Evaluation of a Bottom-up Action Research Approach in a Centralised Setting: HISP in Cuba.

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Abstract

There has been a high rate of failure in the implementation of information systems in developing countries. Participative approaches have received a lot of attention as a way to ensure more appropriate systems with a greater rate of success. The authors of this paper spent 4 months working on designing and implementing a health information system as part of the Health Information System Program (HISP) in the Cuban Ministry of Health using this type of approach. This paper describes the experiences there. The HISP has proven to be a relatively successful information system in India and in several African countries, aiming at empowering local health management and improving information use at the local level. The primary contribution to the current literature on participative approaches is the lessons learned in trying to use this approach in a highly centralized setting. General implications for system development and collaboration in Cuba are also discussed.

Introduction

The benefits of designing information technology systems through participative approaches have received a lot of attention. This approach has been recognized to be especially beneficial when used in developing countries. This paper highlights some of the lessons learned from using this approach within the highly centralized setting of the Cuban Health Services. The paper also aims at providing insight into the Cuban healthcare system and the environment in which health information systems must be developed and implemented, a little explored issue in the current literature.

The paper will first give an introduction to the field of Health Information Systems (HIS) in developing countries, relevant theoretical aspects, and the Health Information System Program (HISP). Secondly, a description of relevant characteristics of Cuban society will be given in order to provide the reader context. The project work done in Cuba will then be covered. The paper will conclude with an evaluation of the approach used.

Health Information Systems

A Health Information System (HIS) can be defined as, "a set of tools and procedures that a health program uses to collect, process, transmit, and use data for monitoring, evaluation, and control" [1]. An HIS is one of the many tools that can be used to improve a healthcare system, but it cannot stand alone as a solution to all of a system's problems.

The 1978 World Health Organization (WHO) conference in Alma Ata, Kazakhstan, concluded that primary health care (PHC), essentially a decentralized system with a focus on preventative care, is the most suitable way to organize health services. The basic tenets are that health services should be offered and managed from small demographic and geographic areas to best achieve good communication with higher and lower levels, be close enough to communities to understand and act upon their problems, and be able to handle decentralization of resources and decision making. A clearly defined geographic area with a population of 30,000 to 500,000, often called a district, is considered to be an optimal size in regards to the previously mentioned targets.

Within this context, an HIS that captures and uses data at a local level is of the utmost importance. It can greatly assist in making appropriate healthcare policy at all levels within the type of decentralized system suggested by the WHO. To successfully achieve this, Amoono-Lartson et al. suggest, "bottom-up," instead of, "top-down," planning in order to correctly assess

the needs, resources, and opportunities at the community level [2]. In this way, health service planning can incorporate the viewpoints from the local level rather than solely the needs as seen at the national level. It is in drawing on these ideas that the project in Cuba was conceived.

Theoretical framework

In terms of the theoretical fields that the study seeks to develop, the focus is on user participation and action research. Theories concerning information collection are also pertinent due to the enormous amount of health data collected by the Cuban government.

Action Research

Action research (AR) is a method that was first explored during WW II. Within AR democracy and user participation are seen as key in achieving goals. Stakeholders participate actively together with researchers to create a democratic process in which everyone can contribute. AR researchers believe that there is great potential in allowing users to analyze their own situation and give their valuable knowledge and insight to the researchers. A core principle is democracy, as the aim is to democratize the research process through inclusion of local problem owners. The context and various aspects of a given problem are often best known by stakeholders, and combining their knowledge with researchers' knowledge often allows the implementation of the most appropriate method of addressing the problem. Under this approach knowledge flows in both directions.

Often stakeholders have lost their ability to objectively view their own situation and see possibilities for change. This however is not in contrast to the belief that stakeholders know their own situation best. A main contribution of the researcher can be to act as a friendly outsider [3] who can loosen up tensions between stakeholders and bring in a fresh viewpoint to assist them in moving from positions in which they may be stuck. As a, friendly outsider, another key contribution of the researcher can be in helping stakeholders communicate with each other.

Constraints of user-participation

Heeks, Mundy and Salazar [4] points out the fact that participative approaches have received the status of a, "magic bullet," that will always be beneficial in system development. In fact they are still beset with problems. User-participation techniques are, according to Heeks, unlikely to work well where:

- users lack information about participative techniques
- the objectives of senior staff is not to share power and the values of the organisation are authoritarian and hierarchical
- users lack the skill and confidence necessary to engage in participative processes
- the management style and organisational structure of the organisation are highly centralised.
- the organisation lacks the time and money to invest in participative approaches.

Information as Symbol

Feldman and March [5] suggest that organizations capture much more data than required to make informed decisions. The organizations often do not know exactly what information they need to make decisions, and request more information even after decisions are taken. Information gathering comes to be seen as a symbol on a good decision maker, even if there is not necessarily a connection between the amount of information gathered and the quality of the decision. The skills of the decision maker are regarded as a product of how much information he collects, and how early he can obtain fresh information.

HISP

The Health Information System Program (HISP) is a research and development project that is collaboration between the Universities of Western Cape (South Africa), Eduardo Mondlane (Mozambique), Oslo (Norway), Indian Institute of Management, Bangalore (India) and the Departments of Health in South Africa and Mozambique. It began as one of several projects to reform the health information system in South Africa after the fall of apartheid. As a result of its relative success, the software that was developed (DHIS) and an essential set of data elements became national standards in South Africa in 1999.

