

Evaluation of HMIS

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What is HIS evaluation

HIS Evaluation: Decisive assessment of defined objects, based on a set of criteria to solve a defined problem

The act of measuring or attributes of a HIS (in planning, development, implementation or operation), the results of which informs a decision to be made about the system in a given context

Three key issues: measuring, attributes of HIS, decision making

HIS evaluation concerns technological, organizational & human issues around the HIS:

Why: The purpose, or the defined problem we want to solve

Who (for whom the evaluation is done- developer, user, patient, purchaser)

When: (4 phases of pre, during and post implementation, routine operation)

- four phases of preliminary, validity, functionality and impact

- formative – to improve system under development or implementation

- summative – to evaluate system in operation, overall effectiveness

What: (technological, organization, human dimensions and their interaction)

How: (objectivist/subjectivist, objectivist limited in understanding the why)

Some purposes of HIS evaluation

Broadly, two types of frameworks

- Cost-benefit and impact analysis

- Impact and performance analysis

- Goals based analysis

- Development impact analysis

More micro level aims

- Improving service delivery outcomes, including clinical performance

- To understand system performance

- To improve the quality of care and its costs

- Determine the safety and effectiveness of the HIS

- Investigate failures and learn from past mistakes

- Improve methods and techniques

Cost-benefit analysis

Mostly quantitative

Though elements of qualitative also used

Popular method- Report card methodology

Developmental impact analysis

Based upon Amartya Sen's "Development as freedom" – places emphasis on human agency, rather than on institutional and structural conditions

Development is about enhancing the capabilities of individuals to make the choices they value

Development then is about removing the "unfreedoms" to achieving the potential of our individual capabilities

Sen identifies 5 types of freedoms:

Social

Political

Economic

Security

Transparency

Evaluation focused on local capacity

Evaluation focus:

1. Does the system contribute to reducing the disparities and inequalities between individual and groups?
2. Does the system foster capacity building and information systems skills amongst user groups, especially those marginalized?
3. Does the system increase the possibilities of enabling local customizations and content, that is responsive to local needs and supports local traditions (eg language)?
4. Does the system facilitate interaction and collaboration between different levels: user-community; medical doctors-nurses; district administrators-medical fraternity; international aid agencies-ministry officials etc?

Evaluation focused on NRHM goals

Broadly, NRHM seeks to make architectural corrections in the Indian Public Health System based on a “health systems framework” as contrasted with a disease or programme specific approach.

Criteria to evaluate HIS reforms within the framework of the NRHM agenda:

1. Have systems been decentralized? And Have the decentralization of the HIS contributed to a broader decentralization of decision making processes?
2. Have systems been better integrated (intra health and intra sector)? Have the integration of the HIS contributed to broader process of integration of the various programmes under NRHM?
3. Has the implementation of the HIS contributed to more effective evidence based decision making? And has this contributed to more effective health outcomes?

Software Evaluation

Any software can be evaluated with respect to the following criterion

- Performance of the software
- Usability of the software
- Security of the software
- Functionality of the software

Performance Evaluation

- Understand the behavior of the application under a specific expected load.
- Understand the upper limits of the capacity within the application landscape. (i.e. response of the application and will the application perform sufficiently if the current load goes well above the expected maximum).
- Determine if the application can sustain the continuous expected load.
- Spike the number of concurrent users to determine whether performance will suffer, will the application fail, or will it be able to handle dramatic changes in load.

Usability Evaluation

ISO defines usability as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use."

- Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design?
- Efficiency: Once users have learned the design, how quickly can they perform tasks?
- Memorability: When users return to the design after a period of not using it, how easily can they reestablish proficiency?
- Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- Satisfaction: How pleasant is it to use the design?

Security Evaluation

Software security can be defined as the process of ensuring that software is designed to operate at a level of security that is consistent with the potential harm that could result from the loss, inaccuracy, alteration, unavailability, or misuse of the data and resources that it uses, controls, and protects.

- Confidentiality: A security measure which protects against the disclosure of information to parties other than the intended recipient that is by no means the only way of ensuring the security.
- Integrity: A measure intended to allow the receiver to determine that the information which it is providing is correct.
- Authentication/authorization: The process of determining that a requester is allowed to receive a service or perform an operation, Access_control is an example of authorization.

