"Opening NGI windows"
an indicative NGI principles and priorities systematic scheme

The vision :

*"The Internet of the future should be more **open**, provide better **services**, more **intelligence**, greater **involvement** and **participation**.*

*It needs to reflect the European social and ethical **values**: free, open and more interoperable."*
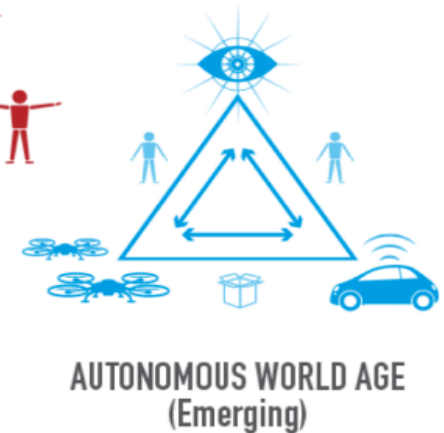
NGI Next Generation Internet

https://ec.europa.eu/futurium/en/next-generation-internet

Presentation Outline

- **The dawn of the NGI era**

- **NGI impact**

- **The NGI … "stacks"**

- **NGI stack I : by the people … for the people**

- **NGI stack II : from bits … to beings**

- **Opening NGI stack windows : an exemplar use case**

- **Widening the … NGI windows**

The dawn of the NGI era

all aspects of life, science, work, and economy are drastically impacted by **Internet evolution** and its emerging **phenomena**.

CROWD™ COMPANIES

FOUR PHASES OF DIGITAL ERAS

INTERNET ERA
(Mid 90s)

SOCIAL MEDIA AGE
(Mid 2000s)

COLLABORATIVE ECONOMY AGE
(Now)

AUTONOMOUS WORLD AGE
(Emerging)

Crowd Companies, Jan 2016

http://www.web-strategist.com/blog/wp-content/uploads/2016/01/Screen-Shot-2016-01-18-at-6.56.46-PM.png
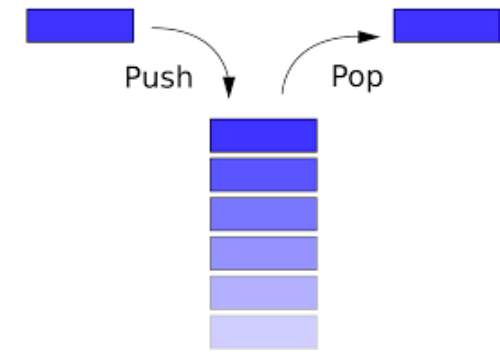
NGI impact

NGI addresses many challenging issues at multiple dimensions, domains, and levels with high impact on the emerging "**Internet of People**" and "**Internet of Everything**" era.

NGI vision impacts :

- **Values** and ethical principles;

- **People** inclusion, awareness, and empowerment;

- **Societal** change and cohesion;

- Disruptive **technologies** and solutions.

4
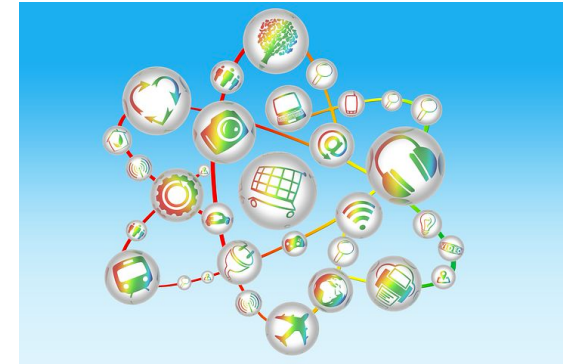
the NGI ... stacks

- **NGI complex ecosystems** involve multiple entities (technologies, platforms, services, etc) which are interchanged and shared among many actors (individuals, stakeholders, communities, authorities, etc)

- The "one fits all" model is not a realistic choice in NGI;

- Multiple **NGI "stacks"** can be harvested and indicated to support solutions at various granularity levels;

- Such "stacks" can unfold the properties, principles, and objectives at varying levels offering insights and inspiration for **NGI effective** solutions

- **NGI stacks layers** are build such that each layer builds on its preceding layer and offers functionalities on its top layers

