

DEVELOPMENT INSTITUTIONS AND TECHNOLOGICAL CHANGE –AN INSTITUTIONAL ENTREPRENEURSHIP PERSPECTIVE THROUGH A CASE STUDY OF PUBLIC HEALTH INFORMATION SYSTEMS IN DEVELOPING COUNTRIES

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Abstract: This paper draws upon an institutional entrepreneurship perspective to analyse the relationship between development and technological change, specifically within the context of public health information systems in developing countries. Firstly the development context is analysed in terms of the changing landscape and also institutions reflecting both change and continuity. Drawing upon three empirical cases from the Health Information Systems Program initiative, the analysis seeks to understand who are the institutional entrepreneurs, what intervention strategies they use, what are the enabling and constraining institutions of development they are engaged in, and what are some of the outcomes achieved. The paper makes three key contributions, 1) the role of free and open source technology as a key strategy for change, 2) networking including networks of networks, both around technologies and also people behind them, helps create new organizational fields, and with it new discourses that challenges existing institutions. 3) Regional partnerships such as of the West African Health Organization, provide an interesting model to structure technical support as contrasted with the earlier top-down development models driven by institutions like the World Bank.

Keywords: institutional entrepreneurship, international development, ICT4D, technological change

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1 INTRODUCTION

Development agencies play a key role in shaping the trajectories of health information systems (HIS) in developing countries, including processes of change they may enable. Research shows that change is hard to create and sustain, and more often than not the status quo remains. We explore why is this the case and what can we do about it. To do this, we place these questions within the broader context of development including the role of development agencies in providing support (technical and financial) to countries, the manner in which disease specific programmes are controlled by international agencies, the role of the Millennium Development Goals (MDGs) in shaping the trajectory of projects, especially related to HIS. Aspects of the development context are both changing and remaining stable, providing both opportunities and challenges to enabling change. First, we explore aspects of the development landscape.

1.1 *The development landscape: change and continuity*

Arguably, the landscape of development has changed rather significantly since the landmark Bretton Woods conference in 1944, described as the “proximate beginning of modern development aid...to create an International Bank of Reconstruction and Development” (Rostow 1985, p 77). This event marked the start of the definition of modernity in terms of economic development, on the premise that “technology could become an engine of change for the rest of the world” (Montgomery 1974, p 18). Harry Truman’s vision in 1949 was of poor countries becoming “developed” by “replicating” the economic models of “advanced” societies, based on the application of capital, science and technology (Escobar 1995, p 4).

The Bank created several institutions around development aid projects, including a top down approach to planning which limited the voices of the recipients thus leading to a marginal understanding of the cultural context of the intended interventions (Caulfield 1996). Another institution concerned the neutrality and universal applicability of scientific knowledge based on principles of economic reasoning. Scientific knowledge was seen as being superior to traditional knowledge systems of the developing world considered “backward and in the need of modernization” (Lummis 1991, p 21). Another key institution concerned that of technology determinism as a key strategy for development, based on the assumption that technology can help a country to kick-start their dormant economy (Puri 2003), and benefits achieved as a consequence of modernization, would trickle-down for the larger good of society (Eisenstadt 1966, Lerner 1962).

Over time, these institutions have faced heavy critique for the lack of development outcomes produced (Rahnema 1992). Sachs (1992, p. 1) summed up this failure as follows: “The idea of development stands like a ruin in the intellectual landscape. Delusion and disappointment, failures and crime have been the steady companions of development and they tell a common story: it did not work.” Escobar (1995) has argued that development agendas are driven by the ulterior motives of promoting first world’s strategic and commercial interests through the re-colonization of developing countries by covert means. Esteva (1987) described the approach as anti-democratic, merely comprising of the transfer of western technology, knowledge and capital to propel developing nations to “acquire the accoutrements of ‘modernity’” (Long 1992, p 19). Amartya Sen (1999) who argued against the dominant use of economic indicators to measure development, and the need to consider human well-being, articulated the Human Development Index” as a measure

of development. These various critiques contributed to a realization that active, informed participation of the recipients was essential (Rahenma 1992), and also the need to incorporate “traditional” knowledge in scientific projects (Puri 2003). We next trace some changes taking place in the development landscape.