The District Health Information Software (DHIS) is a database tool for capturing data elements, that is, medical incidents and figures of managerial interest at district level and lower. It also has a wide range of options to submit, compare, and analyse this data. However, the software is flexible so that it can be used at any level desired.

The philosophy behind the project is to empower local management, and create the ability to analyze and use information locally. HISP has developed as a network aiming to use information technology to improve the health systems of developing countries. The project is funded completely through aid. The software is based on open source, and this enables the ever-larger network of countries using it to contribute in a meaningful way to the improvement of this non-profit alternative to health information systems. It has been translated into Portuguese and Spanish, and has been implemented to some extent in Mozambique, Malawi, Tanzania, India, Mongolia and Cuba, with several other countries showing interest, such as Angola, Brazil, the Dominican Republic and Guatemala.

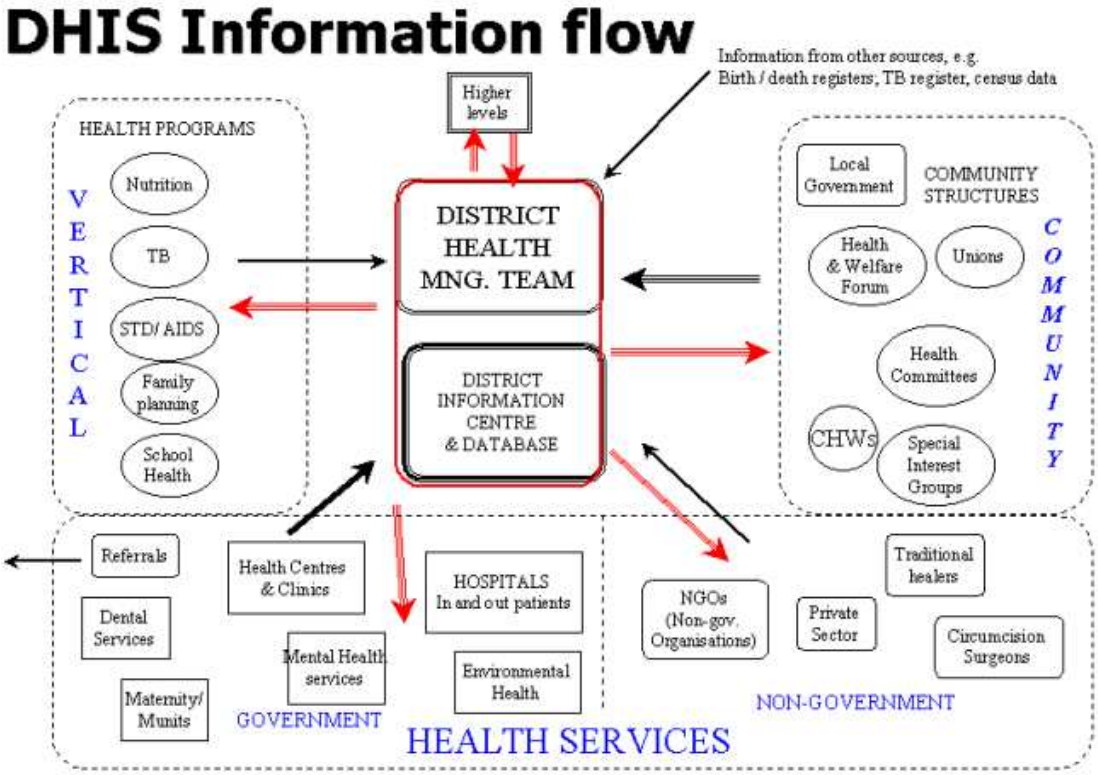

Figure 1 The information flow promoted by the HISP and the DHIS software. Information is used locally by a district health management team. The reality in many countries is information is often divided between many different organizations and departments instead of being analyzed as a whole at the district level.

The HISP focused on strengthening the health system at district level, as proposed by the Strategic Management Team on Health Information Systems in Western Cape [6]. HISP thus promotes the use of information at the local level for PHC. Raw data is collected from all relevant entities within a district, and thereafter the software enables easy use of indicators and analysis tools. Action can then be taken locally, on the basis of an evaluation of local data and knowledge. This is in stark contrast to how health information systems often work in developing countries. Data is collected and submitted to higher levels than the district. Often this results in the loss of the ability to evaluate information within the context of its origin, with variations that are significant at the local level becoming insignificant in national level evaluations.

Action Research and HISP

The processes are strongly influenced by the ideas of participation, following the Scandinavian tradition of action research [7] [8] [9]. In South Africa the friendly researcher role was combined with an informal mechanism for reporting bugs and requesting new functionality. The process was informal and based on improvisation, giving

anyone, regardless of position in the health hierarchy, full access to the development team [6].

As in the theory of AR, context sensitivity is crucial for HISP. One must take in consideration the specific context to where the system is developed or adapted to succeed. As discussed later in this paper, this is what we here will try to do after our experiences so far with Cuba.

