Remediation in human resources for health information systems: From intransparent history in person to diffused decontextualized immediacy

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Remediation and historical memory

In anthropology, cultural memory has been brought forward first as a critique on the historian's bias of seeing memory as fragmented and unreliable (Klein 2000). Recently, interest in memory as "persistence" has grown, where the focus has been on retaining lessons from the past and bringing them into the present moment of evaluation (Crumley 2000, De Vries 2011). Memory, from this perspective, can be seen as underlying cultural reproduction, acting as "carrier waves transmitting information over generations", as (Crumley 2002:40). This paper describes the influence of media on this process of cultural reproduction. In particular it focuses on how paper-based human resources information systems piled still prevalent in low-income countries become digitized into Human Resources Information Systems, or HRIS, as part of the global health development agenda. An "HRIS" collects and provides information used in HR decisions, ideally linking all HR data from the time health professionals first enter medical education programs until they finally leave the workforce through for example retirement. In many low-resource countries, an HRIS relies on paper forms or simple electronic spreadsheets housed in different, unlinked departments. The transition observed and described in this paper is one where IT expert work with local human resource "champions"—as they are often referred to in development context—to transform piles of human resource registries into effective and efficient computer systems. It is without much discussion that this development is a positive one. After all, how could we not be positive about organizing the accessibility of data. But looking at this from the perspective of cultural memory, I wonder: how does this transition actually affect historical memory about strategic decision making in human resources for health? Could it be possible that this transition may actually *decrease* the quality of these "carrier waves" of information? What is the impact of instantaneous circulation of information in the

digital society? Researchers interested in adaptive management have described a shift from "indigenous" or "traditional" diachronic information collection, or long time-series of local observations typically associated to oral history or memory, to "modern" or highly technological information sciences and scientific forms of environmental monitoring with strength in the collection of synchronic (simultaneously observed) data (Berkes and Folke 2002). Do such new information technologies drift away from memory in exchange for an emphasis on the "real-time," or instantaneousness access to systemic information that is relatively recent. Or, in other words, are we *losing* memory in this process? And how will this affect systemic resilience? In this paper I will use the HRIS case study to illustrate how perhaps this transition is actually happening not so much because traditional forms of workforce memory are superior in their ability to capture long-term, diachronic change. Rather, I argue that the reason that memory might be lost is because these digital systems replace personnel managers with deep historical memory with data systems detached from historical context that a temporality that orients not towards past or future, but into the moment. Is this replacement of historical memory in person—however inaccessible and inaccurate—with decontextualized, instantaneous "real-time" access really an improvement? As Bolter and Grusin (1998) have argued, many of the current remediation strategies are based on an insatiable desire for immediacy, or a "live" point of view through which media provide us insight in what is happening now. Arriving at this goal of immediacy, they argue, what is ignored or denied is the presence of the medium itself, and the act of mediation. The perspective or remediation has been picked up by anthropologist studying popular culture (Graham 2004, Silvio 2007, Strassler 2009, Novak 2010), but little described outside.

Method

Funded by USAID through a 5-year, $500 million grant, the Human Resources for Health Strengthening project referred to as the Capacity Project included the Human Resources for Health Strengthening Team. The team developed workforce planning and management software—branded as the iHRIS suite—for ministries of health, professional councils/boards, and similar institutions (Habte & Emmett 2008, De Vries et al. 2009). As evaluation advisor to this team, I was able to get close to its initial development across the world for the last three years of the Capacity Project. At the end of this period and near the closing of the 5-year project, I lead a team conducting a qualitative research study to evaluate the approach for the project in Swaziland, Uganda and Rwanda. The study used a semi-structured interview tool with open-ended questions and interviewed 61 respondents, mostly representatives and key informants inside ministries of health. All of them had been playing an active role in either the implementation of an electronic HRIS or human resources for health in general. Respondents included iHRIS developers and managers, participants of stakeholder leadership groups (SLG) and decision makers who use IHRIS for planning, and users of HR information on a daily or regular basis, including Personnel Departments, heads of departments, council registrars, and regional managers of matrons.

