SUSTAINABLE SMART CITY CONCEPT AND INTEGRATED LANDSCAPE MANAGEMENT

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The Key Ideas

- The Global Risks Galaxy
- Smart City
- Highflyers approach

The Future

- The world's urban population is expected to double by 2050. By 2030, six out of every ten people will live in a city and, by 2050, this figure will run to seven out of ten.
- In real terms, the number of urban residents is growing by nearly 60 million people every year. As the planet becomes more urban, cities need to become smarter.

Concept of Smart City

- ***Smart City*** is a city seeking to address public issues ***via ICT based solutions*** on the basis of a multi-stakeholder, municipally based partnership.

Technological Risk Description

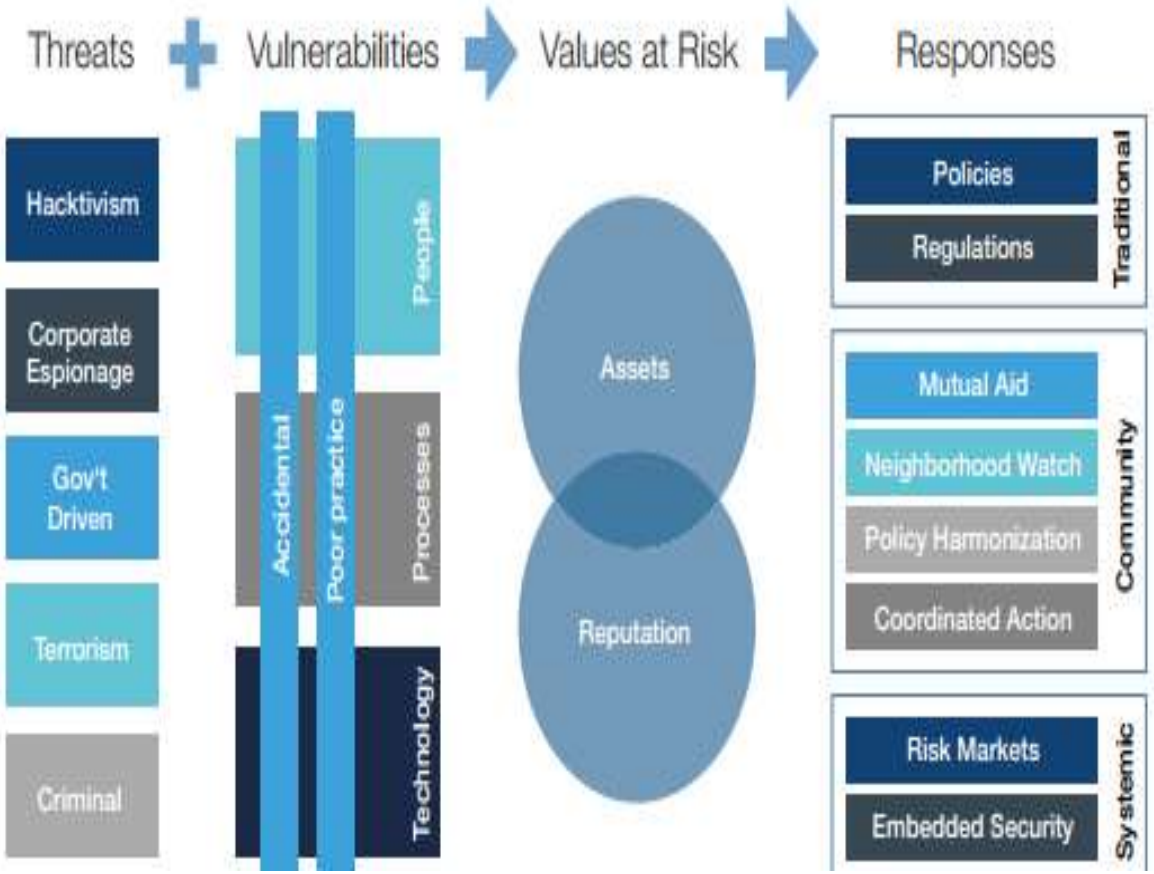
Critical systems failure	**Single-point system vulnerabilities trigger cascading failure or critical information infrastructure and network.**
Cyber attacks	**State-sponsored, state affiliated, criminal or terrorist cyber attacks.**
Failure of intellectual property regime	**Ineffective intellectual property protections undermine research and development, innovation and investment.**
Massive Digital misinformation	**Deliberately provocative, misleading or incomplete information disseminates rapidly and extensively with dangerous consequences.**
Massive incidents of data fraud/theft	**Criminal or wrongful exploitation of private data on an unprecedented scale.**
Mineral resource supply vulnerability	**Growing dependence of industries on minerals that are not widely sourced with long extraction-to-market time lag for new sources.**
Proliferation of orbital debris	**Rapidly accumulating debris in high-traffic geocentric orbits jeopardizes critical satelite infrastructure.**
Unintended consequences of nanotechnology	**The manipulation of matter on an atomic and molecular level raises concerns on nanomaterials toxicity.**
Unintended consequences of new life science technologies	**Advances in genetics and synthetic biology produce unintended consequences, mishaps or are uses as weapons.**

