

Use a Simple Sentence Construct

to improve the utility of your process diagrams

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Abstract: *As an organization strives to design new business processes or improve existing ones, making the complex clearer helps people perform their roles better, faster and cheaper. With so much information available instantaneously, an organization's most valuable asset is the ability to make sense of, and share it within and between business processes. The key is to do this in a way that bridges the businessperson's and the technologist's different perspectives. This paper explores the use of a "simple sentence construct" to describe the steps in a process so that it is easily understood by the businessperson as well as the system analyst.*

Introduction

Process maps, workflow diagrams, and flowcharts have been used by Business Analysts historically as one-time, problem-solving tools to help them understand the flow of work. The primary purpose for preparing a diagram was to provide the analyst with greater insight into a specific operational problem—one that could presumably be mended with a process change or with the introduction of the latest technology. Business Analysts often took great pride in the diagrams they produced and frequently displayed them on a "War Room" wall or in another conspicuous area for everyone's review. Once the immediate problem was solved, or a new system had been developed, the diagrams were dispatched to a file cabinet (physical or electronic) or were simply discarded.

Those analyst who diagrammed a process using the current diagramming techniques, typically provided insight into what was happening in each step, but neglected to specify who or what was performing the work and the object that was being worked on. For example, is it an Accountant or Data Entry Clerk who performs the work and what specific object (General Ledger or data entry screen) is he or she working on? This omission disregarded the various roles people play and generally ignored how they interface with the latest technology, a complaint commonly heard during the implementation of process reengineering projects. This information is important, however, because it has a direct impact on how the process is ultimately designed and implemented.

To be effective, a diagram needs to be a living document that describes what is being done in such a way that everyone in the organization can quickly understand its purpose and their role. Additionally, the diagramming technique used should be flexible enough to permit continuous updating to reflect the impact of technological or other changes. In our practice, we have developed an effective technique for accomplishing these aspirations—the "simple sentence construct."

The simple sentence construct provides a remarkably useful mechanism for describing individual steps when diagramming a process. Moreover, we have developed our diagramming, analysis and design methodology around this rather simple construct—we refer to it as the "RAO paradigm"—which is the subject of this paper.

Resource-Action-Object Construct

By definition, the basic English sentence consists of a *subject* and a *verb*, and usually a direct or indirect *object*. The simple sentence construct as used in diagramming a process consists of the following elements: a Resource (*subject*), an Action (*verb*) and an Object (*direct object or indirect object*). In a very general sense, the RAO construct can be thought of as a set of words stating:

Someone or Something + does something + to Something or Someone

Resource

ACTION

Object

For example, in a grocery store, a Cashier (resource) scans (action) Package (object). An example of a “something” type of resource would be the Payroll Program (the resource) calculates (action) Federal Withholding Taxes (object).

The purpose of the RAO simple sentence construct is to provide a methodology that facilitates the improvement and continuous management of all processes within an organization. This is achieved by defining, precisely and consistently the **resources**, **actions**, and **objects** for all steps in all processes.

Elements of the Simple Sentence

Resources define the actors or doers of an activity. Resources can be people, machines, computer programs, or some other type of doer. The resources used in diagramming a process perform actions; they are not available assets waiting to be used or consumed in a process. Thus money, raw materials or real estate, for example, are not doer resources for purposes of diagramming a process.

Resources should be defined precisely so that for any given step it is clear exactly which role or thing is performing the action. For example, using a general description like “Accountant” may not be precise enough in describing an accounting process because the step may be performed by a more specific role such as Accounts Payable Clerk, or Payroll Clerk. Being very precise in defining resources is important when it comes to identifying process cost because different resources can have different costs associated with them.

When analyzing a process, it is sensible for the Business Analyst to draw a boundary around the area being studied. Events occurring outside this boundary are considered external to the process. As such, they are not included in the analysis except as sources of input or receivers of output. The resources performing these events, therefore, are generally labeled as external resources. Of course, an external resource is not necessarily external to the company or organization; it is just external to the process under study.

For example, as shown in Diagram 1, when diagramming the Purchase Materials process (or Supplies process), the process step, Accountant posts General Ledger (when accounts payable is paid), may be an external process step, depending on how the process scope is defined.

