APPENDIX G—PERFORMANCE MEASUREMENT

PURPOSE

Performance measurement is the process whereby an organization establishes the parameters within which programs, investments, and acquisitions are reaching the desired results in support of mission goals. Performance measures are set during the Select Phase and assessed during subsequent phases. The focus of performance measurement is on outcomes, or how well the IT investment enables the program or agency to accomplish its primary mission. Consequently, performance measurement should look beyond measures of input (resource consumption), activities (milestones), and output (production numbers), which are more directly related to operational performance. This focus, however, does not imply that input, activity, and output measures are not useful. Indeed, internal measures are used to track resources and activities and make necessary adjustments since investments are only successful if hardware, software, and capabilities are delivered on time and meet specifications.

Performance is evaluated using two criteria—effectiveness and efficiency. Effectiveness demonstrates that an organization is doing the correct things, while efficiency demonstrates that an organization is doing things optimally. New acquisitions and upgrades should include a business case indicating the investment will result in effectiveness or efficiency improvements. For example, a new computer network might result in enhanced efficiency because work is processed faster, digital images are transferred among remote sites, or messages are transmitted more securely. Some questions that facilitate performance measure development include:

- What product will be produced, shared, or exchanged?

- Who will use the results?

- What decisions or actions will result from delivery of products from this system?

Answers to these questions will help Project Managers develop effective performance measures with the following characteristics:

- Strategically relevant
  - o Directed to factors that matter and make a difference
  - o Promote continuous and perpetual improvement
  - o Focus on the customer
  - o Agreed to by stakeholders.
- Short, clear, and understandable
  - o Measurable/quantifiable
  - o Meaningful.
- Realistic, appropriate to the organizational level, and capable of being measured.
- Valid
  - o Link to activity and provide a clear relationship between cause and effect
  - o Focus on managing resources and inputs, not simply costs
- Discarded when utility is lost or when new, more relevant measures are discovered.

PROCESS

Outcome-based performance measures are developed through a series of steps. It is important to understand that developing measures is only one part of the more comprehensive process. After measures are developed, baseline information is gathered if it does not already exist, and performance

information is collected, analyzed, interpreted, and used throughout the investment's life. These steps require a commitment of management attention and resources.

The following five steps are recommended to establish performance measures:

1. Analyze how the investment supports the mission goals and objectives and reduces performance gaps
2. Develop IT performance objectives and measures that characterize success
3. Develop collection plan and collect data
4. Evaluate, interpret, and report results
5. Review process to ensure it is relevant and useful.

Steps one to three are completed during the Pre-Select and Select Phases. Steps four and five are completed during the Control Phase, with follow-up during the Evaluate and Steady-State Phases. Each of these process steps is defined in the following sections.

1. Analyze How the Investment Supports the Mission and Reduces Performance Gaps

Effective outcome-based performance measures are derived from the relationship between the new investment and how users will apply investment outputs. Specifically, the users' mission and critical success factors (those activities and outputs that must be accomplished if users are to achieve their mission) must be clearly understood. The critical element of this step is linking proposed and in-process IT investments and activities to the user mission and critical success factors.

This concept is often described as a method of strategically aligning programs and support functions with the agency's mission and strategic priorities. The first step in effectively developing outcome-based IT performance measures is to identify the organization's mission, the critical tasks necessary to achieve the mission, and the strategies that will be implemented to complete those tasks. One structured method of accomplishing this step is to develop a Logic Model linking the mission to IT performance measures. An example of a Logic Model is provided in Figure G-1—Example of Logic Model.

Figure G-1. Example of Logic Model[1]

USDA—Rural Development
Dedicated Loan Origination and Servicing System (DLOS)

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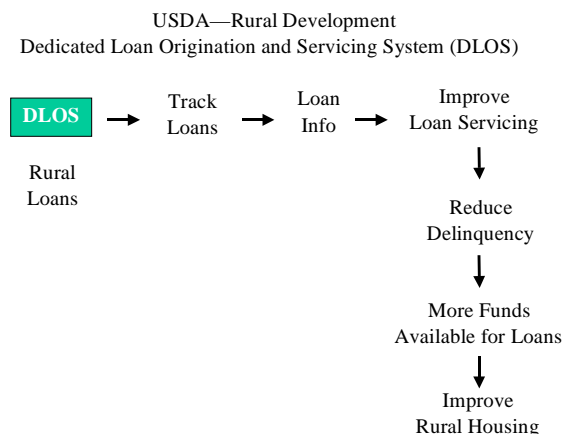
1 DLOS model from the Rural Development's Rural Housing Service.