Source: World Economic Forum

Critical Failure is the Centre of Gravity in the Technological Category

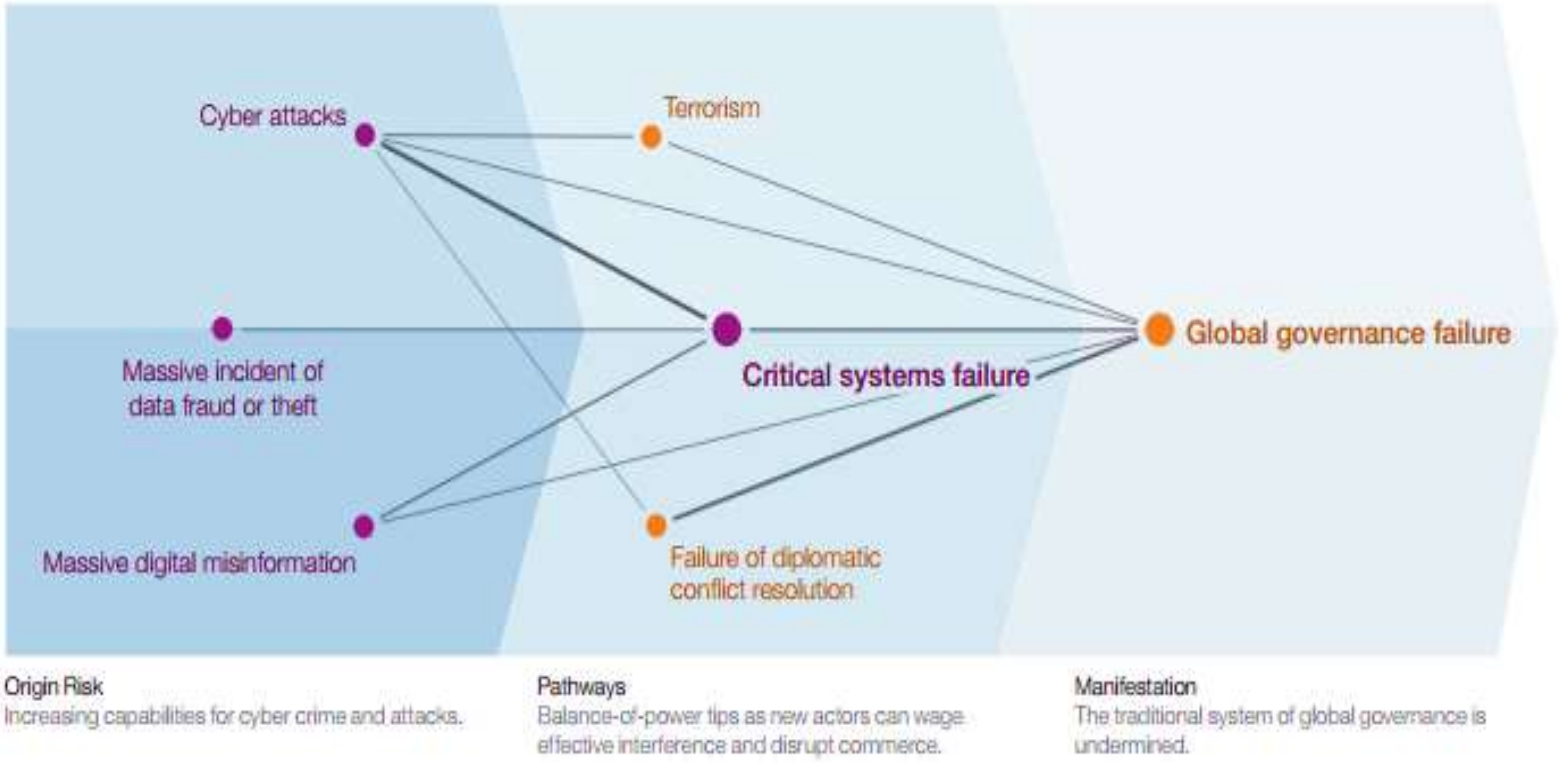
Source: World Economic Forum

Framework for Cyber Threats and Responses



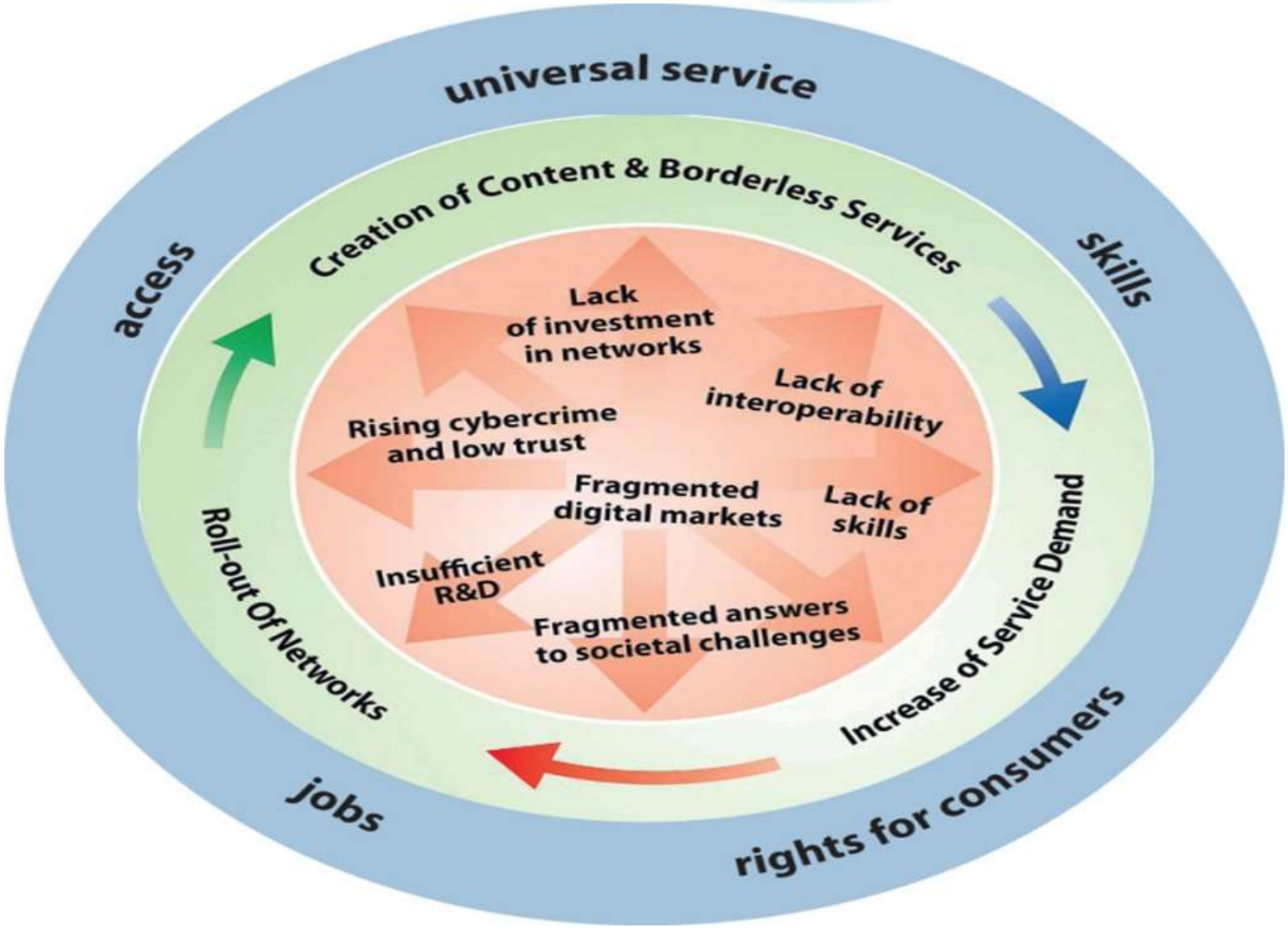
Source: World Economic Forum

The Dark Side of Connectivity Constellation



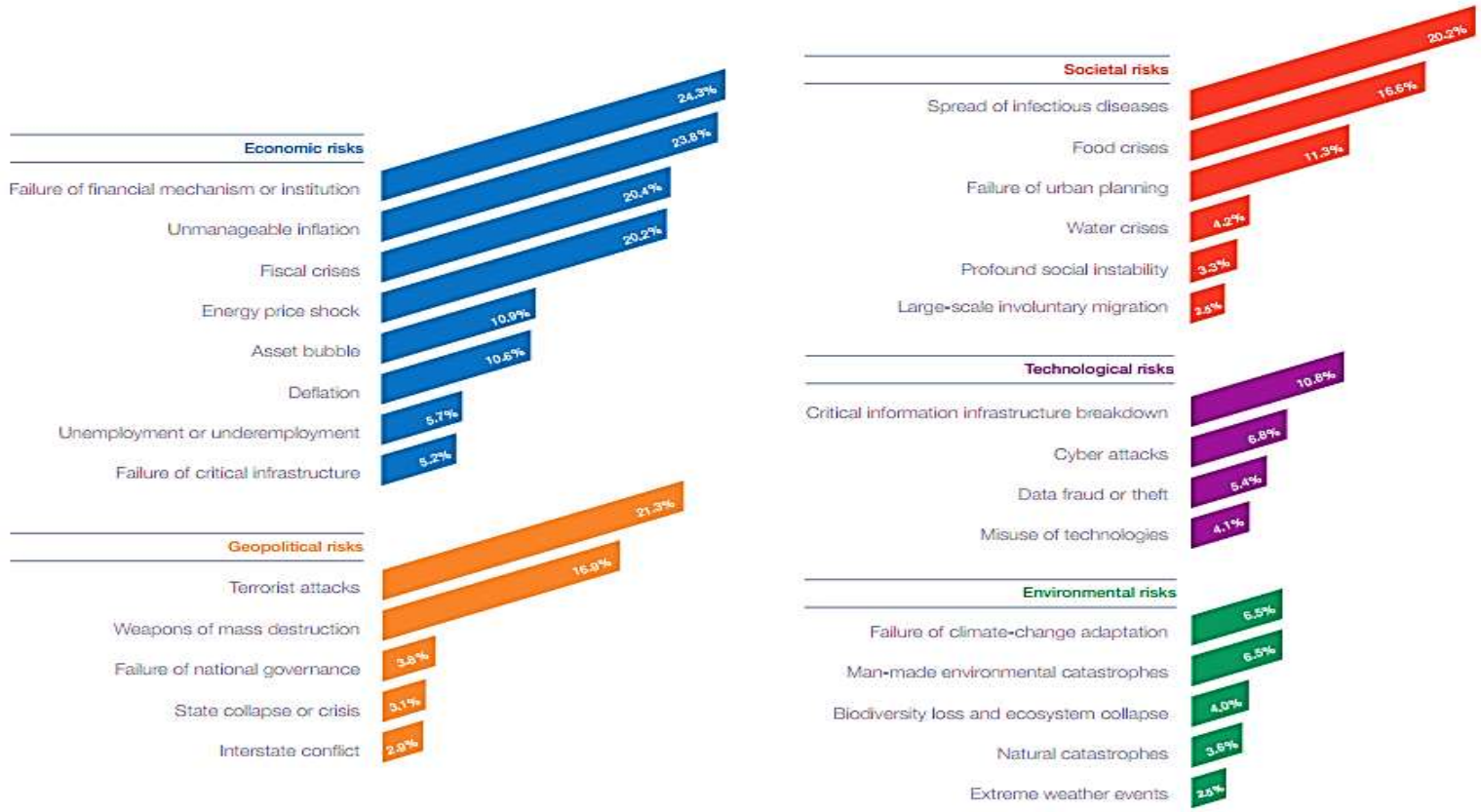
Source: World Economic Forum

Virtuous Cycle of the Digital Economy



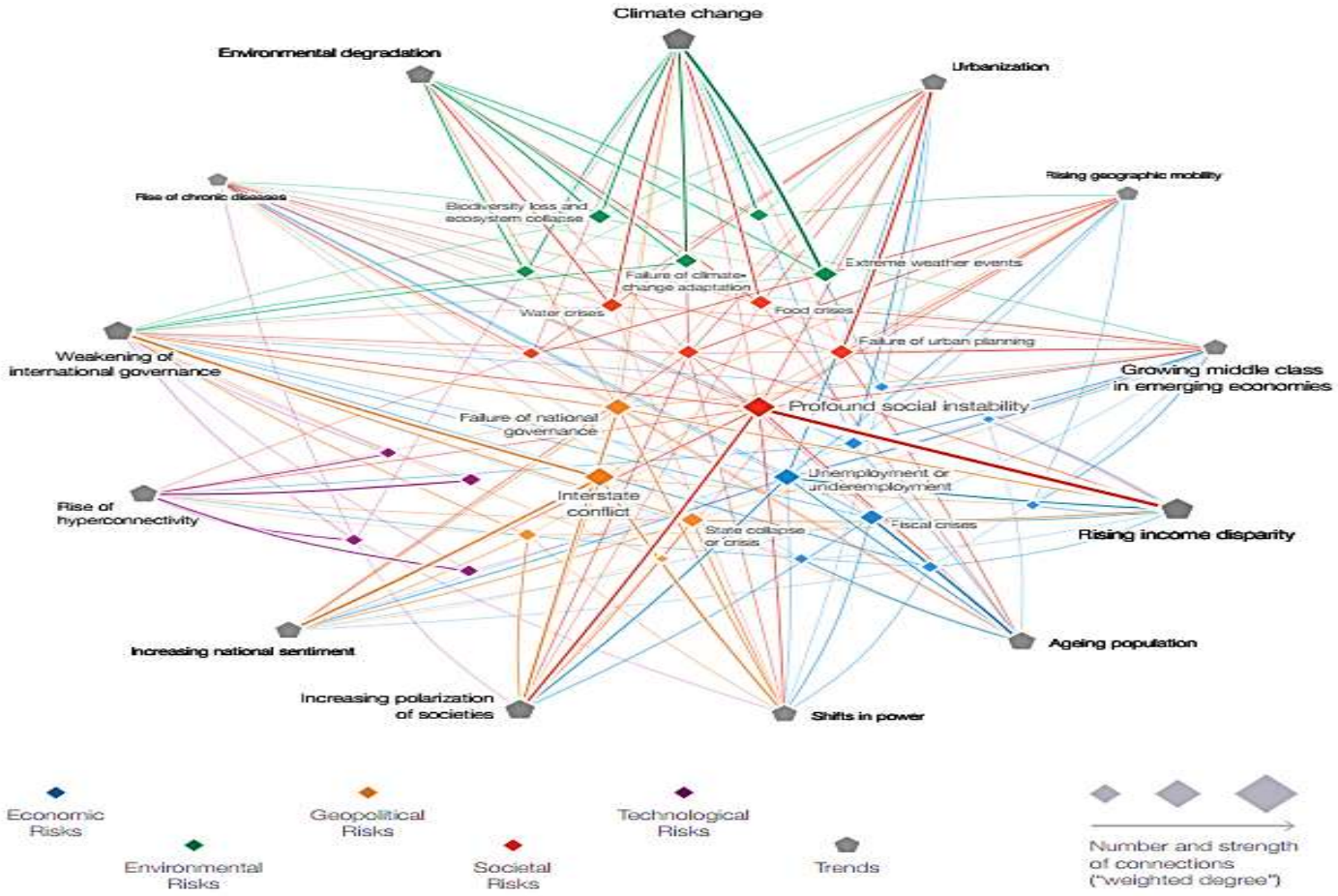
Source: ECA Digital Agenda for Europe , 2010

Global Risks for Which Most Progress Has Been Made within the Last 10 Years



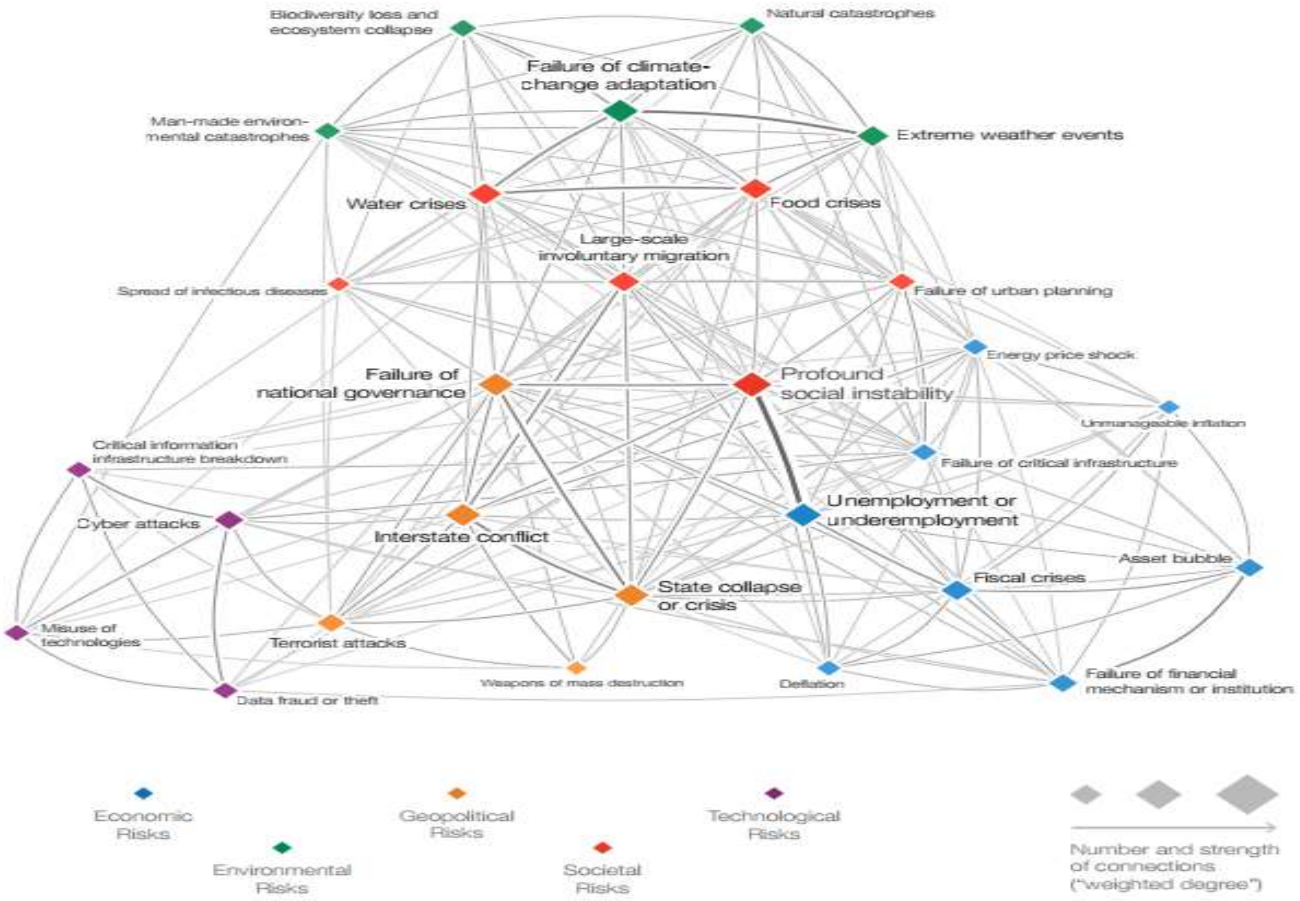
Source: Global Risks Perception Survey 2014, World Economic Forum

