

Quel processus pour estimer la «valeur réelle» d'une technologie de la santé ?

Multidimensionality of the “true value” of home and autonomy technologies

Outline of a general framework for assessing e-health and gerontechnology applications: Axiological and diachronic dimensions

Multidirectionnalité de la «valeur réelle» des technologies pour le domicile et l'autonomie

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Summary

" I think the next century will be
the century of complexity "

Stephen Hawking [January 2000]

Introduction

➤ *What do we talk about ?*

« health technology » « true value » → complexity

➤ Quick review of definition, point of view, values ...

How to go beyond the admission of complexity

➤ Proposition of a practical generic approach of
assessment

Introduction

What do we talk about ?

What is an « health technology » ?

What is (its) « true value » ?

What is (its) assessment ?

Health technology

Health

« Health is a state of *complete physical, mental and social well-being* and not merely the absence of disease or infirmity »

World Health Organization
(Preamble to the Constitution, 1948)

Health Technology

« *Any intervention that may be used to promote health, to prevent, diagnose or treat disease or for rehabilitation or long-term care. This includes the pharmaceuticals, devices, procedures and organizational systems used in health care* »

Wikipedia

Health Technologies according to...

National Institute for Health and Clinical Excellence (NICE, Univ of Leeds)

1. medicines
2. medical devices (for example, hearing aids or inhalers)
3. diagnostic techniques (tests used to identify diseases)
4. surgical procedures (for example, repairing hernias)
5. health promotion activities (for example, ways of helping people with diabetes manage their condition).

Health Technologies according to...

The Health Technology Assessment Handbook

1. Biological preparations: e.g. vaccines, gene therapy
2. Equipment, devices and supplies: e.g. pacemakers
3. Medical and surgical procedures: e.g. cognitive therapy
4. Diagnostic procedures and techniques: e.g. functional capacity
5. Presentation of knowledge: e.g. preventive health interviews
6. Support systems: e.g. telemedicine systems, electronic booking systems, drug selections,
7. Clinical laboratories and blood bank
8. Organisational and managerial systems: e.g. visiting nurse service

Health Technologies according to...

Home Care Technology Association of America (HCTAA) [Technology for aging in the community]

- Aging in Place
 - « is a broad term that defines living independently – that is, living where the patient decides to live – »
- Home care technology provides essential tools to permit aging in place on a widespread, cost-effective scale.
- Access to compassionate and consistent care
- Remote patient monitoring systems (...) to collect and transmit the physiological data of patients with chronic diseases, such as diabetes, asthma, hypertension, and congestive heart failure .
- TeleCare systems; TeleCare Centers

Health Technologies according to...

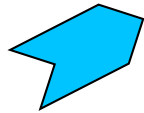
Caring.com (Technology for aging in the community)

1. Communicate with others
 - **How can families be more proficient...**
2. Manage medications
 - **solutions ranging from phone-based products to in-home technological pill containers**
3. Preserve safety
 - **Seniors want to stay in their homes, but their caregivers and relatives worry daily about how they're doing and whether they are safe there.**
4. Enhance health
 - **wearable products, online health records and telepharmacy techniques...**
5. Simplify tasks
 - **Endless supply of products that help seniors with the everyday tasks...**

Scientific disciplines involved

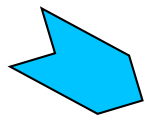
Example of gerontechnology (from JEMH van Bronswijk, 2008)

