



Human Capabilities & Technologies

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TU Delft
Challenge the Future

On Ethics and Engineering

- Amartya Sen, *On Ethics and Economics* (1987): economics can benefit from a closer relationship with ethics
- So can technology and engineering, and the Capability Approach is a suitable normative framework for this purpose

↓

needs to be addressed in order for the **capability approach** to realize its full potential as a **practically relevant ethical theory** concerned with improving the fate of the global poor in the **century of high technology**.

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Capability-Technology Affinity thesis (CTA)

There are close, but unexplored, relations between technology and the Capability Approach

This presentation: introduction + four supportive arguments



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This presentation

1. Technology in a modern world
2. Historical argument: (a) design & (b) ethics
3. Philosophical-anthropological argument
4. Conceptual argument
5. Argument from cases
 1. Ultrasound Medical Technology in India
 2. Spoken Web Application in India



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1.

Technology in a Modern World

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Characterization of Technology

- Ubiquitous
- Constitutive, not merely enabling
- About things that matter
 - Information and communication
 - Health
 - Food
 - Energy
 - Mobility
 - Social Relations
 - Learning, Science and Education
- Puzzling: new and complex
- Value Laden

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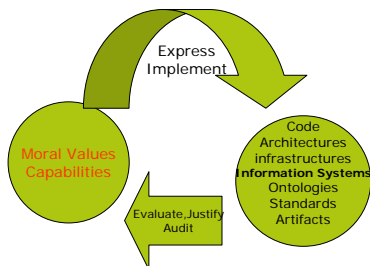
Puzzling

Democracy
Trust
Privacy
Property
Community
Person
Intelligence
Life
Work
Health
Friendship

Example: ICT makes things even more Puzzling

Digital	Democracy
E-	Trust
Informational	Privacy
Intellectual	Property
Cyber	Community
Digital	Person
Artificial	Intelligence
Tele	Life
E-	Work
Net	Health
	Friendship

Ethics and Technology



Value Laden Technology

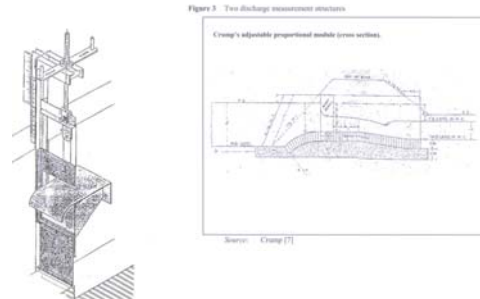
Some examples:

- Low hanging overpasses
- Weirs
- Geographic information systems

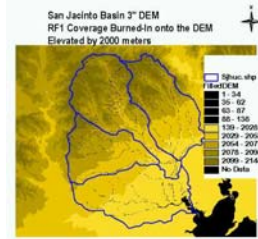
The low-hanging overpasses of Robert Moses



Weirs in colonial India and Indonesia



GIS: “Disappearing” wetlands



2.

Historical argument:

- (a) *Value turn in Design*
- (b) *Design turn in Ethics*

(a) Value Turn in Design

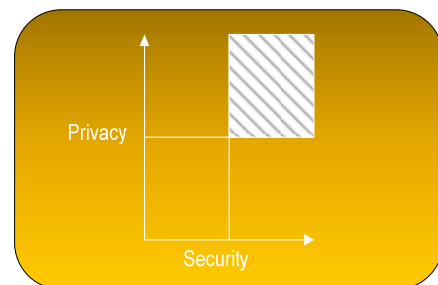
- Design for the Real World (Papanek)
- Design for All (Shneiderman)
- Design for Democracy (Pelle Ehn)
- Design for Sustainability (Schumacher)
- Design for Privacy (Cavoukchian)
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- Design for Values (TU Delft)

Design for Values (TU Delft)

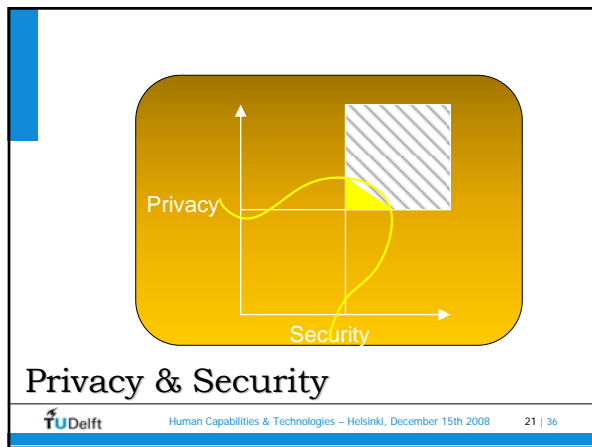
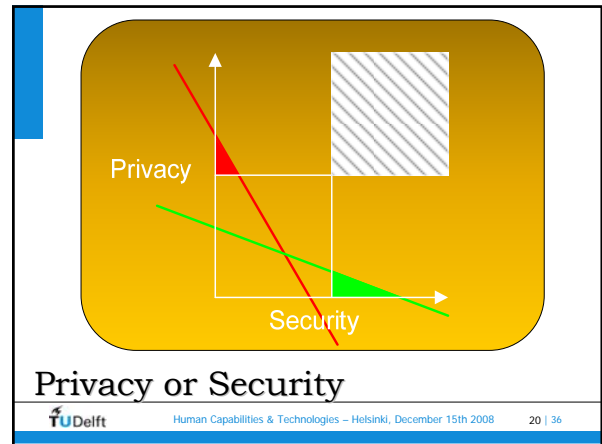
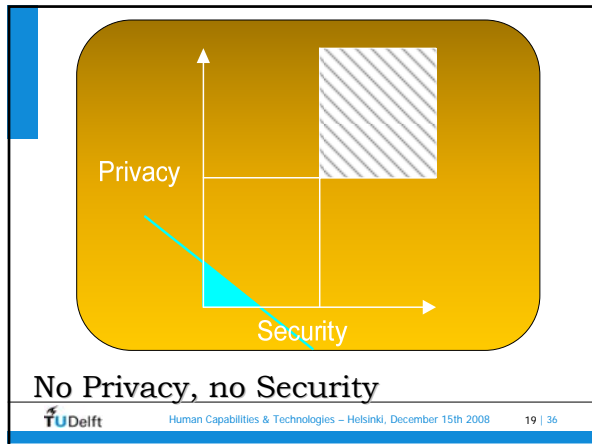