The Risks-Trends 2015 Interconnections Map



Source: Global Risks Perception Survey 2014, World Economic Forum

The Global Risks 2015 Interconnections Map



Source: Global Risks Perception Survey 2014, World Economic Forum

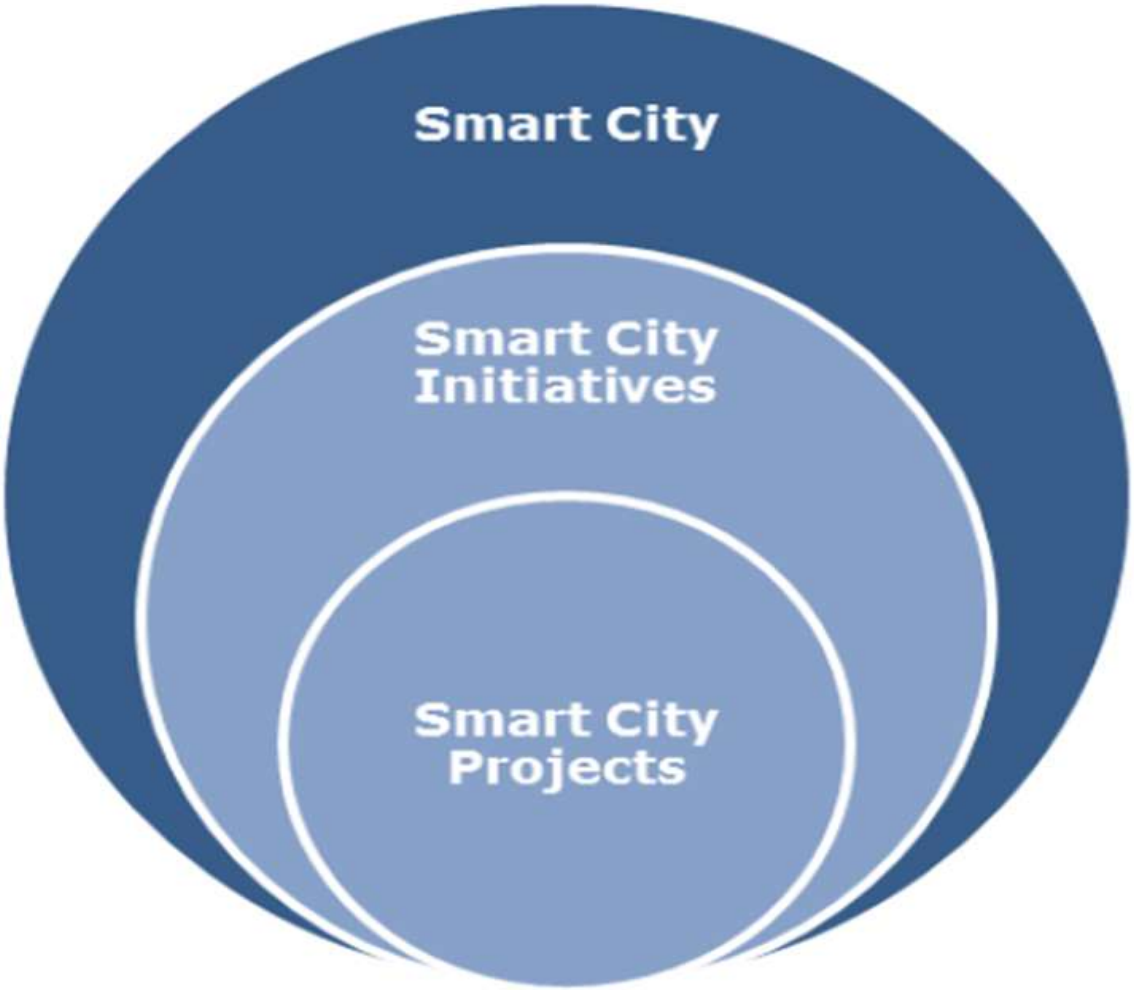
The Idea

- At its core, the idea of Smart Cities is rooted in the ***creation and connection of human capital, social capital and Information and Communication Technology (ICT) infrastructure in order to generate greater and more sustainable economic development and a better quality of life***.

Smart City solutions

- Smart City solutions are developed and refined through Smart City initiatives, either as discrete projects or (more usually) as a network of overlapping activities.

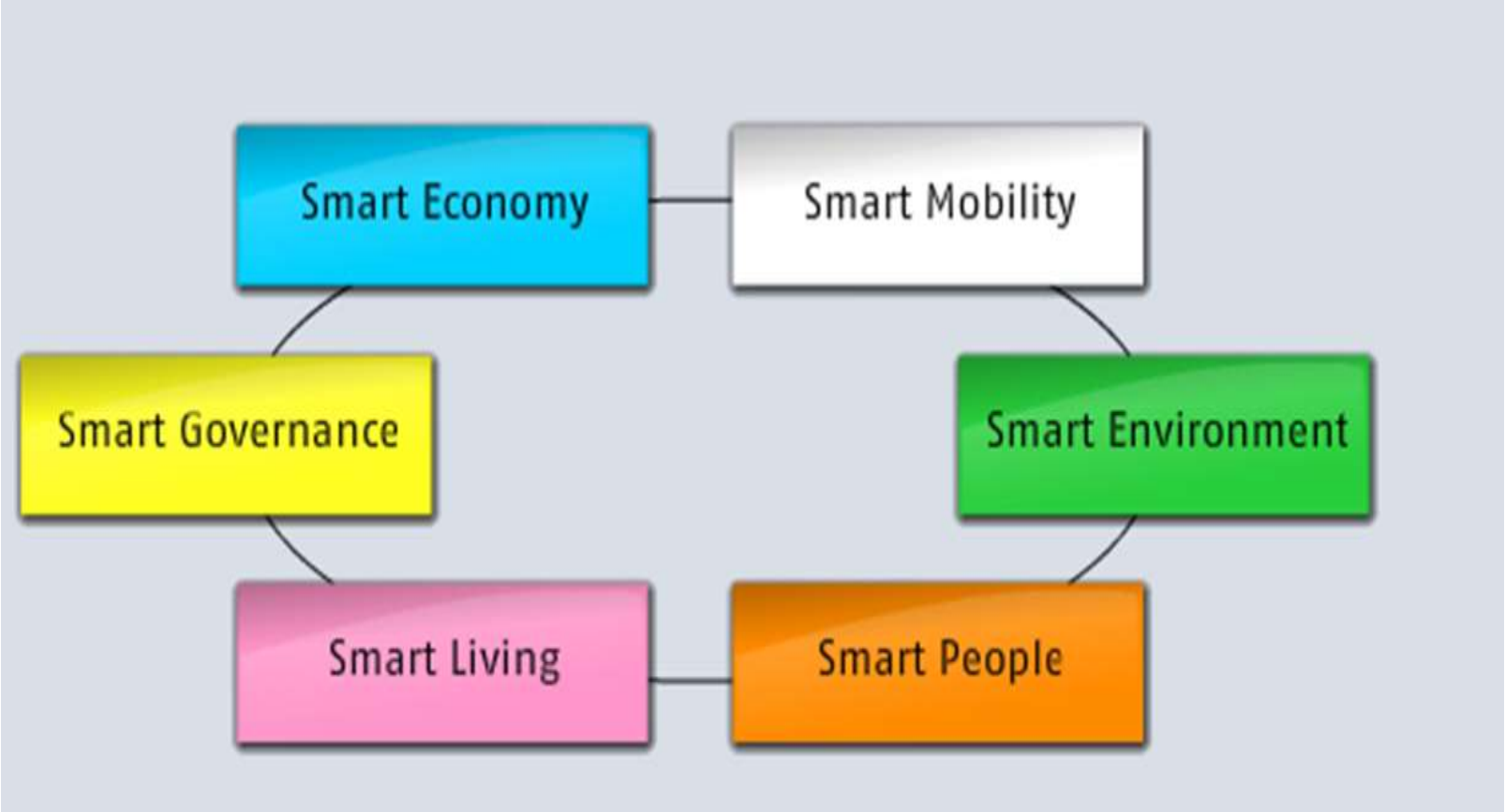
The relationship between Projects, Initiatives and Cities



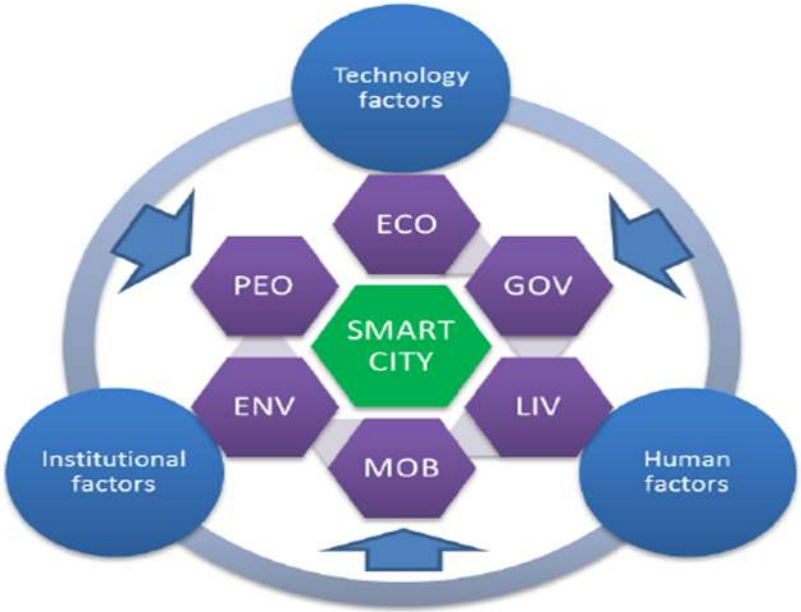
A Smart City is a city well performing in 6 characteristics, built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens.

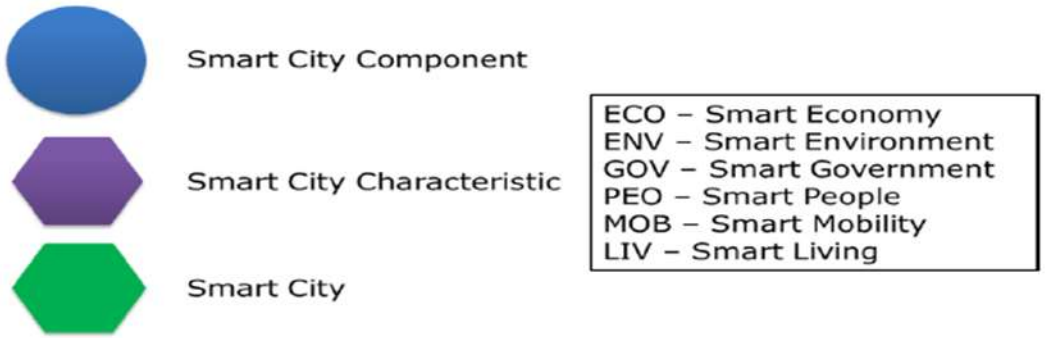
Smart City characteristics

Six characteristics constitute the ends for which stakeholders participate in a Smart City initiative



The relationship between components and characteristics of Smart Cities





Planning and Management
People, Infrastructure

Planning and Management

Long term insights based on comprehesive data analysis, followed up through efficient daily management, help a city stay vital and safe for its citizens and businesses (Big Data analytics).

Infrastructure

- Smarter cities of all sizes are capitalizing on new technologies and insights to transform their systems, operations and service delivery.
- Fundamental services - ***such as roadways, mass transit and utilities*** - make a city desirable and livable, but the key to keeping them viable is ***readiness for constant change***.

