Step Two: Designing the System—Programmatic Decisions

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Planning

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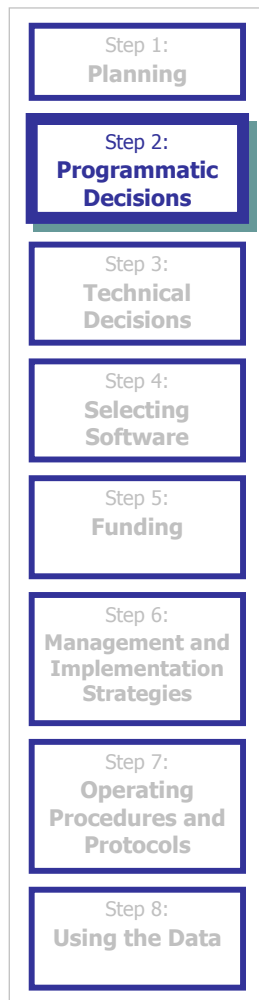
Once a community has completed the initial phases of planning and organizational development, it can begin to design an HMIS to best meet the needs of local partners. The HMIS vision, described in Step One, should guide design and development decisions. For simplicity, this guide divides the design stage into two steps. This step discusses the major policy decisions and the next step (Step Three) outlines major technical decisions. This division supports the idea that a community should first understand its programmatic goals before tackling the technical requirements needed to attain those goals. In reality, these two steps are interrelated and although technical design decisions should be primarily dependent on policy goals, there will be times that technical limitations or opportunities lead policy decisions.

Major policy decisions relate to:

- Size and scope.
- Function.
- Data sharing.
- Privacy and security.
- Minimum data standards.
- Business processes.

In each of these topic areas, this step provides a discussion of the decisions that must be made and some suggested questions for a community to use to develop system design recommendations.

Step Two output:

- System Design Requirements Document—Part One.

Size and Scope

Decisions about size and scope refer to the breadth and depth of system coverage and program participation. These decisions should be documented in a system design requirements document. The primary considerations are:

- When the system is fully implemented, will the HMIS cover one city or county, a region, or a state? Do neighboring jurisdictions already have an HMIS? Are there opportunities to develop partnerships with other jurisdictions to design and implement the HMIS that would help to share costs and enhance regional/statewide information collection and service delivery? At this point, the community should also consider the benefits and potential compromises of economies of scale. Particularly from a cost perspective, greater economies of scale achieve more services and more volume when concentrated at a central server organization.

- Will the system be limited to homeless providers or will mainstream service agencies also be asked to participate? Should agencies that frequently provide services to people who experience or are at-risk of homelessness, such as domestic violence, HIV/AIDS, and/or behavioral health providers be offered an opportunity to participate?

◆ Will the system track only information on people who are homeless, or will it also collect information on people who are at-risk of homelessness or formerly homeless? Is the community interested in tracking client outcomes after individuals are no longer homeless? If so, how might this occur? Do any providers remain in contact with the formerly homeless and should they be encouraged to participate in the HMIS?

HMIS participation

A related issue that is often overlooked is the question of how to get providers to participate in the HMIS. Some communities that have strong government or funder support mandate participation from agencies that receive specific funding sources. Other communities offer incentives for participation. Incentives may include hardware, software, or stipends to offset program costs for data entry. Yet other communities offer indirect incentives for participation, such as bonus points during funding application processes. Ideally, the system will yield sufficient benefits that agencies will want to participate; however, a community should plan to conduct ongoing outreach to engage and retain voluntary partners.

The HMIS congressional directive may eventually change the dynamics of participation. It encourages all communities to collect data on homelessness, service utilization, and effectiveness, regardless of whether the community receives Federal funding. Although persuading agencies that do not receive Federal or local funding to participate may be difficult, in the future it may become commonplace for publicly funded programs to be required to report data to the HMIS. Regardless of the method used to encourage participation, all users must be committed to the HMIS. Without full participation, data quality and accuracy will suffer.