As the HISP software is intended to be used at the district level it is of the utmost importance that the software is developed with collaboration at the district level. In Cuba, the researchers, together with another researcher involved in HISP since its beginning in South Africa, followed this path of local development. The senior researcher, also the tutor of the authors of this paper, had experience from starting up similar projects in many countries, most notably in South Africa, Mozambique, India and Mongolia.

The setting up of a database and the identification and implementation of an essential set of health data elements and indicators in Cuba was seen as a development process, even if no coding of software was needed. It was therefore planned to do system development with strong user participation. A bottom-up approach was followed, focusing on the Cuban equivalent of districts and provinces. Problem areas in each district were identified together with local staff, who also participated in the development of databases. Training took place locally and an effort was made at each pilot site over the span of several months to develop a culture of using the software in informed decision making.

Cuba

Cuba, like many developing nations, has a struggling economy, is unable to pay its debts, and is in need of significant improvements to infrastructure. However, Cuba stands apart from most developing countries in some key areas. It offers free, quality education to the University level, resulting in a society with a very high level technical knowledge and ability. It also offers free health care and has succeed in meeting health standards in terms of life expectancy and infant mortality that are comparable to countries such as the United States.

The idealism behind these unusual characteristics is a result of the goals of the Revolution which took place in 1959. The Cuban Revolution, led by Fidel Castro, overthrew the last in a series of inefficient and corrupt dictators. Castro and his followers nationalized land and industry, much to the chagrin of American investors and wealthy Cubans. This resulted in the US gradually cutting sugar quotas, which segued into the strict US embargo against Cuba still in effect today.

With the help of Soviet technical assistance and subsidises, the country developed its industry, agriculture, health, and education systems during the 60's, 70's and 80's. The fall of the USSR created drastic strain on every aspect of the Cuban system as 5 billion dollars a year in Russian subsidies disappeared.

Today the economy is still centrally planned, with some private enterprise allowed in recent years. Almost total government ownership gives the government the ability to spend all the country's assets in whatever manner desired. While the government is theoretically a democracy, no opposition is tolerated. The political system became somewhat less stable after the fall of the Soviet Union, as hardship in everyday life increased. The US embargo, as well as external and internal dissent, threatens the current political system.

The embargo has had severe effects on the Cuban economy. It effectively closes all markets for Cuban exports such as sugar, citrus, coffee, oil, and minerals. The import of goods, including foodstuffs, medicines, and technical equipment is also almost impossible. The US Helms-Burton Act of 1996 essentially keeps Cuba from being able to participate in international trade. As such, the main industry is tourism, accounting for a substantial part of GDP, and the government is working on developing it further. Unfortunately, the legal system makes foreign investment risky and generally unprofitable. Foreign investments that exist are mostly related to tourism and mineral extraction.

Unfortunately, it seems that the government pumps significant funds into some sectors while ignoring others almost completely. They have made the remarkable achievement of supplying all schools, even those with only one pupil, with computers. Conversely, the health statistical branch in which the HISP takes place only has computers

in offices at the national and provincial level, 16 offices in total. Programs that are not seen as neatly fitting into the centrally planned strategy of economic development are often down-prioritized, regardless of their actual importance.

General implications for IT projects

Issues related to centralism and control in the Cuban system are of central importance and will be discussed later. First, it is relevant to point out some other factors specific to Cuba from the system development perspective. Computers in Cuba are scarce and those that do exist are very outdated. The humidity and frequent blackouts are also detrimental. The lack of computers, air-conditioning, and sufficient power supply are directly caused by the economic situation.

The US embargo unarguably succeeds in its goal "to isolate the Cuban economy and deprive it of U.S. dollars" [10], and this has had a direct effect on ICT and system development. All software and hardware from the US, and foreign branches or partners of US companies, is illegal to export to Cuba. This applies to Microsoft products as well as freeware. Figure 2 shows the message we got when trying to download Java Development Kit, freely available to everyone not in certain countries, as Iran, North Korea and Cuba.

Even though youth grow up with computers in schools, the economic situation is a substantial barrier to true computer literacy. Complete computer illiteracy is high among adults. Lack of resources such as paper and ink cartridges mean that printing as known in many societies is unheard of.

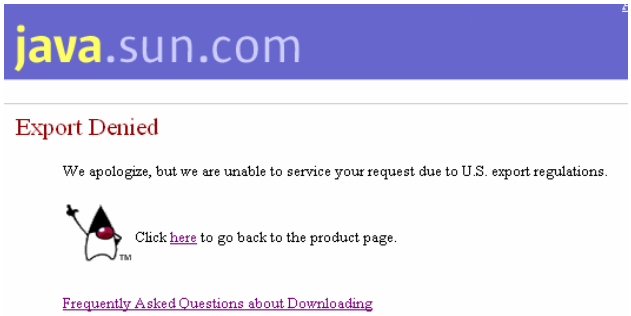

Figure 2: A snapshot of the java homepage, showing how free, leading technology is unavailable to Cubans. "We apologize, but we are unable to service your request due to U.S. export regulations."

