



Governance Processes in Smart City Initiatives

Exploring the implementation of two Dutch Smart City Projects:
TRANSFORM-Amsterdam and TRIANGULUM-Eindhoven

triangulum

TRANSFORM

TU Delft

What is a Smart City?



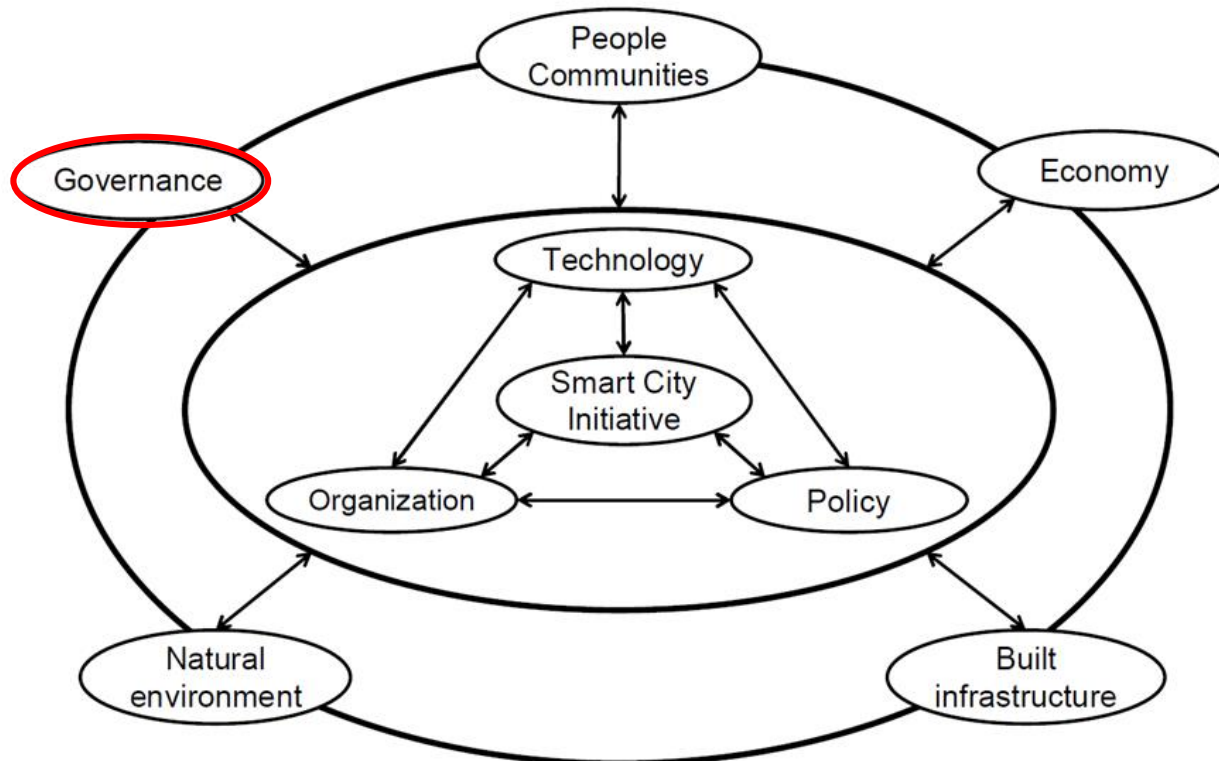
Definition 'Smart City'

"A city seeking to address public issues via ICT-based solutions on the basis of a multi-stakeholder, municipally based partnership"

(EU working definition, 2012)

Smart City Framework

Which factors influence Smart City implementation?



(Chourabi et al. 2012)

Problem statement

A large gap between policy and implementation

Good plans are to be followed by good governance of the city, so governance innovation is an intrinsic part of successful planning and implementation”

(Smart Cities and Communities, 2013)

no comprehensive overview over the barriers and risks that are related to the development and implementation of smart districts”

(Duncan, 2015)

Research objective: to achieve effective implementation of Smart City initiatives by focusing on the governance factors

Main Research Question

How are governance factors used in the implementation of Smart City initiatives Transform in Amsterdam and Triangulum in Eindhoven and how can governance factors improve their implementation?

Smart City governance: “The collective governing in Smart City initiatives based on complex networks of stakeholders without hierarchical structure and line of command and control, meaning to bundle activities of all relevant parties and create an optimal environment to realize agreed upon objectives”

Sub-research Question

1. Which factors influence Smart City implementation?
2. How can governance factors contribute to effective implementation of Smart City initiatives?
3. How are governance factors used in the implementation of European funded Smart City initiatives in Amsterdam (Transform)?
4. How are governance factors used in the implementation of European funded Smart City initiatives in Eindhoven (Triangulum)?
5. How can governance factors improve Smart City implementation in Amsterdam and Eindhoven?

