

The Quest for the Perfect Search Engine:

Values, Technical Design, and the Flow of
Personal Information in Spheres of
Mobility

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Inspirations...

“...we are surrounded by the wondrous effects of machines and are encouraged to ignore the ideas embedded in them. Which means we become blind to the ideological meaning of our technologies”

Neil Postman, *Technopoly*

Must avoid accepting the design of technologies at “interface value”

Sherry Turkle, *Life on the Screen*

Foundations...

- Technology is not neutral
 - *Beniger; Ellul; Marcuse; Mumford; Winner*
- Biases in media & communication technology
 - *Eisenstein; Innis; McLuhan; Ong; Postman*
- Ethics & values in technology
 - *Brey; Friedman; Johnson; Mitcham; Moor; Nissenbaum; Tavani; van den Hoven*

Design of ICT bears directly and systematically on the realization, or suppression, of particular configurations of social, ethical, and political values

Faustian Bargain

Anyone who has studied the history of technology knows that technological change is always a Faustian bargain:

Technology giveth and technology taketh away, and not always in equal measure.

A new technology sometimes creates more than it destroys. Sometimes, it destroys more than it creates. But it is never one-sided.

~ Neil Postman

Research Agenda

Explore the social, political and value dimensions of communication, information, and new media technologies...

- **Technologies**
 - Web search engines
 - Information interfaces
 - encyclopedias → computer file systems → web sites
 - Web 2.0 & social network platforms
- **Concerns**
 - Personal information flows
 - Access to knowledge
 - *Privacy, freedom from bias, autonomy, liberty*

Research Agenda

...and engage with technical design communities to proactively influence design in value-conscious ways

- **Value-Conscious Design**
 - Design for Values (J. Camp)
 - Value Sensitive Design (B. Friedman)
 - Values at Play (H. Nissenbaum)
- Include values of **moral & ethical** import in initial design process
- Pragmatic **engagement & collaboration** with technical designers

Research Agenda

...and engage with technical design communities to proactively influence design in value-conscious ways

- **Value-Conscious Design ~ Methodology**
 - **Conceptual**: Philosophical analysis & development of values at play
 - **Technical**: Material reading of particular design features and variables (operationalization & translation of values)
 - **Empirical**: Measurable analyses supporting the Conceptual and Technical efforts

Dissertation

- The Quest for the Perfect Search Engine: Values, Technical Design, and the Flow of Personal Information in Spheres of Mobility
 - conceptual investigation of the values at play with the quest for the perfect search engine
 - technical investigation of the design features of the perfect search engine itself
 - contribute to future pragmatic attempts to design the perfect search engine in order to re-negotiate our Faustian bargain and protect the values traditionally enjoyed in our spheres of mobility

“Planet Google”

“Organize the world’s information and make it universally accessible and useful.”



Perfect Search

- Provide results that suit the **context and intent** of the search query



- User satisfaction & loyalty
- Increased revenues

Perfect Search

- Perfect Reach:
 - “process and understand all the information in the world”
- Perfect Recall:
 - “understand exactly what you mean and give back exactly what you want”

“Like the mind of God”

“Don’t be evil”

Faustian bargain?

Perfect Search's Perfect Recall

- Must be omniscient
- Collect as much information as possible about the searcher
 - Server logs
 - Cookies
 - User accounts

Server Logs

```
123.45.67.89 - 25/Mar/2003 10:15:32 -  
http://www.google.com/search?q=join+alcoholics+anonymous  
Firefox 1.0.7; Windows NT 5.1 -  
740674ce2123e969
```

IP Address Cookie ID Date & Time

Search terms:
Join Alcoholics Anonymous

Also likely includes results clicked,
referring page, and other clickstream data

Perfect Search's Perfect Recall

- Collecting, aggregating & mining users' searches
 - Necessary for “perfect search”
- Majority of users **unaware** until
 - DOJ v. Google
 - AOL data

But that's only a sliver of the Perfect Recall

Perfect Search's Perfect Recall

- Over **two dozen** products & services
- Interconnected via **cookies & Google Accounts**
- *Contacts, news, subscriptions, blogs, books, stocks, appointments, e-mail, friends, computer files, discussion groups, URLs...*



Database of Intentions

“This information represents, in aggregate form, a place holder for the **intentions of humankind** - a massive database of desires, needs, wants, and likes that can be discovered, subpoenaed, archived, tracked, and exploited to all sorts of ends.”