The internet is also highly regulated, meaning that only high officials and some schools have access through proxy servers requiring access for international communication. Even approved national servers can be hard to reach, especially in rural areas. Hotels and "telephone kiosk's" offer internet connection on 56 k modems. It is unclear if this is open for Cubans too, since hotels are usually a tourist only area. Regardless, few Cubans can afford to pay the common rate of 5 US dollars for half an hour connection, equivalent to half a month's wage.

The Cuban Health System

Despite the many problems in Cuba, the health system is far superior to countries across the developing world. One of the goals of the Revolution was to improve the health system, and to offer it to all people. Over the years, clinics and hospitals were built, and medical staff has been educated. As a result of these efforts, Cuba has situated itself as one of the best countries in the world regarding health services. This has led to excellent infant mortality rates and life expectancy and the eradication of many illnesses. The number of physicians per 100 000 inhabitants was 530 in 1997 [11], in contrast to 413 in Norway and 279 in the US. The figures for nurses and dentists are not so overwhelming, but far better than countries in a comparable economic situation. The main death causes in Cuba are hart disease, stroke and cancer, as in a developed country. As the Cuban says, "We live like the poor, but die like the rich".

Although yellow fever was eliminated as early as 1901, the various pre-revolutionary governments did little to keep up the work. After the revolution however, Cuba has eradicated polio (1963), malaria (1968), diphtheria (1971), measles and mumps (1997) and leprosy (1998). Other diseases which

have been eradicated include cholera, bubonic plague and rubella. Cuba has a strong biotechnical research environment, and holds 400 patents in this field. Cuba is also taking the treat of HIV seriously. Everyone infected are given treatment and education at special sanatoriums, while receiving full salary, where they are free to stay after the initial period.

Cuba has no private health institutions, and is organised as shown in figure 3. The health minister has several sub-ministers who run the different branches of the health system. Except from the national and provincial hospitals and some clinics catering to tourists for dollars, each unit is administered from the Municipal office. A municipality is the Cuban counterpart of the WHO-defined health district. The basic working group and the family doctor is an interesting aspect of the system. The basic working groups consist of 10-30 family doctors, where each doctor typically serves a small community or a neighbourhood. Considering the scarce resources available, this system is quite impressive.

Information use in the Health Services

The information flow follows a hierarchical structure in parallel to the health administrative units. This system is governed by Dirrecion Nacional de Estadisticas, DNE, in Havana. To administer this parallel system of statistics, there are many thousand statisticians employed, typically 4-7 at a policlinic, which there are 440 of, and also at other health units and at each administrative level. The information system is very extensive, with a total of 67 subsystems with 2027 variables [12]. These subsystems and variables are reported with different intervals; daily (e.g. infant mortality rate, all the way to the national level), weekly, monthly (e.g. basic health care data from policlinic to municipality), and quarterly (e.g. hospital data from province to national level). The family doctors report every day to the policlinic, together with the specialists serving there. From the policlinic, the statistical office makes reports to the director of the policlinic and for the Health Area (policlinic with its working groups and specialists) as a whole. This takes place every month. The municipality office of statistics also get data from hospital, home for pregnant, home for elderly, dental clinics etc. in that municipality. The municipality offices of statistics make reports to the administration at the municipality level, and also report all the data to the provincial statistical offices. At that point the same procedure is repeated before the data finally reaches DNE.

The health system is officially decentralized, and each level is in fact administered by the local government. But the information use is not as decentralized as the structure implies. It was experienced that most statisticians at policlinic and municipal level have little or no knowledge of what is “good” or “bad” data, of what is useful or useless. The programs used are made at national level, and this follows the soviet tradition of a strong centrally oriented administration. It was said at the national office, people farther down in the system, even directors, don’t have the knowledge or power to choose appropriate data. Even if data can be requested by directors of hospitals and clinics from their respective statistical offices, it was found that most data is collected because it was requested from Havana.

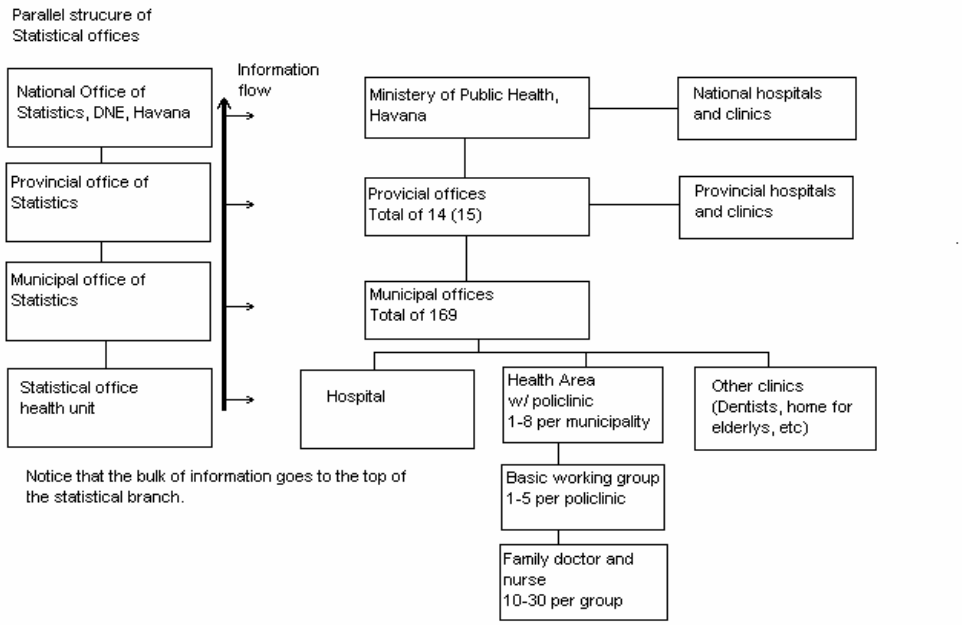

Figure 3. The chart shows the Cuban health structure. The parallel branch of Statistics is where the HISP project is rooted.

