QUALIGRAMME METHOD©

(Business Mapping Methodology)

A graphical language for Business Analyst

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Foreword

This manual is meant to be practical. Its purpose is not to describe or create a new language for specialists exclusively, but, on the contrary, it should be used as a tool to understand a company's organization and processes.

Nor is the aim to provide the reader with a method for optimizing, quantitatively studying or controlling these processes, though process mapping does involve optimizing. This manual is designed for those who seek to describe business processes rapidly and clearly, either for storage or communication purposes or implementation in electronic format (project management, workflow, ERP, etc).

This manual is divided into 8 chapters that allow the reader to become acquainted with and learn how to use process mapping step by step. There is therefore a certain logic to the order in which the chapters are set out, in order to facilitate the learning of the method and the concepts described. The user of this manual is not required to read all the chapters completely or in sequence to be capable of describing the processes. This manual is divided into modules so that anyone wishing to write a process in detail, can do so directly by reading chapter 6. This modular approach is one of the basic concepts of the Qualigramme language.

These concepts are based on common sense and their implementation is subject to basic rules, which are easy to apply and memorize. This manual is thus designed to be used by all those involved in a business, regardless of their activities or their position within the company.

The process mapping method described here, whether it be used "as is" or adapted to the reader's needs, will lead the reader to a new way of thinking when faced with diverse situations (simple or complex), thus allowing him or her to acquire new reflexes to facilitate the communication, exchange, implementation and computerization of processes within the company.

The term "***process mapping***" refers not only to the manner in which the processes are displayed but also the reasoning that will be used. Certain reflexes linked to a more traditional linear approach must first be relinquished before process mapping can be used to the fullest.

To conclude, this document will attempt to provide the reader with a new way to display processes (*mapping approach*), while at the same time supplying him or her with a language that is both practical and useful for describing situations relating to project management, process improvement *(6 Sigma)*, quality *(ISO 9000 certification)*, reengineering and knowledge management.

Introduction

Business Process Mapping *(BPM)* concerns several areas:

- Project management,
- Computerization of work *(Workflow, ERP parameterization, etc.)*
- Description of compliance with standards *(ISO 9000 certification)*,
- Process improvement *(6 Sigma)*.

The processes for these areas must be described in a manner that can easily be understood by all those involved:

- Specialists: familiar with the activity or the process and able to describe it,
- Analysts: "convert" the description provided by the specialists,
- Users: implement and use the description.

The aim of the processes description and modeling is to:

- Improve process control *(performance)*,
- Improve communication within the company,
- Ensure the transition from verbal-based to diagram-based methods,
- Computerize or automate the processes.

In order for the description to be efficient it must be represented graphically so that:

- There are no ambiguities concerning interpretation of text
- Any inconsistencies can be seen immediately
- The activity being described can be understood intuitively.

To enable this graphic modeling, the following is required:

- Define a framework for modeling *(use a **common language**)*,
- Use a suitable and efficient structuring method,
- Use simple and easy-to-use tools.

This manual will attempt to examine all these points in the following chapters:

- ✓ Chapter 1: **Why describe the processes?**:
  A summary of the key points of process description and the advantages of a graphical approach.

- ✓ Chapter 2: **Graphic thinking**:
  Compares linear and modular ways of thinking. Summarizes the basics of the systems approach.

- ✓ Chapter 3: **Qualigramme language principles**:
  The 7 basic principles of the Qualigramme language.

- ✓ Chapter 4: **Process mapping**:
  Overview and explanation of process mapping.

- ✓ Chapter 5: **Organizational processes**:
  Overview and explanation of organizational procedures.

- ✓ Chapter 6: **Operational processes**:
  Overview and explanation of work instructions, operating procedures and protocols.

- ✓ Chapter 7: **Implementing a Qualigramme project**:
  Tips and simple ethical principles for a better process description.

- ✓ Chapter 8: **Conclusion**:
  Summary of the ideas presented in this manual with emphasis on an even greater global use of graphic language.

At the end of this manual, appendices will include a summary of language rules to help the reader to use the knowledge acquired on the subject of process description.

TERMS:

- ✓ The term "**Author**" refers to all those describing a process, regardless of the description's purpose. An author may be a computer programmer, a project manager, a quality manager, a black belt, etc.

- ✓ The terms "**Process**", "**Procedure**" and "**Work Instructions**" are, in fact, different types of process descriptions.

- ✓ The term "**Repository**" refers to activities *(processes)*, skills *(people management)* and knowledge *(of documentation)*.

- ✓ The terms "**Graph**" and "**Flowchart**" are used to describe process mapping. The term "**Graph**" is more specific to Qualigramme language.

1 – Why describe processes?

This chapter addresses this question. First, key points of process description will be discussed and then current practices will be reviewed. The chapter will conclude with a description of the advantages and the purpose of process mapping.

1.1 KEY POINTS

There are many key points for describing processes. Here are just a few (not all) of the aspects noted in companies.

1.1.1 Organization

Knowing who does what and dividing up the work in a company is one of the more important challenges of process mapping. To optimize efficiency, each person must know his or her tasks and responsibilities. The company's organization must therefore be described in detail and be made available to all those concerned.

Mapping an organization does not mean setting it in stone! This is but a starting point for mastering its implementation and leaves plenty of room for making improvements or changes (*acquisition of new knowledge and skills*).