Community Example #4: State of Wisconsin HMIS Implementation

Wisconsin has initiated a statewide HMIS run by the Department of Housing and Intergovernmental Relations (DHIR). The State provides HMIS infrastructure, staffing, and training for all statewide homeless agencies. Participation in the system is voluntary but strongly encouraged. DHIR uses grant application scoring tools as a participation incentive. For instance, agencies applying for HUD Emergency Shelter Grant (ESG) funds in Spring 2001 were awarded bonus points if the agency was willing to participate in the HMIS in 2001. For the 2002 HUD ESG application process, agencies that agreed to participate in 2001 and have not done so by March 2002 will lose points. Agencies that have implemented HMIS by March 2002, as well as those agencies now agreeing to participate will receive bonus points in the scoring process.

Functionality

Options for what a system can do for users abound. Based on the educational process in Step One, community members should think about the system modules that are required to achieve the vision. What functions does the community want the system to perform? For instance, if the system vision relates just to data collection, reporting, and analysis, a streamlined data collection system should be designed, without I&R, case management, or other modules. Conversely, if the vision suggests streamlined referrals, the system functions will need to include modules to help accomplish this goal.

Specific functional requirements include:

Client-level features (clients may be individuals or households)

- Standardized client intake and assessment screens.

- Complete case management services, including client intake, assessment, case management, service history, case notes, client financial worksheets, transaction history, and client follow-up.

- Discharge placement and outcomes.

- Benefit eligibility screening.

- Collection of socio-demographic information about clients served and/or turned away.

Report generation features

- Built-in Federal/HUD reporting.

- A custom report generator that allows users to create their own reports by choosing fields and sorting orders, data ranges, and so forth, while allowing for flexibility regarding data collected by multiple users, in multiple counties, and in specific counties by zip code, street address, and so forth.

- The ability to count service units in either or both hours or monetary amounts.

- The ability to track single or multiple funding sources by service, by client, and/or by staff person.

System-level functional features

- An electronic I&R system that includes the capacity to generate residential logs of bed availability and bed reservations.

- The capability to handle vacancy and rental information with regard to transitional and permanent housing.

- The real-time capability for all users within a geographic locale to communicate with each other individually and as a group using e-mail, pop-up messaging, chat, and bulletin board modes.

(Note: Agencies need phone or DSL lines and access to the Internet to accrue the benefits of real-time functioning.)

Data Sharing

Some of the potential benefits of an HMIS (discussed in the Concepts and Components step) are available only through interagency data sharing. Without this function, an HMIS can still produce unduplicated client reports and generate system-wide client information for funding and policy purposes. However, for an HMIS to be used to reduce duplicative client intakes and provide opportunities to improve case management and service coordination, the system must support interagency data sharing. These objectives are important to a community's vision.

The decision to explore data sharing will necessitate more stringent privacy and security protections. All data sharing should be contingent upon written client consent and must comply with local, State, and Federal legal requirements and the local privacy protection policies (discussed in the next step). In some communities, data sharing agreements are limited to specific time periods, such as one to 3 years. Some potential data sharing functions are described below:

- ◆ Blanket sharing or flexible data sharing. A blanket sharing function discloses a complete client record to other agencies. Flexible data sharing capacity allows clients to identify which part or parts of a client's file they would like disclosed and to specify individual programs with whom to share the information. The extent of flexibility varies depending on HMIS technology features.

- ◆ The real-time capacity for agencies to share client information and jointly manage services for a client through the Internet.

- ◆ The capability for one agency to electronically send a client referral with complete client intake information to another agency.

Privacy Protection Policies

As briefly described in the Concepts and Components step, privacy protection policies are critical to the design of an HMIS in order to protect the confidentiality and safety of the consumers who agree to have their information stored in the HMIS. These policies should govern the behavior of people who use the information, whether during a client interview or after the information has been stored in a paper file, HMIS case file, or another electronic file. Most agencies are already familiar with client confidentiality protocols related to case management. These protocols must be supplemented with HMIS provisions that include parameters for inputting, revising, aggregating, and sharing client information. To generate communitywide data about homelessness, some level of data must be aggregated at the regional level. In some cases, improvements in service delivery can come about through interagency case management, but none of these should occur without proper written consent. It is critical to ensure that private client information, such as undisclosed shelter locations or sensitive personal information, not be divulged to anyone for whom the data are not essential.