(b) Design Turn in Ethics

- a) Designing Institutions (Goodin, e.a.)
- b) Designing Social Mechanisms (Parikh)
- c) Designing Democracy (Sunstein)
- d) Designing Organizations (Hardin)
- e) Designing Incentive Structures (Pogge)
- f) Designing Code (Lessig)
- g)
- h) Designing what matters from a moral point of view



Capability Overload



3.

Philosophical-anthropological argument: Ortega Y Gasset

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- What is technology?**
– Ortega Y Gasset
- Distinction between keeping warm (functioning) and building a shelter/ making a fire (capability)
 - Homo sapiens could live without technology
 - Not living, but living well or well-being is what we are concerned with
 - Variety in artefacts, design and technology related to variety in conceptions of the good life (Basalla)
 - Technology and Capability Approach have as their terminus ad quem "The Good Life"
 - Particular identities require specific technologies/artefacts
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4.

Conceptual analysis of the

- *Capability Approach*
- *Engineering*

Counterfactual analysis

- (A) X can walk with a leg prosthesis
- (A') X could not have walked without his prosthesis
- (A'') If X would not have had his leg prosthesis X would not have had the capability to move

- Given technologies S and T, where S is less advanced than T, it may be the case that

(B) –MSA&MTA

A is not possible with technology S but A is possible with technology T.

- Here MTA may be explicated as

(C) MA&(MA→T)

it is possible that A, but only in the presence of T

Sen Takes A Bicycle

- "Take a bicycle. [...] Having a bike gives a person the ability to move about in a certain way that he may not be able to do without the bike. So the transportation characteristic of the bike gives the person the capability of moving in a certain way. That capability may give the person utility or happiness if he seeks such movement or finds it pleasurable. So there is, as it were, a sequence from a **commodity** (in this case a bike), to **characteristics** (in this case, transportation), to **capability to function** (in this case, the ability to move), to **utility** (in this case, pleasure from moving)." (Sen 1983)

In short...

- commodity (a bike) →
- characteristics (transportation) →
- **capability to function** (ability to move) →
- utility (pleasure from moving)

5.

Argument from cases

- *Ultrasound technology in India*
- *The 'Spoken Web' for the BoP*

Ultrasound technology in India: complicated capability effects

- *For mother and child:* preventing premature death, improving health (+)
- *For individual families:* better financial situation, which may contribute to different capabilities (+)
- *For women in general:* another way to continue a culture that denigrates and discriminates women, which affects many capabilities (-)
- *For young boys/men:* unable to find a spouse and start of family, which affects capabilities in the area of emotions and affiliation (-)



The details of technology matter...

- Developments in 'sex determination technology'
 - Amniocentesis: in 16th – 18th week of pregnancy
 - Abdominal ultrasound: 14th week
 - Trans-vaginal ultrasound: 12th week
- Female feticide now possible in the first trimester, when abortion is less complicated and there is less suspicion of sex selection
- Technological developments do not stop here: Philips BoP project to bring simplified ultrasound equipment to the rural areas
- *Dilemma:* we would like to realize a more equal access to medical technologies, yet we would not want to aggravate the problem of sex-selective abortions either

'Capability sensitive design' solutions?

- When transmitting ultrasound images through ICT connections → severely limit access to information



- What information do doctors really need? → design technologies that produce only that information (and no gender info?)



The 'Spoken Web': The answer to illiteracy?

- Currently being developed by IBM India Research Laboratory
- Comparable to the www, but uses the spoken instead of the written word: people can host and browse 'VoiceSites', traverse 'VoiceLinks', etc.
- Responds to two facts:
 - Many of the world's poor are illiterate
 - Cell phone access is now widely spread, even among the poor
- How will it in reality impact the capabilities of the poor?

Do the details of design matter?

- Idea of 'Spoken Web' could be technically realized in many different ways, that will probably differ in their capability impact
- Positive: attention being paid to make it easy for the poor and illiterate to create their own VoiceSites
- First tests of IBM lab: 10 out of 12 micro entrepreneurs (like freelance plumbers) were able to create one for their businesses within minutes
- Being capable of creating your own VoiceSites instead of just using those created by others → more empowering
- (although these poor will then probably still remain dependent on 'templates' created by companies like IBM)

But what about long-term effects on literacy?

- Evan Selinger: "if literacy campaigns are typically successful because potential students expect to be able to improve business relations and stay in touch with distant relatives by knowing how to read and write, then it becomes reasonable to wonder: Might using phones to accomplish these ends counteract the educator's agenda?"
- Question becomes even more urgent with the introduction of the Spoken Web, another voice-based application
- On the other hand ... applications for mobile phones have already been developed to increase literacy. Could we come up with ways to make the Spoken Web contribute to literacy?