FROM CENTRALIZATION TO COORDINATION: IN THE INSTITUTIONALIZATION OF THE INTEGRATED HEALTH INFORMATION SYSTEM IN ZANZIBAR

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Abstract: Health Information System (HIS) integration is an extensive exercise that goes beyond the installation of the hardware and software. In this research article I discuss the project implementation for the integration of HIS in Zanzibar, Tanzania. The study reveals that, while technical aspects of HIS integration posed a little challenge, institutionalisation of the new HIS across health programmes which are the main actors, the district and zonal offices, as well as the HMIS Unit itself is a problem of great concern. Theoretically, I draw upon the new institutionalism to analyse the institutional forces, and specifically power relations in the institutionalisation of the new HIS. The study reveals institutional differences from the management bureaucracy of the new HIS, where a newly established HMIS Unit is put on top of HIS bureaucracy replacing the historically superior health programmes. However, the unit fails to acquire supportive power sources such as finance, human and material resources, and consequently lacked legitimacy to preside over the new responsibility, posing a clear challenge to the 'actual' integration, where apart from the integration of the artefacts, programmes remained far from this integration in terms of routine and resource allocation, calling for a compromise on the role of main actors – from centralisation to coordination.

Keywords: Health information systems, integration, institutionalization, power, legitimacy.

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1. INTRODUCTION

One of the key human development indicators is the health status of the people of any particular society. The United Nations identifies eight development goals to be achieved by all countries by 2015 (United Nations 2008; www.undp.org accessed on February 2, 2009) three of them are directly related to health and well being. The challenge of the developing countries is to achieve those goals plus country specific goals all aimed at improving the health status of the target population, thereby optimizing the available resources. Certainly, this necessitates for the need of a proper Health Information System (HIS), as emphasized by the Health Metrics Network (HMN):

> It is not the case that countries with insufficient resources should forgo good health information. Indeed, they are the ones that can least afford to be without it (HMN 2008 p.6).

However, the countries are marked with a long history of fragmented information systems serving their healthcare sector. A principal reason mostly cited (Lippeveld 2001; Braa et al. 2004; Aanestad et al. 2005; Chilundo and Aanestad 2005) is the nature of service provision. Healthcare service provision is vertically organised into programmes engaged in providing service for specific diseases (e.g. malaria, Tuberculosis), specialized services (e.g. family planning, immunization), and the general sector management issues (e.g. drugs, human resources). The subsystems used in these fragments often overlap each other in terms of the data collected, and more interesting they use the same staffs, who in the end of the day are at the centre of problems – high workloads (Chilundo and Aanestad 2005), scarce resources (Mosse 2004) and less motivation (Lippeveld 2001; Sheikh 2005). Furthermore, the systems serve only to the respective programme needs, basically at the national levels and to their funding agencies.

Widespread efforts to loosen the tension are hitting the IS research (Lippeveld et al. 1992; Rubona 2001; Braa and Hedberg 2002; Braa et al. 2004; Lungo and Igira 2008), though with a considerable number of reports on either full or partial failure (Heeks 2002). The reform efforts consider integration of the various Health Information Systems (HIS) as the new doctrine, in the HMN comments:

> It will also be important to emphasize the integration of data from different sources at national and sub national levels (HMN 2008 p.18).

The integration efforts have a sole purpose of providing a comprehensive health data to all managers at all levels of the healthcare sector. Data between health programmes, health districts and health facilities can be shared, and comparable analysis can be made to compare performance between districts and health facilities within a particular district (HMN 2008). Consequently, shared efforts and reduced data collection burden to health workers will improve data quality and reduce data administration costs. Despite this visionary reform, HIS integration efforts face serious challenges; legacy systems, as the existing computerised information systems are often typically old and non-changeable for several reasons, and do not support data sharing between different systems, and the fragmented reporting and other work routines (Aanestad et al. 2005). But more

often, even if the integration of the tools is made possible, the institutionalization of the new system becomes a matter of discussion (Sahay et al. 2007).

In this research article I discuss the process of implementing a computer-based integrated HIS for the Zanzibar healthcare sector. While the process to integrate previously working paper-based HIS, thereby developing a new system comprising of normalised data collection tools and a software data warehouse that is used for data storage and analysis is a success, at least in its modest sense, institutionalising the system into the operating healthcare organizational bureaucracy (programmes, district and zonal management as well as the HMIS Unit[1]), remains a challenge.