People

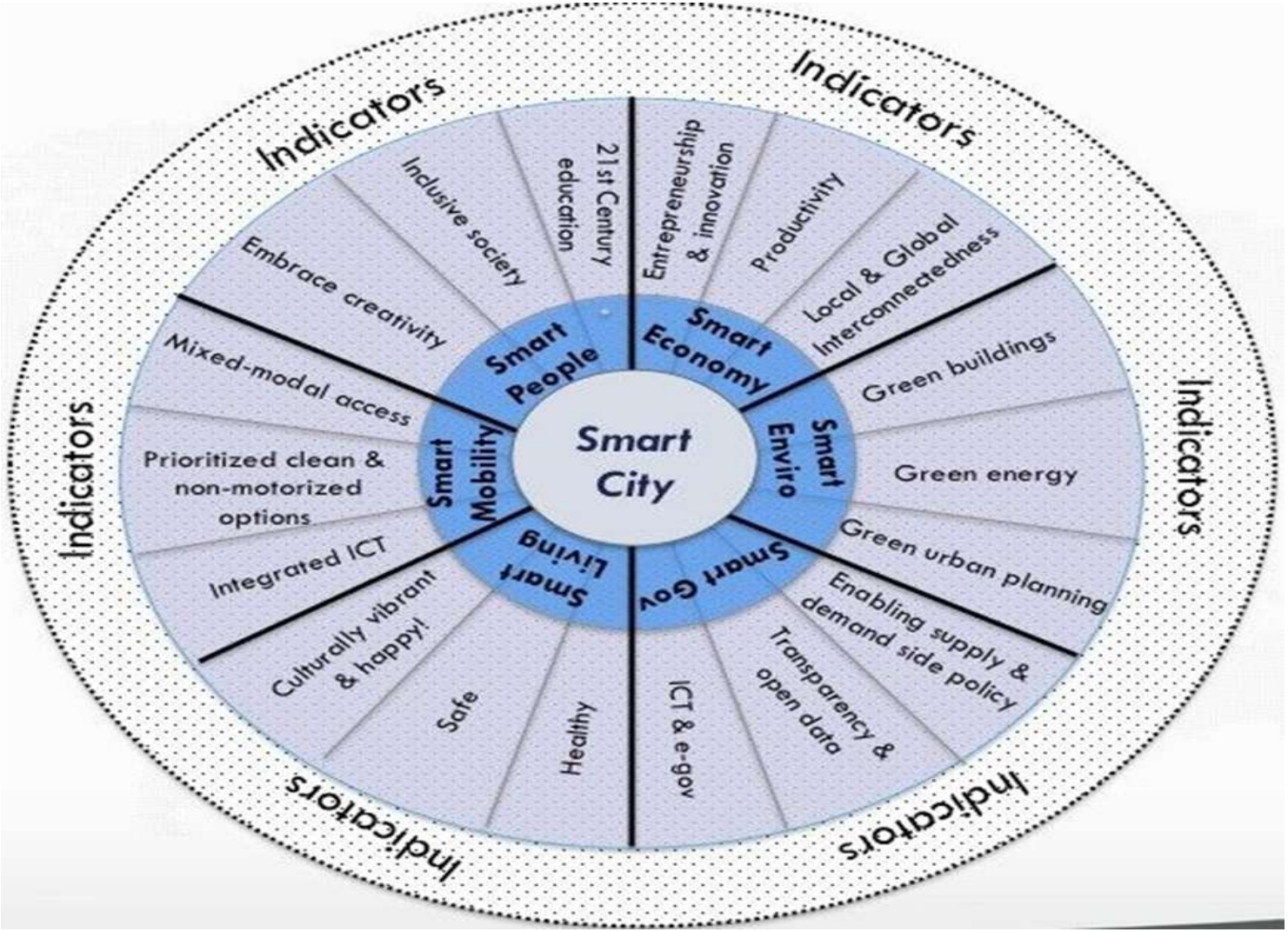
- Smarter cities use the system of systems to their advantage when supporting the needs of each citizen through social programs, healthcare and education.

For smart cities to become wise, more than just technology is needed. Steve Jobs, in a 1994 interview in Rolling Stone magazine, perhaps said it best:

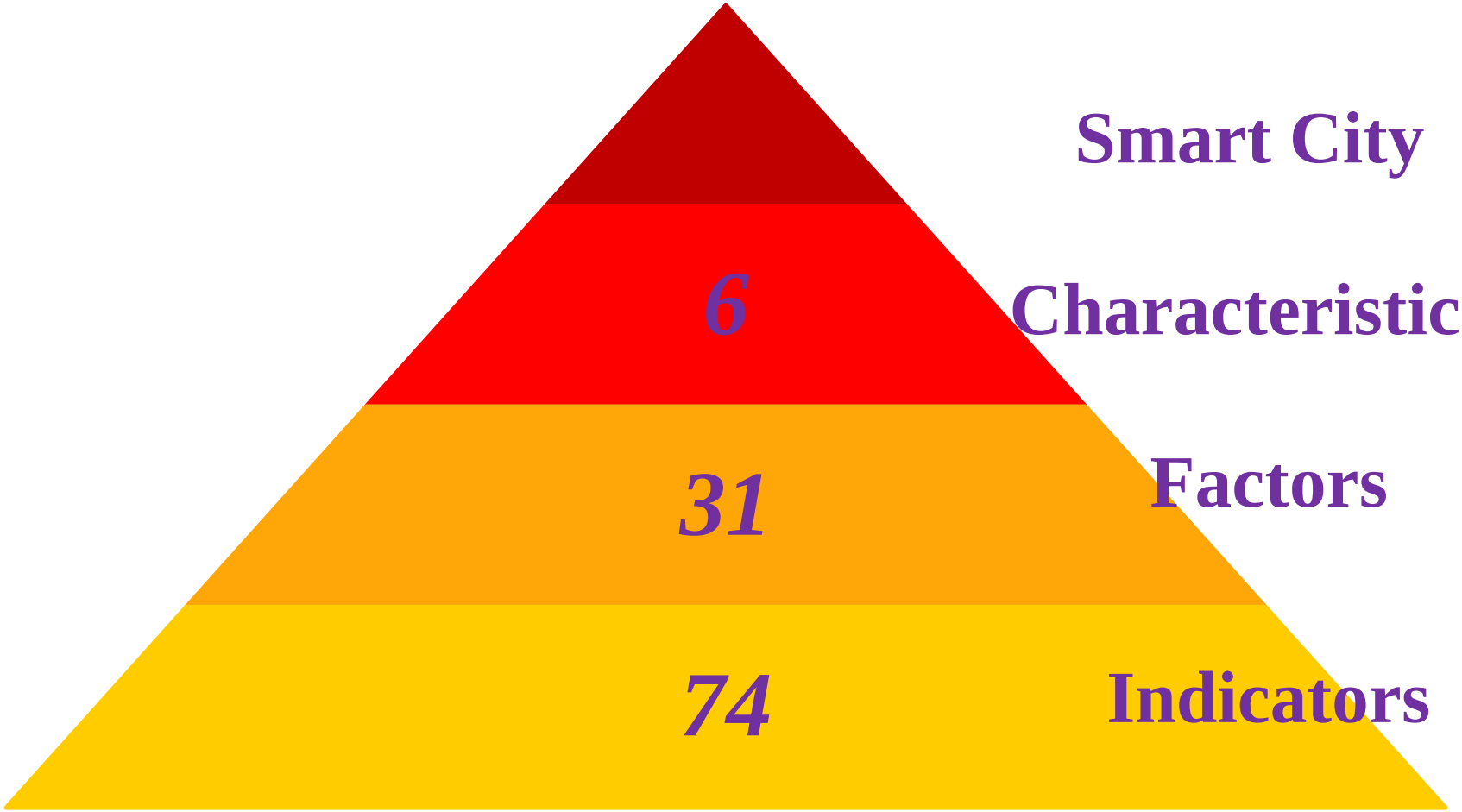
- ***"Technology is nothing. What's important is that you have faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them".***


Smart Buildings
Smart Water
Smart Mobility
Smart Energy
Smart Integration
Smart Public Services

Factors and Indicators



Standardization and aggregation



- To compare the different indicators it is necessary to standardize the values. One method to standardize is by z-transformation.
- This method transforms all indicator values into standardized values with an average 0 and a standard deviation 1.
- This method has the advantages to consider the heterogeneity within groups and maintain its metric information.
- Furthermore a high sensitivity towards changes is achieved.

Smart Economy

	indicators	weighting
Innovative spirit	3	17%
Entrepreneurship	2	17%
Economic image & trademarks	1	17%
Productivity	1	17%
Flexibility of labour market	2	17%
International embeddedness	3	17%
Ability to transform	0	0%
	12	**100%**

Smart Mobility

	indicators	weighting
Local accessibility	3	25%
(Inter-)national accessibility	1	25%
Availability of ICT-infrastructure	2	25%
Sustainable, innovative and safe transport systems	3	25%
	9	**100%**

Smart Environment

	indicators	weighting
Attractivity of natural conditions	2	25%
Pollution	3	25%
Environmental protection	2	25%
Sustainable resource management	3	25%
	10	**100%**

Smart People

	indicators	weighting
Level of qualification	4	14%
Affinity to life long learning	3	14%
Social and ethnic plurality	2	14%
Flexibility	1	14%
Creativity	1	14%
Cosmopolitanism/Open-mindedness	3	14%
Participation in public life	2	14%
	20	**100%**

Smart Living

	indicators	weighting
Cultural facilities	3	14%
Health conditions	4	14%
Individual safety	3	14%
Housing quality	3	14%
Education facilities	3	14%
Touristic attractivity	2	14%
Social cohesion	2	14%
	20	**100%**

Smart Governance

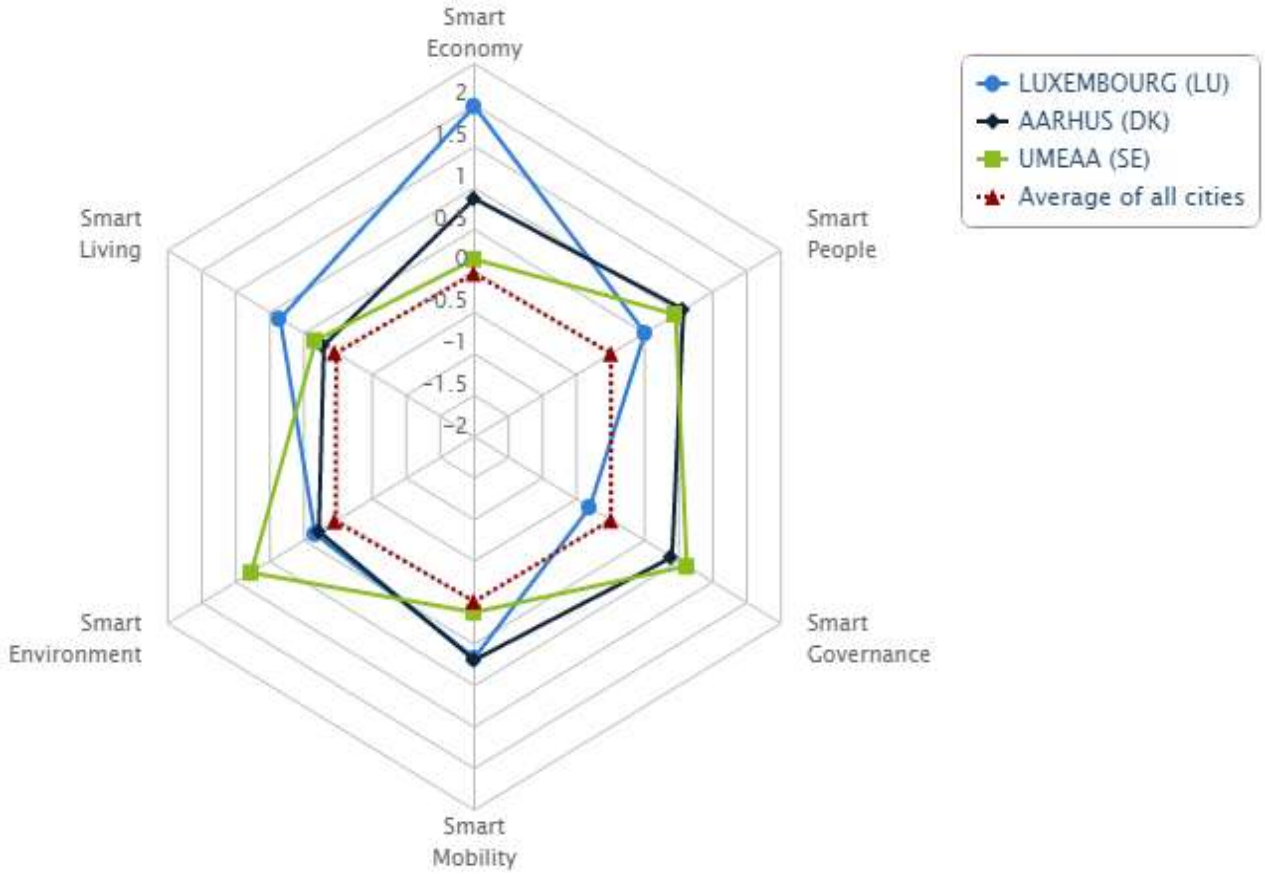
	indicators	weighting
Participation in decision-making	4	33%
Public and social services	3	33%
Transparent governance	2	33%
Political strategies & perspectives	0	0%
	9	**100%**

