(Chapter 7: frontispiece - untitled)

Figure 7-1

TECHNOLOGIES–LANDSCAPE

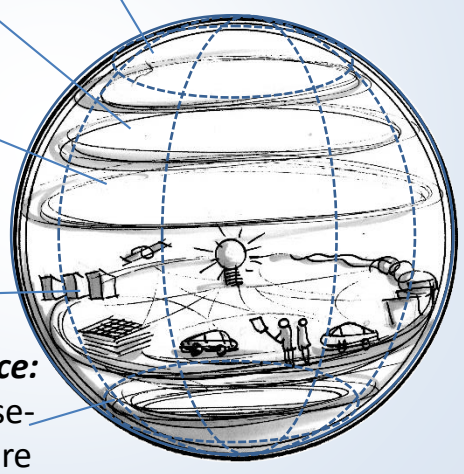
Overview of deeper mind & technologies nexus, with change mapping of long waves & scenarios

a) DEEPER TECHNO-MIND

Techno-economic intelligence for co-production

Techno-political intelligence for co-governance

Socio-tech intelligence for human-digital symbiosis



Techno-intelligence: informatic capacity

Tech-systems intelligence: software, hard-ware, use-ware, org-ware, net-ware

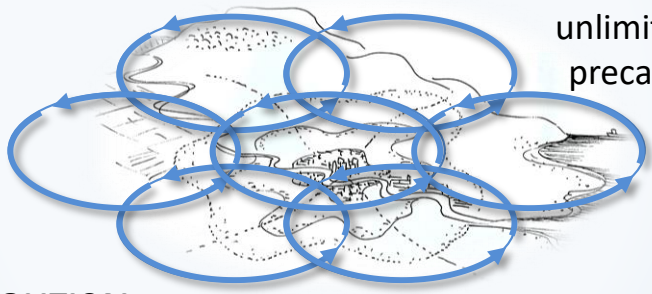
b) TECHNOLOGIES NEXUS

URBAN TECH: smart extractive IOT

SOCIAL-TECH : filter bubbles, techno-addiction

TECHNO-ECONOMIC: unlimited wealth, precarious jobs

CULTURE & ETHICS: privacy, surveillance dilemmas



TECHNO-POLITICAL: Privatized governance by by algorithm

TECHNOLOGIES: AI, IOT, bio-tech, nano-tech, sensing, robotics, materials

C) TECHNO-URBAN LONG WAVES

based on Kondratiev cycles (Marcotullio & McGranahan, 2006)

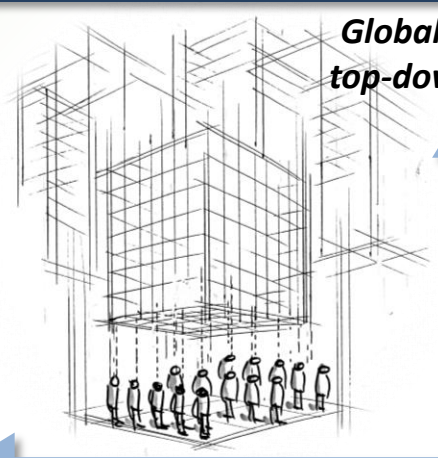
	1800	1850	1900	1950	2000	2050
Urban environment agenda	*'BROWN': sanitation, water, fire*		*'GREY': water, air, transport*		*'GREEN': transport, food, climate*	*'CYBER': security, privacy*
Urban type	Merc-antile	Early industrial	Mature industrial	Post industrial	*Smart urbanist*	*Long waves of techno-economic growth*
Urban techn-ology	Wind, water	Coal, steam, steel,	Automobile, electricity	Electronics, aviation	*Robotics , nano, bio-tech*	
Urban inform-atics	***Mass print, post service***	***Telegraph, railways***	***Telephone, radio***	***Television, computing***	***Smart, mobile, AI, cloud***	

C) TECHNOLOGIES SCENARIOS

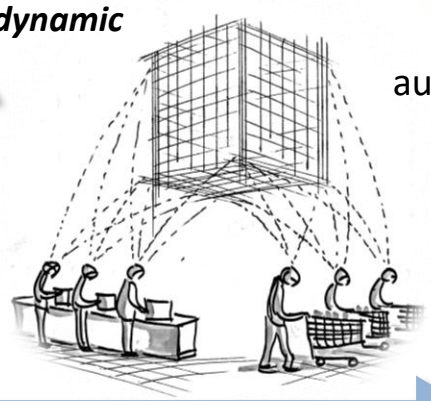
Global / macro & top-down dynamic

Expert super-intelligence can solve all our problems

Hyper-tech platforms for super-intelligent-super-governance (grassroots insurrections)



Corp-tech platforms for total value engineering, paranoia-wars, augmented humans (community-based sabotage)



Our corporate platform knows everything about everyone

Public / community & ecological values

Private enterprise / economic values

We think together in eternal connectivity

Self-learning social-tech & neuro-plastic hive-mind enclaves (corporate infiltration)

Competing tribes of wild west grassroots hackers & hactivists (technocratic resistance)

This little worm can take down the whole

Regional / local & bottom up dynamic

Figure 7-2

INFORMATICS–III

Fundamentals of informatic transaction & learning, with super-intelligence scenarios

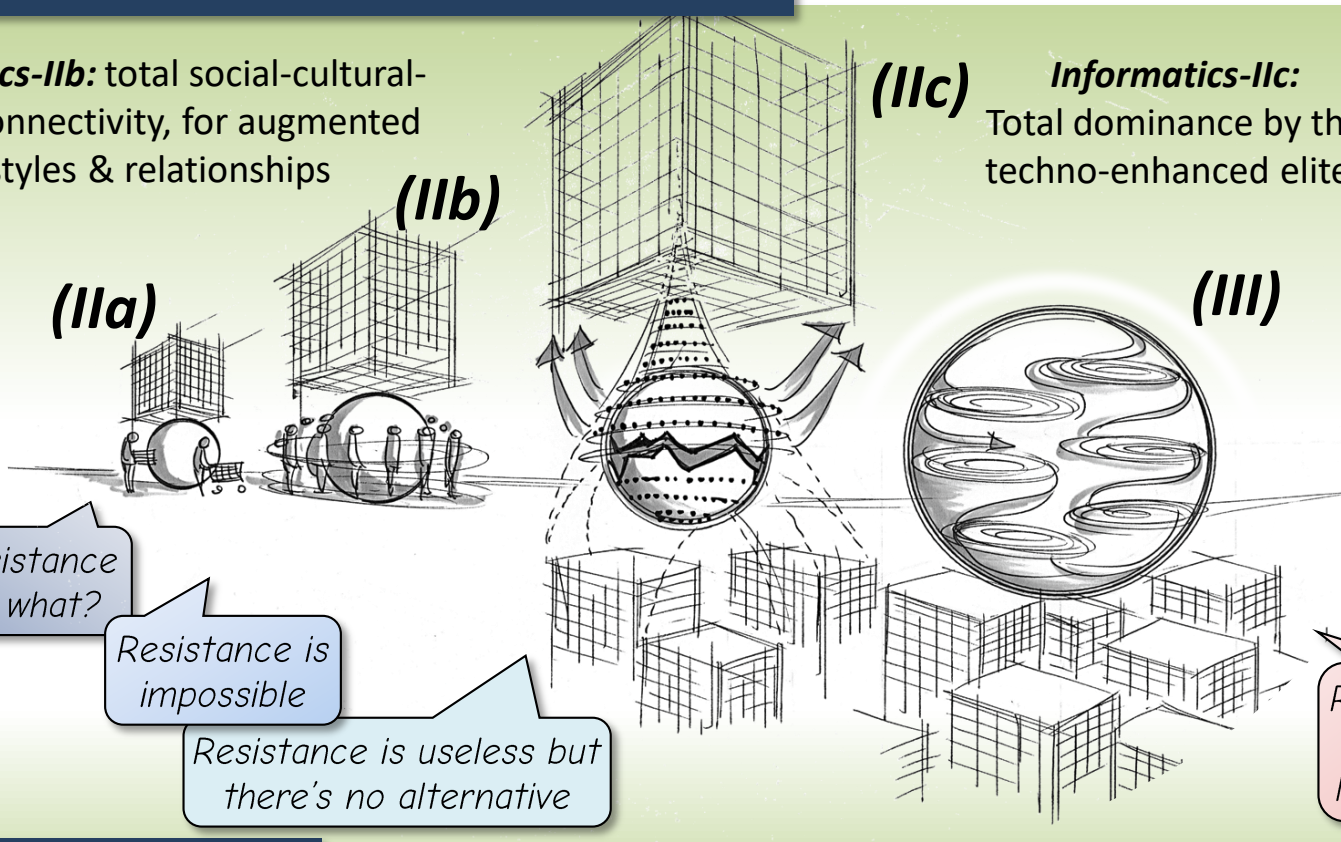
a) COLLECTIVE HUMAN-ARTIFICIAL INTELLIGENCE??

