Mapping EDEN: Revealing the territory created by society and software

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Overview

> *[T]he "writing of technology" is by by no means*
> *universal; the opaque and stubborn places do not lie*
> *simply beneath technology, but are wrapped around and*
> *in it*

> *Adrian Mackenzie*
> *Cutting Code: Software and Sociality p. 181*

This project will examine the Emergency Development ENvironment (EDEN) software package, developed by the Sahana Foundation (a non-profit) and deployed to manage disaster response. The Foundation lists its mission as "Saving lives through information management solutions." They see their software as part of a wave of change in how humanitarian responses can use ICT to improve the quality of their response. The Sahana foundation would like to be seen as peers to other Free Open Source Software (FOSS) ICT projects such as OpenStreetMap which focus on "community engagement" and incorporating user data into digital platforms (Sahana Foundation, n.d.). EDEN is also part of the Information and Communication Technologies for Development (ICT4D) movement - seeking to turn technology to humanitarian ends.

Both ICT4D and "community engagement" applications run the risk of benefiting users only in ways that also can benefit the makers of the technology. Grappling with these pitfalls will be essential to spreading the bounties of technology widely.

This project will look at EDEN from both the outside and the inside. It will examine the ways in which EDEN relates to its users, its referents and to the digital services it uses. What is easy to see from EDEN, what is difficult? What perspectives does it contain? Generative encounters are as important as critical analysis. Can the

standpoints encoded in EDEN be changed? How are they driven by the technical constraints of the system? How does working with the code and on the code change how the code can be understood? I'll investigate by engaging with the perspectives I've discovered and trying to modify EDEN with them in mind. This project proceeds from

a Haraway-driven understanding of standpoint theory into a software-studies informed engagement with an a particular piece of software made for a particular purpose. It draws inspiration from the making and doing traditions of Science, Technology & Society and the craft tradition of software engineering.

I am asking four questions:

1. What standpoints can be find within EDEN by examining how it renders the world?

2. How are these standpoints influenced by EDEN's constitutive technologies?

3. Can these standpoints be changed or "queer"d through changing the code of EDEN?

4. Is the cycle of sociological analysis followed by technical modification useful and generative?

Conceptual Framework

In his famous work on Pasteur, Latour (1983) describes how Pasteur's work was as much about changing the world to be more lab-like as it was about the products of the lab. Science appears magic because it distracts us from the work we do to make it possible to use its products. This focus on the perspective of engagement and knowing is what Haraway (1988) calls "Situated Knowledges." The term evokes the idea of speaking 'from' a location, with a particular view of the world. Others may speak about the same thing from other places and everyone may correctly describe their view. Sandra Harding (1992), another feminist epistemological thinker, later returned scientific epistemology to define "Strong Objectivity." Harding critiques returns to the traditional scientific epistemological practice Latour described of deemphasizing the social changes needed to use science. She points out that hiding this information leaves us knowing less. That a stronger practice would be to engage directly with the social changes we need to use science. Further works have expanded how knowing can be

situated or encoded into social-material constructs. Harraway (1997) returns to the subject to illustrate how the construct of "the gene" is encodes views from the biotech industry. Like Pasteur, the industry has constructed "the gene," as something that can only be seen through their expensive methods. Where Haraway was writing about an emerging technology, Subramaniam (2014) writes about the forgotten perspectives of tools. She describes how the eugenic legacy of population level analysis tools makes those tools better at seeing certain kinds of differences. The danger in a tool whose biases are hidden are that we miss its finger on the scale. We build tools to show us the world from a particular perspective, but we must interrogate for what purposes that perspective was shaped.

Mackenzie (2006) describes software not as a tool, but as a process-tool, whose current state is always inescapably intertwined with socially understood future expectations about its purposes and needs. The sociality of software, as Mackenzie calls it, reflects that software makers are unusually aware of the encoding of opinions in tools. The field has always been home to a huge diversities of practices all of which are justified as being, in some way, the 'right' way to make software (Ensmenger, 2012). A diversity of practice does not create a homologous blend of cultures and practices. Instead, each software community has its own set of values and goals in addition to wider ethics that other projects and cultures share. Scholars have engaged at different levels of scale to understand the impacts of software. Kelty (2008) looks at the qualities of the communities around open source projects. Bivens (2017) describes how the demands of Facebook's tools and the changing social understanding around gender have constrained how they represent gender in their system. (Kitchin & Dodge, 2011) describe how software and social convention have begun to co-determine the rules of how places work, an idea they call "code/space." Software is not a thing that is ever actually finished. It is a continuing process which, through its periodic production of artifacts, is co-constitutive of the space(s) it manifests within. To understand how it

changes the things it interacts with requires both examining the representational choices made by the software and the technical constraints of the systems it relies on.

The design of the project is heavily inspired by Science, Technology & Society practices of making & doing. It also draws on Bivens (2017) work on the material qualities of software, Mackenzie (2006)'s Sociality and the womens studies concept of feminist epistemologies.