Some more on security....

- Availability :Assuring information and communications services will be ready for use when expected. Information must be kept available to authorized persons when they need it.
- Non-repudiation: A measure intended to prevent the later denial that an action happened, or a communication that took place etc.
- In communication terms this often involves the interchange of authentication information combined with some form of provable [timestamp](#) (It is a kind of software evidence of - what time has a particular transaction has been completed).

Functionality evaluation

- *The functionality of a software is measured strictly with respect to the requirements requested or gathered.*
- *There are several matrices by which this is done. Usually executed with the help of Test Plans and Test Strategies measuring all the major/minor functionalities and comparing it with the Software Requirement Document signed by the end user as well as the organization.*

Evaluation criteria – micro level of HIS

- Philosophy and objectives
- Policy and procedures
- Functionality
- Facilities and equipment
- Management and staffing
- User/patient interaction
- Staff development and education
- Evaluation and quality improvement

Philosophy and objectives

Whether mission and objectives documented

Whether different user groups (states and districts) have documented their mission and objectives of how they use for supporting which services

Policy and Procedures

Whether the implementation of objectives is accounted for

Policies on confidentiality

Policies on information systems standards

Functionality

Scope and standards: does the information system deliver the required information

Communication: the capacity to share the required information with other systems, either electronically or by other means

Inter-sectoral links: integration of services to citizens

Security and confidentiality

Consistency of data: implementation of data dictionary, use of health information standards, health integrity checks for data inputs

Appropriateness and accessibility: can those who require to, access it

Acceptability: to user community, and community the system serves

Usability: for all system users

Timeliness of information

Flexibility

Facilities and Equipment

Availability of resources required to run the information system

Implementation of hardware and software standards

Maintenance and support arrangements

Security of the information system, including disaster planning and data protection

Management and Staffing

Management commitment to the development of the information system

Cost-effectiveness of the system

Response to user requirements for effective system utilization, including user support

Strategic planning for information systems development

Availability and suitability of system documentation

User/patient interaction

Impact of the information system on the organization

Impact of the information system on service recipients

Ergonomics

Protection of the patient's right to privacy

Staff development and education

Training of staff

Promotion of an information culture

Evaluation and quality improvement

Implementation of a comprehensive quality assurance plan

Some challenges to evaluation

Unclear, conflicting or changing evaluation goals

Impact of IT projects in health care takes time

Information systems are rather unique in particular settings

Large efforts needed for the design and execution of an evaluation study

Measurement methods are complex, especially on key conditions of social, culture and politics which are most significant

Complex and sometimes contradictory results

Dependence of evaluation results on motivations and expectations of the users

Uncertainty over the generalizability of the results to other settings

Some steps to take in managing evaluation

Evaluation takes time, so take your time in planning and execution

Document all your steps and decisions in a detailed protocol

Strive for management support, organize longer term financial support

Clarify evaluation goals, involve different stakeholders, resolve conflicting goals

Reduce evaluation questions, focus on key ones

Carefully describe the information system and environment, the object of study

Select adequate study design, keep it step wise

Select adequate methods to answer your study questions

Motivate sufficient number of users to participate

Use validated evaluation instruments wherever possible

Be open to unwanted and unexpected results

Allow others to learn from your work

Some guidelines in developing a protocol

Which stakeholders should I include in the study?

How can I motivate stakeholders and get funding support?

How do I develop consensus for the evaluation study aims?

How detailed should the description of the evaluation object be?

Which evaluation questions are possible, which may help me reach my aims?

How can I derive clear criteria from my evaluation questions?

Which methods for data acquisition, data analysis and data presentation are available?

What should a study protocol and report contain?

How can I assess the moving goals problem in the evaluation study?

What should be an appropriate time frame and timing of my evaluation study?