In current times, the role of two actors - the Philanthropists and China – is becoming increasingly significant. Bill Gates and Warren Buffet are amongst the richest businessmen turned philanthropists influencing the development world. Gates and Buffet, with estimated wealth of USD 54 Billion and USD 47 Billion respectively, are actively engaged in shaping development policy. The Foreign Policy writes:

"As the world has lost confidence in the ability of countries and institutions like the United Nations to solve global problems, Gates offers an attractive alternative vision: that the business community's relentless drive to innovate can help with our biggest challenges, from malaria to food scarcity to illiteracy... Whether it's a green revolution for Africa or a vaccine for malaria, Gates's agenda is now the global agenda."

In health information, we cannot ignore the significance of these efforts. Gates Foundation contributed significantly to the setting up in 2005 of the Health Metrics Network (HMN) as a Secretariat within the World Health Organization. The HMN articulated the perspective of an integrated framework towards HIS, and supported various countries to develop strategic plans based on this framework. However, in 2010, the agenda changed, with the focus now on Vital Events (eg births and deaths), contrary to the earlier argument of integration. Gates' agenda changed, and so did that of HMN, even though many countries had committed to the HMN integrated framework. Now HMN supported an initiative called MOVE IT (Monitoring Vital Events using Innovative Technology).

China is undoubtedly an economic superpower today. In the past two years China has given more loans to African countries than the World Bank. Trade has surpassed \$120 Billion last year, with 14% of China's investment taking place in Sub-Saharan Africa (The Economist, April 20, 2011). The Chinese have made a significant impact on financial markets, with the Industrial and Commerce Bank of China having purchased 20% of Standard Bank, previously the African Continent's leading bank. The Economist writes:

“Other mainland banks have opened offices too, and from their sleek towers make collateral-free loans to Chinese companies. In theory, Africans are eligible to borrow on the same terms, but that rarely happens... Most loans and payments are “tied” – ie, the recipient must spend the money with Chinese companies. But tied aid leads to shoddy work. With no competition, favored firms get away with delivering bad roads and overpriced hospitals. Creditors and donors often set the wrong priorities. Worse, the Chinese government is anything but transparent about its money. Aid figures are treated as state secrets. China Exim Bank and China Development Bank, the main lenders, publish no figures about their vast loans to poor countries.”

The Chinese involvement in African development thus represents a new face, one which is driven by quick and dirty capitalism, reflecting tendencies of resource extraction similar to the colonial past of the Continent. How much better or worse it is than existing structures of development aid, only time will tell.

The above discussion has focused on how development agendas are being redefined, and how. Despite these changes, some institutions remain constant, primarily being the weak role of participation of the aid recipients. For example, funding from foundations may target specific problems, such as the eradication of a disease, which may disregard ongoing health systems strengthening efforts prioritized by the state. Such efforts potentially contribute to fragmentation and compartmentalization, historically characteristic of aid projects. The institution of technology determinism also endures, for example the large focus on the use of mobile technology in health

development projects (see for example Germann, Jabry, Njogu, & Osumba, 2012). While the nature of technology has of course changed, from machinery and fertilizers to information technology, its perceived role as one that can solve systemic problems remains strong.

This scenario of change and continuity of institutions related to development helps frame our research problem: “how can HIS support change in health outcomes within the existing context of development?” The context of change and continuity bring in both opportunities and challenges to achieve change. In this paper, we pursue a normative agenda of change of making HIS more decentralized, integrated, and supporting the information use for local action. In trying to realize these normative aims, there are opportunities of greater funding resources, but with it potentially the challenge of biased systems of procurement and funding agencies expectations of technical outcomes. This creates the institutional paradox of “how to change institutions that we ourselves our products of?” Addressing this paradox is the aim of “institutional entrepreneurship” theory, which we now discuss.

