

# Ensuring Responsible Outcomes from Technology

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July 2019

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ACM HCAI Summer School



**IIT DELHI**



# Ensuring responsible outcomes from technology: Key messages

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- Beyond the initial design, deployment management also needs attention
- An underlying ethical framework should be used to guide ICT projects on their objectives, design, and deployment management processes
- The ethical framework is ultimately operationalized by ICT project teams, and therefore the organizational culture directly affects the outcomes

# The promise of technology...



## Asia Buzz: Revolution

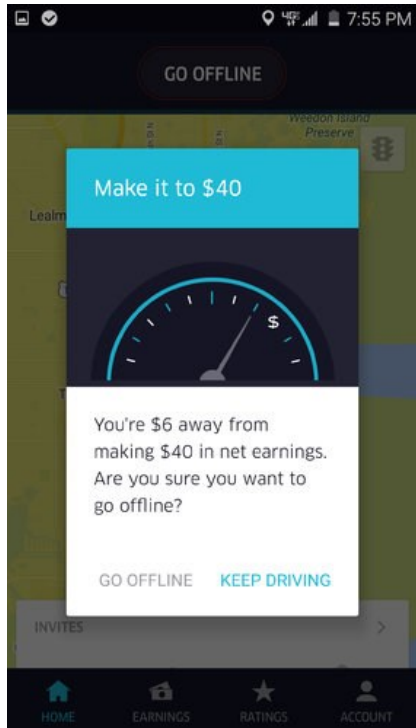
How text messaging toppled Joseph Estrada  
By ERIC ELLIS



January 23, 2001  
Web posted at 2:00 p.m. Hong Kong time, 11:00 a.m. EDT



# But can we ensure responsible outcomes from technology?



## WHAT HAPPENS WHEN AN ALGORITHM CUTS YOUR HEALTH CARE

By [Colin Lecher](#) | [@colinlecher](#) | Mar 21, 2018, 9:00am EDT

Illustrations by [William Joel](#); Photography by [Amelia Holowaty Kroles](#)

RIGHTS

### Of 42 'Hunger-Related' Deaths Since 2017, 25 'Linked to Aadhaar Issues'

**IMPACT** 02/16/2018 05:45 am ET

## In The Rush Toward A Cashless Society, The Poorest Are At Risk Of Further Exclusion

"Unless you're poor, it's hard to understand what it's like to be poor."

OPINION

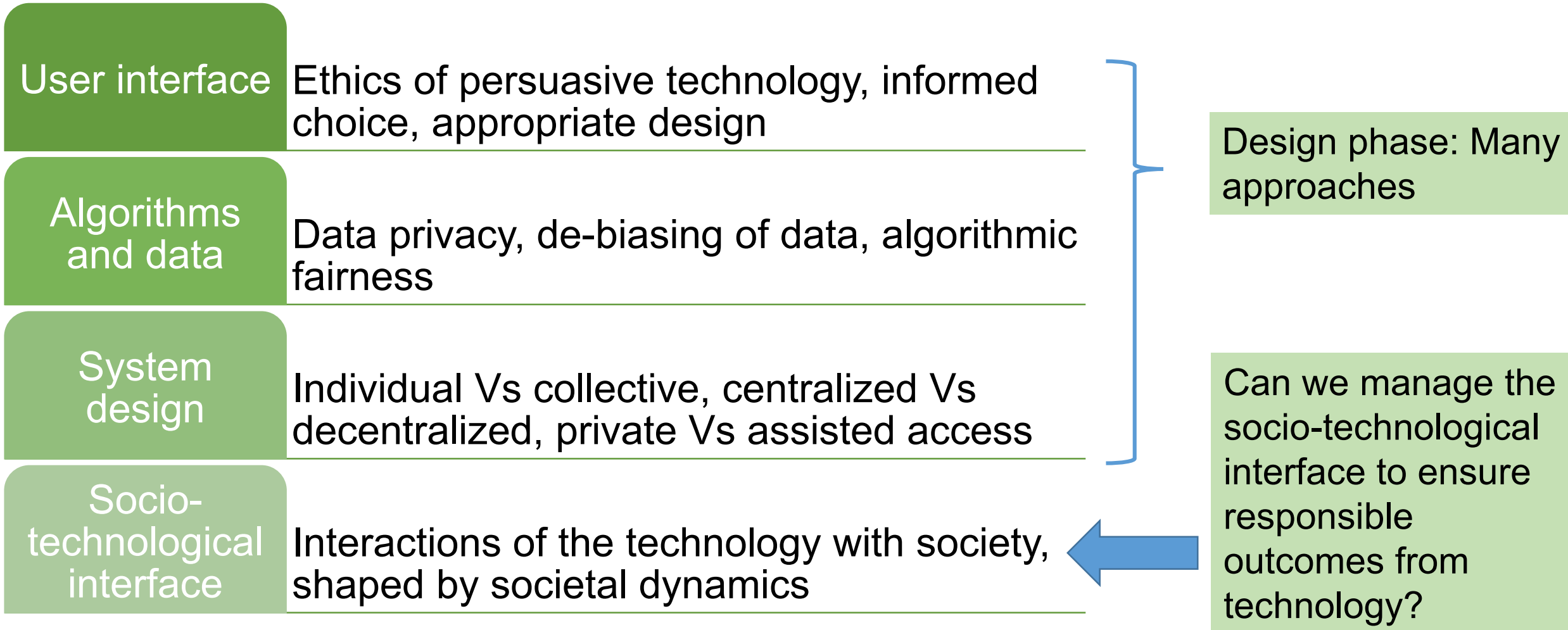
## Cambridge Analytica and the Secret Agenda of a Facebook Quiz

By [McKenzie Funk](#)

### WhatsApp struggling to control fake news in India, researchers say

### Hindu nationalism and cheap mobile data driving spread of disinformation, BBC study says

# At least four layers at which to examine technology



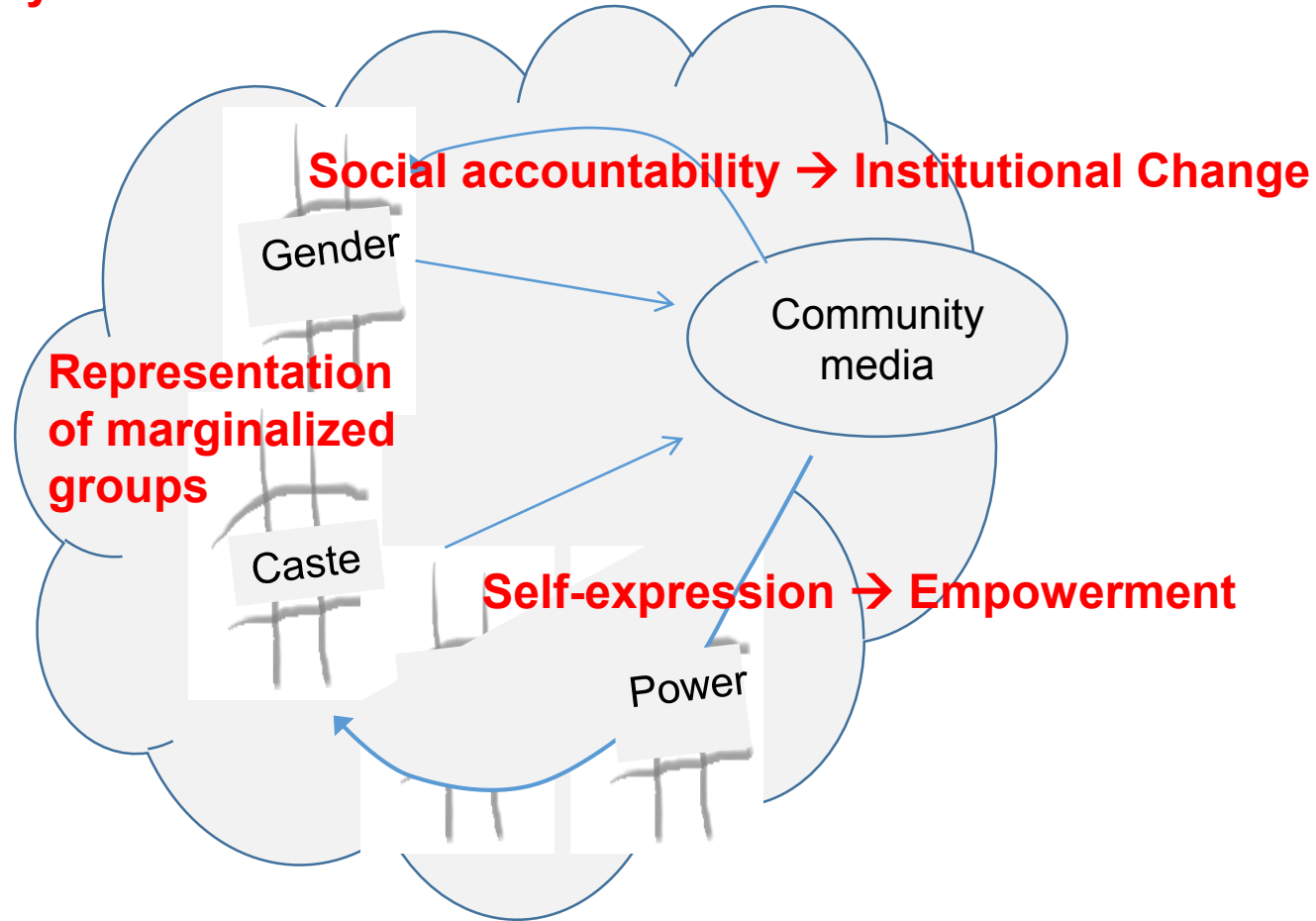
# We try to answer this through a case study of a community media platform

## Variety of mechanisms

- Community radio
- Community video
- Wall newspapers



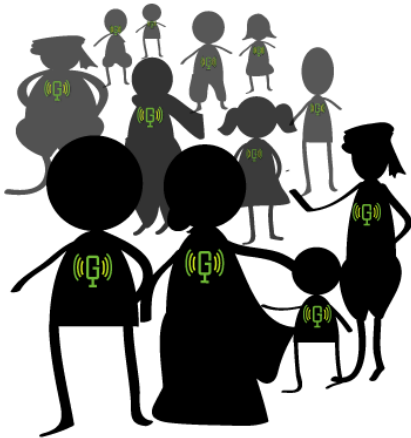
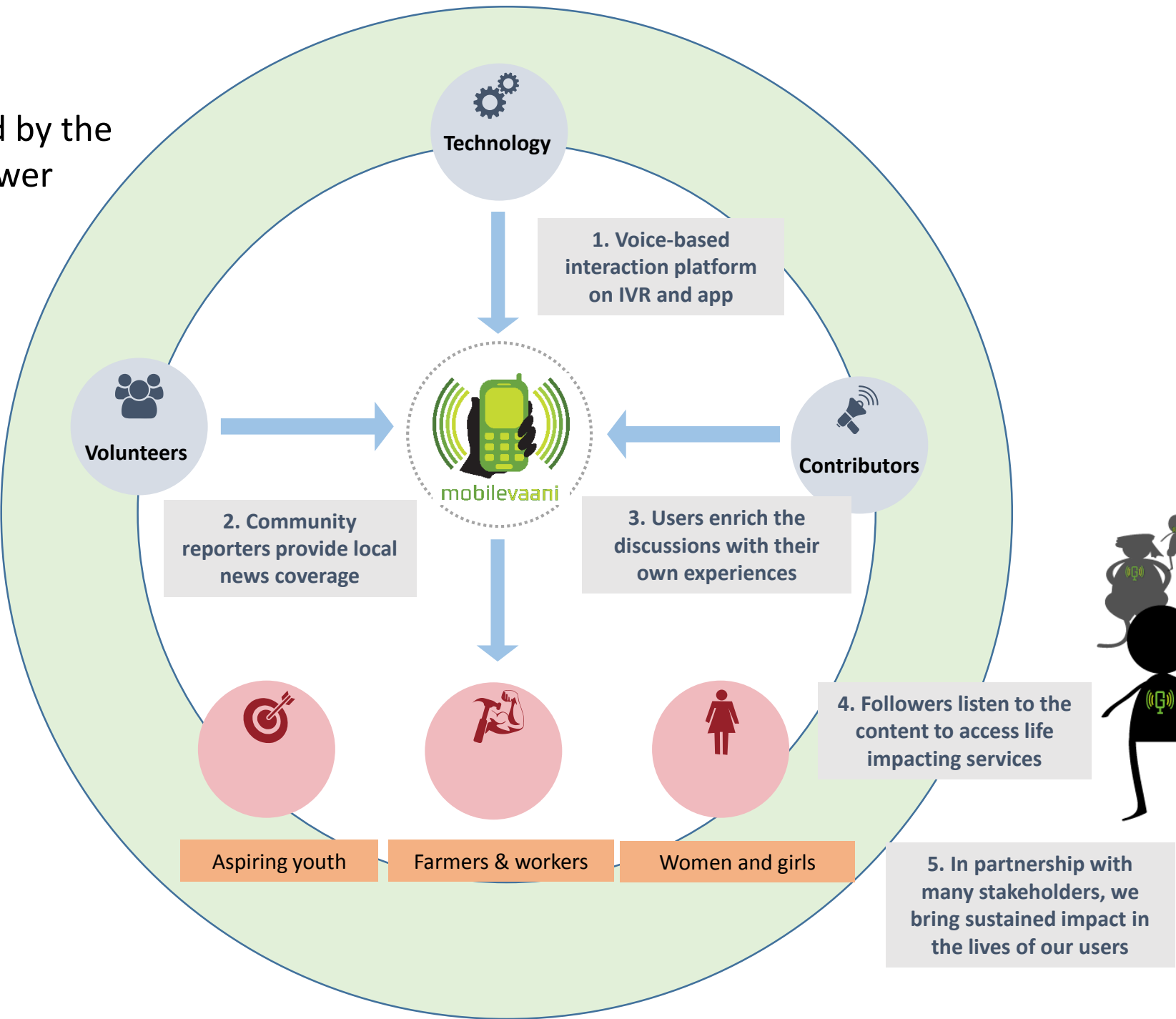
Locally relevant content → Awareness



# Mobile Vaani

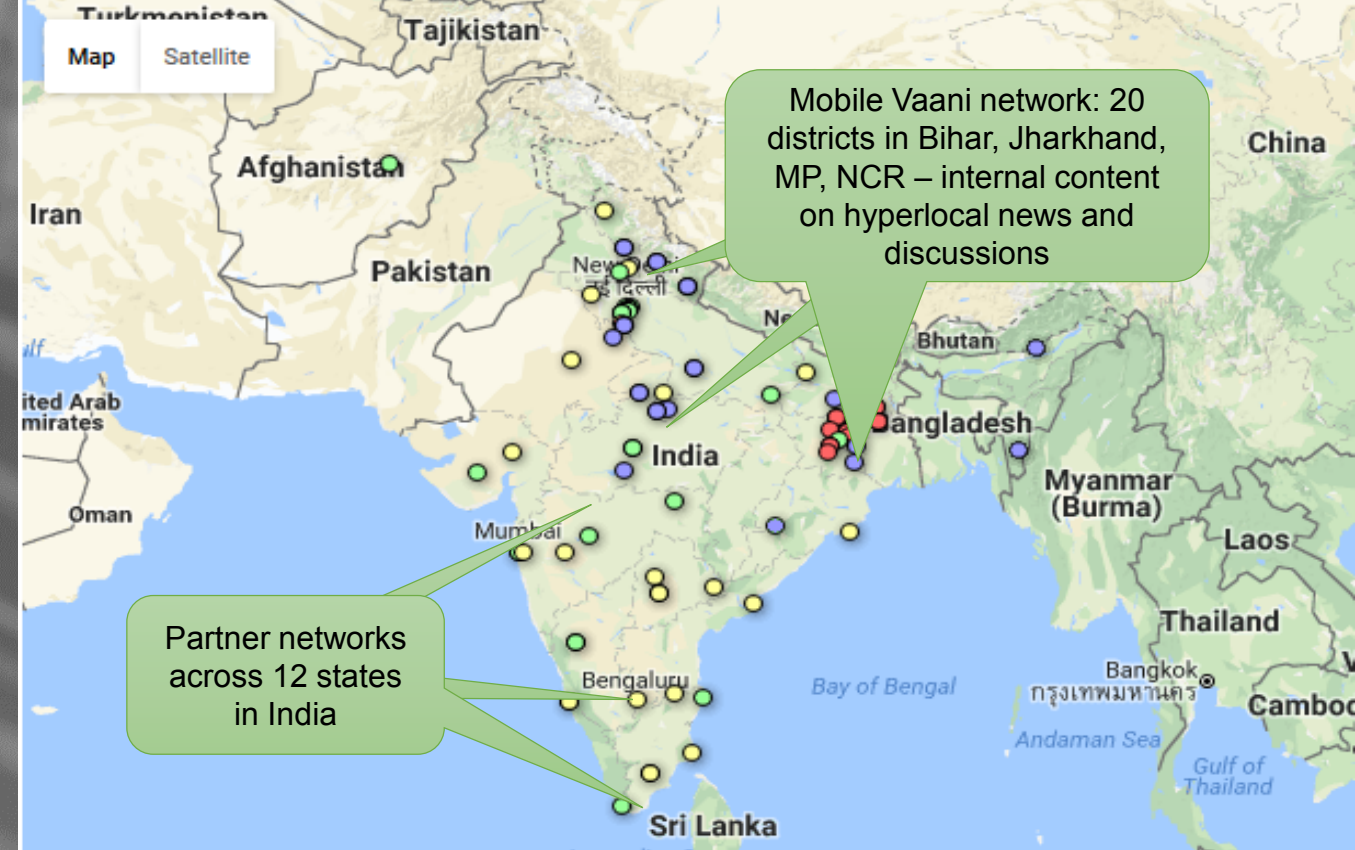
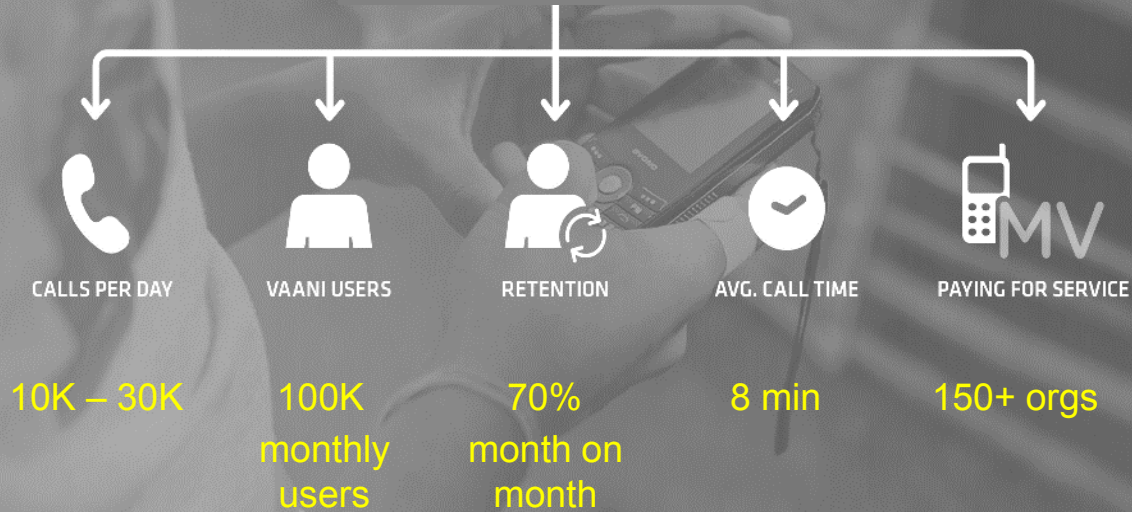
A media platform powered by the people, designed to empower them to change their lives

- Voice-based, does not face illiteracy barriers
- Works on simple phones
- Centered as a platform to give voice to the community
- Responsible content selection, editorial policies to counter echo chambers
- Ensures context and completeness in coverage
- Field presence & rural coverage is an integral part of the model
- Successfully triggered adoption among first time users of technology and media
- Incomplete without community action and impact
- Strategic stakeholder linkages



## CURRENT TRACTION

Jan 2019



- Proven model, running since the last 5+ years, creating impact every day. Also adapted and leveraged by 150+ organizations across the country
- Fine tuned content processes, to encourage users to participate on the platform, share their views, build context and completeness in discussions
- Ideal mix of social and monetary incentives for community volunteers, organized into 20+ district level clubs, engaging 200+ volunteers
- Providing meaningful and actionable information, through our own domain expertise as well as partnerships with dozens of domain experts
- Topics span local news, agriculture advisory, government schemes, rights and entitlements, health and nutrition, local culture, and social accountability
- Processes for structured feedback from users helps understand the pulse of the community and provide them with information that will be useful for them
- Only media platform to reach the poor and marginalized in remote rural areas, in a replicable and scalable manner, and empower them for change

# Processes to manage the socio-technological interface of Mobile Vaani

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**DEALING WITH ASPECTS LIKE...**

**NEEDS**

**PROCESSES LIKE...**

Existing social inequities and literacies

Creating technology and service literacy

# Creating technology and service literacy



Offline processes

**NEEDS DELIBERATE  
EFFORT TO ENSURE  
THAT EXISTING  
INEQUITIES ARE NOT  
PERPETUATED**

Appropriation by the  
more skilled users



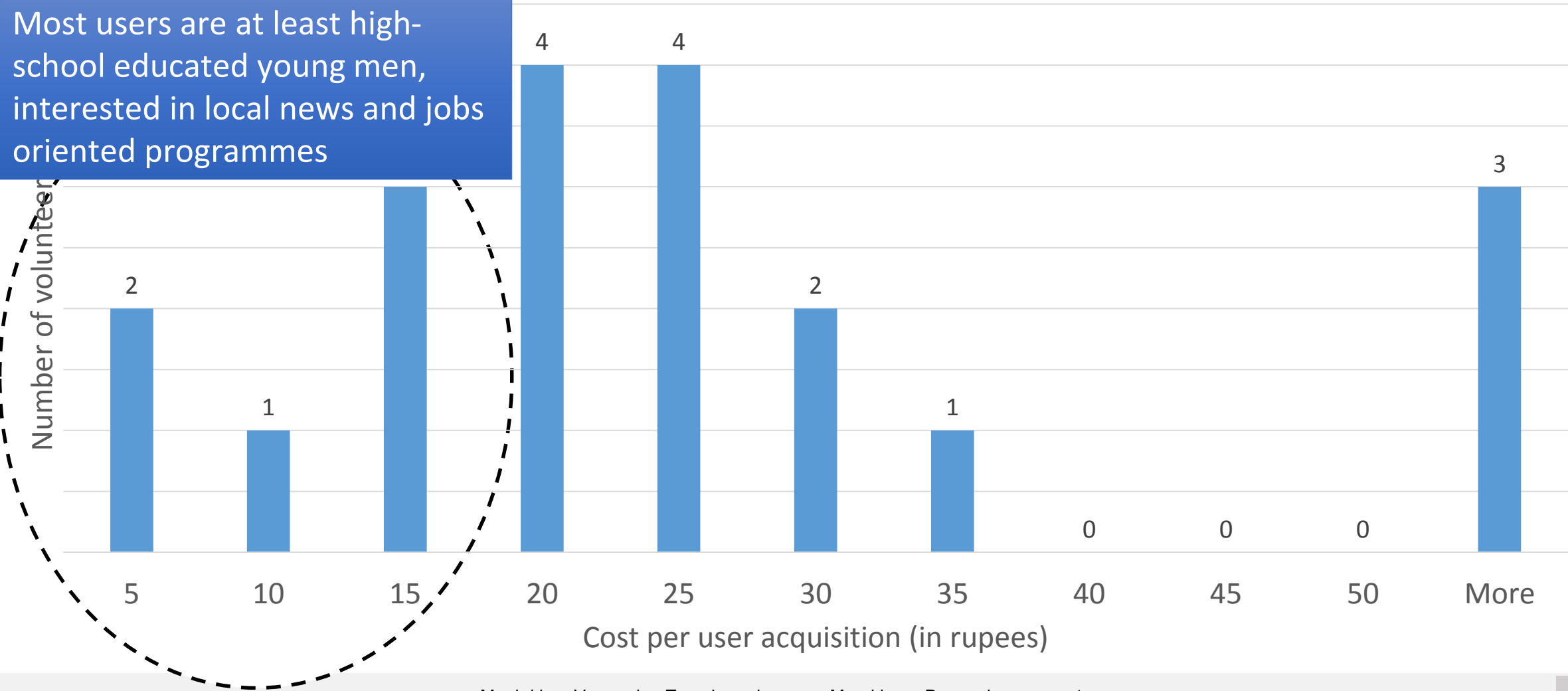
Representativeness  
along class, caste,  
and gender lines