Smart Cities

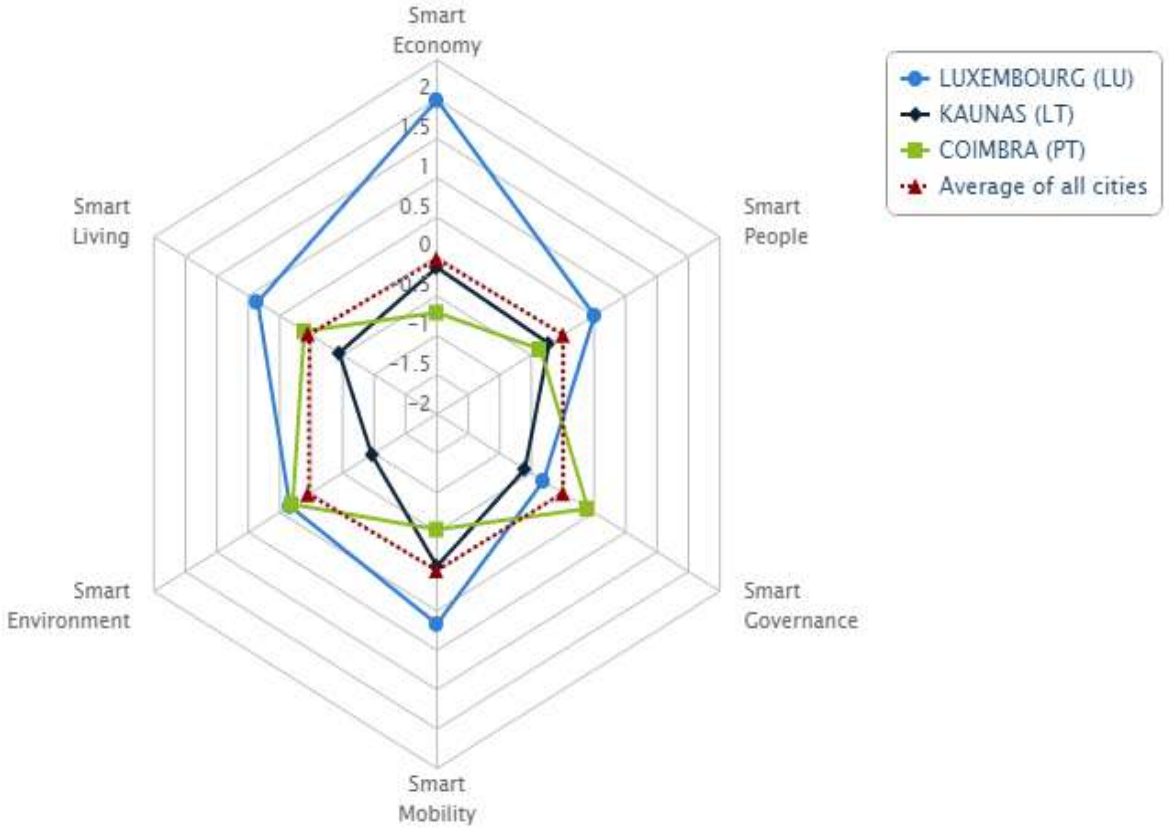
- Examples of Smart Cities come in many variants, sizes and types. This is because the idea of the Smart City is relatively new and evolving, and the concept is very broad.
- Every city is unique, with its own historical development path, current characteristics and future dynamic. The cities which call themselves ‘Smart’, or are labelled as such by others, vary enormously.

Smart Cities in Europe

City profiles: Luxembourg, Aarhus, Umeaa



City profiles: Luxembourg, Kaunas, Coimbra

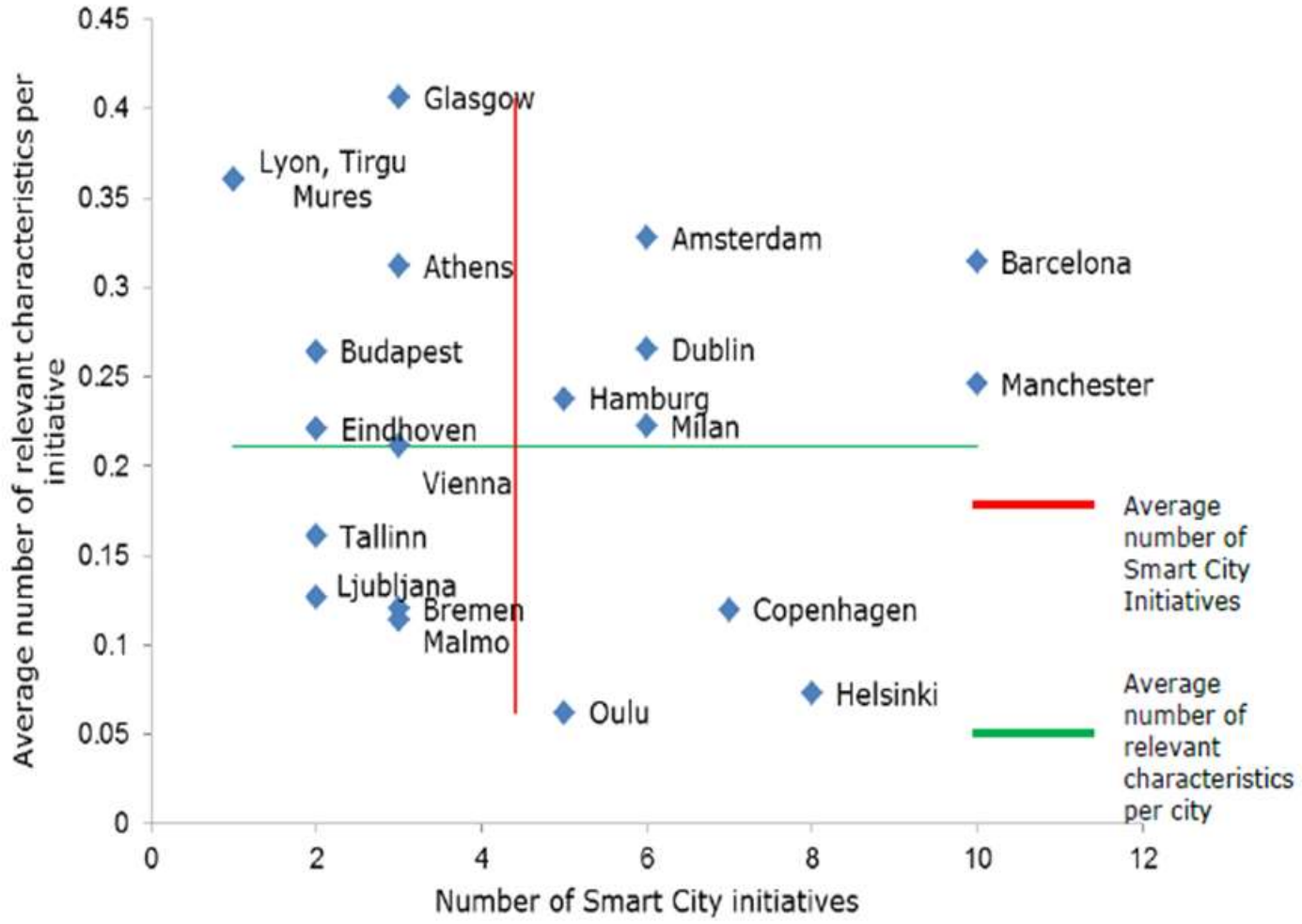


Luxembourg

Kaunas

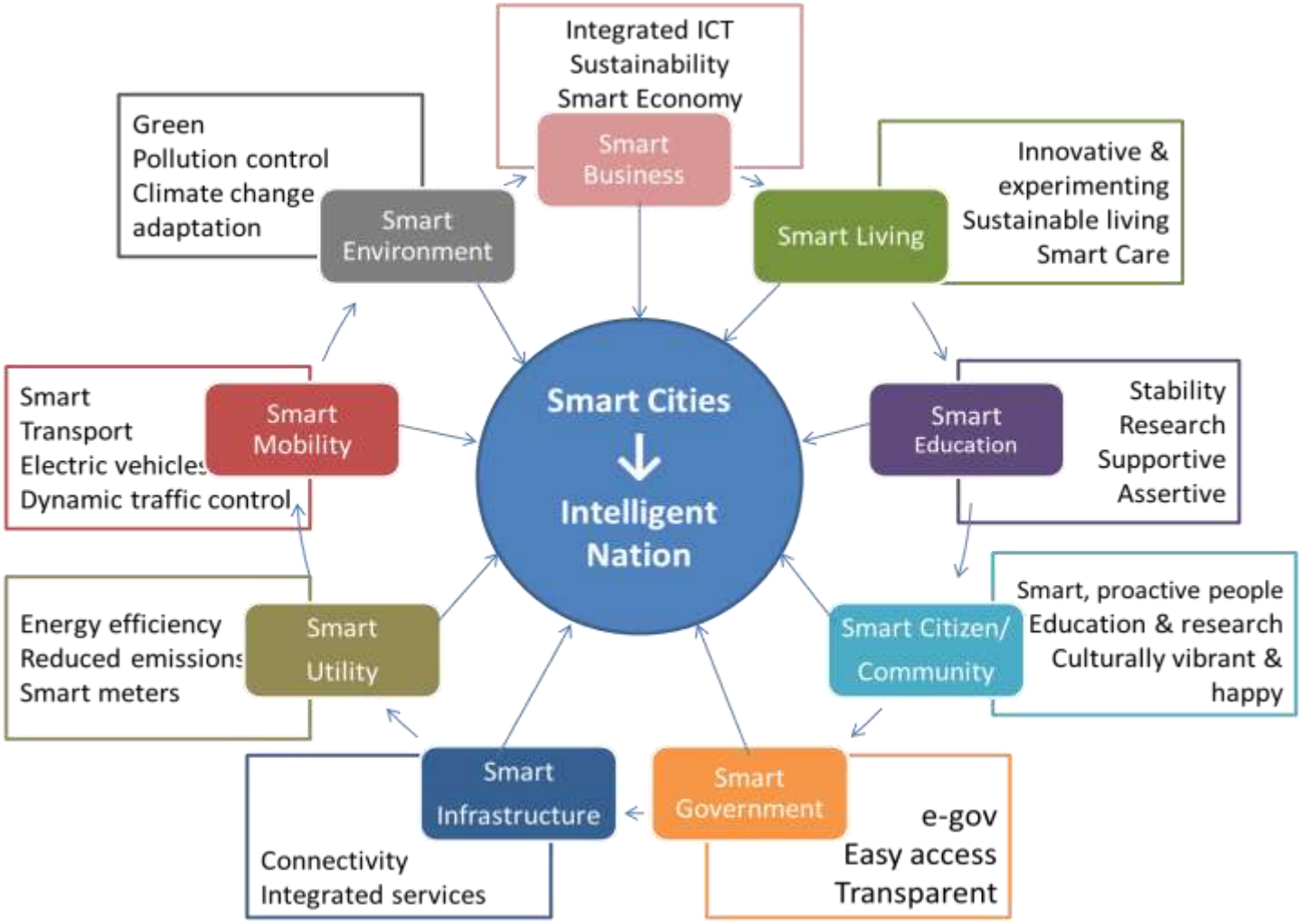
Coimbra

Weighted average cluster analysis of Smart City initiatives and the number of characteristics per initiative



