

ICT4D Design Guidance for Program and M&E Staff



CRS/India
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Feedback

This document, like CRS/India’s ICT4D interventions, is a work in progress. We continue to learn from our technology and implementing partners, from other CRS country programs, and from different organizations engaged in ICT4D work in India and beyond. Any comments, suggestions, additions or corrections to this guidance document are most welcome. Please send your feedback to:

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This guidance document¹ attempts to capture CRS/India’s experience and learning to date around the process of designing information and communications technology for development (ICT4D) solutions—particularly those that leverage mobile technologies (e.g., basic feature phones, androids, tablets, etc.). This guidance is targeted to program and M&E staff as they learn to design content for ICT4D solutions. The purpose is to help staff translate their programming, technical and M&E expertise into high quality content that can be built into appropriate, successful ICT4D applications by CRS’ or partners’ ICT staff.

I. GETTING STARTED

The following reflection questions are essential to consider as you begin planning the design of an ICT4D solution. (See a full list of the reflection questions in **Annex 1**.) Do not begin defining specific content (e.g., questions to be asked, etc.) for your ICT4D application until you have first identified:

- The primary and, if applicable, secondary purpose(s) of the ICT4D application;
- The application user(s);
- The application beneficiaries;
- The frequency of ICT4D-supported visits to beneficiaries; and
- The types of visit(s) to beneficiaries that will be supported by the ICT4D application.

Reflection Question 1: What is the purpose of your ICT4D solution?

ICT4D solutions can have multiple purposes. But it is important to define the primary and, if applicable, secondary purpose(s) of your solution before you begin defining the actual content, messages, and/or questions to be asked. Defining your purpose will help you begin to identify whether your ICT4D solution will involve single or multiple ICT4D applications and/or users.

Examples:

- Primary (and only) purpose: collect survey data
- Primary purpose: project monitoring
 - Secondary purpose: Aggregating project data into country program or Agency databases
- Primary purpose: counseling, behavior change communication
 - Secondary purpose: monitoring, data collection
- Primary purpose: job aid to support client assessment, treatment and referral
- Primary purpose: training, self-learning

Reflection Question 2: Who are the users of the ICT4D application?

“Users” are the people who will actually use the ICT4D application and hardware (e.g., phone, tablet, etc.) in the field.

Examples:

- Staff conducting a survey;
- Staff monitoring community health worker performance;
- Community health workers visiting client;
- Agriculture extension workers visiting farmers, etc.

It is possible that the identified purpose(s) of your project’s ICT4D solution requires multiple users. That is fine. Identify all users—and expect that you might need to design separate ICT4D applications for each user.

¹ Inspired by and adapted from Dimagi Inc.’s [CommCare Worksheet #1 Definition v.13](#).

Reflection Question 3: Who are the beneficiaries of the ICT4D application?

“Beneficiaries” are the people with whom the users share or use the ICT4D application.

Examples:

- Survey respondents;
- Pregnant women visited by health workers;
- Farmers visited by an extension worker, etc.

If you identified multiple users for your ICT4D solution, be sure to identify the beneficiaries who correspond with each user.

Reflection Question 4: How often are the beneficiaries visited?

The frequency of users’ visits to beneficiaries depends on the purpose of the ICT4D application.

Examples:

- For a baseline survey, beneficiaries/respondents are visited once.
- Project staff monitoring cash for work might visit beneficiaries/participants on a weekly basis.
- Community health workers might visit pregnant women once each trimester of pregnancy.
- Extension workers might visit farmers twice during the course of each growing season, etc.

II. DEFINING WORK FLOWS

Reflection Question 5: What are the different types of visits that could happen with this ICT4D application?

An ICT4D application might include only one form that is used for a single type of visit (e.g., a survey form, etc.) or it might include several different forms that are used during different types of visits to beneficiaries.

Examples:

- For a baseline survey, users (enumerators) visit beneficiaries (respondents) once to complete the survey form.
- For a monitoring application, users (project staff) might visit beneficiaries for different reasons or types of monitoring at different times: to observe mastery of a specific skill (e.g., observation checklist), to ask beneficiaries about project inputs received, to follow-up on a complaint raised through the project’s beneficiary accountability mechanism.
- A community health worker might visit a client at one point to follow-up on service utilization and another time she might visit in order to counsel the client about key health messages.