2 Institutional Entrepreneurship and technological change

Change and continuity in the development landscape introduce inherent contradictions and with it the potential for change. Institutions represent “rules of the game” (North 1990), both formal and informal (Jepperson 1991), enabling and restricting human action. Institutions are products of such action, not always by conscious design (DiMaggio, Powell 1991), making them “multifaceted, durable social structures, made up of symbolic elements, social activities, and material resources” (Scott 2001). Organizations and actors function within fields, relevant in our context being actors related to global aid, development, and HIS.

The theory of institutional entrepreneurship (IE) is a recent and interesting strand of work within institutional theory, focusing on understanding and making change, as contrasted with the traditional focus on explaining stability. Institutional entrepreneurship refers to “activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” (Maguire, Hardy & Lawrence 2004). While IE does not focus on stability (Lawrence & Suddaby 2006), the same concepts used to explain change can also help to understand status quo. A central dilemma which IE seeks to address is how actors can create change in institutions that they themselves are products of, and thus are biased to perpetuate. In any given field, there are both dominant and peripheral actors, where the former have the power to make change but may lack the motivation as they enjoy the benefits of the status quo, they are “deeply embedded in – and advantaged by – existing institutional arrangements” (Hardy and Maguire 2008). On the other hand, peripheral actors “may have the incentive to create and champion new practices but often lack the power to change institutions” (Hardy and Maguire 2008, p 3).

As strategies for initiating or inhibiting change, actors will tend to enrol other actors such as individuals, organizations, networks, associations and social movements. The entry of new actors or technologies into an existing field creates new fields, bringing in their own tensions and contradictions. As Hardy and Maguire write:

“emerging fields offer considerable scope for IE because the lack of institutionalised practices results in fluid relationships, conflicting values, and the absence of clearly identifiable norms” (p13)

An example of emerging fields is in the introduction of computer based HIS within a district context where historically flows of information have been paper-based. This creates a “technological disruption” involving deinstitutionalizing (Oliver 1992) existing institutions around paper based information flows. Further, as we move from standalone to web-based or mobile interfaced systems, there will be ongoing processes of existing institutions being challenged. IE theorists point to the potential for change arising from such tensions, contradictions and

technological disruptions. These contradictions arise with the struggles to establish new meanings, and discursive struggles.. As Hardy and Maguire write (2008):

“A growing body of work on IE examines interpretation and explains institutional change with reference to complex, ongoing struggles over meaning among numerous actors, the outcomes of which are not necessarily predictable or controllable”. (ibid, p15)

For example, the introduction of free and open source software in settings previously dominated by proprietary systems will come with new meanings of “software as a public good”. These new meanings will not be established without a struggle, and will be contested both by what existed, and other alternatives that may exist. Such change accounts - “helps to ensure that the efforts of institutional theorists to incorporate agency – in order to move beyond an over-emphasis on the constraining effects of institutions – do not swing too far in the opposite direction.” (Hardy and Maguire 2008 p 4-5). Discursive struggles lead to unintended consequences which were not pre-determined.

Hardy and Maguire (2008) identify three broad strategies for change: the mobilization of resources; the construction of rationales for institutional change, including the discursive processes through which new practices are framed and legitimated; and the forging of new inter-actor relations. Creation of inter-actor alliances are tightly connected to the exercise of power, and require “the assent or, minimally, the acquiescence of various groups as well as the capacity to prevail over opposition” (Hardy and Maguire 2008, p24). No change may also occur if the struggle itself is self-defeating or if the prevailing discourses are too constraining.

In summary, the IE theory discussed above provides us conceptual tools to analyze how technological change can be understood and also enabled within a context of both embedded and changing institutions. We draw upon these concepts for our analysis following the case study description.

3 Methodology

The empirical basis for this analysis builds on the work within the Health Information Systems Program (HISP), working to improve HIS in developing countries since the mid-nineties. The project relies on rigorous action at all levels of the health services to develop appropriate and context-sensitive systems, and to produce knowledge according to the principles of action research (Braa et al 2004). Both authors have been working towards strengthening HIS in a range of countries, at all levels from the community to the national and international.