- John Battelle

*Source of insight into what someone is thinking,
not just what that person is doing*

Faustian Bargain

- Feedback loop
 - Must provide (often non-trivial) information to participate
- Faustian bargain:
 - Perfect search engine promises breadth, depth, efficiency, and relevancy...
 - ...but requires the widespread collection of personal and intellectual information

Acceptable Bargain?

- Rhetoric of efficiency, utility, and relevancy
 - “improve the quality of our services”
 - inherently “helpful,” “useful,” and a “good way to support a service”
- Privacy concerns overblown?
 - “no personal information is shared”
 - “same info already shared with libraries, stores, publishers, etc”

Contextual Integrity & Perfect Search

- Agents
 - Before: Scattered, often unrepeated, rarely consolidated
 - *Perfect Search: Single agent ~ Google*
- Types of info
 - Before: Incomplete, verbal requests, some transaction data
 - *Perfect Search: Complete, consistent, digital*
- Transmission principles
 - Before: Mostly voluntary; bound by ethics codes
 - *Perfect Search: Compelled, hidden, automatic; often intended to share with 3rd parties*

Contextual Integrity & Perfect Search

- Violation of the contextual integrity of the privacy of personal information
 - Significant shift in informational norms (agents, types, transmission principles)
 - Not the same as that provided in other information-seeking scenarios

But what of the rhetoric of efficiency, utility, and relevancy?

Values in Spheres of Mobility

- Freedom to move through physical, intellectual (and digital) **spheres**
 - Explore unknown frontiers
 - Overcome barriers of time & space
 - Free and open inquiry
 - **Privacy, autonomy and liberty**
- Free from answerability or oversight
 - **Self-determination and self-definition**

Tech in Spheres of Mobility

- Technologies introduced to enhance our mobility
 - **Physical:** EZ-Pass, networked vehicles
 - **Intellectual:** library management systems
 - **Digital:** Cookies and DRM
- But Faustian bargains persist
 - Ability to **monitor, track, control mobilities** across spheres
 - **Threaten** the very values meant to enhance

Threat to Spheres of Mobility

- Web search engines are the latest **technological medium** to support physical, intellectual, and digital mobility
 - Perfect search presents a **similar threat** to technologies before it
 - Unable to navigate our spheres free from **answerability and oversight**
 - Threatening values of **privacy, autonomy, liberty and freedom**

Resistance is Futile

- “I find myself getting sucked down the Google wormhole”
- “It’s all part of Google’s benign dictatorship of your life.”
- “I don’t know if I want all my personal information saved on this massive server in Mountain View, but it is so much of an improvement on how life was before, I can’t help it”

Ante up...

- Collection of personal information becomes a prerequisite of participation
 - *“oscillates between seemingly rewarding participation and punishing attempts to elect not to divulge personal information”*

(Elmer, *Profiling Machines*)

- Compelled to provide or make available personal information

Solutions?

- Law & external regulation
 - Yale “Regulating Search?”
- Internal policy & self-regulation
 - Intel & Microsoft
 - No one wants to be first
 - Usually imperfect
- Design
 - Lessig: *“how a system is designed will affect the freedoms and control the system enables”*
 - Design is a **critical juncture** to re-negotiate

Value-Conscious Design

- Conceptual
 - Clarity & normative understanding of the values at stake with the perfect search
- Technical
 - Brief discussion of how the design of the perfect search technically captures user information
- What next?
 - Continued conceptual expansion
 - Continued technical investigation
 - Initiate empirical examination of harms & effects
 - Engage with technical design community...

Help...

- Continued conceptual expansion
 - Need answers to the “nothing to hide” argument
 - Need *FoxNews* sound bites...
- Continued technical analysis
 - Perform Ben Edelman-type technical analysis
 - Method?
 - Explore alternative solutions for personalization, privacy-protecting data-mining, etc...
 - Sampling
 - Alternative business models

Help...

- Initiate empirical examination of uses, harms & effects
 - Perform **Eszter Hargittai**-type user studies
 - **Collaborations?**
- Engage with technical design community
 - Get them **to the table**
 - Overcome challenges
 - **Operationalization**
 - **Competing values**
 - **Role as advocate**