Human Resources for Health Champions

The typical story goes something like this. Enter the Uganda nursing and midwife council before Human Resources Information System Strengthening (HRIS) work began in 2005. The offices operate in one room. Documents, papers, registers, forms are everywhere. A document left on the table by one officer is unknowingly shifted by another. Files are lost

during office relocations, which frequently occurred for decades. While the media makes incorrect allegations about the numbers of doctors who leave the country and the number of nurses on the streets, the council is unable to respond as the containers full of files allow for little data analysis. The situation is not much better at the central ministry where identifying and aggregating basic data at the country-level about the status of health care workers takes about a month.

Figure 1.: Zanzibar paper-based registration of Nurses, 2003. Image that circulated at the IntraHealth International headquarter of the iHRIS team in Chapel Hill.

In comes the USAID funded HRIS strengthening team. A relatively young group of programmers and technology implementers with a passionate drive to prove that technology can make the difference. The HRIS team conducts database assessments at ministries of health and professional medical associations, organizes stakeholder groups, assesses ICT infrastructure, purchases and installed computers, rewires network cables and electricity, purchases supporting software, and installs the in-house open-source “iHRIS

Suite" for ministries of health, professional councils/boards, and similar institutions (Habte & Emmett 2008). The result takes HR decision-makers to a new level of capacity for strategic action, as mentioned in the Legacy Series Technical Brief. Improved accuracy and availability of HRH data. Tracking of individuals as they move through the health workforce system. Decrease in the labor required to maintain the HRIS. Quick aggregation and use of data. Sharing of information across sectors to gain a national workforce perspective. Reporting on and analyze data regularly. And projection of workforce needs into the future, including training requirements.

Moreover, what is driving this revolution is a software development team driven by an anti-capitalist, rhetoric of open-source technology, befitting the development aid world, undermining corporate interests of places like SAS, and driving the passion of the young team to provide the software free of charge to countries in need. Remarking about the initial role of the commercial developer SAS, one key informant noted: "They were interested in selling things and having license fees in these areas and they also wanted guarantees of quite large sums of money. It was a real mismatch and so they were finally eliminated." The experience with SAS led to the open-source approach placing centrally creating capacity at the country level and not having license fees. However, the open-source approach of the project also exploded the demand for technical assistance on the young ICT team. Frequent remarks during the weekly team meetings included expressions that "reflection" and "taking a breath" was impossible, while improvisation came to be the norm. After the first five years of HRIS strengthening work, the infrastructural challenge was taken up in full force with iHRIS strengthening ongoing by local teams in Uganda, Rwanda, Swaziland, Lesotho, Namibia, Kenya, Tanzania/Zanzibar, South Sudan, and Botswana. Local champions—typically

nurse leaders—crucially pushed the envelope further, driving technology improvement projects which were met with high regard in the technology-poor environments. The demand for these champions was noted at the highest level of the USAID hierarchy, which started to take the HRIS strengthening program as one of its "success stories"—reaching "ultrafab" status in their newsbrief collection—highlighting its impact and progress across the internal USAID development board. Health informatics also became the organizational cornerstone for Intrahealth, the NGO leading the Capacity Project partnership.

Remediation as temporal intensification

In the drive to install the iHRIS suite, a strive to introduce immediacy was much notable, if not overwhelming in practice in both the experience of the team and the outcomes underpinning the highly successful ICT project. As data sets identified and integrated at various ministries were imported, cleaned, and large masses of historical paper-based records were entered record for record, previously inaccessible health workforce data suddenly became "immediately" accessible. When queried, the iHRIS delivered information to the user at a never before speed that in particular to senior managers was at times overwhelming—almost magical—and enormously motivating to make human resource management processes run more efficient, effective, transparent, and accurate. The new way of doing HRH seemed like a temporal explosion relative to the traditional way. As one of the Uganda informants tells us about the original paper-based system:

> Case in point was I wanted the information on the various cadres of staff in the country. In their classification; the doctors, specialists, the nurses, so on. And I think manually it took us about a month to get that information together to present to parliament (personal communication HWAB member)

The systemic impact of the iHRIS was a reduction in the time it took for inquiries or problems to be dealt with overall. For example, in Swaziland the time required to identify ghostworkers and stop payment on their salaries was reduced from up to two years to one month or less. In Swaziland, the iHRIS also reduced the time it took to verify the status of employees for promotion or appointment from four to six month to an almost instantaneous process. Similarly, while putting a new health worker on payroll used to take 3-6 months, this was reduced to only one, with significant implications for job satisfaction and retention.