# Creating technology and service literacy

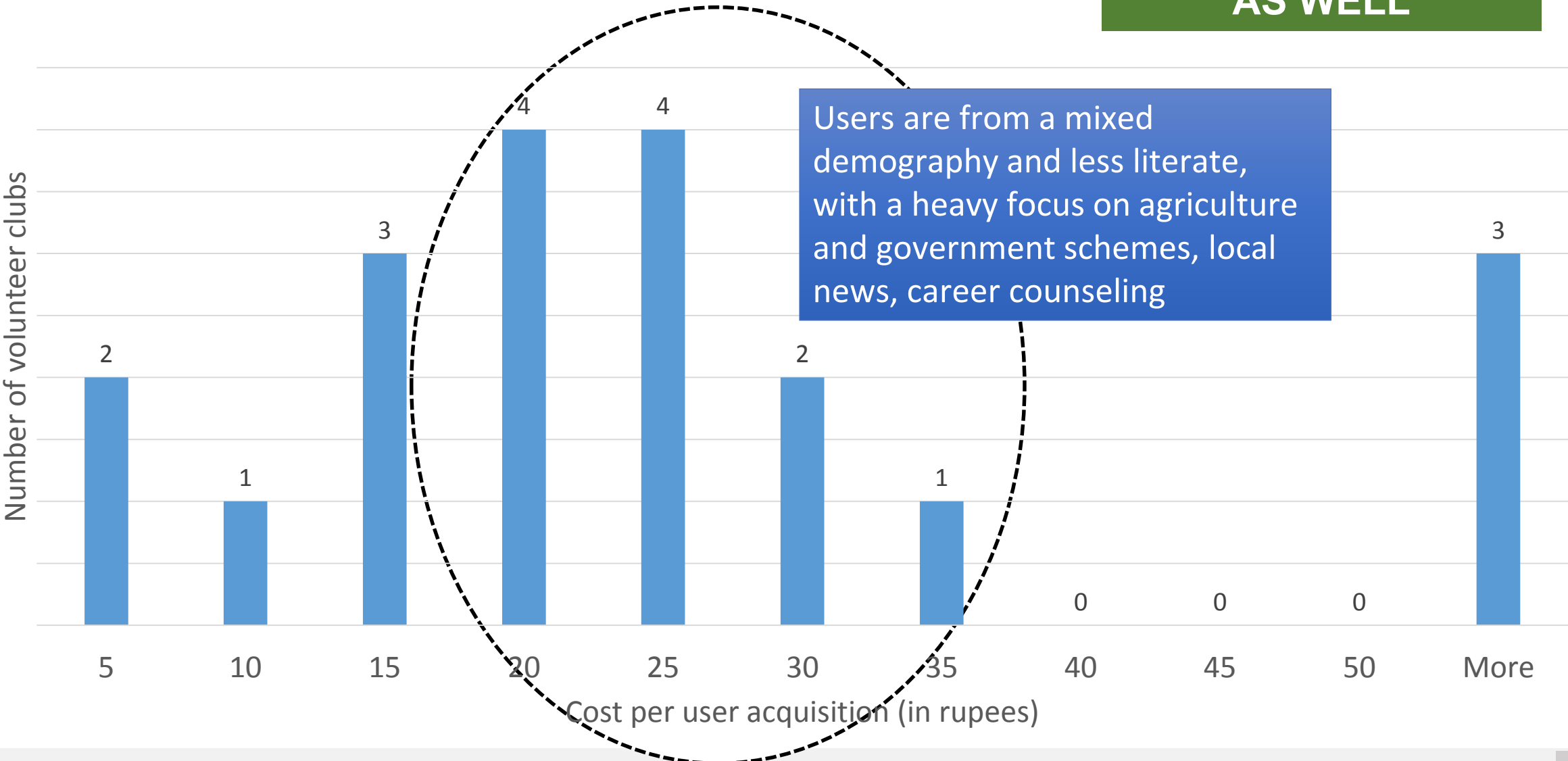
COST IMPLICATIONS  
AS WELL

Most users are at least high-school educated young men, interested in local news and jobs oriented programmes

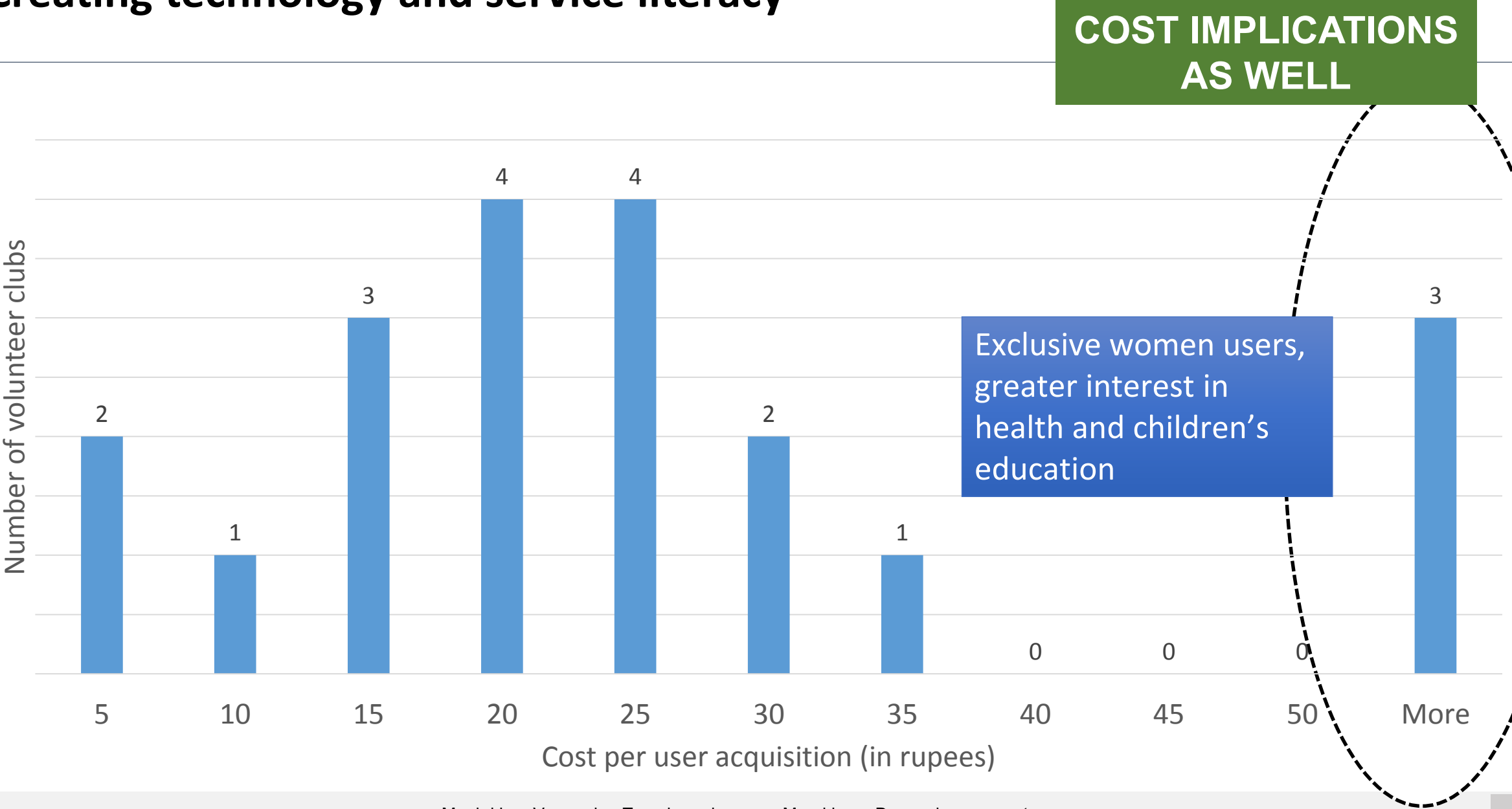


# Creating technology and service literacy

**COST IMPLICATIONS  
AS WELL**



# Creating technology and service literacy



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## DEALING WITH ASPECTS LIKE...

## NEEDS

## PROCESSES LIKE...

Existing social inequities and literacies

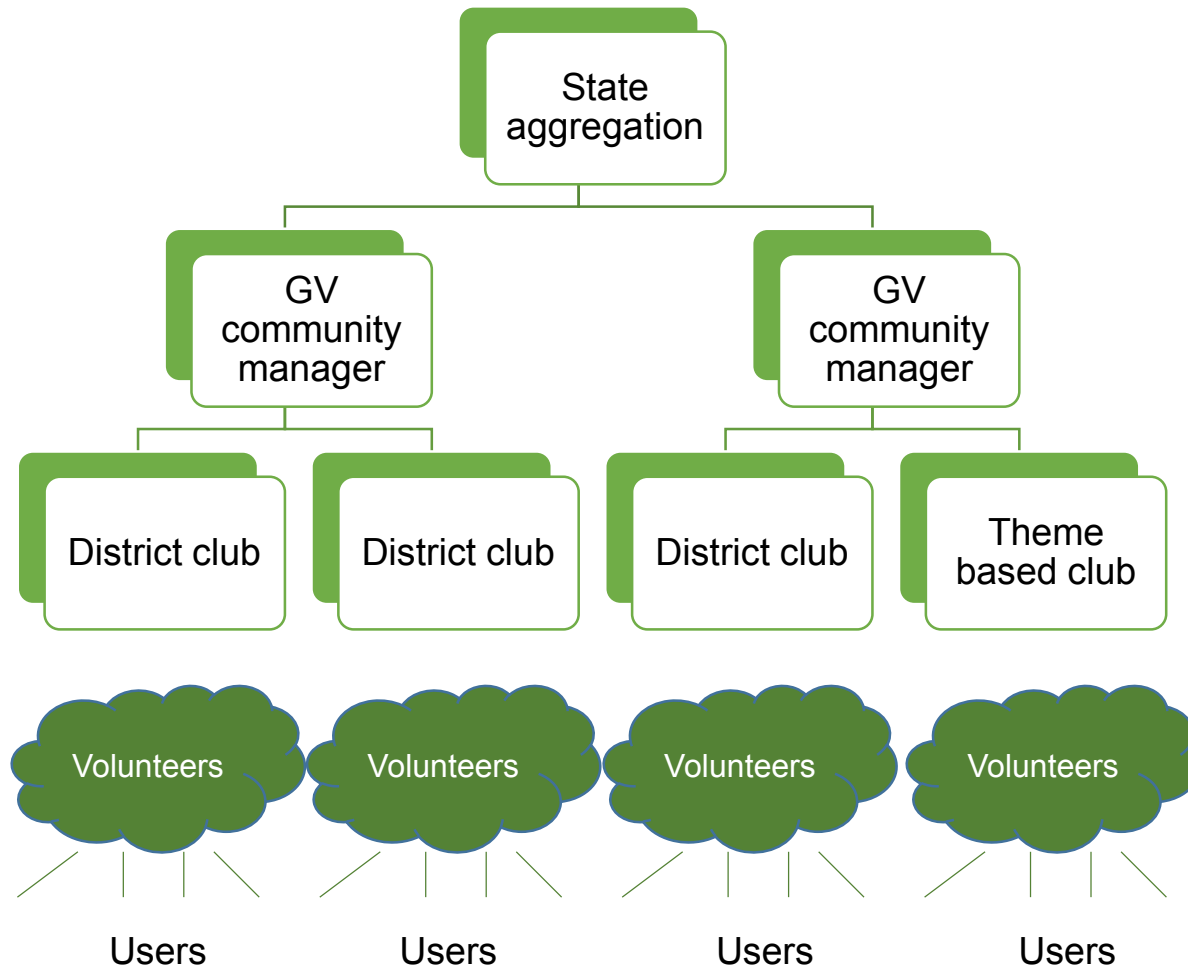
Creating technology and service literacy

Federated setup

Remoteness between designers and users

Feedback processes

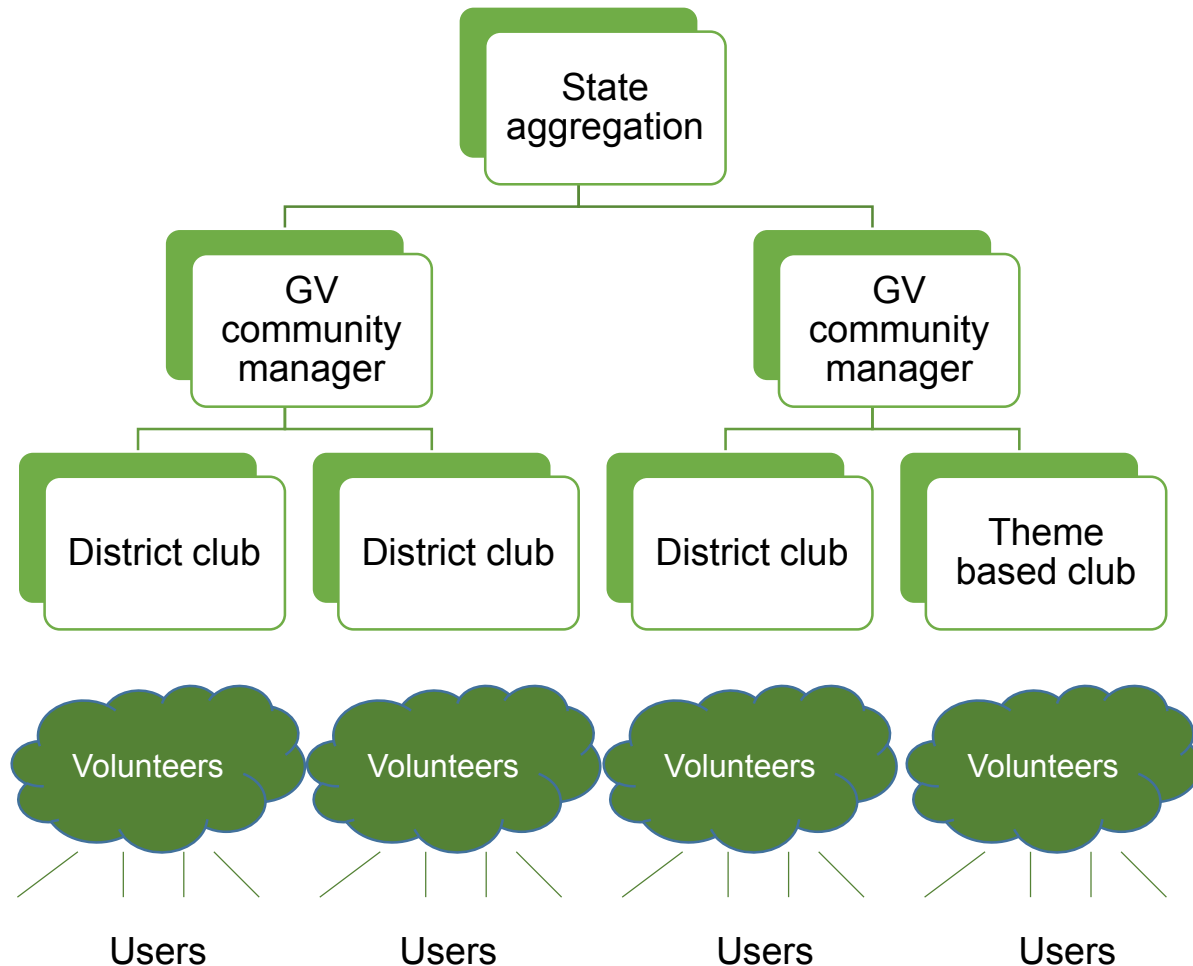
# Federated setup



*In our region, a lot of people suffer from skin and lung cancer; birth defects; inability to carry pregnancy... The number of people suffering from tuberculosis is also increasing day by day. Hence, we **decided to initiate a weekly health advisory on our club by partnering with community health workers and local doctors to discuss the preventive and curative measures of diseases like tuberculosis, malaria, diarrhoea, and also help people point to hospitals and clinics where they can seek treatment for cancer, issues of reproductive health and others...***

**- MV volunteer from Jharkhand**

# Federated setup



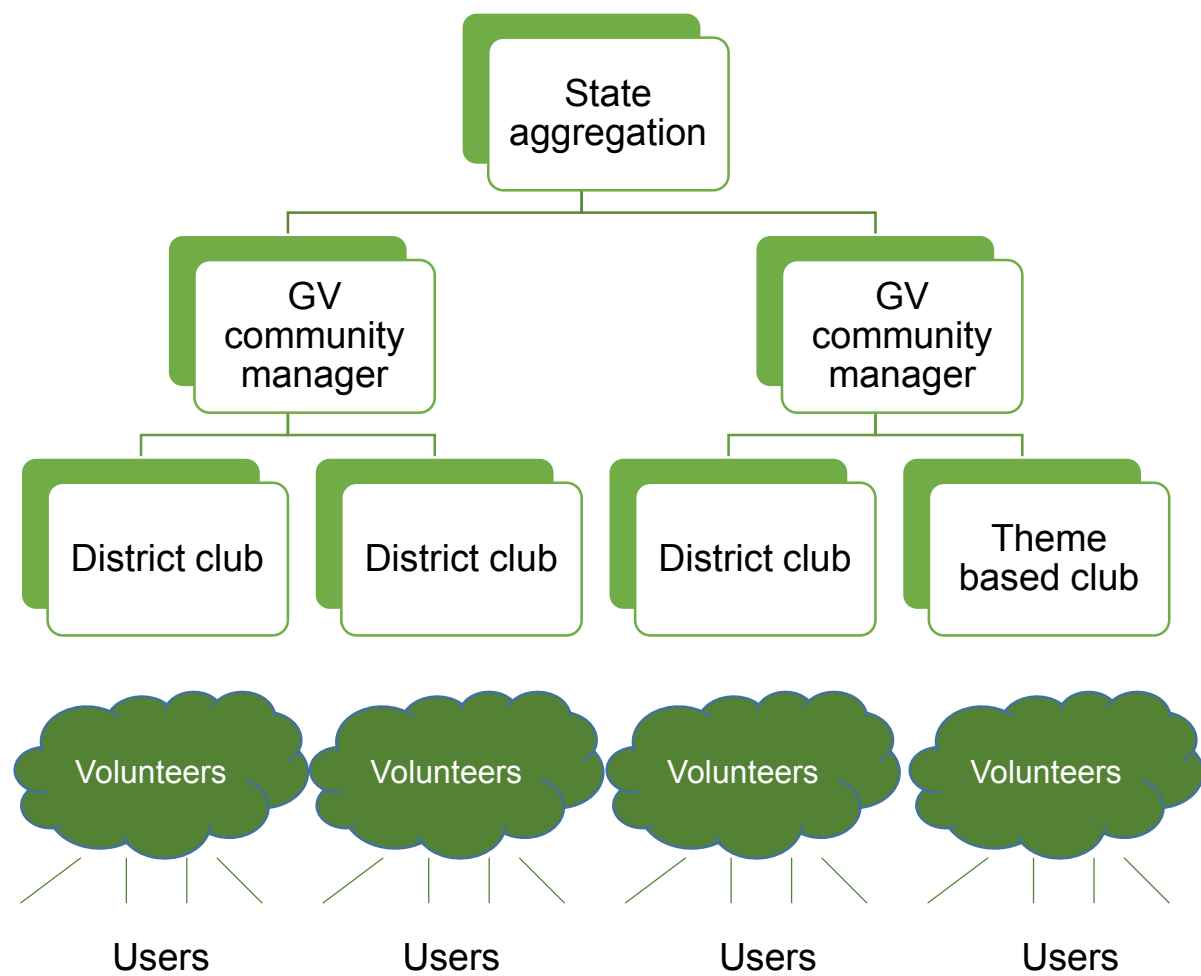
Agriculture advisory in farmer dominated clubs

Career counselling programmes in youth dominated clubs

*Kamyab Didiyon ki Kahaniyan* and *Guru Mantra* in women clubs

Job advisory and support group counselling in channels for physically disabled users

# Federated setup

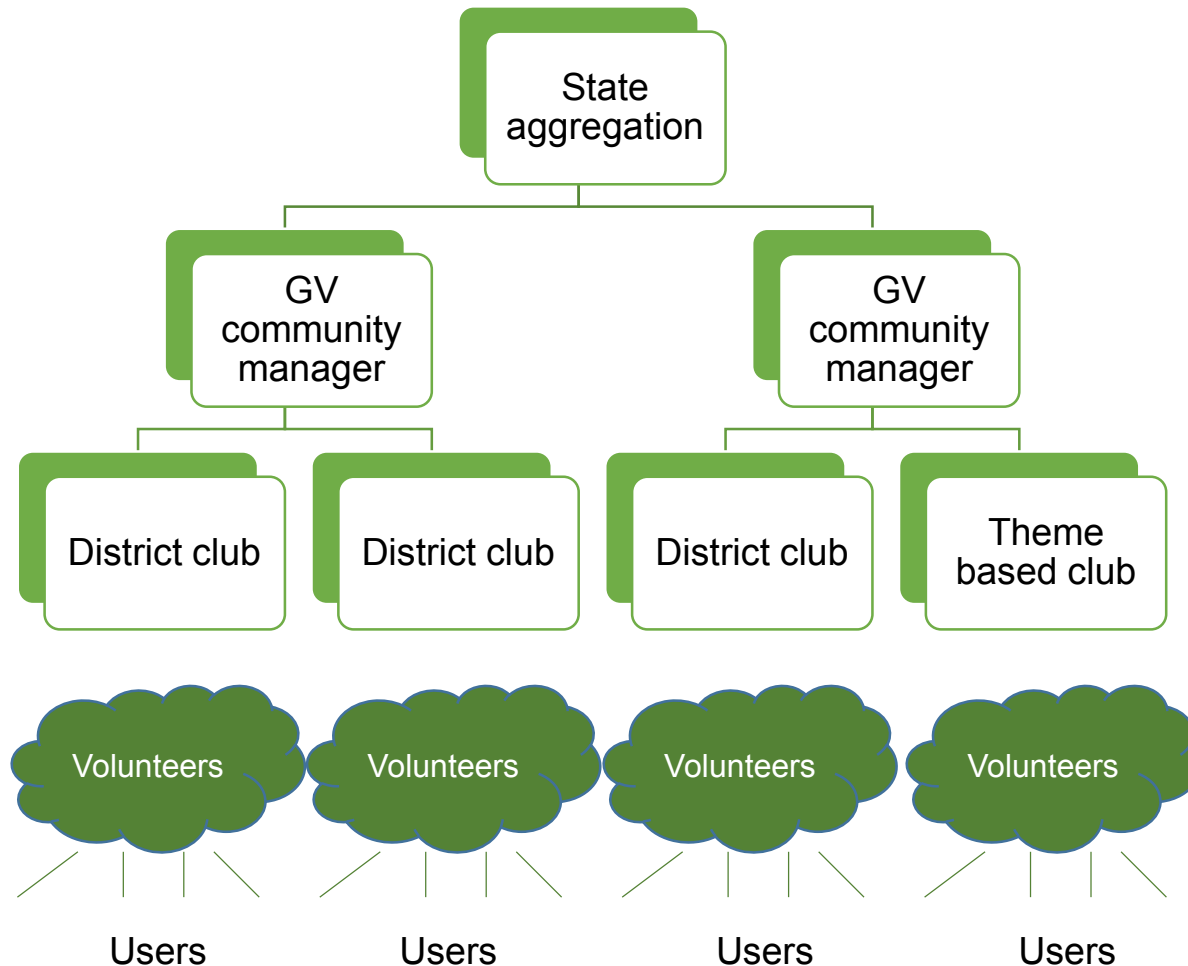


| Time      | Schedule                                     |
|-----------|----------------------------------------------|
| 4-4:30 PM | Employment News                              |
| 4:30-5 PM | User Generated Content - Local Event Updates |
| 5-6 PM    | User Generated Content - Songs and Poetry    |
| 6-7 PM    | Agriculture Slot - Q and A with Expert       |
| 7-8 PM    | Campaign on Elected Women Representatives    |
| 8-8:30 PM | User Generated Content - Local event updates |

Organizational control retained on the content mix to allow in a federated setup

Example: Protocols followed to answer all questions on a weekly cycle

# Federated setup



*Communitization of technology*  
achieved through decentralization

*Organizational control* preserved  
through standardized processes to  
maintain the federated setup

**CONSCIOUS CHOICE OF A  
DECENTRALIZED DESIGN TO  
ENABLE RELEVANT USE-  
CASES, YET WITH  
STANDARDIZED PROTOCOLS  
TO GOVERN USAGE**

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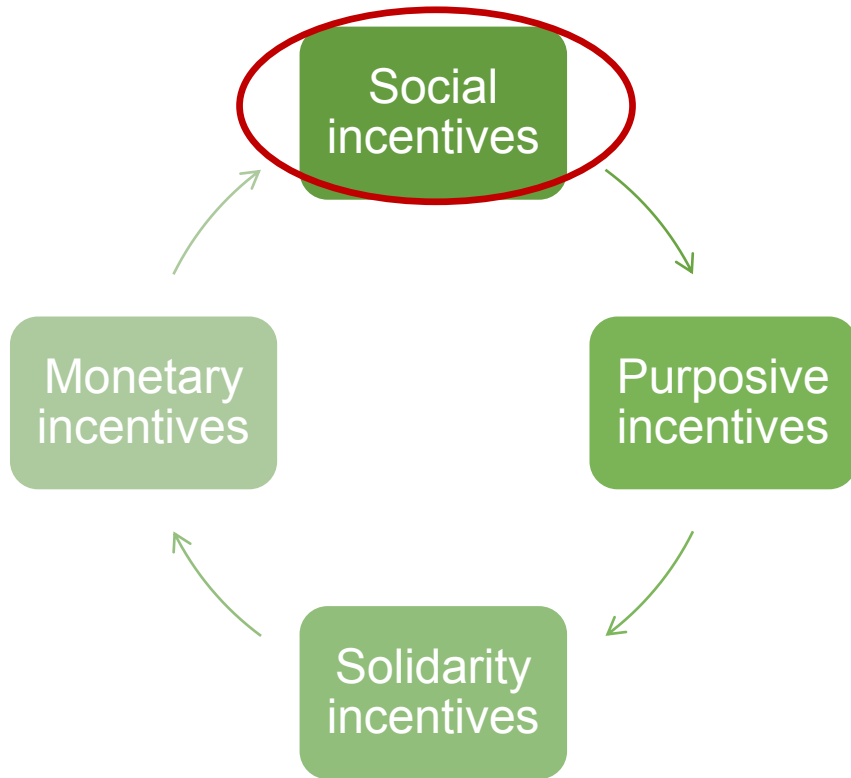
Sustainability and internal accountability

