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Stone Mountain Ultra-Secure Tier-4 Data Center Mega-Complex (SMDC)

Twenty times the size of the Cheyenne Mountain Operation Center in Colorado, SMDC will, upon completion, set new standards for ultra secure data storage. Carved into a mountain of limestone, SMDC will have on site water and sewage treatment, a fire station, a helipad, a power plant, medical facilities, as well as police powers granted by the state to onsite security personnel. The facilities are all under the tightest surveillance, resulting in "indefinite self-sustainability for complete stand-alone operability no matter what happens off-site."

http://stonemountaindataplex.com/index.htm

Fig.1 (courtesy L. Russell, Stone Mountain Data Center)

towards diversity in data culture

Urbanites across the world are inundated with information. The emerging information culture growing in its wake constitutes a fundamental element of 21st century living. Data, the digital residue of information, has crept into the 21st century with astonishing ease, promising conveniences never before possible. Overwhelmed by information made both perceptible and ceaseless, a public attention deficit disorder has taken hold. It seems impossible to objectively measure the benefit of data availability against its invisible and time delayed side effects. And these include nothing less than an unprecedented erosion of privacy and the commercialization of the public sphere [1].

a data culture malaise

There is nothing personal about computing other than the bacteria communities that coat your keyboard [9]. While most people seem to agree that computing has gone public, there is less agreement on which aspects of computing and information remain most relevant. This might be due in part to the fuzziness of the concept of information that spans electrical, biological and logical media as well as factual, subjective and intangible things. The Shannonian-mathematical concept of semantic-independent information (informed by prior work in thermodynamics) is a different creature all together from the linguistic concept of semantic-dependent information (informed by prior work in linguistics). But information with real-world saliency is more, a thing [3] that spans both domains, despite attempts to conveniently reduce it to a single category. One might be tempted, for example, to disregard the interdependence between the technical framework that makes mobile phone communication possible and the cultural habits that form around it, but dropped calls and subsequent mutual accusations of rudeness remind us that the technical and the social remain intertwined.

The twining is less of a problem than the polarizing positions the technical-commercial communities and the critical socially engaged communities operate from. Sociologists and activists have been expending plenty of effort debating just how asymmetric the power relations inherent in the Internet are [10] without building any kind of alternative that could behave otherwise. It is much easier to kill your data [16] than to propose, let alone make, new and robust models of living with information. The information technology (IT) camp is equally complicit in the current data culture malaise. IT still seems to believe that every social and philosophical problem need only be addressed by the proper technological fix.

metaphors of virtualized computing

"Security in the Ether" [17], an article published by *Technology Review* on the current trend in virtualized data management, better known as cloud computing, is a good example of the state of IT rhetorics that accompanies the data culture malaise. The ether, according to Greek mythology the pure air breathed by the Gods, the material that fills the region of the universe above the surface of the earth, is as inappropriate a term for the atmosphere as clouds are for articulating the virtualization of computing resources. In a virtualized computing environment one does not know where requested computing cycles are carried out, or where the data that is produced is stored at any given moment. But there is nothing cloudy about this. Data resides in real places. And these real places – data centers - are owned and operated by private interests. They sit in the country side in non-descript buildings that belie their significance and energy costs. They are real, but virtual. They operate in the background, out of sight.

Fig. 2a and 2b (courtesy realtechsupport)

The Open Biometrics Project - 2002

The Open Biometrics Project challenges the fabrication of automated biometric identification. Biometric classification is a probability problem with social consequences. Consequently, this system does not interpret its own results in a reductionist binary manner, but shares its probabilistic result such that people can see its intermediate results and decision making approach. In the finger print analysis application here, the system calculates the information currently used (in many finger print systems) to describe a finger print: the characteristic points along with their image coordinates, type code (ridge ending or bifurcation) and likelihood (as a percentage) in a color-coded map (dots on the fingerprint in variations of blue, above).

The popularization of biometric analysis has made the procedure of collecting biometric data too easy, in the sense that the results are too easily construed to mean what they only imply. Applied on a large scale, such efficiency-driven authoritative approaches guarantee that errors that do occur, generate confusion and fear, because the system does not make its own operational limits transparent.