Smart City Model

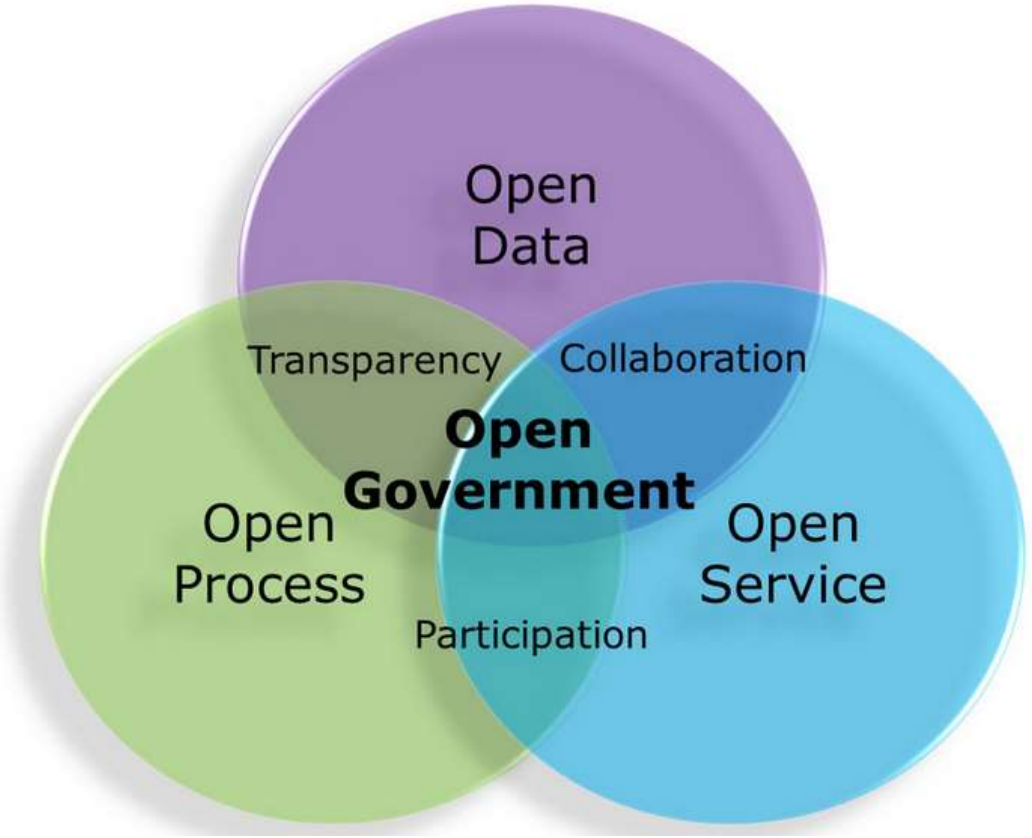
From Smart City to Smart Nation



Competitive environment

- Competition among cities to engage and attract new residents, businesses and visitors means constant attention to providing a high quality of life and vibrant economic climate.
- Forward-thinking leaders recognize that although tight budgets, scarce resources and legacy systems frequently challenge their goals, new and innovative technologies can help turn challenges into opportunities.

Horizont 2020



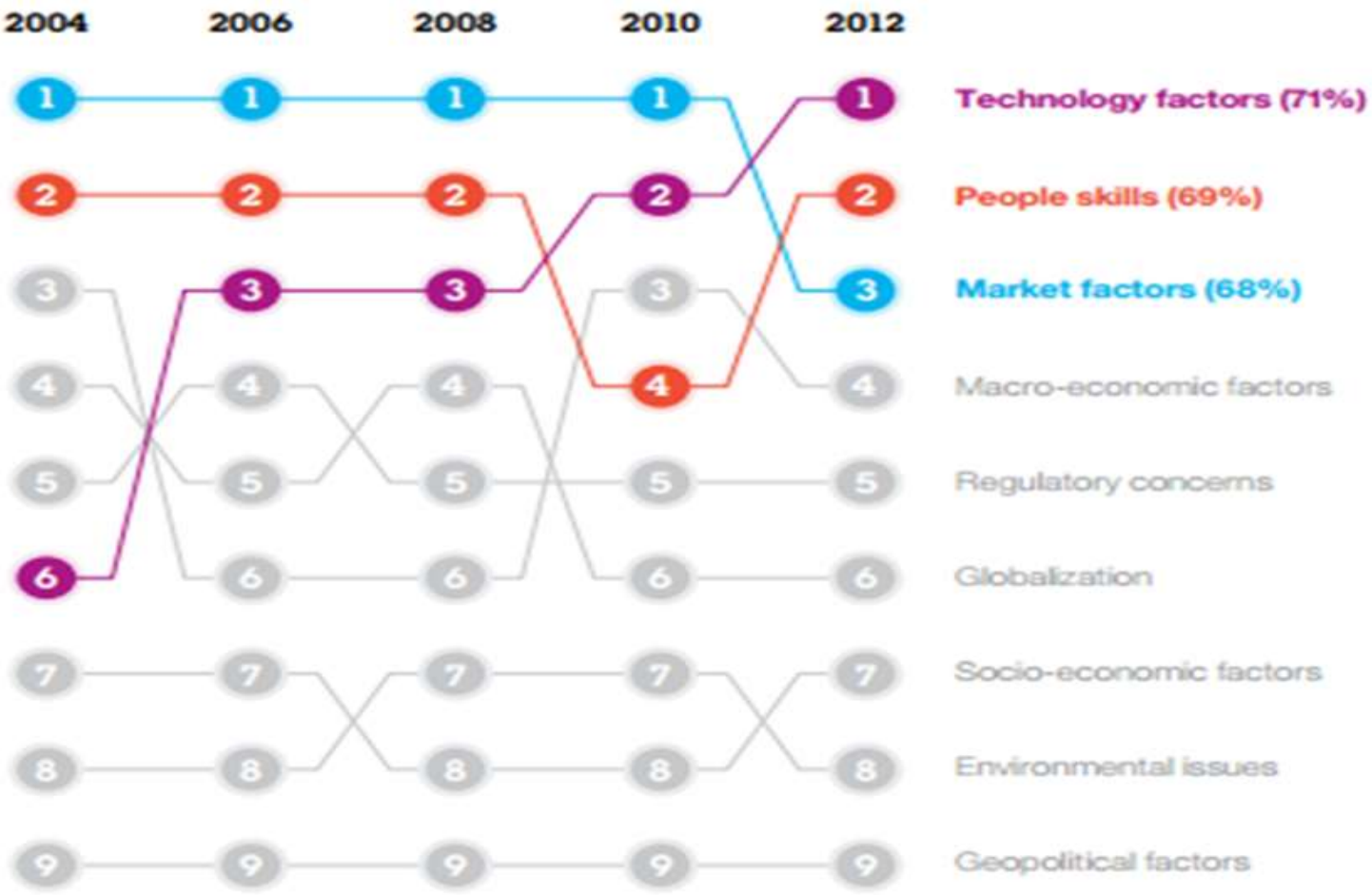
Source: H2020, 2014

Embracing connectedness

- Technology is now driving more organizational change than any other force - even the economy.
- How are CEOs harnessing this unrealized potential?

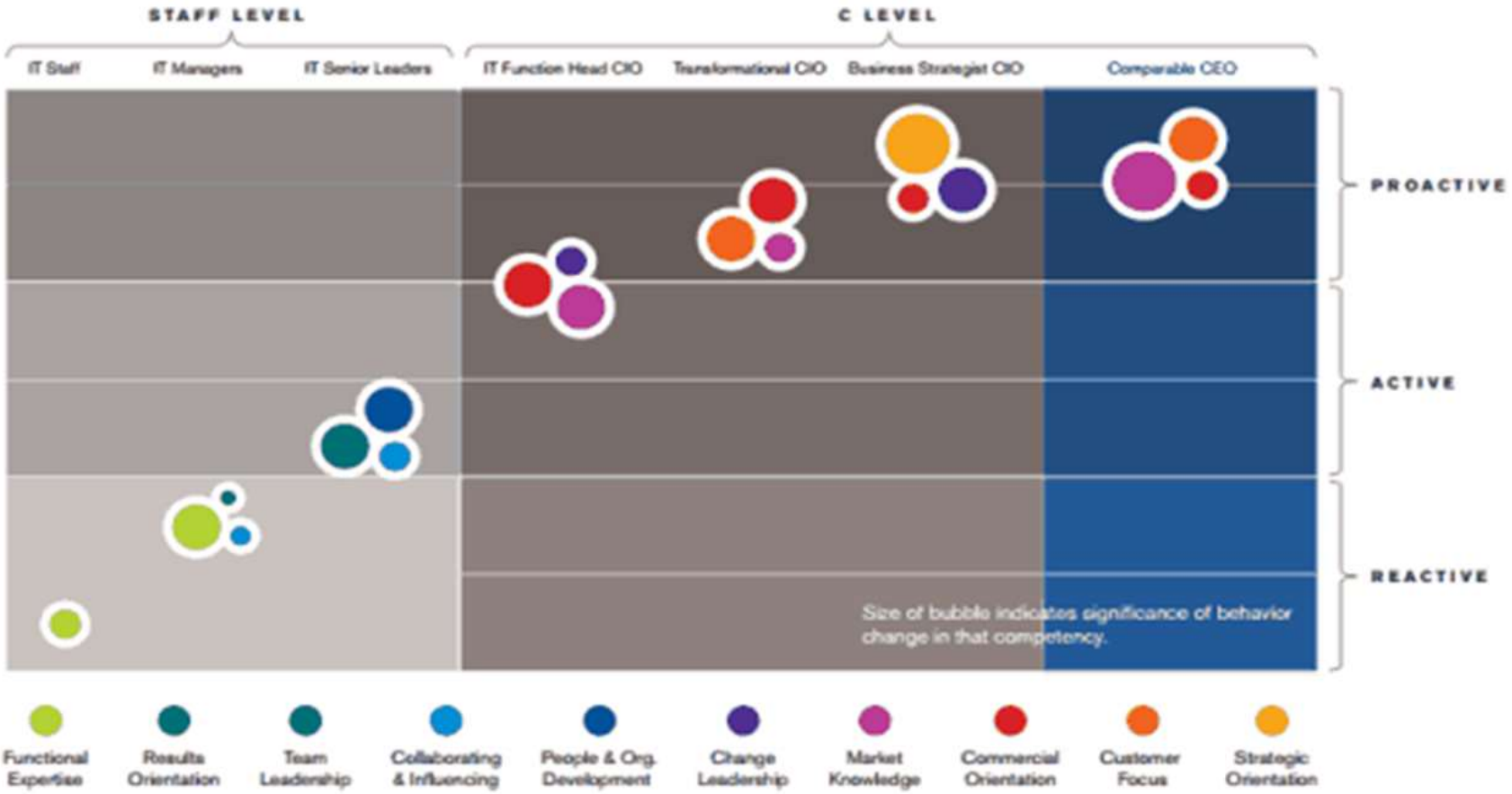
Source – IBM Institute for Business Value, 2012