Mix of social and monetary incentives

Signalling the character of the medium

# Mixed structure of incentives for the volunteers

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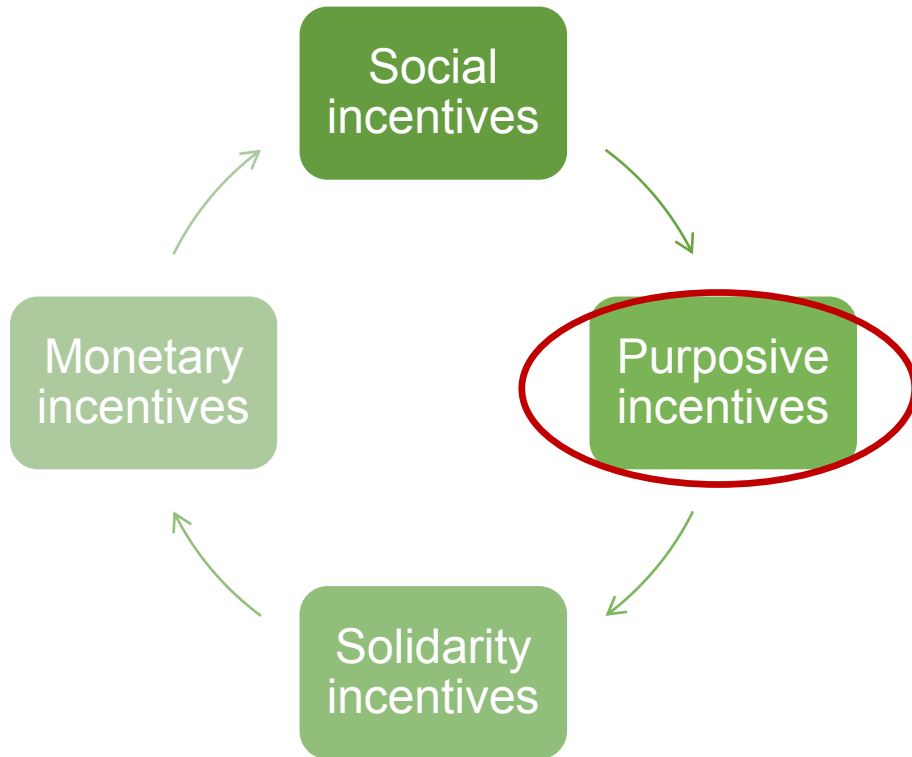


*“I don’t volunteer with MV for **money**, I don’t pay much attention to the payments, and they are such small amounts anyway. I work with MV for **social work and personal development**...”*

**– Male volunteer from Jamui, Bihar**

Olson, M (1965). The Logic of Collective Action

# Mixed structure of incentives for the volunteers

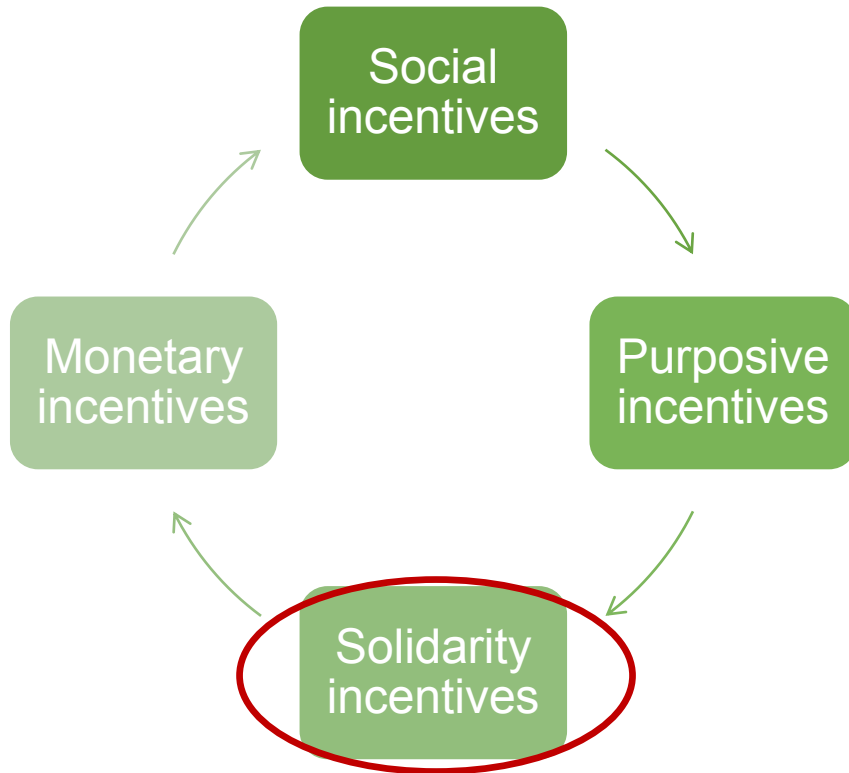


*“... MV has helped women like me, come out of our conservative households, **build our identity** as community reporters and stand for ourselves for finding solutions to our problems... Before listening to MV, my husband never allowed me to go out of the house to attend meetings, but ever since he started listening to MV he has encouraged me go for club meetings... he is positive that I’ll learn something constructive out of it...”*

**– Woman volunteer from Jharkhand**

Olson, M (1965). The Logic of Collective Action

# Mixed structure of incentives for the volunteers

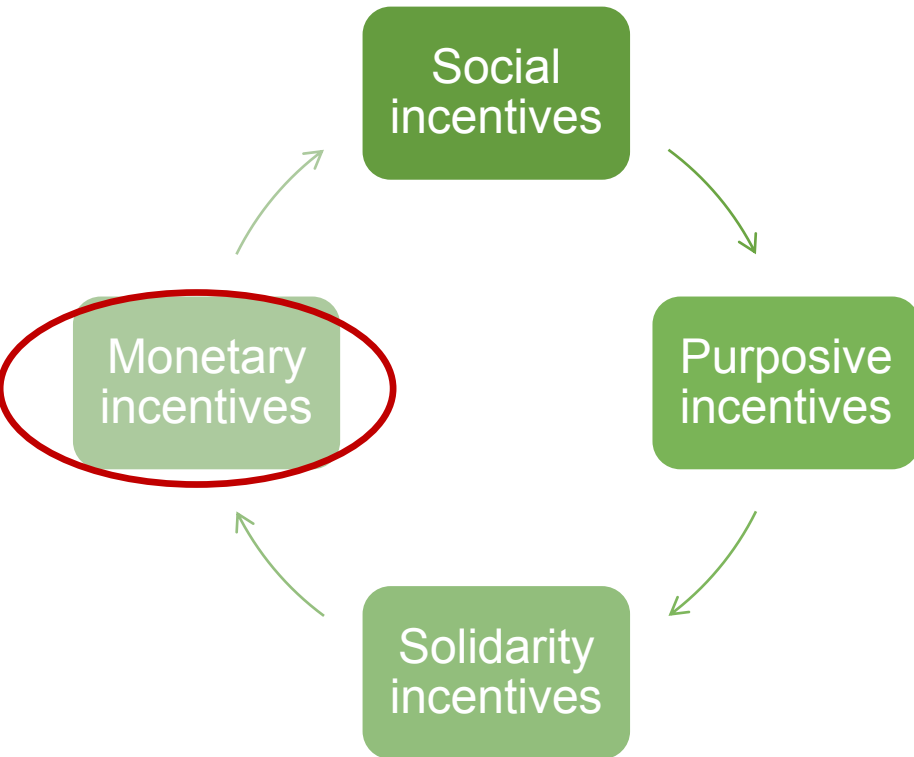


*“I like the concept of **clubs** because it gives us a sense of involvement. Working on the issues of our own area as a close collective gives us a sense of purpose. We have a local club leader, and we believe in future we can also become leaders of our clubs, so it gives us a motivation to keep working for the group...”*

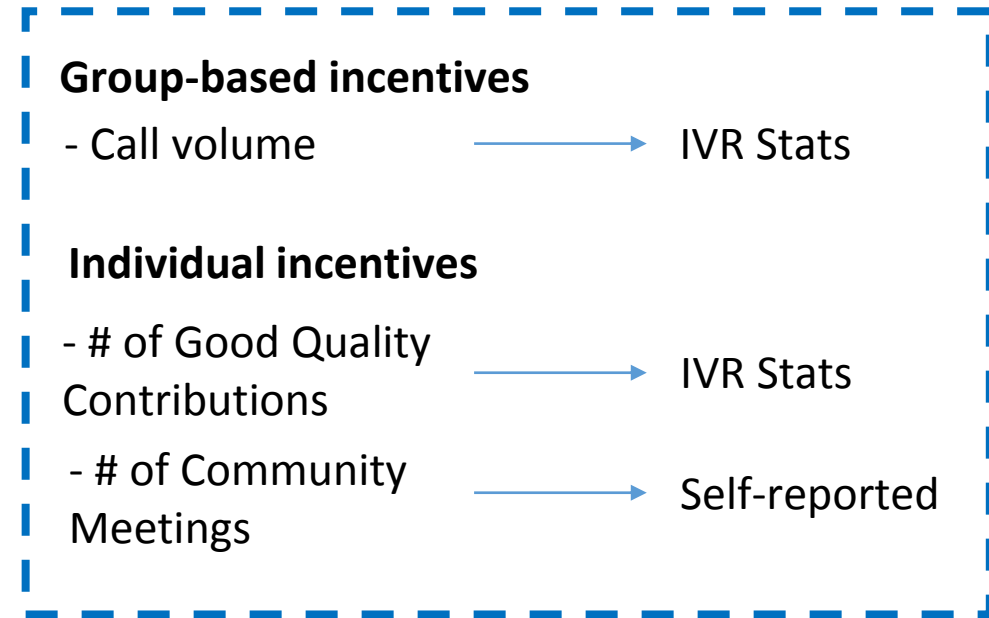
**- Woman Volunteer from Ranchi, Jharkhand**

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# Mixed structure of incentives for the volunteers

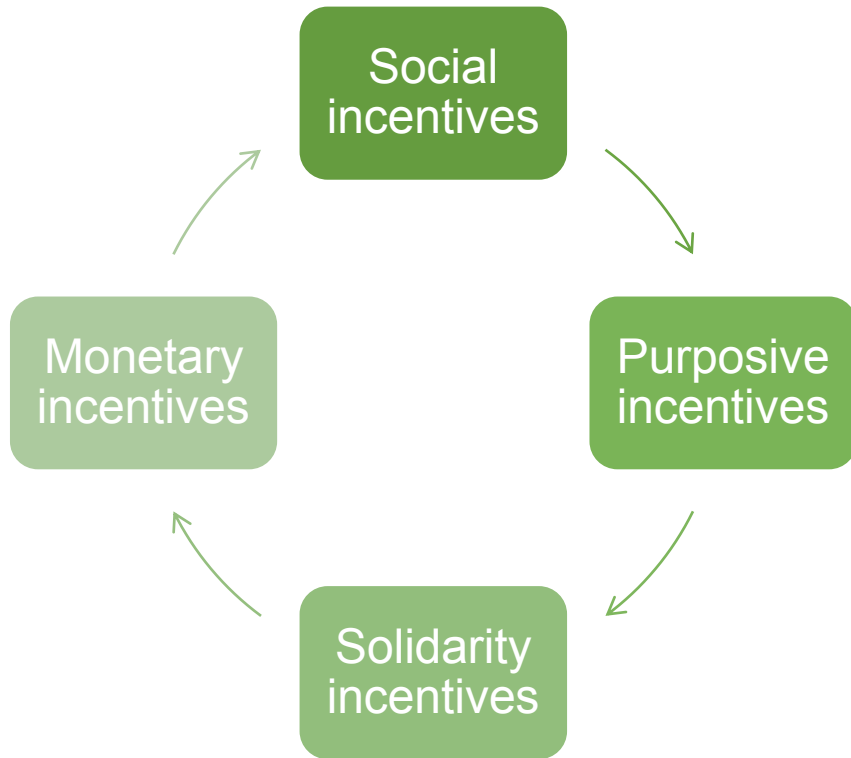


Olson, M (1965). The Logic of Collective Action



Intended to reinforce the signals to build strong collectives, not to free-ride, and to bring visibility to all members about individual contributions

# Mixed structure of incentives for the volunteers



Olson, M (1965). The Logic of Collective Action

- Near zero attrition of volunteers
- Mutual accountability
- Negligible monitoring required
- Clubs have become institutions in themselves

**CAREFUL MANAGEMENT TO FACILITATE  
MUTUAL RESPECT**

# Signalling the character of the medium



|                | Strike update | Problems caused | Valid cause | Invalid cause | Request to Govt. | Request to para-teachers |
|----------------|---------------|-----------------|-------------|---------------|------------------|--------------------------|
| Para-teachers  | 24%           | 7%              | 31%         |               | 37%              |                          |
| Activists      | 10%           | 24%             | 20%         | 12%           | 31%              | 3%                       |
| Students       |               | 43%             | 4%          | 17%           | 34%              |                          |
| Parents        | 4%            | 38%             | 9%          | 9%            | 38%              |                          |
| Govt.          |               |                 |             |               |                  | 99%                      |
| <b>Overall</b> | <b>13%</b>    | <b>22%</b>      | <b>21%</b>  | <b>8%</b>     | <b>34%</b>       | <b>1%</b>                |

|                   |            |            |            |  |           |  |
|-------------------|------------|------------|------------|--|-----------|--|
| <b>Mass Media</b> | <b>53%</b> | <b>17%</b> | <b>23%</b> |  | <b>5%</b> |  |
|-------------------|------------|------------|------------|--|-----------|--|

Editorial policies to handle:

- Grievances on cyber-bullying
- Politically motivated content
- Verification of allegations
- Filter on tone of messages

Information completeness as an editorial principle

**CAREFUL MANAGEMENT TO FACILITATE  
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# Signalling the character of the medium

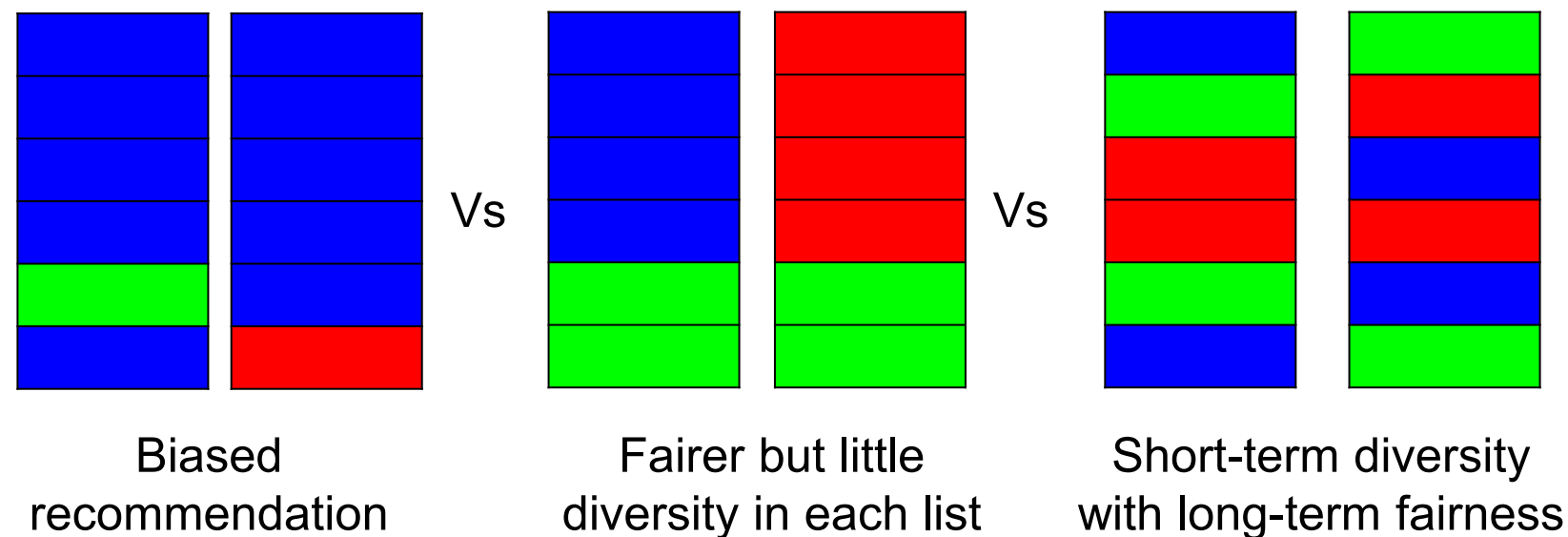
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*“... Mobile Vaani is like an ideal community media platform where people **represent themselves the way they want to**. They don't need an external news agency or a journalist to cover their issues on their behalf... it is the people who own and run the entire MV platform right from choosing the issue they want to base their discussion on, to composing a report, a message, a song or poetry... and recording it on the forum with a view to **encourage further discussion** within the community or make a dent in government administration or **giving mainstream media like our newspaper, material to base news reports on ...**”*

– **Caller from Jharkhand, working with a mainstream newspaper**

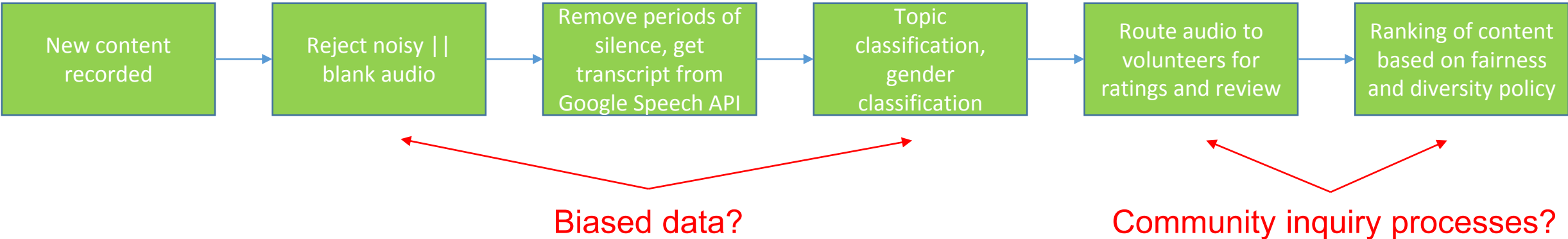
**CAREFUL MANAGEMENT TO FACILITATE  
MUTUAL RESPECT**

# Signalling the character of the medium



Platform managers can define fairness policies:

- Equal coverage to all aspects
- Max-min fairness with at least 5% coverage to each aspect



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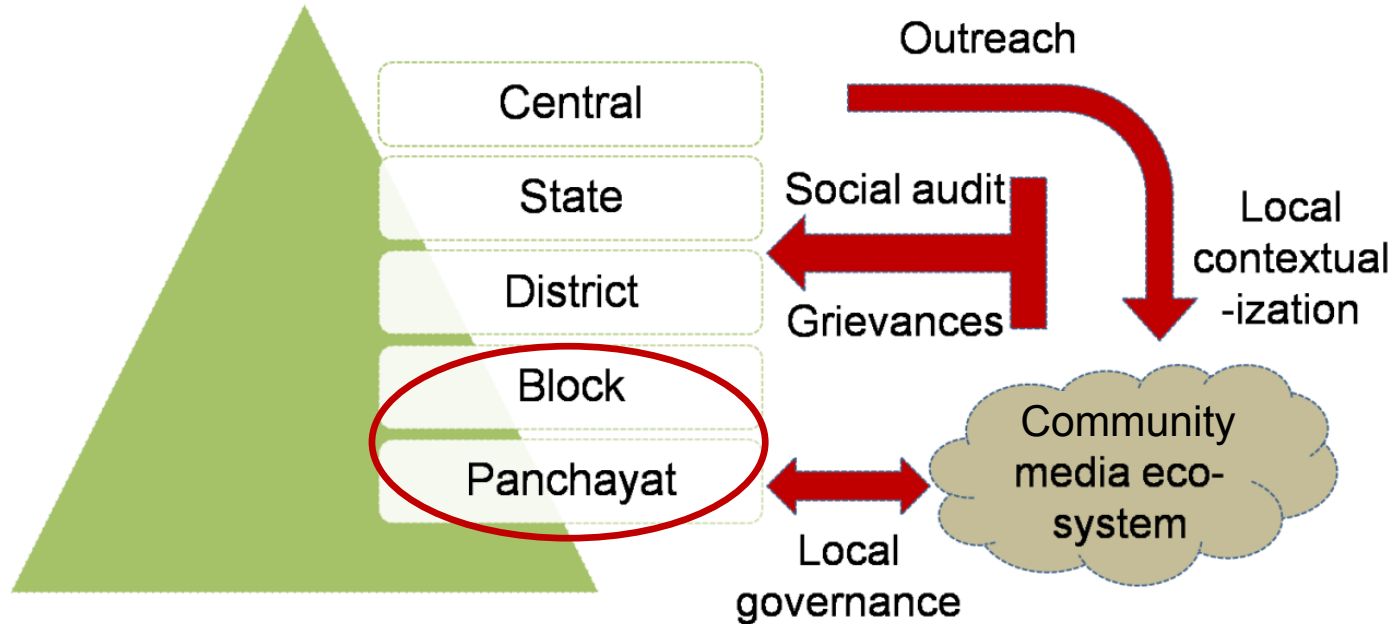
Mix of social and monetary incentives

Signalling the character of the medium

Social and institutional credibility

Offline partnerships

# Facilitating change through media



Fear of escalation and personal networks of volunteers can make things work at the local level

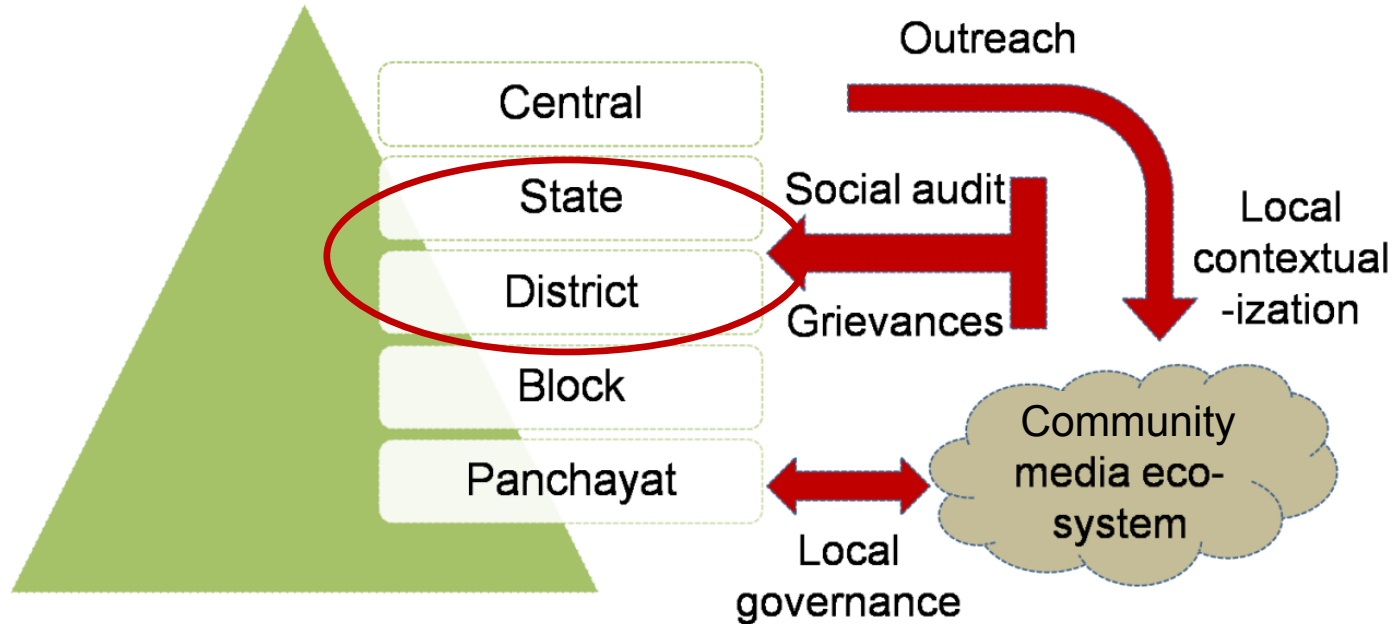
Can be formalized for scale-up:  
*Janta darbar, Jan Shakti Abhiyan, Escalation forwarding*

People reported on a few officials who were demanding bribes for UID enrollment. The site was visited by the block development officer and the officials were fined

A village ignored by health agencies was reported to have had 3 malaria deaths in the last one week. A mobile ambulance was immediately dispatched, with fumigation equipment and first aid

**NEEDS DELIBERATE  
EFFORT TO CREATE  
PARTNERSHIPS AND  
MENTOR THE  
STAKEHOLDERS TO  
EFFECTIVELY USE  
THE SYSTEM**

# Facilitating change through media



Partnerships with the government and other stakeholders can facilitate institutionalized links to improve citizen-government engagement

Authorized to collect grievances on the RSBY health insurance programme and channel them to RSBY mitras, provide publicly accessible reports to the government authorities

Citizen-based auditing of the cleaning status of waste dumping sites in Delhi. Review of disputes by the commissioner helped uncover several process flaws in the urban waste management system.

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# Processes to manage the socio-technological interface

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DEALING WITH ASPECTS LIKE...

NEEDS

PROCESSES LIKE...