The extensive amount of variables collected is apparently used mainly to document what is done, and not what needs to be done. Too much data is collected, and for the wrong reason. An example is the Cuban obsession with the Infant Mortality Rate, reported daily all the way to national level. The reporting of this single data element is a ceremony obviously not only for practical reasons, there is no way to meaningfully analyse trends on this on a day to day basis at any level, much less in a single hospital with less than five incidents in a year.

Infant mortality rate is also a WHO indicator of great international interest, used to determine the status of the country's health system. Cuba has a long history of promoting its achievements in health care and it could look like some information gathering has as its goal to provide political leaders, both nationally and internationally with the right figures, and create an impression that the information is used in decisions and shaping politics. Information gathering is thus a symbol on the quality of the health services' ability to gather information for decisions. However, this leads to the organization gathering more information, and more often, than can be justified according to decision theory terms. The strong information focus in Cuba can thus be seen as a symbol of control for political leaders, and for good informed decision making for the international community. The current use of information has a descriptive focus, it is used to document the situation, rather than to change it. Some major changes occurred in the ministry of health due to this. As described later, there was some change of ministers, among other things, to change the way information was used.

The new health minister has announced a shift to a more preventive health information system, where information should be used locally to prevent, rather than document, health issues. As we will see later, this did not automatically fit well with the theory of HISP.

Summary of HISP project in Cuba

In October 2001 Cuban delegates visited Norway in search of possible collaboration projects and they were presented the HISP program at the University of Oslo. They found the program very interesting, and soon a future collaboration between Ministerio de Salud Pública (MINSAP), the Cuban Ministry of Public Health, and the University of Oslo was planned. In June 2002 a senior researcher from Oslo and the two authors went to Cuba to start the Cuban HISP project. The Cuban institution involved in the project is the Dirección Nacional de Estadísticas (DNE), the national statistics office at

the MINSAP. The national director of health statistics is the leading authority at the DNE, and the Cuban responsible for the collaboration project. A Norwegian donation of 11 computers in May 2002 made it possible to realize the project, and later another 60 computers have been donated to scale up the development process.

First round of fieldwork

In June 2002 field studies were conducted in the two appointed pilot provinces, Matanzas and Sanctí Spíritus, to gain knowledge about information flow and working routines at the different levels in the Cuban health hierarchy. Based on these fieldtrips and discussions at the national level a database system was designed to use as a prototype in the pilot places. Two provincial statistical health offices, six municipal offices, two polyclinics and a municipal hospital were chosen as pilot sites within the two provinces. A small essential dataset of 35 elements were chosen for easy implementation and to get some basic data for evaluation of the project. After designing the prototype at the DNE in Havana, the Norwegian senior researcher signed a terms of reference paper with the DNE, MINSAP and Ministerio para la Inversión Extranjera y la Colaboración Económica (MINVEC), the department for Foreign Investment and Economic Collaboration. When we returned to Norway at the end of June 2002 the Cuban HIS project was official and plans were made to continue the project with Norwegian collaboration for a minimum of 1 ½ years.

The July revolution

In June 2002 it was planned with the DNE that the two authors would return in September to work in the project for three months focusing on implementation of the system in the two provinces. It was also discussed that the senior researcher would return in November and work in Cuba for 3-4 months as project coordinator. During July 2002 there was a drastic political change in the MINSAP, and the health minister and most of his vice-ministers were fired and replaced. New visions and strategies on how to improve the health system were developed, and part of this new strategy was to reduce foreign investments and collaborations. The new minister wanted to shut down the project, but the National Director of Statistics managed to keep it alive. Still, this political change affected the way forward for the HISP project with new restrictions on the extension on pilot sites, restricted involvement of Norwegian project coordinator and a general down prioritization of the project. After some intensive discussions by e-mail between the two collaboration sides in August 2002, the Cubans decided that the senior researcher was not allowed to stay in Cuba for more then 2 weeks at a time, in contrast to the planned stay of 3-4 months. The two authors were allowed to stay for the planned three months, and this differentiation between master students and an authority-person like the researcher with lots of international experience could indicate a fear and skepticism of foreign involvement, a professor is obviously a bigger risk to the Cuban system than two master students when it comes to power to change and interfere.

