

# Smart Cities

Why bother?

Professor KJ Fernandes  
Professor of Operations Management

1. Does supply chain concentration improve sustainability performance: The role of operational slack and information transparency. *International Journal of Operations and Production Management* (accepted in press). ABS 4\*
2. Dual networks: How does knowledge network embeddedness affect firms' supply chain learning? *International Journal of Operations and Production Management* (accepted in press), 43 (8), 1277-1303. ABS 4\*
3. The impact of CSR decoupling on financial performance: The role of customer structure and operational slack. *International Journal of Operations and Production Management* (accepted in press). ABS 4\*
4. Contextualising the role of external partnerships to innovate the core and enabling processes of an organisation: A resource and knowledge-based view. *Journal of Business Research* 144: 146-162. ABS 3\*
5. How to overcome path dependency through resource reconfiguration. *Journal of Business Research* 145: 78-91. ABS 3\*
6. From value chains to technological platforms: The effects of crowdfunding in the digital game industry. *Journal of Business Research* 78: 341-352. ABS 3\*



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 Durham University  citiesabc indexdna

# Blueprint for Smart Cities

A Social Contract  
2022

In Partnership with

 UNIVERSITY OF SURREY  BIG INNOVATION CENTRE  WSCF  
World Smart Cities Forum

Event Organised by

 Durham University  citiesabc indexdna

 ztudium  techabc  openbusiness council

#B4SC  
#citiesabcindexdna  
#smartcitiesblueprint

[citiesabc.com/smartcityblueprint](http://citiesabc.com/smartcityblueprint)

# Who am I?



- Education:
  - B.Eng (Hons) – Production Engineering (WIT)
  - MSc – Industrial Engineering (MSU)
  - SM – LFM Systems Engineering (MIT)
  - PhD – Operations Management (Warwick)
- **Associate Pro Vice-Chancellor (and Professor)**
- Executive Dean, Associate Dean (Internationalisation), Head of Department of Management – Durham University Business School (Professor)
- L/SL/Professor in Operations Management at the York Management School
- EPSRC SRF/RF in Warwick University – Operations Management
- 2 years as Sub-Systems Engineer at NASA – John C. Stennis Space Centre – MS
- Non-Executive Director at the UK National Commission for UNESCO



# The “banana” world view problem



# The “banana” world view problem



Blue Java



Mysore



Red



New Guinea

# The “banana” world view problem





# The “banana” world view problem



## The “banana” world view problem

95% of Indian shampoo sales are through single use sachets.





# The “banana” world view problem



**Walmart**  15% market

25% market and growing

## The “banana” world view problem



## The “banana” world view problem





# The “banana” world view problem



# The “banana” world view problem

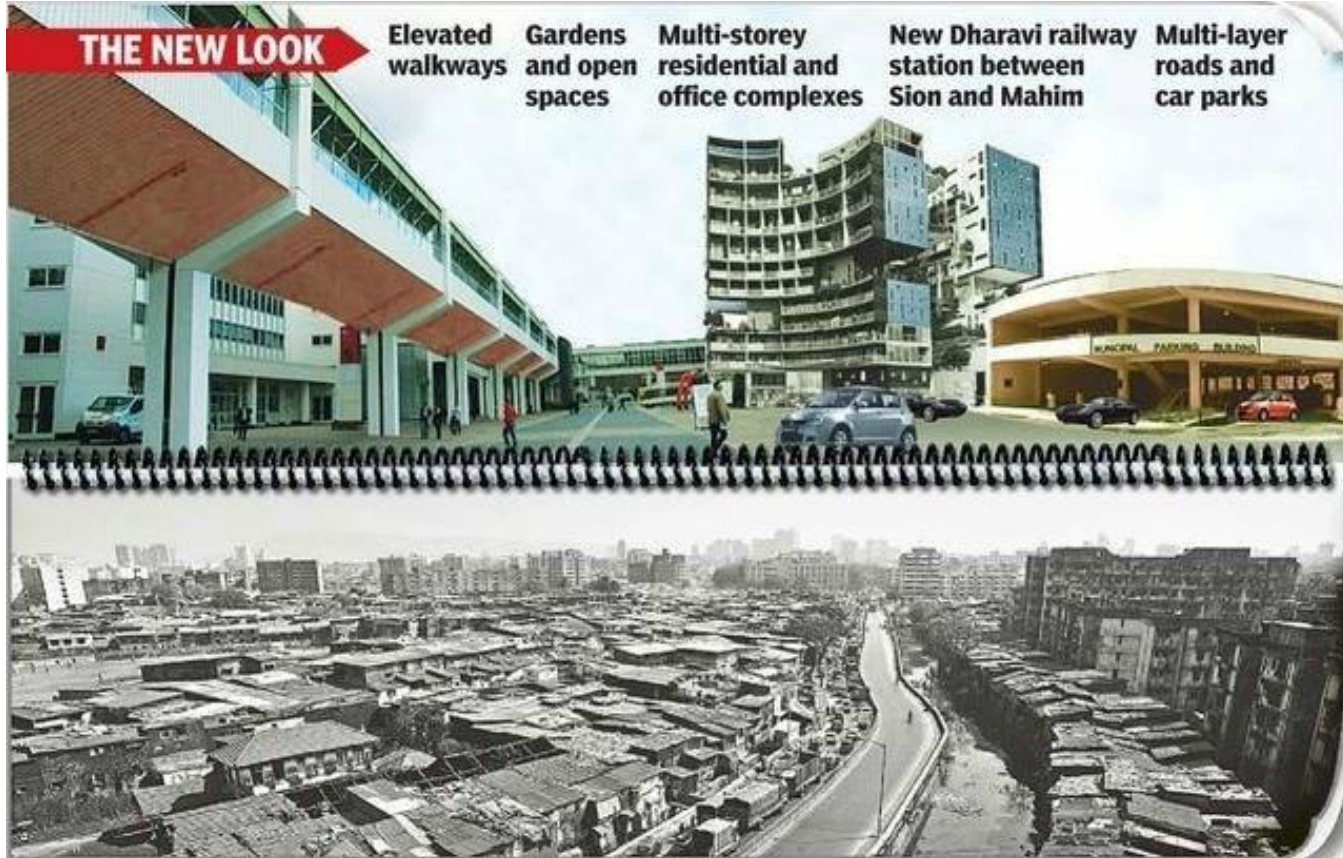




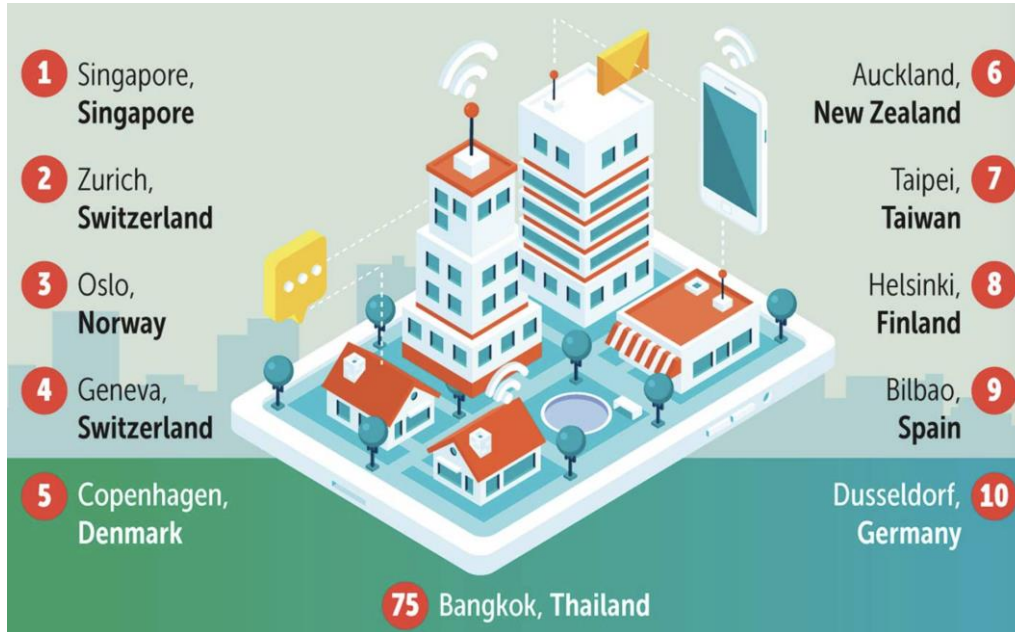
# The “banana” world view problem



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# The “banana” world view problem