Large scale public classification systems must be open, open to insight and scrutiny. The Open Biometrics Initiative applies this philosophy to finger print analysis. Other biometric markers could be treated in a similar fashion.

http://www.realtechsupport.org/repository/biometrics.html

One of the most ambitious future data security centers is currently being built underground, carved into a mountain of limestone. This rock-solid abode suggests renaming the cloudy ether of virtual computing more aptly *cave computing*. Mark Weiser [18] claimed that profound technologies weave themselves into the background of everyday life until they are indistinguishable from it. Maybe cave computing is a consequence of information technology attempting to fulfill the Weiserian prophecy by putting itself into the background in order to become profound, or at least profoundly secretive. IT may be moving into the background, but it is far from becoming insignificant. On the contrary, information like oil, is significant enough to conceive 21st century war scenarios over [8].

from virtualized computing to revitalized data culture

It is time the discussion surrounding virtualized computing fell from the clouds and landed back on earth. Addressing the disjoint between computing technology, computing experience and lived reality requires a new literacy, maybe a 21st century compatible enlightenment. On practical terms it needs, urgently, transparency and openness. But what even the simple concept openness translates to is challenging. It is vested-interest dependent as *WikiLeaks'* disclosure of sensitive governmental, corporate, and religious documents that delight journalists and enrage corporations, including the US Army [19], prove.

The German Hacker group *Computer Chaos Club* (CCC) has its own interpretation of openness. CCC released a proposal for a *Datenbrief,* a declaration of data [4], to improve citizen data self-defense. CCC wants any company that collects, transmits or stores any kind of personal data to disclose this data in full in an annual letter to those whose data they retain. The goal is to reverse the current practice by which people are required to request access to what others know of them and to place the onus of transparency on those who hold the data. Because there is a cost associated with this process, according to the logic of CCC, data collection should become unattractive and companies will have an incentive to reconsider, if not reduce, their data collection schemas. However, some have argued [2] that this well intended intervention will require authorities to "find everyone"; even those who do not want to receive their well intended data declaration letters.

The 2004 EU initiative on the *Disappearing Computer* [14] offers a different view on openness. As lead author of the project's privacy design guidelines, Lahlou understands that privacy design is best addressed in the nexus of technical affordances, social needs, and common sense. Indeed, many of the guidelines are general design principles while others seem at first counter-intuitive. For example, the *consider time* guideline opposes the idea of durability as a design maxim. For public information retention systems, the requirement is to limit data duration through explicit data expiry dates. Like food, data should have an expiry date. Of course, the best way to reduce data is not to collect it in the first place. Lahlou's *privacy razor* stipulates that only absolutely necessary data should be recorded. This is in response to the acknowledged problem of data creep - the bloating of data collection just because the act of collecting can occur. But the sharpness of the razor is blunted by the fact that absolutely necessary is far from absolutely clear. Nonetheless, Lahlou's interpretation of openness is significant because it expands the concept of "open to view data" to open "to view procedure" with the goal of providing a mental model of what an information system is actually doing.

Fig. 3 (courtesy realtechsupport)

Fig. 4 (courtesy realtechsupport)

Shoeveillance - 2006
Shoeveillance is a surveillance system that tracks pedestrian traffic in public buildings and allows for data pleasure. From the goings and comings of shoes, the system tallies pedestrian traffic. As opposed to collecting data where people are loath to share it, shoeveillance takes it from the culture of shoe fashion. It encourages us to enjoy our vanities and prevents this pleasure from being misused for nefarious ends as even the most fashionable shoe never really reveals the identity of its owner. When invasive technologies become part of daily life, they must be tamed and disciplined.

http://www.realtechsupport.org/repository/shoeveillance.html

The House for the Computer for the 21st Century (HC21) – 2006, ongoing (with Hans Frei)
In the HC21, observation systems share information amongst multiple participants and consider their divergent interests in the collected information. For example, surveillance cameras watch for unauthorized visitors and simultaneously observe soft patches of grass that the house dog enjoys.

http://www.realtechsupport.org/new_works/hc21.html

However, none of these attempts reach far enough. Information and the control of information demand a new design philosophy. How should one design data collection, analysis and retention philosophies and practices that care for the cultural good [6] information has become? Information flows faster and denser than eyes, ears and minds can cope with, let alone discern meaning from. The era of information has lead to the age of post-perceptual information management, for which there is no instruction manual. While the individual is overwhelmed and helpless, collectives hold new powers. Teams of workers regularly produce complex assemblages such as operating systems and spacecraft that no single mind can grasp. But where the disjoint between perceptual space and information space is ill-defined, mental navigation, even for collective intelligences, becomes impossible. Technically, culturally, we are at an impasse.