Inspired by new Institutionalism, I explore the institutional forces and specifically power relationship between the HMIS Unit and the operating 'vertical' health programmes around which the newly established HIS operates. The research has identified institutional differences that are not in favour of the organisational structures around the new HIS. The HMIS Unit has been given too many responsibilities but never won the legitimacy to preside over the new structures lacking necessary power to persuade other actors to pursue the new HIS and to institutionalise into their daily routines. I thus, argue for the changing role of the HMIS Unit, from being principal data collector and distributor, to primarily coordinate data flow to all actors. My research is based on Action Research project involved in the development of HIS in several developing countries in Africa and Asia called Health Information System Programme (HISP).

The rest of the paper is organized as follows. In section 2, literature review is presented followed by research settings and methodology in section 3. Case description follows in section 4, and lastly in section 5, I present an analytical discussion and conclusion.

2. LITERATURE REVIEW AND THEORETICAL FOCUS

2.1 Related literature on integration

Kumar and Hillegersberg (2000 p.23) assert that "integration has been the Holy Grail of MIS since the early days of computers in organizations". Within the healthcare sector, the ambitions for integration are backed by the prevailing fragmentation of information systems across the healthcare sector, both in the developed (see for example, Ellingsen and Monteiro (2003); Monteiro (2003) on Electronic Patient Records (EPR) implementation in Norway) and developing (see for example, Aanestad et al. (2005); Chilundo and Aanestad (2005) on HIS integration) countries.

In MSN Encarta online dictionary, integration is described as "a combination of parts or objects that work together well" (MSN 2007). In software engineering, it refers to combining two or more software systems, subsystems, or components, each of which is functioning properly (i.e. satisfying their requirements within their environments), in order to satisfy the combined requirements within the newly formed environment. It also includes incorporating new function or

[1] Health Management Information Systems (HMIS) Unit is a central unit that is responsible for all the HIS related activities in Zanzibar.

technology into existing software system, which may have been functioning properly in the field for a significant period in order to satisfy broader requirements (Isazade 2004). In the domain of HIS, both the situation apply; that is, integrating Information Systems (IS) of different health programmes in the beginning of the HIS integration efforts, and also incorporating the new functions or systems that arise as a result of the evolving healthcare sector.

When different HIS are integrated it is not necessarily important that a single system, a software environment and architecture are chosen. What is important is that the "exchange of data and organizational processes, according to the merged organization needs, are possible and efficient" (Giacomazzi et al. 1997 p. 290). Technically, this can be achieved by selecting proper approach and implementing right standards and techniques that suits best for the systems and environment under integration. However the notion of integration goes beyond the hardware and software installations. "The task straddles engineering design (of whole systems, as well as of components and their interfaces) and business organization and management […. Thus,] Engineering meets economics, and often politics as well" (Alexander 2004 p.160) in order to articulate interests, building alliances among the important actors and struggling over outcomes (Chilundo and Aanestad 2005). This interconnectedness between the technical and political and institutional conditions shaping IS integration (Sahay et al. 2007), draws attention to study the institutional forces that shape the HIS integration in Zanzibar.

In the next two sub sections, I present a theoretical ground that I use to analyse the process of HIS integration in Zanzibar. I use institutional theory to highlight the gap identified and that need to be addressed in the integration process, notably institutional differences, arising from the non-technical aspects of integration. I also bring about a discussion on power and how it affects HIS institutionalisation process.

2.2 Institutions and institutionalization process

"Institutions are social structures that have attained a high degree of resilience. [They] are composed of cultural-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott 2001 p.48). The cognitive elements, which were introduced in the new institutionalism, include widely held beliefs and taken-for-granted assumptions that provide a framework for everyday routines. The normative elements incorporate habits and informally sanctioned social obligations, while regulative elements shape individual actions based on rules and regulations. Institutions are transported by various carriers (Jepperson 1991) – cultures, structures and routines (Scott 2001). Since institutions are social structures that have attained certain state, it pertains that institutionalization is the process to attain such state. Institutionalization thus, "denotes a distinct social property or state" (Jepperson 1991 p.144). It is a process through which "a social order or pattern becomes accepted as a social 'fact'" (Avgerou 2000 p.3).

Within IS research, Institutional theory is becoming overwhelmingly important. Orlikowski and Barley (2001) insist on the use of the theory in order to gain insight on how "regulative processes, normative systems and cultural frameworks shape the design and use of technological solutions" p. 153. HIS integration, just like any other IS innovation can be conceptualised as a double effect process. On one hand, it involves a process to institutionalize the newly introduced solutions, the process that dictates the need on the flexibility of the introduced solution in both the technology and mechanism for introducing it. On the other hand, the process interferes with the existing system, and hence dictating de-institutionalization of the established organizational structures and

practices (Avgerou 2000). Thus, the theory will help to build a deeper understanding of the HIS integration process through exploring the social, economic and political situation around the healthcare bureaucracy in Zanzibar and how the power relationship between the different actors influences the HIS integration process, and how the new HIS is established as an obligatory passage point (Humes and Reinhard 2007) within the healthcare bureaucracy.