When developing a privacy policy, a community should consider the questions below. Some questions may raise issues that are premature to determine in the design phase. However, it is important to think about these issues early in the planning process—to the extent that the community must establish principles and/or make design decisions to protect client privacy concerns. These issues should be revisited in Step Seven, during the development of formal privacy policies, including consent forms,

documented in a community's standard operating procedures, and included in requirements for user training.

Stakeholder issues
◆ Is there a broad range of stakeholders involved in the development of the privacy policy? Are persons who have experienced homelessness at the table?

◆ What is the level of trust among agency partners, and are there historical issues with client confidentiality that may influence this policy? For example, if a particular agency has a reputation for violating client privacy, stakeholders may want to address this issue openly and directly.

◆ Are there integral partners with non-negotiable positions regarding confidentiality or sharing specific types of information? These positions may be a good starting point for discussion—to be sure to keep these agencies at the table. For example, domestic violence agencies often have stringent policies on confidentiality to protect clients' safety.

Design issues
◆ How much and what type of interagency case management or information sharing must the system accommodate? Under what circumstances? How will client confidentiality be protected during these exchanges?

◆ Are there other system function preferences that may affect the design of protection mechanisms?

Privacy and consent considerations
◆ Are there local, State, or Federal laws that may govern the specifics of this policy (e.g., consent procedures, provisions about who can be authorized to share or receive certain client data and under what circumstances)? Applicable Federal laws may include 42 CFR Part 2 (Substance Abuse) and the Health Insurance Portability & Accountability Act (HIPAA) of 1996.

◆ What level of client consent (oral or written) is considered acceptable for entering client data into the HMIS and/or for sharing identified client data among agencies? A blanket release, release by agency, program, or specific case managers? For what data elements? For what time periods (see Step Seven for more information about privacy consent procedures)?

◆ What procedures will be established to inform clients about their HMIS rights, including client consent related to interagency data sharing, whether consent can be retracted, and proposed uses for HMIS data?

◆ What type of consent will be required for aggregating information? For sharing information among case managers within an agency? With another entity? Should specific releases be developed for particularly sensitive issues, such as mental health history?

Protection measures
◆ What security mechanisms can be developed to protect confidential client information? Password protections? Stripping client data of identifying information prior to saving on a central server? Using a unique Client Identifier (ID) that is not identifiable or traceable by general users of the system? Using data encryption when transferring and storing data? (Step Three includes more information on specific technical design decisions.)

◆ Does the policy define client rights? Limit staff who can access an individual's information? The right not to answer questions unless required for program entry? The right to know who reads and/or edits his/her information? Data protection through encryption or other security measures?

◆ Does the policy include client interview protocols and training for case managers and central staff?

◆ What procedures are in place for consumer grievances regarding violations to privacy protections?

◆ What penalties will be established for persons who violate privacy protection policies? Reprimand? Sanctions or revocation of HMIS rights? Termination of employment? Criminal prosecution?

A policy should clearly state a community's position on a specific topic. Once documented, a policy can be implemented in two primary ways, behavioral and institutional. Behavioral solutions require people to act in certain ways or have their behavior restricted in some ways when using the system—as defined by policy. Often, to guide the user in conforming to behavioral policies, a community will develop procedures to document the specific protocol that should be employed in particular circumstances (see Step Seven for a discussion of standard operating procedures). Institutional solutions can be used to enforce protections by limiting system options to operations that conform to the established policy. These solutions are discussed in Step Three.

There are some issues for which it is too critical to rely on individual behavior, particularly given high levels of staff turnover. For example, rather than rely on a written policy that prohibits case workers from sharing client mental health records with a case manager at another agency, the HMIS can be programmed so that these data records are stripped before any client information is transferred. Based on the situation and the environment, each community will need to decide which method is most appropriate. Hybrid models can be particularly effective. These create certain technology or institutional parameters and then set behavioral expectations within them. If well designed, institutional security measures will not affect system performance or function but will provide the level of security needed to guarantee basic client privacy.