\$1.5Tn – Luxury Economy

# The “banana” world view problem



\$1.5Tn – Luxury Economy...  
excludes 2/3 of the world



# The “banana” world view problem



- XX has an unemployment rate of 4.4 percent
- 7.5 percent of the population still lives below the poverty line
- 10 percent of the population in XX controls 21.2 percent of the entire nation's wealth
- 36 percent of immigrant children live in poverty in XX

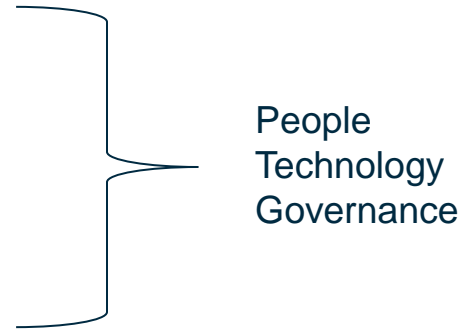
# The “banana” world view problem



- Norway has an unemployment rate of 4.4 percent
- 7.5 percent of the population still lives below the poverty line
- 10 percent of the population in Norway controls 21.2 percent of the entire nation's wealth
- 36 percent of immigrant children live in poverty in Norway



# Features of a Smart City



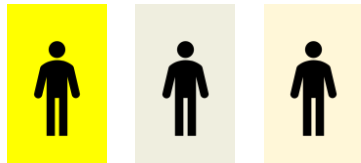
Can smart cities be created with  
ESG?





**1. Multiple Actors**

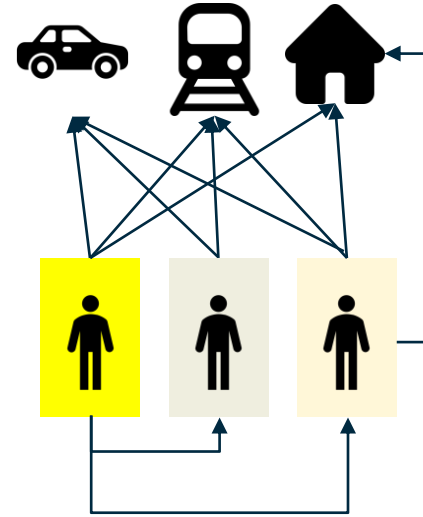
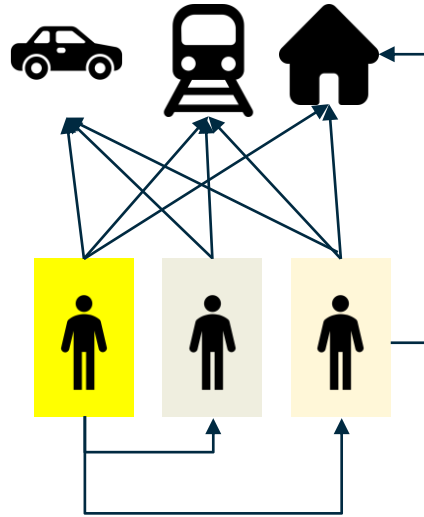