2.3 Institutionalisation and power

According to Max Weber, "power is the chance of a man or a number of men to realise their own will in a social action even against resistance of others who are participating in the action" (Weber 1978 p.926). Thus, power in addition to other mechanisms, supports institutionalisation through the process where actors, either individuals or groups influence others in the process to diffuse an innovation. In any instance of institutionalisation, the exercise of power affects pace – the time it takes for an innovation to diffuse throughout the field, and stability – the time during which the innovation remains diffused and legitimate (Lawrence et al. 2001). This pace and stability of institutionalisation depends on the dimensions of power exercised. First, the mode of power, if it is episodic – the relatively discrete, strategic acts of mobilisation initiated by self interested actors, or systemic – the mode of power injected and that works through the routine, ongoing practices of organizations, often not appearing as power. Second, whether the institutionalisation agent treats the target of power as subject or object (ibid p.629-30).

In the domain of IS development, Silva and Backhouse (2003) argue that the "exercise of power is necessary to institutionalise an information system, which, once in place, becomes itself a source of power" (Silva and Backhouse 2003 cited in Humes and Reinhard 2007 p.3). On their work of the study of implementing a computerized Integrated System for State Financial Administration (SIAFEM) in Brazilian State of Sao Paulo, Humes and Reinhard (2007) also emphasise the use of power for the institutionalization process. In that project, they state, "Initially, coercive power [by the governor] was used to impose the system. Later on, it was expanded and sustained by powerful actors that made use of institutional discourses to develop new systems [to cater for their departmental needs]" (ibid p.10, emphasis added).

Since the exercise of power as institutionalisation mechanism, takes place between actors within the same field, it pertains that institutionalisation agents are those actors which are capable of exercising the power. There are several sources of power, including financial, technological, educational, informational, reputational, traditional, cultural, natural, physical or social order (Zimmermann et al. 2008). Furthermore, according to Lawrence et al. (2001), the more efficient power-based institutionalisation mechanisms, that is, the ones that have fast pace and high stability are the one that depends on domination as its supporting mechanism, or the one that use domination supplemented by force, all of which are highly dependent on availability of resources by the institutionalising agent. To sum up, resources and authority brings about legitimacy to certain actors who will then be able to exercise power to institutionalise an IS innovation.

3. RESEARCH SETTINGS AND METHODOLOGY

The empirical materials are drawn from the Zanzibar healthcare system. Zanzibar is a country that is part of the United Republic of Tanzania, semi-autonomous in various internal affairs including health. The country comprises two major islands (Unguja and Pemba) together with several islets, covering an area of approximately 2,600 sq km with a population of 1,155,065[2]. Zanzibar, just like other developing countries, is marred by health related problems including high Maternal Mortality Rate, Infant Mortality Rate, as well as high disease burden (MOHSW 2008). Various programmes operate in the healthcare service provision, some specialising in specific disease (Zanzibar Malaria Control Programme – ZMCP and TB Programme), and some in specialised services (Reproductive and Child Health, Nutrition, Zanzibar AIDS Control Programme – ZACP and the Expanded Programme for Immunization – EPI).

Healthcare administration is organised into four levels; health facility, district, zonal and national levels. HIS is also organised into the same levels. In addition to service provision, health facilities are the primary data collector using registers and tally sheets that are summarised into monthly reports in the end of the month. Districts are in the second level, and are the general overseers of all health facilities within their respective districts, including collecting filled in forms, distributing medical and other material resources as well as supervising the health facilities. It is at the district level where data are electronically captured into the software system before transmitted to the higher levels. There are ten health districts each corresponding to one administrative district, four in Pemba and six in Unguja. Zones are just above the district level, and are responsible for all administrative activities of their respective districts. There are two health zones corresponding to each island. At the national level are the health programmes and the ministry headquarter where the HMIS Unit exists.

The study is based on the author's participation in an action research project to develop HIS in Zanzibar, as part of global HIS development framework termed HISP. HISP is a global research and development network initiated by the University of Oslo in 1994, and now ongoing in various countries in Africa (South Africa, Tanzania, Mozambique, Ethiopia, Malawi, Botswana, Nigeria, etc) and Asia (India and Vietnam) (Braa et al. 2007). The author has been participating in the project from the early negotiations (2004), through project inception (August 2005) to date. Throughout this period I have participated in the process to develop HIS including revision of data collection tools, software adaptation and customization, user training and support, and project planning and administration.