Informatics-IIa: total AI integration of all services, products, events, locations, markets, profiles

Informatics-IIb: total social-cultural-psycho connectivity, for augmented lifestyles & relationships

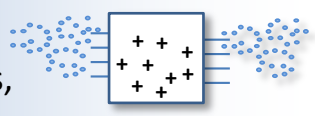
Informatics-IIc: Total dominance by the techno-enhanced elites

Informatics III: existential opportunity for a new ***CHAI*** - *'Collective-Human Artificial Intelligence'*

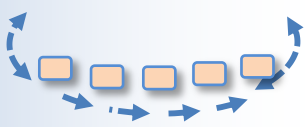


b) ANALOGUE SYSTEMS–I

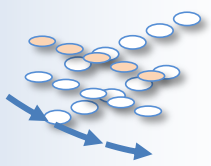
TRANSACTION LEVEL
'Free market' random exchanges, low '*mutual information*'



FACTOR LEVEL
Weak feedback on supply chain, weaker on wider value chain

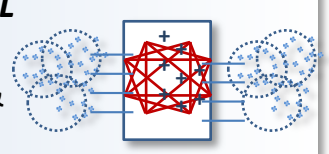


SYSTEMS LEVEL
Multiple value chains, only random overlaps in 'free market'

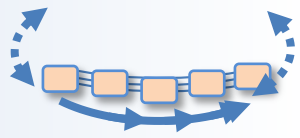


c) SMART SYSTEMS–II

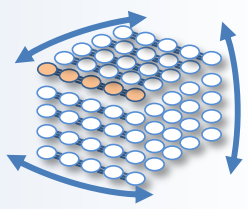
TRANSACTION LEVEL
'platform market', guided exchanges & centralized *mutual information*



FACTOR LEVEL
Strong feedback on supply chain, weak on wider chain, impacts dumped

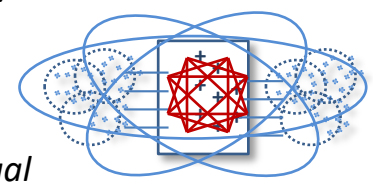


SYSTEMS LEVEL
Multiple value chains are inter-connected, by location, time, price, person etc

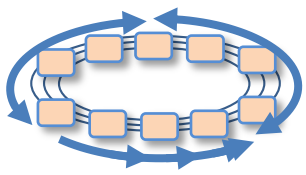


d) 'WISER' SYSTEMS–III

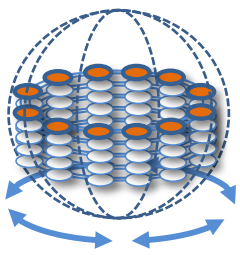
TRANSACTION LEVEL
'Deeper-mind market', self-organizing *mutual information*



FACTOR LEVEL
Strong feedback on supply chain, strong on wider value chain



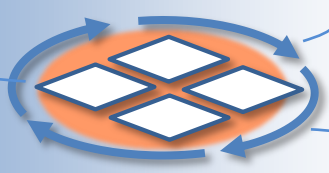
SYSTEMS LEVEL
Multiple inter-connected value-cycles, for *wider* societies, *further* effects, *deeper* values



e) SINGLE-LOOP LEARNING

1) Functional learning, assimilation

2) Single loop knowledge & sense-making



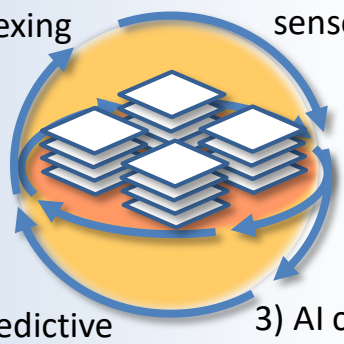
3) Single loop synthesis, design, innovation

4) Single loop strategy, planning, management

f) A.I. MACHINE LEARNING

1) Double-loop learning, search, indexing

2) AI filtering, ambiguity, sense-making



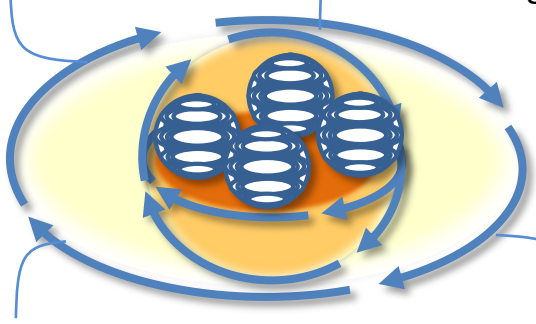
3) AI creating, value-added networks, associations