Second round of fieldwork

In September the two authors started the implementation process, together with training of staff at all levels. Local workers at health units, at the municipal offices and the provincial offices were encouraged to participate in the design process to make the system more tailored for each place and to secure local ownership to the system. In this period we had a strong focus on local implementation and the national level in Havana was not much involved in the process. In November 2002 the DNE complained that they had lost control of the development process, they wanted a more centralized approach and they especially disliked that local workers were getting more skilled in the system than themselves. After discussions at the DNE with the National Director of Statistics and the Norwegian senior researcher, there was a shift in the development strategy towards a more centralized approach. DNE in Havana froze the local development processes in the two provinces and the focus was now 100% on developing a database system that suited the needs of the top two levels in the hierarchy, the national and the provincial. The DNE stressed the need for more knowledge transfer at the national level, and we started to design this database at the DNE with participation of the national staff.

Dissolving the project

In December 2002 the two authors finished their project period and another Norwegian master student arrived in Cuba to continue the

project process. A national hospital database was developed during the first months of 2003, a database tailored for the national and provincial levels. In April 2002, the DNE decided to roll out the hospital database to all 14 provincial offices, equipping each office with two of the donated computers. The Norwegian student worked in Cuba until June 2002, and by that time the Cuban interest for DHIS was totally gone. Central planners had decided to develop entirely new web-based software, in Cuba, with the latest technology available. How this will be done with the scarce resources and the centralistic nature of Cuba will be very interesting.

Evaluation of the approach

The research and development approach followed by the Norwegian participants in the HISP project was focused on a too low level. We went out to the municipal and provincial offices after a short period establishing the project in Havana, and in the second period we visited Cuba, we concentrated most of out time out in the field. This lead to several implications;

Firstly, Cuba is strongly centralized. The information use at the lower levels in the health system is scarce, and most data are reported up to the next level. We were told at the national level at even if the structure is decentralised, staff at the provinces and municipalities don't know what data is good or not, or have any skills in determining useful new elements to collect. We found that this is partly right. In the statistical branch, there was no culture of information use, and when asked of what elements and indicators they thought were important and useful, they would always point to the centrally decided information subsystems, however unable to explain why they were important except that Havana wanted them. This is a legacy of 40 years of strong centrally planning, and it will take a long time to change this. But we also found that some data were collected in addition of the official reports. They called this "datos negros", black data. They collected this at some health units to cater their own needs. This is a good example of local initiative. As in a hierarchy of local universalities [6] [13], these data elements make up their local data set together with data elements in the provincial, national, and international systems. These local elements are important to keep the standardized systems as small as possible. But the use of local elements was not encouraged by the above levels, and we did not find them in all pilot sites.

Secondly, staff down the hierarchy, especially at municipal and health unit level, didn't know what the project was about, what the goals were, and why we were working with them. They were not told from above, and they did not ask. As long as we were there, we cold tell them and inform them, but when working in Havana or another province, they project would usually stop. The people we worked with are used to get orders from above.

Thirdly, the different parallel vertical structures in the health system are strong. This means that it is very difficult to cooperate across structures. Working within the statistical department meant that it was very difficult to communicate with the information technology department. When dealing with the parallel vertical structures, it is imperative to move from the top down and to gain political support behind the interactions with the different actors in the health system. When working in the provinces and municipalities it was hard to arrange meetings with other important groups such as the strategic planning group or the administration. These problems tend to ease farther down in the hierarchy as well as geographically farther from Havana. This freedom of interaction take the shape of a mountain as shown in figure 4, where the foot of the mountain is broad and allow interaction with other departments, while closer to the top and Havana this interaction was harder. Also physically distance from Havana is important, since communication and transportation problems prevent close supervision far from the capital and highways.

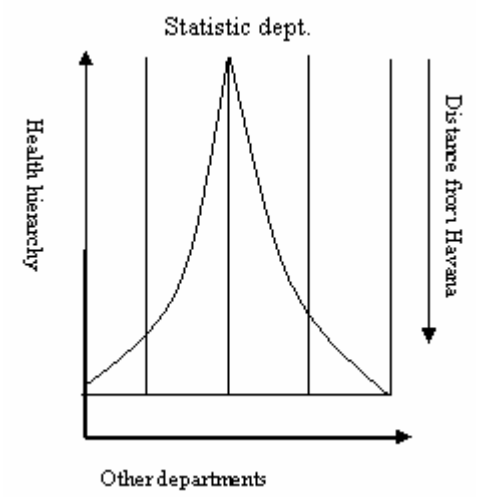

Figure 4 shows expanding possibilities for cross-structural collaboration farther from Havana and at local level. Policlinics in rural areas tend to be more self-governed and offer better possibilities for participative research and development between departments.

The main contact from the start was the Director of Statistics. He had great responsibility for the project at all levels and was accountable for his handling of the project to those above him. As mentioned earlier, foreign projects cause some degree of suspicion in Cuban political life, and this can be understood in light of their peculiar history. The director was personally responsible for the actions of the authors of this paper and his trust in them was evidenced by allowing them to work fairly independently outside of Havana.

In the summer of 2002 the Minister was replaced and this changed things considerably. The way politics work in Cuba creates a culture of fear. Ministers can be replaced instantly, together with all their sub-ministers. The Director of Statistics was now accountable to a new Minister of Health and allowing foreigners too much freedom in their work in the health system could have compromised his position in the eyes of the new Minister. This resulted in a reduction of freedom in working at the lower levels.