**IT IS VERY COMPLEX!**

**WELL BEYOND THE TECHNOLOGY DESIGN**

**EVEN BEYOND THE SYSTEM DESIGN**

**NEEDS CAREFUL MANAGEMENT, THE RIGHT SIGNALLING, COST  
DECISIONS, PARTNERSHIPS...**

**PROCESS ORIENTED APPROACH OF CONSTANT EVOLUTION, INCLUDING  
OF THE DESIGN, AS NEW ASPECTS GET DISCOVERED THAT NEED TO BE  
MANAGED**

# Processes to manage the socio-technological interface

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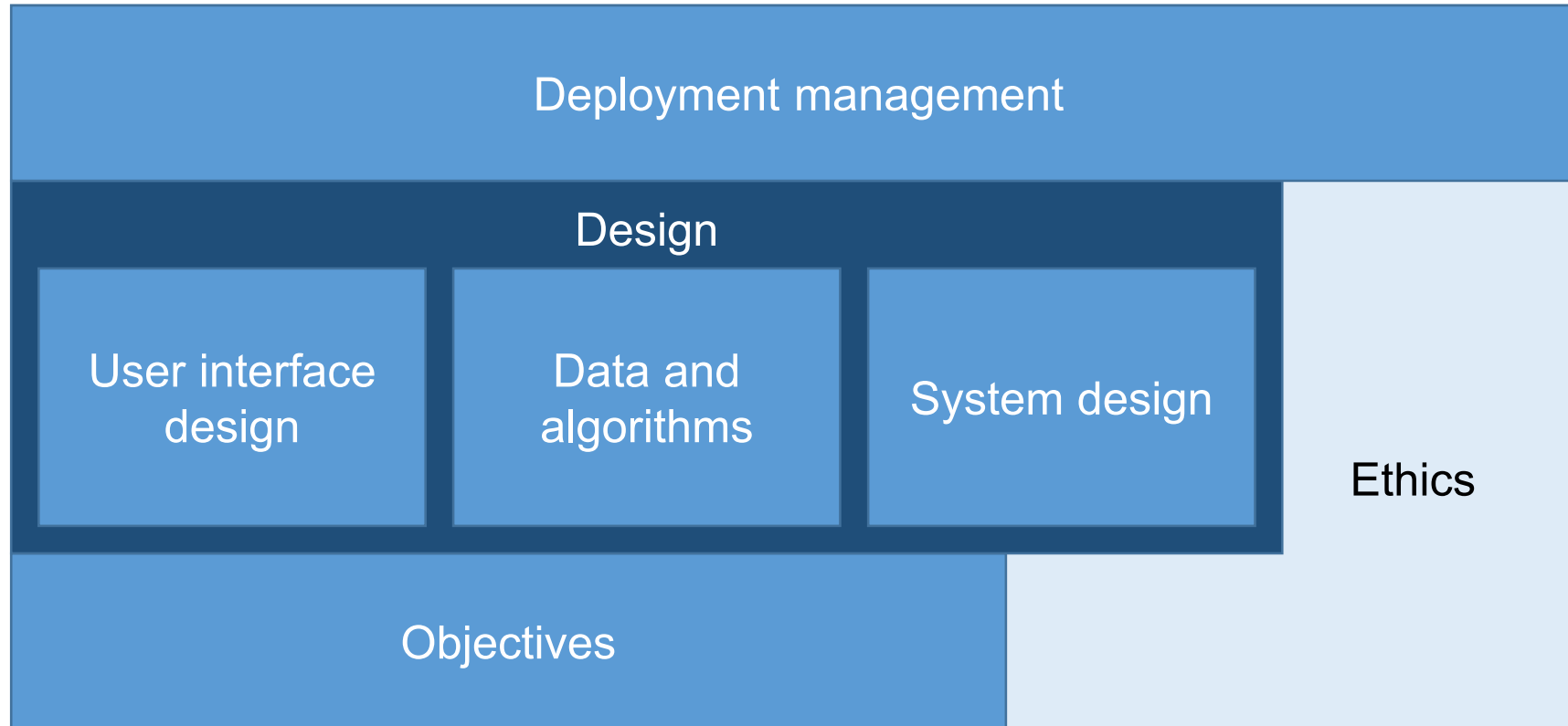
|                               |                                                                                    |
|-------------------------------|------------------------------------------------------------------------------------|
| User interface                | Ethics of persuasive technology, informed consent, appropriate design              |
| Algorithms and data           | Data privacy, de-biasing of data, algorithmic fairness                             |
| System design                 | Individual Vs collective, centralized Vs decentralized, private Vs assisted access |
| Socio-technological interface | Interactions of the technology with society, shaped by societal dynamics           |

Are there any guiding principles that can help build such processes to manage long-term deployments?

Achieving desired outcomes through design alone does not sound convincing enough!

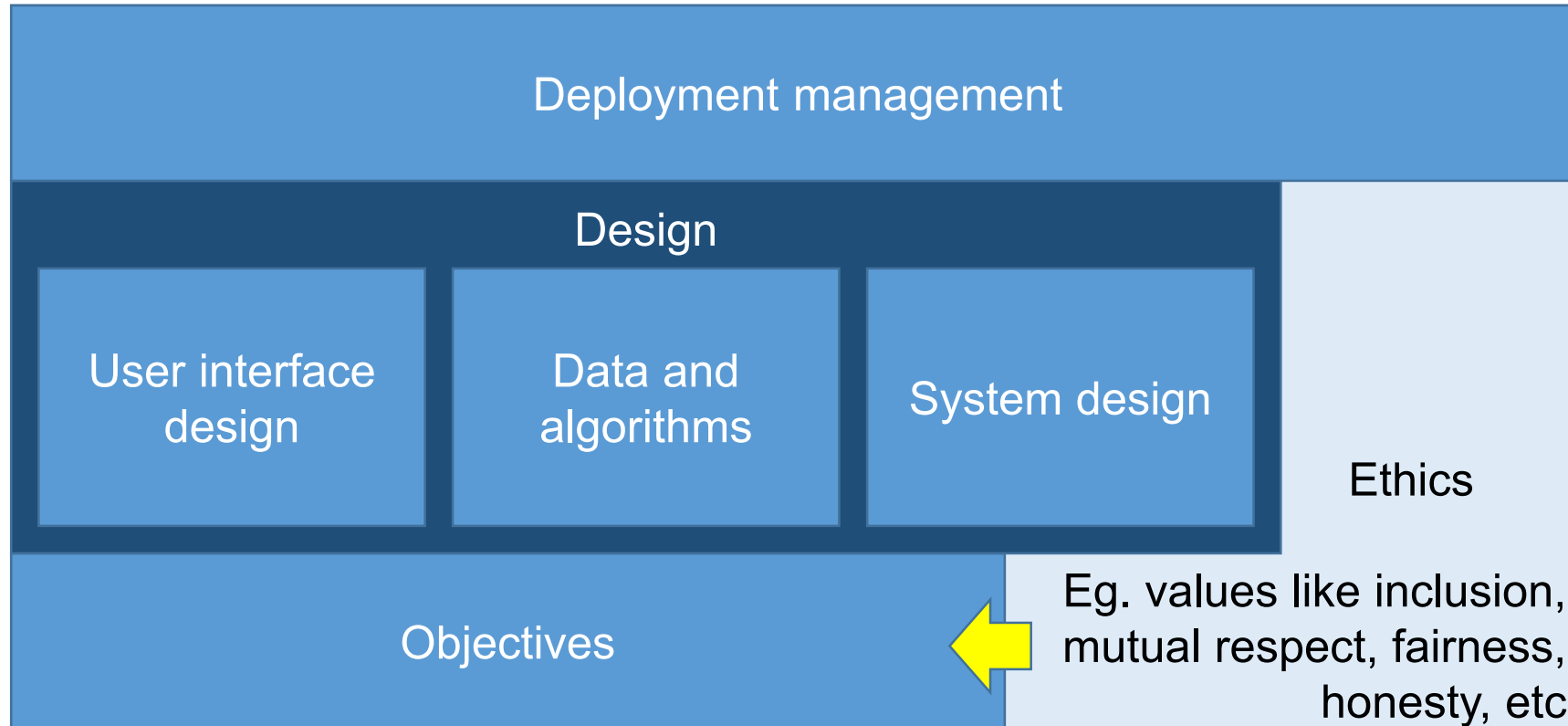
# Ethical underpinnings in the design and management of ICT projects

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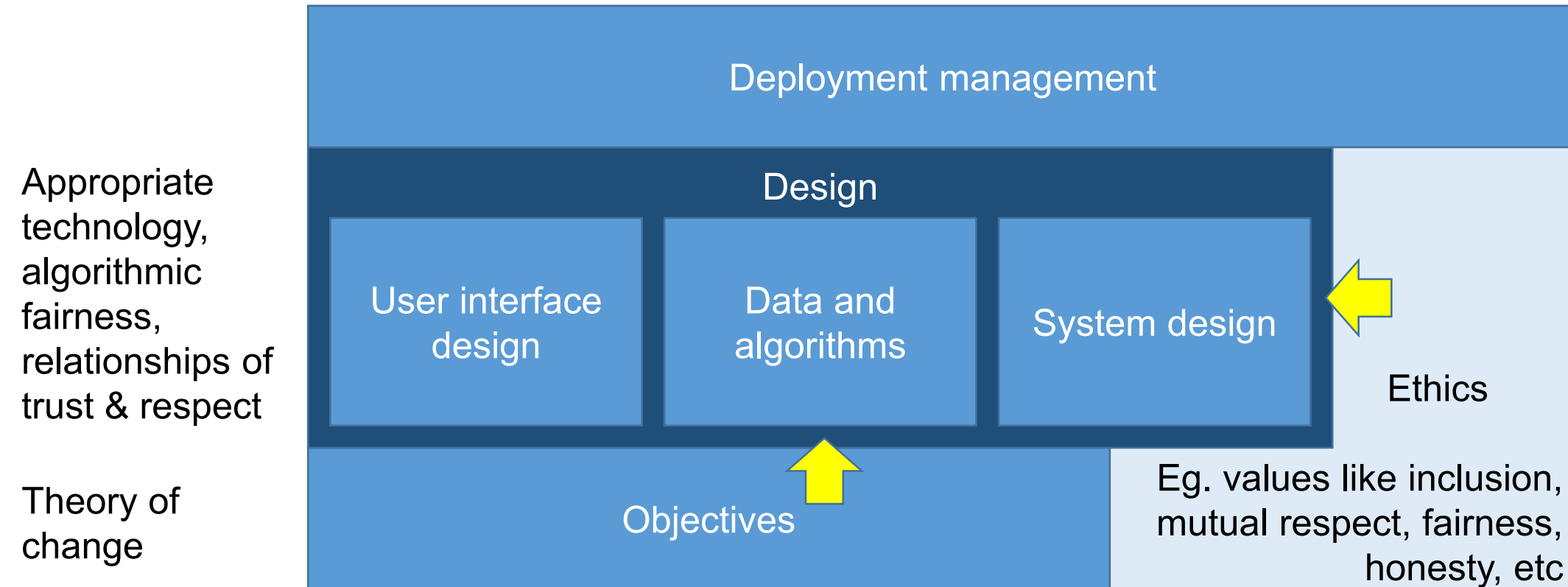
**Rich history of diverse ethical systems to think about fairness, equality, power...**

# Ethical underpinnings in the design and management of ICT projects



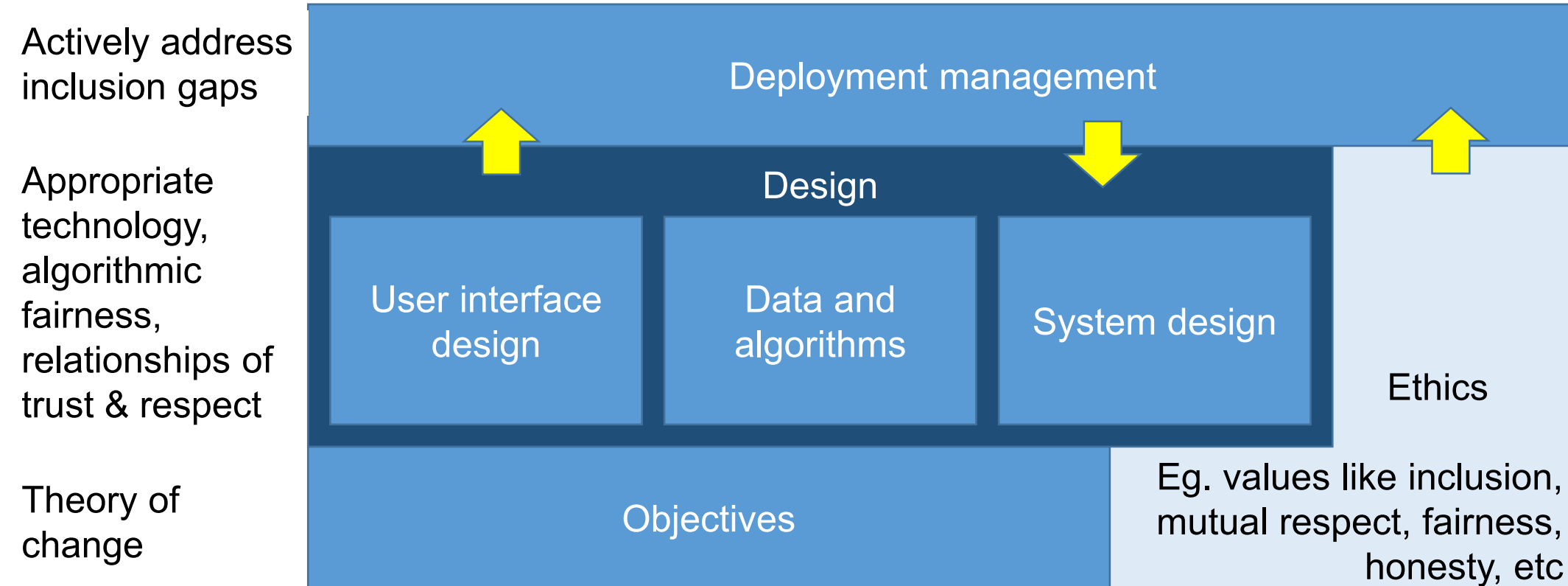
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# Ethical underpinnings in the design and management of ICT projects



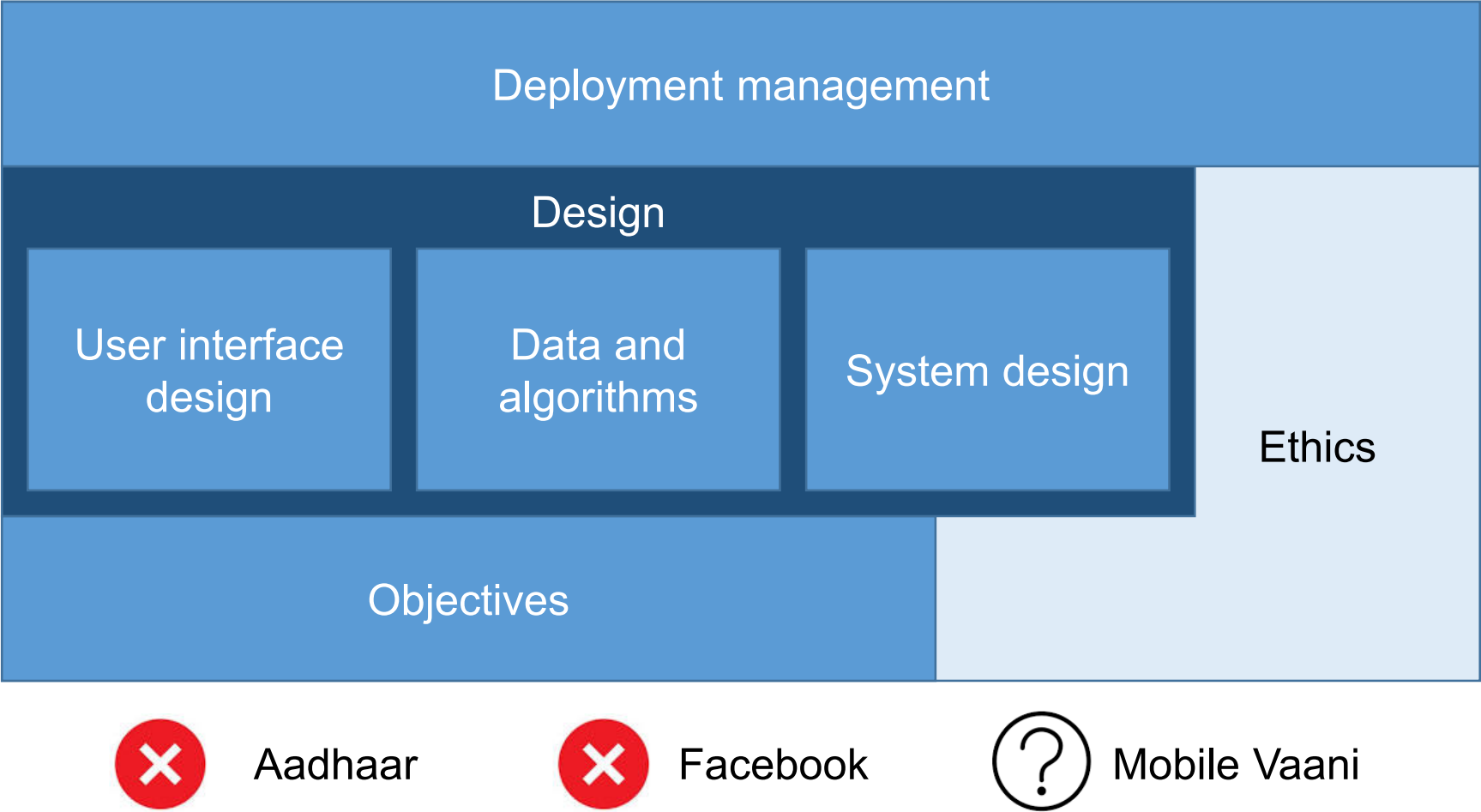
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# Ethical underpinnings in the design and management of ICT projects



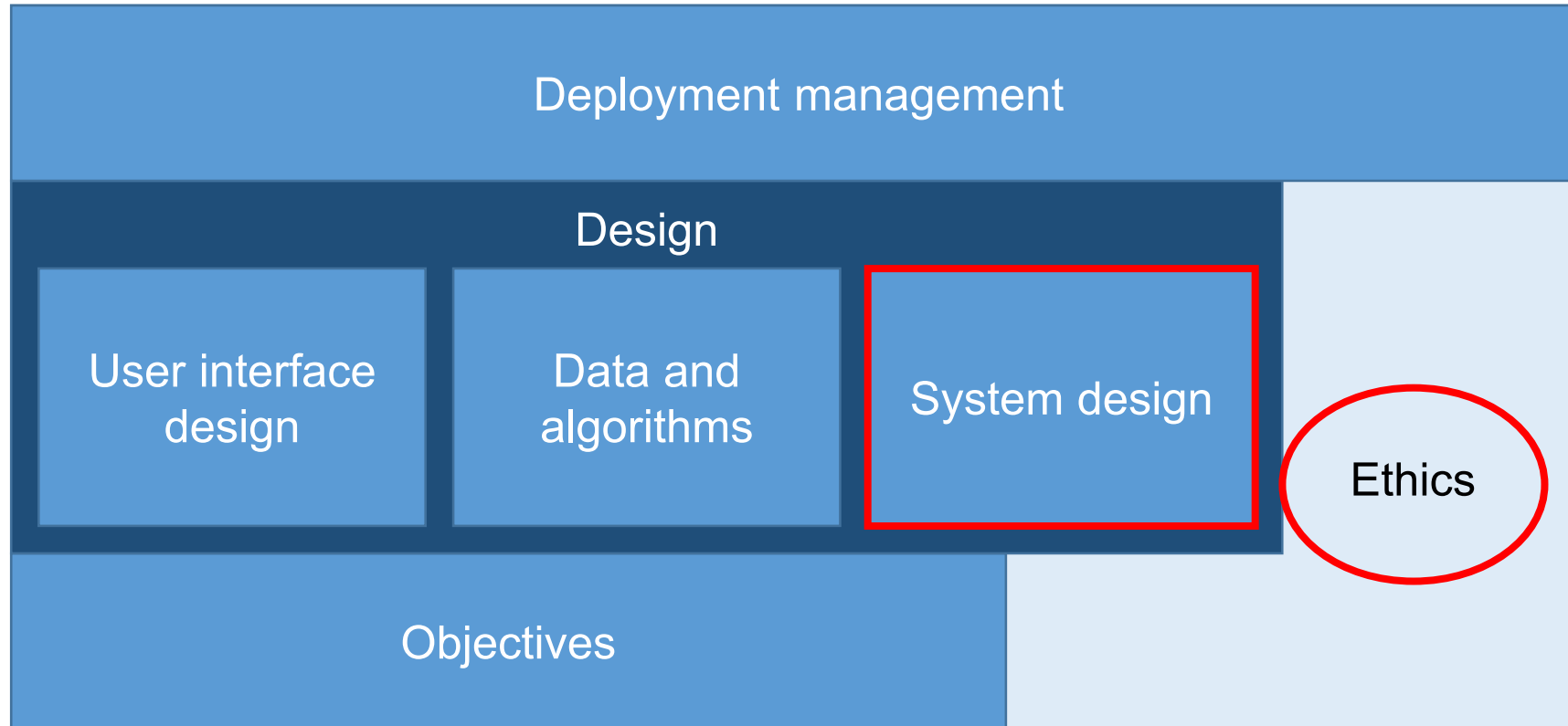
**Rich history of diverse ethical systems to think about fairness, equality, power...**

# Consistency test for adherence to a common ethical system

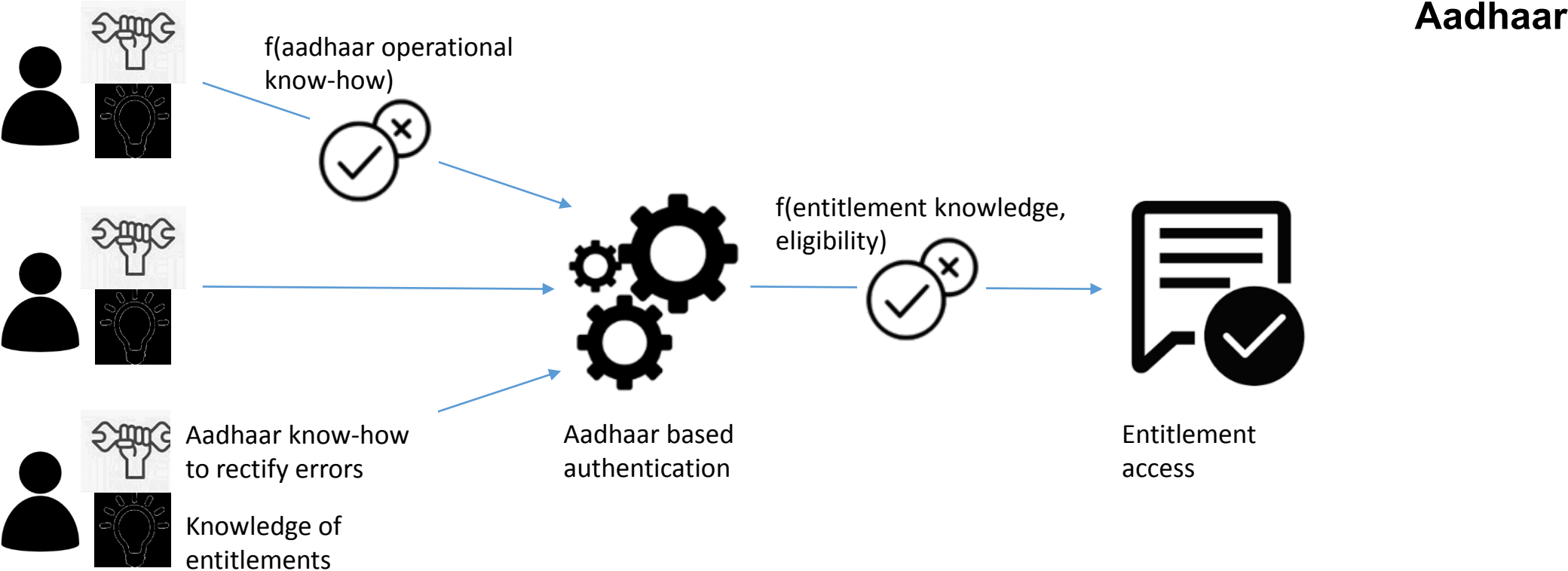


# A set of core values? Empowering Vs disempowering systems

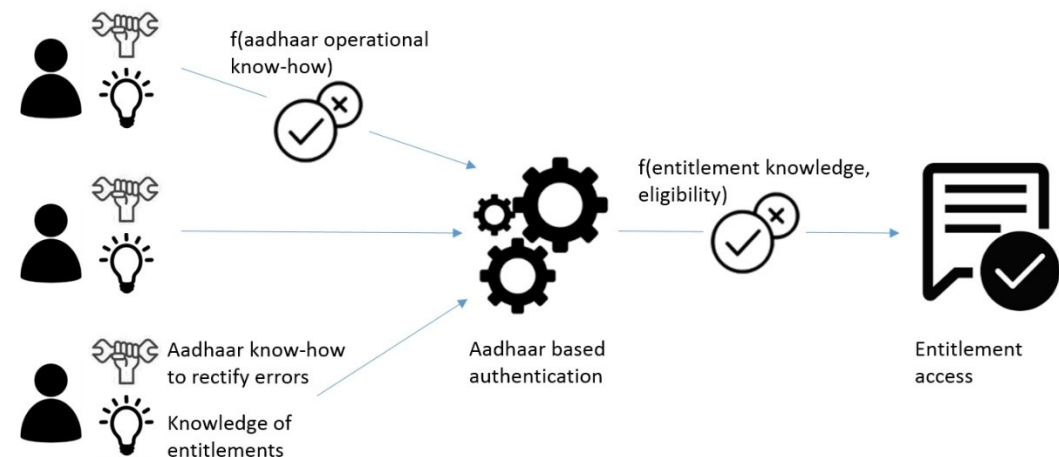
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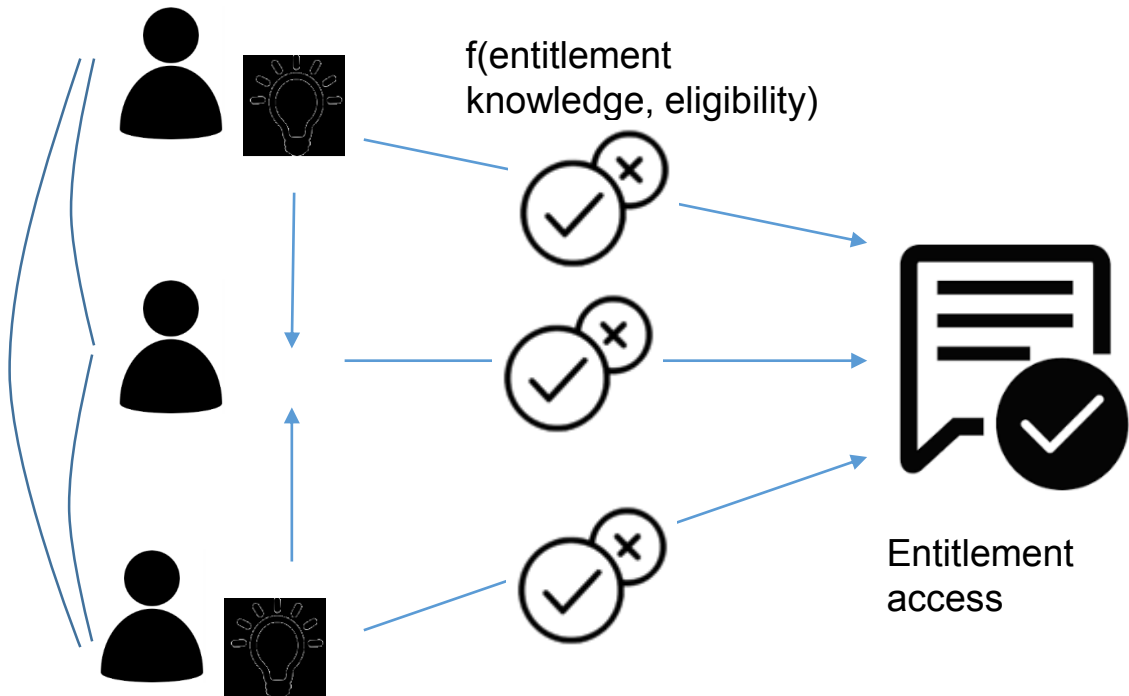


