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Technology as Rorschach: Stage and Backstage of the Making of an Information Infrastructure
Gianluca Miscione
at Max Plank Institute / Halle University
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Overview

1. Information infrastructures in an action research frame
2. Stage and backstage, for whom?
3. Reflexive exercise
4. Case periods
5. Discussion
1. Why are information infrastructures worth our attention?

Omni-present and creating “new normality” of services provided

Information infrastructures can make “other realities” (excluded by the contemporary “network society”) visible, otherwise they do not exist at all on the international stage
Made of material (wires, computers, organizations, people) and immaterial elements (software, datasets, information flow schemes, institutional settings)

IS (closed, stand-alone, task-oriented) vs. II (open, multipurpose, no-life-cycle)

No sunset on II (problematic for qualitative research)
Action Research frame

From Unionist Scandinavian Tradition:
- users are involved in the process of new technologies introduction and development
- workers are those who know their job
  → Participatory Design

Adopted in this longitudinal case study

Relevant for acknowledging the interplay between action and ideas
Action research learning cycle (iterative)
Limitations

Diverse and widely distributed activities of an information infrastructure do not lend themselves to the action research cycle easily:
- IT are not confined to ethnographer place of residence (nor eye-catching)
- Scale (time and space) and network effects
The five step cycle of action-research (diagnosis, action planning, action taking, evaluation, specifying learning) has not always been followed rigorously, because of the scale of time and space, and because the engagement in action which made the methodology secondary.

The dilemmas and trade-offs engendered by this question are faced on a daily basis by the authors. It differs from the dualism between knowledge about and knowledge for.
Methodology of this work

AIMS

- extending the crucial action research learning process
- strengthening of sense-making within a network dispersed across a number of countries
- Involve a broader research community in facilitating learning within and beyond this case

Authorship has sometimes (purposefully) faded towards editorship
Research group’s production as empirical material
to highlight the *intimate relation - and continuous
interchange - between ideas and actions*

*Particularly relevant for noticing how systems
evolve together with the ideas they support and are
supported by, at the same time*

*Double hermeneutic* not only social construction of
technology
Technology as Rorschach

“we shall be looking at the computer as a metaphor and as a projective medium, and suggesting that this subjective side of the computer presence is highly relevant to understanding issues concerning computation and public life […] Other technologies, knives for example, can serve as projective screens: do we associate them with butter of with blood?”

Computer as Rorschach, Sherry Turkle 1980
2. Stage and backstage, for whom?

Analytical classification of empirical material [hundreds of docs] in practically and academically relevant

Is the research arena the stage, and the action the backstage, or the other way around?

Research forms a backstage for ministries of health of several developing countries AND they are backstage for the information system research community which reads about implementations and challenges
Article as Mediator in Action – Research

Action and research did not get along easily

- co-authoring for sense making (and reflection) as part of action-research:

1. detailing the close, complex, and always unfinished interplay between actions and ideas in the constitution of an information infrastructure (which a clear cut theoretical focus risks missing).

2. proposing to extend the traditional learning cycle of action research [Baskerville: 1996] by explicitly including the broader research community
3. Reflexive exercise

Incomplete project:

- inherently (always in the making: II no life-cycle)
- for contingencies (I moved to other research lines)
4. Longitudinal Case-study in 4 periods

- Evolved over a 15 year period, coincidental with the “Internet age”

- The infrastructure building was not an initial aim (data mining and informed action for public health care systems)
  - the activities implemented in various organizations as information systems retrospectively became potential dots to connect an information infrastructure dedicated to health

- We introduce "p.H.I.s." as an acronym as a hybrid of PHI and HIS (the principal software developed within the project)

In the apartheid years, prior to 1993, the South African health services were highly fragmented.

Traditionally the health system has been centralized with an orientation towards hospital services. Primary Health Care (PHC) delivery has been poorly developed.

Different systems for different races

Alma Ata declaration to achieve the “health for all by the year 2000” goal (the PHC approach)

The discourses of health management and health information systems form the policy and theoretical basis for the PHI initial development and emphasize that information is seen as a key
The South African ministry of health originally comes up with a master plan for a health management information system based on a “one size fits all” principle, with centralized standardization to counter the chaos.

