APPENDIX H

Tip Sheets for Analysis Phase

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TIP – H.1: Data Collection Methodologies

Introduction

There are various techniques to collect data. The methods you choose will depend on the parameters and constraints identified for your project, such as the allotted time to conduct the analysis or the availability of accomplished performers. Once you have decided what data to collect and the best source for the information, you will need to decide which method(s) to use.

Each method has it pros/cons and some may work better than others depending on the particular type of data you are trying to collect. The following information describes each method and provides some basic guidelines to help you decide which method(s) to use. Be sure to document your decisions for your project. See *WS – F1.1 Task Analysis Part 1: Data Collection Plan*.

Tip Sheet Sources

The primary sources for the following information are:

- ASTD 1998 Annual Info-line Collection– The How-To Reference Tool for Training and Development Professionals, Issue 9808, Task Analysis, pages 141 through 143, published by ASTD Alexandria, VA, http://www.astd.org
- Optimizing Human Performance, New Performance Planning Front End Analysis, Job Aid 6, pages 2 through 32, and Appendix 3: Guidelines for Interviewing and Observing , pages 50 through 54, published by SABA as part of their Accomplishment-Based Curriculum Development (ABCD) Human Performance Technologies Series, 1997 edition
- FKA Designing Instruction Workshop – Support Manual ©, Analysis, Guidelines for Gathering Analysis Data, pages 54 through 58, Friesen, Kaye, and Associates, http://www.FKA.com

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TIP – H.1: Data Collection Methodologies, Continued

Individual Interviews

This form of data collection utilizes direct questioning of accomplished performers (APs), subject matter experts (SMEs), supervisors, or others who have significant involvement with task performance. For conducting task analysis, interviewing true APs is the preferred method when resources (time, people, and money) allow for it. The following are some useful points to remember:

- These interviews can be highly structured using standard questions for each interview or open ended, asking respondents to narrate how they perceive a task is performed; use the structure that will ensure the most actuate data at the correct level of detail for your project.
- You make choose to ask questions about how workers currently accomplish the work, as well as gather information about improving the performance of the tasks.
- Carefully plan for the interview(s); determine the levels of data you want to collect and design specific questions based on each level of detail.
- Carefully plan the interview and the steps to be taken during the process; be prepared – ensure there is enough structure to get the desired data efficiently; do not it be too ad hoc.
- Ask for access to someone who is currently performing the work correctly (to standard) and can give you the details of what is done; this would be a ***real*** AP; the individual the supervisor would choose to use as a model for exemplary performance), DO NOT accept just somebody who is available at the time.
- Some on who is considered an SME can provide how they think the work should be done; use SMEs to provide additional “big picture” details, clarification of documentation or policies, as well as the technical reviewer of content. They may also be able to provide historical information and the rationales which can be used to prioritize how the tasks are sequenced in the training material.
- During the interview, avoid using training jargon; speak in plain terms and us his/her language whenever possible.
- You can use interviews to clarify ambiguous or confusing information obtained from other data collections methods such as extant data reviews or observations.

TIP – H.1: Data Collection Methodologies, Continued

Observations

With this form of data collection you will observe individuals performing tasks in their work setting for the job and/or job specialties addressed by your project. Consequently, it will be important for you to keep the following in mind:

- Plan for the site visit to ensure you will be there when the work is being performed; ensure you have a written agenda or outline for what you want to observe (and why), as well as the general questions you want answered.
- Dress appropriately for the environment; particularly any safety requirements such as rubber-soled/non-slip shoes.
- Get permission in advance for any photograph or video-tape you want to take of the work environment.
- Minimize disruptions to the work; follow all safety rules.
- Make sure you explain to workers, their supervisors, and any other key individuals the purpose of your observation(s).
- Take notes on each work task including any key elements of the work such as:
  - What signals and inputs the workers receive
  - The terminology they use
  - Work groups or others that they interact with
  - Evidence that specialties exist within the job or job title