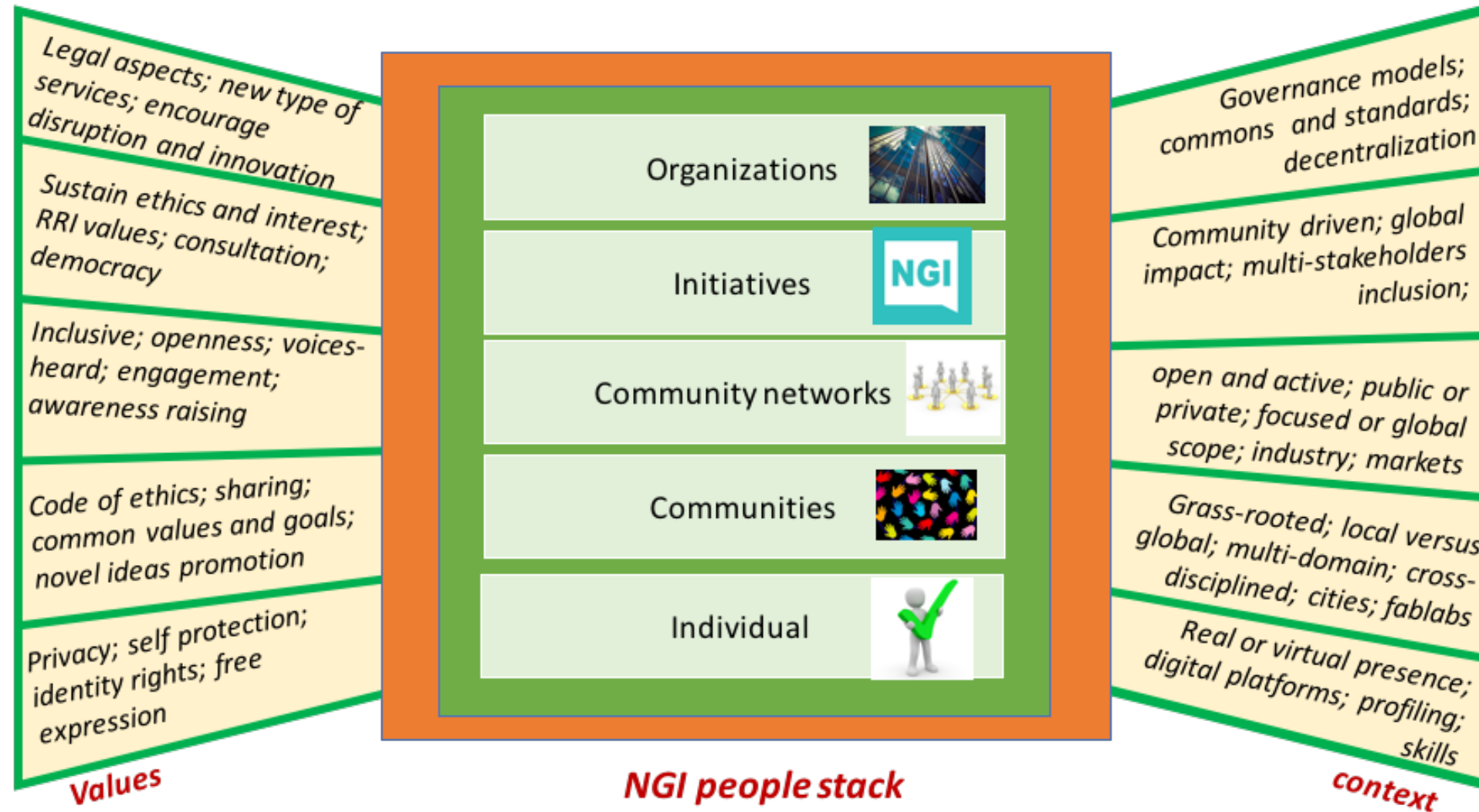# NGI stack I : by the people … for the people

- an indicative people's stack should provide all levels of actors from the **individual** to the **organizational** level;

- from the "self" (bottom) to the "global" (top) layers, **NGI solutions** should respect certain **values**, depending on underlying **contexts** and requirements