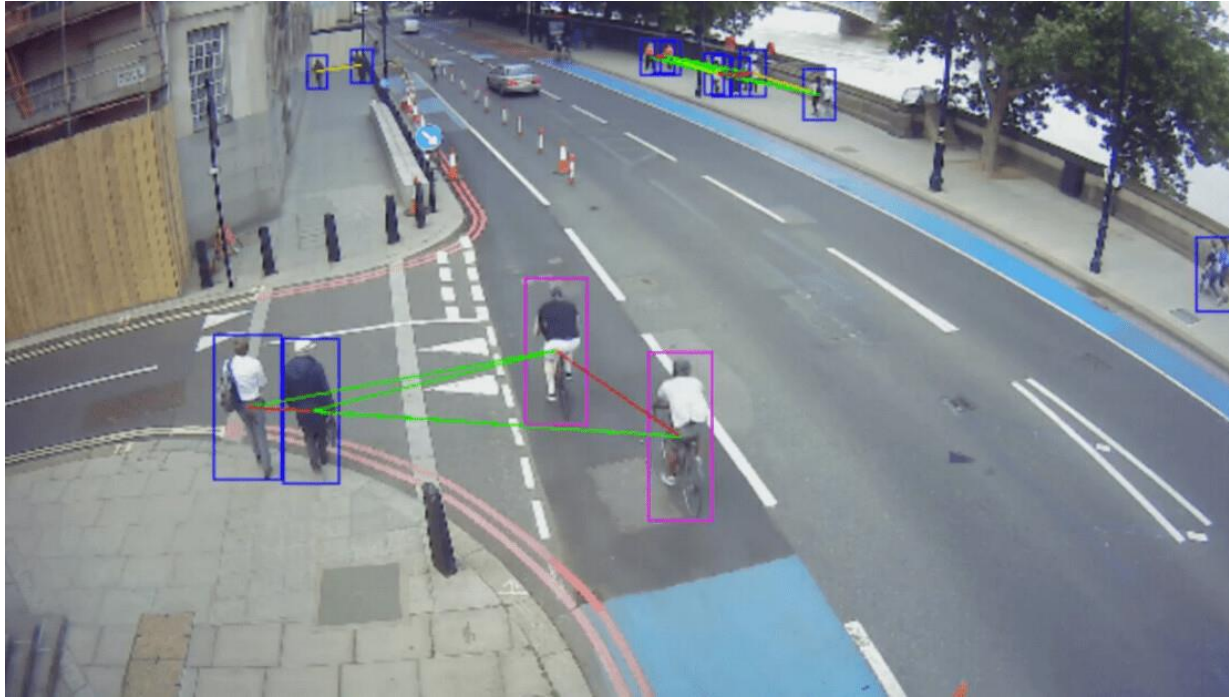
## 1. Multiple Actors



1. Multiple Actors
2. **Interact dynamically**

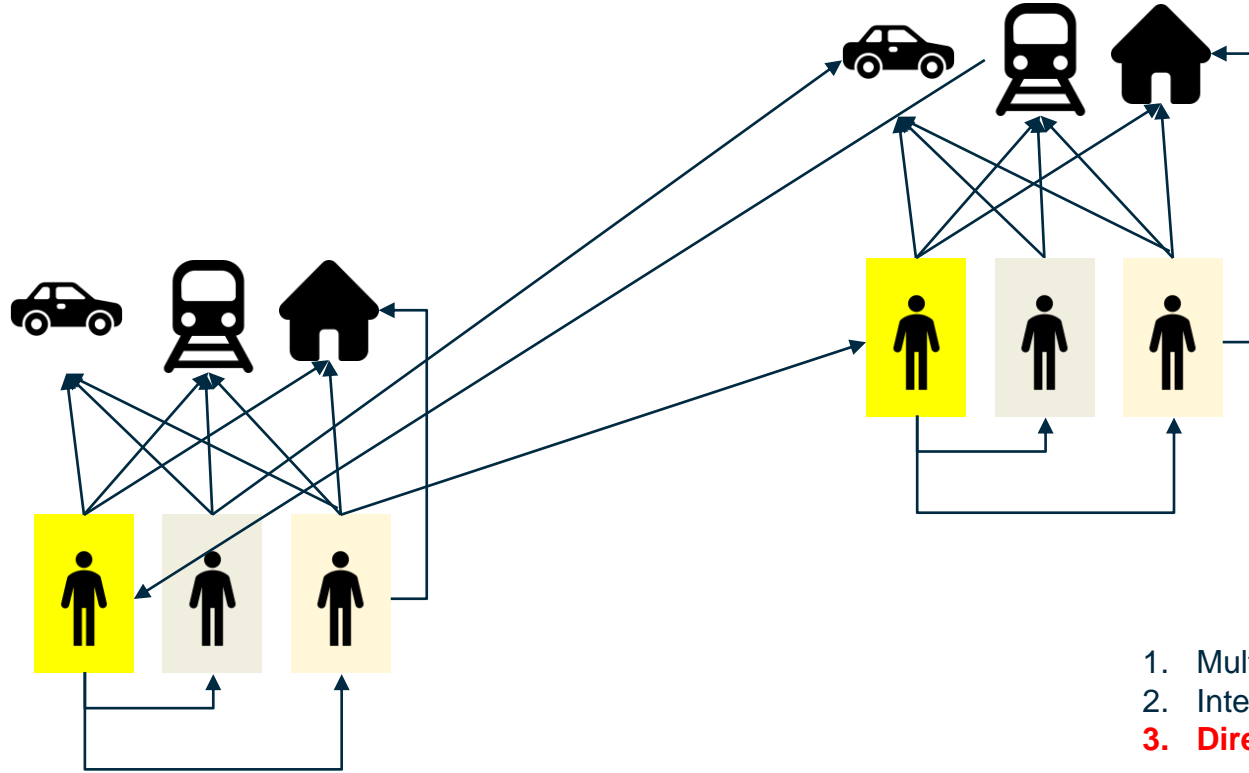


1. Multiple Actors
2. **Interact dynamically**



1. Multiple Actors
2. Interact dynamically
3. **Direct & Indirect feedback loops**

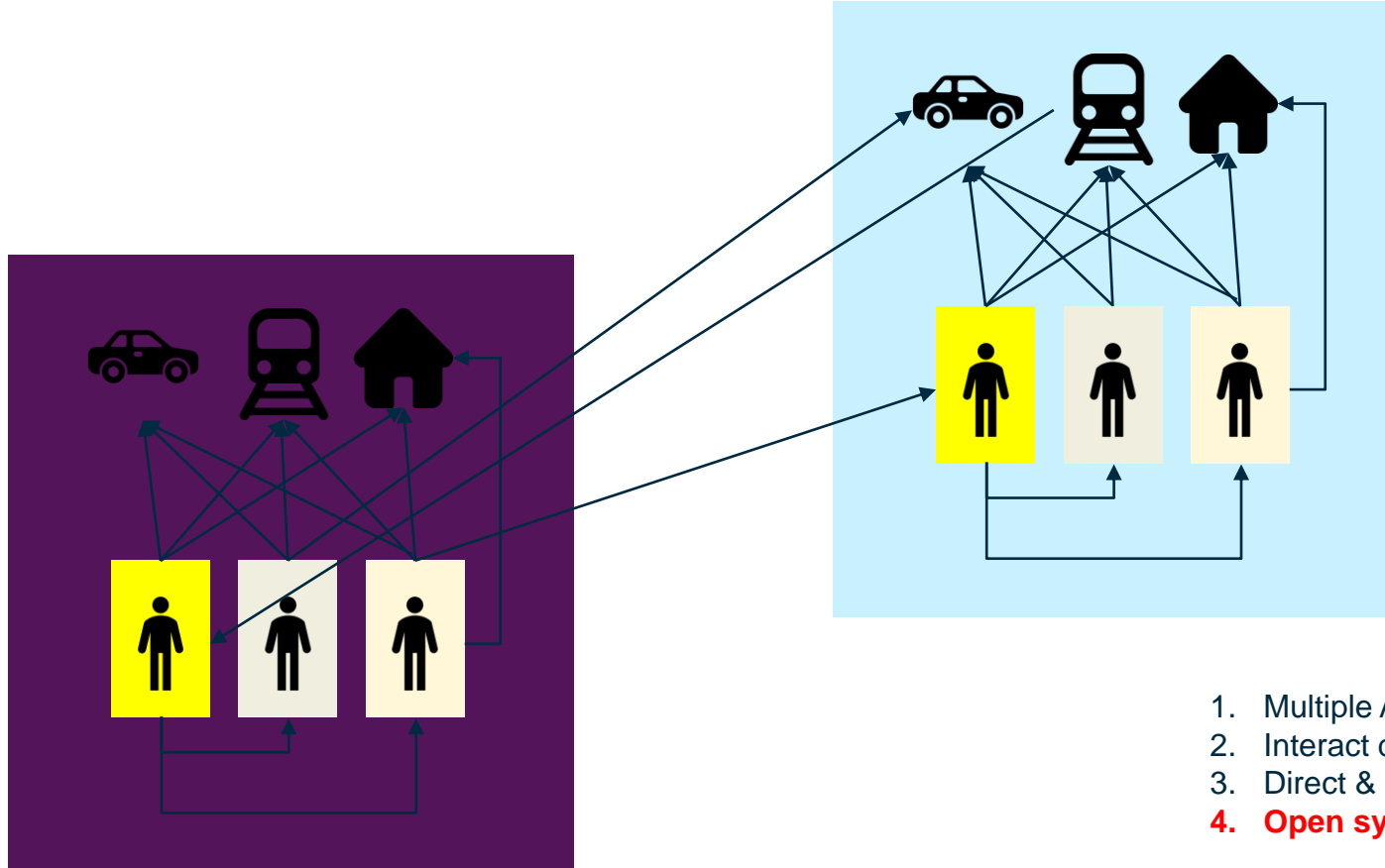




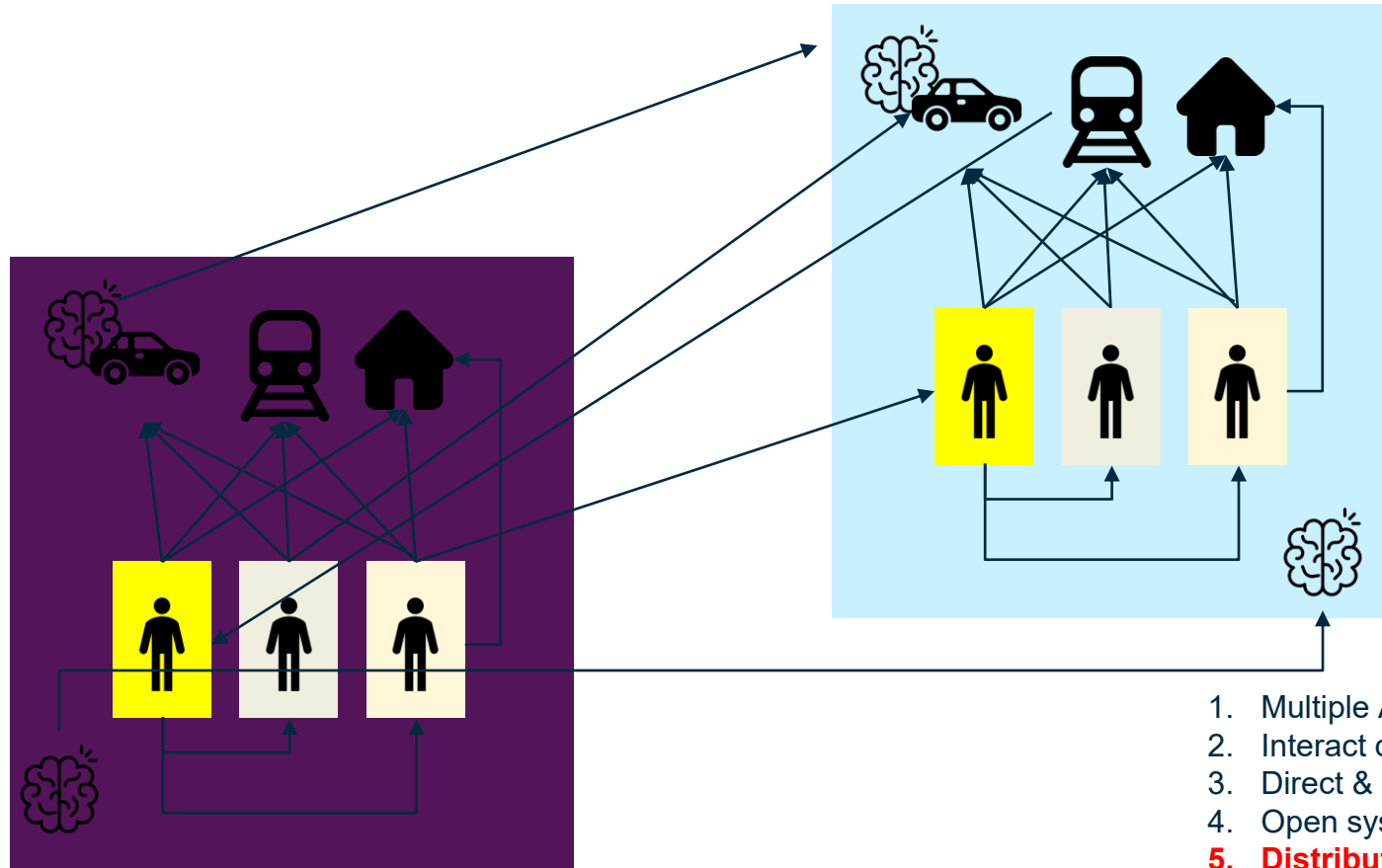
1. Multiple Actors
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3. **Direct & Indirect feedback loops**