Project Structure

> *That virtual worlds are places means they can be fieldsites;*
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> *Tom Boellstorff*
> *Two Bits: The Cultural Significance of Free Software p. 107*

Outcomes

The project will produce three artifacts: a paper detailing some perspectives within EDEN and reflecting on the attempt to engage them, New EDEN (a modified version of EDEN) and a git repository that will have a history of the project..

The Git Repository. The two primary artifacts and all the other ephemera (including this proposal) involved in producing them will be publicly available in a git repository.

The Git repository for this project is available at `https://github.com/aeturnum/masters_project`.

Phases

One. The first phase of this project will be a survey of literature. Focusing on Science, Technology and Society works that analyze the standpoint and biases of other technical tools and relevant work on digital humanitarianism and disaster recovery. I will also be familiarizing myself with the implementation and operation of EDEN itself. These theoretical tools are what I will engage the "text" of EDEN with in the second phase.

The git repository will begin having content added to it immediately.

Two. The second phase will be a co-constitutive process between social critique and technical analysis. I'll search for perspectives within EDEN, analyzing how that perspective emerges from EDEN and impacts the world around EDEN. My focus will be perspectives that seem driven by the material technical realities of EDEN. These findings will be the center of the project. This will be a filtering process - some number of perspectives will need to be investigated and found uninteresting.

This phase will produce the first half of the paper.

Three. The perspectives found in phase two will guide modifications to the EDEN software package itself. These modifications will be made with the goal of engaging with EDEN on a material level and understanding the practicalities of trying to address encoded perspectives. The modified software, called "New EDEN", will be the second product of this project.

This phase will produce the second half of the paper and New EDEN.

Schedule

Phase	Quarter	Activity	Time Allocation	Goal
One	Fall	Reading	80%	800 pages read with notes
		Writing	10%	Notes and planning documents
		Coding	10%	Notes on EDEN program structure
Two	Winter	Reading	40%	Final selection of bibliography with additions based on notes and readings.
		Writing	30%	Outline for final paper with 20% of content finished
		Coding	30%	Rough modifications completed, but in need of polish
Three	Spring	Reading	10%	Unexpected additions to literature and gathering specific quotes from previously completed elements.
		Writing	40%	Final paper
		Coding	40%	Full branch of EDEN project with documentation and demonstration server.

Fieldsite Details

EDEN was initially developed and deployed by an alliance of companies in the Sri Lankan Information and Communications Technology (ICT) sector in response to the Indian Ocean Earthquake & Tsunami. EDEN has been used in response to a number of disasters in the developing world as well as ongoing supply management programs in the developed world (Sahana Foundation, n.d.). It is written in the FOSS language Python and uses the FOSS web framework web2py to build its components. Its functionality is broken up into many different modules which group common functionality within a layer of access conventions. EDEN also uses FOSS tools wherever possible: its databases of choice (MySQL and PostgreSQL) are FOSS databases. The focus on Free Open Source Software technologies is an obvious structuring perspective for the EDEN project and ones whose impacts are worth investigating.

The software's homepage can be found here: `https://sahanafoundation.org/`. EDEN's source code can be found here: `https://github.com/sahana/eden`

Preparation of Researcher

As a Science, Technology & Society graduate student I've been engaging with analytical questions around the impact of tools and their power to structure space. A previous project of mine used a energy pricing tool as a jumping off point for a critique of approaching the question of energy supply financially and suggested an alternative or additive perspective and gave me experience engaging with the social implication of a technical system.

Previous to being a graduate student I obtained an undergraduate degree in computer science and worked professionally as a programmer for about eight years. I did most of my work writing and designing web services and generally used python for this purpose (like EDEN in both cases). I have experience using most of the tools and environments that EDEN utilizes and expect that this background will be an asset in smoothly

Goals

This project will create a new space where the intersections between technology and society are hyper-visible. It will help to highlight the qualities of technical objects that give rise to their socially visible qualities. It will hopefully inspire others to further explore the power of modifying software as a way of finding and highlighting ways in which that software intrudes into our social lives. It may even provoke more engaged and practical work in software studies that struggle the daily challenges of writing software.

Glossary

MySQL MySQL is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language. MySQL is a component of the LAMP web application software stack (and others), which is an acronym for Linux, Apache, MySQL, Perl/PHP/Python. MySQL is used by many database-driven web applications, including Drupal, Joomla, phpBB, and WordPress.. 5

OpenStreetMap An open community of volunteers that maintain data about roads, trails, cafés, railway stations, and much more, all over the world.. 2

PostgreSQL PostgreSQL is a powerful, open source object-relational database system with over 30 years of active development that has earned it a strong reputation for reliability, feature robustness, and performance.. 5

python Python is an interpreted, high-level, general-purpose programming language.. 5

web framework A heterogeneous set of software that allow a programmer to efficiently write and manage providing a service over the Internet. This could be a website or a mobile app (often it is both) or a go-between for other services. Examples include web2py and Django in Python or Phoenix in Elixir.. 5

Acronyms

EDEN Emergency Development ENvironment. 2, 4, 5

FOSS Free Open Source Software. 2, 5

ICT Information and Communications Technology. 2, 5

ICT4D Information and Communication Technologies for Development. 2

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