Identifying and framing potential stakeholders in complex innovation ecosystems

Supplementary materials

Appendix A. Emerging stakeholder types (listed from most to least prominent)

Type	Stakeholders identified
Commercial, Industry, Private Companies (n=278)	3D printing technologies, Biomolecular interaction technologies, Care facilities (aging, ill), Data processing and storage services, Dependant on nanosensors, Device calibration services, Health insurance, Healthcare products (existing), Healthcare products (future, direct competitor), Injection molding, Lab-on-chip technology start-ups or SMEs, Law firms, Leisure Travel, Manufacturer (Circuit board, Displays and screens, Disposable testing panel, Electronics, Hand-held interface device, Mobile device (durable), Pump component, Pipettes and sample tubes, Traditional laboratory testing equipment, Microchips and/or semiconductor, Non-chemical sensors and/or nanosensors), Marine Logistics, Marketing, Materials (Biological samples and proteins, Hydrophobic coatings, Polymer/composite shell for test device, Recyclable plastic), Mechanical design and engineering, Medical accessories (consumables), Medical Laboratory, Medical waste services, Mining, Oil & Gas Industries, Pharmaceuticals, Private medical care and centers, Shipping Industries, Social media platforms, Software development, Supply chain logistics, User focussed UX and UI design, Wearable healthcare and monitoring products, Wind turbines and wind power
Groups of people (n=131)	Astronauts, Commercialisation Consultant, Environmentalists, Explorers and adventurers, Financier, Healthcare engineers, Laboratory technicians, Medical and healthcare professionals, Patients, People opposed to western medicine, Politicians (radical or controversial), Private citizens in warzones, Researchers and data scientists, Rural and isolated community members, Sailors and offshore workers, Sustainability consultant, Technophobe, Traditional tourist
Governmental and public concerns (n=110)	Armed forces, Border control, Care facilities (aging, ill), Continental healthcare (Africa), Continental healthcare (Middle East), Environmental Monitoring Institute, EU, EU – funding, EU - health union, General Public Hospital, Health monitoring agencies, Military Hospital, NASA (USA), National and local healthcare systems, National and municipal level funding and grants, Bodies for information and data protection, Regulatory bodies (healthcare devices), Union - healthcare workers, Union - sailors and marine professionals
Non-profit Organizations (n=31)	Healthcare, Humanitarian, Rescue Teams
Academic (n=30)	Universities (in general), Medical Faculties, Arctic Research, Marine Research, Material Science
Institute (n=9)	International Maritime Health, Research (private)
Natural World (n=5)	Animals - sea-life, Environment - harsh conditions, Viruses and bacteria, Weather
Religious (n=2)	Religious institutions

Appendix B. Relative novelty and variety of stakeholders identification within initial role-based analysis

Types of stakeholders identified	Health & Wellbeing Stakeholders	Engineering & Technology Stakeholders	Additional Stakeholders
Relative novelty of identified stakeholders	38% stakeholders identified by 5+ students; 42% stakeholders identified by 2-4 students; 19% by just 1 student.	38% stakeholders identified by 5+ students; 14% stakeholders identified by 2-4 students; 48% by just 1 student.	39% stakeholders identified by 5+ students; 20% stakeholders identified by 2-4 students; 41% by just 1 student.
Variety of identified stakeholders	An average of n=6 stakeholders identified per student.	An average of n=4 stakeholders identified per student.	An average of n=6 stakeholders identified per student.
Variety of recognized stakeholder roles	7/7 stakeholder roles identified, only n=8 stakeholders identified in a single role across the maps.	7/7 stakeholder roles identified, only n=16 stakeholders identified in a single role across the maps.	7/7 stakeholder roles identified, only n=20 stakeholders identified in a single role across the maps.