1. Multiple Actors
2. Interact dynamically
3. Direct & Indirect feedback loops
4. **Open systems**

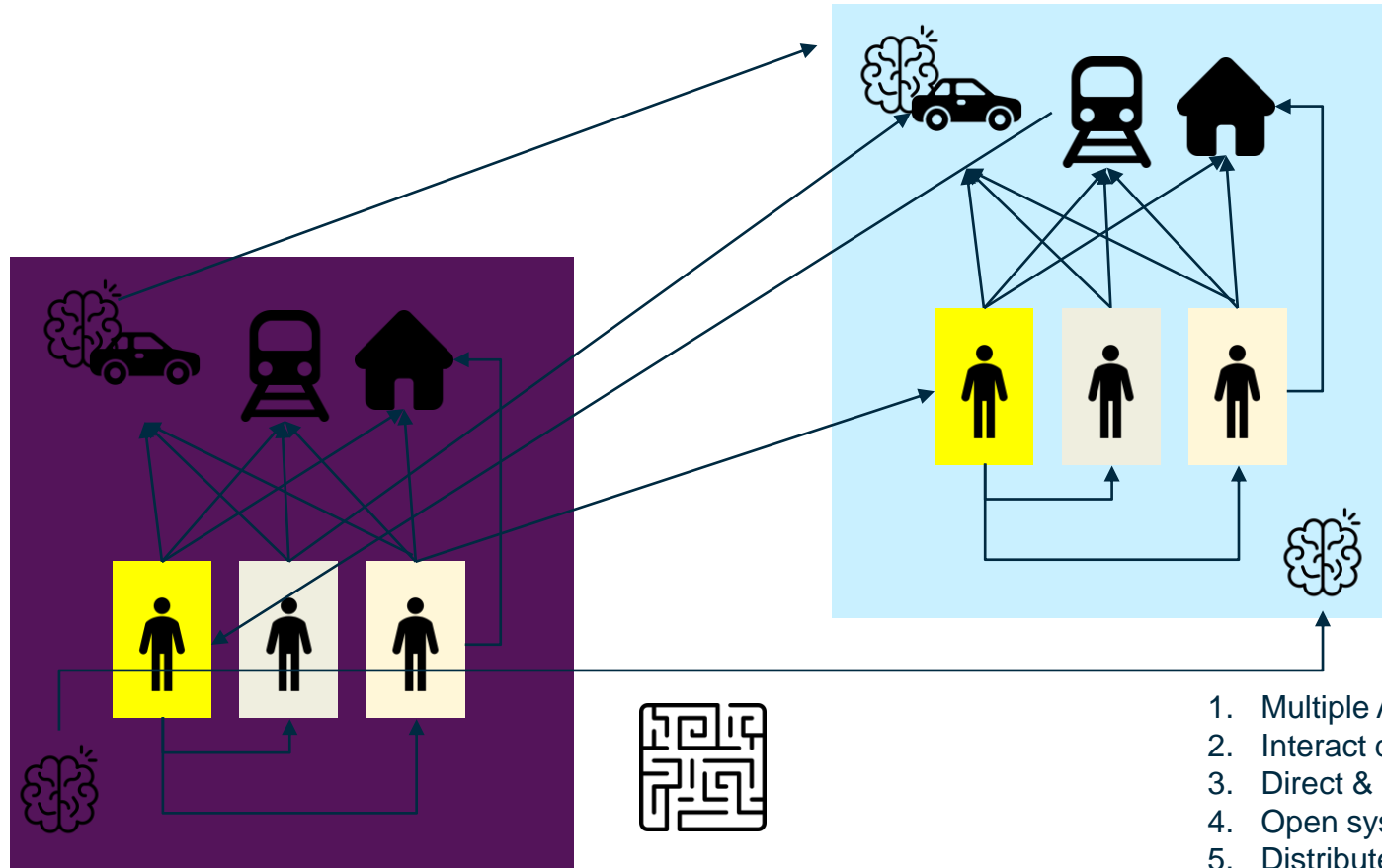


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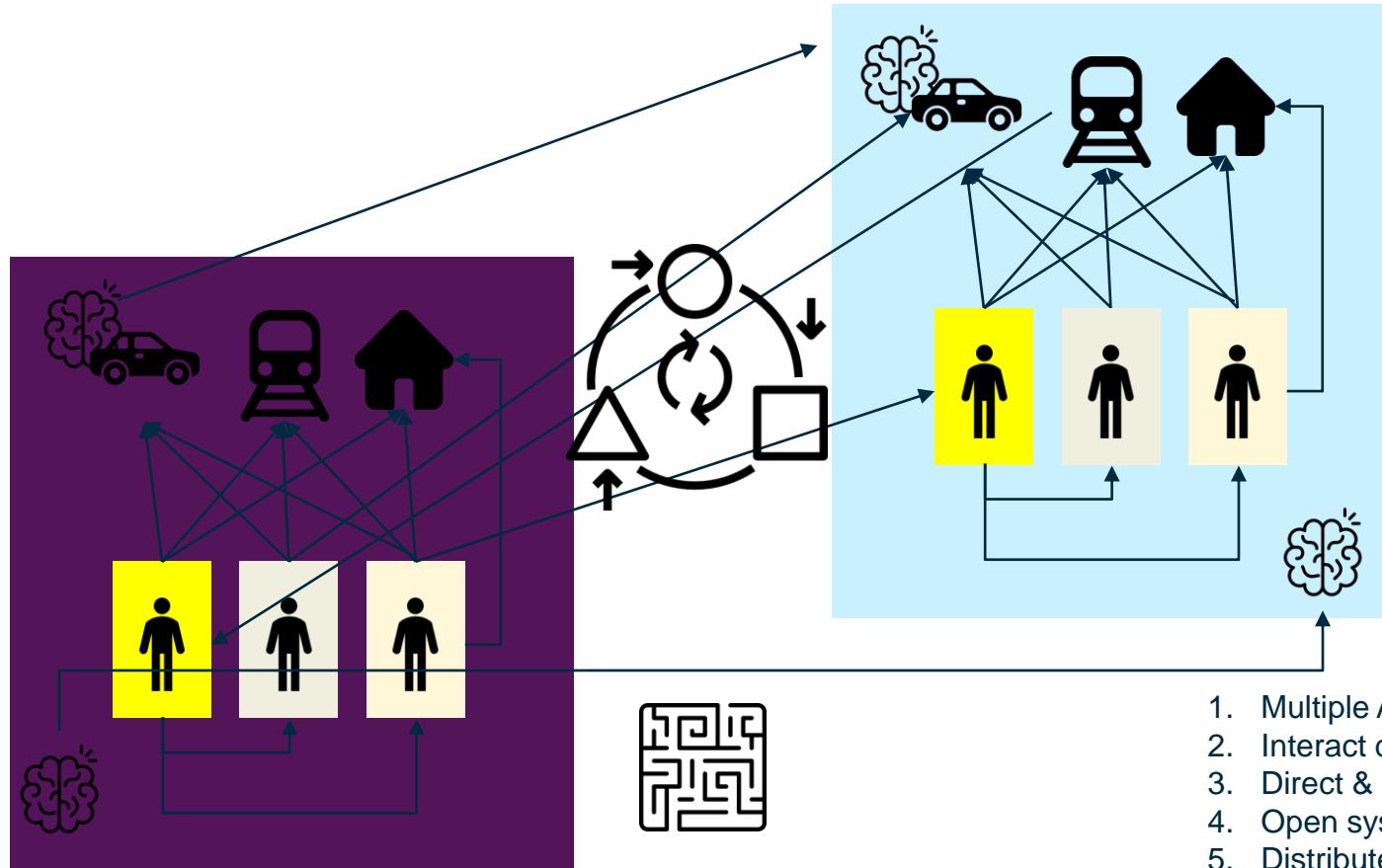