4) AI predictive analytics, intelligent systems

g) 'C.H.A.I.' CO-LEARNING

1) ***Co-learning &*** multi-loop '*wider*' human- digital links

2) Co-knowledge: '*deeper*' sense-making



4) Co-production: '*further*' cause-effects

3) Co-creation: multi-loop '*Longer*' visions

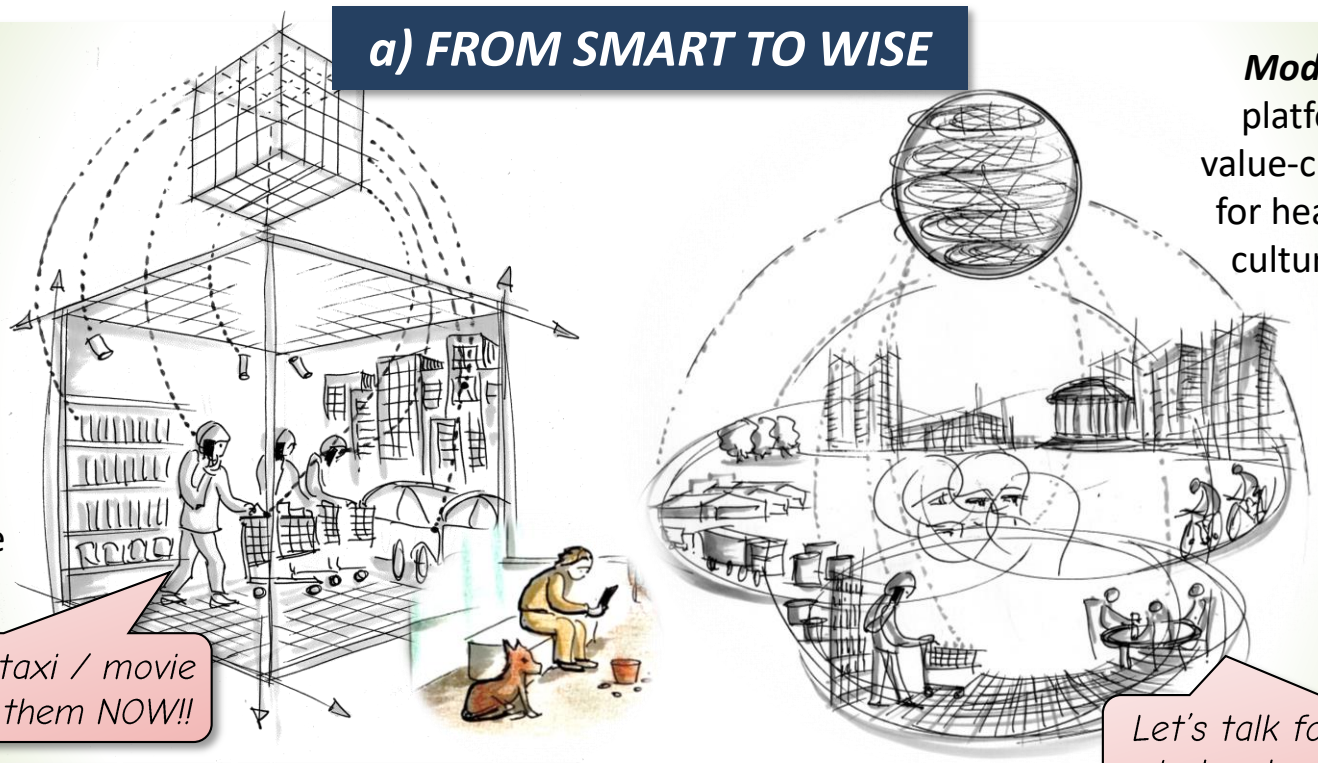
Figure 7-3

SMART-SERVICES–III

Co-evolution of platforms from analogue to smart to wise: examples of transport & housing

a) FROM SMART TO WISE

Mode-I&II functional platforms: real-time info on products, preferences, prices, locations. Logic of material gratification, social impacts are excluded



Mode-III synergistic platforms: real-time value-chains co-creation, for health & education, culture & community

Enterprise logic is for community, empathy, prosperity, livelihood

b) 'MASS PRODUCTION'–I

Economies of scale for mass production & consumption

c) 'LONG TAIL'–II

Economies of niche & long tail specializ-ation

d) 'WISE HEAD'–III

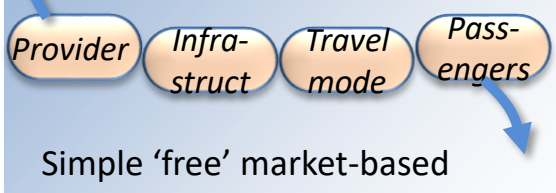
Economies of synergistic value & co-creation

e) 'CLEVER' SERVICES–I

ANALOGUE TRANSPORT

Taxi on street or by phone

Profit extracted



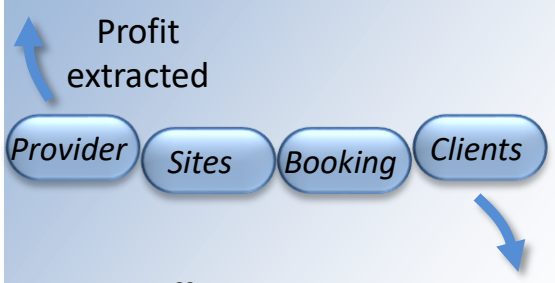
Simple 'free' market-based supply-demand chain: blind transactions with low 'mutual information'

ANALOGUE ACCOMMODATION

Bookings by post or phone

Simple 'free' market-based supply-demand chain

Profit extracted



Inefficiency raises prices, capacity highs and lows, little feedback to community

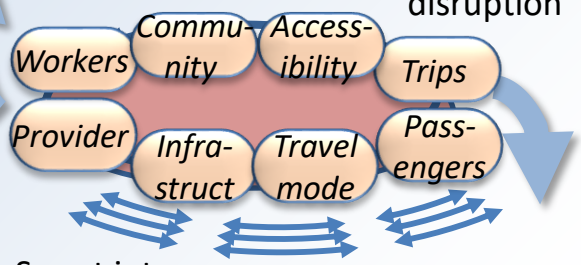
f) 'SMART' SERVICES–II

PLATFORM TRANSPORT

Taxi bookings by app & geolocation

Profit & data extracted

Community disruption



Smart inter-mediation

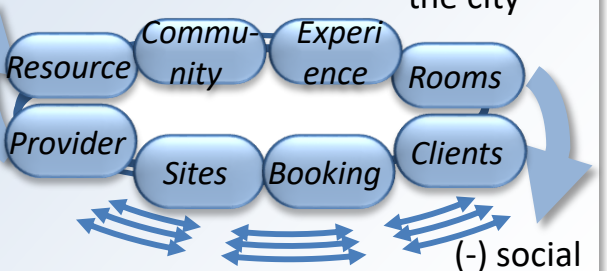
PLATFORM ACCOMMODATION

Smart supply chain & market effects

(-) global profit extraction

(+) space efficiency

(-) market-ization of the city



(+) market efficiency

(+) new enterprises

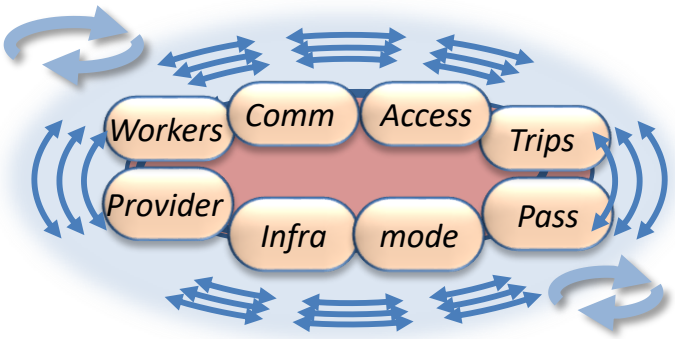
(-) social impacts dumped

g) 'WISE' SERVICES–III

SYNERGISTIC TRANSPORT

Integrated transport by geo-community

Profit & data recirculated

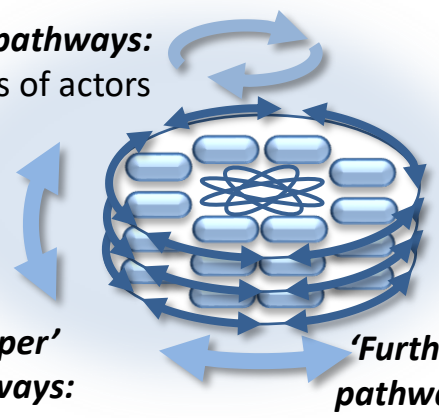


Impacts are internalized

SYNERGISTIC ACCOMMODATION

Resocialization of disruptive innovation

'Wider' pathways: synergies of actors



'Deeper' pathways: synergies of domains

'Further' pathways: synergies of value chains

Figure 7-4

SMART-COMMUNITIES–III

Co-evolution of systems from social network to 'societal meshwork'