Appendix C. Thematic grouping of emerging stakeholders

Type	Stakeholders identified
Health and Wellbeing (n=254)	**Academic:** Medical faculty (n=2); **Company:** Healthcare products (existing) (n=34), Medical Laboratory (n=25), Private medical care and centres (n=21), Pharmaceuticals (n=12), Healthcare products (future, direct competitor) (n=4), Health insurance (n=3), Medical accessories (consumables) (n=3), Medical waste services (n=1); Wearable healthcare and monitoring products (n=1), Care facilities (ageing, ill) (n=1); **Governmental:** General Hospital (n=21), National and local healthcare systems (n=18), Health monitoring agencies (n=9), EU - health union (n=6); Regulatory bodies (healthcare devices) (n=5), Continental healthcare (Africa) (n=3), Union - healthcare workers (n=3), Care facilities (ageing, ill) (n=2), Continental healthcare (Middle East) (n=1); **Groups of people:** Medical and Healthcare Professionals (n=32), Patients (n=33), Healthcare engineers (n=3); Medical opposed (n=1); **NPO Organisation:** Healthcare (n=9); **Natural World:** Viruses and bacteria (n=2).
Engineering and Technology (n=132)	*MATERIALS & TECHNOLOGY* **Academic:** Material Science (n=2); **Company:** Injection moulding (n=9), Biological samples and proteins (n=9), Lab-on-chip technology start-ups or SMEs (n=9), Recyclable plastic (n=6), 3D printing technologies (n=1), Biomolecular interaction technologies (n=1), Mechanical design and engineering (n=1), Polymer/ composite shell for test device (n=1), Hydrophobic coatings (n=1) *PRODUCT COMPONENT MANUFACTURING* **Company:** Electronics (n=11), Mobile device (n=6), Disposable testing panel (n=5), Hand-held interface device (n=3), Displays and screens (n=2), Circuit board (n=1), Pump component (n=1) *SENSORS & TESTING COMPONENTS* **Company:** Non-chemical sensors and/or nanosensors (n=18), Microchips and/or semiconductor (n=11), Traditional laboratory testing equipment (n=3), Nanosensors (n=1), Device calibration services (n=1), Sample pipettes and sample tubes (n=1) *DATA & INFORMATION TECHNOLOGIES* **Company:** Data processing and storage services (n=8), Software development (n=4), Social media (n=1) **Governmental:** Privacy of Information privacy and data protection (n=2) *ENERGY & RAW MATERIALS* **Company:** Oil & Gas Industries (n=8), Mining (n=2), Wind turbines and wind power (n=2)
Other (n=214)	*MARINE* **Academic:** Marine Research (n=2) **Company: Shipping Industries (n=23),** Marine Logistics (n=4) **Institute:** International Maritime Health (n=1) **Governmental:** Sailors and marine professionals' unions (n=1) *MILITARY & CRISIS RESPONSE*

Governmental: Armed forces (n=8), Border control (n=2), Military Hospital (n=1)
Groups of people: Rural and isolated communities (n=11), Private citizens in warzones (n=1)
NPO Organisation: Humanitarian (n=17), Rescue Teams (n=5),
FUNDING BODIES
Governmental: EU - funding (n=12), National and municipal level funding and grants (n=8)
Groups of people: Financier (n=6)
ENVIRONMENTALISTS
Company: Seeking positive public response, social responsibility (n=1)
Governmental: Environmental Monitoring Institutes (n=2)
Groups of people: Environmentalists (n=2), Sustainability Consultant (n=1)
GENERAL RESEARCH
Academic: Universities (n=23), Arctic Research (n=1)
Governmental: EU (n=7)
Groups of people: Researchers and data scientists (n=12), Laboratory technicians (n=6)
Institute: Private Research (n=8)
SPACE
Governmental: NASA (USA) (n=1)
Groups of people: Astronauts (n=1)
TRAVEL & LEISURE
Company: Leisure Travel (n=11)
Groups of people: Explorers and adventurers (n=5), Traditional tourist (n=1)
Natural World: environment - harsh conditions (n=1), Weather (n=1)
COMMERCIALISATION & MARKETING
Company: Marketing (n=2), Law firms and professionals (n=1)
Groups of people: Commercialisation Consultant (n=1)
HUMAN-FOCUSED DESIGN
Company: User focussed UX and UI design (n=5), Supply chain logistics (n=1)
Groups of people: Direct Consumers and end user (n=6), Technophobe (n=2)
POLITICAL
Individuals: Politicians (radical or controversial) (n=1)