Research methodology

Literature research

RQ 1 & RQ 2

Smart City Framework

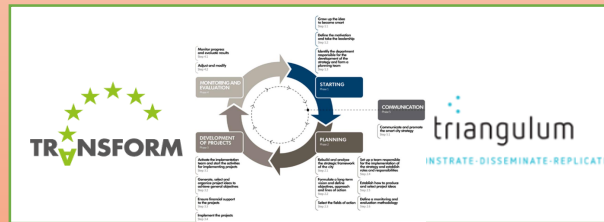
Governance Framework

Governance Factors

Empirical Research

RQ 3 & RQ 4

Research Cases studies & interviews



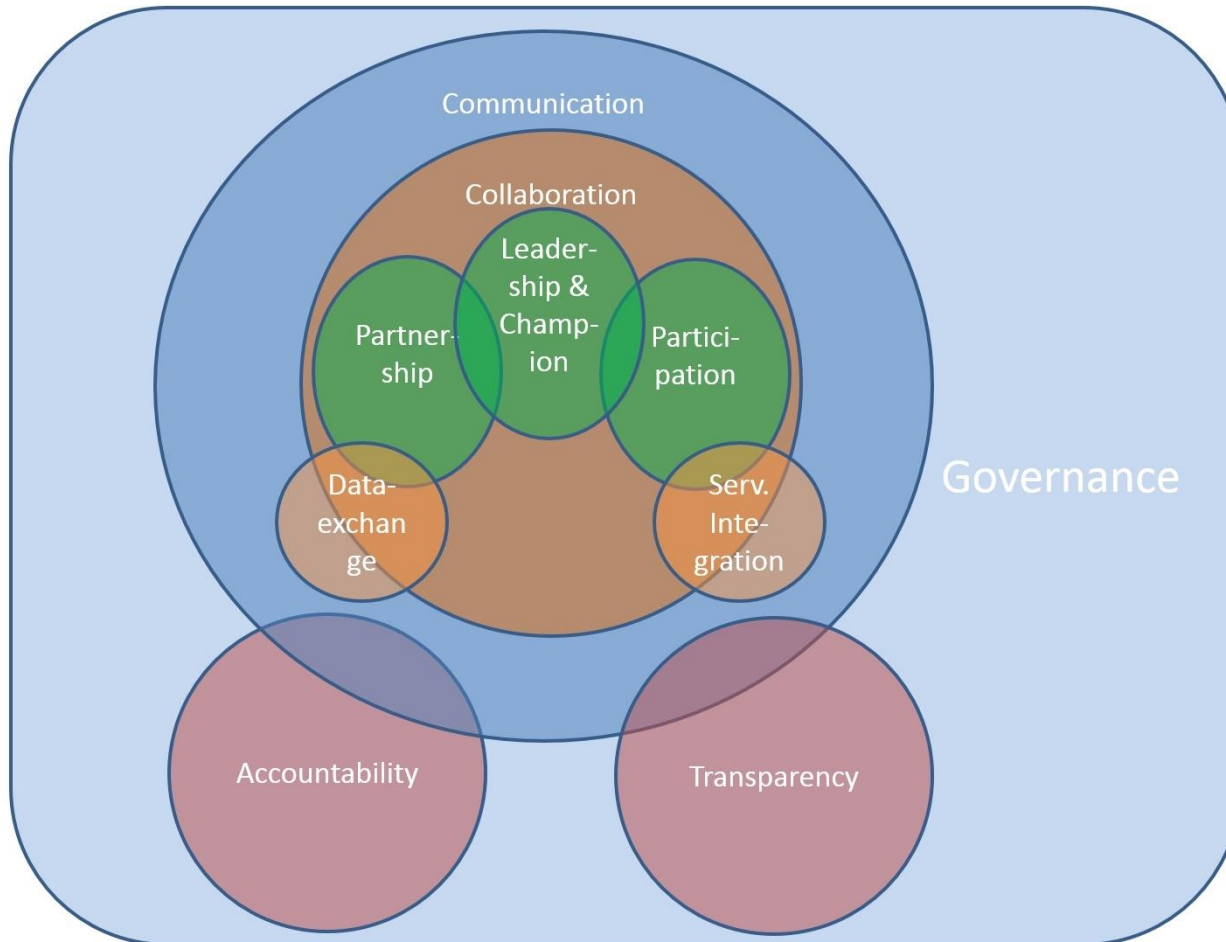
Conclusion

RQ5

Validation Frameworks

Validation Factors

Governance Framework



Collaboration

How can governance factors contribute to effective implementation of Smart City initiatives?

1 Collaboration factors

Who?

- + Organizations from multiple sectors
 - + Municipality interdepartmental
- + Including academic & non-profit
- + Government with different jurisdictions
- + Municipality experienced in international networking

Why?

- + To create innovative solutions based on synergy
 - + Driven by 'free area's' or Living labs

How?

- + Sharing information, resources and authority
- + Sharing vision, objectives and commitment
 - + Sharing regulations & standards and clear roles
 - + Formalised in an organizational format
- + Promoting digital presence
- + Sharing with other cities

Leadership

2 Leadership factors

Who?

- + Top management and Champions from stakeholders (mayor's office, executives)
- + Elected officials and politicians
- + Government willing to work with the community

Why?

To boost a city's capabilities and organizing capacities to design and execute innovative strategies for sustainable competitiveness

How?

- + Strategic focus
- + Clear vision on 'Smart'
- + Championing initiatives
- + Political support / Clear mandate
- + City wide & organizational commitment for change and innovation to achieve quantifiable objectives
- + People able to innovate and act entrepreneurially seeking out new opportunities
- + Building credibility and trust
- + City leaders, managers and administrators can work in partnership with providers
 - To sit on their hands, debating etc.
 - Missing the attitude

Participation

3A Participation factors

Who?

+ Citizens involved both in the plan phase and in the smart city implementation steps

Why?

Ensure that an initiative has the focus on solving the most important problems with solutions that will be generally positively valued by the involved community

How?