Focus is on local level and community based Participatory Design (PD).

Possible relations between community participation and PD as practiced in the Scandinavian tradition are explicitly explored.

PD in a developing country's context, the focus shifts from the workplace to the community.
Main areas of research and implementation:

(a) development of Minimal Data Sets and standards for primary health care data, and

(b) development of a District Health Information Software application supporting the implementation and use of such data sets
Two components that are emphasized for development of staff capacity are on-site and formal training sessions.

The “information cycle” as a means to define needs for data collection and analysis is presented as a core element in the training sessions.

The term “attractor” (From Complex Adaptive System theory) is introduced at a later stage (see 2005) in the PHI literature to interpret this period.
Due to the relative success of the project so far, it is believed that a similar approach and philosophy may be translated to other similar countries. Scalability and sustainability start being bound for institutionalization after the researchers leave.
PhD students as driving force and the major resource also for action (backgrounds from either IT or medicine)

PHI has not been fully accepted by official structures, but neither fully dismissed: it indicates both the strength and the weakness of an agile approach, which allows spread but exposes to volatility.

Technology transfer vs. translation

Technology needs to be translated into supporting new local needs when brought into new contexts, as the characteristics of both health information handling procedures and organizational patterns of power differ.

Concepts are brought in from Actor-Network Theory to explain how initiatives must be aligned with the pre existing network of systems and practices.

Counter networks
Translation Period (2002 - 2004)

- GEOGRAPHIC (to Asia and Cuba)
- TECHNOLOGICAL (Pure Free and Open Sources Software)

Global aim
Confidence in ‘internet culture’ (crowdsourcing, open participation)
PHI applies PD methods as in South African

User participation carries a democratic inscription

Influenced by Scandinavian egalitarian values and the ideal of local participation, Norwegian students and researchers in Cuba overstep clear boundaries of the centralized and compartmentalized system and are reprimanded

The distinction between context-free and context-sensitive aspects of IT is acknowledged more

Findings are generalized to a multilevel cultivation approach, which includes the enrolment and alignment of multiple actors, by enabling the translation of their interests in the network.
European master students and technical coordinators are attracted to state-of-the-art FOSS frameworks and tools.

A perspective on action research and ANT is developed, with a claim that "local interventions need to be part of a larger network to be robust" and handle the twin challenges of sustainability and scalability.

Free and Open Source (FOSS) approaches are aligned closely with participatory principles.

AND The highly modularized and parallel, geographically distributed development model exemplified by leading FOSS projects is seen as relevant to the building of open infrastructures.
Scaling as Institutionalization (2005 - 2007)

The latest three years of the project are characterized by two paths to institutionalization:
- information infrastructure on which p.H.I.s. is active,
- within academia

The issue of scalability is common, but the practices are not always like that

Gathering for a group on “Globally Scaleable Information Infrastructures”

“Theorizing micro - macro relationships” which is of central relevance when aiming at moving from information systems to information infrastructures
A PhD research fellow is admitted at the coordinating university informatics department with a research project on the topic of scaling and scalability.

The introduction of the HIS in Botswana is portrayed as an “attractor”, assigning a high level of agency to the software.

Theoretical relation between “flexible standardization” and Complex Adaptive Systems theory is formalized in these years, on the basis of empirical experiences dating back to 1998.
The complete abandonment of proprietary software has posed a new argument between:
- the university based group (state of the art technologies and architectures), and
- those who are on the implementation side (poor local capacity and global participation)

→ Opposite effect

Scalability in the manifesto: “how to generate and manage growth” (non technological determinism and invisible at pilot level)
International activities beyond the formally involved PHI partners increase
A network is mobilized around HIV-related activities: ART software, demanded in several sites globally

“HIS can make changes if it can bridge the legacy systems” (increasing pressure to leave a monolithic activity centred on HIS, modular policy of alliances to allow and support integration efforts)
The strategy is based on two principles:
- flexible standards, and integrated independence

OXYMORA!
South Africa and today’s India raised a question in university corridors: “can it be that the chances to bootstrap and establish an infrastructure depend heavily on historical contingencies and causalities?” In India:
- powerful software entities, and
- Heavy bureaucracy make it hard to pursue a bottom-up approach

A conference about information technologies for development marks the empirical crisis of the PHI bottom-up approach to HIS development and implementation.