Gerontechnology



Technology disciplines

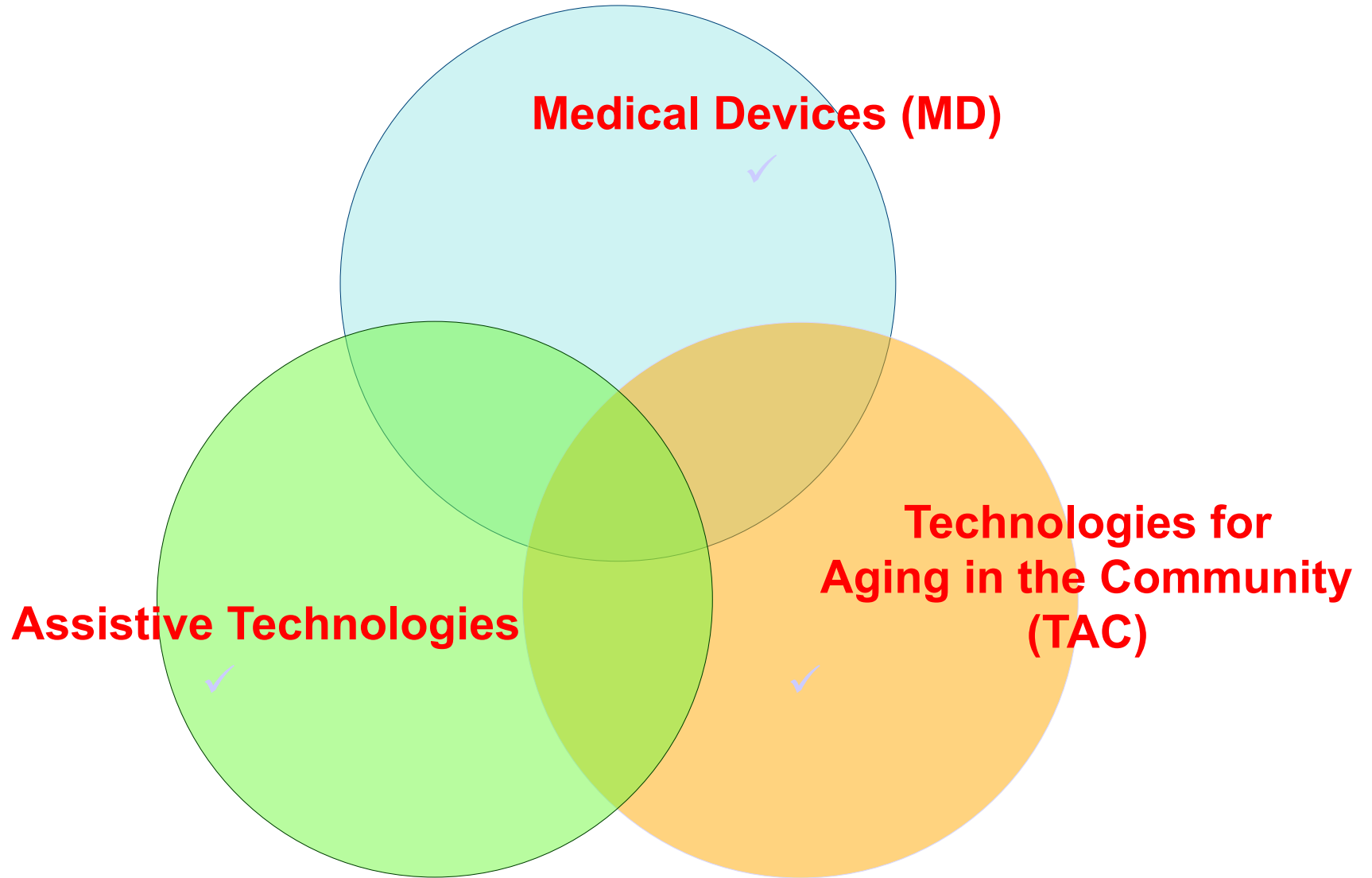
- 1. Chemistry / Biochemistry
- 2. Architecture / Building
- 3. Information / Communication
- 4. Mechatronics / Robotics
- 5. Ergonomics / Design
- 6. Business management



Gerontology disciplines

- 1. Physiology / Nutrition
- 2. Psychology / Social psychology
- 3. Sociology / Demography
- 4. Medicine / Rehabilitation

Health Technology



True value

Values

Case 1

Danish Centre for Health Technology Assessment

- 5 domains of values
 - Technology
 - Patient
 - Organization
 - Economy
 - Ethics

– *Health Technology Assessment World Europe 2009*

<http://www.healthnetworkcommunications.com/2009/hta/>

Values

Case 2



European network for Health Technology Assessment (EUnetHTA)