Organizations

Initiatives

Community networks

Communities

Individual

Opening the NGI people stack windows

Values

Legal aspects; new type of services; encourage disruption and innovation

Sustain ethics and interest; RRI values; consultation; democracy

Inclusive; openness; voices-heard; engagement; awareness raising

Code of ethics; sharing; common values and goals; novel ideas promotion

Privacy; self protection; identity rights; free expression

NGI people stack

Organizations

Initiatives

Community networks

Communities

Individual

context

Governance models; commons and standards; decentralization

Community driven; global impact; multi-stakeholders inclusion;

open and active; public or private; focused or global scope; industry; markets

Grass-rooted; local versus global; multi-domain; cross-disciplined; cities; fablabs

Real or virtual presence; digital platforms; profiling; skills

NGI stack II : from bits ... to beings

- an indicative technical stack should provide all levels of technologies from the **network & "things"** to the **human** level;

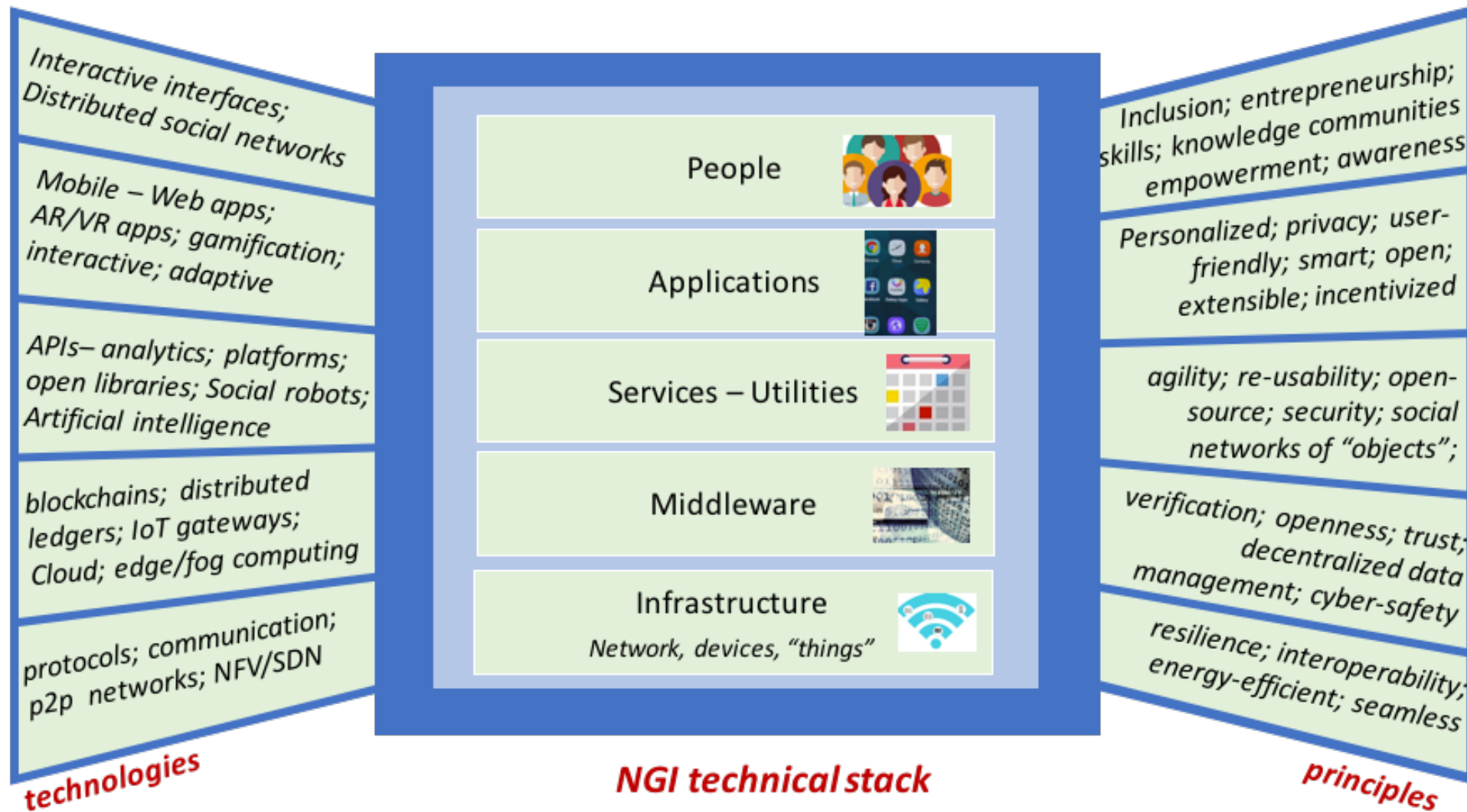- from the "things" (bottom) to the "people" (top) layers, **NGI solutions** should respect certain **principles**, adapting and evolving disruptive **technologies**