- + the adoption of ex-post satisfaction criteria to assess projects outcomes
- + participation is materialized in very different formats like ULL, UTL, Innovation Districts
- + different levels of citizen participation: provision of information, consultation, partnerships, citizen participation in decision making, monitoring city services, and providing feedback
- + governance permits readjustments of goals
- it depends on the presence of public e-services and on the digital awareness and culture of the city population
- being the wish or favor of an existing power

Partnership

3B Partnership factors

Who?

- + A wide range of partners and stakeholders playing different roles
- + A strong local government partner as a key strategic player and co-founder
- Risk avoiding government culture
- + A coalition of business, education, government and individual citizens

Why?

Ensure that an initiative has the focus on solving the most important problems with solutions that will be generally positively valued by the involved community

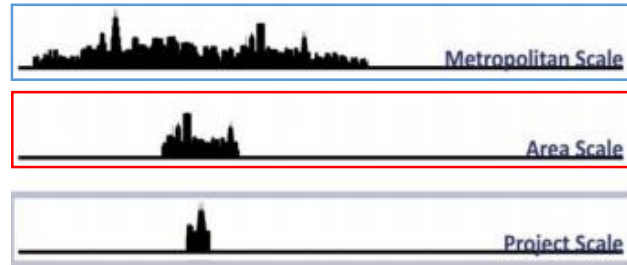
How?

- + Active involvement from every sector of the community is essential. United efforts create synergy
- + Foster participative environments that facilitate and stimulate business, the public sector and citizens to contribute

Transform and Triangulum

	Transform	Triangulum
Consortium European level	Amsterdam, Vienna, Lyon, Genoa, Hamburg and Kopenhagen	Eindhoven, Manchester, Stavanger, +
Cities	Amsterdam	Eindhoven
Smart Urban Labs (urban laboratories)	Amsterdam Southeast	Strijp-S Eckart/Vaartbroek
Period	1 st of January 2013 until the 30 th of June 2015. Status: Completed	1st of January 2015 – 31 December 2019 Status: Ongoing, 16 months in project
<u>Local Partners Or Stakeholders</u>	<u>ASC, AMC, ArenA, Liander, Nuon, HvA, Ikea, ING, ABN, etc.</u>	<u>KPN, Woonbedrijf, Technical University of Eindhoven, Municipality of Eindhoven, Volker Wessels</u>
Themes	Energy	Energy, Mobility, ICT, focus on intersections
Goals	EU 20-20-20 targets	EU 20-20-20 targets
Innovation level	immature	mature (TRL 7-8)
Type subsidy	FP7 Research & innovation Project	Horizon 2020 Implementation project
Funding (Euros)	Total 10 M, Amsterdam ?M	Total 25M, Eindhoven; 6,4 M, '254 months'
Projects	Energy atlas, ArenA-AMC solar parking	Woonconnect, Smart Office, Smart Parking