This study entails interpretive (Walsham 1993) study within the action research (Baskerville 1999) framework. Interpretive research assumes that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts. It thus, tends to develop a deeper insights into IS development and management since it helps the researchers to understand human thought and action in social and organizational contexts (Klein and Myers 1999). My participation in the project entails an action research principle; aiming at improving the HIS at the same time developing a theoretical understanding (Baskerville 1999). Applicability of action research in IS studies has been highlighted by (Baskerville and Wood-Harper 1998), arguing that a deep understanding of IS is build when attempts are alongside made to change the social situations underlying and the practices underlying the IS.

[2] Population estimate for 2007 based on the 2002 Tanzania Population and Household Census

Data have been collected and analysed using qualitative methods. These include a number of meetings and discussions with several health workers and managers of different levels, including staff at the public health facilities who are involved in data collection; district and zonal health managers involved in the report collection from the health facilities, data entry and analysis at district and zonal offices; and programme data managers and HMIS Unit staff at the national level. While the health facility staff and district managers were met during supervision and technical support activities at their work places, discussion with the zonal and programme managers were primarily during routine quarterly feedback meetings, and at data cleaning and data use workshops, where district managers also participate, as well as during technical support visits. Discussions with the HMIS Unit staff were held during regular meetings conducted between HISP staff and the unit, as well as during day-to-day activities. I also had time to analyse various software used by the programmes (Malaria and EPI) and documents such as monthly and quarterly routine reports and policy documents. The data has been analysed using principles of the hermeneutic circle as outlined in (Klein and Myers 1999).

4. CASE DESCRIPTION

4.1 Zanzibar Health Information System – past and present

Zanzibar Health Information System can be described in two eras; first, the pre-integration period in 2004 and backward, and second, the integration era – 2004 to date.

4.1.1 Pre-integration era (2004 and backward)

This period present a fragmented HIS, driven by the operating 'vertical' health programmes based on their needs and requirements. Each health programme operated a totally independent HIS with most programmes collecting redundant data but using the same human resources – the health facility and district staff. The situation can be explained in terms of its integration from health facility to district level where all health facilities report to their respective district, and fragmentation where programmes, zonal office and other offices at the national level collected data on individual basis, a chaotic situation which made some of them receiving data routinely and others on more ad hoc manner. Figure 1 depicts the situation.