Some available tools

Tali tool to assess level of information usage

Readiness Matrix on use of information for action

Assessment tool for national health information systems

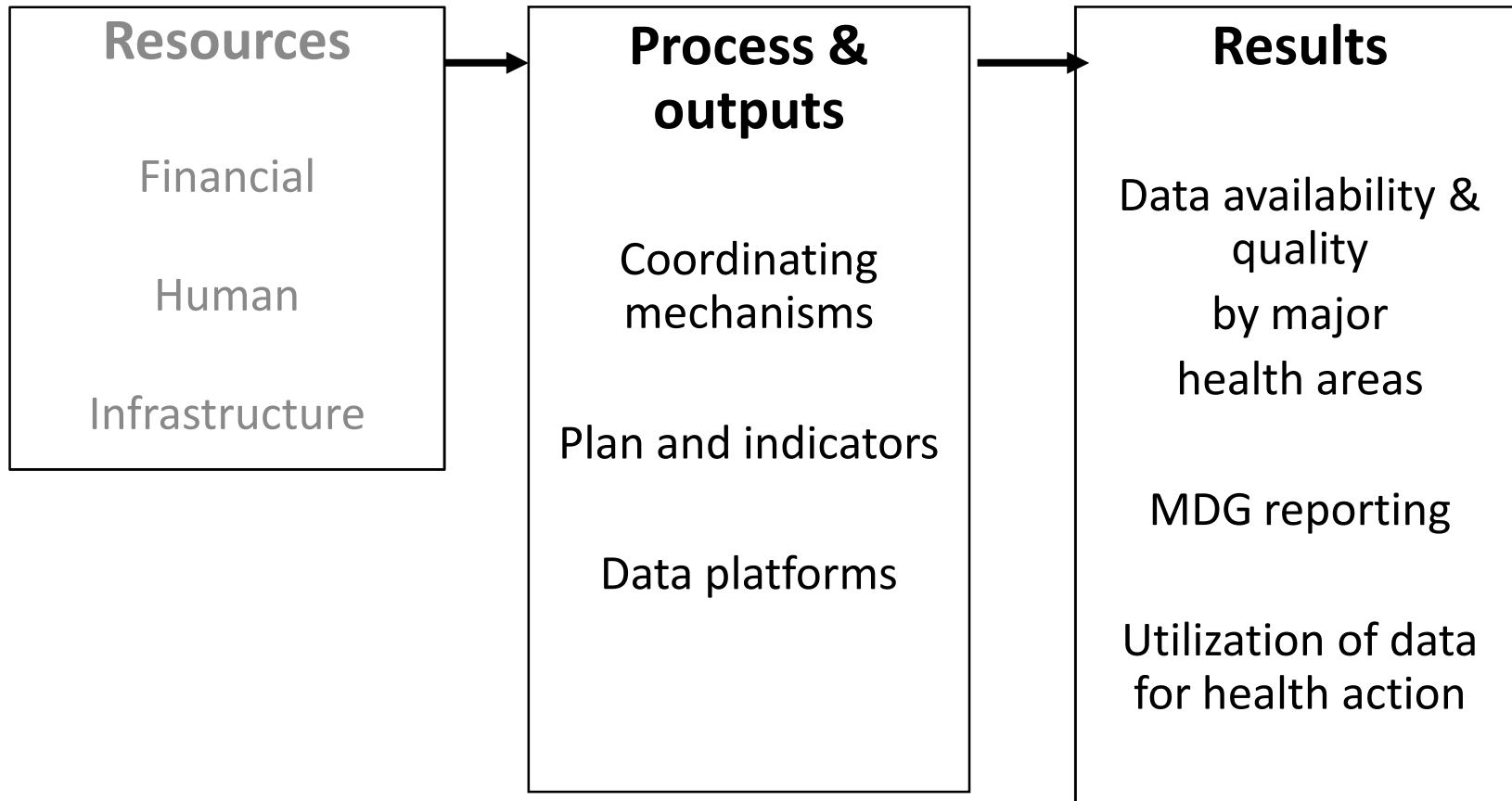
Consensus Technical Framework – Health Metrics Network

(see handout Chapter 8)

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Assessment of Country Health Information System

Framework for a standardized tool - HMN



Task Forces

A two-pronged agenda

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graph TD; A[Task Forces] --> B[A two-pronged agenda]; B --> C[Advocacy and resource generation]; B --> D[Work with countries to promote implementation];
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- Advocacy and resource generation
- Harmonization
- Norms and standard setting
- Spur new developments, including tools and methods

- Work with countries to promote implementation
- Use lessons learned by ensuring country participation in Task Force (real time OR)