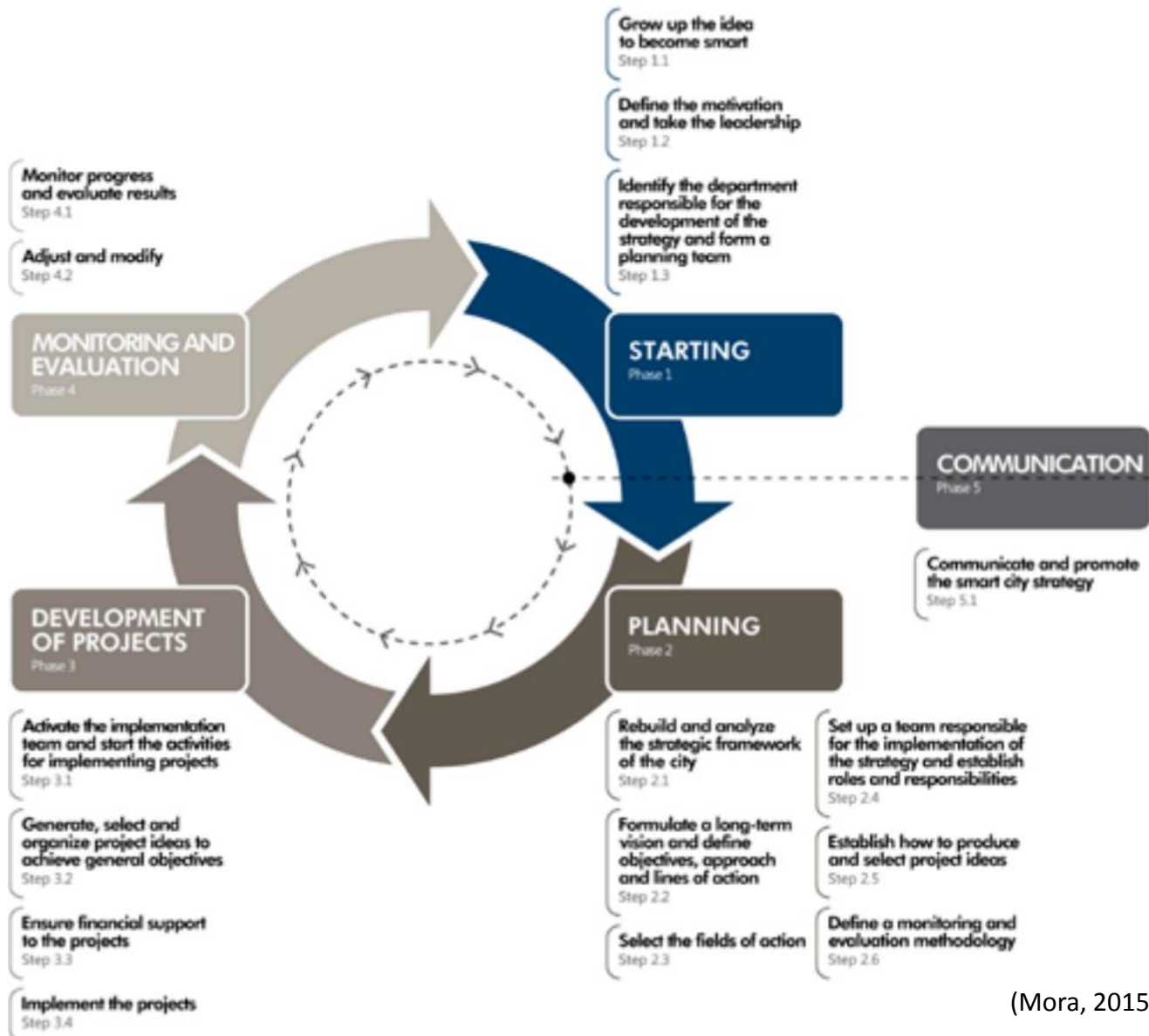
Smart Urban Labs



Amsterdam South East (300 ha)

Eindhoven: Park Strijp-S (27 ha)
Eindhoven Eckart/Vaartbroek (68 ha)

Case Description Model



Governance Transform



What governance factors have been used to stimulate the implementation of European funded Smart City initiatives in Amsterdam?

	Governance aspect/ nr statemen	Transform	%	SF's	Factual	Barriers
1	Collaboration	45	32	13	4	28
2	Leadership & champion	43	30	12	1	30
3	Participation & Partnership	24	17	13	3	8
4	Communication	4	3	4	0	0
5	Data-exchange	10	7	5	2	3
6	Service & application integration	2	1	1	0	1
7	Accountability	8	6	0	1	7
8	Transparency	5	4	1	0	4
	total statements	141	100	49	11	81

Case Transform: Starting



Partners

-  Ontwikkel partner
-  Ontwikkel partner
-  Ontwikkel partner
-  Ontwikkel partner
-  Ymere
-  Accenture
-  Cisco
-  Liander
-  Waternet
-  Alliander
-  Amsterdam ArenA
-  Nuon-Vattenfall

Case Transform: Developing



Datacentre & Greenhouse

Using the waste heat of a data center(s) to heat a new greenhouse. This project researches the possibility to use this type of waste heat and decreasing the CO₂ emissions in the area. Moreover, the project is an experiment to green the data industry and links the city to food production with innovative forms of urban farming in the greenhouse.



Hospital Waste heat

The AMC hospital owns a private powerplant to ensure power for the vital parts of the hospital. Most of the time, the total capacity of the powerplant is not used. Recent ideas are to bring this capacity to the electricity market. If the hospital succeeds in doing so, a big amount of heat is generated to. The possibilities to use this heat in the local district heating system will be examined.



Playground ESCO

A project that invites the ESCO industry to start a small project to overcome the assumed main hurdle: trust. The journey to implementation of an ESCO will reveal the real barriers and helps the ESCO industry to develop suitable services.



Lighthouse IKEA

Showcase within the IKEA store of a sustainable house equipped with solar panels, insulation and IKEA's sustainable products, and a normal house without energy saving measures and basic products. By visualizing the reduction in energy usage and the amount of saved money in € and actual groceries, it will create greater public awareness.



AJAX Public Action

Encouraging the Ajax supporters to use sustainable energy and generate a public motion in a relatively short time. One of the possible concepts is an innovative construction of crowd funding which enables Ajax to support local social facilities with investing in solar panels. Through savings on the energy bill the solar panels energy can be refunded and the structural cost for energy will drop.



Solar gambling

Raising awareness by playing! Present a working solar panel on the local market and let people bet. People can place a bet for free on the estimated amount of energy the solar panel will produce. Prizes are coupons for services and products of local retailers: a free meal, a haircut or groceries. Monthly prizes are bigger: a ticket for the Ziggo dome or Pathé, and the yearly prize could be a solar panel or an e-bicycle.



Community Lighthouse

Inspiration lighthouses are schools, libraries, community centers and youth centers in South-East that run a program for children (and their parents) on renewable energy and energy efficiency. The program is based on learning about renewable energy in a light, playful way in order to challenge people to undertake new initiatives. State of the art technologies are presented in an understandable, visual way.



Smart living Gaasperdam

Combining several new, innovative products and services on energy reduction and smart living for the residents of Gaasperdam. In that way, companies can make smart product combinations and present a package at once to the residents. This new impetus in the area raises the comfort of current residents and make the area more attractive for new residents.