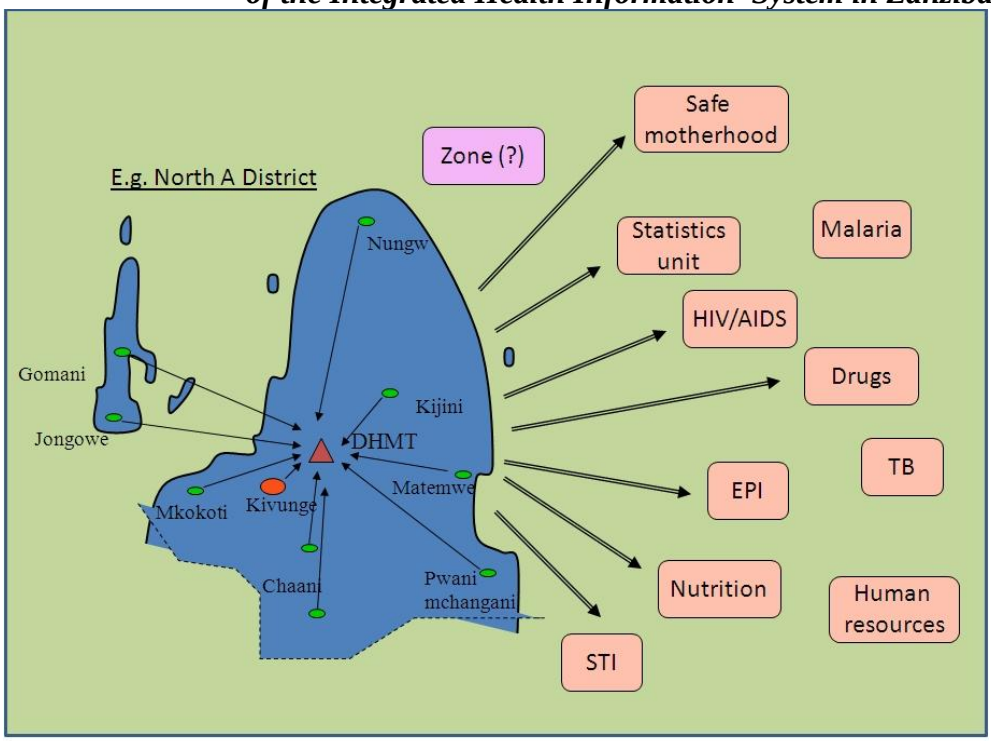


Fig 1: The fragmentation problem of old HIS in Zanzibar. Source: Fieldwork

4.1.2 Integration era (2004 to date)

In recognition of the situation, the Ministry of Health and Social Welfare (MOHSW) was keen to find solution to the prevailing problem, and as a starting point it established Health Management Information System Unit (HMIS Unit) merging the then Statistics Unit, Epidemiology Unit and Research Unit to undertake the overall responsibility of data collection, supply of data collection tools and information dissemination to the other stakeholders. The HMIS Unit was intended to serve as the national data warehouse, and the programmes were meant to receive data from the HMIS Unit. The second point was to review the existing data collection tools from different programmes and design new tools with a sole purpose of reducing data redundancy and facilitating data sharing. Efforts to design new registers, monthly, quarterly and annually aggregated data reporting templates were initiated, but a full scale implementation did not take place until August 2005 when HISP was contracted to undertake the development process. The project was funded by DANIDA under Health Sector Programme Support (HSPS) II.

With approximately ten years of experience from the same kind of projects in different countries, HISP approached the development in two strategic points. One, to continue with the revision of the existing forms, as it had been the ministry attempt, but with focus on minimum indicator and datasets that are essential for the healthcare system planning, monitoring and evaluation; and two, to implement a data warehouse software that will be used to capture the collected data and that serves as analysis tool for managers at different levels of healthcare administration. District Health Information Software (DHIS) was adopted and adapted to the Zanzibar healthcare context. DHIS 1.4 is a Microsoft Access based application, and uses Microsoft Excel pivot tables at a presentation layer in addition to the built in report formats. While HISP followed a slightly different and more advanced approach to the development, management-wise they adopted the same strategy – power shift from the programmes to the HMIS Unit.

The new integrated HIS was intended to serve the larger community promoting decentralised information use, as well as implementing a centralised data warehouse at the HMIS Unit (Sheikh and Titlestad 2008). To undertake the process, main actors were identified, which in the technical support of HISP, are responsible for the routine data collection, analysis and dissemination of information, as well as information use at their respective management levels. These include the HMIS Unit, the zonal and district offices, health programmes, and the health facilities at the bottom of the bureaucracy. At the centre of the whole process is the HMIS Unit that is the general overseer of the new HIS including ensuring proper data flow from the lower (health facility and district) levels and ensure timely dissemination of data to health programmes. The unit is also responsible for supply of data collection tools to the health facilities, training and supervision to the facilities and the districts, and it was aimed at taking overall responsibility of technical support to all DHIS implementation nodes including districts, zones and programmes; a key challenge to this being its capacity in terms of human, financial and other material resources.

4.2 Integration on the scene - what has been integrated?

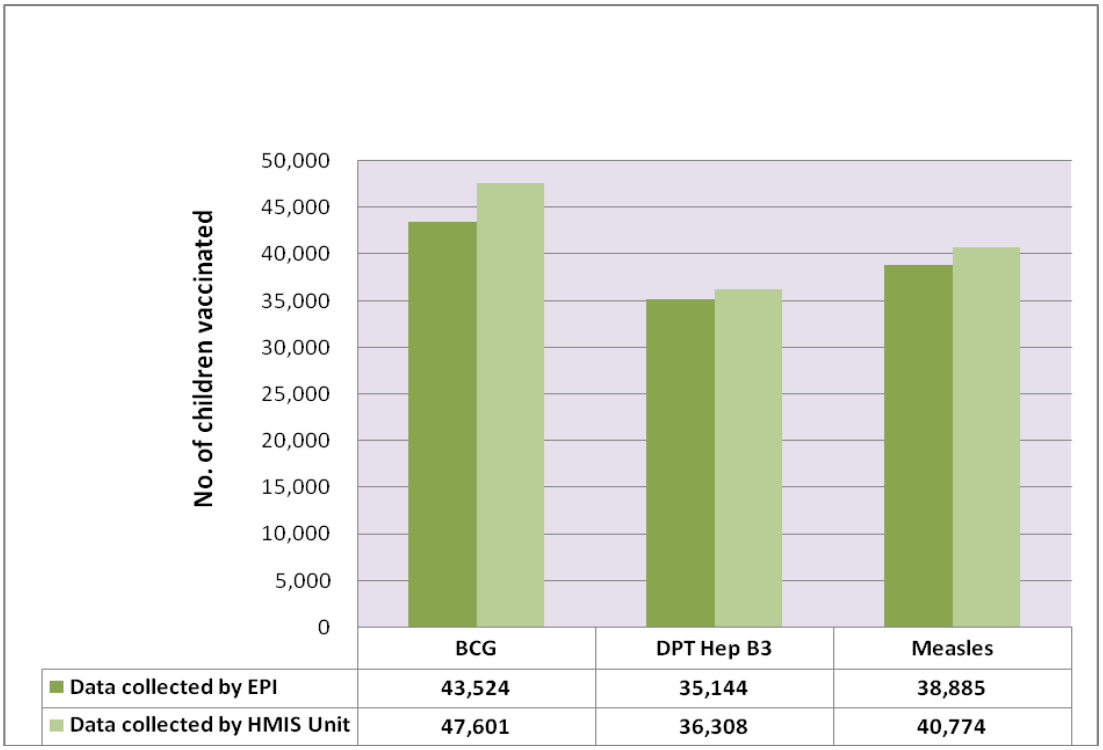
The implementation of the new HIS enjoyed two advantages. First, the un-anonymous agreement to continue with the revision of the data collection tools and the design of the tools organised into essential datasets reflecting requirements of all programmes. Second, the chosen software, DHIS offered all the required features for the automation of the new HIS, and as added advantages it uses the existing platform (Microsoft Windows and Office), and furthermore it had no competitors. In addition, there was no immediate requirement to integrate with other system used by any of the programmes, raising a hope of full DHIS takeover. In this case, the discussion of the computer legacy systems was not considerable, and thus the only technical challenge was to adapt the DHIS software to fit with the Zanzibar context, something that the HISP team managed to do.

