Data Integration Checklist

You may need to consider data integration when:

☐ Homeless provider(s) cannot use your Continuum's HMIS, yet still wish to participate.
☐ Mainstream services such as hospitals, law enforcement, and schools have useful homeless services data to contribute to an HMIS.
☐ Reporting across many continua, each with their own separate systems, is required.
☐ Counties comprising a Continuum each must use their own systems, yet a Continuum-wide roll-up is needed.
☐ Statewide HMIS reporting is needed, though there is more than one HMIS system in the state.
☐ Multi-state/regional HMIS reporting is needed.

Steps in a data integration process:

☐ **Step 1:** Decide whether it is advantageous to perform an integration
    ☐ Continuum objectives
    ☐ Cost/benefit analyses
    ☐ Funder mandates
    ☐ Vendor support

☐ **Step 2:** Determine governance structure, scope of project/initial requirements, and basic plan
    ☐ Will the central system be a data warehouse, or another HMIS, or ...?
    ☐ Will agencies be able to receive data from a central system or just send to it?
    ☐ Who will implement and when? Hint: Use the most capable agencies in a pilot.
    ☐ Will the client release of information be closed off when sent to the central system, or be kept intact?
    ☐ How will new data be merged into/unduplicated with existing data?
    ☐ Establish budget/funding sources
    ☐ Determine basic roles
    ☐ Project phases (with the most simplest features first). Who will implement and when? A pilot with a limited number of your most capable agencies is safer. It is often best to start with agencies sending data in one phase and add receiving data to a later phase.
    ☐ Set time frames

☐ **Step 3 (can be performed simultaneously with Step 2):** Draft and negotiate interagency data sharing agreements. Specify:
    ☐ Data format, transmission frequency, messaging type.
    ☐ Security guidelines, sharing.
    ☐ Whether only changed data are sent or all prior data as well; if the former, the message envelope will need to state whether the data elements are updates or deletes.
    ☐ How costs are handled.

☐ **Step 4:** Determine a common data format contributing agencies will use
    ☐ HUD HMIS XML – good for uniformity, portability of standard across different vendors and states/regions.
    ☐ HUD HMIS CSV – easy for providers to generate, but difficult to validate, so CSV might cause more overall ongoing work.

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- ☐ Extended HUD XML format: take HUD's format plus add your own elements – a good compromise of standardization and customization, plus you can always convert back to HUD format if necessary.
- ☐ Proprietary vendor data formats – good for getting all the functionality out of your HMIS capabilities, but the uniqueness of the format may defeat the data integration portability and may need to be reworked by all your sending agencies if you change vendors.
- ☐ Some other non-HMIS standardized format, such as HUD CARS, Disaster XML (draft), AIRS XML, HL-7 XML, those used by Health and Human Services, etc.
- ☐ Obtain/create documentation and sample data for whichever format you choose.

☐ **Step 5:** Determining data transmission/architecture details
- ☐ Transmission frequency: quarterly, daily?
- ☐ One-way or bidirectional transfers?
- ☐ A data warehouse or just a pass-through of data to HMIS?
- ☐ Validation of received data before uploading to HMIS?
- ☐ Uploaded records sharing amongst providers?
- ☐ Unduplication/matching/updating/deletion; total refresh or updates
- ☐ User and/or agency authentication/authorization
- ☐ Connection security (SSL, SSH, VPN, TLS, etc.)
- ☐ Messaging protocol implementation (HTTP POST, SOAP, FTP, etc.) so agencies can send data in a predictable fashion with predetermined error codes

☐ **Step 6:** Development of model schema/mapping
- ☐ Assemble spreadsheet, database, or unified modelling language (UML) class diagram of all data elements to be used
- ☐ Add metadata for each data element, such as, data definition (text), federal register data element id #(for HUD HMIS elements), data type (string 50, integer, etc.), cardinality (min/max counts), picklist values, allowable patterns (regular expressions for strings), other restrictions on data, funding stream requiring this element, uniqueness (key fields), etc.
- ☐ Mapping to equivalent element in the HMIS system
- ☐ Mapping to HUD HMIS XML or CSV elements, build transformations (XSLT, etc.) if necessary

☐ **Step 7:** Testing – preferably at first in a test HMIS environment supplied by vendor
- ☐ Build test instance files
- ☐ Validate against model schema & run against stylesheet, if any
- ☐ Start with one client, minimal data – check user interface, add simple data
- ☐ Add data with multiple instances (i.e., income, services)
- ☐ Add multiple entries into program
- ☐ Repeat all of the above with a household with at least 3 people
- ☐ Test the dynamic elements of data – such as removing a household member
- ☐ Test a file with multiple households
- ☐ Test all variables together – multiple households, multiple entries, multiple instances of data
- ☐ Test all picklist options
- ☐ If you'll be uploading updated data, test updating everything
- ☐ Keep a log of your test files
- ☐ Keep a log of your testing process

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☐ Keep a log of your issues and their resolution
☐ Pilot agencies begin sending data. Expand the number of agencies as funding and system limits permit.

☐ **Step 8:** Ongoing data integration work
☐ Facilitate uploads by service providers - provide error reporting for uploads, assist with correcting data formats
☐ Modify schema/data format - new HUD versions, new funder requirements
☐ Communicate/coordinate changes in schema to service providers sending uploads
☐ Facilitate new providers' uploads
☐ General approaches

*Helpful Hint:
Always include the following items in an RFP when procuring software to ensure a smooth integration process should the need arise.

- *Support for both transmitting and receiving HUD XML v. 2.7 (or most recent HUD approved version)*
- *Support for batched or real-time messaging of this XML (HTTP SOAP is recommended)*
- *References from past data integration projects/compatible systems.*