Case Transform: Monitoring & Evaluation

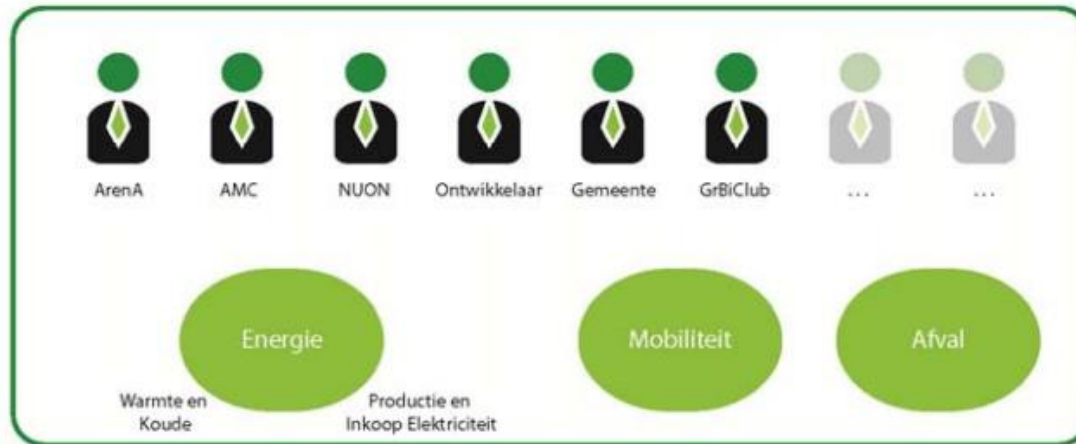
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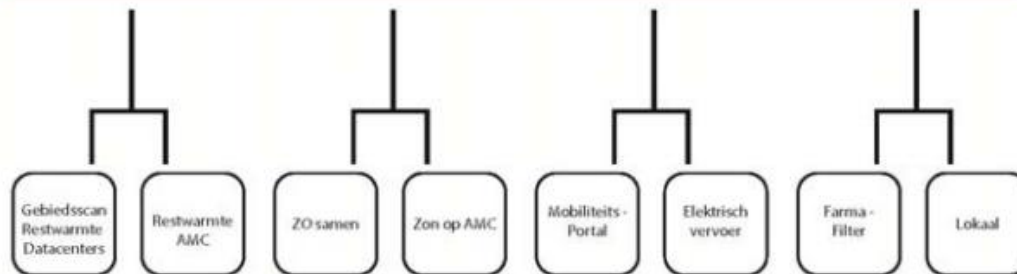


THEMA'S

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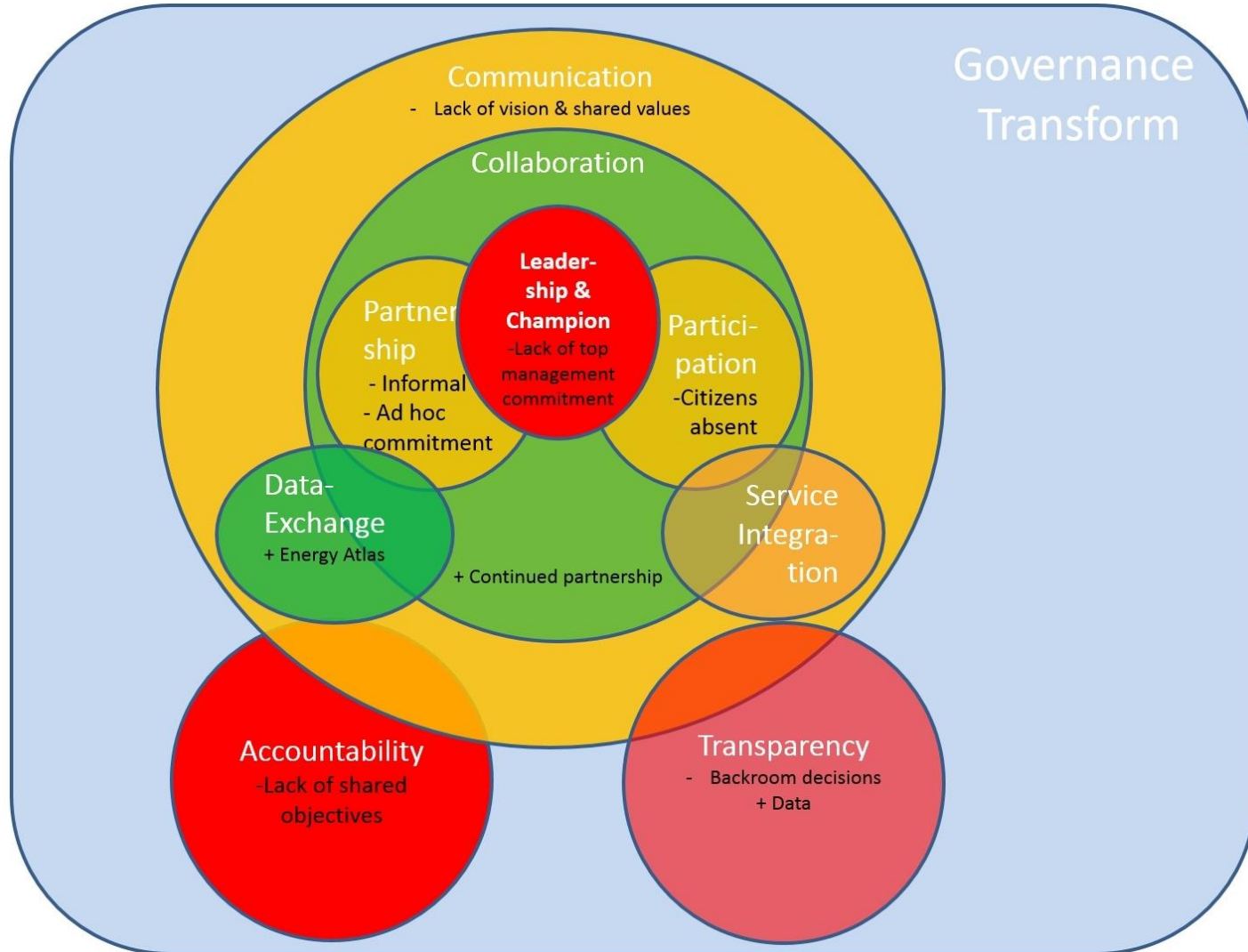
PROJECTEN