Aadhaar

1. Having a more connected graph of decision-dependent edges can indicate less concentration of power

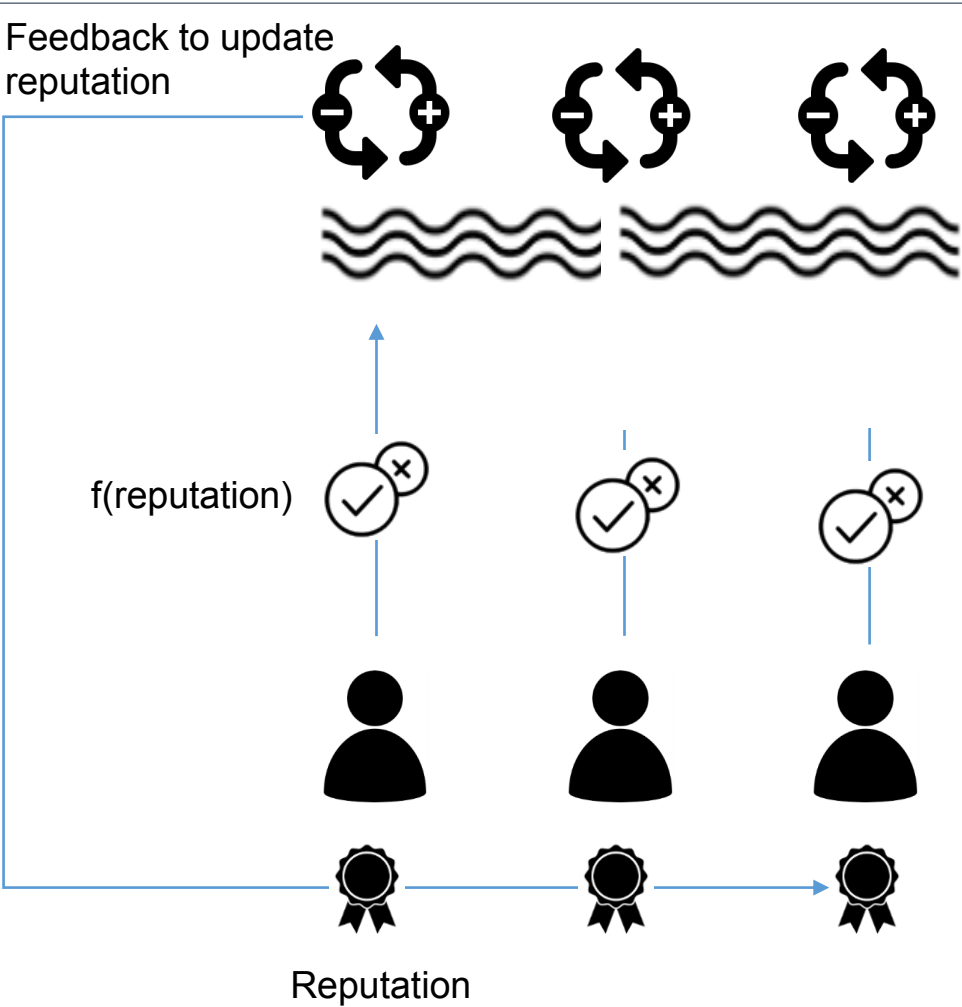
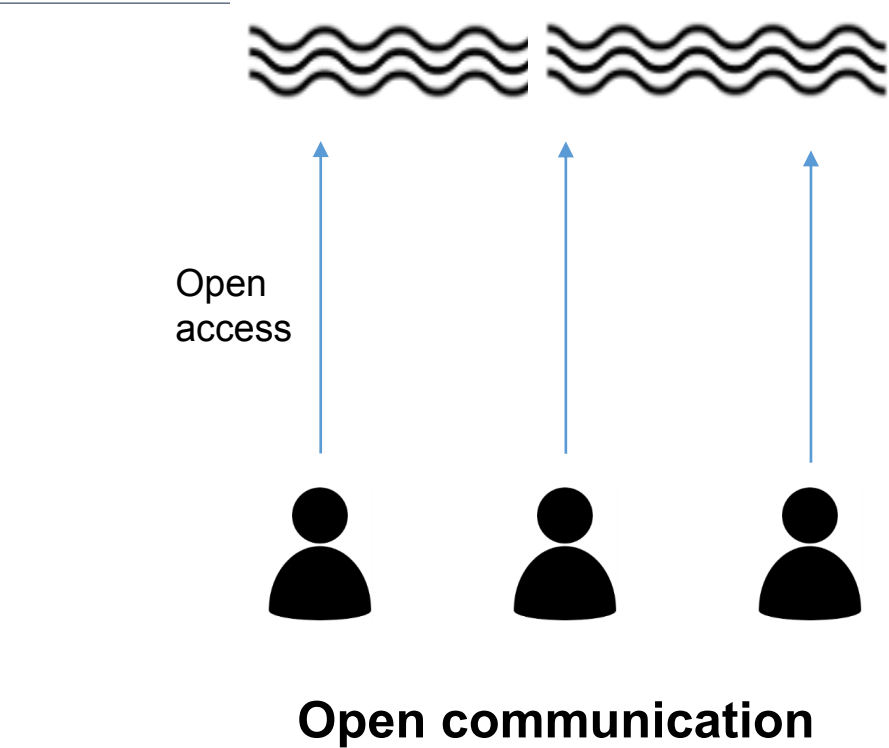
Community structures make knowledge accessible to everyone

Non-Aadhaar



# A set of

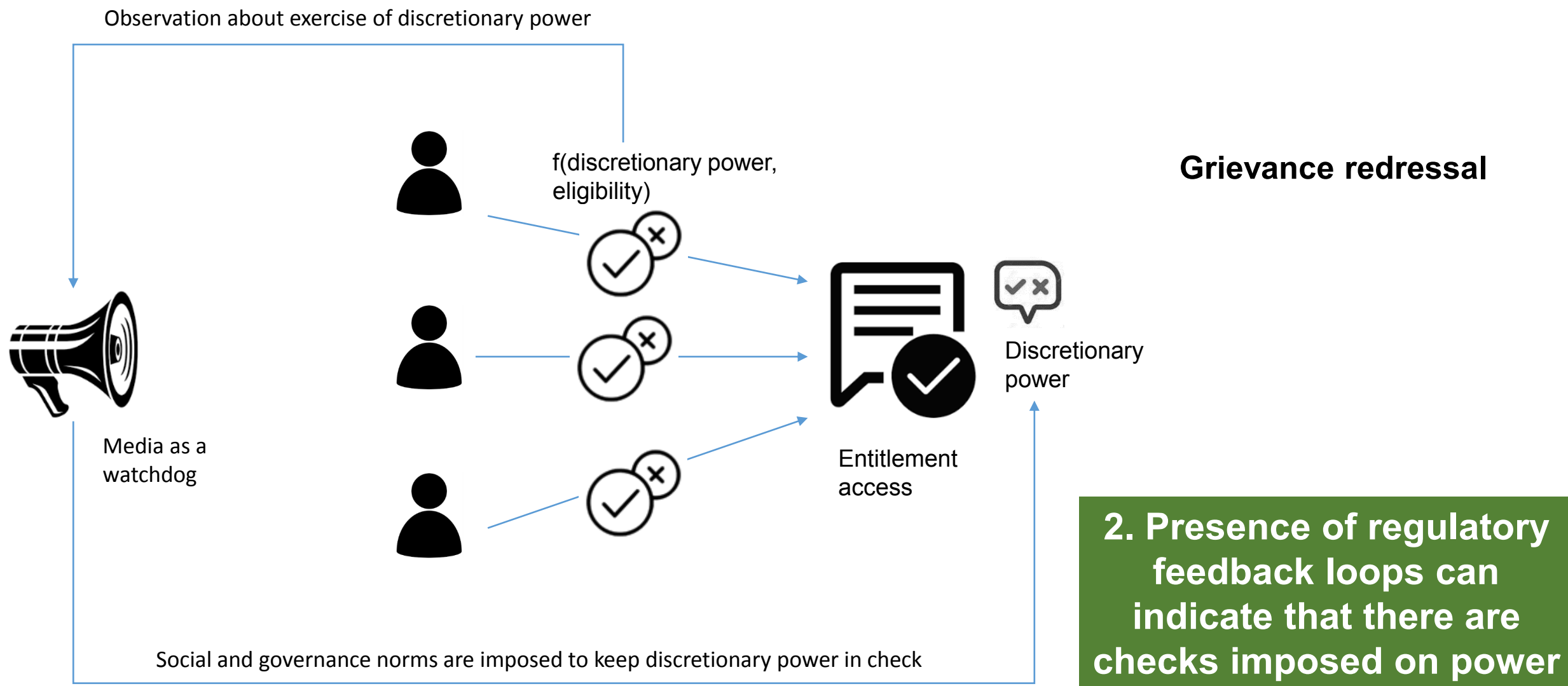
# empowering Vs disempowering systems



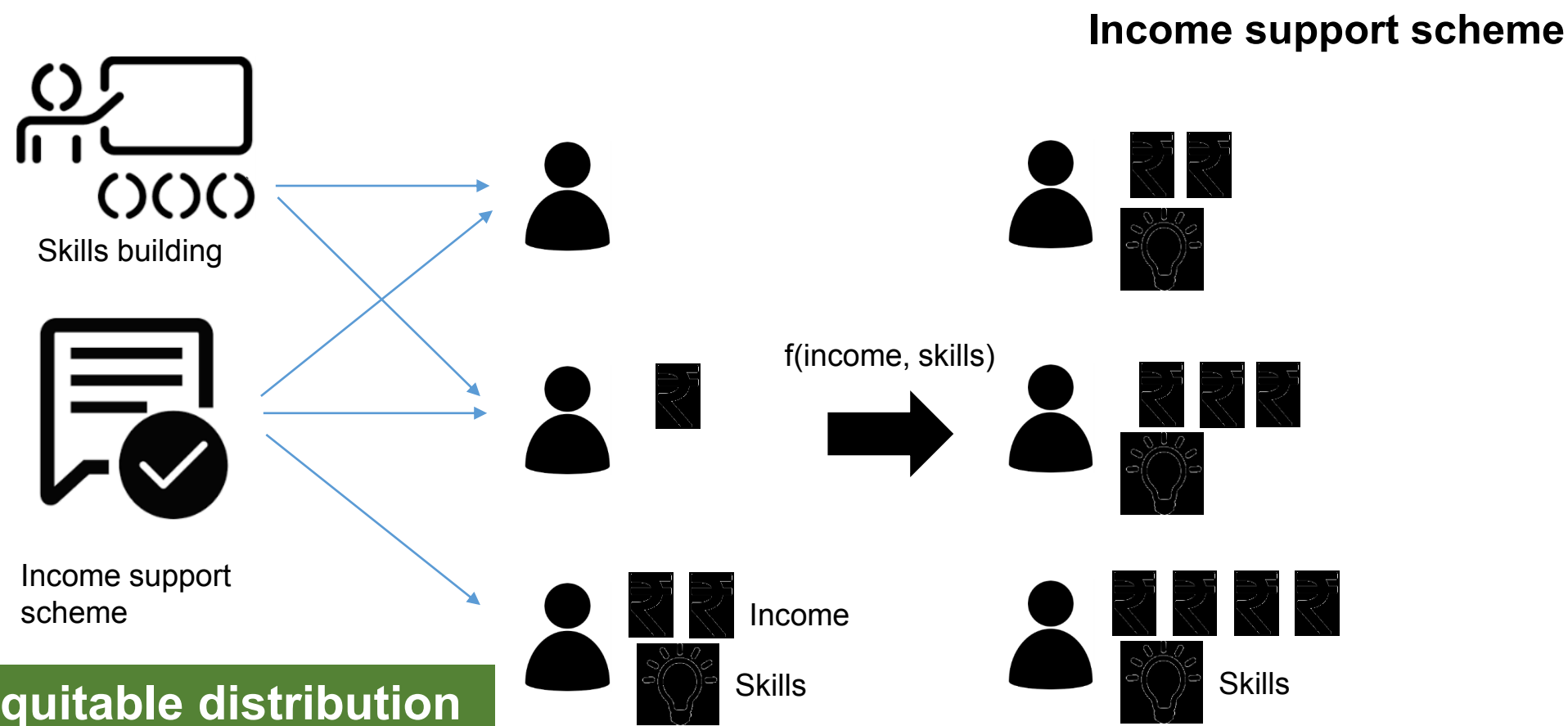
2. Presence of regulatory feedback loops can indicate a justified allocation of power among the participants

Regulated environment for communication

# A set of core values? Empowering Vs disempowering systems



# A set of core values? Empowering Vs disempowering systems



3. Ensure an equitable distribution of resources that influence different forms of power

# A set of core values? Power-based equality to build empowering systems

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1. More connected graph of decision-dependent edges to avoid the concentration of power
2. Regulatory feedback loops to keep a check on power
3. Ensure equitable distribution of resources that influence different forms of power

These principles can avoid many common patterns that lead to problems:

- Inclination of the state to build legibility enhancing systems for control
- Myth that markets are self-correcting and do not require any regulation
- Myth that concentrated power will not be misused to reinforce itself

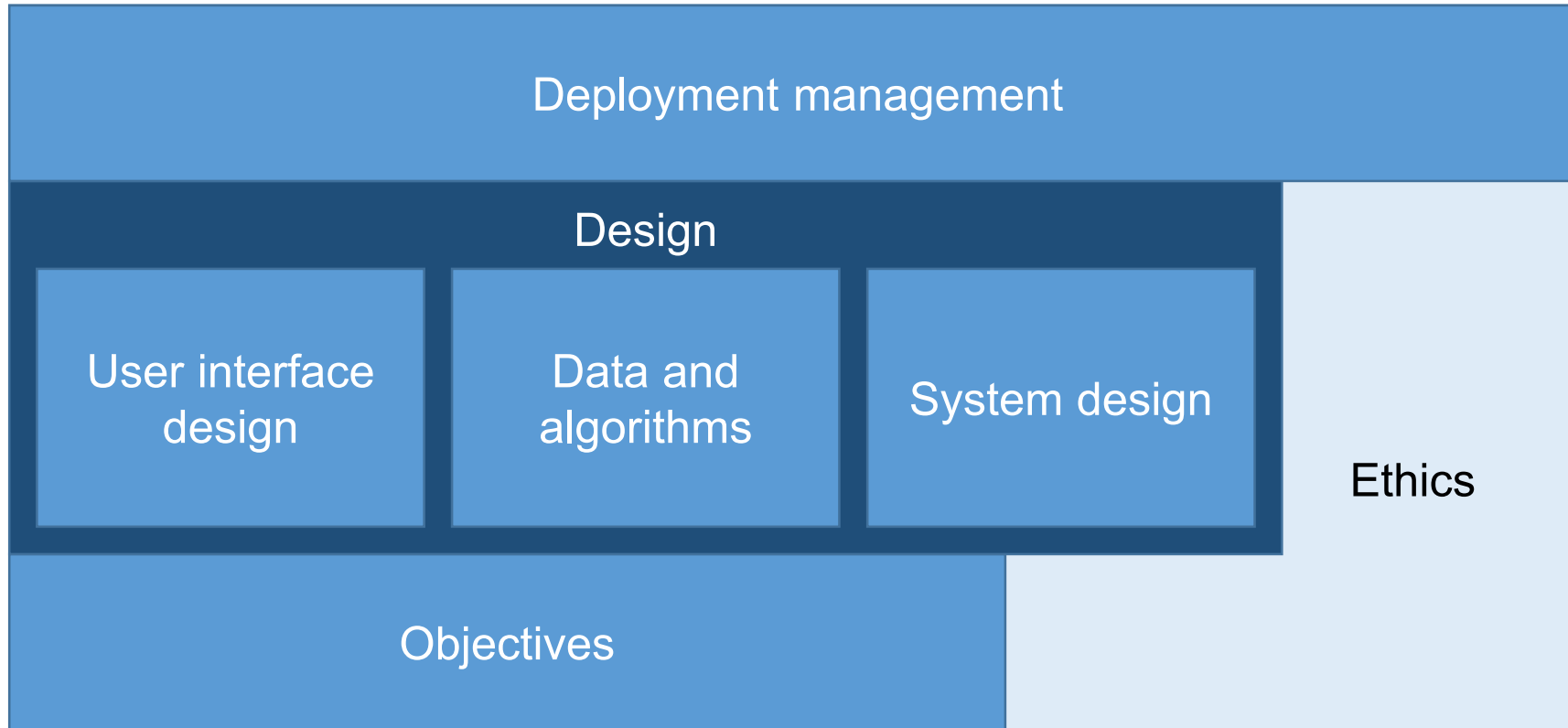
# Operationalizing an ethics based approach for ICT projects

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- Several methods for shaping technology design and outcomes through user consultations
  - Discover user preferences: User centered design
  - Design together with the users: Participatory design
  - Manage together with the users: Action research
- However, in today's platform-based era of rapid scaling, both by companies and governments, such user consultative processes are rare
- More onus rests on the technology providers to ensure responsible outcomes

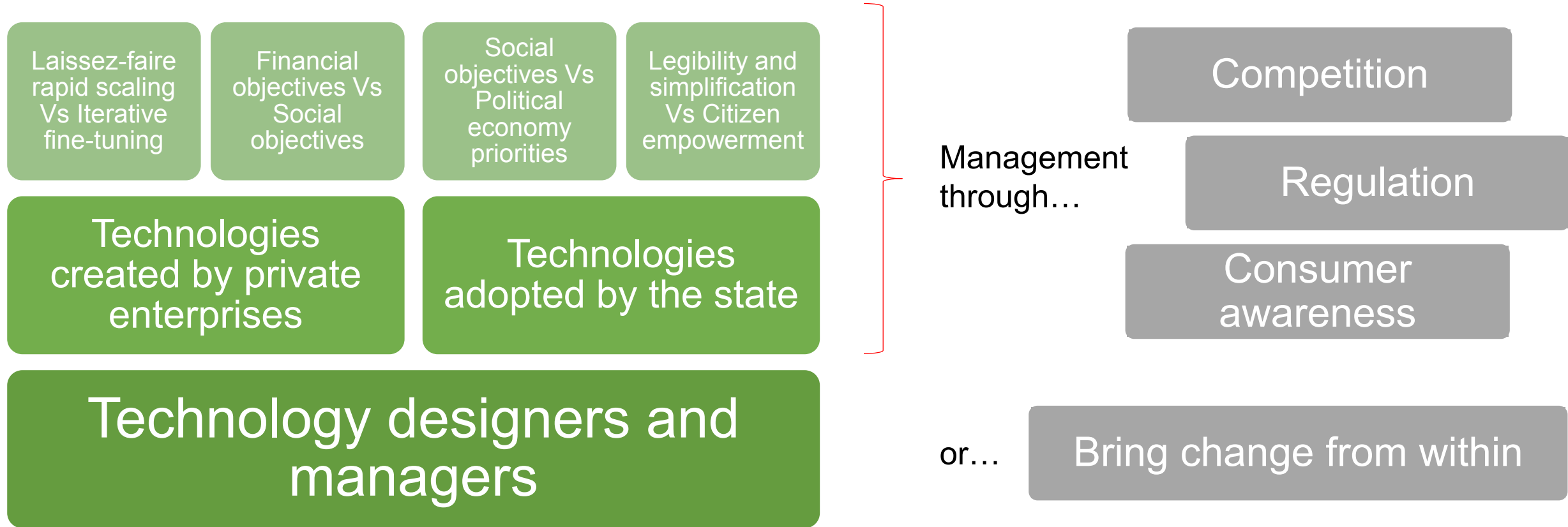
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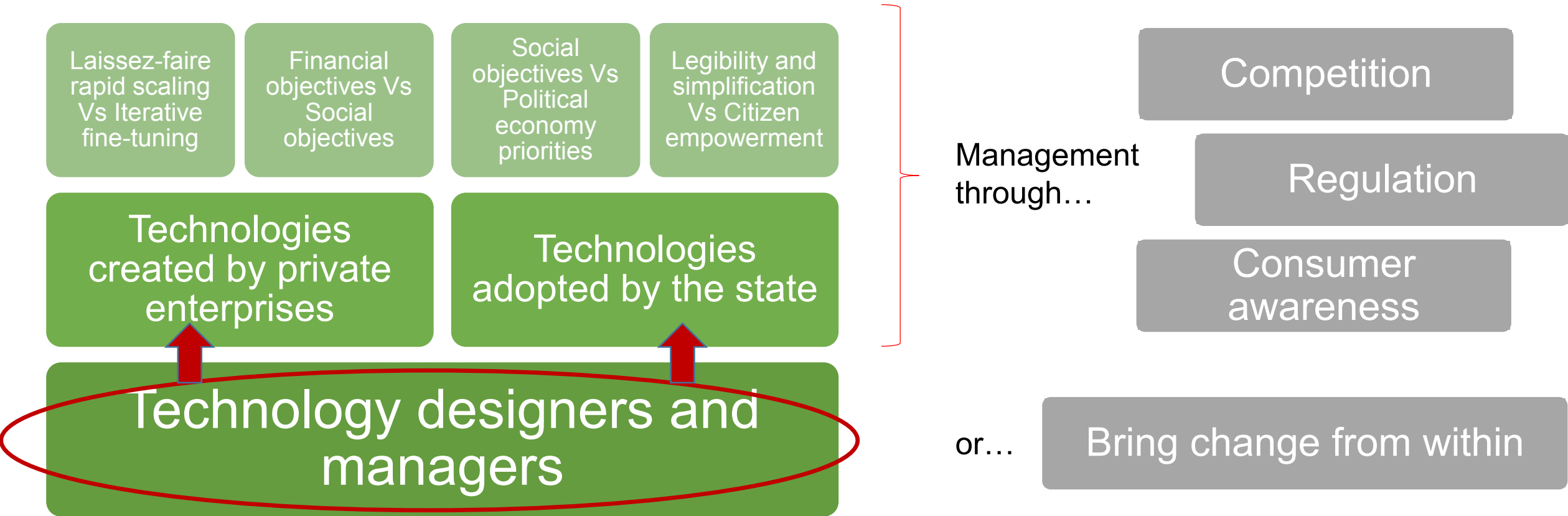


**How can we ensure that companies or governments building and managing these technologies, define and adhere to a consistent set of ethical principles?**

# How can we ensure that technologists pay attention to these layers?

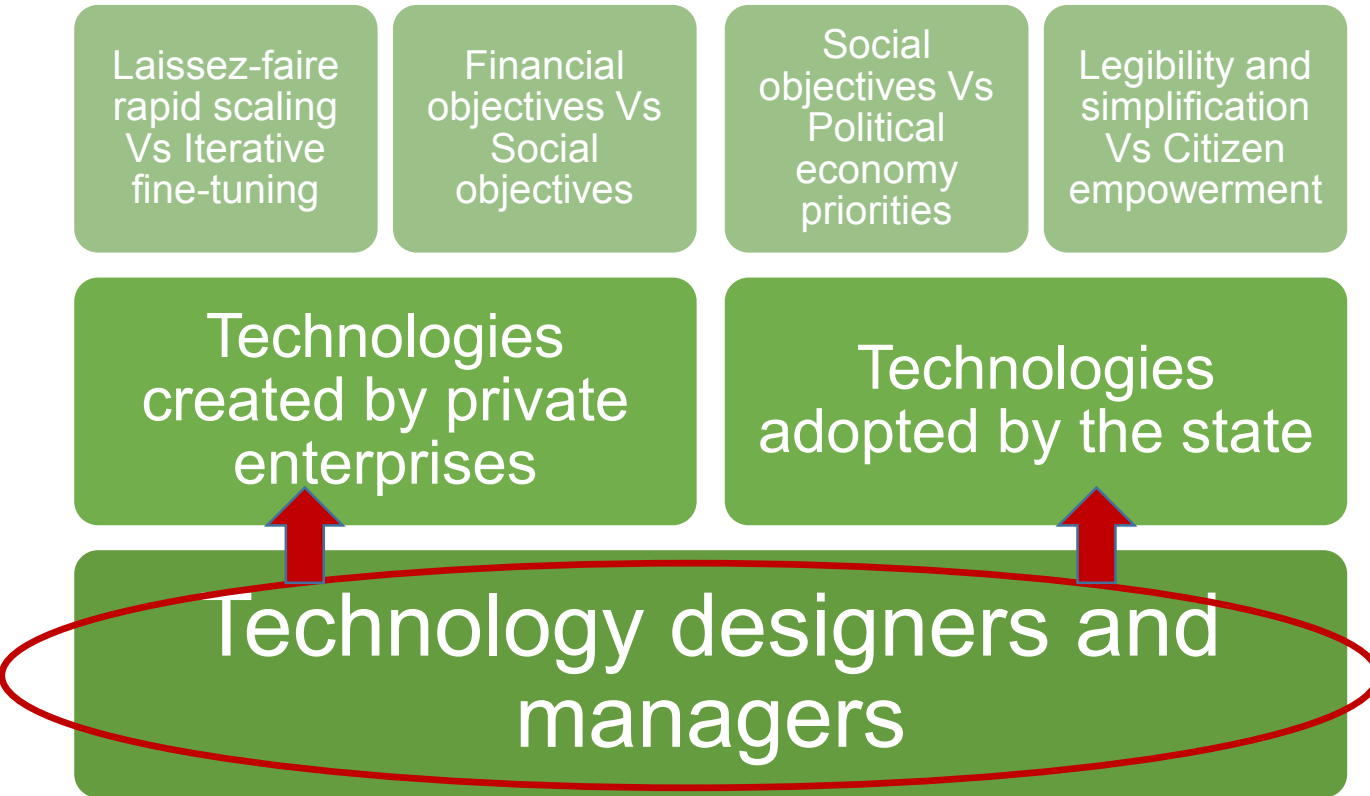


# How can we ensure that technologists pay attention to these layers?



Can technology designers and managers ensure that their labour leads to responsible outcomes? That their output reduces inequities by helping the poor and marginalized?