a) COLLECTIVE LOCAL INTELLIGENCE

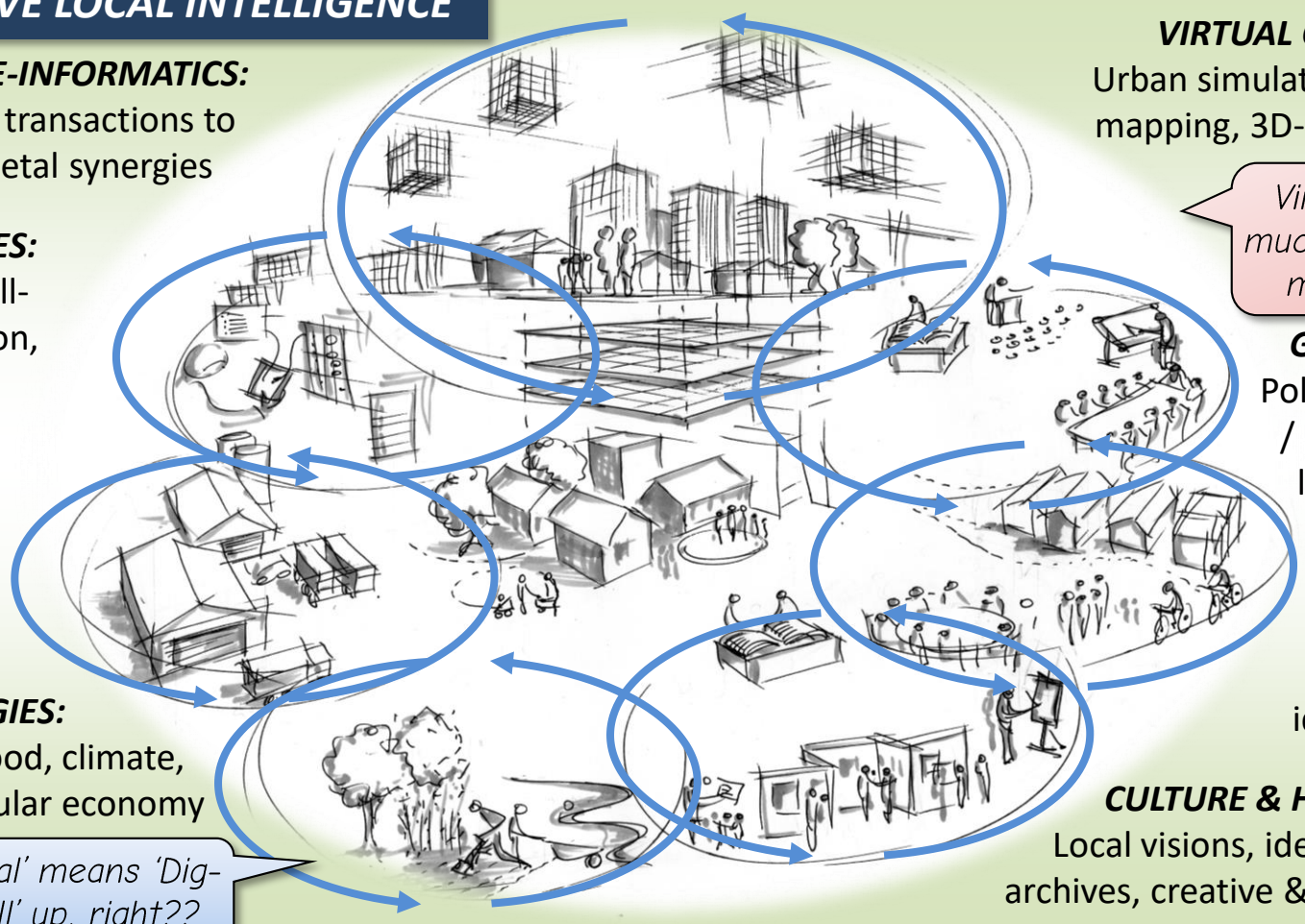
SMART-WISE-INFORMATICS: From digital transactions to digital-societal synergies

PUBLIC SERVICES: Big data for well-health, education, security

ENTERPRISE: Digital value-chains, local services

ECOLOGIES: Platforms for food, climate, biodiversity, circular economy

'Digital' means 'Dig-it-all' up, right??



VIRTUAL CITIES: Urban simulation, digital mapping, 3D-4D models

Virtual cities are much easier without messy humans

GOVERNANCE: Politician / planner / citizen - active learning loops

COMMUNITY: Platforms for social needs, ideas, resources

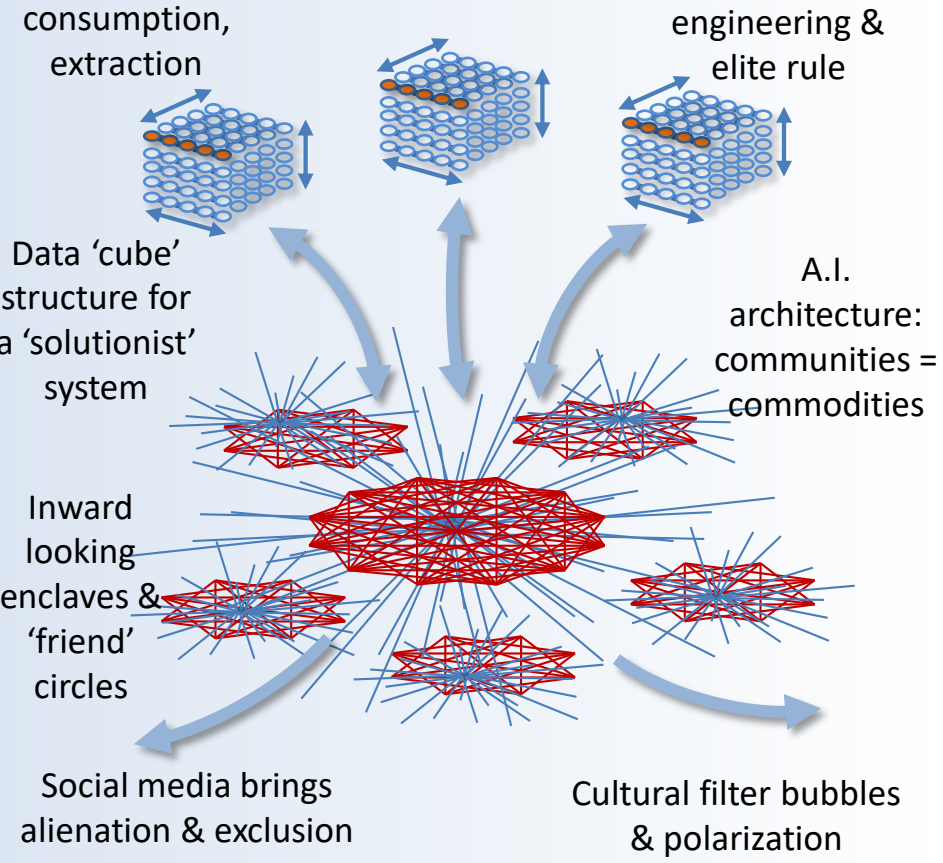
CULTURE & HERITAGE: Local visions, identities, living archives, creative & critical activism