In order to clearly map the work flow of your application, it is critical to identify as clearly as possible the type of visit, information/form required for each visit, and frequency of visit/form filling. A Work Flow Planning Table (**Annex 2**) can be used to help you initially think through these 3 critical elements in defining your ICT4D application work flow. **Examples 1 and 2** show work flow planning for single-form and multi-form ICT4D applications, respectively.

Example 1. Work Flow Planning Table (single-form ICT4D application)

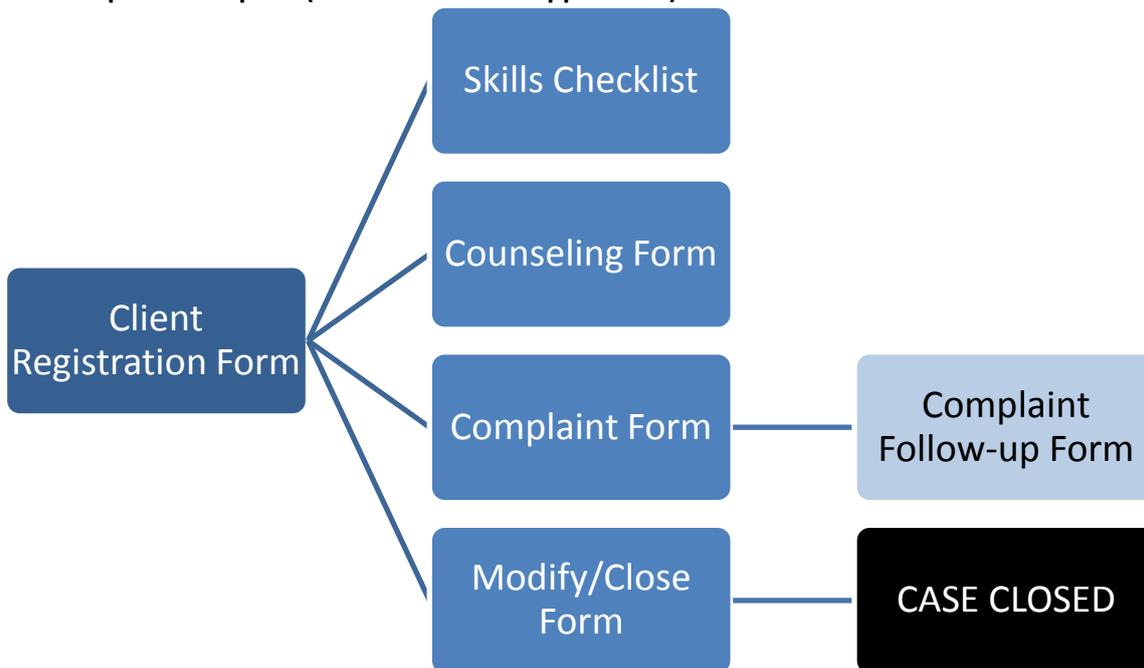
Type of visit	Information/form required during this visit	How often is this visit conducted/form filled?
Baseline Survey	Baseline survey questionnaire	Once

Example 2. Work Flow Planning Table (multi-form ICT4D application)

Type of visit	Information/form required during this visit	How often is this visit conducted/form filled?
Register a beneficiary in the ICT4D application	Registration form	Once
Observe beneficiary’s mastery of a skill/knowledge taught by the project	Observation/Skill Checklist	Quarterly
Counsel beneficiary on behavior change	Counseling form	Monthly
Report beneficiary complaint as per accountability plan	Complaint form	As needed
Follow-up response to beneficiary complaint	Complaint follow-up form	Within 72 hours of submission of complaint form
Modify or close a client’s case	Modify/Close form	As needed

For a multi-form ICT4D application (see **Example 2** above), it is useful to prepare a flow chart that maps out how the different forms identified in your Work Flow Planning Table relate to one another. If ICT staff is available, it is strongly recommended that program and M&E staff works with the ICT team to map the application’s work flow.

Work Flow Map for Example 2 (multi-form ICT4D application)



DESIGN TIP

ICT4D design is a dynamic process. As program and M&E staff move forward with the development of content for an ICT4D application, they should periodically review and update the application’s Work Flow Map in collaboration with ICT staff to make sure that it accurately reflects the evolution of the application’s design.