# Reasons for inconsistencies in the ethical systems of technologists



- Inadequate sharing of insights across cross-functional teams → differences in user familiarity, empathy, priorities
- Clarity in the organizational mandate, deliberate ambiguity or selective propaganda with workplace segregation
- Power relationships within and across teams
- Political ideology of different team members. Technologists Vs Users. White-collar Vs blue-collar workers

Can technology designers and managers ensure that their labour leads to responsible outcomes? That their output reduces inequities by helping the poor and marginalized?

# Let's think through a scenario

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How many of you agree with economic policies like GST and a push for cashless?

How many of you agree with the Modi govt's methods to push these policies?

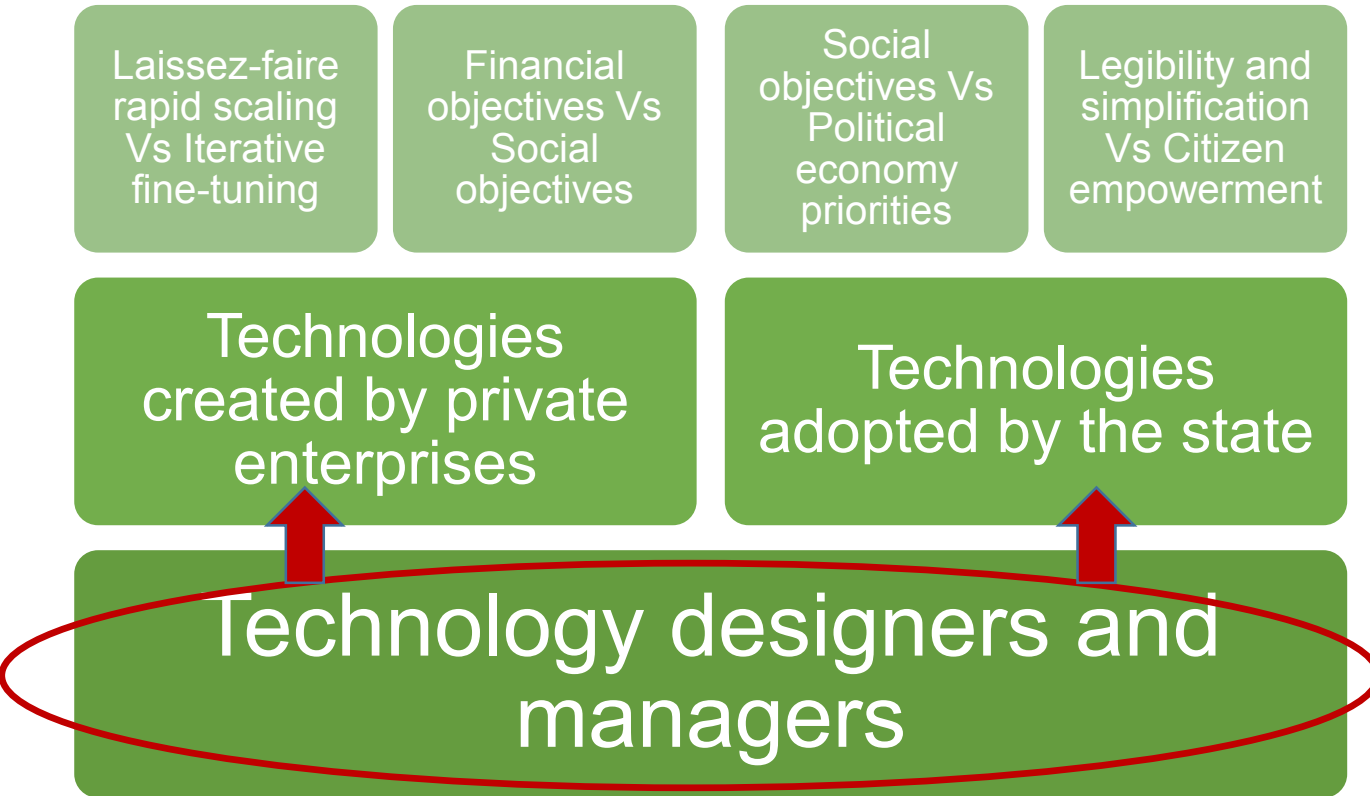
If you were running a mobile money company and complaints of fraud were rising...

- Do nothing, let the users figure it out by themselves
- Use more technology and better design to contain fraud
- Commission tutorials and workshops for your users, evaluate the users on their technology ability
- Close the company and start a policy advocacy organization for responsible digitization

Demonetization happens...

- Jump at the opportunity and push users to move to using your mobile money products
- Do nothing
- Build systems to help users deal with the crisis, eg. alerts for when your nearby ATMs have money
- Close the company and start a policy advocacy organization for responsible politics

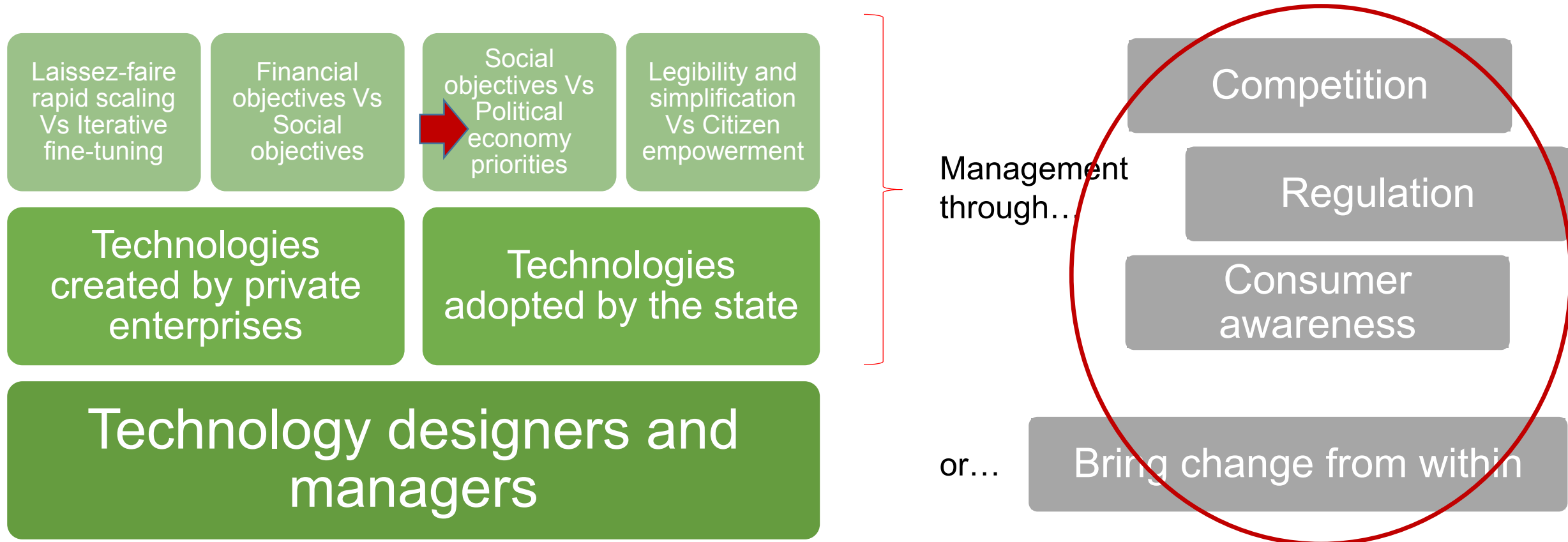
# Mechanisms to bring consistency



- Courses on the ethics of building information systems
- Co-determination in companies through worker representatives
- Lucas Plan, UK, 1976
- Bridge the gap between designers and users, to be able to manage the socio-technological interface

Can technology designers and managers ensure that their labour leads to responsible outcomes? That their output reduces inequities by helping the poor and marginalized?

# But will it be enough to counter the “system”?



# Political economy behind policy making

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What can the media coverage of different policies tell us about the political economy around policy making?

Aadhaar

Digital India

Cashless economy

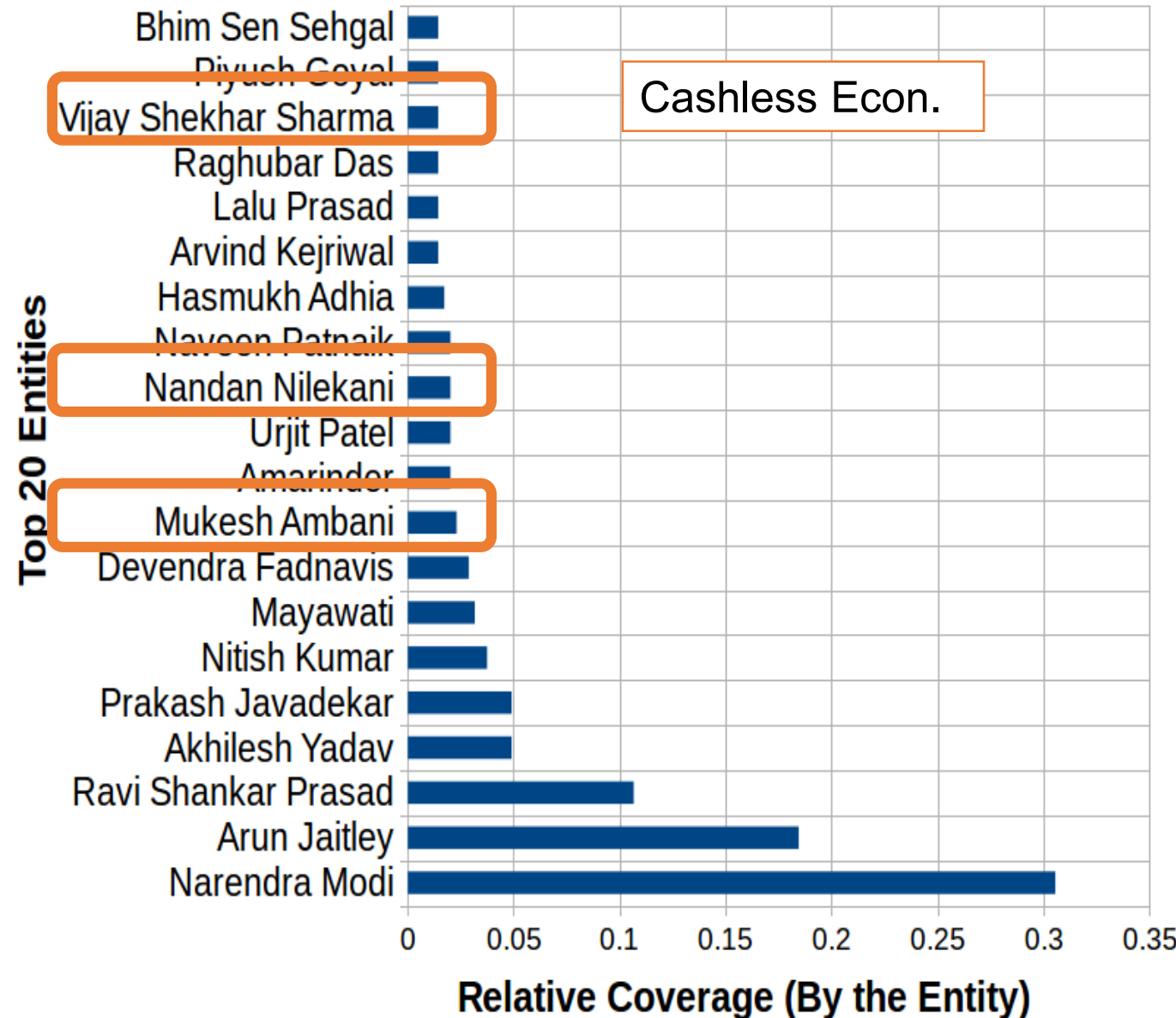
E-Governance

# Who is the most vocal, most featured in the mass media?

## Cashless Economy

- Corporate engaged people:  
Mukesh Ambani, Nandan  
Nilekani, Vijay Shekhar  
Sharma

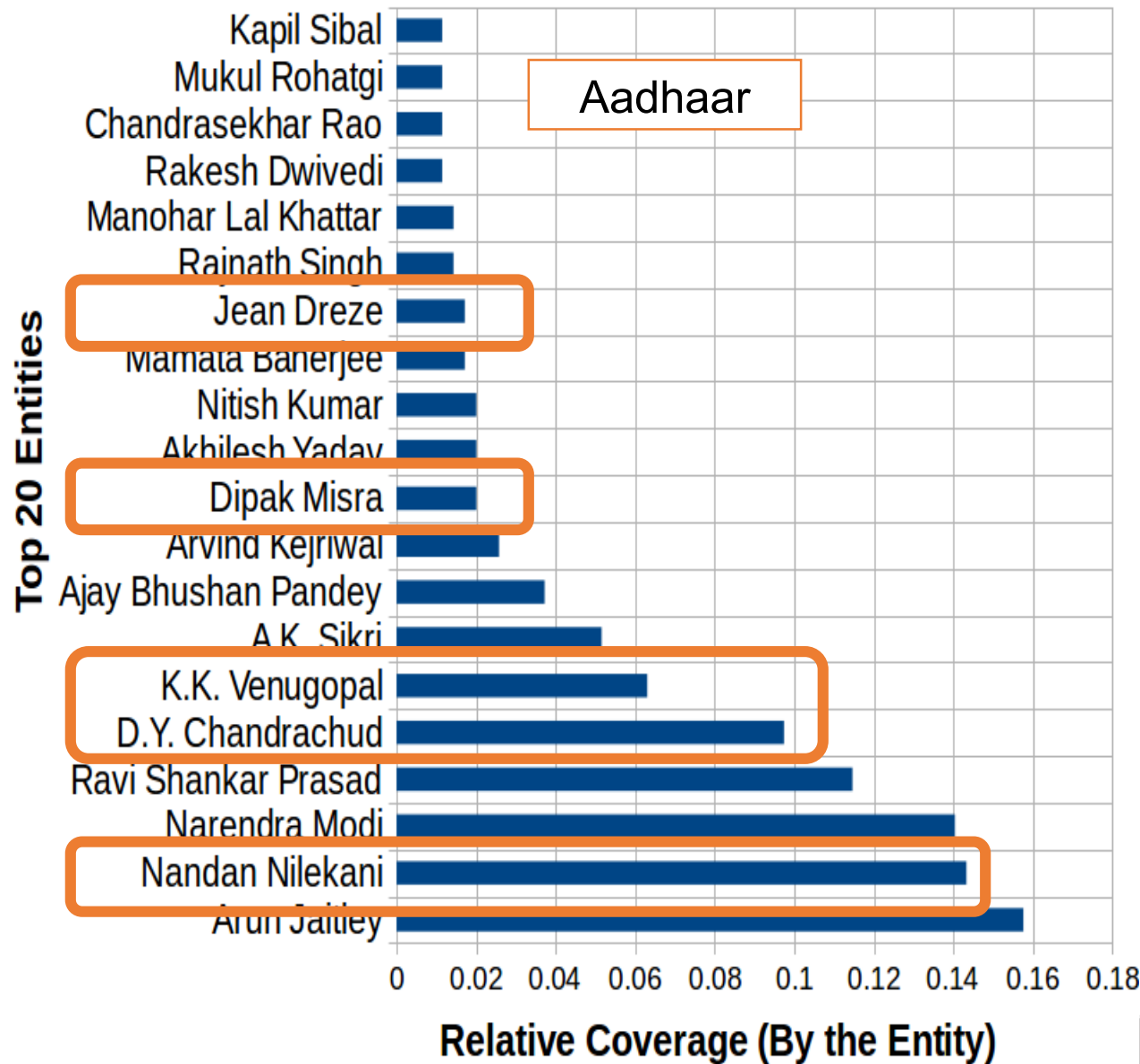
paytm



# Who is the most vocal, most featured in the mass media?

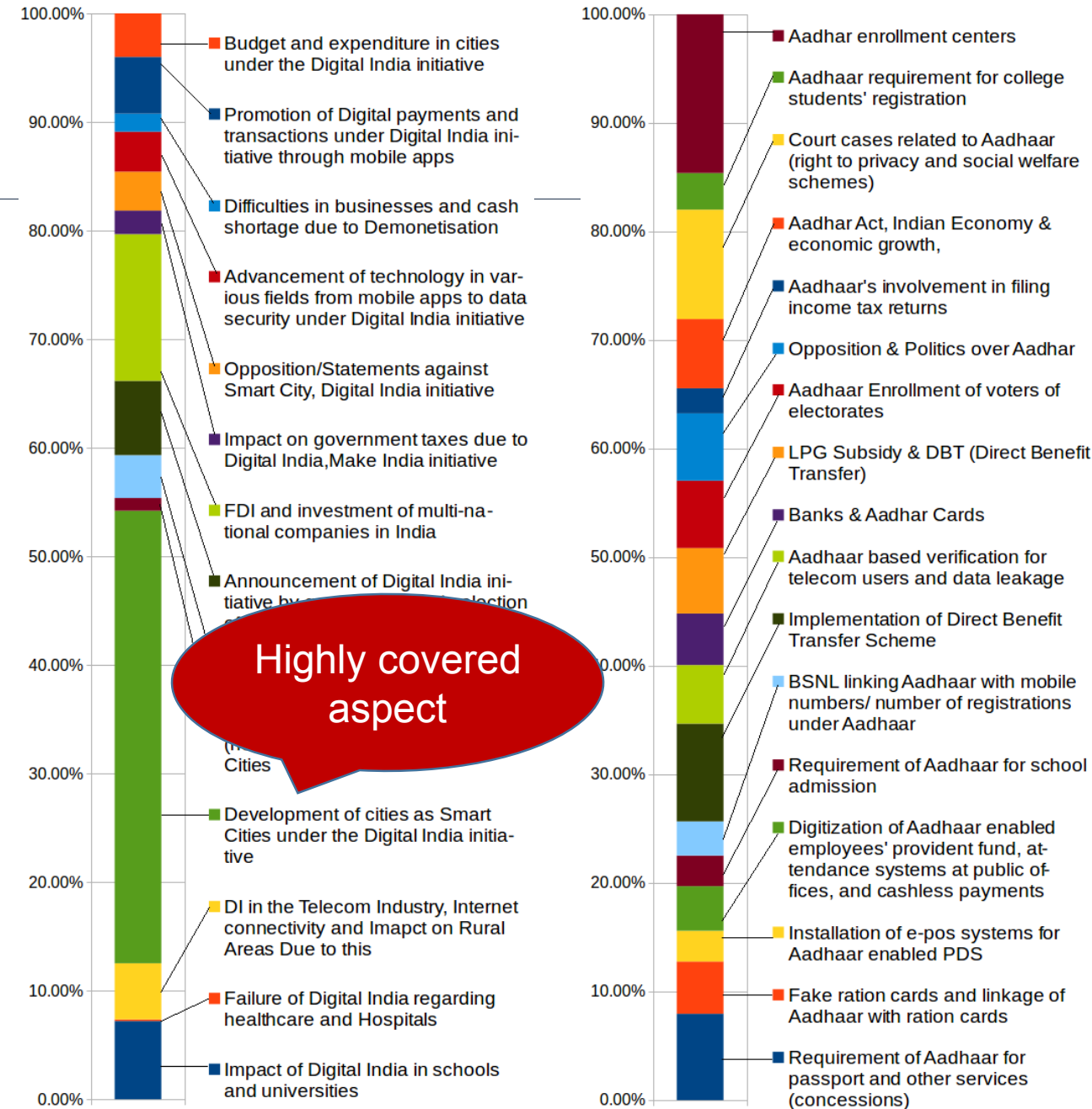
## Aadhaar

- Nandan Nilekani
- Judiciary members: K.K. Venugopal, D.Y. Chandrachud, Dipak Misra
- Academic/activist: Jean Dreze



# Which aspects are covered?

- Topmost coverage is given to **aspects related to the middle class, or state's rationale to encourage the schemes**
  - **Development of smart cities under Digital India initiative (42%)**, FDI of multinationals in India
  - **Aadhaar enrollment centers (17%)**, Court cases on privacy issues, LPG subsidy



# Which aspects are covered?

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  - **Development of smart cities under Digital India initiative (42%)**, FDI of multinationals in India
  - **Aadhaar enrollment centers (17%)**, Court cases on privacy issues, LPG subsidy
- Less coverage is given to **failures in the implementation and problems of the poor**:
  - **Absence of physical infrastructure in smart cities (1%)**, Digitization of land records
  - **E-pos centers and problems with PDS (3%)**



Digital India

Aadhaar

# What do the power elite say?

*"... its wider application in areas such as passport issuance, online identity*

*verification*

*governments*

*the country*

*-- Narendra Modi*

*"When*

*of 10*

*time.*

*do it*

*to acquire a million customers a day, which is unheard of in the industry"*

*-- Mukesh Ambani*

*"The Narendra Modi government must guard*

**VEIL OF ELECTORAL POLITICS AND ASPIRATIONAL TECHNOLOGY**

**MASS MEDIA IS A PARTY TO PUTTING UP THIS VEIL**

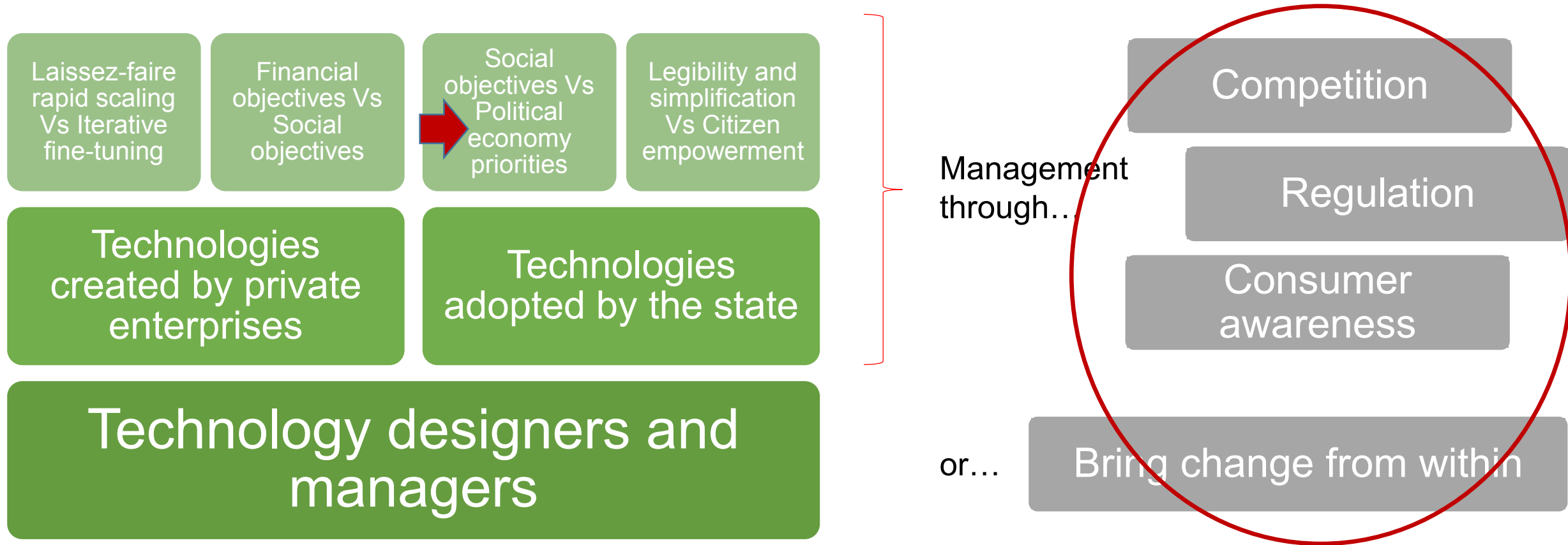
**WHILE STATE AND CAPITAL CLOSELY COOPERATE (MANY REASONS)**