Training of the DHIS followed by user support was planned and conducted but initially an emphasis was put in the district offices realising their pivotal importance in the smooth operation of the system. The district offices are the first level where data are electronically captured. Districts also serve the most important task of fetching the paper-based forms from the respective health facilities. Later on, selected officers from programmes and zonal offices were trained to be able to work with the data exports from the districts. IT technical staff from the HMIS Unit (in the beginning were two but later on, one joined ZACP) were receiving hands on training through joint operations between HISP and HMIS Unit with the sole intention of knowledge transfer. However, the staff showed little interest as a result of too much work around them, and hence making the unit non-reliable for the overall management and support of the system.

Despite this problem, the data started to flow routinely, from the health facilities to the district and to the HMIS Unit, but in a very close support and follow up by HISP. During this process, however three major problems arose. First, the new information flow left the Zonal Offices orphaned. Second, the new information flow could not guarantee proper data flow to the programmes. Data flow to the programmes was rather on ad-hoc manner where programmes received untimely data and only upon request. Third, some of the district officers who received training refused to work with the system and the HMIS Unit had little action to them lacking administrative authority to act upon them, Zonal offices that are formally superior to the districts felt marginalised, and hence were reluctant to act upon the district officers throwing blames to HISP and HMIS Unit. As an alternative solution, HISP identified other interested people within the districts and gave them in-service training.

The unreliable data flow to programmes persuaded them to struggle for alternatives. EPI for example, decided to fetch the data from the districts, but encouraged the use of DHIS by asking

custom report[3] printouts from DHIS that were used to generate district overviews in Microsoft Excel. These data were then sent to the EPI regional office in Nairobi. The disadvantage of this was data inconsistency with the HMIS Unit since the programme could not run for the updates in the districts. An obvious result was shown on the preparation of the 2007 annual health bulletin where data brought by EPI differed from that of the HMIS Unit (See Fig 2), virtually from the same system – DHIS. Other programmes like ZACP went back to their original systems, as it was emphasised by the programme data manager "we can only rely on your system once we get all the data we want", while others (Malaria, Nutrition, and RCH) could wait for the good luck or remind the HMIS Unit when they are in urgent need of the data.



	BCG	DPT Hep B3	Measles
Data collected by EPI	43,524	35,144	38,885
Data collected by HMIS Unit	47,601	36,308	40,774

Fig 2: Data inconsistency – data collected by EPI differing from that of the HMIS Unit. Source: Fieldwork.

Apart from this, programmes are hardly aligned to the new system, being result of the new structure that limits their power and freedom they enjoyed before the integration initiatives, and from their management and financial schemes that are still in the vertical manners. The HMIS Unit has been relying on financial assistance from DANIDA for all the HIS activities. Even the training programmes that programmes used to conduct are not scheduled through the new HIS scheme, rather the programmes either do not conduct training or they conduct training on their specific parts and not the HIS as a whole. Overall, the new HIS is far away from being institutionalised into the programmes, which in principle are the main data users since they are the key players in the healthcare service provision.

[3] Special reports that are identical to paper-based monthly report, but aggregated at health facility, district, zonal or national level based on someone's need.

4.2.1 New approach meeting the old

Considering the threat to the HIS failure, a compromise solution was proposed, where the programmes are meant to fetch data from the districts in parallel, as an e-mail copy of the HMIS Unit (Fig 3). This is intended to have two effects; one, programmes will be able to get timely data, and two, since the programmes are the principal users of the data, it is assumed that they might have immediate quality checks and give feedback on at least any anomaly identified. This will help to improve the data quality, activate the programme involvements and at the same time maintain consistency, since any data update at the districts will be e-mailed to all. The programme will also feel more responsible and perhaps re-shift their resources towards the new HIS.