People

Applications

Services – Utilities

Middleware

Infrastructure

Network, devices, "things"
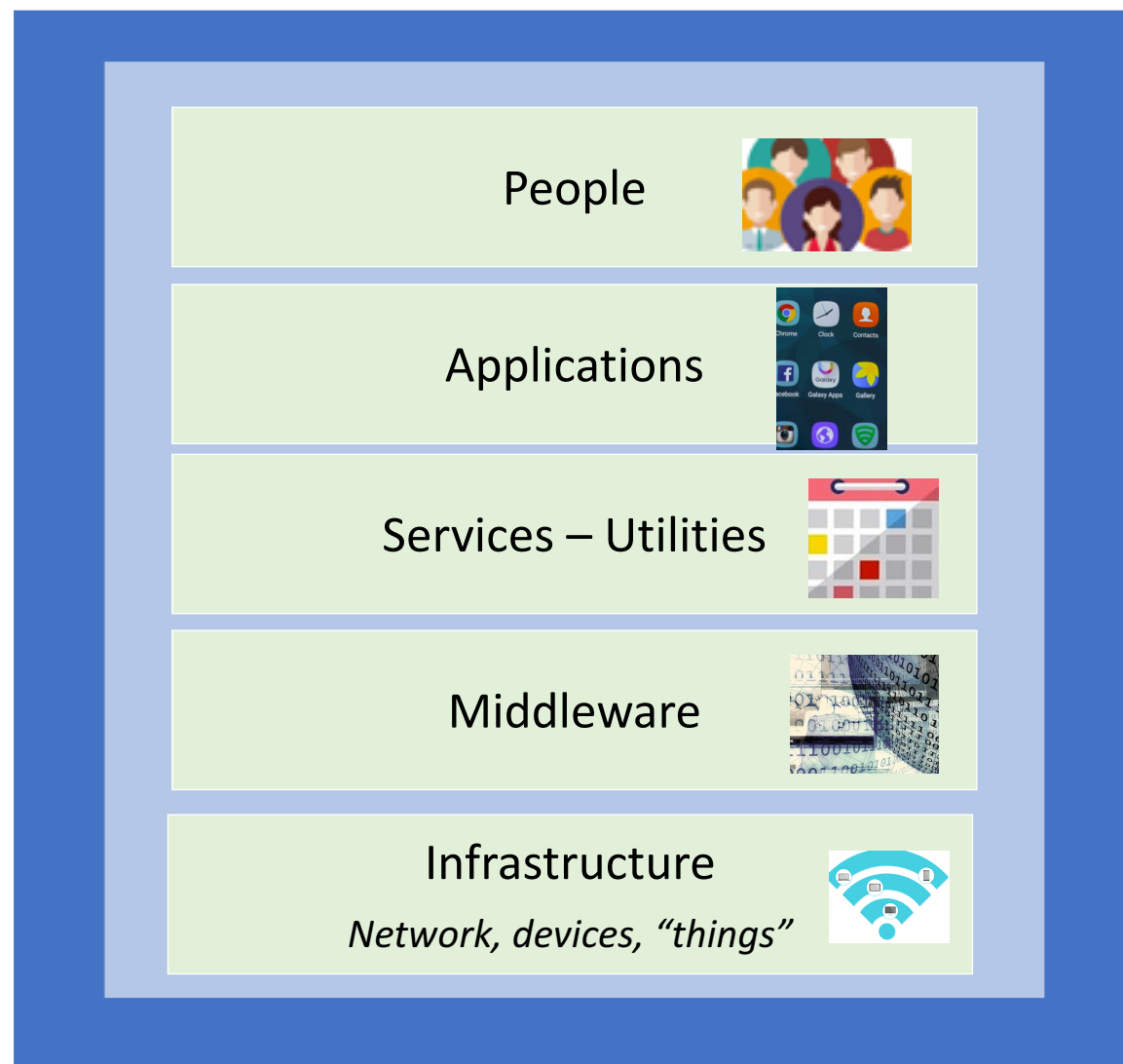
Opening the NGI technical stack windows