III. DEFINING APPLICATION CONTENT

Reflection Question 6: What questions do you want to ask in each form of the ICT4D application?

Once the application work flow has been outlined, program or M&E staff can begin defining the content to include in each form of the planned ICT4D application. The content depends on the identified purpose of the application. For M&E applications, staff should ensure that content aligns with CRS’ M&E Standards. M&E content should draw, insofar as possible, from Agency and/or recognized industry standards for indicator definitions and survey tools. See **Annex 4** for a list of resources for standard indicators for different sectors. For behavior change communication, counseling, and training applications, ICT4D content should be drawn from evidence-based best practices and industry standards for the technical sector. Content for ICT4D applications that support clinical and/or community case management of illnesses should be fully aligned with approved, country-specific treatment protocols. As required, staff should seek input from CRS’ network of technical advisors and/or local experts to ensure the technical appropriateness and accuracy of ICT4D content.

DESIGN TIPS

- Include only “need to know” information among the questions asked in your application. **Do not collect data that you have no plan, capacity or resources for analyzing and using!**
- If the purpose of your application includes monitoring or survey, be sure to include the appropriately formulated questions as per the project’s M&E and Analysis Plans to ensure the right data is collected to assess ProFrame indicators. Use globally accepted indicators and/or tools—including standard question formulations and definitions of numerator and denominator—to define your M&E or survey application content.
 - During design, talk to the person who will do the analysis of data collected with the ICT4D application. Determine whether data needs to be available as numeric (number) or string (text) variables for the purpose of analysis. Then talk with the ICT team to make sure the application data is captured in the format required to best facilitate analysis.
- If your project’s sustainability plan includes phase-over or scale-up of the proposed ICT4D solution through another organization or structure (e.g., partners, government, etc.), design your content so that it aligns with the protocols, data needs, priorities and training/behavior change content of the targeted phase-over/scale-up organization or structure.
- If you want to track or provide additional support to high risk or highly vulnerable beneficiaries through your application, be sure to include questions that collect demographic or other key data that corresponds with an evidence-based profile of your targeted high risk group. This enables you to design the ICT4D solution so that it can effectively identify and trigger targeted information or support to high risk groups.

Reflection Question 7: When is the content/question shown and how is the response recorded in the ICT4D application?

As you begin thinking about what questions to ask or which information to show in the ICT4D application, it is also important to consider: **1)** when will the question/information be shown and **2)** what type of question do you want to ask.

In a traditional paper-based tool, guidance on skip logic is typically printed on the page for users’ information (see **Example 3**). In an ICT4D application, skip logic is not necessarily visible to the user. Rather, the program

and M&E staff who design the content specify the required “show if” logic as part of defining the content which is then built into an ICT4D application. Once built, the application automatically shows questions that correspond with the logic specified by program and M&E staff in the content definition.

Example 3. Traditional paper-based survey questionnaire

Question ID	Question	Response	Skip Logic
ANC1	During your pregnancy with (NAME OF YOUNGEST CHILD), did you meet anyone for antenatal care?	0 . No 1. Yes 999. Don't remember	→ If no or don't remember, skip to question CRS1
ANC2	Whom did you see for ANC? ASK: Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN FOR ANC.	0. NO ONE 1. DOCTOR 2. NURSE 3. LADY HEALTH VISITOR (LHV) 4. AUXILIARY NURSE MIDWIFE (ANM) 5. INDIGENOUS SYSTEM OF MEDICAL PRACTITIONERS (ISMP) 6. TRADITIONAL BIRTH ATTENDANT 7. ASHA 8. ANGANWADI WORKER (AWW) 9. RURAL MEDICAL PRACTITIONER (RMP) 88. OTHER (specify)_____	→ If no one, skip to CRS1

Depending on the type of question/information being shown, you can choose the type or format of data the application will accept in response to the question asked. Examples of different “*question types*” include:

- Labels require the user to enter no date. Rather, the label simply displays information to the user. Example, you can have a label that shows the beneficiary’s name at the top of each form. You can use a label at the end of a form to let the user know that the form is complete. You can use a label to convey a pre-defined counseling or behavior change message.
- Single Answer questions are those that have a list of possible (multiple choice) options, but the application only allows one response to be selected.
- Multiple Answer questions are those that have a list of possible (multiple choice) options from which the user is allowed to choose multiple responses.
- Number (integer or decimal): You can specify in the application definition that only numbers are acceptable responses to certain questions. If you know, you can further specify that you want the application to only accept an integer (i.e., a whole number, not a fraction or decimal) or a number with a decimal point.
- Text can be specified for questions that require that the response be recorded in narrative or text form (e.g., beneficiary’s name, etc.)
- Date and/or Time can be specified as the type of response(s) to be entered for a given question.
- Phone or ID number can also be specified as the type of response required/allowed for a question.
- Other question types include *GPS* if GPS coordinates are required, *microphone or audio* if the response is being audio recorded, *camera or photo* if a picture is being taken, *barcode* if the response requires a barcode scan.

A Form-wise Content Planning Table (see **Annex 3**) can be used to initially detail the content/information required in the different forms identified through the Work Flow Map. **Example 4** below shows a sample Form-wise Content Planning Table for a multi-form pregnancy application.

Did you know?

Unlike paper-based forms, ICT-based forms can “talk” to each other. In a multi-form application, this means that data collected in one form can be used to inform when and how questions or information is displayed in another form within the same application.

Example 4. Form-wise Content Planning Table (multi-form pregnancy application)

Question Code Every question or variable must have its own unique code	When is this question shown? ("Show if" Logic)	Question	Type of Question Examples: label (no data), single answer (multiple choice with only one response allowed), multiple answer (multiple choice with more than one response allowed), integer, decimal, date, phone number, GPS, camera, microphone, barcode, text
Form 1: Client Registration (filled once)			
Name	Always show	Client's full name	Text
Age	Always show	Client's age	Number (integer)
LMP	Always show	Date of last menstrual period (LMP)	Date
EDD	Always show	<i>Application calculates and shows estimated date of delivery based on LMP</i>	Label
Form 2: Pregnancy Checklist (filled at least once per trimester)			
Show_name	Always show	Show client's name	Label (application draws information from client registration form)
Show_edd	Always show	Estimated date of delivery	Label (application draws information from client registration form)
ANM_reg	Show if previous answer to this question is not "yes" <i>[show if previous ANM_reg is NOT = "yes"]</i>	Have you registered your pregnancy with the ANM?	Single Answer (yes, no)
TT1	Show if the woman has registered her pregnancy with the ANM AND has not previously reported that she has had her first TT shot <i>[show if ANM_reg = "yes" AND previous TT1 is not = "yes"]</i>	Have you had your first tetanus toxoid shot?	Single Answer (yes, no)
TT2	Show if the woman reports she has had her first tetanus toxoid shot AND has not previously reported that she has had her second tetanus shot. <i>[show if TT1 = Yes AND previous TT2 is not = "yes"]</i>	Have you had your second tetanus toxoid shot?	Single Answer (yes, no)

DESIGN TIP

For ICT4D forms that are completed more than once for the same beneficiary, “show if” logic can take into consideration not only the beneficiary’s current responses to questions, but also responses given during previous visits. This allows the application to avoid unnecessary repetition of certain questions during multiple visits to the same beneficiary.

Excel-based ICT4D definition files

The Form-wise Content Planning Table (see **Example 4** above) is an intermediate tool for defining ICT4D application content. For program and M&E staff who are just learning to define content, the Form-wise Content Planning Table is potentially the easiest tool for capturing the questions/information and essential details required for ICT staff to build the application. As staff gain familiarity and confidence with the way application content needs to be defined—including “show if” logic and question types—in the Form-wise Content Planning Table, they can begin transferring and further defining content in an Excel-based definition file. With experience, staff might be more comfortable to move directly from defining the application Work Flow Map into content definition using an Excel-based definition file.

