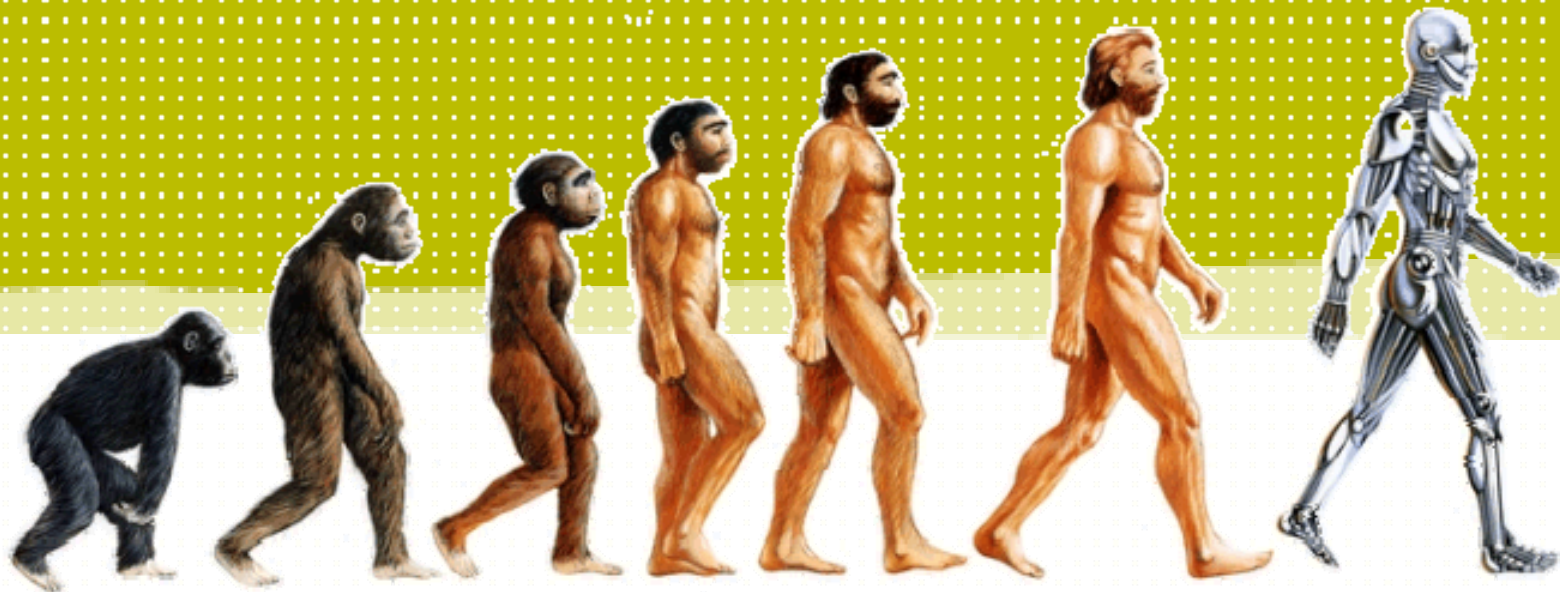


Outcomes assessment: the missing link

Gert Jan Gelderblom
Vilans, the Netherlands



User problem

Technology

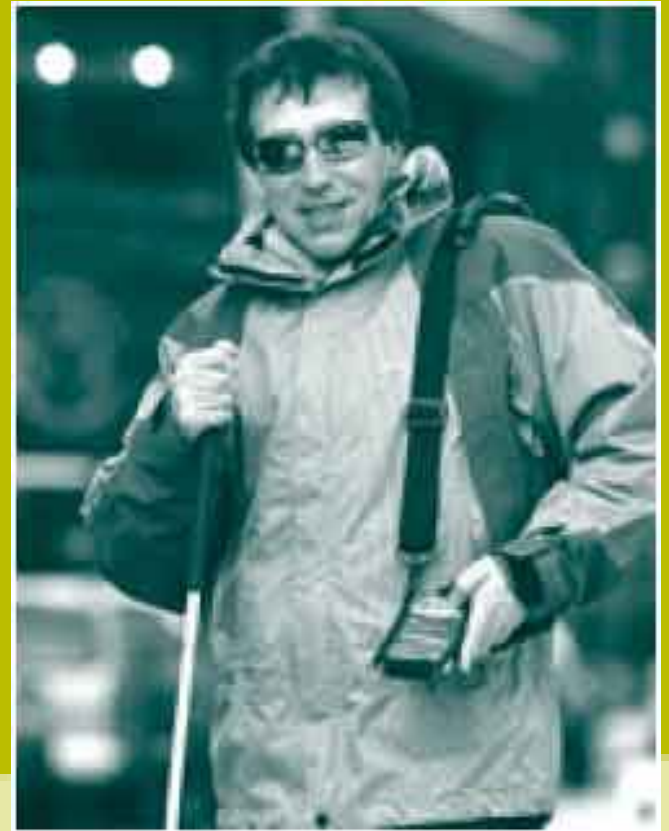
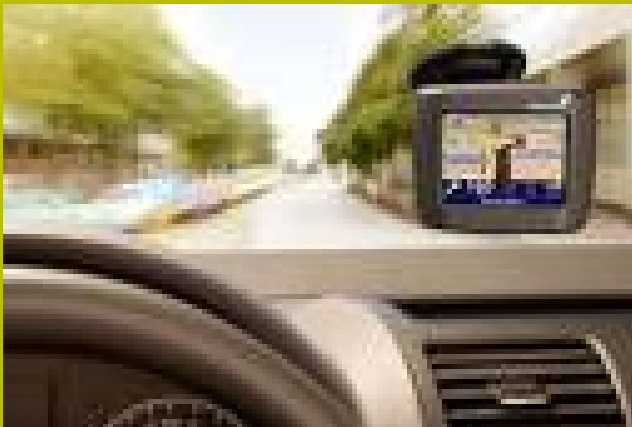
Market

Product



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GPS: TomTom vs Viktor Trekker



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Robotics: Industry versus ADL



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Virtual Reality: Wii vs Caren



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Technology to the AT market?

- The intention of many projects to support disabled people in ADL **rarely** turns into reality
- In the end people with disability **rarely** benefit from (public funded) system development



AT Market

- Imperfect market
- Technology Push vs Demand Pull
- Not all product developments will be an instant success



user problem

available
technology

market
introduction

product
concept

outcome
assessment
trial(s)

product
development

technical and
usability tests



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Missing link?

Two examples

- Robotics for Healthcare
- Manus Manipulator (ARM)



Robotics for Healthcare

- EC funded study (ICT for Health)
- Development Research Roadmaps
- Consortium:
 - TNO (NL)
 - Vilans (NL)
 - VTT (Fi)
 - Fraunhofer (De)
 - Euroact (Jp)