Minimum Data Standards

Many communities struggle to determine the information that should be collected in an HMIS. For each element, a community must also define the frequency and specific points in time at which to gather data from clients. HUD's CoC Annual Progress Report (APR) requirements set an ad-hoc national data standard, and many HMIS software vendors have informally suggested a standard by offering a common package of data fields in their HMIS applications. All of these are good beginning points. However to make sure that the HMIS meets local needs, each community should determine its own data standards early in the design process, based on the programmatic goals and vision for the system. Four major areas should be considered in the development of local data standards, a unique ID approach, data collection fields, type and method of data collection, and data storage. See Supporting Materials for additional reference material.

Unique client identifier

The unique ID is an exclusive code generated by the HMIS for all clients as their data are entered into the system. The HMIS must have an algorithm or formula built in to create this ID in a way that protects

client privacy. It cannot be associated with the individual's identity. However, the algorithm must consistently generate the same ID for each individual, regardless of which program he/she participates in. The formula for a unique ID is actually a technical decision. However, it is important for the planning participants to understand the ID and to make sure that the HMIS has a valid way of generating it. One example of how to generate a unique ID is presented in the box below.

Sample Client ID: First initial of client's last name, third initial of client's last name, six-digit date of birth, client's gender, and first initial of mother's last name before she was married (i.e., maiden name initial)

Example:	Client's name:	William Simpson
	Client's Date of Birth:	September 5, 1948
	Client's gender:	M
	Mother's name before she was married:	Kelley

Client Code: SM090548MK

Data collection fields

Data collection fields are the specific elements that an HMIS will store in the database. Each item (client name, date of birth, gender, date of shelter entry, etc.) must to be specified in a community's system requirements to ensure that the HMIS software package purchased includes that information. Depending on the HMIS goals, planners can begin with identifying items of information already collected and used for case management and reporting purposes by the majority of participating agencies.

The community may want to consider three sets of information:

◆ Minimum data set: Information that is needed for basic aggregate community reports. All providers agree to collect and input at least this minimum set of data for every intake client. For example, the data could include basic demographics and housing history.

◆ Universal data set: Information that everyone in the community agrees is valuable to collect about all clients over time. For example, the universal data set could include all of the default information that appears on blank client intake and case management screens. These additional fields could be completed, as appropriate, for case management clients and, in some case, intake clients as well.

◆ User-defined fields: One or two programs will want some data that other programs will not need. Rather than clutter the system with every possible data field, developing a handful of user-defined fields that can be customized for use within a specific program is worthwhile. These fields will typically not be aggregated at the community level because most other agencies will not be collecting the information.

Although a temptation to collect every piece of client information exists, there are several reasons to avoid collecting too much data. For one, the more data that are collected about a client, the greater the privacy risk to that individual. Another reason—the more data the system collects, the greater potential for data entry errors. Finally, buy-in at the agency level will be easier to obtain if case managers are not required to collect much additional information. Balancing the opportunity of data collection and analysis with the privacy concerns and data collection burdens of an HMIS is important. An additional issue,

discussed in Step Four (Selecting Software), is user-friendly screen design layout, which can make a big difference in staff comfort and willingness to use the system.

Types of data fields

After defining a list of system data elements, types need to be assigned to each element to ensure that the HMIS collects data in a way that can be easily analyzed. The hardest information to analyze is open-ended information. Therefore, to the extent possible, the data in the HMIS should be collected in prescribed formats to minimize the possibility of entry errors. Many of these formats are incorporated into HMIS products so communities are unlikely to need to design response types. It is important, however, that technical workgroup members understand these issues because the community needs to decide how it collects various data elements. This understanding will also be helpful in reviewing and choosing software products. The various data types are described below. Also see Step Eight for further discussion.

◆ Fixed-answer responses, such as drop-down menus

Software limiting the choices of responses to a specified set of options can reduce data entry errors. For example, options for marital status could be married, divorced, widowed, single, or separated. Or the community could choose to customize the fields differently. The benefit of fixed-answer responses is that once a community has decided on the fixed options, each case manager must choose from that standard list, which ensures continuity for the purposes of data analysis. Missing, unknown, and no answer categories should be distinctly defined as potential responses for each variable.