We conceptualize HISP as an Institutional Entrepreneur, working towards making change in the health information sector, while being confronted with and also being products of various institutions, such as ministry level politics, competing vendors, aid agencies. The different strategies employed by the HISP entrepreneurs, have included the design, development, and distribution of free and open source software, a focus on capacity building at multiple levels, including doctoral and master’s studies within the formal ambit of universities, and also in-service training of health staff in collaboration with local partners. In this way, HISP is involved in trying to enable change through both technical and socio-political means. In various countries, success has been achieved (such as Zanzibar and Kenya) as they have been able to overcome the institutional constraints and leveraged upon opportunities provided such as by web-based technologies. While in other countries, such as Cuba and Ethiopia, existing institutions of ministry and aid politics have overcome them and HISP efforts have folded up after years of trying.

The authors have been working on various areas including software development, requirement specification, capacity building, developing policies, negotiating integration and harmonization of information requirements, and mobilizing local actors and alliances. For this paper, we draw upon three set of experiences to highlight the IE efforts, the manners which these have managed to overcome or not the existing institutions, and usher change. The first story is from India, the

second the West African regional and third the global level of the Health Metrics Network (HMN) in Geneva.

We present the empirical material as anecdotal stories based on the experiences rather than as full case studies. The empirical stories illustrate efforts towards IE, confronting of existing institutions, reflecting upon the outcomes achieved, and the underlying challenges.

4 Empirical stories

In the Indian story, one author has worked for ten years at state and national levels, designing and implementing HISs. In the HMN story, one of the authors has worked there for two years. In the West African Health Organization (WAHO), the HISP project has a formal agreement to support it and its member countries to develop integrated and interoperable HIS.

4.1 India – tensions between centralized and decentralized systems

In the Indian story, the efforts of the NGO HISP India is described as an IE trying to introduce change in supporting the use of free and open source software in facilities, strengthening capacity building for health staff, and promoting the concept of integrated HIS.

HISP India started as an informal effort in 1999 in a few facilities in one district of Andhra Pradesh implementing a HIS application (called District Health Information Software –DHIS Version 1). Over the 5 years that HISP worked in the state, significant success was achieved as the systems were scaled also to the state level. However, with change in the political leadership in 2005, the HISP effort was terminated as their supporting network was dismantled.

Following this, HISP moved to a neighbouring state of Kerala in 2005, which also marked the initiation of the development and implementation of the DHIS Version 2 which was web based. Kerala had an explicit policy towards adopting open source systems for the public sector, supported the DHIS 2 efforts to incrementally scale to cover all 2000 odd facilities in the state. Seeing this success, other states like Gujarat and Jharkhand invited HISP India to implement the DHIS 2 in their respective states. Mixed success was achieved, while full scale implementation was reached in Gujarat, in Jharkhand political upheavals aborted the project mid way.

These state level successes led to HISP India in 2008 being asked to contribute to national level system reform efforts. This was through a partnership with a national level technical support group. One of the authors of this paper served as an Advisor in this group, and participated in the initial redesign of the national system and its subsequent implementation in the states.

The implementation model defined by the national level was that a Ministry supported proprietary developed web portal to serve as the national data repository, and states would enter their district consolidated reports into this. States were given the option to use DHIS2 to carry out their facility based reporting and analysis, generate the district reports for electronic uploading into the national portal. Even though the ministry portal was initially supposed to focus on district consolidated reports, they soon expanded into the sub-district facility space, thus competing with DHIS2. The national level instructed states to enter facility data directly into the portal, and some agreed to shift while others continued with the DHIS2. This was because DHIS2 had already been well institutionalized and states had invested resources in its adoption.

Negotiations were initiated between the states and the national level for the latter to provide interoperability with state systems. However, when asked to enable interoperability by providing the database structure for integration bridges to be built, the Ministry was reluctant. This created a situation where interoperability could not be enabled, while at the same time, states were mandated to input all their facility data into a national web portal. In essence, the Ministry promoted the strategy of a “single window of truth”, even though states may have made significant efforts in setting up their state systems over time. From a public health perspective, it could also be questioned why the national level was interested in facility level data which was more appropriate

for district and facility monitoring. The existing situation thus represented a conflict between two architectures – one centralized and aimed at control of local facilities, and the other decentralized and geared towards promoting local use of information for action.