1. Multiple Actors
2. Interact dynamically
3. Direct & Indirect feedback loops
4. Open systems
5. **Distributed memory**

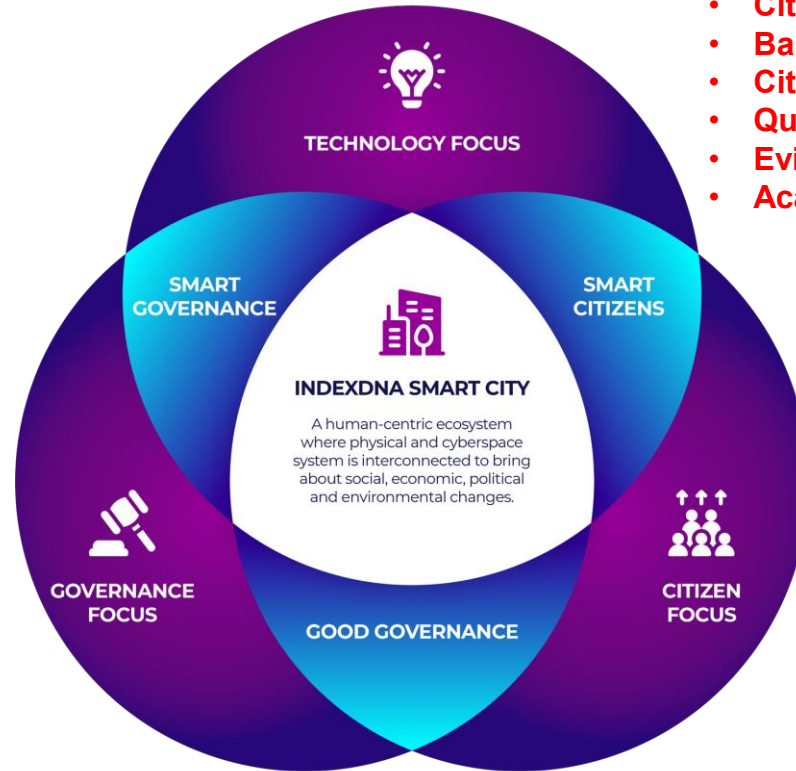




1. Multiple Actors
2. Interact dynamically
3. Direct & Indirect feedback loops
4. Open systems
5. Distributed memory
6. **Emergent behaviour – non linear**



1. Multiple Actors
2. Interact dynamically
3. Direct & Indirect feedback loops
4. Open systems
5. Distributed memory
6. Emergent behaviour – non linear
7. **Adaptive**



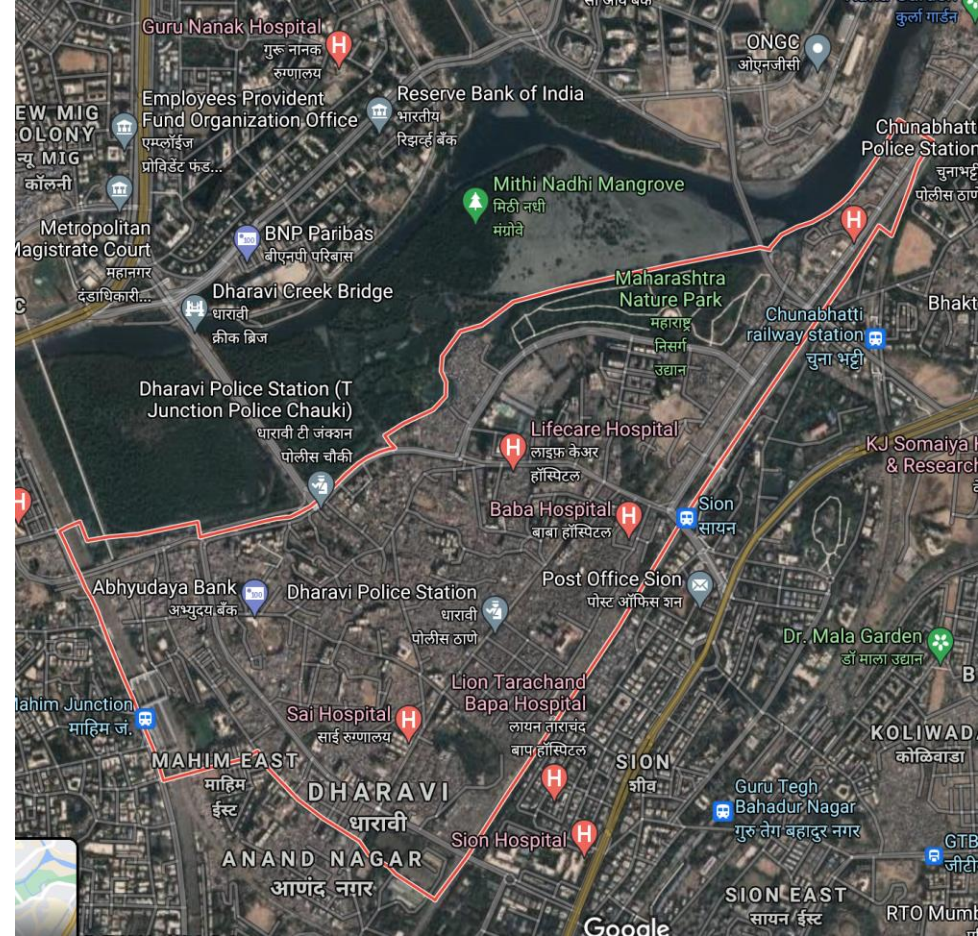
- **Cities – Trade corridors**
- **Balancing Complexity**
- **Citizen-Place Centric**
- **Quadruple focus**
- **Evidence driven**
- **Academically driven - pragmatic**





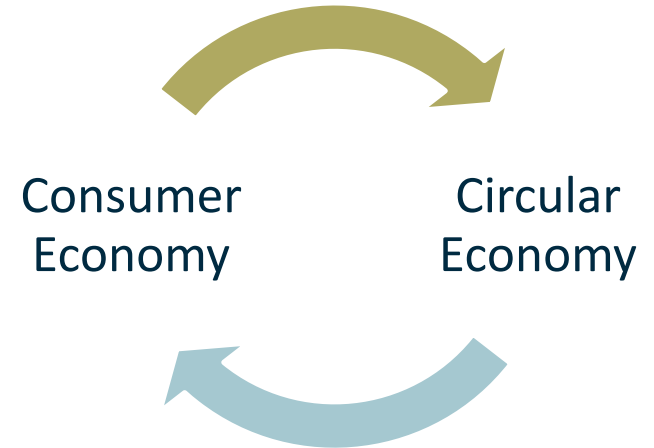
## Circular Economy

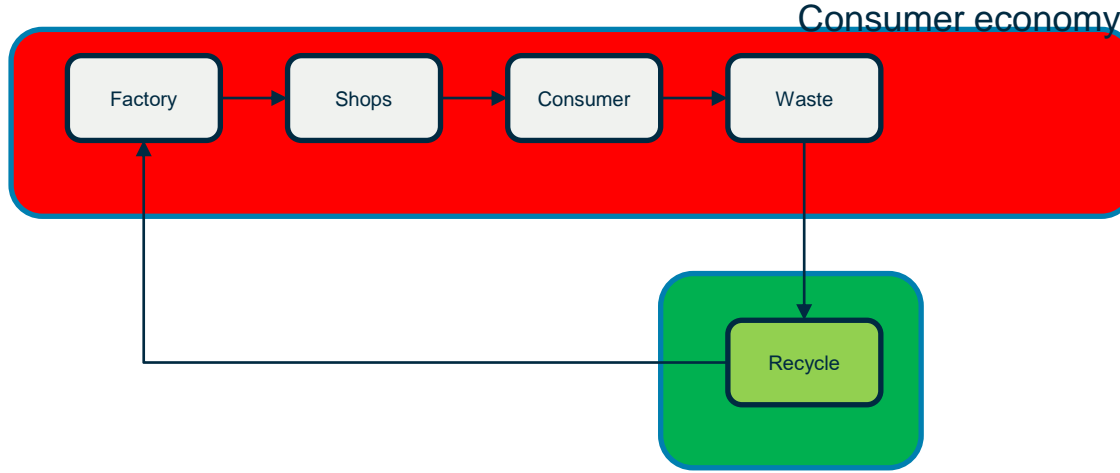
- One million people live in the 240-hectare Dharavi (2 sq. Kms)
- 43% of Dharavi are self-employed (US <11%)
- Estimated 5,000 businesses and 35,000 single-room factories
- Unskilled average income 150 rupees a day (\$2.50) SDG 1.1 (\$1.25 per day)
- Skilled average income is 1500 rupees a day (\$20.50)
- 60 primarily schools 13 secondary schools and 8 private
- Annual economy approx. \$1.6 Bn