Leading Through Connections: CEOs now see technology change as most critical



Source, IBM Leading Through Connections , 2012

Leadership Competencies Journey



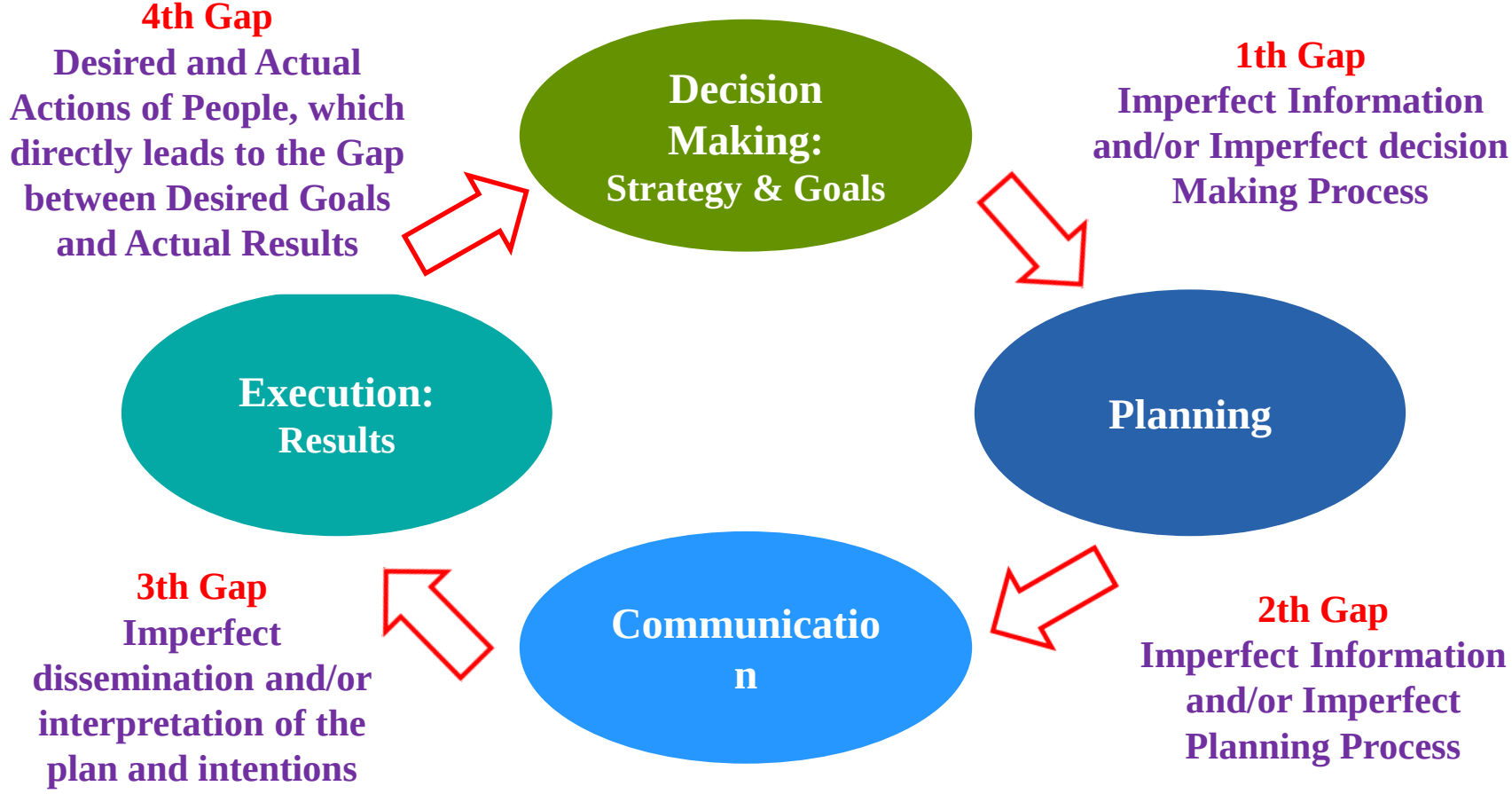
Source: Kelner and Patrick, 2010

Balancing core identity with envisioned future

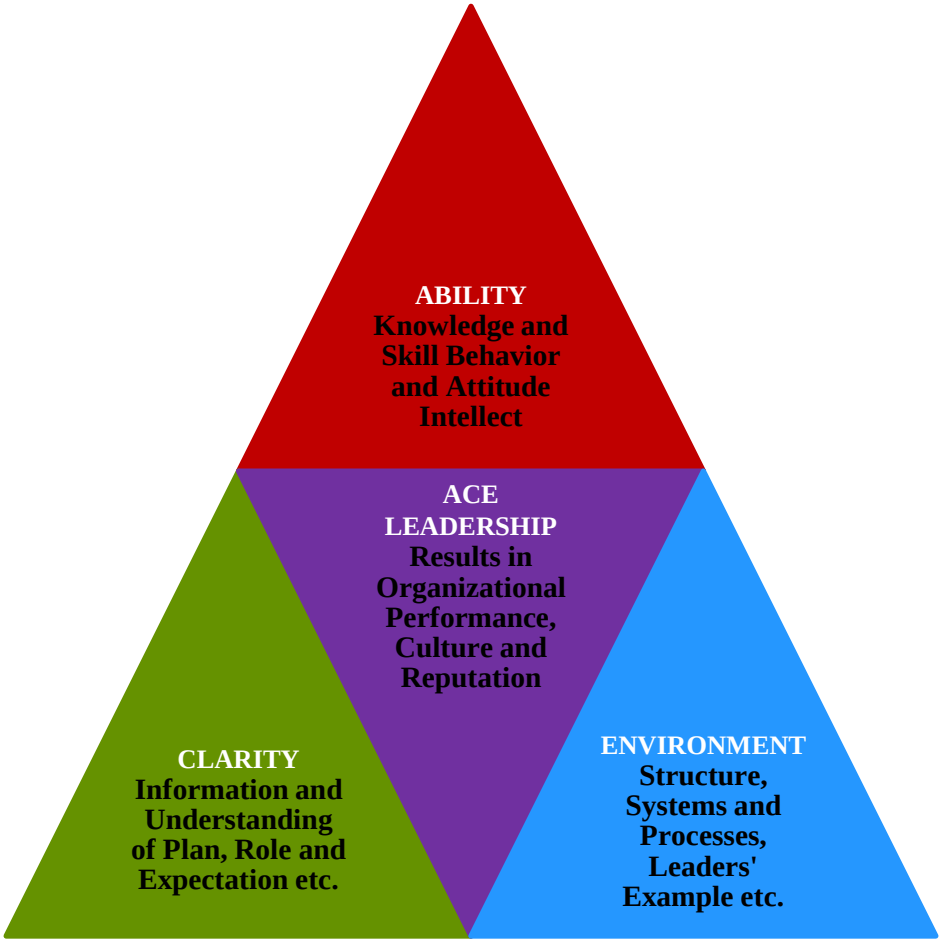
Core Identity:
Purpose, enshrined Values, Business Doctrine, Myths and Cultural Norms

Envisioned Future:
Defined and Inspiring Vision, Robust Strategic Plan for its Achievement