  If possible, talk with the performers about:
  - What a typical work day is like
  - Elements of the job that are most important and what elements are most difficult
  - Things they wish they had learned prior to assuming the position (job specialty)
  - Events that are part of the job but not performed on a routine or predictable basis (i.e. off-normal) and about emergency events
- When an AP is demonstrating or talking through an activity, do not stop him/her to ask a question until the sequence is complete; for example, do not stop the AP to ask to define a term – wait until there is an obvious stopping point.
- Use observation data to validate findings obtained through other data-gathering methods.

TIP – H.1: Data Collection Methodologies, Continued

Focus Group Interviews

This form of data collection is similar to individual interviews because it also utilizes direct questioning techniques; however, the questioning is conducted with groups of APs in the same job or job specialty to come to consensus data about how employees perform the tasks. You may want to consider using this technique when project constraints include limited travel funds or compressed timelines.

In addition to using the guidelines stated in the block of text for "Individual Interviews," the following guidelines should be kept in mind when using this data collection method:

- Encourage members to analyze and discuss various aspects of the job, especially those areas that are problematic or difficult to perform.
- Use this process to determine how cooperative and interdependent roles/job specialties contribute to accomplishing major outputs.
- Keep group members specific to the job or job title and for APs who are currently doing the work; avoid having SMEs participate on same focus group with APs; DO NOT mix officers and enlisted personnel in the same focus group.
- Prepare for and practice any presentations that will be part of the focus group process; for example you may choose to use a PowerPoint presentation to introduce the task analysis data collection procedure that will be used during the focus group or explain how data consensus will be achieved.
- Decide on a process for dealing with unresolved points before you start collecting any data; share with group.

On rare occasions when completing task analysis for resident instruction, there may not be any real APs because the performance is too new to the organization. If this situation occurs, seek guidance from your supervisor. You may need to evolve the accomplished task performance from one or a combination of these sources:

- Designers of the new equipment, system or new policy
- SMEs or other key individuals who can speculate the new performance
- Performers in another organization who have some experience similar to the new performance

TIP – H.1: Data Collection Methodologies, Continued

Extant Data

This term is usually used for printed material, and can include documents such as previous job task analysis, technical manuals, job aids, job descriptions, doctrine/policy. The review of this type of data is generally where you will start the data collection phase. When using this form of data collection, follow these guidelines:

- Prepare an inventory or list of all of the various documents and other forms of extant data; be sure to include the version or published date of the document.
- Before completing a detailed review of the document, decide what you expect to find out, that is, what is the goal for spending the time to review the document; prioritize your document review based on which documents can provide the most accurate information in the largest quantity; this process will result in the most efficient use of your time and produce desired results quickly; don't waste time reviewing material of little value; SME's can help identify high impact extant data.
- Be aware that job descriptions may be written to justify a particular bias and may NOT accurately reflect how the job is actually performed; also confirm initial findings through another data collection method, such as individual interviews or observations.
- Based on your project's data needs, look for sources of information outside of your organization, such as benchmarking studies, professional organizations, or academic publications.
- When reviewing extant data, be on the lookout for concepts; when reviewing content, focus first on identifying and structuring the required information, then focus on getting the information that makes it performance oriented (this way needs to be done through individual interviews/observations).
- Use printed information to supplement other data collection methods; always use other data collection methods to validate/confirm initial findings during extant data review.