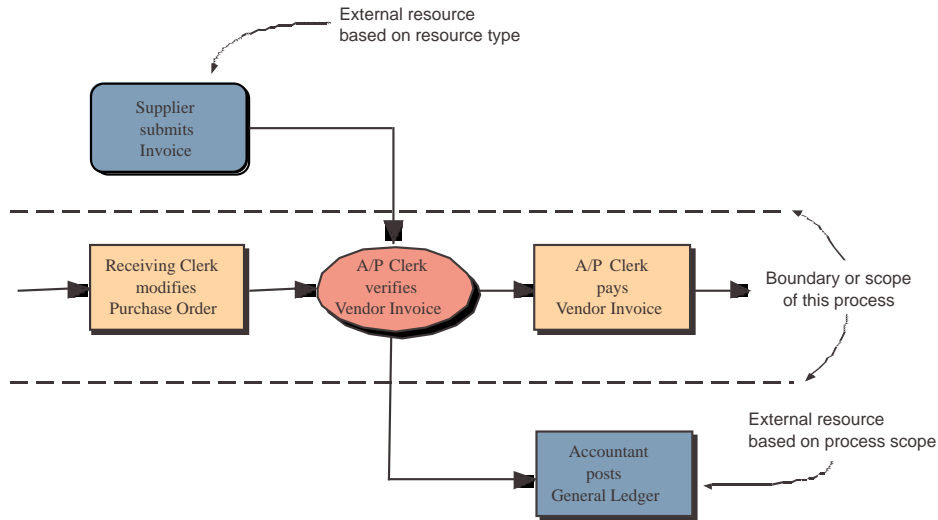


Diagram 1 – External Resources

Actions describe what resources do or perform. To make describing a process easier to analyze, graphic symbols can be associated with the actions. For example, a diamond symbol can be used to highlight all process steps using the word "approves?."

Another useful diagramming technique is to distinguish between value-added or non-value-added actions. By definition, value-added activities must be performed to meet customer or business requirements. So activities that do not contribute to customer or business requirements should be tagged as non-value-added.

The use of certain words or actions—such as approves, reviews, reworks and inspects—usually indicates that the work is potentially non-value-added and should be minimized or eliminated. When a Business Analyst defines these actions as non-value-added, the process steps using them can be highlighted on the process diagram by coloring them in a bright rose or red color.

As stated earlier the verb describes the action being taken. It is important to define actions relative to the level of abstraction as well as to the value of the step being performed. For example “decides” is a very specific low-level action that has only two outcomes, either yes or no, good or bad. Whereas, the verb “review” suggests that several lower level steps are involved, such as collecting information, analyzing the information and finally making a decision. In addition to the definition of the resource, the verb that describes the action should also help the Business Analyst determine the appropriate level of abstraction (refer to Diagram 2).

Objects are the things that resources act upon. Some common examples are: a purchase order, a product design document, an engineering drawing, or a check. To simplify the analysis process, like objects should be classified or abstracted by type or subject. For example, invoice, accounts receivable, accounts payable and general ledger could be classified as accounting records; or purchase order, factory order and invoice could be classified by type as standard forms.

The object classes chosen should help the Business Analyst identify and document the underlying business data from as many perspectives as possible, (i.e., resource, functional, geographic, time, etc.). It also helps a Systems Analyst understand the underlying object structures for developing software using object-oriented techniques.

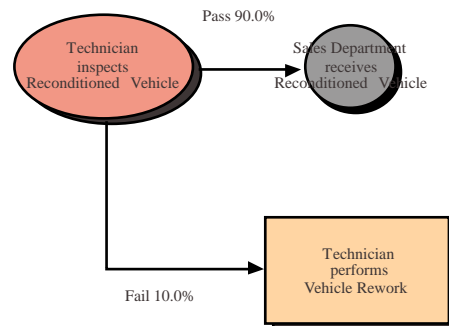
Objects should also be defined at each step in the process because as an object is processed its attributes change. For information and data collection purposes, changes in an object's attributes need to be visible at every step in the process. A customer order that comes into an organization is a different object than a customer order that has been priced. So the initial object "Customer Order" is a different object than a "Priced Customer Order". It is true that many of the attributes are the same, however there are additional ones associated with the latter object.

Using the Simple Sentence Construct

To facilitate the physical act of diagramming a process, the analyst should create a custom environment of resources, actions, and objects by building an RAO Library. To build the library, the Business Analyst would identify the resources, actions and objects from the organization's day-to-day environment. For example, to build a library for a manufacturing concern simply extract the resource information from human resource records, the objects, such as equipment, from your current information systems, and make a list of the most common "actions" discovered while diagramming each process.