Indicative technologies and principles per stack layer

Interactive interfaces; Distributed social networks

Mobile – Web apps; AR/VR apps; gamification; interactive; adaptive

APIs– analytics; platforms; open libraries; Social robots; Artificial intelligence

blockchains; distributed ledgers; IoT gateways; Cloud; edge/fog computing

protocols; communication; p2p networks; NFV/SDN

technologies

People

Applications

Services – Utilities

Middleware

Infrastructure
Network, devices, "things"

NGI technical stack

Inclusion; entrepreneurship; skills; knowledge communities empowerment; awareness

Personalized; privacy; user-friendly; smart; open; extensible; incentivized

agility; re-usability; open-source; security; social networks of "objects";

verification; openness; trust; decentralized data management; cyber-safety

resilience; interoperability; energy-efficient; seamless

principles

9

Exemplar case : "battle against cyberbullying and aggression" (I)

Values

Legal aspects; new type of services; encourage disruption and innovation

Sustain ethics and interest; RRI values; consultation; democracy

Inclusive; openness; voices-heard; engagement; awareness raising

Code of ethics; sharing; common values and goals; novel ideas promotion

Privacy; self protection;identity rights; free expression

NGI people stack

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context

Governance models; commons and standards; decentralization

Community driven; global impact; multi-stakeholders inclusion;

open and active; public or private; focused or global scope; industry; markets

Grass-rooted; *local* versus global; multi-domain; cross-disciplined; *cities*; fablabs

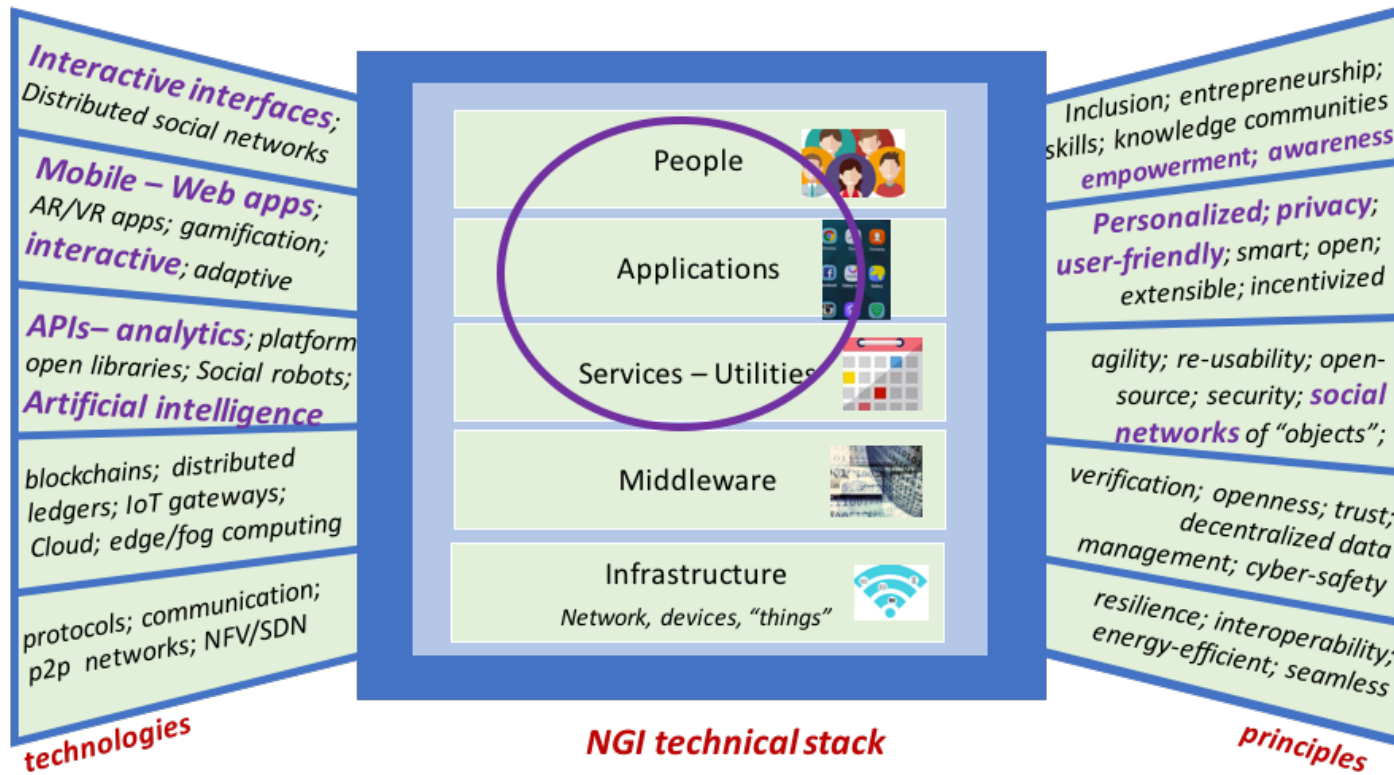Real or *virtual presence;* *digital platforms;* profiling; skills