Example 5. Screen shot of Excel-based ICT4D Definition File

	A	B	C	D	E	F	G	H	I	J	K
1		CONTENT			HINDI						
2		Date last revised:	6-May-13		Date last revised:	8-May-13					
3		Last revised by:	Marianna		Last revised by:	Satish					
4		keyword - This is a unique one or two key word description of	logic - Logical description on when to	visible text - This text will be displayed on screen. If you are using images, please limit the visible text to one	visible text - hindi	audio description - This text will not be displayed on screen. This is a description of the message that will be played upon pressing the # key. These messages should be reviewed and finalized	audio description - hindi	image description - You may insert a pre-existing image or type a description for a new	type - Prompt type (input, select1, select, label)	required	validation - Logical description of the range of accepted values for this prompt (usually for numeric input fields)
5	#	keyword	show if	visible text - english	visible text - hindi	audio description - english	audio description - hindi	image description	type	required	validation
6	1	full_name	n/a	# Full name	# पूरा नाम	What is your full name?	आपका क्या नाम है?		input (text)	yes	n/a
7	2	age	n/a	# Age	# उम्र	What is your age?	आपकी उम्र क्या है?		input (int)	no	>= 10 and . <= 60
8	3	number	n/a	# Number	# नम्बर	Do you or your family have a phone number? If so what is the number?	क्या आपके पास मोबाइल है? यदि मोबाइल है, तो अपना नम्बर बताइये।		input (decimal)	no	n/a
9	4	husband_name	n/a	# Husband name	# पति का पूरा नाम	What is your husband's name?	आपके पति का पूरा नाम क्या है?		input (text)	no	n/a
10	5	hamlet_name	n/a	# Hamlet name	# गाँव का नाम	What is the name of your	आपके गाँव या मजरे का		input (text)	no	n/a

In an Excel-based ICT4D Definition File (see **Annex 5**), each worksheet corresponds with a different form in the application. In addition to the question code, “show if” logic, question and question type that is detailed in the Form-Wise Content Planning Table, the Definition File allows the staff defining content to include additional information to further strengthen the quality and appropriateness of information shared or data collected through an ICT4D application. Examples of the additional information and content details that can be included in an Excel-based Definition File include:

- Specifying whether a response to a specific question is **required** or not. If required, the application will not advance until the user has entered a response. This helps to ensure data completeness.
- **Constraints** (or validations) for individual questions can be added so that the application only accepts responses within an allowable range or that meet a pre-set criteria. Examples include specifying a valid range of numbers for age, temperature, crop production, allowable date, etc.
- Specifying detailed **audio descriptions** (in English and/or local language) for ICT4D applications that will use audio.
- Specifying **images** for individual questions/labels for applications that will include still images or videos.

Annex 1 – Reflection questions for ICT4D design

- 1. What is the purpose of your ICT4D solution?**
- 2. Who are the users of the ICT4D application?**
- 3. Who are the beneficiaries of the ICT4D application?**
- 4. How often are the beneficiaries visited?**
- 5. What are the different types of visits that could happen with this ICT4D application?**
 - a. Complete Work Flow Planning Table**
 - b. Develop Work Flow Map**
- 6. What questions do you want to ask in each form of the ICT4D application?**
- 7. When is the content/question shown and how is the response recorded in the ICT4D application?**
 - a. Complete Content Planning Table**
 - b. Complete application definition template (Excel)**

Annex 2 – Work Flow Planning Table

Add or remove rows from this table as required.

Type of visit	Information/form required during this visit	How often is this visit conducted/form filled?

Annex 3 – Form-wise Content Planning Table

Remove or add rows and forms to this table as required.

Question Code Every question or variable must have its own unique code	When is this question shown?	Question	Type of Question Examples: label (no data), single answer (multiple choice with only one response allowed), multiple answer (multiple choice with more than one response allowed), integer, decimal, date, phone number, GPS, camera, microphone, barcode, text
Form 1: insert form name			
Form 2: insert form name			
Form 3: insert form name			

Annex 4 – Resources for Standard Indicators

At the Agency level, CRS has been working to define Globally Accepted Indicators (GAIN) since 2008. This work is currently on hold while CRS defines its Beneficiary and Service Delivery Indicators (BSDI). But there is a GAIN site on CRS Global where staff can continue to go to access resources for GAIN indicators for various program sectors.