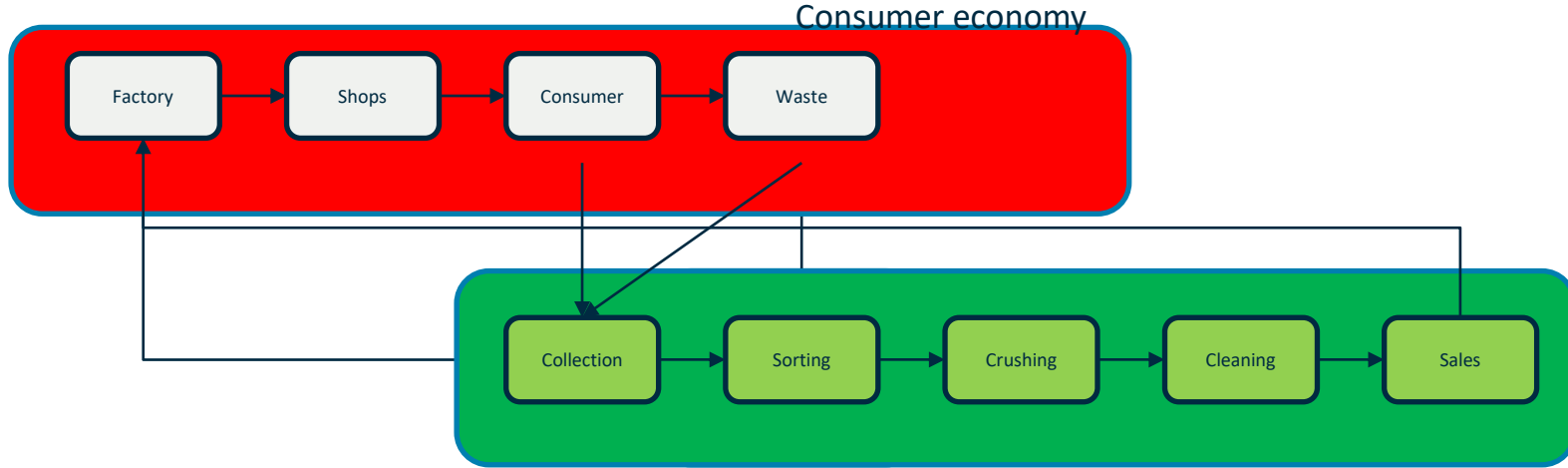
- Mumbai generates 9400 tonnes of waste daily.
- 80% of all solid waste (60% of plastic) is recycled in Dharavi.
- 15,000 factories dedicated to recycling.
- 250,000 people are directly employed by the recycling industry.