b) 'SMART' NETWORKS–I&II

Business systems: total integration of production, consumption, extraction

Technologies: data extraction, covert algorithms, financial logic

Governance systems: total surveillance for social engineering & elite rule

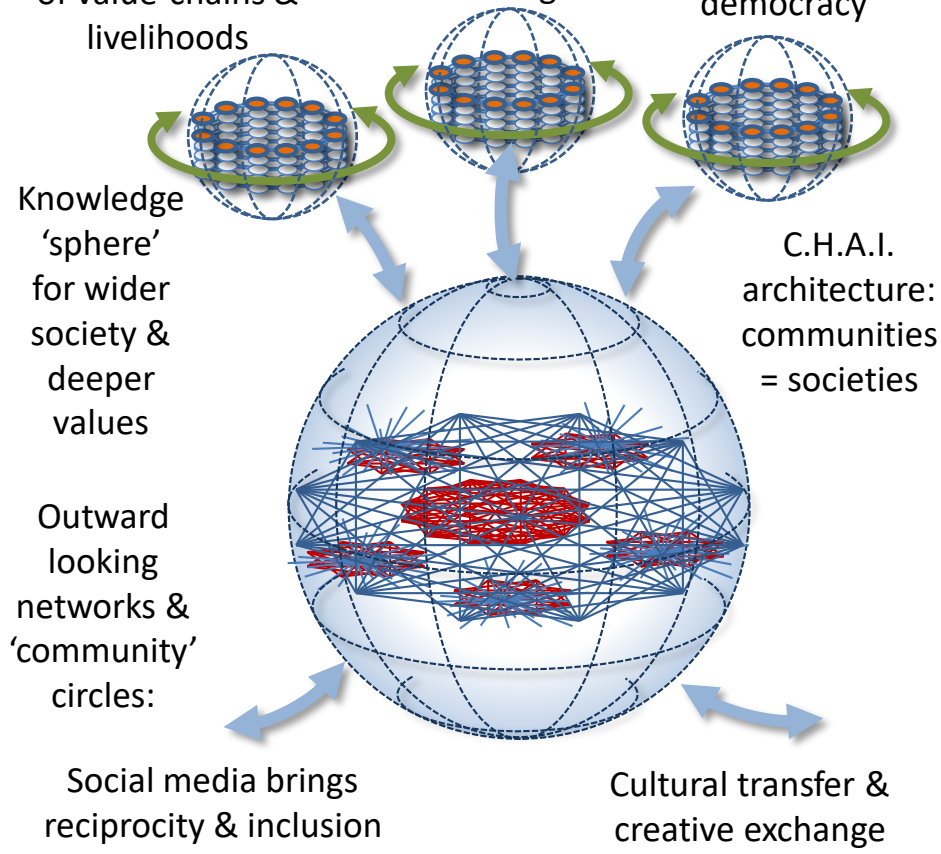


c) 'WISER' MESH-WORKS–III

Enterprise systems: total integration of value-chains & livelihoods

Technologies: open data, transparent algorithms, societal logic

Governance systems: connectivity for associative democracy

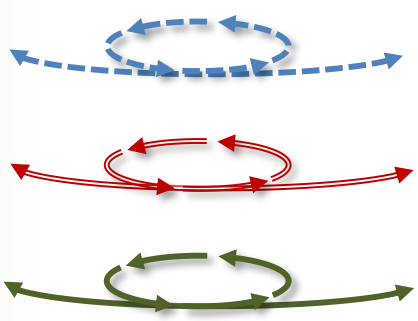


d) PATHWAYS

Socio-political gaps: smart algorithms for privatization & segregation

Urban-economic gaps: local data captured by global corporates

Techno-cultural gaps: networks of extremist bubbles & hyper-competition



Smart-wise democratic: collaborative decisions & co-production public services

Smart-wise developmental: city / region recirculation, to mobilize all values & cycles

Smart-wise ingenuity: collective human-artificial for empowerment & cohesion

Figure 7-5

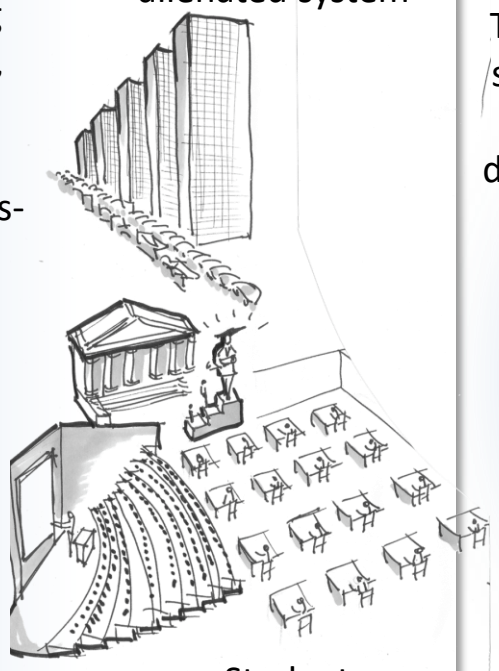
EDUCATION–III

Co-evolution from single loop to multi-loop learning process & structures

a) UNIVERSITY–I&II

Raw graduates look for niches in alienated system

Self-serving institutions, obsolete methods, 'winner-takes-all' logic



We must get our exam results to the top of the pile!!

Students assimilate 'facts' in lectures

Students regurgitate 'facts' in competitive exams

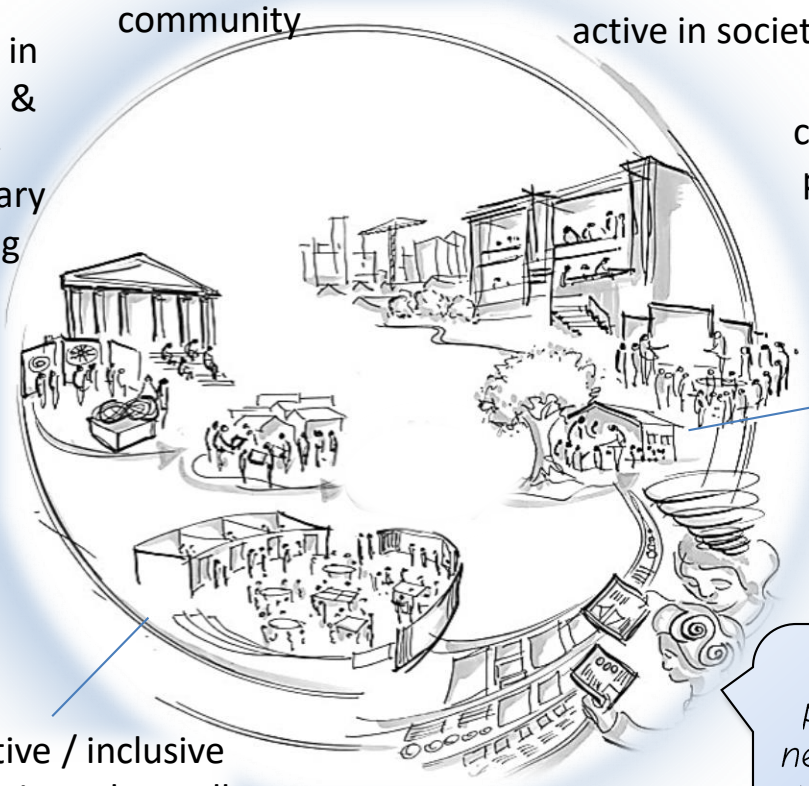
b) MULTI-VERSITY–III

Students learn from each other & from community

Rounded graduates, collaborative skills, active in society

Training in systems & trans-disciplinary thinking

Evaluation by collaborative peer panels, networks



Reflexive & deliberative learning with real world experience

Interactive / inclusive deliberation where all can speak

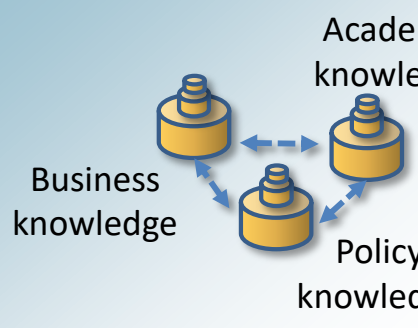
Digital supports real-time creative collaborations