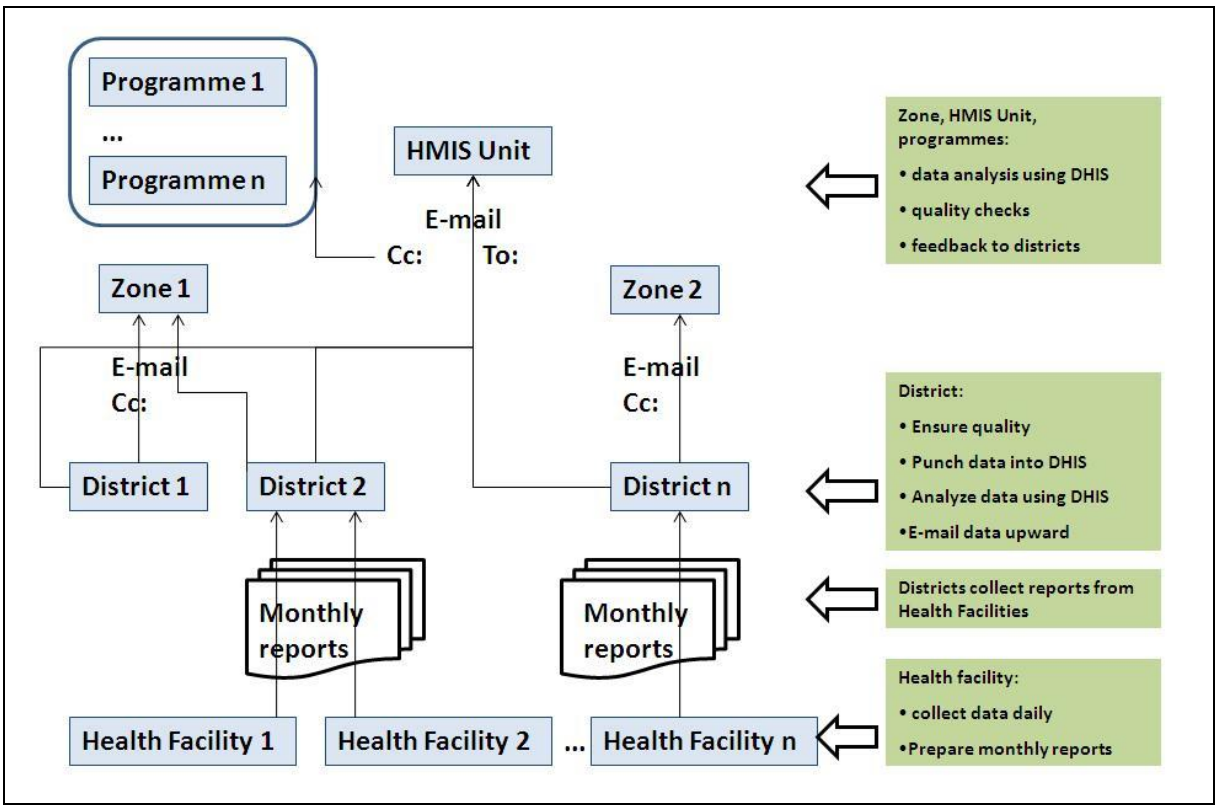


Fig 3: Proposed new reporting structure to reduce data delays. Source: Fieldwork.

Two programmes, which showed much interest in the proposed solution (Malaria and EPI), were selected for implementation. However, both Malaria and EPI used Microsoft Excel applications supplied by their donors for data capturing, HISP staff developed a gateway solution where data from DHIS (through already prepared Microsoft Excel pivot table templates) could be easily transferred to those applications. While Malaria programme fetch data at the health facility level, EPI required data in districts aggregation. With this linkage the programmes get live updates every month. While elements of improvements in timeliness can be clearly traced, it is too early to talk about improvement in data quality.

5. DISCUSSION AND CONCLUSION

The HIS integration in Zanzibar has shown remarkable success in, at least, data collection, but institutionalising it into the healthcare organisational bureaucracy is still a challenge. The success witnessed cannot be standing apart from the existence of the contracted HISP consultants both

local and international. As the case depicts, the process of HIS implementation has involved integrating information systems of the various health programmes, at least on the data collection tools and efforts. However the data related routines fall short of integration, signalling failure to the institutionalisation of the new HIS.