Dharavi aims to be a circular economy benchmark





Circular economy



Circular economy









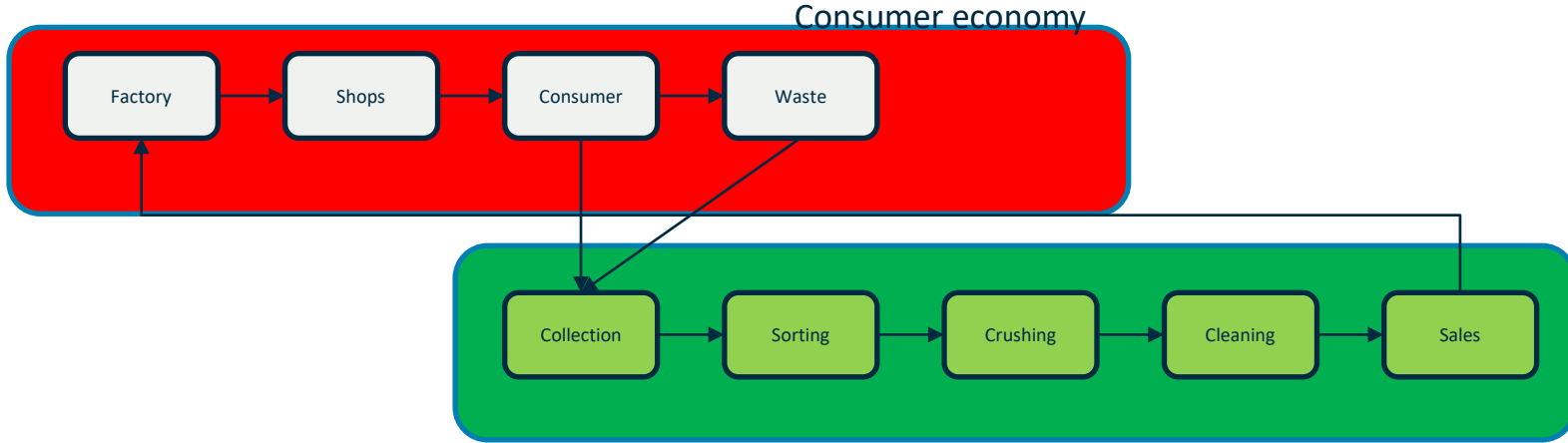




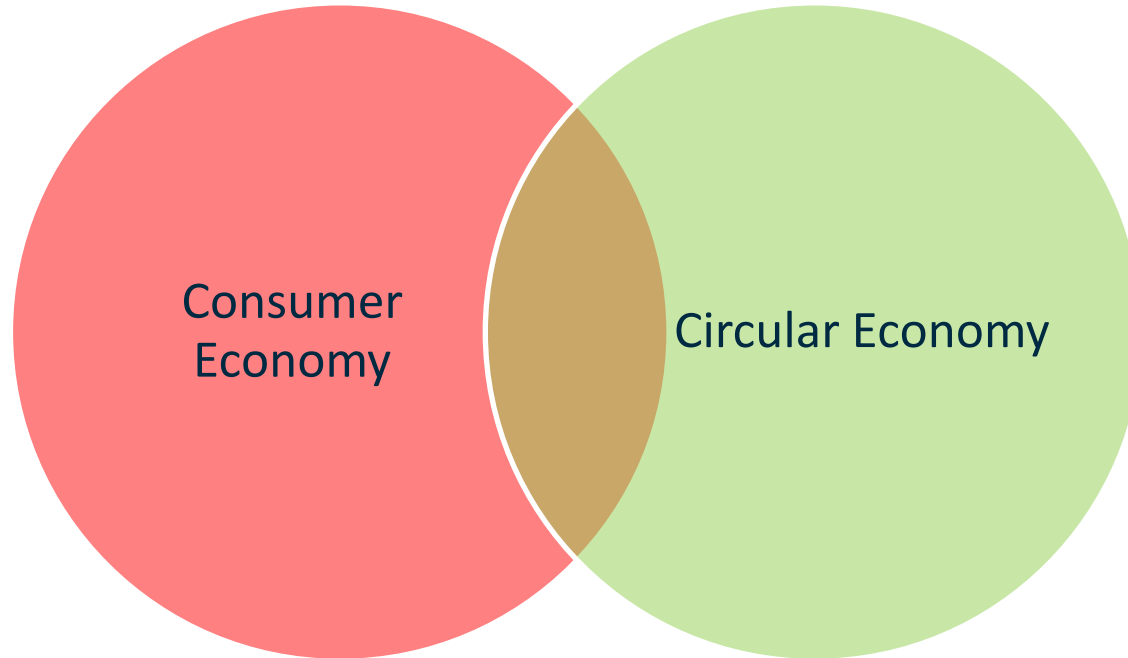


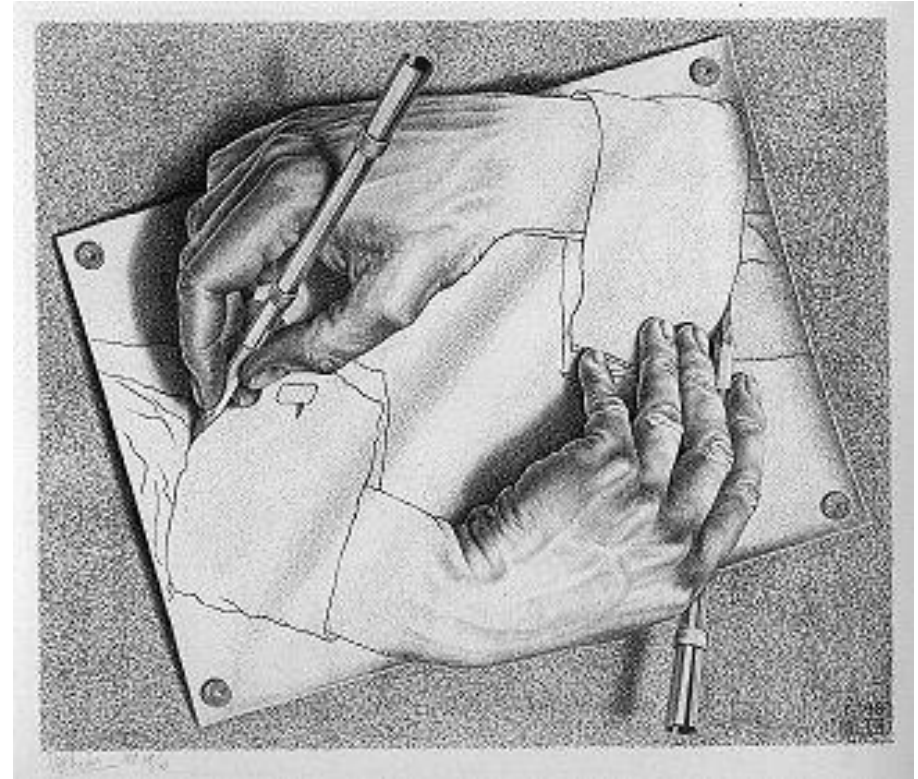
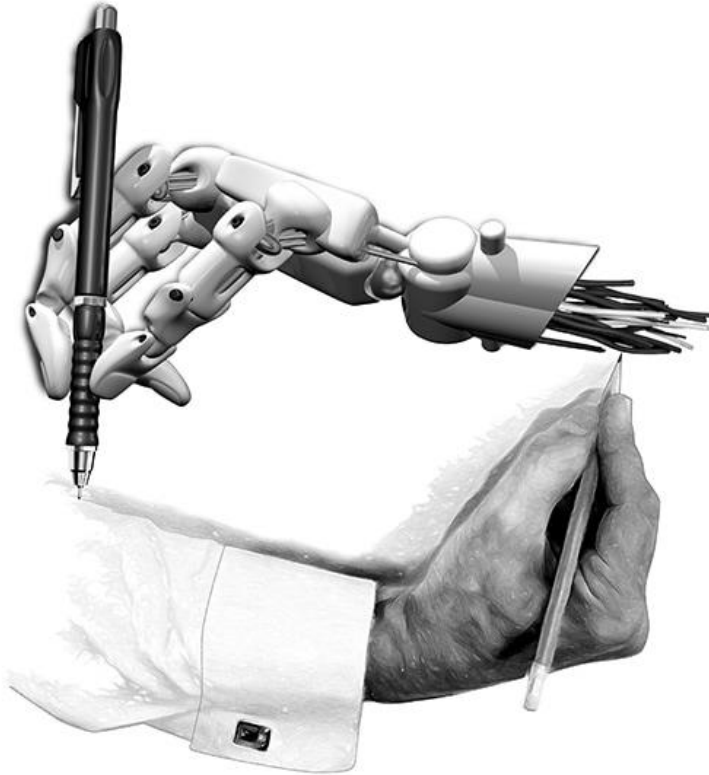






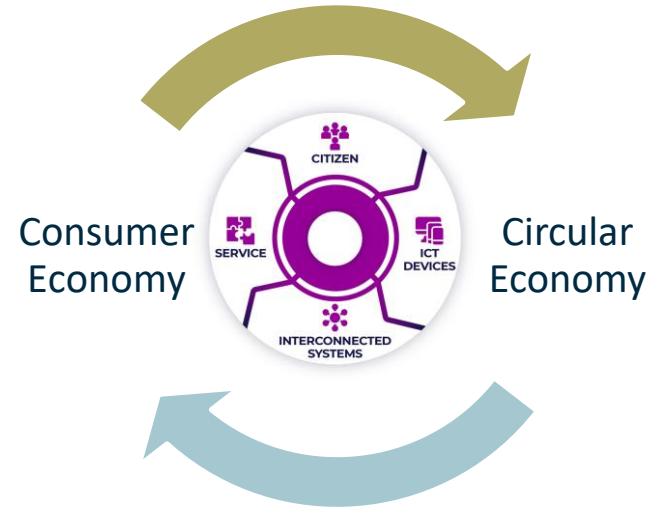
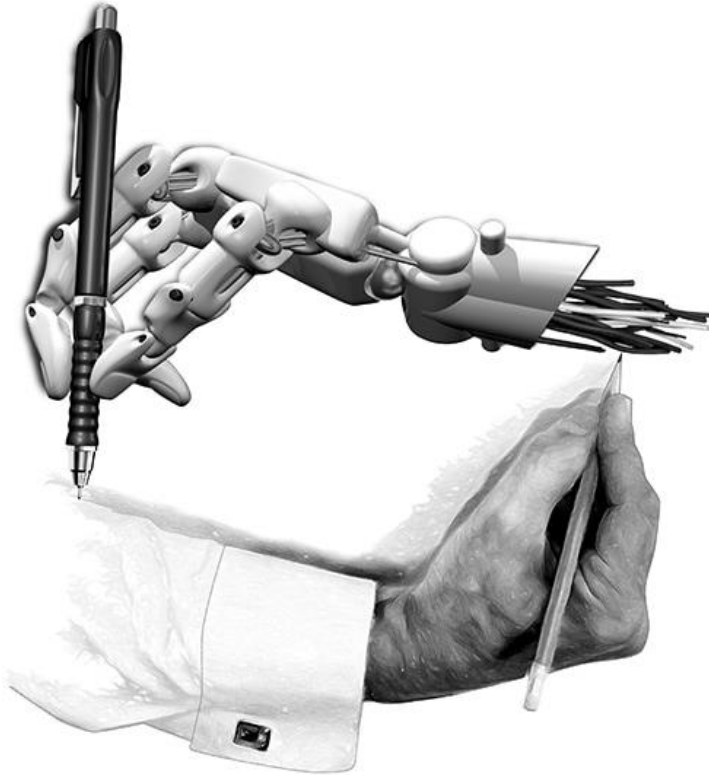
Circular economy