For this project we need physics, history, art, religion & tech

c) EDUCATION–I

KNOWLEDGE SILOS

Inward-looking & inflexible



MODE-I 'ASSIMILATION'

'Single-loop' info-processing

Input: 'facts' from textbook

Problem is fixed & defined

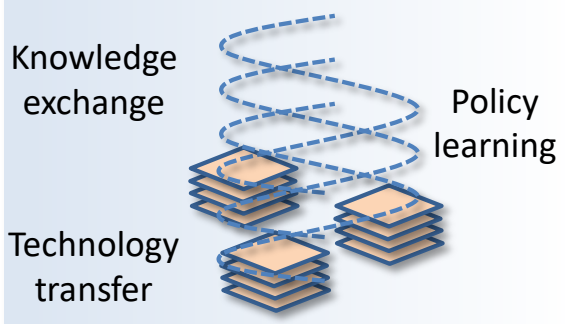
Action: pass exams

Result: grades & 'attainment'

d) EDUCATION–II

TRIPLE-HELIX UNIVERSITY

Open innovation & exchange



MODE-II 'LEARNING'

'Double-loop' entrepreneurial

Input: learning by doing

Problem: to survive & win

Actions: compete & innovate

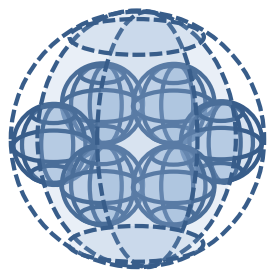
Result: evolu-tionary success

e) EDUCATION–III

SYNERGISTIC MULTI-VERSITY

Everyone can learn with, by, from, everyone

New synergies of academic, business & cultural knowledges



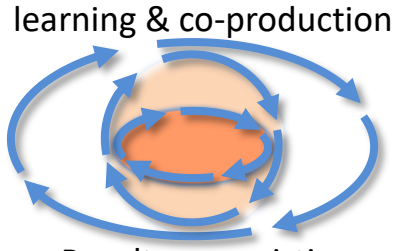
New synergies of social, technical, ecological & policy domains

MODE-III 'CO-LEARNING'

'Multi-loop' creative, reflexive, transformative

Input: collaborative co-learning & co-production

Problem: reflexive, deliberative enquiry



Actions: co-creation & co-innovation

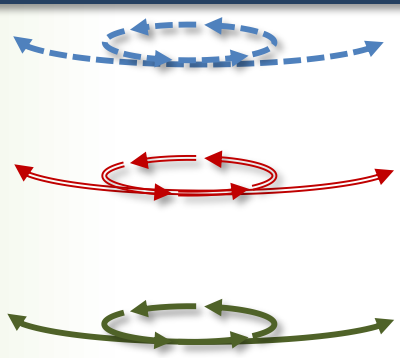
Result: synergistic collaborative knowledge

f) PATHWAYS

Political-economic gaps: education is anachronistic & ineffective

Socio-cultural gaps: material knowledge not suited to societal challenges

Technical-systems gaps: learning process is inefficient & divisive



Learning institutional (context) pathways: co-learning society, open space co-creation hubs

Learning network (content) pathways: trans-disciplinary & societal skills & values

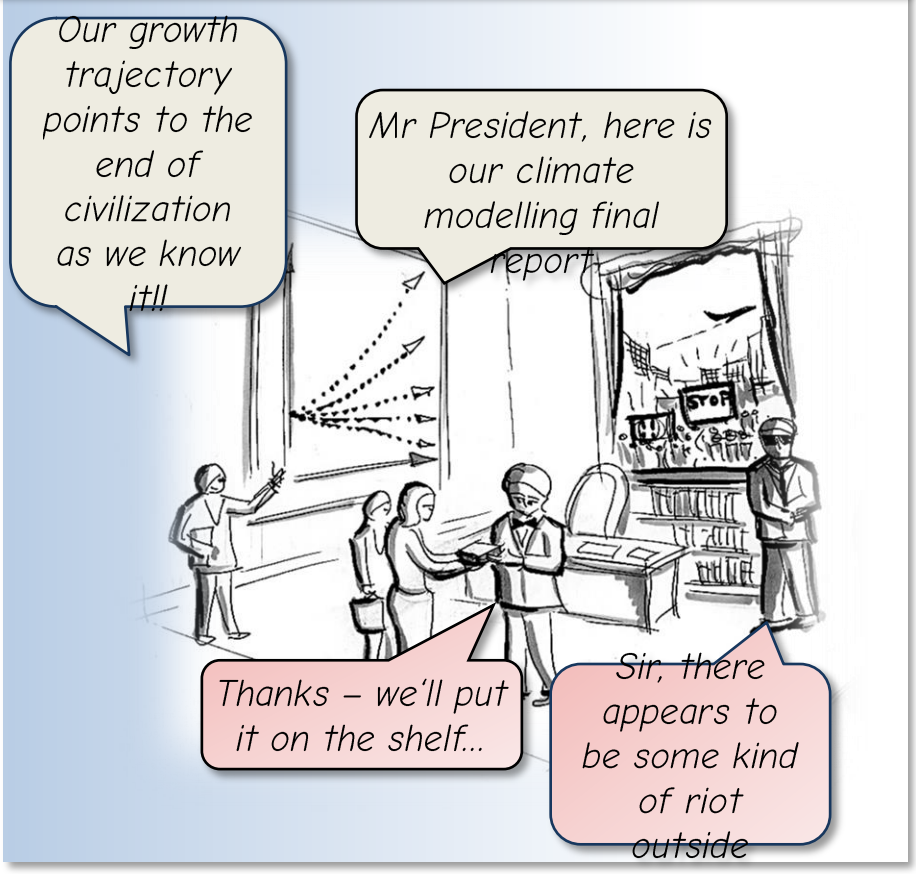
Learning neural (process) pathways: collaborative & self-directed action learning