Answers to the following questions will aid logic model development:

- Identify the system or the left most box. What will the system do? What are major functions or features that the system will provide (i.e., what functionality or information)? Is this system a stand-alone system or is it used or integrated with another large system? What is the purpose of that system? How is it used?

- What aspects of the system, service, and information quality are needed for the system to perform optimally or acceptably?

- Identify who will use the system. What is the principal business task they perform? How will using the system help them with that task?

- How does completion of that task contribute to a business function?

- How does completion of the business function contribute to achievement of the program goals?

- How does completion of program goals contribute to organizational goals?

- How does completion of organizational goals contribute to Departmental goals?

- Determine whether there are related IT investments that impact the mission area and goal(s) selected. Understand the relationships between various IT investments that address the same or similar needs. This will help identify potential areas for consolidation.

Once the mission is clearly defined, a gap analysis is performed to understand how IT can improve mission performance. The analysis begins with the premise that IT will improve effectiveness, efficiency, or both. To accomplish this, requirements are defined and the following questions are answered:

- Why is this application needed?

- How will the added functionality help users accomplish the mission?

- How will the added functionality improve day-to-day operations and resource use?

The investment initiation and requirement documentation also describes gaps between the current and future mission and strategy in terms of how overall efficiency and effectiveness will be improved. Project managers assist users in developing a baseline measurement of the current IT use and in comparing the baseline to the business objective to identify gaps. This analysis defines the investment need as the basis for determining what success will look like (e.g., the investment is successful when the gap is reduced by "x" amount).

2. Develop IT Performance Measures that Characterize Success

Well-designed performance measures define success parameters for the IT initiative. The following questions should be asked for each performance measure and answered affirmatively before deploying the measure:

- Is it useful for monitoring progress and evaluating the degree of success?

- Is it focused on outcomes that stakeholders will clearly understand and appreciate?

- Is it practical? Does it help build a reliable baseline and cost-effectively collect performance data at periodic intervals?

- Can the performance measure be used to determine the level of investment risk and whether the investment will meet performance targets?

Answering these questions affirmatively results in an agreement that the IT investment, by supporting improvements identified earlier, will support organizational goals and objectives. Additionally, it will help limit the number of performance measures and focus management attention on the requirements that have the greatest priority or impact. After three to five major requirements have been identified, the following questions are asked:

- What are the performance indicators for each major requirement?

- How well will those outputs satisfy the major requirements?

- What additional steps must be taken to ensure outputs produce intended outcomes?

- How does this IT investment improve capabilities over the current method?

Once requirements to be measured are identified, determine when each requirement is met. Some requirements may need to be changed if they are too difficult to measure. Or, if the requirement has indirect rather than direct outcomes, it may be necessary to use "surrogate" performance measures that mirror actual outcomes. For example, it is difficult to measure the direct benefit of computer-based training (CBT) systems. In this case, a surrogate measure might be the percentage of staff achieving certifications through the CBT with implications that certified staff are more desirable than non-certified staff because they have demonstrated initiative and are more proficient.

Of the possible performance indicators, select one or more to report performance against each requirement. One performance indicator may provide information about more than one requirement. The objective is to select the fewest number of performance indicators that will provide adequate and complete information about progress.

Selecting the fewest performance indicators necessary is important because data collection and analysis can be costly. The cost is acceptable if the benefit of the information received is greater than the cost of performance measurement, and if the data collection does not hinder accomplishment of primary missions. Costs are calculated by adding the dollars and staff time and effort required to collect and analyze data. When calculating costs, consider whether they are largely confined to initial or up-front costs, or will occur throughout the IT lifecycle. For example, the cost of developing and populating a database may have a large initial cost impact but diminish significantly for later maintenance. Answers to the following questions will help to determine the cost of tracking a specific performance indicator:

- What data are required to calculate the performance measure?

- Who collects the data and when?

- What is the verification and validation strategy for the data collection?

- What is the method to ensure the quality of the information reported?