- Nine domains of values
 - 1. Health problem and current use of the technology
 - 2. Description and technical charac. of the technology
 - 3. Safety
 - 4. Effectiveness (mortality, morbidity, function, QoL, patient satisfaction)
 - 5. Costs, economic evaluation
 - 6. Ethical aspects
 - 7. Organisational aspects
 - 8. Social aspects
 - 9. Legal aspects

Assessment

Health Technology Assessment

" technology assessment in health care is a multidisciplinary field of policy analysis. It studies the medical, social, ethical, and economic implications of development, diffusion, and use of health technologies "

International Network for Agencies in Health
Technology Assessment



Health Technology Assessment

" research-based, practice-oriented assessments of relevant available knowledge on the direct and intended consequences of technologies, as well as the indirect and unintended consequences "



Health Technology Assessment international

An International Society for the Promotion of Health Technology Assessment

Assessment methods

- 90% of the HTAs use literature review as method of assessment (Draborg *et al.*, 2005)

Types of studies

- Randomised Clinical Trials study
- Prospective Observational study
- Prospective Pragmatic Registry Based study
- Before-After study
- Ethnographical study

Inherent complexity of the assessment of Technologies for living in the community

Origin of complexity

- Technology involves **services** (social, medical...)
- HATs includes **world-objects**
 - **world-objects: an object who shares one of its dimensions with the dimensions of the whole world**
 - *"A satellite for speed, an atomic bomb for energy, the Internet for space, and nuclear waste for time...these are four examples of world-objects. » Michel Serres*

Consequence

- A number of possible indicators
- A number of assessment methods

Necessity to share a common language

to describe functions and body structures, activities and social participation, and environment factors

That exists:

- International Classification of Functioning, Disability and Health (ICF)

ICF

- = an « international standard **to describe and measure health and disability** » (www.who.int/classifications/icf/en/)
- Designed to be used within studies of « Outcomes, quality of life or environmental factors »

Magnitude

Example of the clinical assessment phases

Pre-clinical studies

- n vitro (test tube) and in vivo (animal or cell culture)

Phase 0

- exploratory

Phase I

- first stage of testing in human subjects; small groups

Phase II

- to assess how well the drug works; on larger groups (20-300)

Phase III

- randomized controlled multicenter trials; large groups

Phase IV

- Post marketing surveillance trials

*Proposition
of a generic approach
of assessment of TLC*

Proposition for structuring complexity: The TEMSED approach

A two faceted approach

- One for the « values » multidimensionality : Axiology
- One for the size and maturity of the study : Magnitude

1. Axiology

Technology **E**rgonomics **M**edicine **S**ociety **E**conomics **D**eontology

2. Magnitude

Design: Research and development

Phase I: technical aspects (reliability, robustness...)

Phase II: relation between the user and the device

Phase III: probing results in various terms

Phase IV: economical viability and dissemination capacities

Two main dimensions

Axiology

– from Greek ἀξία, *axiā*, "**value, worth**"; and *-λογία, -logia*). *Axiology is the study of quality or value* (<http://en.wikipedia.org/wiki/Axiology>)

