

Introduction

The effective management and use of health information is increasingly being recognised as a strategic resource for health reform initiatives in developing countries with key focus on decentralisation of service management and health delivery systems, integration of disparate health programmes, and most significantly, building the culture of evidence based decision making. This heightening recognition is contributing to bring in new institutional and technological actors into the arena of Health Information Systems (HIS), changing dramatically this landscape with every passing day. At the level of individual facilities, the degree of sophistication of systems are changing, for example district hospitals are attempting to move from manual-paper based systems and adopt electronic medical record systems as they seek to provide more comprehensive and continual care to their patients. Similarly, district health systems are trying to adopt diverse systems such as human resources that can monitor their workforce more effectively including individual service records, recruitments, trainings, and planning. For purposes of closer control, many health systems are attempting to use biometrics based applications to ensure their staff are available in the facilities when they are supposed to. Similarly, there are other systems mushrooming for managing drugs, logistics, procurement and other line areas. The supporting infrastructure for HIS are rapidly changing with the introduction of servers and cloud computing, use of mobile devices, and the combination of various media to cater to the uneven environments found in developing countries, where largely paper still dominates.

A definite trend in the changing landscape of HIS is the demand for more integrated and also specific and granular information. No longer are countries concerned only with standalone routine HIS dealing with aggregate statistics for purposes of upward reporting, but a whole range of diverse information including cross-cutting indicators taking inputs from multiple systems. The need to monitor Millennium Development Goals (MDGs), for example, requires such cross-cutting information. This entails integration of different types of systems (e.g. patient and facility based data), health programmes and their respective information systems (such as HIV and ANC programmes) which are being made possible by the use of technologies of data warehousing with powerful Business Intelligence (BI) capabilities such as mapping, and a stronger national and global mandate towards integration. The introduction of mobile technologies which enable data reporting from remote outreach areas previously not accessible for computerisation, and cloud computing which allows for a single central server based deployment for a province or a nation, are redefining both the demand and supply for integrated information, including of reporting practices, needs for capacity development, and also the cost-effectiveness of HIS deployments.

This book is an attempt to make sense of this changing landscape, and to present our perspective on IHAs, how they are designed, operationalised and used. This represents our efforts to abstract from more than 15 years of experience of active engagement in research, teaching and attempting to design, develop and implement HIS in more than 20 countries across the developing world. A common learning from these experiences has been that computer based HIS are complex, for both technical-institutional reasons, and have delivered far less than what promise and potential that has been attributed to them. While computerisation is arguably a necessary condition for strengthening management processes around information, their use does not naturally make it sufficient for making improvements in the HIS itself, and with it the basis they provide to making health services delivery improvements. This book attempts to try and build the bridge between HIS design and development and its impact on use, which arguably can help to enhance achievement of the untapped potential of HIS, especially in light of the changing landscape and arena of HIS.

Through various empirical examples in which we, the authors of this book, have been engaged in across the globe within the framework of the Health Information Systems Programme (HISP) research and development network, along with their various friends and colleagues, we attempt to sketch out the changing nature of the landscape of HIS in the developing world and describe the manner in which technology has been and can be harnessed to realise the vision(s) of health reforms. A key challenge we focus on is “how can systems can speak to each other – both technologically and institutionally” – in order to provide “power to the users” to use information to enable health systems improvements. While the technological and institutional domains are inextricably intertwined, they are most often been treated as independent islands, with adverse consequences. Without the institutional buy-in, even the best technological solutions for integration will not work on the ground, which has been the reason why the benefits of huge amounts of investment have gone unrealised. Integration requires a system of practically working and accepted standards for sharing data and their interoperability, and international agencies like the World Health Organisation (WHO) and various national governments are in the process of developing standards and frameworks. Making them work in practice is a much larger challenge than their design and development. Another key aim of this book is to put in perspective the various strategies being adopted towards integration and standardisation, approaches towards making them practically work on the ground, and how the information being generated can be effectively used.

While technological systems proliferate at a rapid rate, the institutional framework of most health systems lag far behind in their relevant utilisation, with adverse implications on the use of the information generated for supporting action aimed at making improvements in health care delivery. Why this is the case? The technical systems are not public health friendly enough, and thus not amenable to be used by the not so computer savvy health programme managers for their local purposes. The entire institutional culture of the health system which has historically been geared towards supporting a centralised system of upward reporting requires a radical reconfiguration where the local use of information is not resisted but also actively supported. This requires a mindset and cultural change and the building of trust and capacity, requiring years and not months to achieve. How to approach this complex socio-technical challenge of maturing use of information directed towards making health systems improvements is another key aim of this book.

Given this brief preview of some of the burning contemporary issues surrounding HIS in the context of the developing world, we have developed a framework of this book which is divided in three parts:

Part I – Good design – Our worldview on architecting

Part II – Implementing good design: Practical systems development

Part III – Maturing use: Impact of health information architectures

While the first part is concerned with presenting our *world view on the design* of integrated health information architectures (which we label IHIA) including the different components and principles it is constituted off (such as standards and principles of scaling), the second part deals with the *process* aspect, including systems development and capacity building, giving insights into how good design can be operationalized in practice. The third part of the book is concerned with the *impact* of making HIAs work on the ground – of how it is taken up by users through a process of maturing of capacity and information culture to make improvements in the HIS and its linkages with the policy domain along with practical impacts in health services delivery. Feedback from the use domain will go into making improvements in both domains of design and its operationalisation. In a simple way, this illustrates our systems thinking in the structuring of this book.

While the details of the chapters are provided at the introduction of the three parts of the book, we emphasise here that each chapter has largely a distinctly action focus, as also explicitly advocated by the verbs used designing, implementing and maturing. The aim thus is to try and challenge readers to reflect on how the ideas and approaches expressed in the different chapters can be made to practically work. A key medium to do this is the use of case studies and examples, most of which in we ourselves have been engaged in within the HISP framework. These examples are intertwined with concepts – explicitly and sometimes not so explicitly – so that there is a vehicle provided for the readers to try and generalise the empirical experiences to other settings and contexts.

Potentially, we believe this book would be useful to different groups of readers. These include:

1. Policy makers and managers in countries that are engaged in deploying HIS to support their health systems reform processes.
2. Managers of international aid agencies that are supporting the deployment of health information systems in different countries.
3. Technologists involved in the design and development of architectures, related to public health domain specifically, but information systems more broadly.
4. District level managers – responsible for data systems and also for health programmes – who are engaged in making HIS more relevant and useful for supporting their everyday work.
5. Users of HIS, including field nurses, doctors, administrators and policy makers.
6. Masters level and Doctoral students who are pursuing graduate level studies in public health informatics.