**FOCUS ON RAPID SCALING OF TECHNOLOGY**

**PAYING INADEQUATE ATTENTION TO SOCIAL RESPONSIBILITY**

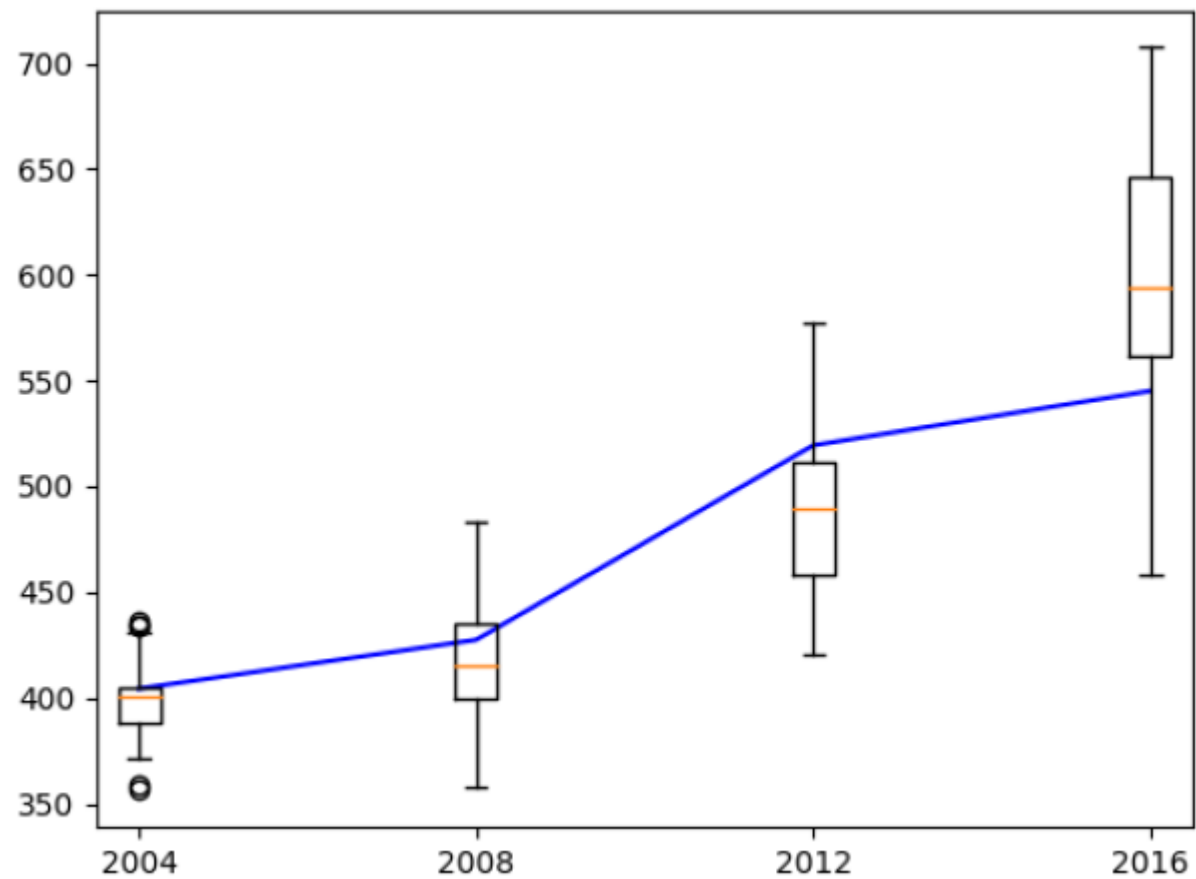
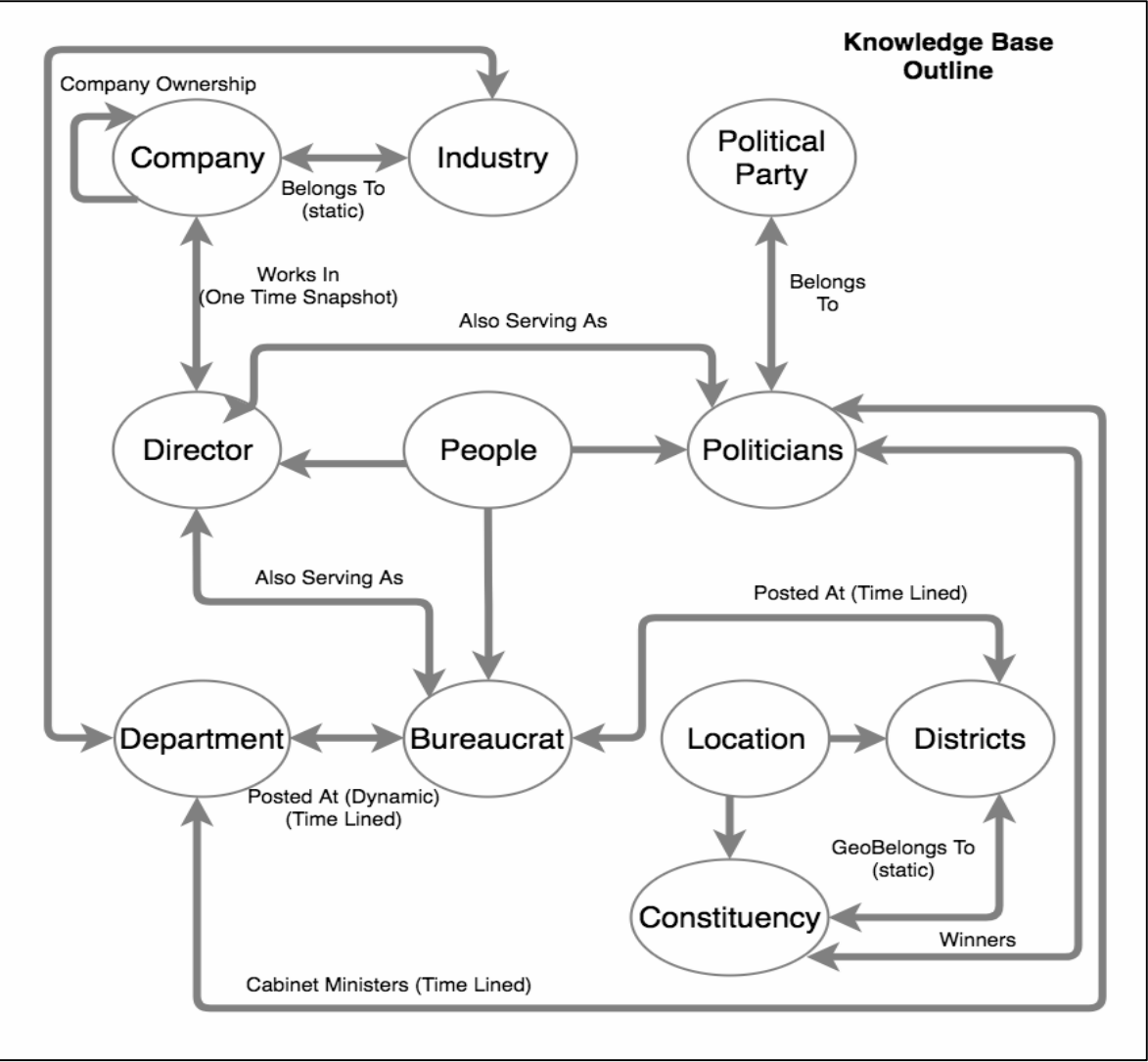
*-- Narendra Modi*

# But will it be enough to counter the “system”?



Can we build information systems that can bring transparency in the regulatory and democratic process itself, and demand accountability?

# Are there interlocks between the corporate and government actors?



Index of interlock

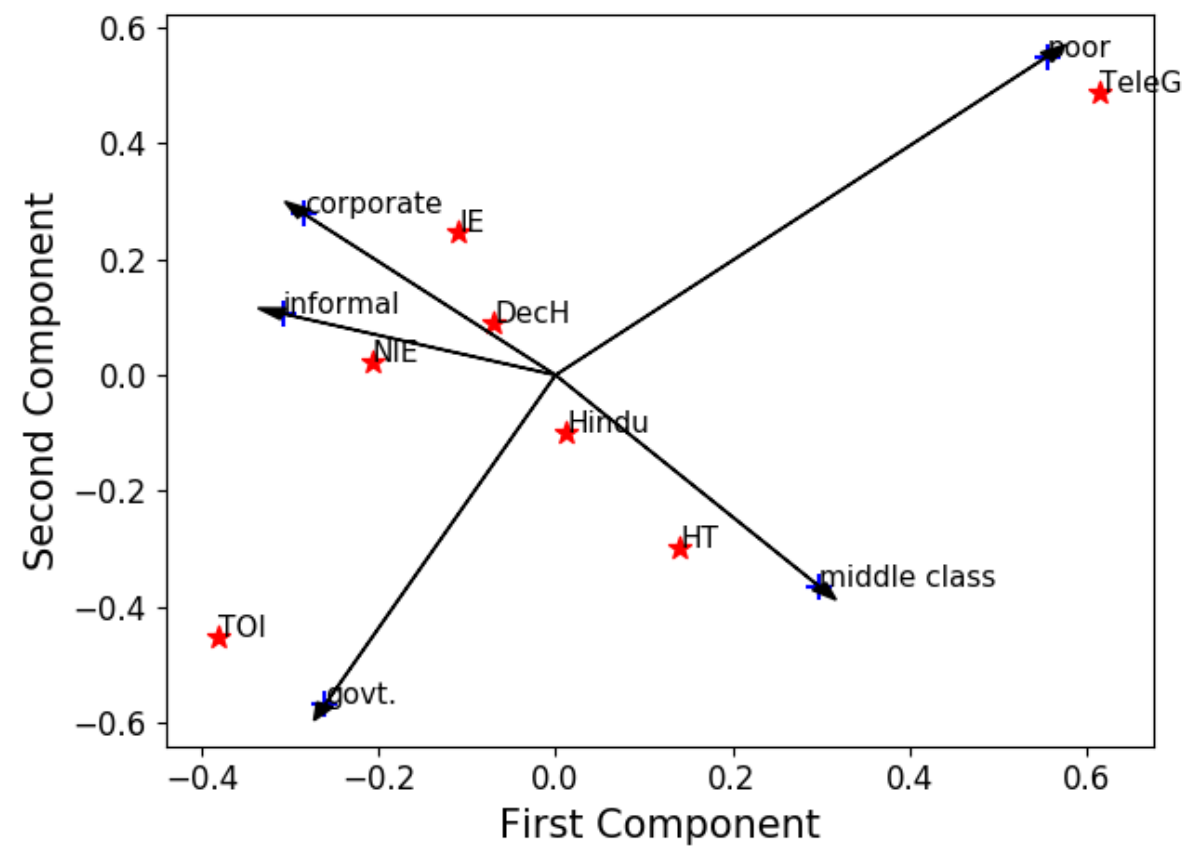
# Is the mass media helping build an informed public opinion?

Demonetization

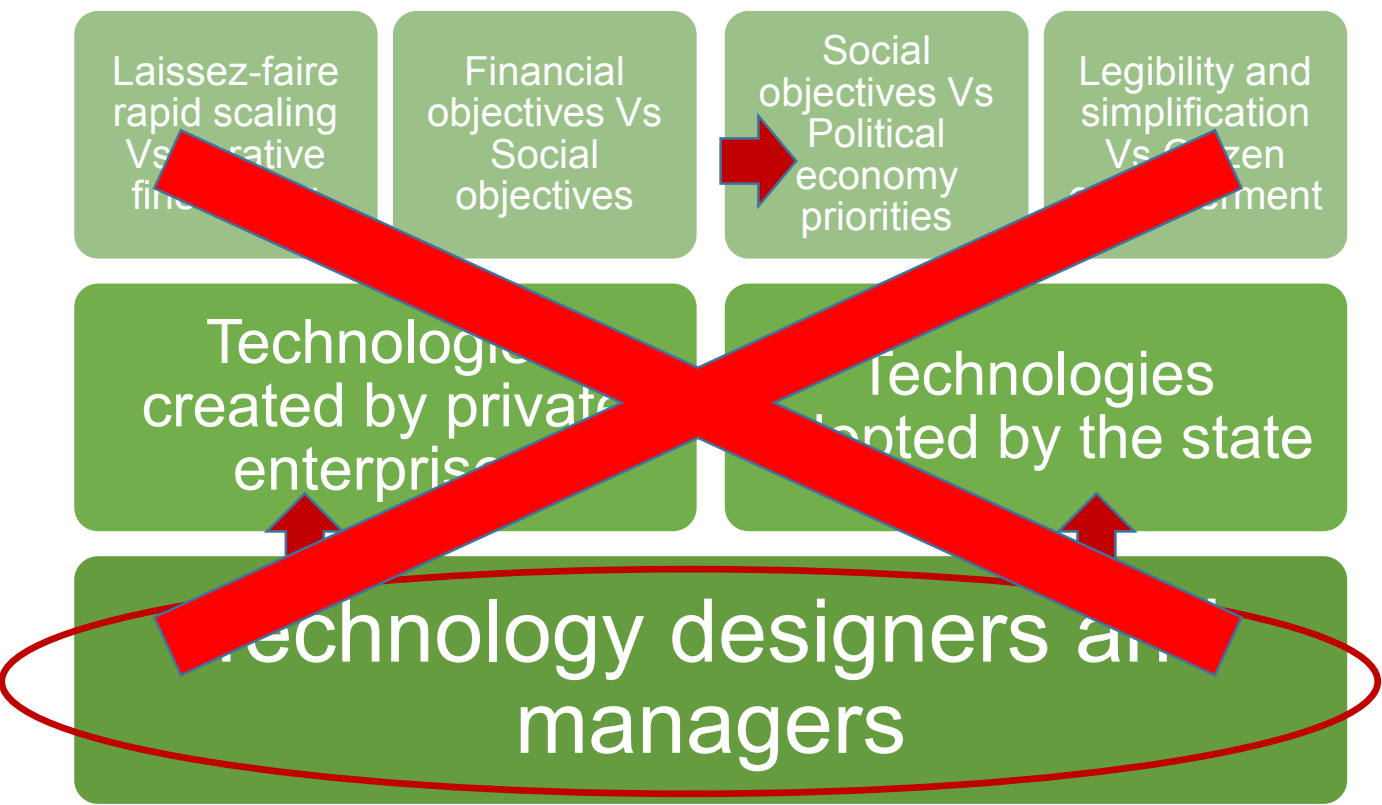
GST

Aadhaar

Farmer protests



# Are there any alternate models of technology and development?



- Creation: Opensource development
- Sustainability processes: Appropriate technology
- Ownership: Platform cooperatives, bottom-up collectives
- Competition with other models: Unanswered

Initial financing? Training? Growth?

Are we destined to play a game of cat and mouse?!

## In summary...

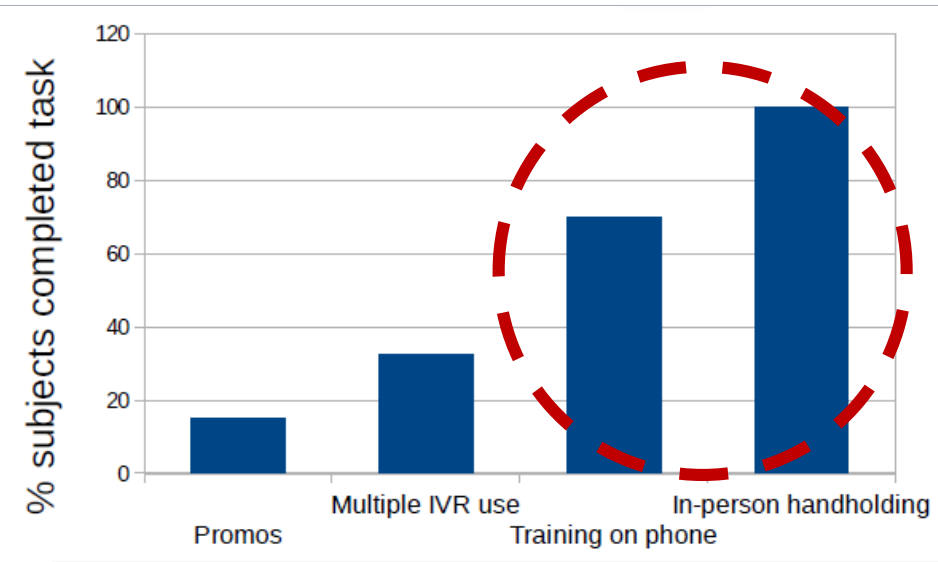
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- Ethics forms a crucial foundation for thinking about ICT projects
- The socio-technological interface layer needs carefully designed processes to manage it
- A lot is known on how to ensure that responsible outcomes arise from technology, but companies and states need to be held accountable to manage it
- One pathway is by empowering the engineers and researchers who design and manage these computer-based information systems. Courses and curriculum. Networks of white-collar workers / blue-collar workers / and users. Bring change from within
- Also need to build checks and balances in the democratic regulatory framework to bring transparency and accountability in policy formulation (for technology)

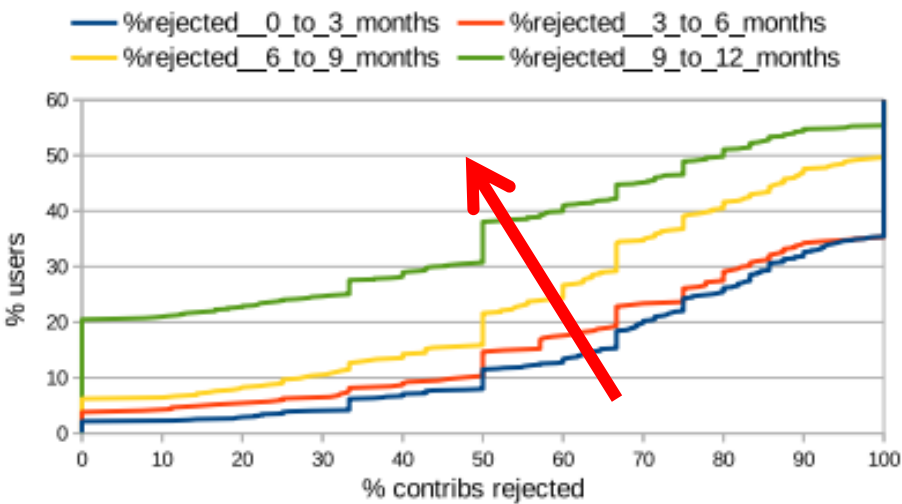
Thanks for participating!



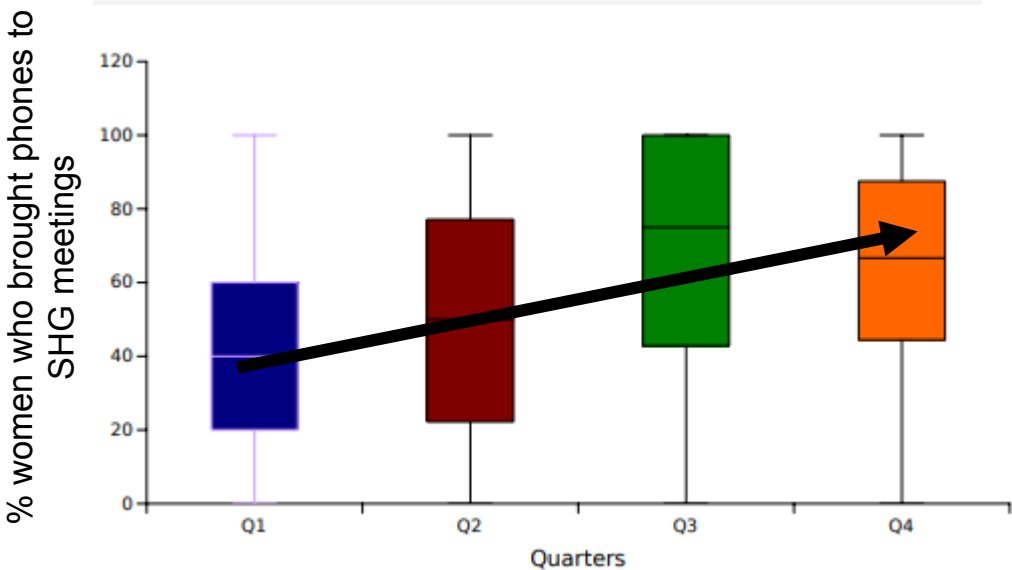
# Creating technology and service literacy



**In-person trainings most effective in helping people to successfully record a message on IVRS**  
(Koradia, et al., 2013)

