



The Performance Technologist's Toolbox

Process Mapping

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This article on process mapping is the fourth in The Performance Technologist's Toolbox series on data collection methods.

Process mapping is the step-by-step description of the actions taken by workers as they use a specific set of inputs to produce a defined set of outputs. The resulting process maps depict the inputs, the performers, the sequence of actions the performers take, and the outputs of a work process in a matrix or flowchart format, usually combining both words and simple graphics. The maps may also include the elapsed time required to perform each step, the feedback the performers receive, conditions of work, consequences, and other elements.

Process mapping is also known as system task analysis, process task analysis, process diagramming, and work mapping (Langdon, 1999, 2000; Marrelli, 1998; Siever, 1993; Swanson, 1994; West, 1997).

Depending on the span of the process of interest, a process map may focus on an entire organization, a business unit, a division, a function, a work group, or even an individual performer. If the process involves a complex entity such as a business unit, a series of maps may be produced beginning at the highest level, for example, the business unit, and then proceeding to lower levels such as division and work group (Langdon, 1999).

Process mapping is typically conducted by a facilitator working with a small group of performers who are especially knowledgeable about the process. This group often includes the process owner, top performers, and representatives of each work group that participates in the process. The facilitator prompts the group to define the work groups involved, the process inputs and tasks, the sequence of tasks, the resulting outputs, and any other elements of importance. One popular approach is to cover a wall with a very large sheet of paper and write each process element on adhesive-backed notepaper. The notes are arranged and rearranged in sequence until stakeholders are satisfied that the process is accurately and comprehensively portrayed. Another approach is to enter each process element into a software program that automatically organizes the information into a process map. One example is JobKnow®, a program developed by the International Society for Performance Improvement members Danny Langdon and Kathleen Whiteside (Performance International, 2005). A draft of the process map is then circulated to a larger group of employees for review and comment before the final map is prepared (Langdon & Marrelli, 2002; Marrelli, 1998).

Figure 1 shows a simplified example of a process map for catalog orders.

Applications of Process Mapping in Performance Technology

Performance and Cause Analysis

Process mapping can be a powerful tool for both identifying performance improvement needs and determining the underlying causes of performance problems. Once a process is mapped, it is easy to spot redundancies, omissions, insufficient work support, ineffective communication and workflow, and other obstacles that impede the performance of work (Langdon, 2000; Marrelli, 1998; West, 1997). For example, when my team mapped a civil service examination appeals process that involved six employees, we noticed that the same appeal returned to the desk of four of the employees at least three times in the course of the process. The repetitive workflow was clearly an obstacle to efficient resolution of the appeals.

Job Analysis

Process mapping can be an excellent data collection method for identifying job duties and tasks because in defining a work process we are describing the specific actions each person takes. It also offers a systemic view of work, so we see each employee's work in the context of the complete workflow and interactions with others rather than only studying the work of one person at a time.

Competency Modeling

Process mapping can also provide an efficient technique of data collection for competency modeling. Langdon (2000) suggests using each element described in the process map as

a framework for competency identification. After the process map is completed, a small group of top performers identifies the competencies needed for each element (e.g., inputs, process steps, feedback). For example, for each process step, the performers name the competencies they need to successfully execute that step (Langdon & Marrelli, 2002).

Instructional Needs Analysis

A process map can be an excellent approach to identifying the content that should be included in an instructional course, manual, or job aid intended to help workers execute a process. The detailed step-by-step descriptions included in process maps provide a clear and concise blueprint for content. As a quick overview of a process, the maps also provide a handy job aid for employees.

Organizational Development

For organizational development initiatives such as business process improvement, workflow designs, or reorganizations, process mapping offers an excellent approach to understanding the current "as is" state and a detailed, visual guide to areas for improvement (Langdon, 1999, 2000; Marrelli, 1998; Siever, 1993; Swanson, 1994; West, 1997). As the project continues through the design stage, process mapping can be used to develop a prototype of the re-design and check its effectiveness (Marrelli, 1998).

Communication

Many people in organizations find it easier to understand performance problems and their consequences when they see a

Catalog Telephone Order Process					
Performer	Process Steps				
Customer	1. Calls service center and is routed to first available associate.	2. Tells associate the catalog numbers of items selected.			
Sales Associate		3. Enters order into computer system as customer talks.			
Picker		4. Receives batch of orders with item numbers via computer.	5. Fills each order by picking items from warehouse shelves and placing in tub.	6. When has picked 25 orders, brings them to packing.	7. Enters the 25 order completions in computer.
Packer					8. Packs and labels each order and delivers to shipping.
Shipper					9. Enters orders as "shipped" in computer and loads on truck.

Figure 1. Simplified Example of a Process Map.

visual depiction. The data collected in process maps are often more compelling to executives and managers, for example, than a narrative report or an oral presentation. They often seem to more quickly grasp the nature of performance challenges and their negative impact when they see a process map.