4.2 HMN – Changing global agendas

The HMN was established in 2005 with funding from Gates Foundation as a partnership within the World Health Organization, with a primary mission is to improve decision-making in health, summed up by the slogan “Better information. Better decisions. Better health”. The initial HMN Framework called for an integrated data warehouse, to deal with problems of fragmentation rampant in country HIS. After releasing the HMN Framework document and the HMN Assessment tool, HMN began supporting countries to go through a process of HIS assessment and strategic planning.. About 60 countries released assessments by 2010, representing 69% of low and lower middle-income countries (World Bank classification) (HMN 2010). At the same time, about 30 of these countries had developed a strategic plan for HIS strengthening, and achieved a national consensus about the way forward. As countries completed these plans, they approached HMN for technical support for implementation. Though HMN was not mandated to deliver such support, and instead of urging countries to explore other sources of financial support, they made implementation plans with countries. A guidelines series of documents were presented to countries at the Global Health Information Forum in Thailand in January 2010, as well as to the executive board of HMN shortly thereafter. However, at that time it became clear that HMN was drastically changing its focus; from a systems perspective, to a vital events perspective. Instead of following the demand from countries asking “we have everybody on-board for an integrated system, what now?”, HMN instead replied “registration of births and deaths is our greatest concern”. In other words, HMN who had previously advocated against the fragmentation of health information systems caused by donors’ specific interests, now adopted a specific, narrow interest themselves, just as the majority of poor countries were in the starting-blocks to follow the “old” agenda.

While there is no inherent conflict between strengthening birth and death registration within an integrated framework, but with the change of focus HMN, perhaps unintentionally, changed the order of the day; reduction of legitimacy for integration, strengthening of limited national actors (with focus on vital events), and diverting attention and funding away from the still unfinished agenda of integration. For countries in the middle of HIS strengthening processes, the result was confusion about the way forward, and a renewed skepticism towards global development agendas. The comments below from the Director General WHO on March 11, 2011 echoed this feeling of countries:

“Commitment to the health-related MDGs has unquestionably brought results. But many wonder if we are getting the best possible results from these increased investments. In other words, aid is still not as effective as it ought to be. In some instances, there is a sense that the way development assistance is being delivered can do more harm than good. Ask a developing country about the current situation, and you are likely to get some frank answers. Yes, they need and want development assistance, but on their own terms, in line with their own priorities, and delivered in ways that develop essential health infrastructures and capacities. They want, for example, help in developing information systems for collecting comprehensive health information, and not a range of separate systems for data on individual diseases.”

In contrast, HMN justified the shift of focus:

“HMN has embarked on its next phase of operations with a sharply focused 2010-11 work plan, budget and tighter organizational structure. Its two priorities, for which funding has been approved, are improving civil registration and vital events recording in order to reach the Millennium Development Goals (MDGs) and tracking progress towards stronger health information systems” (HMN 2010). And;

“The strategic refocusing of HMN comes at a most opportune time. Its new priorities Monitoring Vital Events (MOVE-IT for the MDGs) and production of the State of the World’s Information Systems for Health report will be important instruments for following up the work of the Commission” (HMN 2011)

Thus, the agenda of reaching the MDGs before 2015, took precedence over the long-term involvement of making lasting impact on health systems strengthening. HMN was set up as a new actor in this domain, trying to influence national health systems. Initially, HMN achieved a great deal of success, drawing from the legitimacy of WHO, and by pursuing the important and relevant agenda of integration. However, this change could not be sustained, as the historically existing institutions of fragmentation struck back, plus the urgency of showing results towards the MDGs.

4.3 WAHO – regional independence and legitimacy

The West African Health Organization (WAHO) is the health division of ECOWAS, the organization for political and economic integration and cooperation of West Africa. It consists of 15 member countries and operates officially in three co-equal languages—English, French, and Portuguese. WAHO provides leadership in regional health policy, including the strengthening of HIS. First, by trying to collect and manage quality data from countries on diseases and epidemics, and second mobilize efforts to strengthen HIS in countries by harmonizing data collection procedures and data standards. Some of these strengthening processes are summarized.