In addition to determining costs, it is also necessary to determine the baseline performance, target performance, and expected time to reach the target. The baseline value is the start point for future change. If performance measures are currently in use, the data collected can provide the baseline. Otherwise the manager must determine the baseline by a reasonable analysis method including the following:

- Benchmarks from other agencies and private organizations

- Initial requirements

- Internal historical data from existing systems

- Imposed standards and requirements.

To determine the target value, obtain stakeholder agreement regarding the quantifiable benefits of the new system. These targets may be plotted as a function over time, especially for IT investments that are being installed or upgraded or as environmental factors change. However, incremental improvement is not necessarily success. The targeted improvement from the baseline must be achieved within the designated timeframe to be counted as a success.

3. Develop Collection Plan and Collect Data

To ensure performance data is collected in a consistent, efficient, and effective manner, it is useful to develop and publish a collection plan so all participants know their responsibilities and can see their contributions. The collection plan details the following items:

- Activities to be performed
- Resources to be consumed
- Target completion and report presentation dates
- Decision authorities
- Individuals responsible for data collection.

In addition, the collection plan answers the following questions for each performance measure:

- How is the measurement taken?
- What constraints apply?
- Who will measure the performance?
- When and how often are the measurements taken?
- Where are the results sent and stored, and who maintains results?
- What is the cost of data collection?

While costs should have been considered during the previous step, the actual cost will be more evident at this stage. Excessively costly performance measures may require project managers to find a different, less costly mix of performance measures for the IT investment. Or it may be necessary to creatively collect the measures to reduce collection cost. For example, a sampling may produce sufficiently accurate results at significantly less cost than counting every occurrence, and some results can be automatically generated by the system and accessed through a standard report.

To ensure data is being collected in a cost-effective and efficient manner, it is important to ensure the data collectors are involved in developing performance measures. The collectors will do a much better job if they believe the performance measures are valid and useful, and they will have insight regarding the best way to collect the data.

4. Evaluate, Interpret, and Report Results

Performance measures are useful in monitoring the investment against expected benefits and costs. To evaluate performance, data is compiled and reported according to the collection plan that was previously constructed. The data is then evaluated and the following questions are answered regarding the collected data and the investment's performance:

- Did the investment exceed or fall short of expectations? By how much and why?
- If the data indicates targets are successfully reached or exceeded, does that match other situational perceptions?
- What were the unexpected benefits or negative impacts to the mission?

- What adjustments can and should be made to the measures, data, or baseline?
- What actions or changes would improve performance?

This evaluation reveals any needed adjustments to the IT investment or performance measures. It also helps surface any lessons learned that could be fed back to the investment management process.

5. Review Process to Ensure It Is Relevant and Useful

Performance measures provide feedback to managers and help them make informed decisions on future actions. To ensure that performance measures are still relevant and useful, answer the following questions:

- Are the measures still valid?
  - o Have higher-level mission or IT investment goals, objectives, and critical success factors changed?
  - o Are threshold and target levels appropriate in light of recent performance and changes in technology and requirements?
  - o Can success be defined by these performance measures?
  - o Can improvements in mission or operations efficiency be defined by the measures?
  - o Have more relevant measures been discovered?
- Are the measures addressing the right things?
  - o Are improvements in performance of mission, goals, and objectives addressed?
  - o Are all objectives covered by at least one measure?
  - o Do the measures address value-added contributions made by overall investment in IT and/or individual programs or applications?
  - o Do the measures capture non-IT benefits and customer requirements?
  - o Are costs, benefits, savings, risks, or ROI addressed?
  - o Do the measures emphasize the critical aspects of the business?
- Are the measures the right ones to use?
  - o Are measures targeted to a clear outcome (results rather than inputs or outputs)?
  - o Are measures linked to a specific and critical organizational process?
  - o Are measures understood at all levels that must evaluate and use them?
  - o Do the measures support effective management decisions and communicate achievements to internal and external stakeholders?
  - o Are measures consistent with individual motivations?
  - o Are measures accurate, reliable, valid, and verifiable?
  - o Are measures built on available data at reasonable costs and in an appropriate and timely manner for the purpose?
  - o Are measures able to show interim progress?
- Are measures used in the right way?
  - o Are measures used in strategic planning (e.g., to identify baselines, gaps, goals, and strategic priorities) or to guide prioritization of program initiatives?
  - o Are measures used in resource allocation decisions and task, cost, and personnel management?
  - o Are measures used to communicate results to stakeholders?