Evaluation

After an intervention involving organizational design is implemented, process mapping can provide a helpful method for evaluating the effectiveness of both the design and its execution. It provides data on how the design is actually being implemented and identifies both successes and problem areas. Process mapping can be a good data collection tool for before/after evaluation designs: the target work process is mapped before and after design and the maps are compared for efficiency and effectiveness of process execution.

Advantages and Disadvantages of Process Mapping

As a method of data collection, process mapping has both advantages and disadvantages.

Advantages

- Process mapping helps the performance technologist develop a systems view of a situation, because the map highlights the interactions of several individuals or work groups and how the work of one entity is affected by the work of another.
- Creating the maps guides one through a thorough step-by-step appraisal of a performance situation.
- The mapping technique can be adapted to studying the work of entire organizations or business units, functions, work groups, or individuals.
- As much or as little detail as is needed for decision making can be collected.
- Process mapping requires a small investment of time and employee involvement in order to collect a large amount of valuable data.
- Employees are usually very comfortable describing their work processes and do not hesitate to provide candid information.
- Completed process maps can also serve as effective educational and communication tools.
- Process mapping provides straightforward data that require little or no interpretation.

Disadvantages

- Process mapping typically is based on input from only a small group of employees. However, wider input can be achieved by circulating the draft map to a larger group for review and feedback.

- It requires a high level of facilitation skill to guide a group through the process mapping exercise.
- Persons who do not like working with detail can find it very difficult to sit for the time usually required to create a process map.
- As with most data collection methods, the quality of the data collected depends heavily on the accuracy of the information provided by participating employees.

Guidelines for Process Mapping

Plan

The first step is to clearly define the process to be mapped; then designate the boundaries of the process (see Langdon, 1999; Siever, 1993; West, 1997). What are the triggers that begin the process? What are the outputs or consequences that end the process? The next step is to determine the organizational levels to be included in the process map. Is this a process that cuts across business units, or is it confined to a single business unit? Does the process involve several functions or just one? How many work groups are involved?

Another important and difficult step is to determine the level of detail that will be included in the process map. For example, will only key process steps be included, or will specific tasks within steps also be portrayed? Will individual assignments be noted or just overall work group responsibilities? The process elements to be described in the map must also be defined. Process inputs, outputs, action steps, and performers should be included in all process maps. Optional elements include the time required to complete each step, feedback to the performer, consequences of the outputs, work environment, and other attributes of the process (Langdon, 1999).

The media and format used to create the process map also require planning. Will a computer software program or a manual process be employed? Will the map be formatted using a simple matrix or a complex workflow diagram with different symbols for activities, inputs/outputs, decisions, connecting points, storage places, etc.? Also important in ensuring success is planning the logistics of the process mapping session such as meeting rooms, food (it's a lot easier to keep people in a room for several hours if they are fed), mapping materials (e.g., wall-size mapping paper, markers, adhesive notes), and computers.

Form and Train the Process Mapping Team

It's important to carefully select the people who will form the process mapping team. The team should include the process owner, the individual with overall responsibility for the routine management of the process, and the employees who play key roles in the process. If many employees participate in the process, it will be necessary to select a representative from each work group. It is usually best to limit the team to eight to ten people to keep the process manageable.

Before the actual process mapping session, schedule a training session of about three hours. The training should review the basic concepts and methods of process mapping before the team works together to map a familiar process, such as planning a vacation or hosting a festive party. This type of mapping practice can be very effective in preparing the team to efficiently map the target process.

Conduct the Session

There are several different approaches that may be used in process mapping. The steps below describe one manual approach using a matrix format; the key tasks of identifying work groups and process steps are the same for both manual and computer-based methods.

1. Before the session begins, prepare the mapping paper.
Tape a roll of paper about five feet wide and 10 feet long to a wall.
 - With a black marking pen, draw a vertical line down the entire width of the paper about 12 inches from the left margin.
 - Draw nine horizontal lines across the entire length of the paper about six inches apart.
 - Write “Work Groups” (or another entity you have chosen for the assignment of process steps) at the top of the first, narrow column.
 - Write “Process Steps” in the middle of the second, wide column.
2. When the team assembles, begin with a quick review of the mapping process, and then reach consensus on the work groups or other entities involved in the process. Write the name of each entity in one of the cells in the first column on the mapping paper.
3. Lead the team through identifying each step in the process. As each step is identified, write it on an adhesive note and place the note in the row of the entity that performs that step. Use different colors of notes to indicate small differences in process steps. For example, for some processes there may be different steps for hourly and salaried employees. In this case, yellow notes could be used for hourly employees, blue for salaried employees, and green for all employees. (Note: If the process varies significantly for different employee populations or situations, it is best to create separate maps for the different situations.)
4. When all process steps have been agreed on and placed on the map, walk through the map step by step and discuss any changes or additions that need to be made. Rearrange, add, or discard the adhesive notes as needed.
5. Review the revised map again with the team and make any further changes or additions.
6. Number the steps by placing sequential numbers in the upper right-hand corner of each note. If steps occur concurrently, assign them the same number and add a lower case alphabetic letter, e.g., 2a, 2b, 2c.