The DHIS2 process: In 2007 HMN selected Sierra Leone as their pilot country for HIS strengthening and engaged the HISP network as their technical support partners. While in 2007, the HIS in Sierra Leone was characterized by extreme fragmentation, during 2008-2009 the various actors agreed to integrate their systems into the DHIS2 leading to the development of a best-practice project for West Africa. Following this, The Gambia implemented DHIS2 in 2009 and from 2010 similar projects were initiated in Burkina Faso, Liberia, Nigeria and Ghana.

Interoperability: While DHIS2 is an application for managing aggregate statistical data, the iHRIS is a human resources system for managing records of individual employees and the OpenMRS a system for individual patient records. SDMX-HD is a standard for interchanging metadata and statistical data which development has been led by WHO. It was first implemented “live” in Sierra Leone for the interoperability between the DHIS2 and OpenMRS in a project to manage ARV treatment of AIDS patients. Even though small, this practical demonstration of interoperability gained global visibility. So also the integration of DHIS2 and iHRIS covering the important application domain of human resources. Such integrated data would be very important for planning and evaluation of the health services and currently not easily available.

In September 2010, WAHO organized a regional workshop on interoperability in Accra which included training in DHIS2 and iHRIS. The SDMX-HD standard was officially launched and came to symbolize the importance of forming partnerships between WAHO, on the one hand, and other open source software applications on the other hand. The idea of partnership was subsequently formalized, and has led to the creation of a regional support strategy, to be coordinated by WAHO, and supported by technical groups like HISP and iHRIS.

5 Case analysis and discussion

Using the concept of institutional entrepreneurship, we analyse the cases. In the first part of this section, we sum up the main strategies followed, the enabling and constraining institutions within which these institutional entrepreneurs function, and the results to date.

5.1 India

The NGO HISP India is the institutional entrepreneur in the case of India, with a broad strategy of using free and open source software (DHIS2), promoting architecture approaches, creating and making visible best-practices while being present at multiple levels, from facility to national,

enrolling support of global networks, remaining strong links with educational systems, and being responsive in their support to state users. The enabling institutions leveraged upon include a decentralized approach based on a facility focus and the enabling of interoperable systems. The constraining institutions are a strong centralized ministry system, official support for proprietary and non-interoperable software, and a system of procurement which places NGOs at a disadvantage. Despite this, DHIS2 has been institutionalized in more than 12 states in the country, the discourse of use of information for action is now quite present, even in the ministry, and information for action taking place in various states, and an integrated architecture is taking birth in a few states.

5.2 HMN

The identified institutional entrepreneurs in the case are the HMN secretariat and their technical partners. The strategies for intervention is advocacy for integration, financial support to countries, making visible best practices (such as Sierra Leone), and making partnerships with member countries. Enabling institutions include the legitimacy of WHO, the agenda of MDGS, and the acceptance of the integration agenda by countries. The constraining institutions are the fragmentation of WHO, the financial dependency on a single donor, and the increasing focus on MDGs, sometimes at the expense of health systems strengthening. The outcomes so far are the adaptation of the HMN Framework in many countries, significant success achieved in Sierra Leone in implementing it, and the raising expectations of interoperability. However, some of these expectations have been left unfulfilled.

5.3 WAHO

The institutional entrepreneurs in this story are WAHO and their technical partners, including HISP. Their strategies for intervention have been forming a regional partnership enabling country-specific participation, creating networks of networks enabled through interoperability of systems, and unifying systems across countries as a strategy for scaling. The enabling institutions include the independence of WAHO from top-down global agendas, a suite of interoperable open source software, the success of Sierra Leone, and relative financial independence. Constraining institutions in place are existing donor-specific projects and legacy systems in countries, weak infrastructures to support web-deployment, and weak capacity on new technologies. The outcomes so far are agreements made for interoperability-based approaches using open source software, and implementation processes started in member countries (Sierra Leone, Ghana, Gambia, Liberia, Nigeria).