Maurits Cornelis Escher

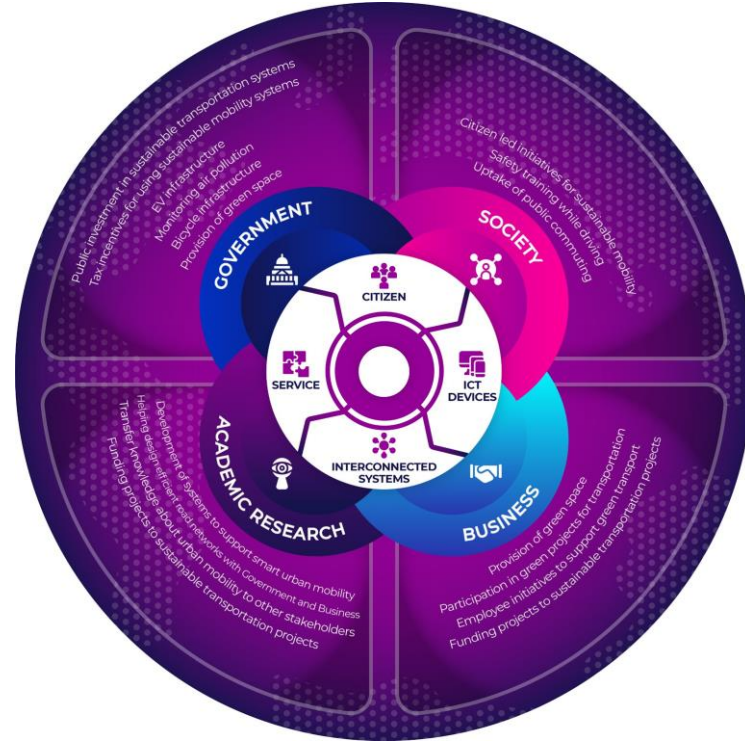


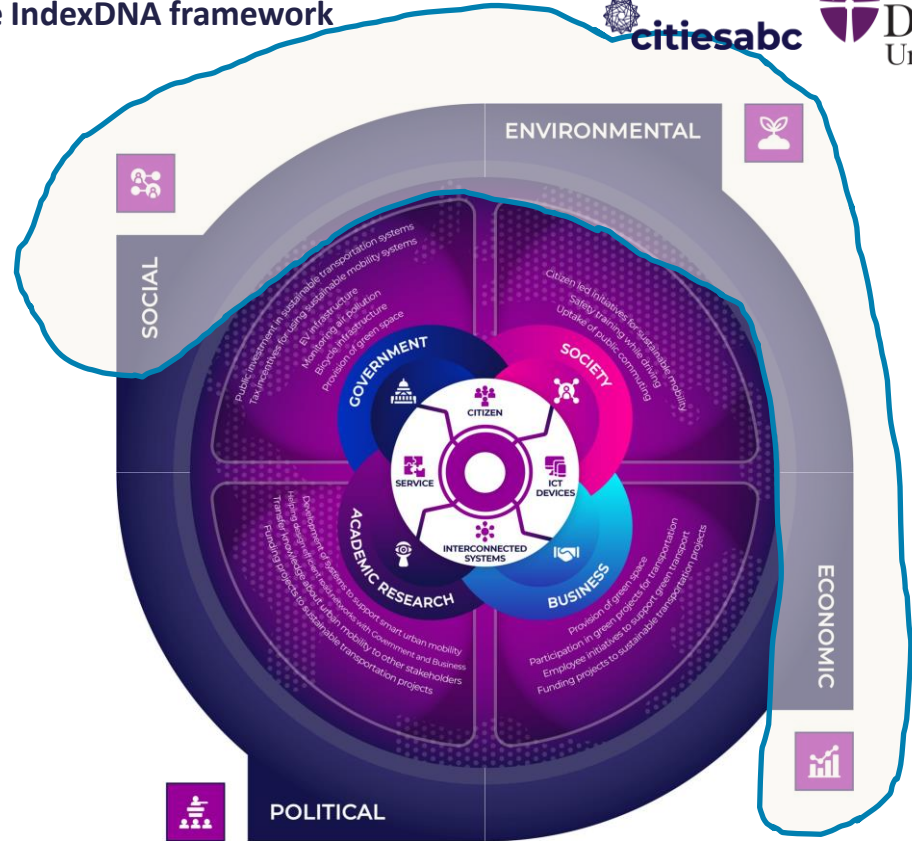


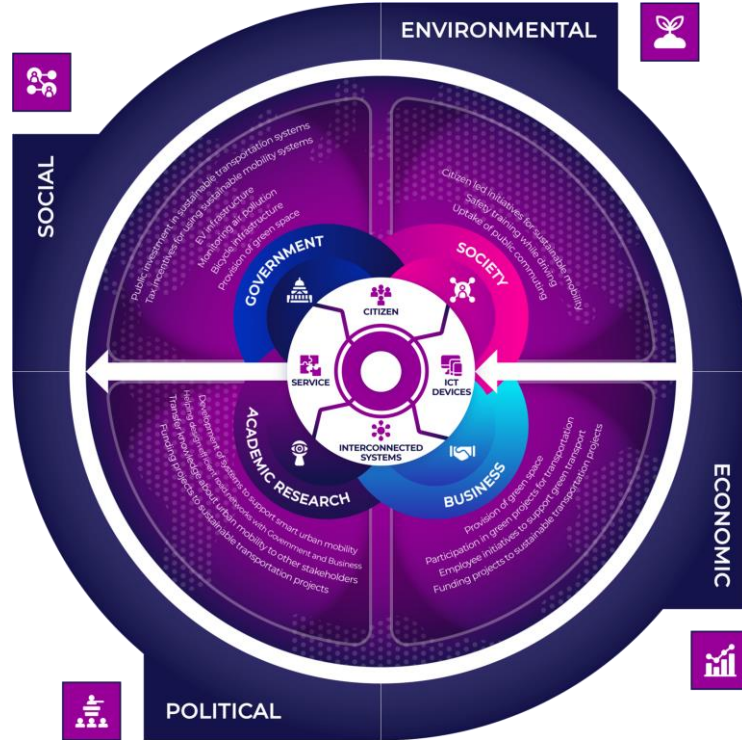


**Government of Maharashtra**

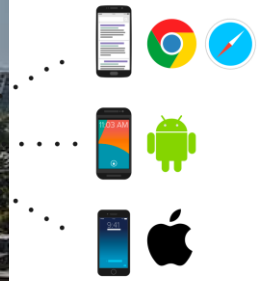
## Dharavi



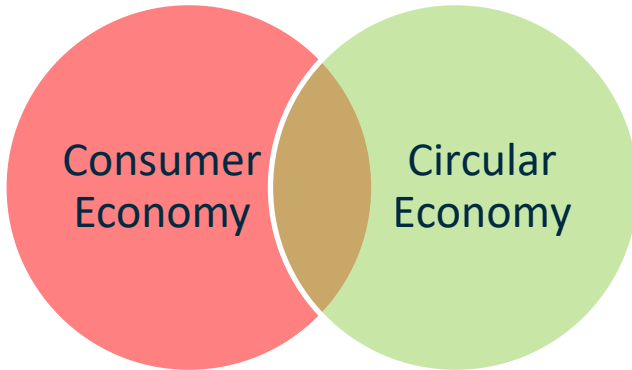
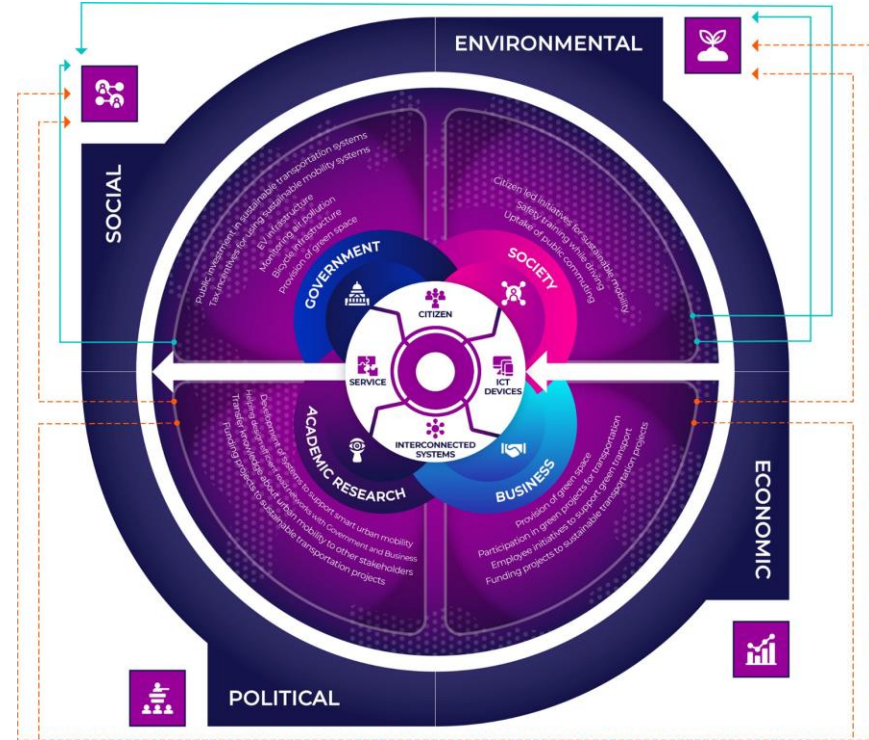




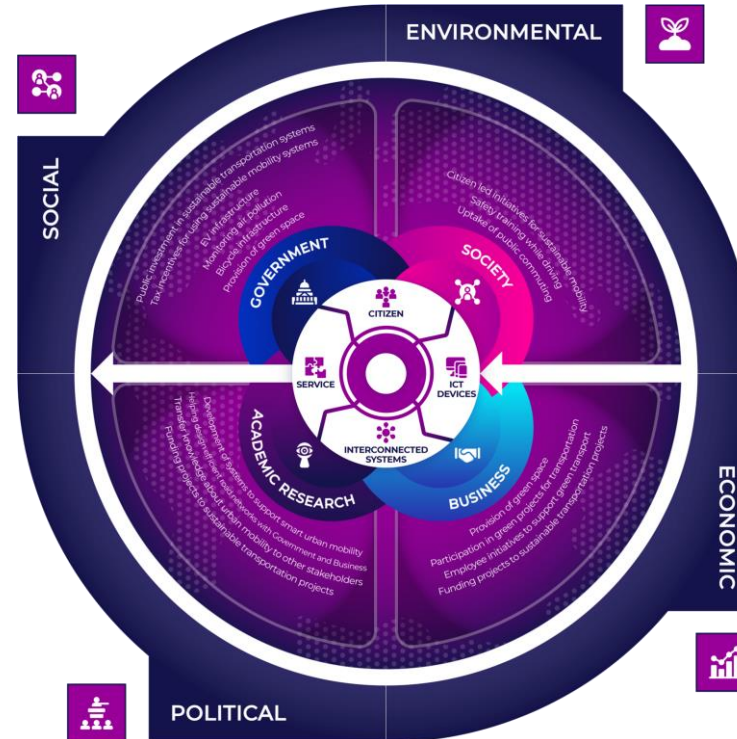




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- IndexDNA™ framework
- Complex Systems Perspective
- Focused on Society 5.0
- 5 Layer Model





## Contributors



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