As HIS integration involves both technical and institutional aspects (Alexander 2004; Chilundo and Aanestad 2005; Sahay et al. 2007), it is certain that the technical solution will only survive if the related institutional environment is in favour of the solution. The institutional environment comprises actors (in our case health programmes and other offices) where the HMIS Unit seeks support and legitimacy (Finkelstein, 1992). With the new structure where the HMIS Unit takes charge, this support and legitimacy is crucial to deinstitutionalise the old routines where each programme collected their own data using their own system in their own resources, and institutionalise the new integrated and shared system, without much sacrifice on the advantages those actors enjoyed, e.g. programmes getting timely data.

However the HMIS Unit never won that support and legitimacy. Various institutional forces opposed the process. Historically, programmes have been enjoying financial and other resources supported by donor agencies, and hence owning power over the district and health facilities staff, not from administrative authority, but through various incentives and promotional activities such as seminars and training, and hence maintaining legitimacy to them. These programmes, also based on the resources they possessed were able to get timely data or at least whenever they wanted the data since they can fetch them directly from districts or health facilities, responding to any informational requirements from their donors, to whom support and legitimacy is also sought. In this situation, programmes find it difficult to be tolerant to any situation that risks their secured legitimacy. A very clear example comes from the EPI attempt to fetch the data from the districts rather than waiting for the delaying HMIS Unit. To maintain their legitimacy to their resource providers, who want them to report by the 10th of every month, the programme bypassed the new routine that seemed to risk their reputation. Consequently, this affects the whole system.

Another institutional force agitating the institutionalisation of the new HIS comes from the HMIS Unit itself. While the previously working information systems of the programmes enjoyed the respective programme's resources, neither the HMIS Unit has acquired enough resources nor has it managed to negotiate resource sharing from the programmes. Since the unit was established, it has been financially relying on DANIDA to support its routine activities such as forms printing, training and payment to the consulting staff. Lack of transport, small number of qualified staff and too many responsibilities to the available staff makes the unit unreliable for timely data dissemination, quality checks and proper supervision. Another inhibiting factor is that the unit lack administrative authority over any of the actors, even the health facility. According to the existing organisational structure, it is zonal offices that have administrative authority over districts and health facilities, and the unit has no authority to question, for example, if the district managers refused to send data. Zonal offices could do, enjoying administrative authority over them, but in a very bad luck they were orphaned – in most of the time the districts reported directly to the HMIS Unit.

Whether authoritative or resource-based, it is the discussion of whether the HMIS unit, as the institutionalisation agent of the new HIS possessed enough power to overcome the opposing institutional forces that hinder the institutionalisation of the new HIS. This power is very important in mobilising all actors from the old system of fragmented HIS to the new integrated and shared HIS. Lacking sufficient financial, human and material resources, which are among key sources of power (Zimmermann et al. 2008) the HMIS Unit fails to preside over the new HIS, and it is only

through a compromise with other actors who were considered legitimate (and still maintain their legitimacy) in the previous system, the new system can be institutionalised and sustained.

I thus argue that, one of the possible barriers to a 'true' integration of HIS in Zanzibar is the organisation of the management structure around the new HIS. The HMIS Unit was given too much responsibilities without the necessary power to exercise those responsibilities in terms of human, financial and infrastructural resources as well as legal authority to, for example, push or at least persuade the lower level staff who do not abide to the HIS activities. The zonal administration has the authority to promote, demote or punish any staff within their zones. Programmes on the other hand, are resources sufficient, and hence by combining administrative authorities of the zonal offices and resources and reputation of the programmes, the HMIS Unit can attain power to overcome the hurdles to build its legitimacy to other HIS actors at the lower levels (district and health facility).

At the national level, the prevailing institutional differences between the old and the new signal an obvious challenge to the HIS integration exercise. The new management structure swerves the old established and very natural routines that programmes who, at the national level, are the principal data users, at least on its modest sense, to wait for the un-experienced, under-resourced and not well established HMIS Unit and which in principle has no power and authority to use data apart from preparing reports such as health bulletin, to provide them with the data collected from the district. The result is, as it has been discussed, untimely and under reporting to the programmes as well as data inconsistency; the worst case being programmes reverting to their old systems.

Overall, the HMIS Unit suffered legitimacy on the broad process of HIS integration, and so institutionalisation of the new HIS. This institutional reform was neither possible nor desirable, considering the nature of the healthcare service provision. In contrast the promoted institution of parallel reporting to HMIS Unit and programmes is intended to reverse the process to be more natural where data users (programmes) will have more responsibilities, such as timely quality checks and consequently this will help to improve the sense of ownership, which according to Zimmermann et al. (2008) will not only help to institutionalize the HIS, but also enjoy higher institutional stability, and also promote further expansion (Humes and Reinhard 2007).

6. REFERENCES

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