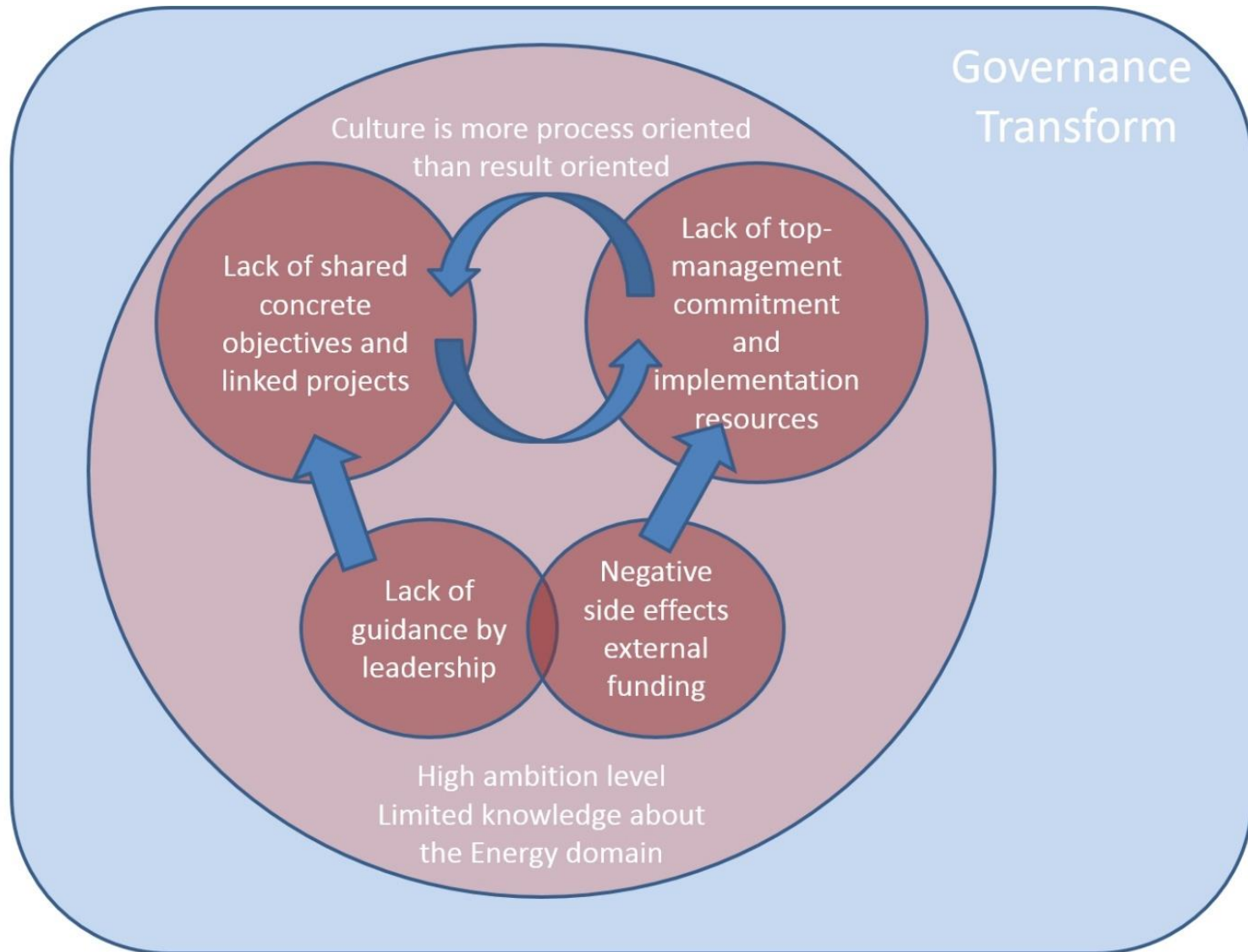
Case Transform: Communication



Conclusion Governance Transform



Conclusion Governance Transform

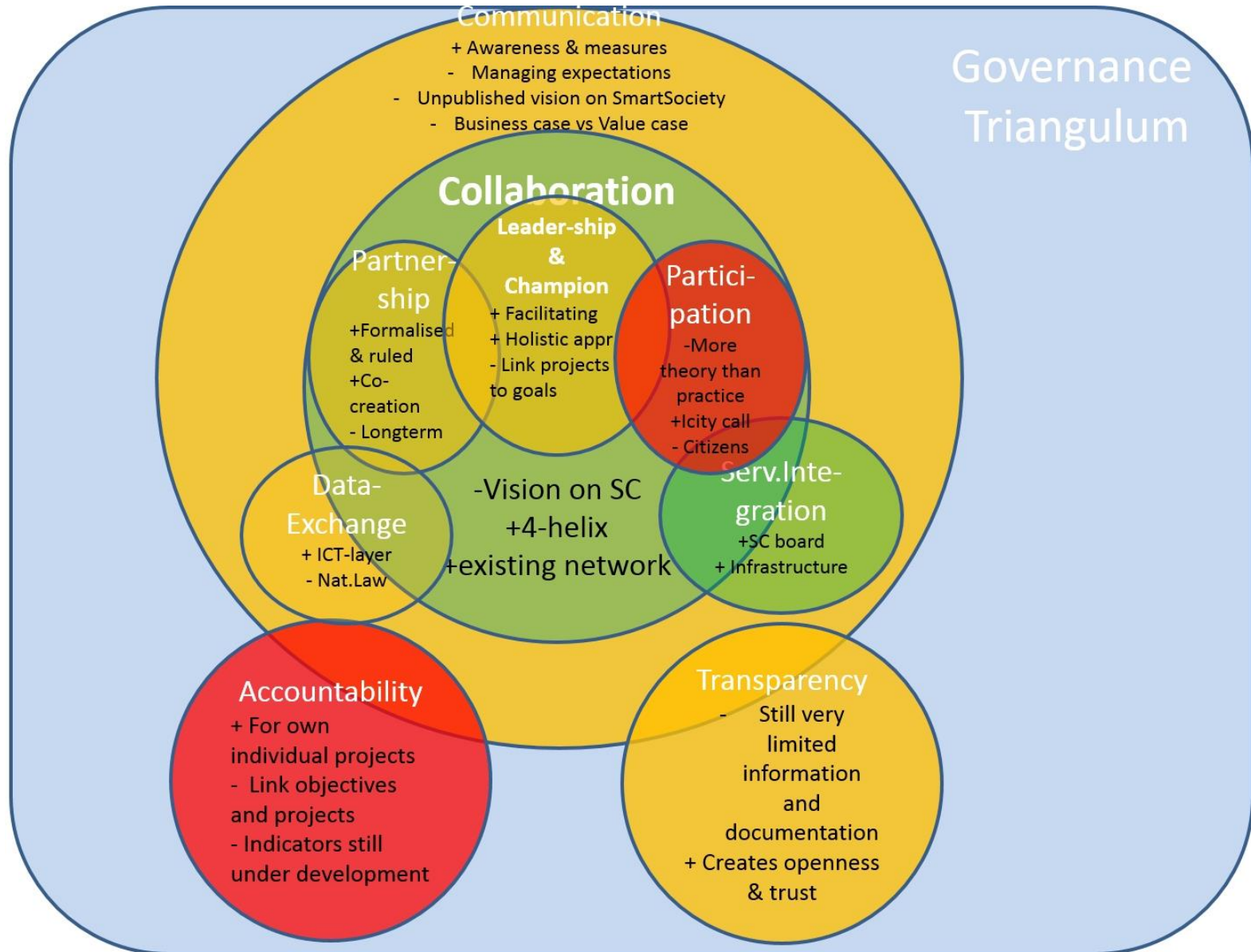