SCIENCE–III

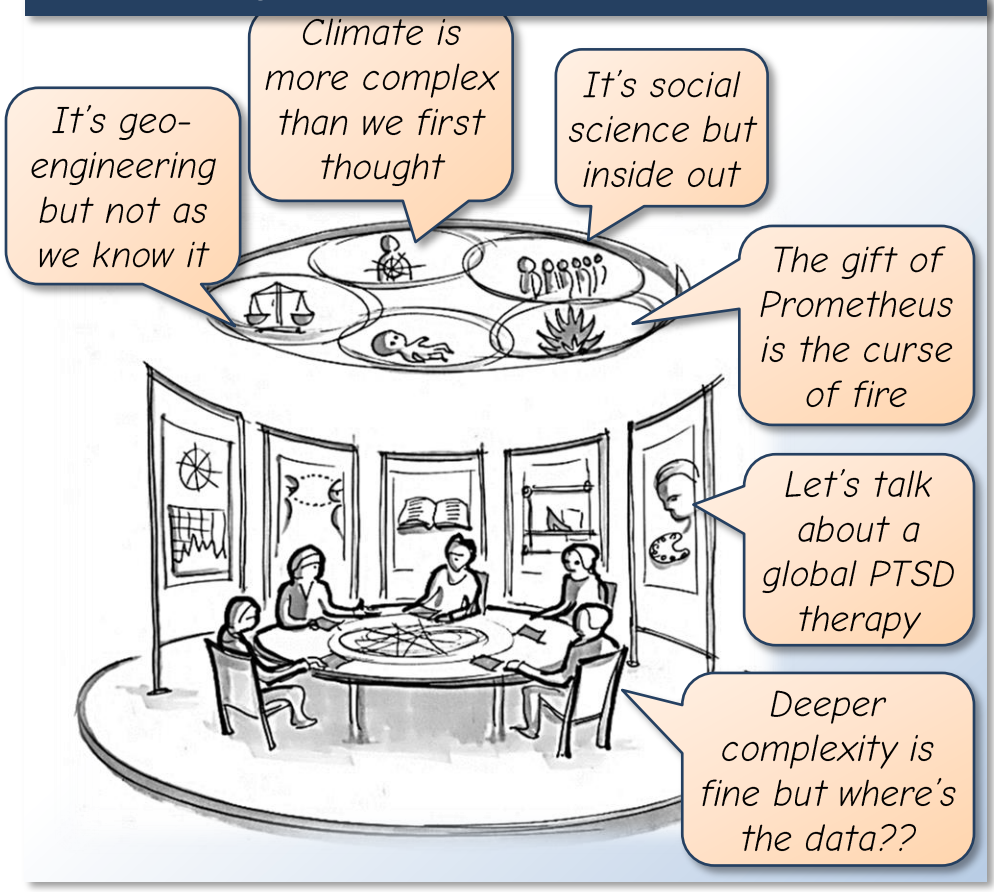
Figure 7-6

Transformation from reductive, to post-normal, to synergistic science paradigm

a) TREND-TARGET CURVES

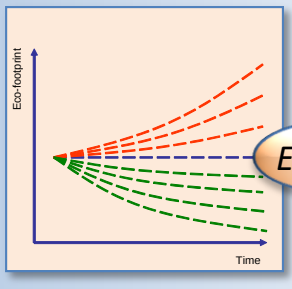


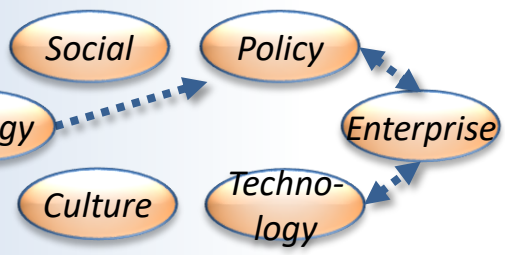
b) CO-LEARNING CURVES



c) REDUCTIVE RESEARCH–I&II

Scientific research is presented to policy-makers as neutral value-free facts / forecasts



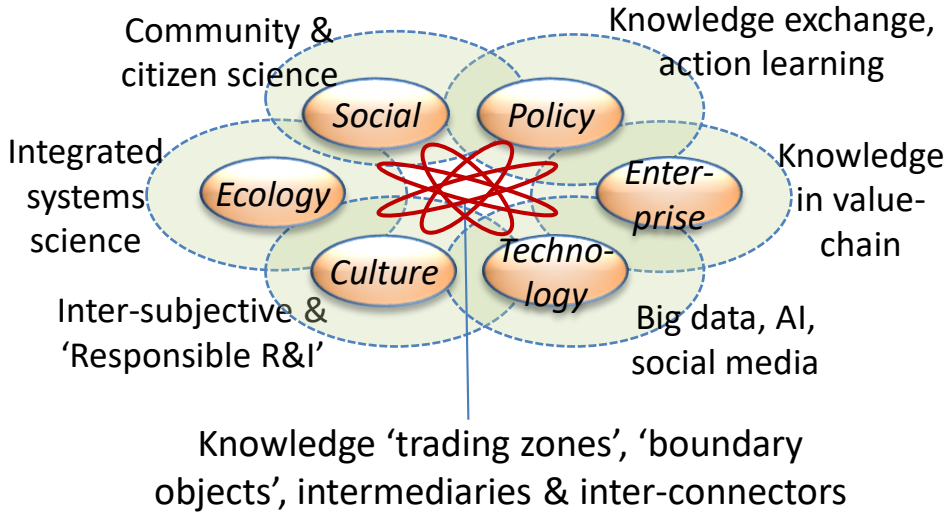


Scenario modelling translates complexity into simple variables

Policy engages with business & technology

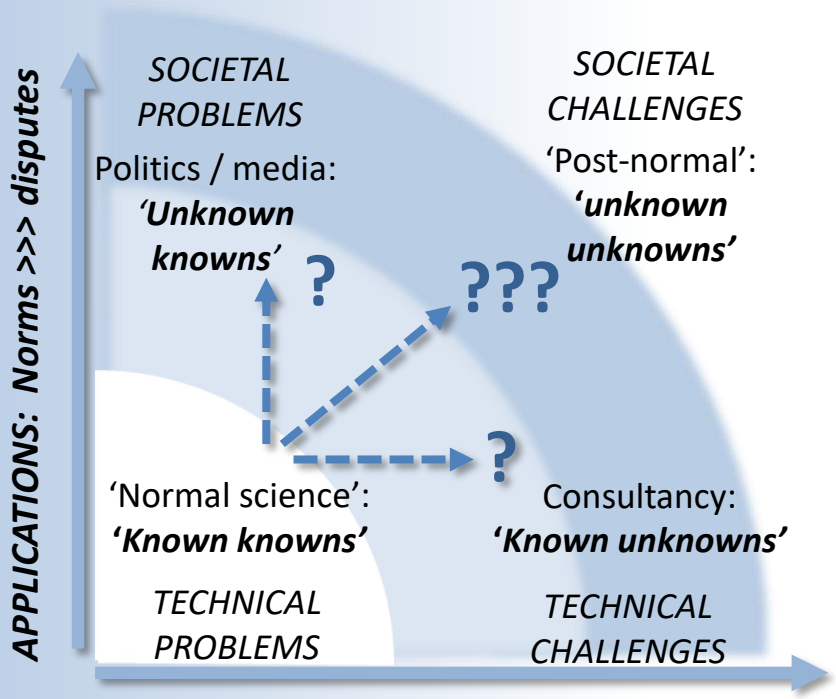
d) SYNERGISTIC RESEARCH–III

Synergistic research is debated with policy, business & society, as 'episteme, phronesis, techne'