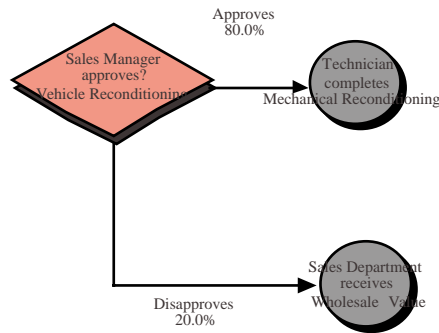
Indicate Resource utilization—The following suggestions will help the Business Analyst create more accurate process diagrams using the simple sentence construct:

- *Inspection Points*—An inspection point is based on some type of evaluation where one of several outcomes may be chosen. The symbol used for an inspection step is an ellipse.



Examples of actions that indicate an inspection step: Analyzes, evaluates, and inspects. An inspection step is usually considered to be a non-value-added activity.

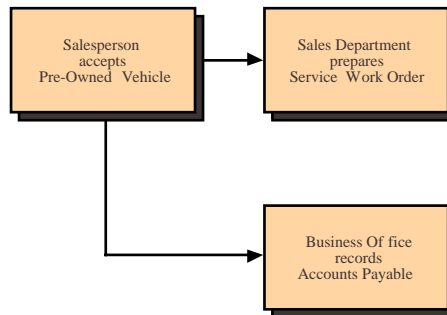
- *Decision Points*—A decision step is indicated when only one of two outcomes may be chosen. Unlike inspection, the decision step does not involve any complexity or lower level detail to the evaluation. It is a specific task that is performed at the lowest level in the process. The symbol used for this step is a diamond. A question mark after the action is used for readability.



Approves?, decides?, verifies?, these plus any other actions followed by a question mark indicates a decision step. Like inspection, a decision step is usually considered to be a non-value-added activity. Unlike an inspection point, which may have multiple outcomes, a decision step can have only one of two outcomes. It is either good or bad, true or false, yes or no, etc.

A label, and the probability of occurrence, helps to identify the frequency of each path. For example, in the above illustration the Sales Manager approves Vehicle Reconditioning for 80.0% of the vehicles traded in.

- *Parallel Paths*—A step, or event, may trigger more than one event without any conditions or exceptions. When this occurs two or more parallel paths in the process can result. An example of this situation might be where the physical reconditioning of a vehicle occurs at the same time that the paperwork for payment of the vehicle is being processed.



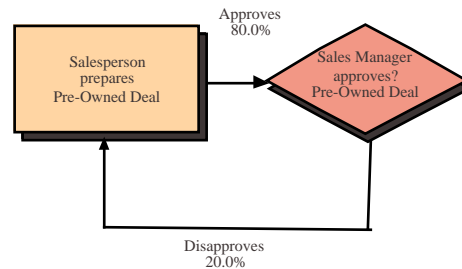
It is important to note that the same resource cannot simultaneously appear on multiple or parallel paths. This is another good reason to identify specific resources on each step. It helps to avoid process designs where the same resource is required in more than one step at the same time.

To visually illustrate the relationship of time between steps in the diagram, the analyst can do the following:

- Offset the steps when one event finishes before the other starts.
- Partially offset the steps when one event starts, then an event on a parallel path starts before the first event completes.

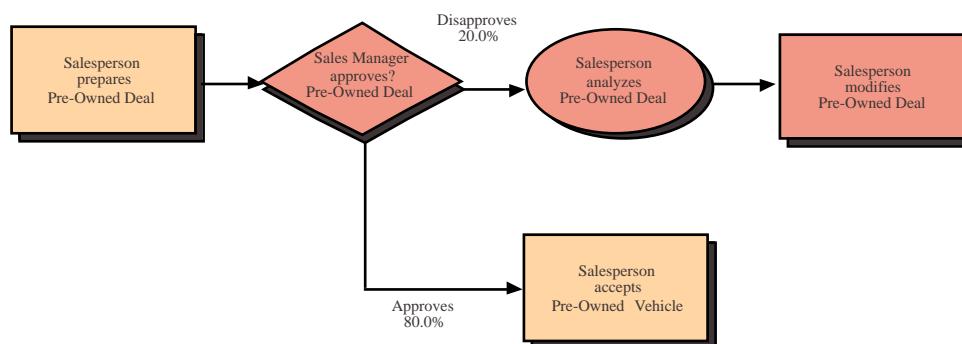
Simple Sentence Construct

- *Limited Backward Loops*—A common habit in diagramming processes is to automatically loop back to a previous step from an inspection or decision type step. For example, if an inspection step indicates rework must be done, then an arrow would be drawn from the inspection step back to where the work was originally performed. This typical assumption is incorrect because it ignores the process time element.