The Strategy Reality Gaps

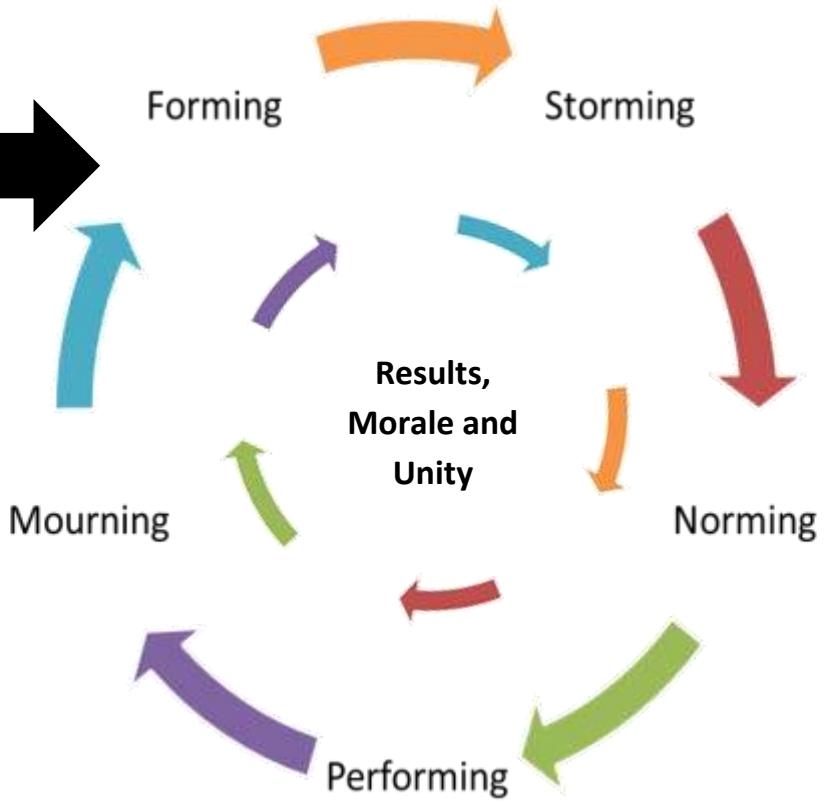


The ACE Conditions for Success

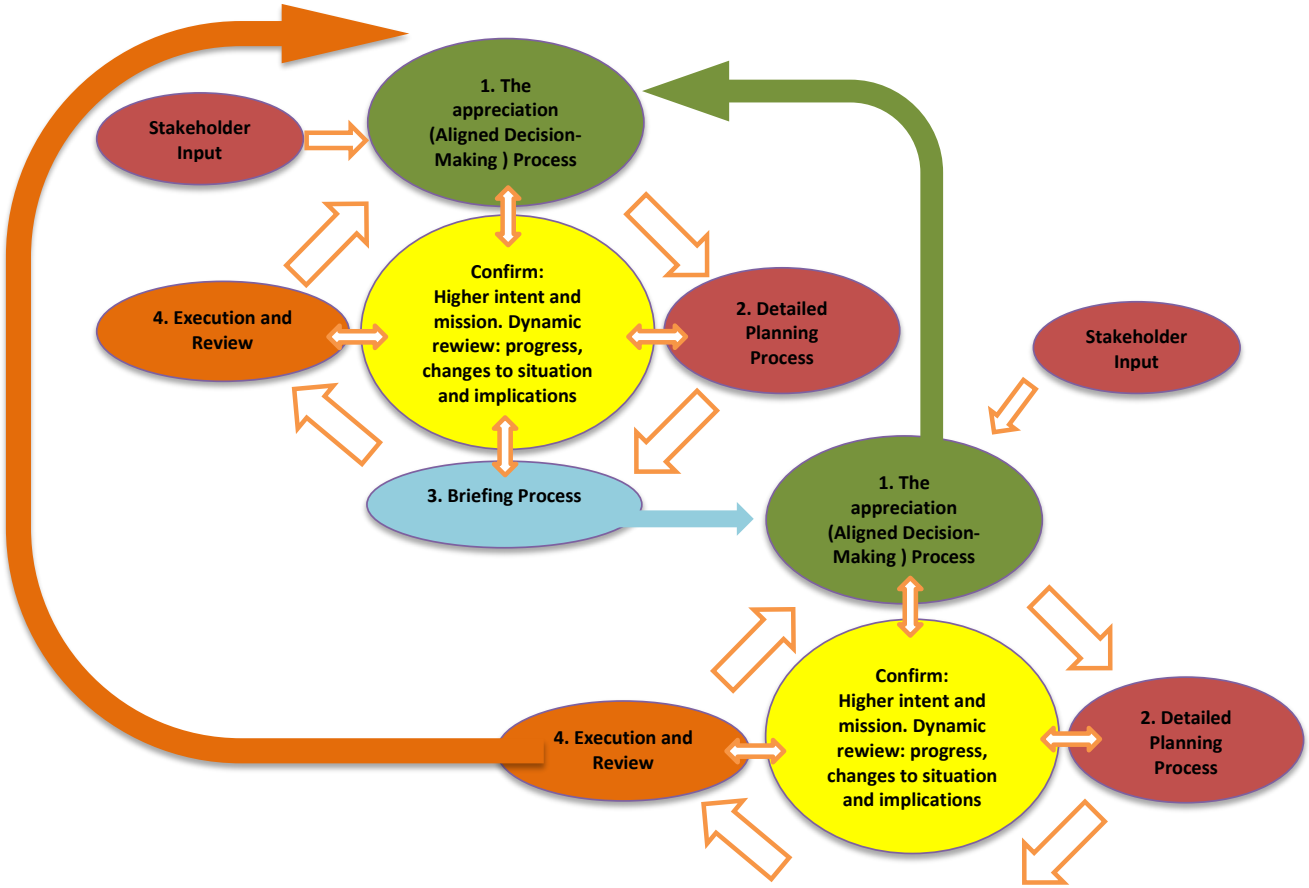


The Stages of Team Development

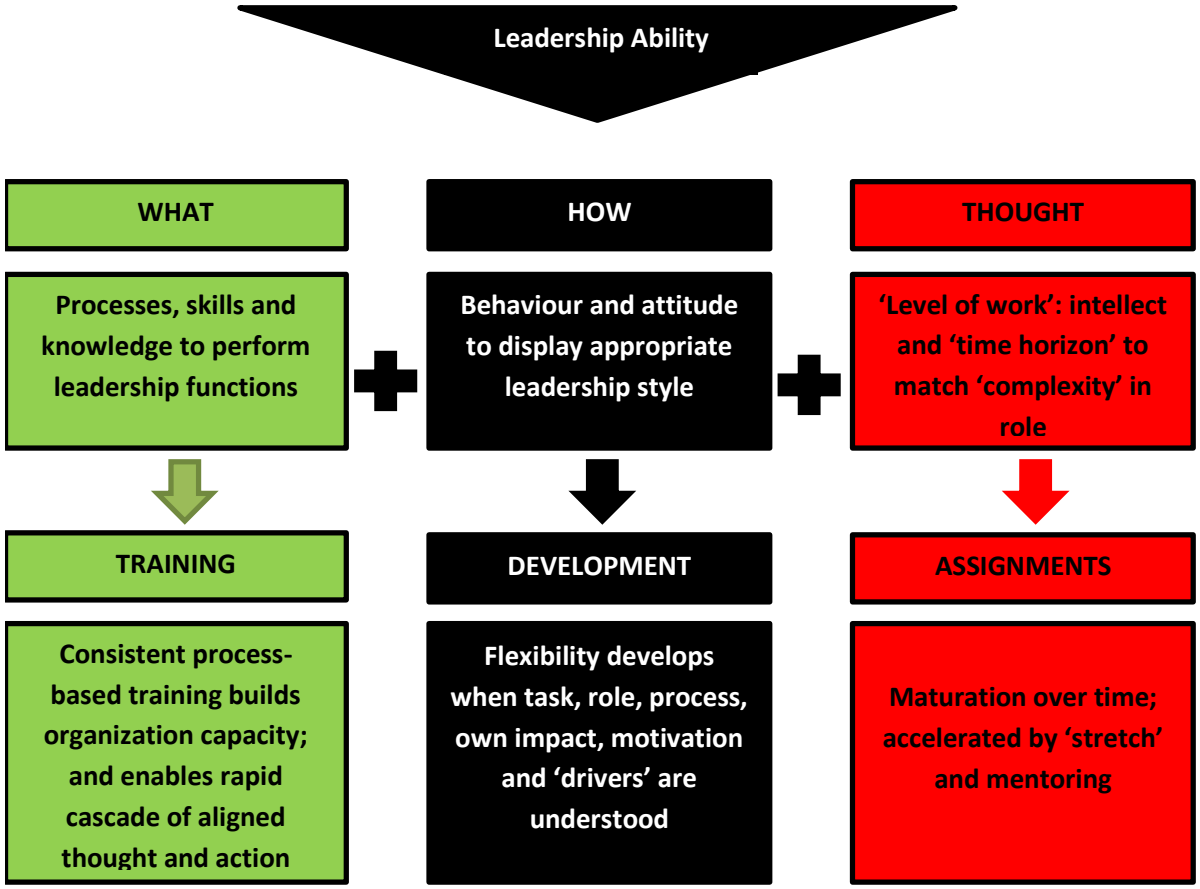
LEADERSHIP
Accelerates
the process



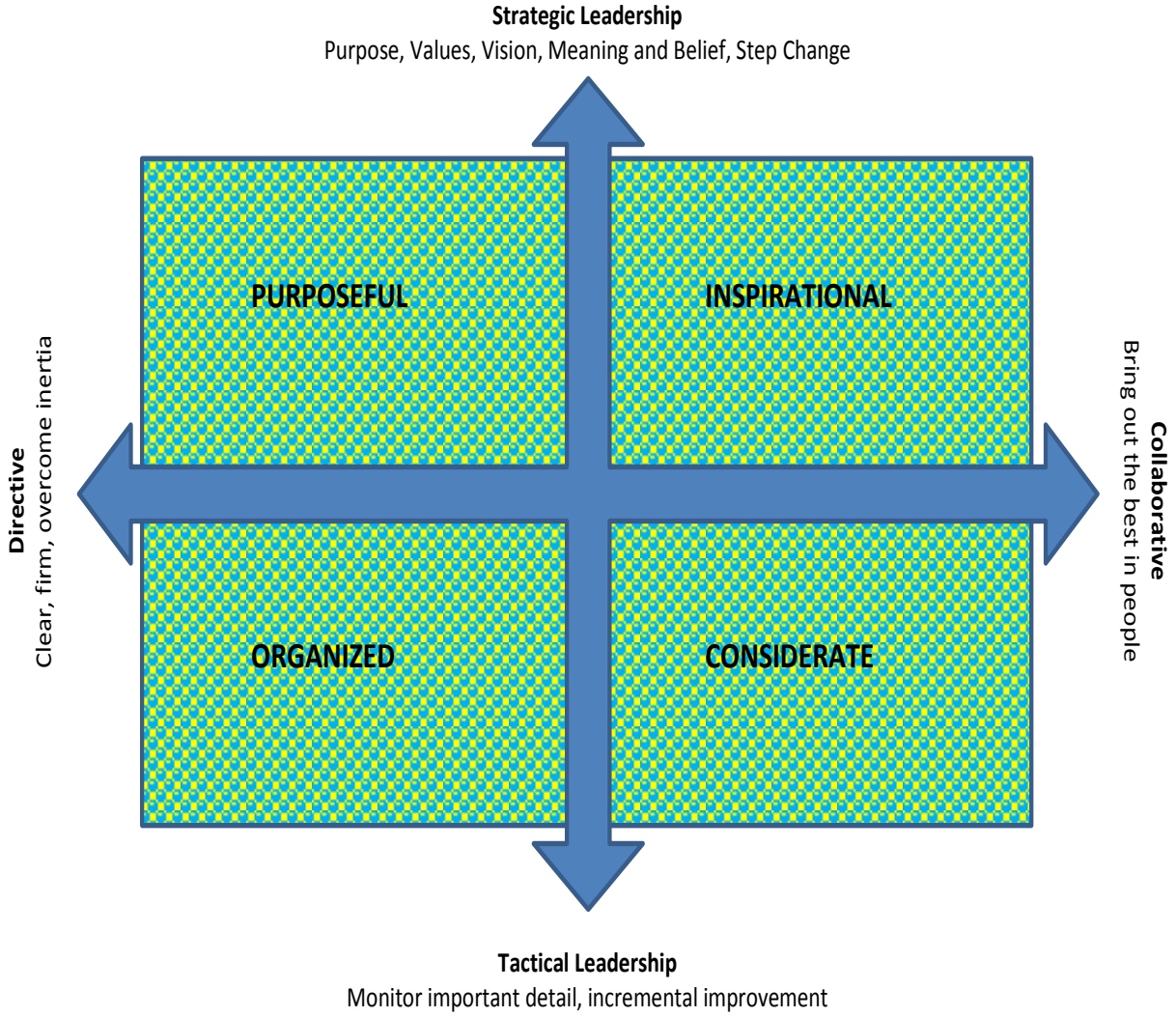
Cascading, Iterating and Recurring Processes to Align Activity and Engage People



The Components of Leadership Ability



Leadership Style Quadrants



Leadership Style Quadrants in detail

PURPOSEFUL

- Sets clear aim and intent
- Readily asks the 'why' question
- Has past, present and future orientation
- Is a catalyst or trigger for change
- Values competence (especially intellectual competence)
- Challenges norms, anticipates and removes obstacles
- Focuses on inventing more than improving
- Makes sure results are effective
- Can be decisive and take risks

INSPIRATIONAL

- Leads by example – 'signal actions'
- Readily asks the 'what if' or ' why' question
- Has largely future orientation
- Champions the team
- Values making a difference
- Builds networks, shows insight and credits others
- Communicates with enthusiasm
- Focuses on helping people grow
- Ensures results are in line with values

ORGANIZED

- Disciplined and efficient approach
- Readily asks the 'what' question
- Has largely a past or present orientation
- Clear objectives, procedures and measures
- Values logic and physical competence
- Challenges illogical thought
- Is productive
- Focuses on continuous improvement
- Takes responsibility for results

CONSIDERATE

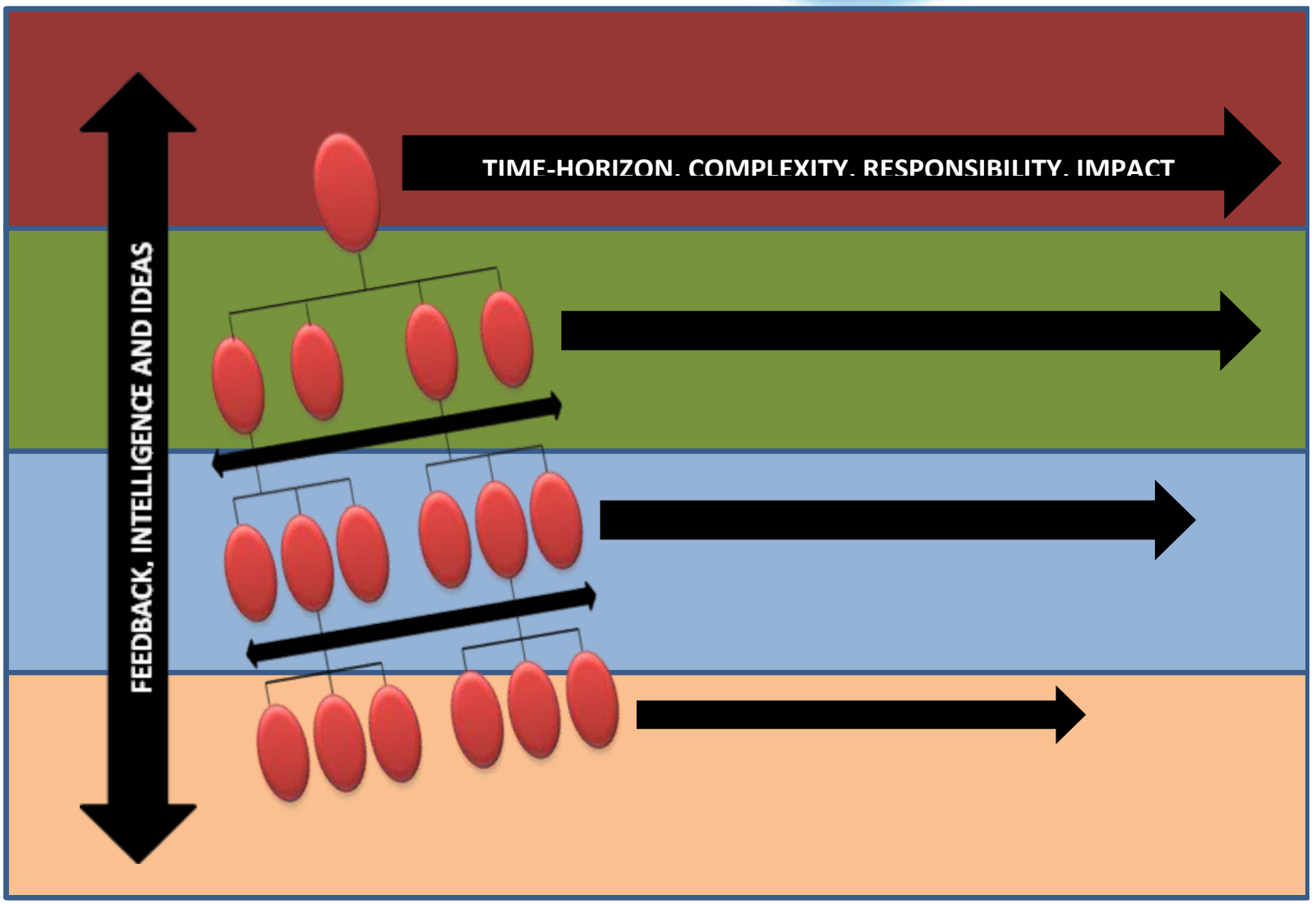
- Shows concern for individuals ' welfare
- Readily asks the 'who' question
- Has largely a past or present orientation
- Builds friendships with team members
- Values the individual
- Is quick to praise, thank and reward
- Genuinely interested in others
- Focuses on listening and on sharing information
- Ensures that results help people

Network Organizations Fare Better in Sustained Crisis

Organization 1	Organization 2
Hierarchical	Networked
Centralized leadership	Distributed leadership
Tightly coupled (greater interdependence among parts)	Loosely coupled (less interdependence)
Concentrated workforce	Dispersed workforce
Specialists	Cross – trained – generalists
Policy and procedure driven	Guided by simple yet flexible rules

Source: World Economic Forum

The Hierarchy of "Complexity"



Aligning complex organizational activity to a clear aim and purpose