TIP – H.1: Data Collection Methodologies, Continued

Surveys and Questionnaires

When using these types of prepared question and answer formats that focus on detailed information about various work activities, you will want to ensure the following:

- Design the survey/questionnaire with the help of an SME to ensure that the questions are focused and accurate.
- Test the survey/questionnaire with a sample group of workers to verify that its directions are clear and easy to understand and that it's navigation works as designed, such as the survey branching to other questions based on the "yes" or "no" response of the survey taker.
- Use a survey/questionnaire when you need to gather data from a large number of geographically dispersed workers or to add validity to data gathered from other methods.
- When designing the survey/questionnaire exclude information that can be obtained from other sources, that is information already known about the problem or opportunity, or that the respondent cannot supply.
- Identify the survey participants: who will get the survey (and why)? Will it be sent to a representative sample of the target population or to APs? Will SMEs or supervisors be included?
- Identify the type of demographic information needed to filter or sort the survey results, for example if you will need to sort the survey results between afloat and shore units, your survey will need to ask the respondents to indicate the type of unit they are assigned to.
- This method requires some expertise in developing survey questions, ensuring the relationship of the data in survey design and creating the correct flow through the various survey navigation techniques using the CG's approved web-hosted (on-line) survey tools.

TIP – H.1: Data Collection Methodologies, Continued

Other Methods

These methods for collecting data are not used as frequently as those described earlier in this session. However, they may be useful in some particular situations and have been included for your consideration.

Checklist: Providing a checklist to the worker for choosing the tasks associated with performing a job can sometimes be a useful tool, but they involve some precautions. The use of checklists requires:

- Recognition rather that recall; this is simpler for the respondents and less time consuming than individual interview and/or observations; however, the information gathered may be limited, particularly in relation to task sequencing, relationships between tasks and worker-machine interface.
- Extensive preliminary work to identify the tasks for including; this preliminary work could involve interviews, observations, questionnaires, or some other means which could increase the overall time allocated for data collection if not managed appropriately.

Diaries: This method requires workers/participates to organize activity schedules and to follow schedules by keeping logs and records for their daily activities. When using this method, remember the following:

- This method is time consuming and disruptive for the worker, which could result in inaccurate or missing data.
- Can be used to determine the frequency of the task performance.

Additional Resources

For more information on conducting focus groups or facilitating groups see:

- ASTD 1999 Annual Info-line Collection– The How-To Reference Tool for Training and Development Professionals, Issue 9907, How to Conduct Focus Groups, pages 114 through 129, published by ASTD Alexandria, VA, http://www.astd.org
- Facilitating with Ease – A Step-by-Step Guide with Customizable Worksheets on CD-RM, written by Ingrid Bens, published 2000 by Jossey-Bass, in San Francisco CA

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TIP – H.2: Flowcharting Guidelines

Introduction

Flowcharting can be extremely helpful to you during the analysis phase. You have already learned that there are various ways to collect data (see *Tip – H.1 Data Collection Methodologies*). Flowcharting provides a way to graphically represent the job, the job specialty, or the associated tasks all the way down to the step level of data.

A flowchart provides a picture of the relationship of the signals, behaviors, and resulting outputs (accomplishments) for various levels of data details. For example, at the beginning of your project you may only be interested in the general flow of major outputs of a job or job specialty. However, as you need to make more detailed decisions about the actual performance needed to produce the major outputs, a flowchart can be used to gather more and more detail.

Tip Sheet Source

The primary source for the following information is:

> Optimizing Human Performance, New Performance Planning Front End Analysis, Job Aid 6, Appendix 1: Flow Charting, pages 39 through 43, published by SABA as part of their Accomplishment-Based Curriculum Development (ABCD) Human Performance Technologies Series, 1997 edition

One Basic Rule

When using this process for the Analysis phase, particularly with Task Analysis, use this rule of thumb:

Only flowchart to the level of detail required to reveal the elements needed by the stage of analysis at which you are currently working.