Frequently, a system will use drop-down menus for fixed-answer responses when only one option applies. For instance, drop-down menus with the specified choices for employment, yes/no questions, and names of programs or locations can minimize data-entry errors. Small differences in the way things are entered can lead to increased headaches during data analysis. For example, *Chicago, CHICAGO,* and *Chgo* all imply the same city, but data analysis software would categorize them as three different places. Auto fill software features can correctly complete the data entry after a few keystrokes, which can also save time for staff.

Additional features, such as checkboxes, can be used for list options. For example, many programs provide a long list of choices for factors that contributed to homelessness and ask the client to check all that apply. To provide more flexibility, these options often provide an *other* category with a small comment field for specific descriptions. For situations in which the client is asked to choose one option from a list, the software can be programmed to accept only one check mark or a drop-down menu can be used.

◆ Fixed-format responses

The HMIS can limit numerical information, such as dates, phone numbers, and zip codes, to specific formats to help ensure that information collected is consistent. For example, the date-of-birth field can have pre-formatted slashes between the day, month, and year and can prompt a 4-digit year so correct ages may be calculated. Regions that have multiple telephone area codes can format all numbers to prompt for the correct code. Income fields can be formatted with dollar signs and decimal points to avoid simple mistakes.

◆ Open-ended data fields and attachments

In some cases, it may be useful to include open-ended data fields, such as case management notes. However, these fields should only be used for information that does not need to be routinely analyzed. Options to attach copies of computer documents and scanned images of signed client consent forms, client records, or photographs can also be helpful for case management purposes.

◆ Static versus transactional data

Each data field needs to be set up as either static (value remains the same) or transactional (value is situational and can change over time). For static information, only one data value needs to be recorded. If new information is learned, then the field can be revised with the new value replacing the old. For example, when clients enter the process, they may be living at a shelter, so their address would be that of the shelter. Later, when they move to transitional housing, the caseworker could revise the address.

Transactional data are likely to change over time. For this type of data, the community needs to decide whether this information should be collected once, acknowledging that it only represents a particular point-in-time, or if a history of values should be collected. For instance, many agencies suggest that enrollment in their program will help a client increase their income over time. To determine whether the program is successful, the client's income must be tracked over a period of time. In this case, income should be programmed as a transactional data field, and at key points (e.g., program entry, 6- or 12-month follow-up, and program exit) the client information should be updated. Transactional data should be entered in tandem with the date. Stakeholders must agree about which points in time transactional data will be collected for each relevant field.

On a related technology note, the HMIS should have built-in software query capacity to detect and correct data-entry errors and omissions. For example, if the program entry date is later than the discharge date, some software can be programmed to query the user. If much data are omitted, reports on the entire client pool may be misleading.

Data storage

The community must also consider the length of time for which it is committed to storing the information. Policies can be developed that delineate periods for different purposes. For example, archival data could be stored indefinitely for analysis purposes, but online data may be stored for a shorter period, such as one to 5 years.

Business Processes

A business process is a series of steps or procedures required to accomplish a specific task. For instance, a business process could list the series of steps required for a consumer to apply for a specific program. In communities with ad-hoc business processes, providers and consumers are often confused about how to access services. These steps can be modeled in the form of a flow chart or diagram that can be used to explain the process to consumers.

An HMIS implementation provides a tremendous opportunity for a community to review how they conduct business and to institute service delivery changes to improve the process for consumers. These kinds of improvements may not be directly related to the HMIS, but they can be a valuable side benefit of

the planning and design process. Regardless of whether changes to business processes are actually made, this is an excellent time to document business processes and to clarify how a system functions. If a community decides to incorporate case management or interagency referrals, the HMIS vendor can use the business process diagrams to automate these procedures within the system.

For instance, if the referral process between emergency shelter programs and transitional programs is standardized, the HMIS could be used to streamline the application and referral processes. A household staying in the emergency shelter program could complete a standard application with the assistance of their case manager. The case manager could use the HMIS to complete an automated eligibility verification to determine which transitional shelter programs are most appropriate for that household. Depending on the results, the system could submit the application electronically to the transitional shelter provider. The application process could be automated within the HMIS, based on the steps outlined in the business process, which could save time and eliminate reduce the human-error common in application processing.