Governance Triangulum

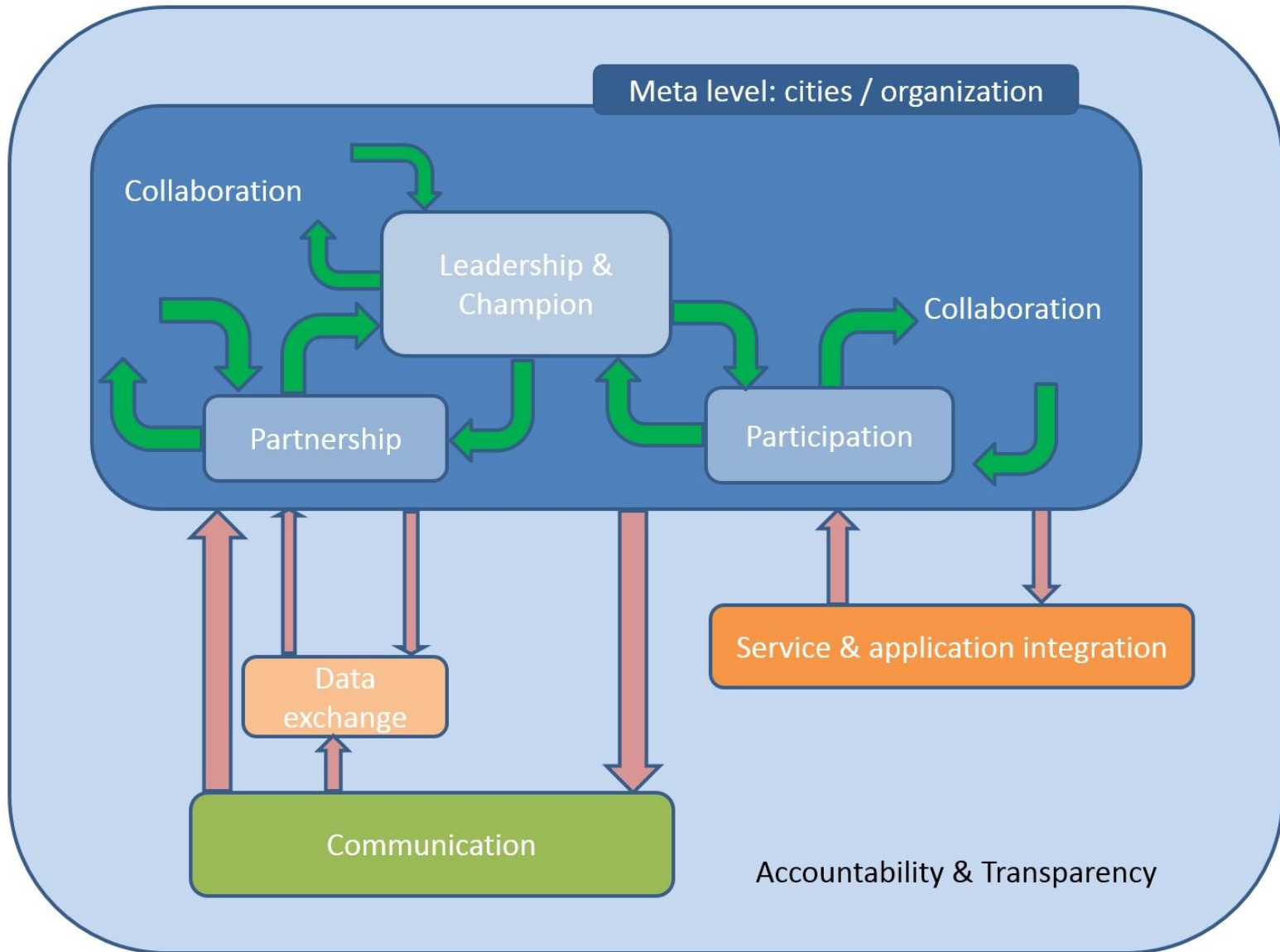
What governance factors have been used to stimulate the implementation of European funded Smart City initiatives in Eindhoven?