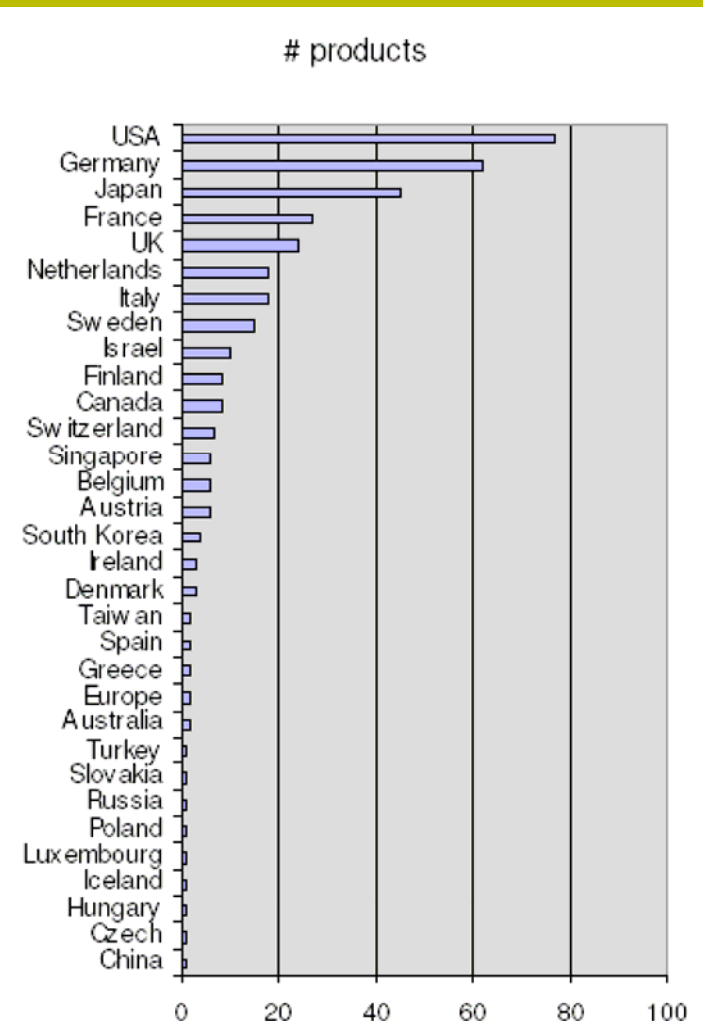
Robotics for Healthcare

- State of the Art Report
 - Robotics assisted preventive therapies and diagnosis
 - Robotic Assistive Technology
 - Robots supporting professional care
 - Robotics for rehabilitation treatment
 - Robotics for medical interventions
- Roadmaps on 10 sub domains

Available robotic systems

- In total 339 robotic systems were collected,
- 125 mapped in detail regarding development phase.
- In Rehabilitation Robotics only very few systems on the market
 - I-Bot
 - Manus/Arm
 - MySpoon
 - C-leg
 - Lokomat

.....



Development progress

	Invention	Research	Innovators	Early adopters	Early majority
Intelligent fitness systems					
Robotised motion and coordination analysis					
Tele diagnostic and monitoring systems					
Small medical capsules					
Systems supporting manipulation					
Systems supporting mobility					
Intelligent prosthetics					
Robotised physical tasks in care taking					
Robotised paramedic tasks					
Logistical robotised support for nurses					
Patient monitoring robots					
Robot assisted physical training therapy					
Robotised motor coordination therapy					
Robot assisted mental, cognitive and social therapy					
Robot assisted micro surgery					
Robots for surgery assistance					
Robots for precision surgery					
Robot systems for minimal invasive surgery					
Medical and micro surgery					
Remote surgery robots					
Robots for assisting small medical interventions					

Manus Robotmanipulator



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Manus Robotmanipulator

Some History

- 1985 start of system development
- 1993 field trial with 3 systems
- 1994 first 40 systems reimbursed
- 2000 experimental provision of 10 systems
- 2003 temporarily funding program, 160 systems given out
- 2006 formal acceptance in reimbursement system
- 2007 Introduction of 2 competitors on the Dutch market



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Manus Robotmanipulator

Problems regarding acceptance

- Too expensive for an individual provision
- Novelty of type of system
- Lack of insight in added value



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Manus Robotmanipulator

- 1985 start of system development
- 1993 Field trial with 3 systems
- 1994 first 40 systems reimbursed
- 2000 experimental provision of 10 systems
- 2001 effect study
- 2003 temporarily funding program, 160 systems given out
- 2003 study into provision procedure
- 2006 formal acceptance in reimbursement system
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Manus Robotmanipulator

Study into the effects (and costs)

- Satisfaction (Quest)
- Use (duration and frequency) (Life H)
- Use (activities) (Life H)
- Care substitution (professional and informal)
- Level of observed independence
- Level of perceived independence (FIM)
- Perceived effectiveness (IPPA)
- Quality of Life (EuroQol, EATS-2D)
- Sickness Impact (SIP)
-



Manus Robotmanipulator

Study into provision procedure

- Is it suitable for the applicant
 - ICF related criteria (health, physical and characteristics, activity participation)
 - Practical criteria (can I take it in the van?)
- Is it the most suitable system
 - Instead of alternatives (arm support, social dog)
 - Instead of competitors (e.g. Raptor)



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Conclusion

- The intention to go to the market is not the problem.
- Absence of reimbursement is not a cause but a consequence.
- In the logical development of systems field trials are **at** the end of the line.
- Trialling provides insight in effects and added value, but also provision criteria.
- Demonstration of added value is essential for market success.
- Financing of trialling