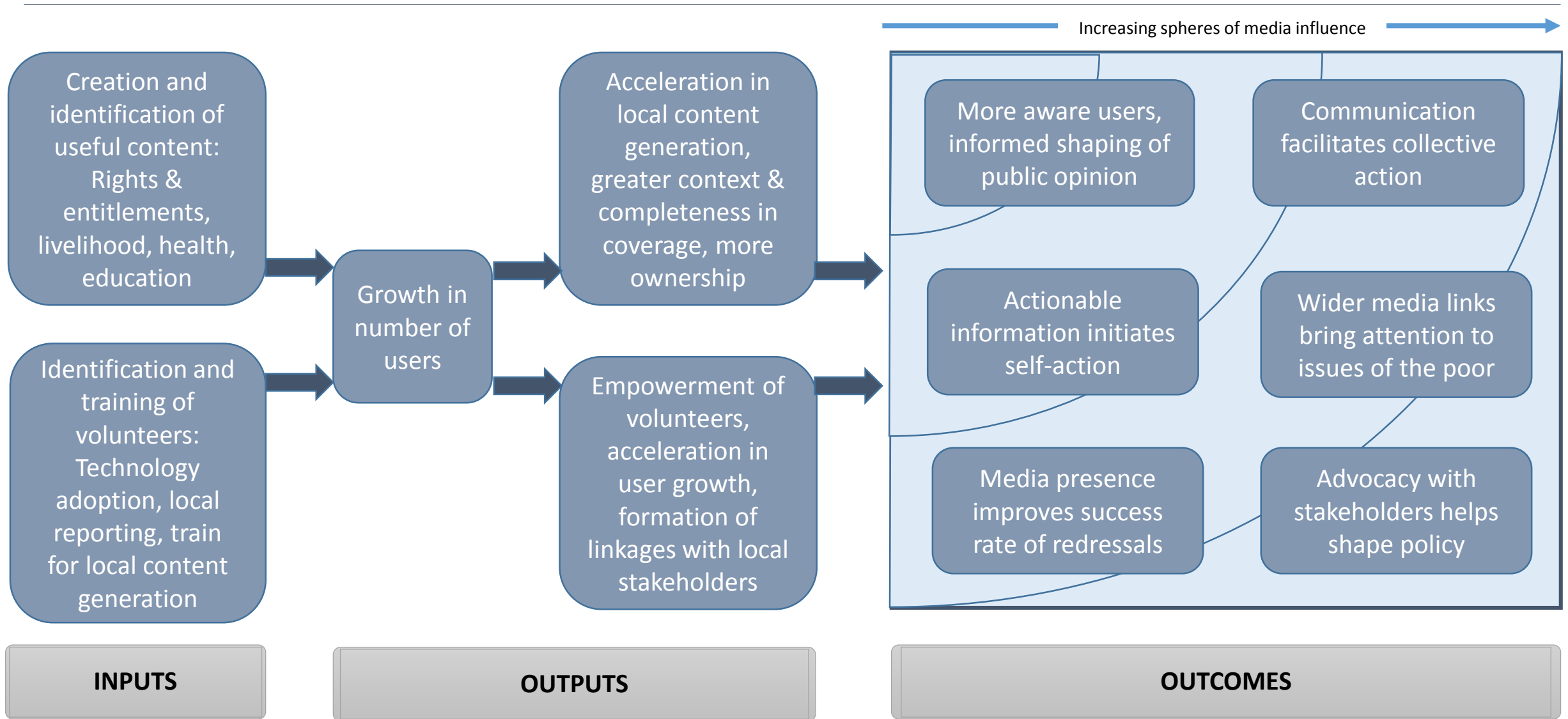


**People learned over time how to use the platform more effectively**  
(Chakraborty, et al., 2019)

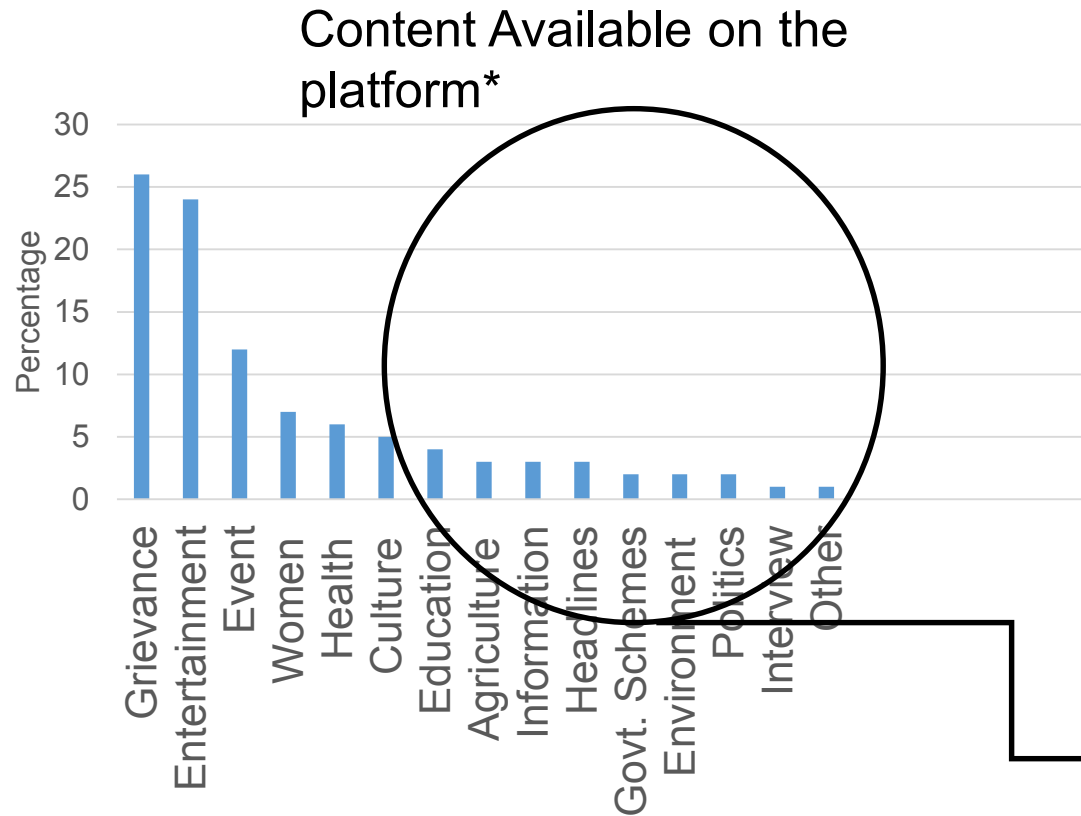


**Constant persuasion helped improve overall phone access and usage** (Chakraborty, et al., 2019)

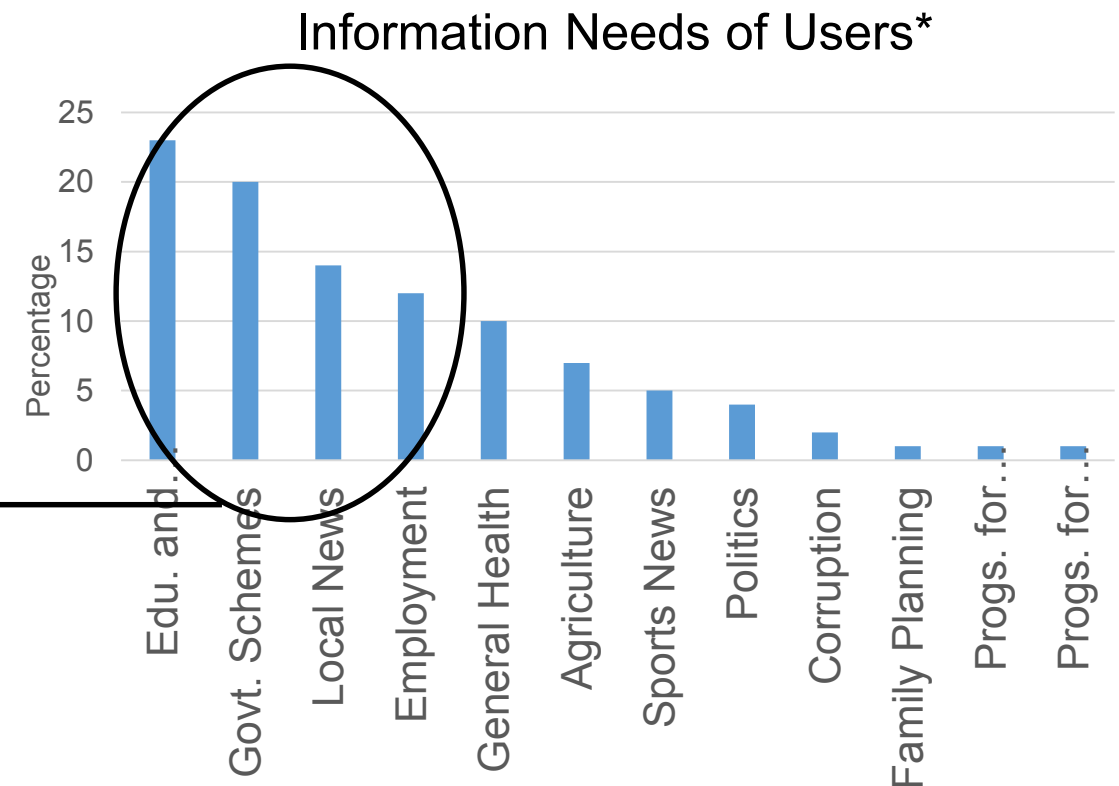
# The theory of change for how and why Mobile Vaani works



# Feedback processes



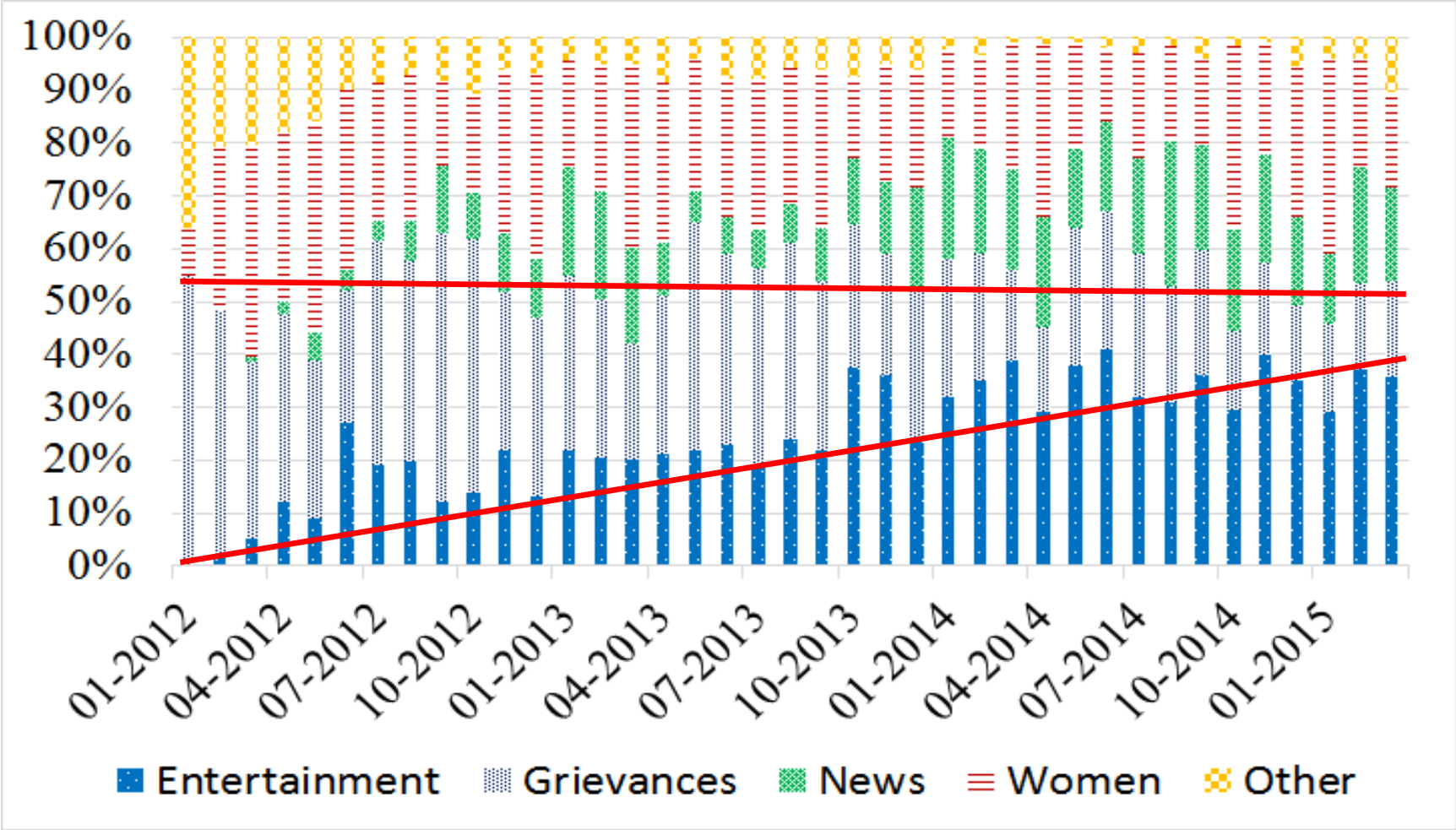
**Drastic differences observed between content available on the platform and users information needs**



**\*Graphs based on stats and surveys from first year of MV operations**

# Feedback processes

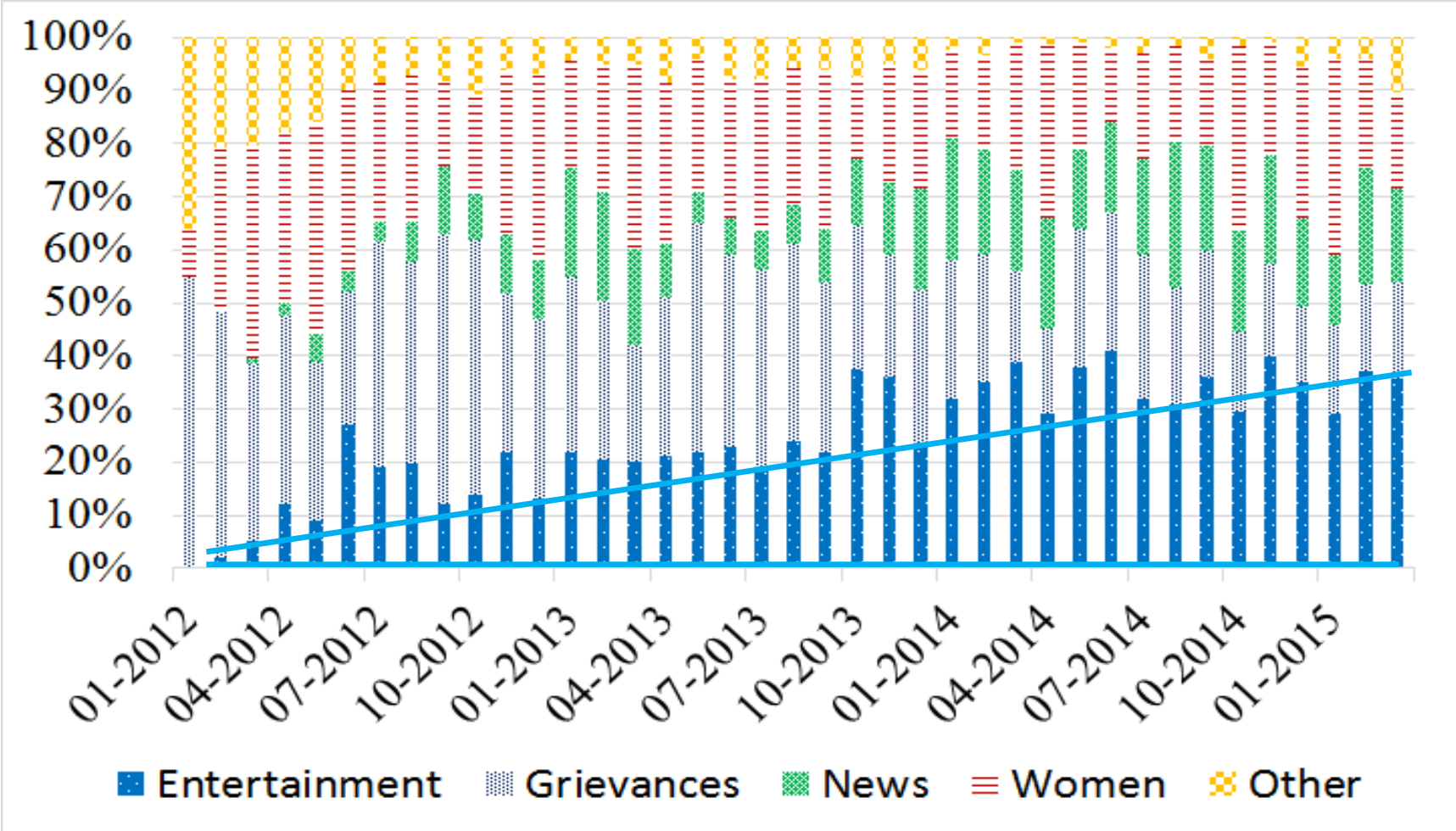
Reduction in  
Grievance  
Content



Content production patterns on MV

# Feedback processes

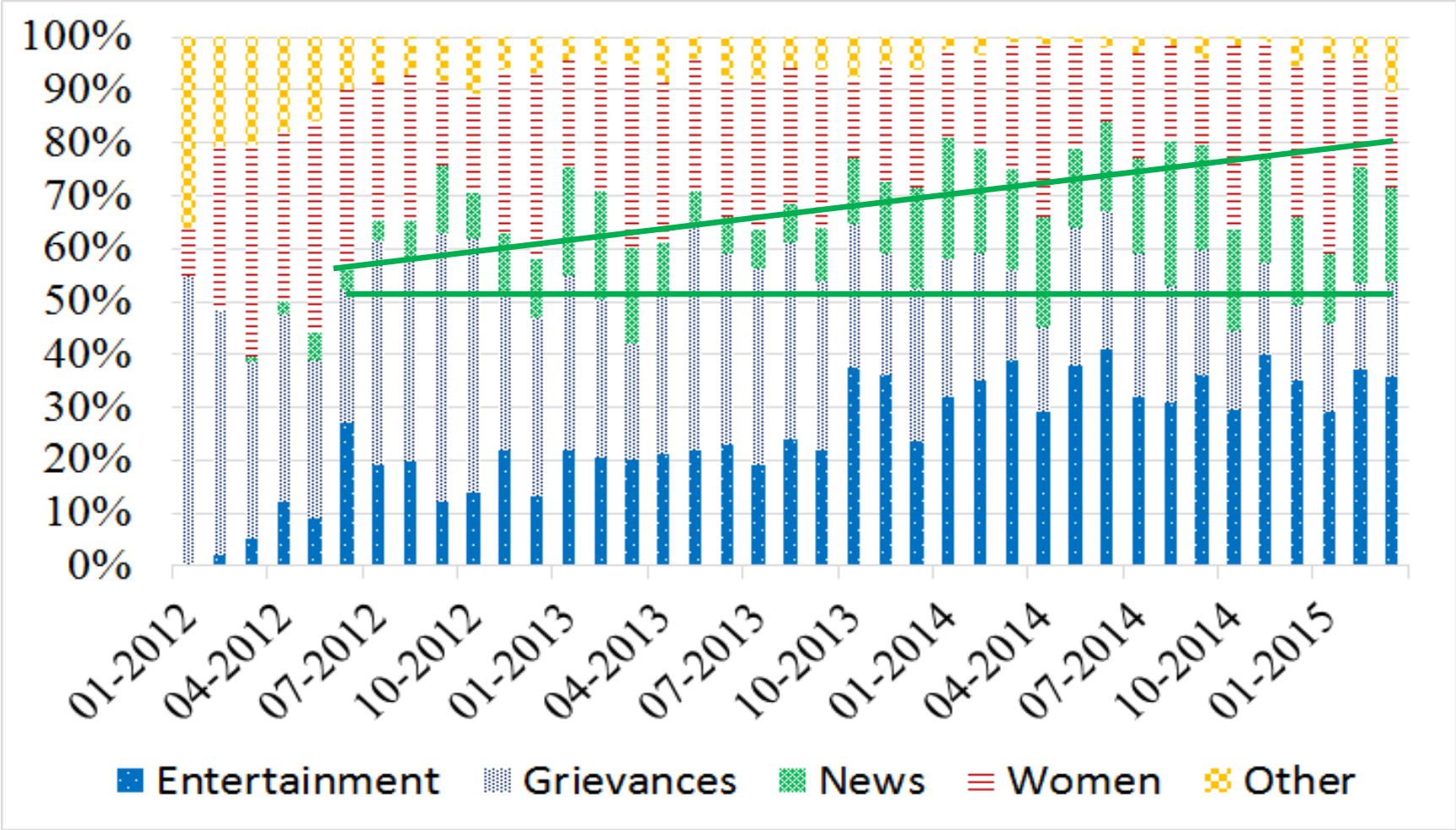
## SYSTEM DESIGN MEANT TO FACILITATE DISCOVERY OF RELEVANT USE-CASES



Increase in Entertainment Content

Content production patterns on MV

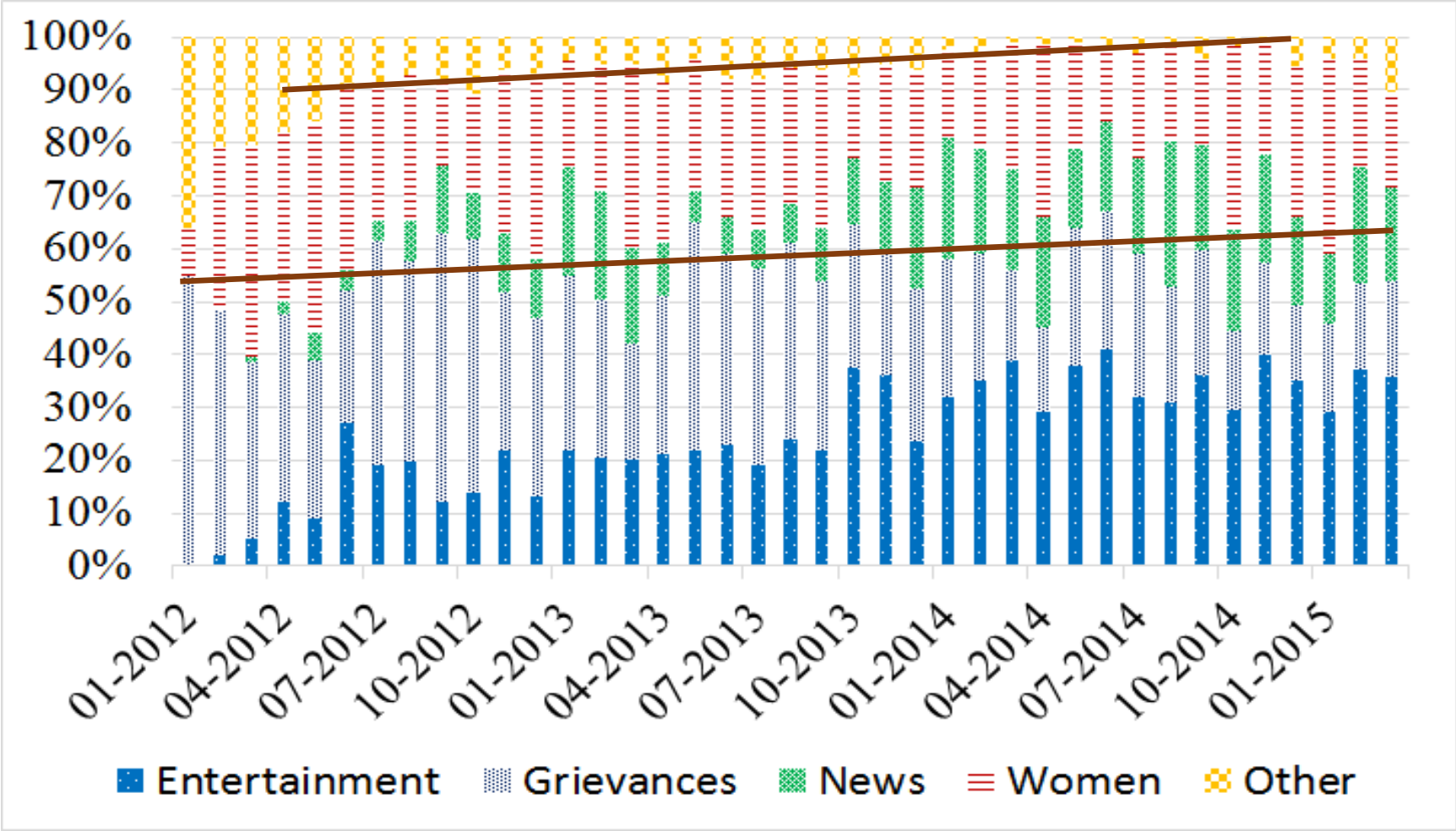
# Feedback processes



Increase in News related Content

Content production patterns on MV

# Feedback processes



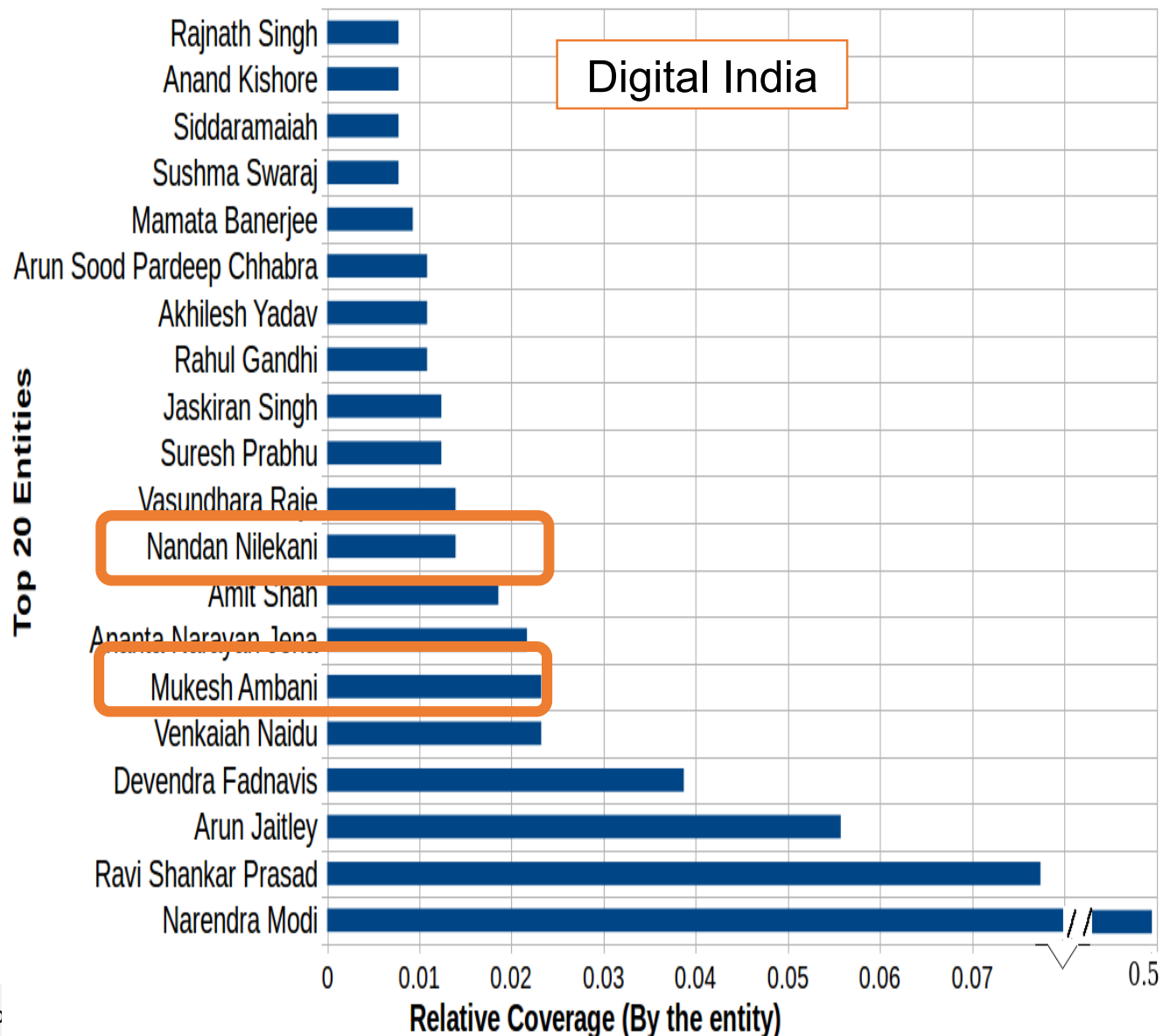
Consistency in Women and health related Content

Content production patterns on MV

# Who is the most vocal, most featured in the mass media?

## Digital India

- Presence of corporate engaged people like Mukesh Ambani, Nandan Nilekani



# Processes to manage the socio-technological interface of Mobile Vaani

