Number	LANCS-D4.2-SN-2	A-PI--

Title	Summary Note (SN) for D4.2
Subtitle	Key lessons from development area **B**, '**Convergence of the physical, mental and virtual**', and flagship investigation into latest developments in '**Assistive robotics**'.

PROBLEM	■	SOLUTION			Research Note	X ■	Selected Annotation	

Categories: | | |

Summary:

This note summarises key lessons from engaging the development area on convergence and the flagship investigation into assistive robotics. It draws attention to problems associated with advanced sensory and data-management capabilities as well as the potential for social and emotional intimacy in human-device relations.

CONTEXT

Convergence of physical, mental and virtual phenomena is met with high expectations, primarily manifested in the development of assistive robotics, including advanced bionics and body/brain implant technology. We might look forward to sharing our lives with perceptive and cognitive robots, with integrated sensors and free-range mobility. Engineers have come under growing pressure to develop machine intelligence that is more *in-hand* and *at-home* in both production and common everyday affairs. We might also embrace the possibilities of inserting signals into the brain and extracting them, storing and using data transactions and electrical signals inside the body.

FACTS

Implant technologies can be used for therapeutic, security and modification purposes and are generally seen as important to the future of individual and social well-being. Expectations are particularly high surrounding:
- medical applications
- safety and security applications
- enhancement possibilities

Assitive robots are conceived with physical-cognitive characteristics which include anthropomorphic characteristics, animal-like characteristics and specialised hardware and software characteristics. A significant area of development puts the communicative abilities of robots to the test, as well as their abilities to operate in ordinary unstructured and semi-structured private, occupational and public settings, the natural habitat and cyberspace. Expectations are particularly high surrounding:
- assistance in everyday affairs
- entertainment
- law enforcement and military applications

COMMENTS

A host of ethical issues are implicated for reflection and debate:
>Technicalisation of the body
>Advanced therapies
>Quality of Life
>Autonomy and independent living
>Risk management
>Safety and liability
>Brain-device interdependence
>(Ir)reversibility
>Human-robot relations / intimacy
>Robot empathy / companionship / deception
>Human vulnerability as a tool in H-R relations
>The border between nature and artificiality
>Human self-understanding and identity
>Dignity and privacy
>Human enhancement /transhumanism
>Body sanctuary and body resource
>Dignity and privacy
>Data protection
>Implants /robots for selected social groups
>Implants /robots for security
>Implants /robots for tracking
>Implants /robots for the management of health and illness
>Social pressure: for and against
>Healthcare equality and justice
>Technological 'fix'

This list is not complete, but many of the concerns raised here as ethical concerns, have legal ramifications and overlap with social and cultural interests in the development of these technologies. For example, risk management, safety and liability, the use of tracking devices, and collection/management of data are governed by legally binding treaties which need constant review.

1. How can we frame the legal ramifications of risks that have no precedence, for example, being harmed of psychologically 'abused' by your robot companion?
2. To what extent will the legal frameworks on data protection need reform in light of the latest development, for example, on-the-fly data processing which does not require databases?
3. What are the particular social and organisational challenges engendered by the latest developments, for example, new service provisions that rely on machines to monitor conditions, flag warnings and mobilize response?

The convergence of physical, mental and virtual phenomena draws attention to problems associated with advanced sensory and data-management capabilities as well as the potential for social and emotional intimacy in human-device relations. Key considerations include:

1. changing perceptions of companionship (companion robotics)
2. changing perceptions of body, self and/or identity (advanced robotics, body/brain implants, cyberbeing)
3. new tracking, monitoring and adjustment capabilities of bodies, behaviour and state of being
4. new experiential opportunities (how far can body modification art be taken ?)
5. risk of unequal access and lack of both distributive or commutative justice (health-related applications)
6. changing perceptions of warfare, policing and related safety and security operations, engendering alienation and distrust between operators and their subjects, authorities and the individual.

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