The history of communication technology illustrates how the shape of information space increasingly deviates from that of physical space [12]. Books draw together information dispersed in physical space and the newest network systems promise to collapse all information into a single point. The disjoint between experience and information accelerates the opportunity to search and find, but it further removes one from the ground truth of physical experience. However, the disjoint need not produce the kind of skewed systems we currently suffer from. Required are conduits that actively acknowledge the differences between the space of the real-experiential and that of the informational-representational. Making the disjoint operational, conceptually and practically, goes beyond performance transparency; it is an opportunity to fundamentally reconfigure information systems and change the way knowledge is defined.

But this process has yet to begin in earnest. The growing discomfort, for example, with involuntary data, data generated without consent, is generating loud disputes. The problem of involuntary data is not new and not restricted to electronic information, as the discussion of tissue rights (body parts removed from patients and later used for research without patients' knowledge) show [11]. Those who collect involuntary data cloak themselves in unfittingly casual self-justification. That is why automobile manufacturers who let their GPS-enabled vehicles send log-data discretely back to headquarters for 'product evaluation' act genuinely surprised by the outrage of their unsuspecting customers. But even where the collection occurs in full view, such as in Google's Street View [7], sources are taken for granted.

Fig. 5a and 5b (courtesy realtechsupport)

The Glass Bottom Float (GBF) – 2008, ongoing (with Joe Atkinson)

GBF collects real time water and weather data into a 30 dimensional environmental descriptor and combines this with input volunteered by beach visitors to a new metric that emphasizes the potential pleasure of being in the water. This new metric, the *swimming pleasure measure*, combines the strength of analytic data produced by computers with the intangible quality of intuitive experience that human beings are able to articulate. In the example above, the interview data, the latest fecal contaminant measurement, the weather and water data all suggest a good day at the beach. The result is translated into a color-coded light with the same color scheme as existing beach flag systems (red: compromised conditions, blue: ok). More detailed data is available to any internet enabled mobile phone. This allows beach goers to make informed decisions about going to the beach before they leave their homes and to compare their own experience directly with the results of the GBF system.

http://www.realtechsupport.org/new_works/gbf.html

Where the disjoint between experience and information is not articulated as a resource to be shared and designed with this in mind, new kinds of conflict are pre-programmed. If every human folly can be recorded and every social transgression tallied, then the über-precise data recording systems of our own design need to be endowed with a proxy of common sense and generosity; everyone shall have his/her fair share of allowed (and recorded) transgressions that expire as predictably as the earth rotates.

However, where the disjoint between experience and information is interpreted as an experimental design space, radically new opportunities will arise. It is well known that machines excel at repetitive tasks and that people excel at intuition and invention. But the fusion of information from disparate intelligences with complementing features can generate insights neither can achieve in isolation. Procedures with heuristics yet untested might generate new qualities from masses of data no human being can behold, acknowledge the disjoint between experience and information while offering conduits to deep understanding. Even business analytics [5] seeking to integrate 'intangible assets' into service science models, seems to share such desires. Harvesting intangibles is but one venue to explore. Information resource management of the future will need the kind of long term view that guided the conception of the *Svalbard Global Seed Vault* [15]. In the long term, information fusion approaches could act along temporal axes to combine the present with the past; along cultural axes to combine information across language barriers, and across species axes as only science fiction might consider. Imagine an earthquake early warning system that combines mammals' sensitivity to low frequency fluctuations in the earth's magnetic field [13] with the best seismic sensors available on the ground and in the sky.
This is material for a new data culture, one that might, over time, contribute to a diversification of the monoculture from 'old' machine generated data we have become unwittingly slaves of. If new information polycultures are distributed liberally, the information forests of the future will offer plenty of space for creatures of all kinds.

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