The improved access to information which iHRIS brought provided these data to the desktops of ministerial managers. This flow of information dominantly motivated data accuracy improvements:

> I think the biggest change has been that a lot of information has gotten out there. A lot of people found out they had vacant posts they didn't know about. We've got a big list of people who've left the ministry years ago. The personnel unit didn't' know they'd left. (Swaziland MOHSW Official).

Many individuals no longer appear twice in HR systems, allowing the professional and Ministries to have a relatively accurate number of qualified health workers in the country for the first time in their history. The consolidation of data in one location also made visible previously unknown gaps that could quickly be rectified. An Uganda Registrar described how he recognized the absence of about 100 files of which he has been unaware:

> "I didn't know that I didn't have them here. So when the data entrant started is when I realized that I don't have that part of the data. So I had to look around… and found them."

As health worker status verification improved dramatically at the councils, the general laxity in licensing typically observed under paper-based HRIS disappeared allowing fewer

individuals to falsify documents and/or impersonate someone else, in effect altering the local patronage systems. Transparency in the hiring and recruitment processes including making visible the complex sequence of steps involved in recruitment, as the iHRIS indicated the location of a request in the HR system. In Swaziland, monthly circulation of hardcopy, facility-level reports from the central to facilities levels and back ("the Swaziland feedback-loop") allowed facility-managers to monitor the status of their HR requests. This empowerment enabled dialogue and feedback needed to improve workforce distribution problems, unfilled vacancies, unknown posts, and other problems. An example from Lubombo District illustrates this feedback process:

> Lumbombo actually came back and did a three-month evaluation against the plan to then see how they were going, and again we supplied them with more reports. And that's where they were really surprised to find they had been given new posts but the notification of those new posts hadn't got down to them from HR. And so they immediately started pushing and fiddling. So that wasn't specifically about the planning, but again it's that information flow, the reports that we brought to that meeting, they just had these posts created, they weren't aware of them and they were able to start pushing. Whereas without this information flowing down they probably would have sat there for a year unaware they had the posts.

The problem of data usage

The results were received as amazing. Yet, as the HRIS strengthening program progressed subtle criticism became noticeable regarding the visibility of actual workforce outcomes. Although to some extent critics were misinformed as to the actual impact of the strengthening program, which as an health system strengthening project is difficult to directly link to health improvement on the ground, an enormous hurdle slowly came to the front and center, namely that of *data use*. This issue had not been systematically addressed by the HRIS program other than through the establishment of Sustainable Leadership Groups (SLGs), which by themselves did not do enough to promote the use of the iHRIS. Immersed in

infrastructure, development, and organizational issues, arriving at the end-goal of routine iHRIS *use* seemed to be a step too far in the hectic experience of being the leading program in large global health operation. To remedy this, special Data Driven Decision Making (DDDM) workshops were organized by a senior, Kenyan staff person tasked with this problem. He described DDDM as, "a journey, not a destination" and argued for a managed process for analyzing data and getting it to the right decision maker at the right time with the power and resources to act on it. In particular in the case of HRH, a key challenge to HR practitioners and policy makers appeared to be to find ways of contextualizing the human resource data for more effective decision making, policy formulation, and practice.

The DDDM workshop showed potential for usage, but the majority of the gains made still focused on increases in accuracy, timeliness and efficiency of data flow. In opposite direction to the idea that the new HRIS supported analytical access to previously inaccessible information, its impact moved more towards emphasizing instantaneous time, or "timeliness". A quote from the main Swaziland systems engineer illustrates some of the tensions that rose from this movement:

> We've got our HMIS system, which is where most of my attention is being focused, we're getting much better information, really timely, we're getting information within a few weeks of the end of the month, so we can, we are now in a position where we can start to do much more of that sort of analysis. But, again, we're just stretched as a team. But we're still at the…we haven't done a lot with that. I think we did something for Lumbombo at some point, a report. But again, all of these reports, producing the reports and then see that turn into action of staff actually redeployed… that is difficult.

