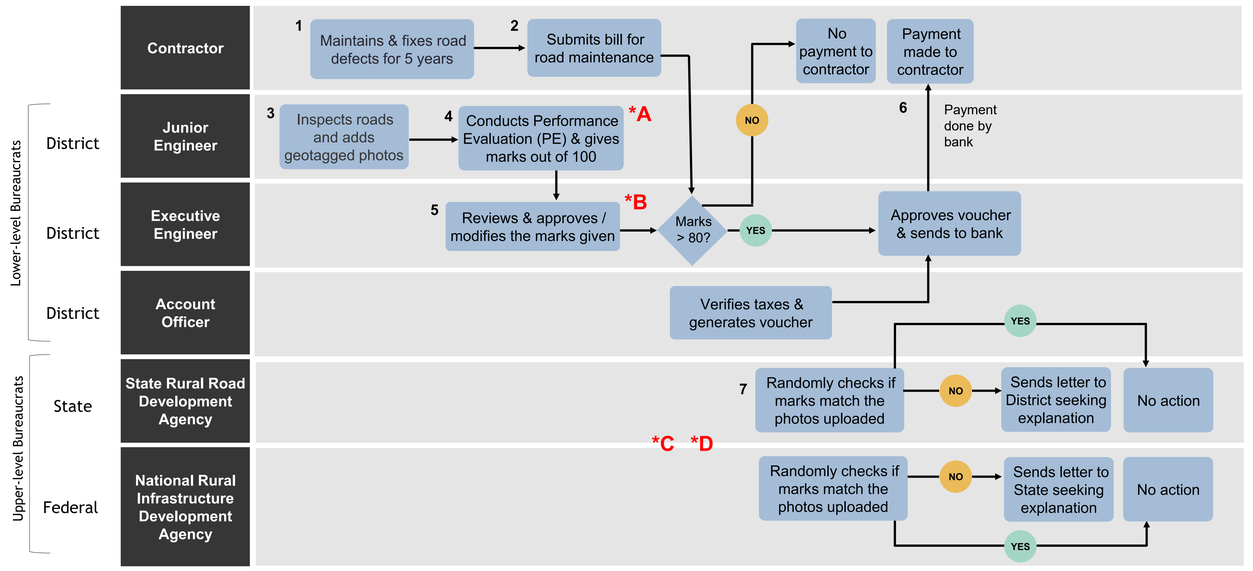
- Rajesh Veeraraghavan. 2013. Dealing with the digital panopticon: The use and subversion of ICT in an Indian bureaucracy. In ACM International Conference Proceeding Series, 248–255.
- Anna Kawakami, Venkatesh Sivaraman, Hao-Fei Cheng, Logan Stapleton, Yanghuidi Cheng, Diana Qing, Adam Perer, Zhiwei Steven Wu, Haiyi Zhu, and Kenneth Holstein. 2022. Improving Human-AI Partnerships in Child Welfare: Understanding Worker Practices, Challenges, and Desires for Algorithmic Decision Support. Association for Computing Machinery.

SITE: eMARG

- Contractors who build roads under the Government of India's federal rural roads program are required to maintain the road for 5 years post-construction.
- This rural road maintenance process is managed through an IT system called eMARG.
- The road inspection process requires geotagged photographs to be uploaded as evidence.
- Roads are given marks out of 100, which determine the payments made to road contractors.

AI INTERVENTION:

- The computer vision model uses the road inspection photographs and marks as inputs.
- The objective is to ensure that marks are commensurate with road condition as shown in photographs.



FINDINGS & DISCUSSION:

- The findings are based on *a priori* deliberations on the site for deployment of the AI intervention.
- Whether the intervention is perceived as a form of support or control depends on the site and mode of deployment:

SITE OF DEVELOPMENT	ACTOR	PROPOSED MODE OF DEPLOYMENT	SUPPORT	CONTROL
A - Performance Evaluation (PE)	Junior Engineer (JE)	The AI model triggers a pop-up warning, if any, when the JE enters marks.	JE	
B - PE Approval	Executive Engineer (EE)	The AI model shows a pop-up warning, if any, when the EE proceeds with the final assessment of the marks given.	EE / HQ	JE / EE
C - Post-facto Decision Monitoring	State or Federal level (HQ)	Independent of whether the warning is shown at site A or B, the warnings shown and the responses can be monitored by upper-level bureaucrats.	HQ	EE
D - Post-facto Aberration Reporting	State or Federal level	No intervention is deployed at site A or B but a report is made available to upper-level bureaucrats highlighting when marks given by JE/EE do not correlate with the AI model's analysis.	HQ	JE / EE

DIGITAL PANOPTICON:

- Veeraraghavan translates Foucault's concept of the digital panopticon to the Indian bureaucracy wherein "higher-level bureaucrats exert power over the lower-level bureaucrats primarily through the lens of controlling their micro- practices".
- The digital panopticon is enacted in eMARG through geotagged photos. The AI system extends and narrows the *gaze* by parsing through each photo. This can then exert control in the form of warnings shown to lower-level bureaucrats or data on responses to the algorithm for upper-level bureaucrats.

FACTORS AFFECTING PERCEPTION OF SUPPORT OR CONTROL:

ORGANIZATIONAL CONTEXT

- Hierarchical bureaucracy
- Suspicion & mistrust
- Low state capacity
- Administrative burden

USE OF ALGORITHMIC METRICS

- Overt control by upper-level bureaucrats
- Erosion of agency of lower bureaucrats
- Increased risk of automation bias and subversion
- Reduced administrative burden

AI INTERVENTION DESIGN

- AITL prioritizes human judgement
- Input generated as routine process
- Binary classification
- Blind to contextual factors

POLITICAL ECONOMY

- Competing priorities
- Tussle with vested interests
- Deliberative approach accounting for local needs & context
- Legalistic approach relying on rules & imposed hierarchy