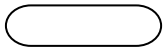
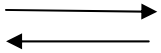
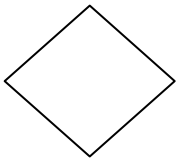
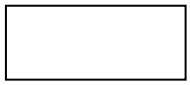
For example:

If you are producing ….	Then flowchart to a level which will reveal the elements of…
A general job level overview	Major signals for starting job outputs, general behaviors, and job accomplishments (outputs)
A list of major outputs for a job specialty, grouped by normal, off-normal, and emergency operations	• The signal/start for each major output • Behaviors • The major outputs (accomplishments)
A list of tasks for each major output	The signal/start for each task and the sequence of the tasks to produce each major outputs (accomplishments)

TIP – H.2: Flowcharting Guidelines, Continued

Basic Symbols

There are several universal symbols used to graphically represent a particular behavior in the flowchart process. However, when using this process to graphically represent a job and the associated behaviors/tasks and major outputs, you can do it with the following five (5) basic flowcharting shapes. You read a flowchart by following the lines with arrows from shape to shape. The shape of the symbol makes it easy for the reader to recognize what is happening in the situation that is being flowcharted.

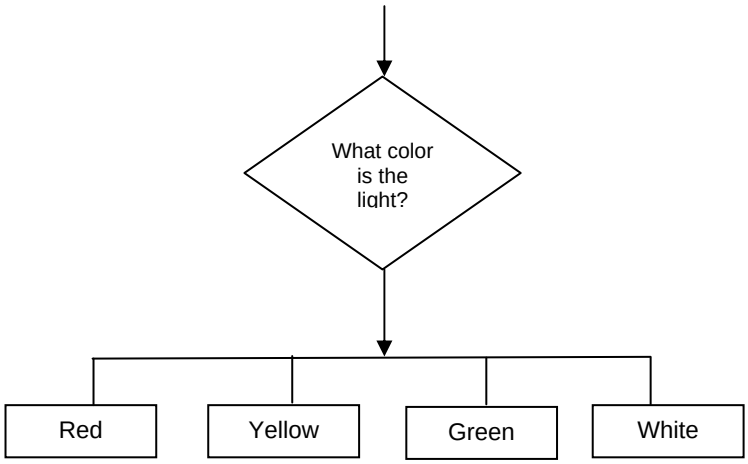
Shape	Meaning
	**Start / End** – This shape tells you where the flowchart begins and ends; flowcharts usually have one starting point but can have multiple end points.
	**Directional Arrows** – Indicates the flow or sequence of actions through the chart; charts usually flow from top to bottom or left to right; you read the flowchart by following the arrows from shape to shape.
	**Decision** – Asks a question, and the answer to the question determines which directional arrow you follow when leaving the shape. The arrows are usually labeled “yes” or “no”, but you can label them any way you want as long as the meaning is clear. The shape has one (1) “input arrow” and can have two (2) or three (3) exit points. If you need more than 3 points, see the first block of text on the next page.
	**Action** – The rectangle is the most common shape used to show a process, task, operation or other action. It shows something that has to be done or an action that has to be taken. The text in the shape almost always includes a verb.
	**Connects** – this shape is used when you need to connect to another page or section of the chart. Draw a directional arrow to the connecting shape and label the circle with a letter. Copy the shape with the letter to the start of the flowchart on the page that you want to connect to. This activity should be avoided, but sometimes it may be necessary due to the complexity of the “action” being charted.

You do not have to use these symbols to construct your flowcharts you will need to produce to support your task analysis efforts as long as you include each element (stimulus, behavior, task, steps, output, accomplishment, etc.) in its own box of information.

TIP – H.2: Flowcharting Guidelines, Continued

When You Need More than Three Exit Points

If you need for more than three possible exit points from the decision shape, then use the following or similar tactic for representing the correct number of possible responses to the text in the decision shape:



Software Tools

This process can be labor intensive, if you try to construct and maintain the flowcharts manually. The following two tools are optional flowcharting software tools that have been approved for use on the CG standard workstations. If you do not already have access to these tools, check with your supervisor for gaining access.

- Microsoft Office: Visio 2007
- Mindjet – MindManager 8

You should also keep in mind that Word and PowerPoint programs in the Microsoft 2007 Office Suite also have flowcharting shapes that can be added via the “Insert” tab located in the ribbon header.

