

HUMANANE

The HUMANE roadmaps – towards future human-machine networks

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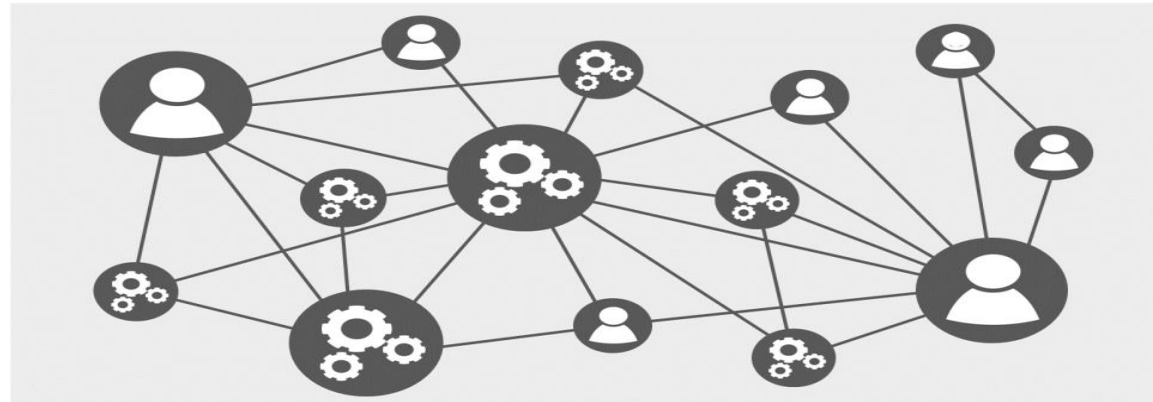
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Outline

- HMNs Trends: How are HMNs evolving?
- The need for future-thinking and roadmaps of future HMNs
- The HUMANE domains of interest
 - Sharing Economy
 - eHealth
 - Citizen Participation
- Example roadmap: eHealth HMNs
- The way forward

HMN Trends: How are HMNs evolving?

- Major transformation in the Internet: from a network of **interconnected computers** to an **“Internet of services”** and an **“Internet of things”**
- Increased machine agency
 - can react autonomously to physical world events
 - can trigger actions by humans, that in turn impact other humans or machines



The need for future-thinking and roadmaps of future HMNs

- Need to find a **balance** between human requirements and machine constraints (processing power, energy, intelligence, etc.)
- **Rules** governing different domains such as economy, health, governance **need to be adapted** so that machines are integrated harmoniously in human life, but also humans adapt to certain machine behaviors and outputs
- Need to study how variations in **HMNs affect emotions or behavior characteristics** such as trust, sense of responsibility, motivation, and concepts such as privacy, security, innovation
- Need to translate these into **policies** for the design and management of HMNs in different social domains

How can HUMANE help?

- The HUMANE **typology and method** for creating HMN profiles can support the analysis, requirements collection, design, and evaluation of future HMNs
 - Helps to **identify similarities and differences between HMNs** in different domains
 - Helps to **understand better the implications of HMNs** (i.e. effects on motivation, trust, shared responsibility, privacy, etc.)
 - Serves as a **guidance for examining social domains** for which we build the roadmaps

What is a roadmap?

- A roadmap is a comprehensive work plan to **meet desired goals** in a certain domain
- It acts as a reference for a **collaborative effort** for a complex task
 - Helps the involved parties recognize the goals and the steps needed for their achievement, and to better understand their roles/interrelations.
- Initially conceived as a decision aid to policy makers on technology issues
- Inherently about technological issues, but emphasis can also be given on other aspects, such as policy or business

HUMANE ROADMAP PROCESS

Initiation

Describe what is the need in the HMN of your interest. By HMN we mean collectives of humans and machines that generate synergistic effects, such as collaborative networks, open innovation platforms, crisis management support systems, or sharing economy collectives.

Background Knowledge

Describe the social domain where the HMN takes place, the current technological situation, policy background and/or regulatory context.



Goals and Expected Outputs

Describe feasible goals and the expected outputs of the roadmap after consultation with stakeholders.



Domain professionals
adopt new technologies



IT and research experts
implement technical solutions and help improve future practices

Policy makers
decide on future policies



User Groups
evaluate the solution and provide user feedback



Required actions to achieve the Goals

Define feasible actions that can be used to implement the goals identified. Engage stakeholders to agree on the actions to achieve the goals. Highlight necessary cooperation and complementary roles of stakeholders.



Design Strategies

Identify the needed design strategies with the help of HUMANE typology, method and tools.