- **NGI phenomena,** such as cyberbullying, largely impact individuals and communities

- NGI stack windowing can offer a **systematic layered "protocol"** to classify the problem's setting

- **Tuples of stack's layers** and attributes can easily spot the problem's goals and impacted entities

Scenario "spot the city bullies !" : detection of cyberbullying and aggression intensities at cities (neighborhoods) level

StackPeople(cityCyberBullies):= {   [Layers : Individual,Communities];
*   [Values : privacy,identity, ethics code],*
*   [Context : local, city, social media platforms]}*
*   }*

Exemplar case : battle against cyberbullying and aggression" (II)

technologies

Interactive interfaces; Distributed social networks

Mobile – Web apps; AR/VR apps; gamification; *interactive*; adaptive

APIs– analytics; platform open libraries; Social robots; **Artificial intelligence**

blockchains; distributed ledgers; IoT gateways; Cloud; edge/fog computing

protocols; communication; p2p networks; NFV/SDN

People

Applications

Services – Utilities

Middleware

Infrastructure
Network, devices, "things"

NGI technical stack

Inclusion; entrepreneurship; skills; knowledge communities *empowerment; awareness*

Personalized; privacy; user-friendly; smart; open; extensible; incentivized

agility; re-usability; open-source; security; **social networks** of "objects";

verification; openness; trust; decentralized data management; cyber-safety

resilience; interoperability; energy-efficient; seamless

principles

- NGI technologies such **data analytics and AI** can largely contribute in harvesting and delivering open knowledge

- NGI stack windowing can offer a systematic layered "protocol" to classify the **required technologies** along with the targeted principles

- Tuples of **stack's layers and attributes** can easily spot the technologies to be utilized and their focus

Scenario "spot the city bullies !" : detection of cyberbullying and aggression intensities at cities (neighborhoods) level based on AI and data analytics techniques

StackTechno(cityCyberBullies):= {   *[Layers : Services, Applications, People];*
[technologies : data analytics, AI, apps, interfaces],
[principles: social networks, personalized, user-friendly, empowerment]}
}

Widening the NGI windows

- Enable **NGI flexible and adaptive schemes** to unfold as people and technologies co-create and evolve;

- Inspire **NGI entrepreneurship and technological disruption** at multiple layers and under varying settings;

- **Empower individuals and society** in battling with emerging phenomena (cyberbullying, fake services/news, hate speech, etc);

- Sustain **new models for NGI** awareness, knowledge sharing, and ethics guarantees

Images by https://pixabay.com/

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