In the first part of the analysis we have provided an IE-based analysis of the three cases, including discussion on who are the institutional entrepreneurs, what strategies they have used, and the institutions that they engage with, providing both enabling and constraining influences. Finally, we have also discussed some of the technological change-related outcomes achieved. In the next part, we theorize the relationship between development and technological change..

6 Theorizing development and technological change

With respect to the development landscape, we see today a paradigm shift at least with respect to who defines the development agenda, the strong financial support, and the primacy given to ICTs in achieving the agenda. For example, in India, computer based systems are being mandated for tracking pregnant women and child immunization without seriously examining what is the program logic of collecting this data, and who should receive what data. Primacy is given to computerization and purchase of servers as if it would solve systemic problems such as relating to availability of vaccines, skilled staff, infrastructure, and primary registers.

Opportunities come with this changing paradigm, but so do also serious constraints as many of the old institutions remain. For example, the HMIS roll-out in an African country announced in a

recent tender attracts the funding of about 25-30 million USD. This sum of money represents a quantum leap from previous budgets for HMIS, and thus a great opportunity to induce large-scale technological change. However, accessing this money for small organizations working on the ground is next to impossible as tender conditions favour larger corporations with prior experience with American funded projects. This then biases who can participate, what technologies are adopted, and the methodologies of implementation. Top-down methods of implementation, a problematic institution of the past, gets re-enforced, although in a different setting and with different actors.

The cases highlight different strategies for intervention towards technological change, but with it also specific forms of resistance. Key interventions strategies identified include the building of networks, and also networks of networks, enabled through the use of free and open source software. Open source technologies, by their very nature, allow integration with other systems, creating opportunities for new organizational fields to develop. With increasing possibilities of partnerships, different software providers find convergences of interest, as their basic systems can be conserved. This networking then allows for stronger alternative voices to develop against existing institutions promoting proprietary systems and centralized procurement. Resistance, as seen in the India case, comes through exercise of central power where interoperability as a strategy is consciously denied. In the case of HMN, the challenge of fragmentation which HMN set out to try and address, in fact struck back to dismantle their agenda, as there are other agencies also supporting similar efforts. Changing agendas are accompanied with funding changes, movement of personnel, and refocusing the mandate to a more limited vital events-focus.

The WAHO example provides the refreshing approach to organize technical support in a region through a partnership approach.. In this collaborative framework, agendas are defined by the partner countries themselves, articulated in partner forums. The decision to partner with HISP for technical support for DHIS2 across all countries provides a unique strategy for harmonization and the building of standards, and streamlining support. Since countries have their interest in getting regional level data and comparisons, they find a win-win situation in using the same software, data sets and indicators. From the software side, advances in technology, the development of standards for interoperability, and the support for open source software helps to converge technical support involving global leaders. The prior success of one of their members - Sierra Leone – adds legitimacy and experience to the change efforts.

7 Conclusions

This paper, which has theorized the relation between development and technological change using IE theory, has drawn upon empirical cases from the HISP program, to develop some key contributions. First, technology, often ignored by the institutional theorists, has been described as an important actor to enable change. Specifically, features of the openness of software, the ability to interoperate with other systems, helps to fill the gap for integrated systems. This provides important agency to the technology to enable change. However, this is not without a struggle, as existing institutions of proprietary systems and centralized procurement will contest the entry and stabilization of these open systems using existing institutional arguments of “this is how things are done here before”.

Another key contribution relates to the role of networking. While IE theory has emphasized the role of coalitions, social movements, and other forms of associations, they have not seriously looked at how global groups and technologies can come together as a strong and collective force to help challenge the existing institutions. These networks bring with them alternative discourses and interpretive meaning which challenge the existing meanings. Legitimacy of global organizations like HMN also helps to provide a stronger voice to these alternative meanings.

An important area of future action could be in how these alternative networks can influence the agenda of the new development actors like the philanthropists, so as to incorporate a broader

vision of change. Maybe the source of influence can come through the regional partnerships like WAHO, which have the backing and legitimacy of the national governments and a critical mass that also makes it attractive for the philanthropists.

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