The GAIN home page is: <https://global.crs.org/teams/GAIN/Pages/default.aspx>

The GAIN page for Indicator Resources and Documents can be found at:

<https://global.crs.org/teams/GAIN/Project%20Documents/Forms/By%20Topic.aspx>

Education

- USAID/FANTA Food for Education Indicator Guide. Available at: http://pdf.usaid.gov/pdf_docs/PNACQ757.pdf

Food Security & Nutrition

- FANTA Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide. Available at: http://www.fantaproject.org/downloads/pdfs/HDDS_v2_Sep06.pdf
- FANTA Months of Adequate Household Food Provisioning (MAHFP) for Measuring Household Food Access: Indicator Guide. Available at: http://www.fantaproject.org/publications/hdds_mahfp.shtml
- USAID’s Feed the Future Indicator Handbook available at: http://www.feedthefuture.gov/sites/default/files/resource/files/ftf_handbookindicators_apr2012.pdf

Health

- BASICS Newborn Indicator Profiles. Available at: <http://www.basics.org/documents/Newborn-Indicator-Profiles-1.pdf>
- WHO’s World Health Statistics 2012 Indicator Compendium. Available at: http://www.who.int/gho/publications/world_health_statistics/WHS2012_IndicatorCompendium.pdf
- MCHIP’s KPC2000+ tools for knowledge, practice and coverage surveys for maternal, newborn and child health and nutrition. This tool has historically been used for baseline and evaluation measurement of projects awarded under USAID’s Child Survival and Health Grant Program. Available at: http://www.mchipngo.net/controllers/link.cfc?method=tools_modules_kpc2009
- Measure Evaluation’s *A Guide for Monitoring and Evaluation Population-Health-Environment Programs* available at: <http://www.cpc.unc.edu/measure/publications/ms-07-25>
- Refer to your country’s Demographic and Health Survey (in India, the National Family Health Survey) for indicators that can also be incorporated into your project. <http://www.measuredhs.com/>

HIV

- PEPFAR: Next Generation Indicators Reference Guide. Available at: <http://www.pepfar.gov/documents/organization/81097.pdf>

WASH

- OFDA WASH Indicator Matrix. Available at: http://www.usaid.gov/sites/default/files/documents/1866/indicator_matrix.pdf
- FANTA Water and Sanitation Indicators Measurement Guide. Available at: <http://www.fantaproject.org/downloads/pdfs/watsan.pdf>

Refugee Programming

- UNHCR's *Practical Guide to the Systematic Use of Standards and Indicators in UNHCR Operations* available at: <https://global.crs.org/teams/GAIN/Project%20Documents/UNHCR%20Practical%20Guide%20to%20Indicators%202004.pdf>

Women and Child Protection

- Measure Evaluation's *Violence Against Women and Girls: A Compendium of Monitoring and Evaluation Indicators* available at: <http://www.cpc.unc.edu/measure/publications/ms-08-30>

Annex 5 – Excel-based ICT4D Definition Template

	question code - This is a unique identifier of the question. It cannot contain spaces (underscores are recommended to link words together)	display logic (show if) - Description on when to show or hide this question with respect to data entered up to this point. You may refer to include questions previously asked in this form or on previous visits.	Required? Please specify if an answer to this question is mandatory or not.	question text - This text will be displayed on screen. If this question has an image, please limit the visible text to a few words so that the image will fit on the screen at the same time.	question text - This text will be displayed on screen. If this question has an image, please limit the visible text to a few words so that the image will fit on the screen at the same time.	question type - describes the type of data the question collects: prompt (no data) open-ended, multiple choice (pick one option), list (pick several options), integer, decimal, date, phone number, GPS, camera, microphone, barcode	values - Possible answers to the question. This may be a list of options (like yes/no, male/female) in case of multiple-choice type question. In case of other type of questions, this column contains the validations. For example a constraint range (between 10 and 100).	audio description - Description of what the audio recording for this question should be.	audio description - Description of what the audio recording for this question should be.	image description - Description of what the image for this question should look like.	Image File - Please specify the image file name	Audio File - Please specify the audio file name
#	Question Code	Display logic (show if)	Required?	Visible question text in English	Visible question text in Local Language	question type	options for multiple choice question OR constraints for open-ended questions	audio description - English	audio description - Local Language	image description	image file?	Audio file?
1												
2												
3												
4												
5												
6												
7												
8												
9												