e) SYNDROMES & KNOWLEDGE GAPS

'Post-Normal Science' as a space of unresolved questions



f) SYNERGISTIC KNOWLEDGE CYCLE

'Synergistic Science' as a dynamic cycle of unfinished learning

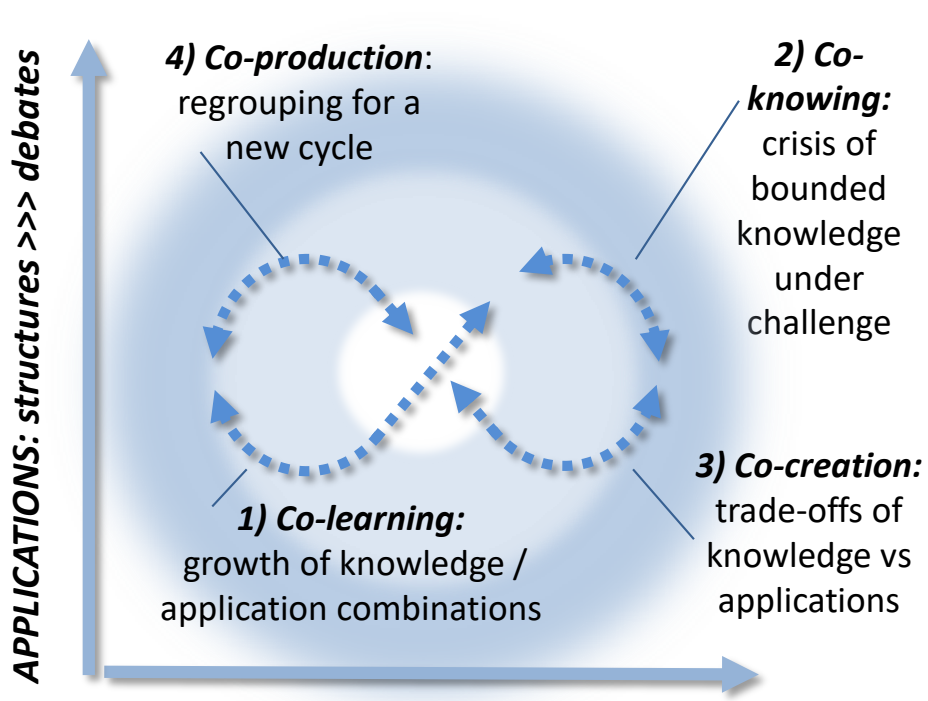
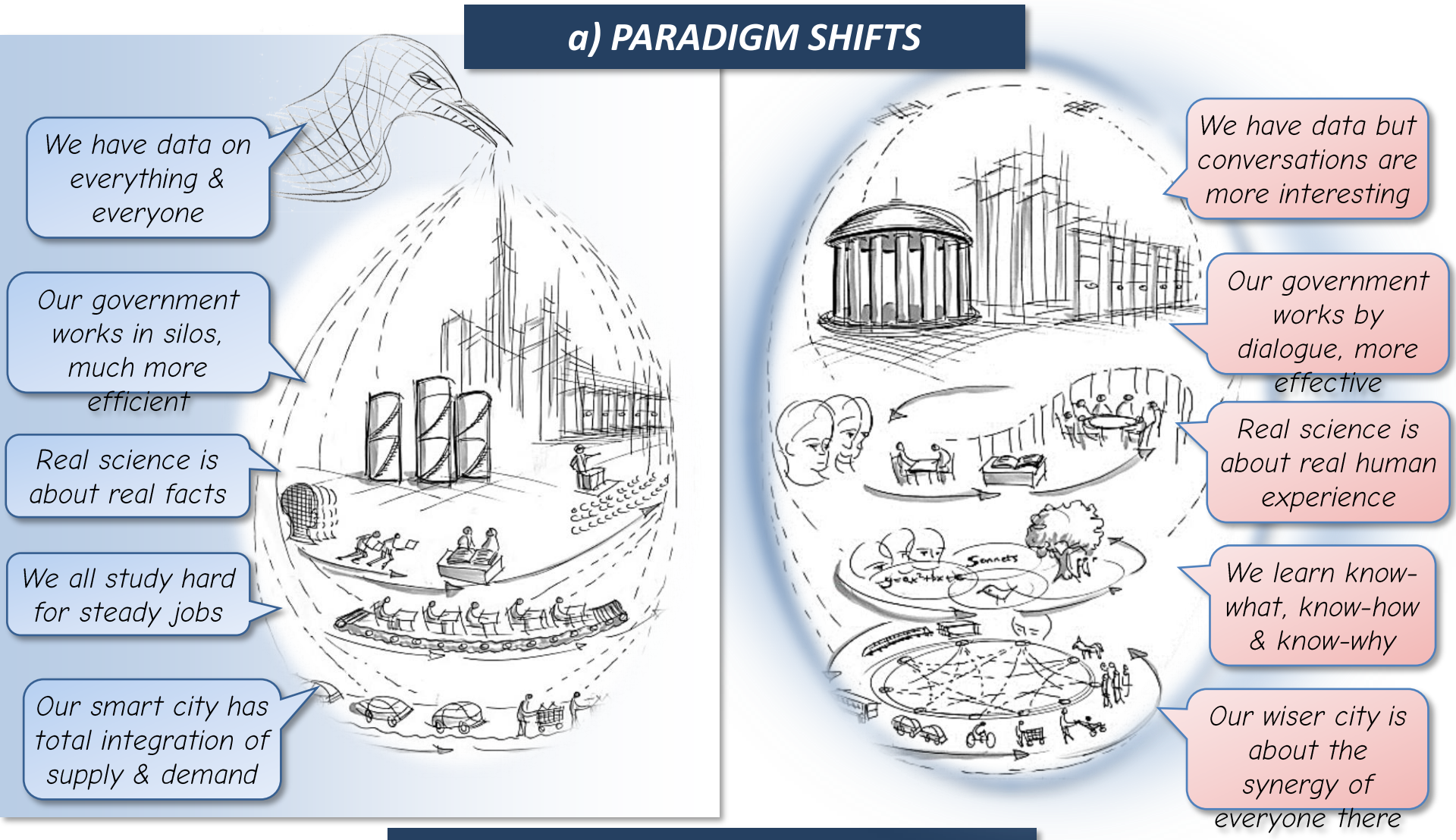


Figure 7-7

TECH-KNOWLEDGES–III

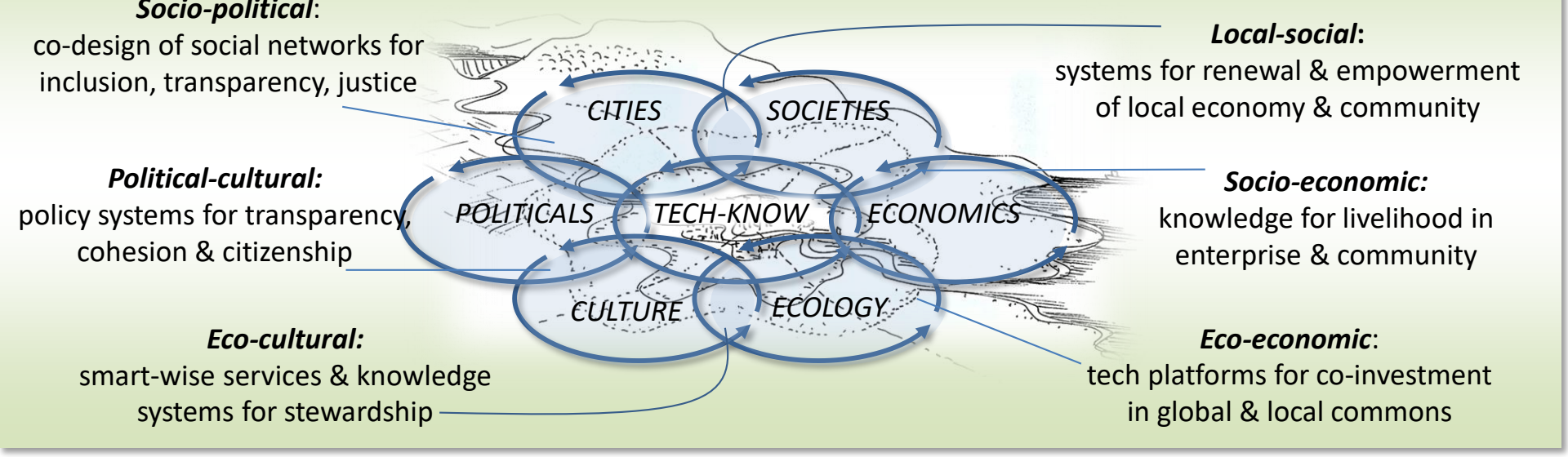
Putting it together: transformation pathways for tech-knowledges from smart to wise

a) PARADIGM SHIFTS



b) TECH-KNOWLEDGES CONNEXUS

Pathways on the interconnections between domains



c) TECH-KNOWLEDGES PATHWAYS