More often than not, some remedial action must be taken before the flow moves to the next step. If these transitional steps are not included in the diagram, then the calculated time and cost for the process will not be accurate. Therefore, the Business Analyst should always draw all of the steps involved in the process so that the complete process is evident, and the time and cost is calculated correctly.

To understand what is involved in redoing the work, the individual steps need to be diagrammed. Doing so identifies any additional cost and time involved in the process. For example, by redrawing the above process, two additional steps were identified...which resulted in additional time and cost elements if modifications have to be made.



Finally, use the simple sentence construct to redesign all of the elements of the process flow, work-group structure, and individual entities at the same time. All three factors must work together, so redesigning one or two is not desirable.

Benefits of the Simple Sentence Construct

The primary benefit attained through the use of the RAO paradigm is obvious: Business Analysts, process improvement teams, systems designers, process participants, and managers alike will understand the simple sentence construct without difficulty—we were all taught it from a very young age. By using a common agreed-upon, predefined language—such as the RAO paradigm—all the business stakeholders

will attain the same understanding of the process flow, the resources being consumed, value-added versus non-value-added steps, and the objects being created, modified, or disposed of.

Additionally, the simple sentence construct will help the Business Analyst perform his or her work more efficiently and effectively because it:

Promotes Cross-Functional Communications—It provides an inclusive description of the process steps that is easily understood across functional lines. It eliminates the need for each function to create special terminology since it provides a common language that all the functions can use. There is nothing more frustrating and less productive than a cross-functional process team having different opinions about a process simply because they are using different semantics in describing what is happening in the process.

Promotes Cross-functional Coordination—The structure is simple to understand and provides a basis for developing a process hierarchy for use by both the business and systems side of the business. By describing the attributes for the resource, action and object, a data base of key data is available for designing supporting information systems. Thus providing the bridge between the Business Analyst's perspective of workflow and the Systems Analyst's perspective of information flow.

Supports the Notion of Abstraction—The description of the resource, and in some instances the verb, can help in assuring consistency in identifying the level of the process being diagrammed. It also provides a way to drill down or abstract up levels in the process hierarchy while maintaining a logical relation between the different levels. For example, the very highest process level in an organization would describe the key functional processes and their relationship to each other. At this level the resource would be the various functional managers that are responsible for their respective processes.

At the next lower level, the resources would typically be the processes managed by each department; and, at the next level down, the resources responsible for each step would typically be a specific job title, such as order clerk, accounts payable clerk, etc. Of course, this "drill down" technique can continue all the way down to a line of code in a computer program that performs a specific action such as calculate federal payroll tax. Thus, it is possible to form a bridge between the Business Analyst and the System Analyst (refer to Diagram 2).

Facilitates Employee Training—Diagrams using the RAO Paradigm provides an effective tool for training new employees. We have found that when most employees are asked to describe what they do they tend to give an hour-by-hour, minute-by-minute explanation of their daily activities. Their description of these daily tasks represents a simple list of the tasks they perform absent a clear understanding of what their specific role is within each overall process. With a clear definition of the roles they play in each process, and the actions they are responsible for on various objects, they can see how their performance impacts the total organization.

Simplifies Process Improvement Efforts—Using pre-tagged actions (verbs) will simplify the process diagramming effort by highlighting non-value-added steps in the process. For example, actions such as "repairs," "rewrites," and "reviews" are typically tagged as non-value-added because the step is being performed to inspect or correct the output from a previous step or steps. Actions such as "plans," "operates," and "performs" are value-added because they are steps that actually create value-added output for either the customer's or business benefit.

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Using actual resources also provides a way to determine the cost of the process. Every resource can be assigned a direct (such as salary or hourly pay and benefits) and indirect (overhead to support the resource) cost. Using the time required to perform each step, the analyst can cost out the process to highlight those areas where significant opportunities for reducing process cost exist.