The amount of new information was amazing, but apparently also overwhelming to the local teams. When I arrived in Swaziland to evaluate the custom iHRIS solution, the main personnel manager at the Ministry of Health and Social Work who had been part of the HRIS

strengthening program proudly showed the glowing new desktop provided by the Capacity program. But as others told us in between the lines, he never used the machine; hardly knowing how to turn it on and delegating such task to his junior officers. Still shuffling paper files, it seemed that his position as personnel manager had not only been strengthened by the new data—which did provide him evidence to advocate for certain needed changes—but also somewhat jeopardized by the new influx of technology. While the Swaziland database was a relatively "simple" standard reporting system, the personnel manager troubles were supported by many other users noting to us that to generate reports they had become dependent on "next door", or the statistics unit. Apparently, this new strategic analysis function had moved analytical power around in the Department. Respondents from the personnel department acknowledged that when it came to producing reports, "for now, that mainly is a function of the statistics unit and they're maybe about four people." No sense of ownership of the database existed, a view which was corroborated by the manager of the statistics department: "Every time we talked to them about the HR information system their eyes would glaze over a bit. And that was 'ours,' it was our system, not theirs." Much of this may have had to do with general computer illiteracy, an issues of even greater concern in rural areas where much of the system would have to be rolled-out, and were desktop computers were still status symbols.

But while the statistic unit grew in centrality as a result of these development, the type of data this unit would obtain appeared somewhat compromised. This became most clear when we ended up discussing the issue of confidentiality. Responding to the question what type of information the system actually could not be share outside of the department, or in "public", the primary personal officer noted:

> Maybe what can be confidential it's my own personal information, so that one I would consider it to be personal, I mean confidential but that's my own view. Information like knowing how many nurses are qualified in this area, for me, I don't think that is confidential because I wouldn't be attaching any names with those figures.

The way in which confidential information in personnel management is tied to actual history in people appeared a challenge that had not been overcome yet. As the statistics staff person explained:

> There is this form, this is I think where the greatest challenge is. Nobody really wants to fill in confidential information on a piece of paper; you don't know whether it's actually going to get to the desired destination. It could get lost on the way. So some people didn't fill in those forms so that was the greatest challenge really.

The statistics department tried to solve the issue of missing information by regular feedback of data in the system to their clients, showing what was missing month after month until it slowly got filled in, but what this feedback loop did not really solve was how the informal human resource information remained completely uncaptured in these systems. This crucial informal memory containing essential information about hiring contexts remained outside of the system. A senior USAID consultant who had been present locally for a number of years to set up the system in country explained how structural of a problem this issue of confidentiality was:

> I think people do talk about, oh so and so's put in, been recommended for this and that, we should release it inside the unit. Two issues we bumped into. One of them is actually confidentiality within the personnel unit because we update on the system the name of a person who's been recommended to civil service commission so the principal personnel officer, we found there were quite a few that were being missed and it was because anything that was kind of internal to headquarters, the principal personnel officer was taking and processing himself without going through the normal office procedures because he didn't want people in the office, even in the personnel team, to see what was going on. And so that data was missing from their system.

What we see is a diffusion of health personnel data towards a broader set of users, with a reduced role of senior human resource managers, while at the same time the type of information that gets disseminated is of different quality from the historical, in person

memory and paper-trailed left behind by the system it replaced. The personnel officer himself carried the memory of why certain human resources decisions were made, and under what context these decisions were deemed appropriate. None of such micro-level contextual stories were documented in the system itself. The iHRIS software itself in fact did not even allow for contextualization of more macro-level learning. The complexity of lessons learned got reduced to univariable depictions of trends over time without context or relevance and starting at the baseline year of data entry, as illustrated in Figure 2, a screenshot from the iHRIS data management system.