Flowcharting Summary

Flowcharts are very helpful in understanding a complicated process, particularly when there are many decisions and different actions/steps associated on those decisions. By looking at a flowchart you can visually follow the different paths in the chart to see if action paths can be combined or eliminated for efficient execution of the task. When constructing the chart, the flow of the task can be a linear pathway (in a straight line with one action after the next) or have a branched pathway if decisions are involved.

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TIP – H.3: Learner Motivation – Why This Might Be Important

Introduction

People approach learning with varying degrees of motivation. Some enthusiastically pursue any new information and enjoy learning for learning's sake. However, others are reluctant learners even when their jobs depend on it. Assessing learner motivation can seem confusing when you first begin, however there is a lot of value in learning how to do this correctly and knowing when it should be used. Use this tip sheet when your target audience analysis indicates that the learner's motivation or attitude may have some influence on the learning outcome.

Tip Sheet Sources

The primary sources for the following information are:

- Building Expertise – Cognitive Methods for Training and Performance, by Ruth Colvin Clark, Chapter 15 – Motivation and Expertise and Chapter 16 – Motivating your Learners, pages 337 through 375, Third Edition, 2008, published by Pfeiffer, San Francisco, CA
- *Planning, Packaging, and Presenting Training – A Guide for Subject-Matter Experts*, by Gene E. Custer, pages 42 through 55, published by University Associated Inc, San Diego, CA, 1986

What is Motivation

Ms. Clark defines motivation as, "the mix of beliefs that causes one to initiate a learning activity, to adopt goals related to the activity, to invest effort to achieve the goals and to reflect on outcomes in ways that lead to improved and sustained effort. Beliefs are the fuel that trigger and sustain these activities."

Why is Motivation Important

Successful learning is serious and, sometimes, hard work. But that does not mean that the learning process has to be harder than it needs to be. Understanding how your target audience learns best and understanding how motivated they are to attend the training can go a long way to designing and delivering a successful course. Based on Ms. Clark's definition of motivation, it would be very difficult, if not impossible, to teach someone to be motivated to learn without first addressing his/her belief structure. However, it is possible to promote productive belief learning goals by choosing the right instructional strategies and creating motivational environments that promote learning.

TIP – H.3: Learner Motivation – Why This Might Be Important, Continued

Creating a Environment for Success

Research has revealed that motivation beliefs are related to self-confidence and/or self-control, interest in the content, and task value. The instructional environment you create can help learners adopt more productive beliefs about themselves and their learning outcomes. The following list is from Chapter 16 of Mr. Clark's book and includes some suggested strategies for helping to set up a successful learning environment.

- Promote self-confidence by structuring for success by:
    - Constructing tasks of optimal challenge
    - Matching the instructional architecture with learner background knowledge and skills
    - Assigning relevant practice with feedback
    - Incorporating social models of success
    - Offering guidance regarding course prerequisites
- Encourage Mastery (Progress) Goal Orientations
    - Establish a criterion-reference learning environment
    - Encourage attributions to control causes
    - Establish technique goals as well as outcome goals
- Exploit personal and situational (emotional or cognitive) interest by correlating with lesson content
    - Techniques to promote cognitive situational interest:
        - Write understandable and coherent lessons
        - Use language and examples that are concrete and vivid
        - Use conversational tone to engage readers through personalization
        - Present new content in familiar terms
    - Leverage personal interest to make content understandable
    - Make relevance of content explicit to create value

TIP – H.4: Target Audience Characteristics – Design Factors

Introduction

Determining which target audience characteristics are relevant factors for your project can often be challenging. Remembering that the reason for conducting the analysis is to determine any specific differences which could influence the effectiveness of the training, can help you focus on the important factors. The following information provides some guidelines as to how a particular target population factor can influence your design considerations for the resident training program you are going to develop.