Roadmap Dissemination

Disseminate the roadmap to EU and national policy makers, as well as other stakeholders to serve as a guide for future policies and for possible implementation.

Implementation Priorities and Timelines

Set implementation priorities based on the time sequence of actions and the importance of each action. Set a timeline for implementation.

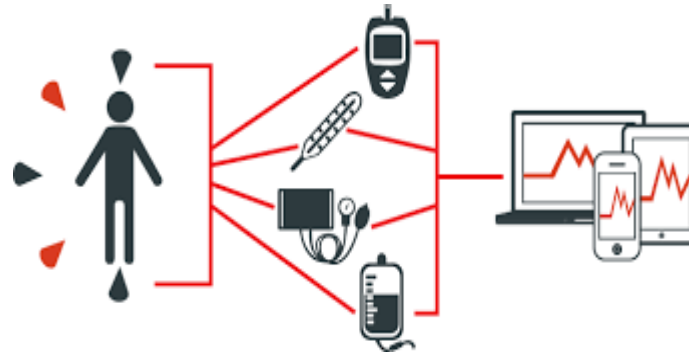


The HUMANE domains of interest

Sharing economy



eHealth



Citizen participation



Example: eHealth roadmap

eHealth - current situation, emerging and future trends

Trends

- Early detection of diseases
- Health status monitoring
- Healthy lifestyle
- Higher life expectancy
- Population ageing

Goals

- Achieve a healthier lifestyle, and monitor health conditions to prevent diseases
- Provide better care to more people
- Decrease individual healthcare costs

How to reach the goals

- Use technological advances of HMNs
- Learn from and exploit health data
- Provide hospital-level care remotely

Technological advances in eHealth

- management and dissemination of patient data, in digital form (Electronic Health Records ,EHR)



- telemedicine networks and applications (including telesurgery)



- **networks for physiological monitoring of patients with smart mobile and wearable health systems and applications**



Policy background in eHealth HMNs

- Action plan on eHealth for the period 2012-2020
 - Main barrier: lack of clarity on legal and other issues around mobile health (“mHealth”) and “health & wellbeing applications”



2011:
eHealth
network

http://ec.europa.eu/health/ehealth/policy/network/index_en.htm

2014:
- Green
paper on
mHealth
- Staff
Working
Document

2016:
industry-led
Code of
Conduct for
mHealth

http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=16125

eHealth HMNs key implications (1/3)

- **Human agency** implications
 - **Behavioural change and motivation:**
 - Need for higher degree of patient intervention
 - Need to increase motivation of users and make behavioural change a basic premise
 - **Privacy & confidentiality:** Protect the privacy of individuals and confidentiality of medical information
 - **Trust:**
 - Foster citizens' trust in eHealth systems and applications
 - mitigate resistance from healthcare providers in using eHealth systems and applications

eHealth HMNs key implications (2/3)

- Implications from high **machine agency**
 - very large volumes of data from monitoring devices: need for **efficient data management**
 - **Increased reliance on machines**: non-availability may produce a major risk to patients' health
 - **Need for QoS-enabled medical services**: avoidance of congestion episodes, especially for critical applications, such as remote heart monitors
 - Need for **increased security**: protection from threats like eavesdropping and denial of service in eHealth devices
 - Need for **interoperation between eHealth devices of different manufacturers**

eHealth HMNs key implications (3/3)

- Implications from **distributed network structure** and **high geographical expansion**
 - **Change of traditional social patterns:**
 - from disease monitoring provided at medical establishments to patients' homes
 - From face-to-face patient-doctor communication to remote communication
 - **Interoperability and Standardization:** needed for widespread usage of eHealth systems, within and across national boundaries
 - **Cost-efficiency:** provide eHealth systems at low cost, to foster widespread adoption

Roadmap actions and roles of stakeholders

	Policy makers	Health professionals	Patients and user groups	IT and research experts
Conduct realistic large scale studies	X	X	X	X
Develop eHealth services with guaranteed QoS	X			X
Provide interoperable eHealth devices and common data formats	X	X		X
Study of business models	X			X
Review and merge the provisions of the different regulatory documents	X			
Perform clinical validations	X	X		X

Way forward

Current status and further work

- Working **collaboratively with stakeholders** to identify required actions to achieve implementable goals
- HUMANE survey:
<http://hestia.atc.gr/limesurvey/index.php/339749/lang-en>
 - Open until **end of March 2017**
- Final roadmaps published **end of April**
- **Disseminate results** through HUMANE website and social media

Who are we, where to find us

<http://humane2020.eu/>



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