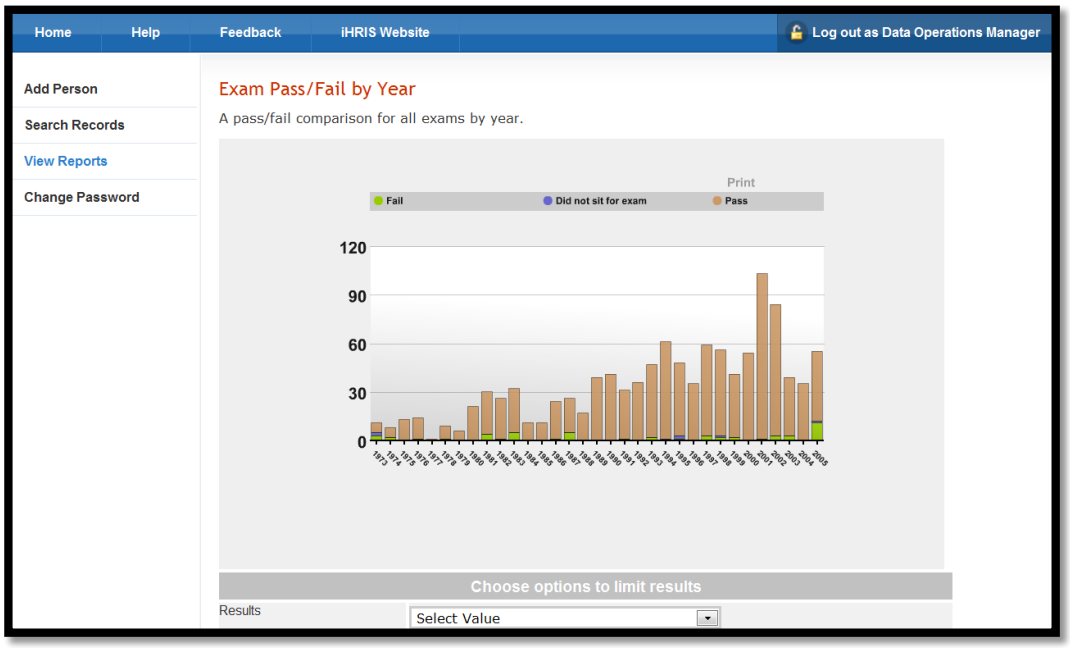

Figure 2. iHRIS Manage screenshot.

Placed in its larged DDDM context, we see that during this initial phase of the system, the iHRIS facilitated access to the past, but did so a compromised and decontextualized form, lacking perceived relevance in a human resource management culture where analytical inquiry was not dominant and context overwhelmingly political. As a result of this situation, harnessing the "power" of HRIS by the team came to mean making it relevant to issue on the ground, or connecting it to the historical reality from which the system had been detached.

This was prominently present in final recommendations for improvement of the HRIS evaluation study: “It is key to motivate relevance of the system from the initial moment on. The major point of emphasis here is to turn relevance into opportunity for improving the systems, and allowing district level initiative to self-organize beyond what was envisioned and explicitly planned” (De Vries et al. 2009).

Conclusion

In this paper a remediation is described where traditional information collection in the form of personnel files shifted around are remediated into fast-paced human resources for health information systems (HRIS). Yet, to go beyond mere existence in the moment and instead be used to obtain insight in system history captured in by the lived reality in which health workers move, the systems alone were not enough. Instead, champions, coaches, DDDM workshops, statistic departments, and consultants were needed to make the system’s relevance explicit. Furthermore, confidential information about human resources decision making captured informally at in the cultural memory of senior HR staff remains outside of the new HRIS. As the case from Swaziland showed, the new networked environment where access became democratized, appeared to coincide with a change in the position of the statistics department as well as the type of HR data made available in real time.

The conversion of HRIS into iHRIS did intensified access, and particularly so in its explosion of speed, a new temporality of access which has a profound impact on the systems at play. But the remediation did not change the importance of the human dimension, while it appeared to struggle to include all relevant memory. Or, in other words, while iHRIS motivated a

significant real-time temporal orientation and practice, what it did not seem to encourage was a complete capturing of context, able to historically contextualize the "data". With the transition of the paper-based system, lessons learned in the past captured by memory and experience of the unique health personnel manager, was replaced by a computer network needing context. The HRIS transition as such can be characterized as going from a diachronig, intransparent, inaccurate, and (to many) inaccessible history in person—carried by senior HR staff—to a largely synchronic, transparent, accurate and accessible dashboard of the moment. As I have previously argued, in order to strategically enable system history and memory to motivate resilience in health systems, attention is needed to the many ways in which temporal references are created, maintained or lost during (De Vries 2007, 2008). When and how memory is enabled (referenced) or *made relevant* again in the present moment of decision-making? Does remediation help or not in this process? Where are the weaknesses of new innovations such as digital HRIS? This begs the question: does the widespread, global remediation of health workforce systems from paper-based to digital versions move crucial historical memory of previous decision making into oblivion? And, if so, is this an issue the archaeologist of the future may deplore?

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