7. Assign each work group an upper-case alphabetic letter and write the letter in the work group’s cell in the first column. For each process step, identify the work group that performs the step by writing the work group letter in the lower left-hand corner of each note. (This lettering helps identify the proper work group in the event that the note comes loose from the map.)
8. Before the team adjourns, review all acronyms, abbreviations, or special terms written on the notes to ensure they are understood by all and consistently used.
9. Tape each note to the mapping paper.
10. Immediately after the mapping session, the facilitator should transfer the information on the paper map into a table within a word processing or spreadsheet program to create an electronic version of the map.

Review and Revise the Process Map

- Distribute copies of the map to the team for individual review. Meet briefly to confirm that the process was accurately captured and note any changes that need to be made.
- Make any changes needed, and then distribute the revised map to a larger group for review. This is an opportunity to solicit input from many people who participate in the process.
- Use the feedback received to revise the process map as needed. It is now ready for use in the chosen application.

Case Study

As the performance improvement manager for a large aerospace firm, I was responsible for managing business process improvement projects. In each of these projects, I used process mapping as a key data collection method for both performance and cause analysis. One project focused on the incentive compensation process. In this process, each manager received an annual incentive budget and allocated the budget dollars among direct reports for merit salary increases, bonuses, and stock options based on their performance in the previous year. The process was a yearly ordeal dreaded by both the managers and human resources staff. The managers would work for weeks trying to allocate the dollars and most would miss the submission deadlines. Human resources (HR) staff would become frustrated trying to assist the managers and by the many errors the managers made. Employees complained frequently and loudly, because if their managers missed the submission deadlines, the employees did not receive their salary increases or bonuses on time. Clearly, there was a serious need for performance improvement!

The first step was to develop a project plan. I divided the work into four phases:

1. Define the critical business needs.
2. Understand how and why the current process works and doesn’t work.
3. Design a new process.
4. Implement the new process.

The next step was to form a project team consisting of a sponsor (the HR director), the process owner (the compensation manager), the HR leader of each business unit, an information technology specialist, and an administrative assistant.

Our work began with the first phase, defining the critical business needs. The team met to define the project by describing the problems with the current process, customer needs, project boundaries, project objectives, design requirements for a revised process, and constraints. In the second phase, understanding how and why the current process works and doesn't work, the HR leaders collected input about the process through informal interviews with the managers in their business units. The project team met to map the incentive compensation process and reviewed the map with managers in the business units.

The final process map was then developed. The team used the map to identify multiple inefficiencies and obstacles in the process. For example, we learned that the managers were spending many hours calculating the outcomes of several different incentive award scenarios, and there was also redundant data entry.

In the third project phase, designing a new process, the team met several times to redesign the current process and then presented the proposed redesign to company leadership for approval. Once we obtained approval, we then met with business unit leaders and additional HR staff to collect their input. The suggestions they made were incorporated into the new process design and the team created a new process map.

In the last phase of the project, implementation, the revised process was presented to the compensation staff for careful, step-by-step scrutiny. They made suggestions for minor changes and the final process was mapped. After review and final approval by company leadership, the team then created a detailed implementation plan for the revised process, which included the development of a computer-based modeling tool for the managers' use in testing compensation-allocation scenarios. The process map was extremely helpful to us in creating the implementation plan because it served as an outline of the steps that needed to be taken in implementing the new compensation process.

When the annual incentive compensation period arrived shortly thereafter, the new process was implemented and evaluated. The project team, managers, and HR staff were delighted with the results. For the first time, the incentive compensation process was completed on time. Every manager met the submission deadline, there was a 90% reduction in errors, and there were no complaints from employees!

Conclusion

Process mapping is a versatile and valuable method of data collection that can be used in many different applications of performance technology. It offers a straightforward view of work processes and makes it easy to identify both work requirements as well as obstacles to good performance. 🌟

References

- Langdon, D. (1999). Process mapping. In D. Langdon, K. Whiteside, & M. McKenna (Eds.), *Intervention resource guide* (pp. 311-317). San Francisco: Jossey-Bass/Pfeiffer.
- Langdon, D. (2000). *Aligning performance: Improving people, systems, and organizations*. San Francisco: Jossey-Bass/Pfeiffer.
- Langdon, D., & Marrelli, A.F. (2002). *A performance-based model for competency identification: The workshop*. Bellingham, WA: Performance International.
- Marrelli, A. (1998). *Guide to managing process performance improvement projects*. El Segundo, CA: Hughes Space and Communications Company.
- Performance International (2005). *Introducing job modeling* [On-line]. Available: <http://www.performanceinternational.com/output/model4.htm>
- Siever, D. (1993). *Process mapping*. El Segundo, CA: Hughes Aircraft Company.
- Swanson, R.A. (1994). *Analysis for improving performance: Tools for diagnosing organizations and documenting workplace expertise*. San Francisco: Berrett-Koehler.
- West, J. (1997). Managing performance in the white spaces. In G. Rummier (Ed.), *Performance improvement pathfinders: Models for organizational learning systems* (pp. 108-123). Silver Spring, MD: International Society for Performance Improvement.

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