	Governance aspect/ nr statemen	Triangulum	%	SF's	Factual	Barriers
1	Collaboration	33	33	22	2	7
2	Leadership & champion	13	13	8	5	0
3	Participation & Partnership	26	26	19	4	3
4	Communication	7	7	6	0	1
5	Data-exchange	5	5	2	1	2
6	Service & application integration	7	7	4	2	1
7	Accountability	4	4	4	0	0
8	Transparency	6	6	4	0	2
	total statements	101	100	69	14	16

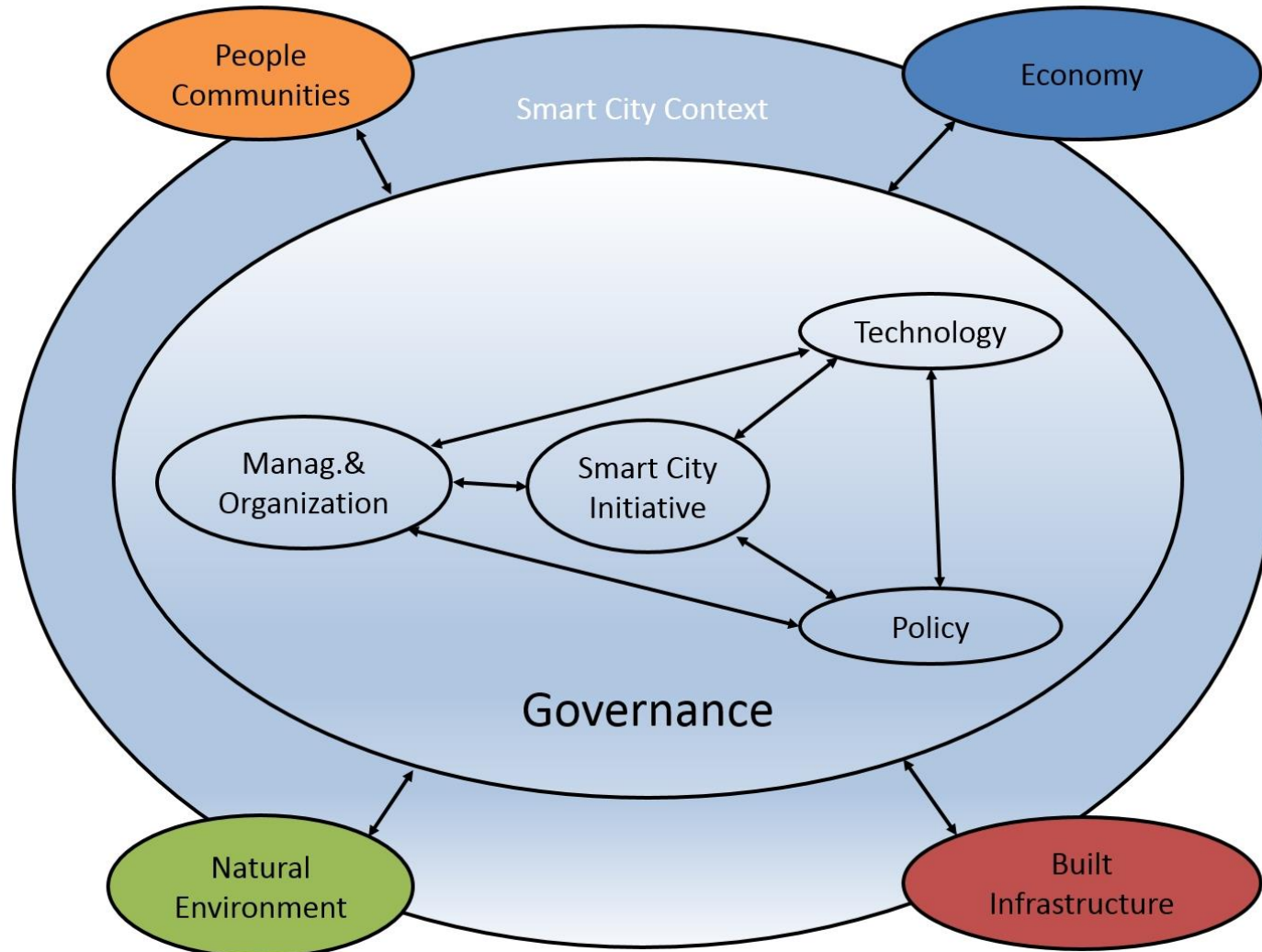
Conclusion Governance Triangulum



Revised Governance Model



Revised Integrative Framework





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