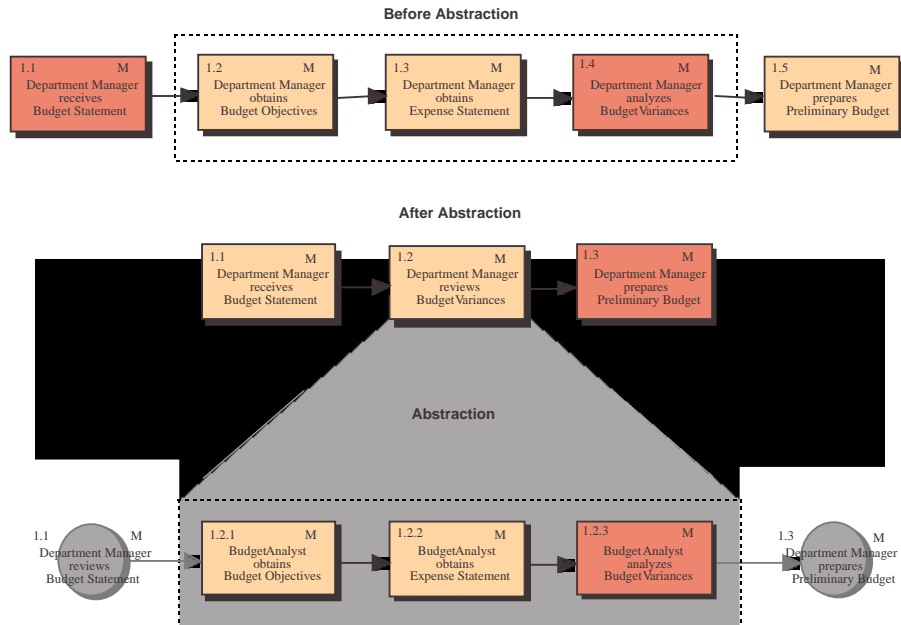


Diagram 2 – Abstraction

Concluding Thoughts

Business Analysts are often under pressure to make significant process changes in the shortest time possible. Thus, it is not unusual for the analyst to save time by shortcutting the planning step in the “plan-execute-review-adapt” cycle. This often results in an unproductive outcome that ends up wasting everyone’s time. In our experience, this is one of the primary reasons why a process improvement project fails to meet its expected time and cost saving objectives.

The “plan-execute-review-adapt” cycle is the heart and soul of any quality program and planning must be done to ensure a successful process design. On the other hand, the “review and adapt” steps are where most of the non-value-added steps occur. If an organization does a good job of planning its processes, then obviously there will be less reviewing and adapting to do—and this principle applies to the process of process improvement as well.

For example, when planning for a process diagramming or mapping effort, the analyst should take the time to accurately characterize the organization’s resources, actions, and objects. Doing so will provide everyone involved with a more useful understanding of where short-term improvements can be made; and longer term, it will help the process owner manage his or her process more effectively...and both of these factors are important to the continuous effectiveness of a process. If management is to harvest longer-term benefits from the team’s short-term efforts, it is worth the time it takes to describe implementation stages of a project

Finally, the greatest value of the RAO paradigm lies in its potential for accurately describing the structure and content of a process throughout the definition, analysis, design and implementation stages of a project. For example, the resources structure can be used to abstract lower-level processes using the existing organizational structure. The ability to abstract resources within the existing structure permits everyone involved in the process to understand it from his or her own functional point-of-view. But more importantly, it helps them understand it from everyone else's point-of-view as well. Promoting a common understanding of process requirements is absolutely key to managing the changes required to make an organization more effective and efficient.

Additional Readings

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Galloway, Dianne. *Mapping Work Processes*. Milwaukee, WI: ASQ Quality Press, 1994.

Trischler, William E. *Understanding and Applying Value-Added Assessment: Eliminating Business Process Waste*, Milwaukee, WI: ASQ Quality Press, 1996. This book describes the use of the RAO paradigm for analyzing business processes. It also contains a dictionary of verbs that are commonly used to characterize value-added and non-value-added steps in a process.

Hunt, V. Daniel. *Process Mapping: How to Reengineer Your Business Processes*, New York, NY,; John Wiley & Sons, Inc., 1996