It is important to remember here that the health system is Cuba's pride. It is the child of the revolution, and the Cubans are proud of competing with the developed countries in regards of health service achievement. And foreign projects working in this health system at a low level outside Havana's control, even without creating much-needed hard currency, is a potential dangerous situation for the person in charge. He needs to have full control over the situation, and be updated on the latest news. This can be difficult enough working in the rural areas in Cuba. The best way to control that nothing "dangerous" happens, is to limit the possibilities the researchers had to interfere in the normal life of the health units. People were told not to spend time on the project, and it proved impossible to meet directors outside the statistical department. As this is the reality in Cuba, the bottom-up approach followed will not succeed without political support at the highest level first.

All information systems, paper based or computerized, are developed in Havana. The systems are developed in the DNE, and some software is developed centrally in a special department of the ministry of health. This is the way it has been done the last 40 years, and participative development theory was unknown in the statistical department. The ideas and benefits of such an approach were not easily understood by the Cubans.

Benefits of a participative bottom-up approach

The approach yielded information which could not have been obtained in any other way. And this is the core of the methods. The focus on participation with stakeholders at local level, the people who will use the system, will create the necessary knowledge to the make the system work, and work right. There were many discrepancies between the database first set up in Havana and the reality out in the provinces. For example, names in the national database could be like GBT 1, GBT 2 and GBT 3 for three basic working groups, but in the municipality and policlinic where the data for these groups were collected, the names would be GBT North GBT South and GBT Central. These smaller units are never used in national analysis as the DNE use data aggregated at a much higher level, but locally they have developed more intuitive names for all these units.

We also found that data elements included in the essential dataset were sometimes understood differently from place to place, and they did not know what figures to put in the right place. This would have been realized much later using a top-down approach. The approach used revealed how things was at the local level, and to a certain degree local staff were involved in identifying and addressing problems and opportunities. Some very enthusiastic people, at all levels, shared the vision

of a computerized system which eased the local use of information. From the national level it was made understood that they did not exist! Some people really had knowledge about what data was good or not, and wanted to use it. These people contributed to the project both in terms of daily organization of the researcher's stay and through discussion about different relevant issues, and their participation led to a tremendous amount of ideas and knowledge. They staff who have now worked on this project have got a feeling of ownership to the HISP. This is important to acquire sustainability at each site. By working as far down as the health units, tailored solutions could be made at each level. This was especially important where the enthusiastic people worked, where more than the initial training could be done and the software could be utilized to their own needs. This cultivation is an important aspect both to get good standardization of data elements and promote local use of data and development of local universalities.

The findings of the study fit well with the writings of Heeks, Mundy & Salazar [4]. As recalled, participative approaches are less likely to succeed if;

- users lack information about participative techniques

Some people at local level in the statistical department had even little knowledge about statistics; they just aggregated and forwarded their daily numbers.

- the objectives of senior staff is not to share power and the values of the organisation are authoritarian and hierarchical

The senior staff in Cuba is afraid of loosing power and control. Even if they officially divert power down the system, they need control to be able to document their work and secure their job.

- users lack the skill and confidence necessary to engage in participative processes

Many people in Cuba are greatly skilled and have great confidence, but are unable to participate due to restrictions from their manager.

- the management style and organisational structure of the organisation are highly centralised.

This is true in Cuba. But it was less obvious the farther away from Havana. Poor transportation and infrastructure creates decentralised units where people have to take decisions themselves. Participative approaches in these nodes tend to be very fruitful

- the organisation lacks the time and money to invest in participative approaches.

There were generally far too many people working in statistics to keep them occupied with work. But lack of time was the explanation why collaboration with other departments was unfeasible.

Other countries in the HISP network have had similar approaches, but with different results. In Tanzania and Malawi staff at all levels could agree on decentralizing power, but the administrative structure was not strong enough to put it into action when HISP researchers were not present. In India the bottom-up process met problems since a superior level don't see the benefits of the system before every node under it uses it. And in India there are so many hierarchical levels that this was a major problem. This was also a problem in Cuba, because the project was not allowed to equip all municipalities in one province with computers. The provincial director saw the potential and wanted full coverage of his province, but was unable to convince the national office without the output from the software on the whole province. It was a "Catch 22". [1]

Conclusion

In light of the specific situation in Cuba it is necessary to adjust the approach of the HISP. Nevertheless, following the, "Cuban way," proposed, is not a possibility within the time frame or the philosophy of the HISP. The Cuban approach is to complete systems development in Havana and then impose them at the provincial and municipal level. The study also shows that

[1] Catch 22 is a military term from the novel with the same name by Joseph Heller. In the book, you can only go home from The War if you are crazy, but saying you are crazy proves you are sane and trying to get home, hence locking the situation to keep you in the war.

participative development is likely to be very fruitful at health units not often supervised from Havana. This paper proposes a middle ground solution between the HISP bottom-up approach and the Cuban top-down approach. The last phase of the project was completed in this manner to try and accommodate the concerns about the project in Havana.

A database using the DHIS has been implemented within the complete hospital system, Movimiento Hospitalario (MH). This system was originally developed in Havana, and this centralized approach is in contrast to the HISP philosophy. This approach was taken due to the difficulties in travelling to each municipal and provincial office in the pilot areas. This made it impossible to implement a database based on the strong participation of local staff. This was an opportunity for both the Norwegian researchers and the Cubans to cooperate and implement the DHIS in some offices for use.