Tip Sheet Source

The information in this tip sheet has been adapted from the following source:

FKA Designing Instruction Workshop – Support Manual ©, Analysis, Population Factors, pages 45 – 47
Friesen, Kaye, and Associates, http://www.FKA.com

Directions

Locate your target audience relevant or key characteristic in the "Population Factor" column to determine the "Design Considerations" for your instructional program. Refer to the Glossary for term definition.

Target Audience Characteristics – Design Factors Tip Sheet		
Category	**Population Factor**	**Design Considerations**
1. Aptitude / Abilities	Current knowledge of work or subject matter area (Work experience)	• Examples • Detail of content • Amount of practice • If limited or no experience, need to paint realistic picture of the job
	Current job	• Examples • Motivation
	Current performance	• Amount of practice • Transition strategy
	Relevant background and experience (Related experience)	• Amount of practice • Transition strategy • Detail of content

Continued on next page

TIP – H.4: Target Audience Characteristics – Design Factors, Continued

Directions, Continued

Target Audience Characteristics – Design Factors Tip Sheet		
Category	**Population Factor**	**Design Considerations**
2. Tools & Prerequisite Skills	Specific tools and prerequisite skills	• Availability of equipment/tools • Amount of practice • Detail of content • Examples • Class size and/or scheduling of sessions
3. Learning and Language Preferences	Vocabulary or terminology understanding • Technical • Non-Technical	• Examples • Detail of content • Amount of practice • If limited or no experience, need to paint realistic picture of the job
	Overall language skill level (mastery of spoken and written language)	• Choice of vocabulary • Clarity of directions • Amount of facilitation • Timing for exercises/practices • Amount of writing required • Type of non-performance questions • If low, more emphasis on demonstration and more use of visual images
	Overall reading skill level	• Reading level of course materials • Amount of reading required • If advanced, may be able to capitalize on independent learning skills • Use of complementary graphic, narrations, etc.
	Overall math skill level	• Job aids • Use of calculators • Timing for exercises/practices
	Overall computer literacy level	• Use of computer as a training tool • Use of computer related examples • If advanced, may be able to capitalize on independent exercises/practices • Timing for exercises/practices

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TIP – H.4: Target Audience Characteristics – Design Factors, Continued

Directions, Continued

Target Audience Characteristics – Design Factors Tip Sheet		
Category	**Population Factor**	**Design Considerations**
3. Learning and Language Preferences. continued	Overall verbal communication and interpersonal skill level	• Amount of discussion • Degree of facilitation • Presentations by learners • Mix of individual and group methods • If low, use care in choosing group method • If low, more attention to set-up for group method
	Learning preference	• Strategy • Methods • Media
4. Attitudes	Attitude to organization	• Review of expectations • Time to establish positive atmosphere • Transfer strategy • If negative/resistant, strong facilitation needed
	Attitude to job	• Review of expectations • Time to establish positive atmosphere • Motivation • Transfer strategy • If negative/resistant, strong facilitation needed

	Attitude to training	• Review of expectations
		• Time to establish positive atmosphere
		• Motivation
		• Transfer strategy
		• If negative/resistant,
		  o strong facilitation needed
		  o provide lots of opportunity for learners to contribute knowledge and experience
		  o be sure to involve learner population during design & development, whenever possible
		  o give more weight to learning preferences

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TIP – H.4: Target Audience Characteristics – Design Factors, Continued

Directions, Continued

Target Audience Characteristics – Design Factors Tip Sheet		
Category	**Population Factor**	**Design Considerations**
5. Audience Specifics	Overall length of time with the organization	• Time to establish atmosphere • Grouping for training sessions (when mixed experience levels) • Methods, media • Examples
	Age	• Examples • Methods
	Gender	• Meaning and respectful media images • Mix of collaborative and competitive methods • Examples
	Culture or heritage	• Meaning and respectful media images • Examples • Types of group activities • Amount of interaction