A community may want to start business process modeling with the areas that directly relate to the HMIS implementation. Some of these areas include:

- Client intake: How, where, when, and by whom will the basic client information be collected and entered into the system?

- Program referrals: How do clients access shelter beds and services within the system?

- Case management: How and when will case management information be updated? Will information be updated from clients at specific points in time, such as at 6 and 12 months following program completion? If the system supports interagency case management, what are the specific protocols and procedures for how the case management information will be shared and coordinated?

Documenting Design Decisions

Before going to Step Three, stakeholders should document all of the programmatic design decisions formulated in Step Two. These decisions will provide the framework for assessing and defining technical design options and requirements.

System design requirements document

The system design requirements document should provide a brief summary of the community's programmatic decisions, including, at least:

- Size and scope.
- Function.
- Data sharing.
- Privacy and security.
- Minimum data standards.
- Business processes.

These programmatic design decisions will compose the first part of the system design requirements document, which will be supplemented by the technical decisions that will be developed in Step Three. The complete document can be used in the software selection process to convey community needs and

goals to software vendors, to select appropriate software applications, and to document decisions that will be needed throughout the implementation phase.

Supporting Materials

◆   See appendix A for a list of privacy protection resources.

◆   *Homeless Management Information Systems: An In-Depth Look,* Center for Social Policy, McCormack Institute, University of Massachusetts Boston (January 2001). (See pages 91 to 117 for information on data elements.) This publication is available on HUD's HMIS Web site at http://www.hud.gov/offices/cpd/homeless/hmis/index.cfm.

Programmatic Design Exercise #1: Privacy Protection Working Group

Questions to Explore:

1. What State and Federal laws affect the sharing of client-level information?

2. How will privacy protections work? This includes decisions about:

   a) Approach to client-identification.

   b) Client consent for data sharing.

   c) Access to identified client-level data (Who has access to data, for what purposes, and under what circumstances?).

   d) Access to anonymous aggregate data (Who has access to data, how, and under what circumstances?).

3. What are the participating agencies' concerns and anticipated benefits regarding electronic sharing of client-level information among agencies?

4. What information-sharing practices currently exist among agencies? What information-sharing practices does the community want to encourage or discourage?

5. At what level of the system will client-identified or anonymous data be aggregated—at the central server level, the community level, or the participating agencies?

6. What technologies should we use to ensure protection and privacy of data?

Recommendations for Working Group:

◆ Review existing Federal and/or State laws that affect the sharing of client-level data.

◆ Review existing models of data sharing from other States or locales that have implemented HMIS (open- versus closed-system models).

◆ Review Seattle's "Safe Harbors Design Project" (see community example footnote in Step One).

Programmatic Design Exercise #2: Participation Working Group

Questions to Explore:

1. Will participation in the system be mandatory or voluntary?

2. What incentives can be used to encourage participation? Are there any government agencies/contracts that will mandate participation (i.e., will participation be required by any of funders of homeless programs and services)?

3. What sanctions might be used for non-participation? What is the process for dealing with communities and/or agencies that do not want to participate in the system?

4. What will the community recommend as participation requirements at the agency level?

5. What will be community expectations regarding cost sharing in HMIS implementation?

6. What will participation targets be during each year of implementation?

Recommendations for Working Group:

◆ Review existing participation requirements from localities currently using HMIS (mandatory vs. voluntary participation models).

Programmatic Design Exercise #3: Minimal Data Elements Working Group

Questions to Explore:

1. What are the reporting requirements of participating agencies?

    ◆ HUD McKinney programs.
    ◆ ESG.
    ◆ Domestic Violence.
    ◆ Veterans Services.
    ◆ Runaway and Homeless Youth.
    ◆ Other.

2. Which data elements are necessary for completion of these reports?

3. What data elements must the system generate?

4. What are the current data collection processes of participating agencies and funders?

Recommendations and Resources for Working Group:

    ◆ Develop a matrix of data elements currently collected by participating HMIS agencies and the reporting requirements from different funding sources.

    ◆ Review minimal data elements required by other localities using HMIS.

    ◆ Review recommended minimal data elements in *Homeless Management Information Systems: An In-Depth Look.* (See Supporting Materials in at the end of Step Two.)