Why do top-down agreements coexist to bottom-up rhetoric

Is that the organizational field has become much more crowded? (isomorphism vs. identity?)
The actual scaling process requires resources and management which also come from a university.

The terms in which these issues are discussed are – at least formally – academic.

The collision about scalability-related practices can be reduced to two positions:

- scaling itself is not research vs.
- without actual scaling there is no research (and: “no participation, no understanding”)

(Reinvention of the past)

Even then, and even now, I think most of the participation has been within the health services rather than the community itself, and I think our starting point has always been the formal data which comes into..., and the design of the system to support that process, but we haven’t really gone into community to understand what data that should be collected.”
Although the South African case is brought in for negotiations, and local pilots do not seem to be central anymore.

New states joining the project ask to shut off some of the functionalities of HIS, the ones which make the system useful at local level.

Even if pilots are started to test viability in each country, the power remains at the central level. Decentralization and local empowerment do not seem to determine PHI’s action.

To be noted how FLOSS is a response to a need of research group cohesion.

“PHI’s activity was not driven by theory. [...] To me, one of the really important things is chaos theory: trying to bring order to the edge of chaos. We always work in situations of change. If too much stagnation – if inability of infrastructure to adapt, there can be no change. If too much change, then chaos and cannot change”
The capacity to anticipate future changes and keep the software open is what has made PHI agile and flexible enough to cope with rapid changes and a variety of contexts.

“I think the action research is a fundamental approach and prototyping is an important part of it […] Other than that, I do not think there is a need to get stuck on one theory or another. I think there are some basic principles of how things are being done and you can really draw upon whatever theoretical lens you feel comfortable with.

“One aspect may be the action orientation. Data is not been collected for its own sake, but we actually have to do something with it – we have to guide action.”
1. Post-Apartheid South Africa
2. Diffusion
3. FOSS
4. Int'l organizations
6. Discussion

Case presented with its tensions, contradictions, achievements for debate

Dichotomies:
- autonomy / heteronomy
- local / global
- homogeneity / difference
Information infrastructure operates simultaneously at the concrete level of participatory design and implementation (fields in a database, capacity building, integration of datasets and organizational practices…) and at an abstract one (dealing with the relationships between information science, organization, public health, and global software development, among others).

[Paraphrasing Bowker 2000]

PHI shows that efforts to establish an information infrastructure can be seen as institution building activities
Swinging Legitimation

**Vertical axis:** intensity of relevance of specific places and local settings.

**Horizontal axis:** Stages

1. **pioneer,**
   switch of legitimation from local contexts to networks of action

2. **field constitution,**
   switch to legitimation relying on state structures

3. **full-scale implementations**
The ‘geographical’ travel of an information system to new contexts was not as determinant as the ‘organizational’ travel across quite different contexts and historical contingencies

“we shall be looking at the computer as a metaphor and as a projective medium, and suggesting that this subjective side of the computer presence is highly relevant to understanding issues concerning computation and public life.” “Other technologies, knives for example, can serve as projective screens: do we associate them with butter or with blood?”

[Computer as Rorschach, Sherry Turkle]
- not simply in its inherent qualities (as usually assumed by highlighting the flow of information), but a relational property which can emerge through the encounter with organizations, practices and needs which are GLOBALLY DISPERSED

- the regime of multiple accountabilities (Suchman, 2000) is neither purely global, nor local. The mismatch between the functioning of formal bureaucracies, common top-down software development schemes, local organizations’ needs, and actual trajectories of development initiatives constitute a complex empirical field, which shapes and is shaped by the socio-technical processes
On reflexivity

Not eschatologically oriented by the aim of presenting my own grand theory, as I do not have one.

Reflexivity beyond self-ethnography:
A dialogue with a broader audience as a method to manage sensemaking, actions that confirm and reproduce, or not, what is conceived as appropriate.

The problem of sense-making is therefore an issue of construction of accountability and normality.
Normality is quite paradoxical issue when exploring new fields (i.e. doing research).

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Questions?

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