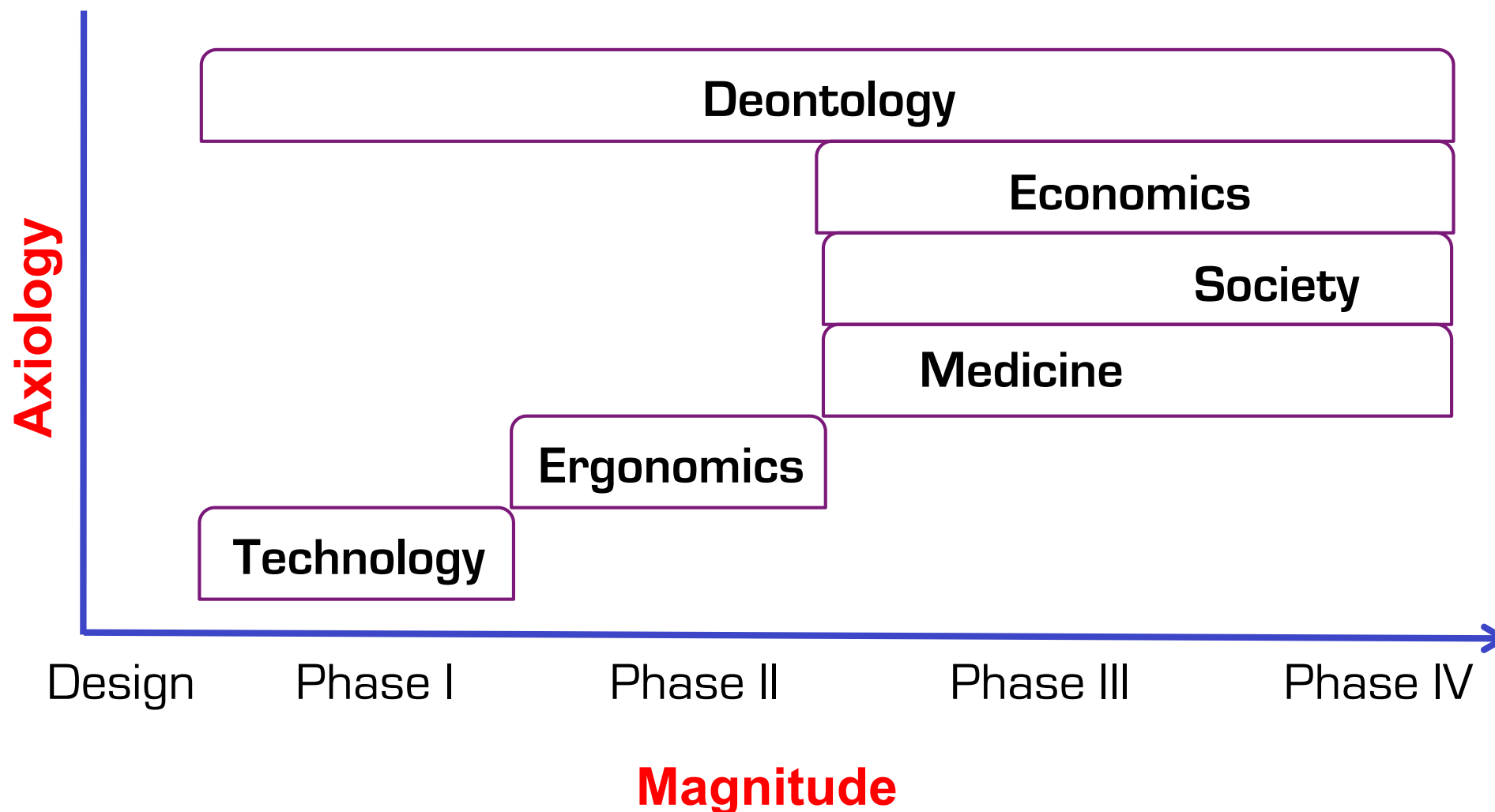
- Question tackled : What are the « values », in the broad sense, of the assessment ?
 - Includes scientific disciplines, economy, deontology...

Magnitude

– from Latin *magnus*, “grand”; with the suffix *itudo*

- Question tackled : What is the extent (size, duration, efforts...) of the assessment ?
 - Includes all procedural aspects, extent and maturity of the technology/ service to be assessed

TEMSED general diagram



Rialle V, Vuillerme N et Franco A. Outline of a general framework for assessing e-health and gerontechnology applications: Axiological and diachronic dimensions. *Gerontechnology*, 2010, 9 (2): 245.

Discussion - conclusion

TEMSED

- Provides a framework
 - For gathering complimentary assessment traditions
 - For helping to systematise assessment
- Is not a definite model *stricto sensus*
- Is intended to be used, namely
 - By the French National Reference Center for home care and autonomy (CNR SDA)
 - By the French Chapter of ISG
- Is not intended to provide all solutions regarding assessment methods
- May be the summary of a vast handbook of evaluation
 - to write together...

Thank you

Any questions ? Remarks ?