The MH consists of all elements for hospitals, which are reported quarterly from each province office to Havana in a FoxPro database. However, this database offers limited opportunities for easy manipulation and analysis in comparison to the DHIS. The goals of HISP and the Cuban Ministry of Health are not different, but the HISP approach argued for was not possible or suitable in the Cuban political, economical and cultural setting. The centralised approach of implementing systems from the top-down has to be taken into consideration when planning development approaches in Cuba.

The experience in Cuba also shows that the participatory design needs to be undertaken with some scepticism. In Cuba, people are used to agreeing with people in positions of power and are not used to opposing official views. Within this type of culture, a participatory approach is difficult to undertake. Rohitratana [14] and Walsham [15] discuss a project in Thailand, where system users did not want to confront the leadership and say that the system was not appropriate in their company because they felt that to do so was too risky. While the cultural context of Thailand and Cuba is very different, the Thailand example represents a similar case where a respect for the hierarchy and fear of losing one's position is an impediment to a participatory approach. Local managers are afraid of confronting their bosses, which in turn are afraid of confronting the next level. These types of circumstances do not make a participatory approach entirely impossible. They do however necessitate that the approach is undertaken in a diplomatic manner with actors at all levels of the hierarchy, especially those at the top. In the Cuban case, the political context was a very important issue and it was necessary to keep it in mind during all discussions and meetings in order to insure a diplomatic approach in the implementation of the HISP.

The primary goal of the HISP is to offer a decentralized health information system. This is also the goal of the new Minister of Health. He wants to change the focus from the collection of data to the use of data for the targeting of preventative health care. There seems to be a common vision, but a primary impediment is the desire to keep things centralized in Havana. From the perspective of the HISP project, the best way to achieve these goals is through the strong participation of local medical, statistical, and administrative staff. The conclusion of this paper is that an HIS project in Cuba must combine the Cuban tradition of spreading finished systems from Havana with the development methods advocated by the HISP network. In practice, this means a top-down approach in implementations combined with a design approach that combines input from all levels within the health system hierarchy. The project experience in Cuba reaffirmed the belief that there is often knowledge and understanding at the local level that does not exist at the national level. Especially in light of the highly centralized Cuban system it is of the utmost importance to find an approach that allows HISP to be viable without eliminating local participation in the design process.

References

[1] EQUITY project 2000
www.equityproject.co.za

[2] Amonoo-Lartsen R, Ebrahim GJ, Lovel HJ, Ranken, JP "District Health Care. Challenges for Planning, Organisation and Evaluation in Developing Countries", Macmillian Press, London, 1984, p 14

[3] Greenwood, Davydd J. & Levin, Morten "Introduction to Action Research: Social Research for social change" SAGE publications 1998
ISBN 0-7619-1675-X

[4] Heeks, Richard & Mundy, David & Salazar, Angel "Why Health Care Information Systems Succeed or Fail"

Information Systems for Public Sector Management, Working Paper nr. 9, University of Manchester, 1999
ISBN: 1-90251825X

[5] Feldman, Martha and March, James (1981) "Information in Organizations as Signal and Symbol" in
Administrative Science Quarterly 26
Cornell University Press, 1981, pp 171-186
ISBN: ISSN: 0001-8392

[6] Braa, Jørn & Hedberg, Calle "The Struggle for District-based Health Information Systems in South Africa"
The Information Society 18(2) 2001

[7] Braa, Jørn, Monteiro, Eric & Sahay, Sundeep "Networks of action: sustainable health information systems across developing countries. Submission for special issue on action research, MISQ due Sept. 2002

[8] Bansler, Jørgen "System Development Research in Scandinavia: Three Theoretical Schools" in
Scandinavian Journal of Information Systems
University of Aalborg, 1, 1989 p. 3-20
ISBN: ISSN: 0905-0167

[9] Ehn, Pelle "Ch. 4: Scandinavian Design: On Participation and Skill", in (eds.) Schuler, Douglas & Namioka, Aki
"Participatory Design: Principles and Practise",
Lawrence Erlbaum, 1993, p. 41-77
ISBN 0-8058-0952-X

[10] Office of Foreign Assets Control, "What You Need To Know About The U.S. Embargo"
U.S. Department of the Treasury, Washington DC, 2001

[11] WHO, World Health Organization
www.who.org

[12] Ministerio de Salud Pública, "La Salud Pública en Cuba: Hechos y Cifras", La Habana, Republica de Cuba, 1999

[13] Timmermans S, Berg M "Standardisation in action: Achieving Universalism and Localisation in Medical Protocols" "
Social Studies of Science", vol. 27,1997, p. 273-305

[14] Rohitratana, K, "The Role of Thai Values in Managing Information Systems: A Case Study of Implementing an MRP System",
in Avgerou C. and Walsham, G., eds, "Information Technology in Context: Implementing Systems in the Developing world"
Ashgate Publishing, Aldershot, 2000

[15] Walsham, G. Ch. 8 "Culture as Context"
in "Making a World of Difference: IT in a Global Context" John Wiley & Sons Ltd, 2001
ISBN 0-471877