1.1.2 Structure

Process description can have very beneficial effects. For example, it is common to find out about a problem by looking at the way information circulates or at the possible improvement in certain departments. Process description in this case will involve (re)structuring the way a company works. Unstructured knowledge cannot be exploited effectively!

1.1.3 Conservation

This aspect, though less obvious than the first two, is just as important. When people leave a company, they take their knowledge and skills with them which could be costly to the company – in both time and money – as it is forced to replace the "savoir-faire" (the English word is “know-how”)lost. **If and when this is possible!**

This is why mapping the processes will ensure that these processes will remain with the company.

1.1.4 Learning

Directly related to conservation, the learning and transmission of knowledge are made easier when processes are mapped. All knowledge cannot, of course, be described and certain "tricks" still require on-the-job training. In terms of organization *(who does what)*, however, process mapping will allow a new staff member or an employee changing jobs to rapidly become operational.

1.1.5 Understanding

Transmitting information orally is not reliable as this information may be distorted when repeated. It is therefore essential to refer to a reliable information source to understand how a company or an activity operates. This source can then be used as many times as you like.

It is also important that all responsible for completing a task or activity have access to the same information to ensure the same level of performance and quality of service.

1.1.6 Communication

Process mapping is the basis for a correct understanding of tasks, but it is also a fast, efficient and easily reproducible way to communicate within a company. If documents created are clear, concise and similar in form, communication will be easier.

Communication requires a language that can be understood by all at all levels in the company. Process description must take the problem of language into account to allow efficient communication and to ensure cooperation within the company.

1.1.7 Standardization

We are not referring here to the term standardization as used in Taylorism *(this is not Scientific Management[1])*, but rather the concept of homogeneity and rationalization related to "*Best Practice*" standards.

Clearly defining the required tasks not only enables these tasks to be standardized, but also allows them to be reproduced.

This is especially important when it comes to providing customers a certain level of quality over time.

Standardization is related to *(re)*structuration and enables a company to increase productivity.

1.1.8 Evaluation

Evaluation is a key point in process description. It is often useful to check whether the processes described are efficiently implemented in compliance with its definition.

An evaluation, generally called a "*process audit*", indicates problems or differences between "*in-the-field application*" and what has been described.

This gives the company an opportunity to progress and develop by changing the mapped processes and adapting them to the efficient techniques used in the field *(conserving new skills, improving the learning of these new techniques)*, or on the contrary introducing discipline when performing activities by putting emphasis on procedures indicated in the processes *(increasing reproducibility of actions)*.

1.1.9 Improvement

As long as activities remain vague and dissimilar, their effectiveness cannot be evaluated. Once they are mapped, however, their implementation can be assessed and improved.

To improve a mapped process it is sufficient to change one of its conditions *(changing a document circuit, indicating an employee's responsibilities and defining the tools used to perform an action)*.

[1] Scientific management: Planned management of production related to Taylorism that is based on the study of workers' knowledge and skills to determine how to increase overall productivity.

1.1.10 Computerization

Computerization of processes, when using ERP or Workflow, for example, requires a clear description of reality before being translated and processed by computer programmers or analysts.

The description must include the activities or tasks to be performed as well as those who are to perform them, the data to be processed and, if necessary, the tools required. Only process mapping can display these activities or tasks in a concise manner.

As we have seen in the 10 reasons indicated above, which justify the use of mapping to describe processes, it is especially useful to develop such a visual approach since a process described in this way can be used (*or instantiated*) in many situations.

1.2 THE CURRENT SITUATION

It is common to say that a "*picture is worth a thousand words*". Since 80% of people are visually-orientated, a situation described visually will be more readily understandable than the same situation described in words (*we are talking about situations linked to business activities and not situations relating to verbal debates*!).

Vision is a tool that allows our brain to grasp and react to a given situation.

We can see, for example, that at the end of meetings in which complex matters are discussed, once everyone has had their say, the concluding words are usually something like "*We shall see, we will need to look into…*".

Drawing as compared to writing certainly has its advantages. The use of flowcharts forces the writer to create a model of the situation he or she wishes to describe, using pre-determined shapes. This simplifies reality by reducing it to a few shapes rather several complicated sentences. Modeling, when performed correctly, also allows the writer to clearly express his or her ideas and facilitates the thinking process.

1.2.1 The advantages of process mapping

a) **A clear and concise summary**:
A flowchart is a clear way to represent a company's organization. It summarizes actions and their sequence because it forces the user to break down these actions, step by step.

b) **Comprehension of complex situations**:
Mapping allows the display of the various actions or choices clearly and precisely and the user can thus follow the various pathways in the flowchart and understand what needs to be accomplished in a given situation.

c) **Problem solving**:
Process mapping encourages the user to take better stock of the situation, allowing him or her to actually modify the organization while describing it, sometimes intuitively (*induced improvement*).
Using this method the writer has an overall view and can find the solutions for organizational problems, while graphic shapes can be used to determine critical pathways or actions that loop back onto themselves or go nowhere.

d) **Digital storing of processes**:
The use of predetermined shapes and symbols (*circles, squares, triangles, etc*.) saves the need for long sentences and allows software to analyze the processes "*intelligently*".

Software tools are perfectly capable of identifying and processing geometrical shapes, which is why it is worth storing the company's processes in graphical format, rather than as text. By adding to the database in this way, we can find a response to a query such as "*In which processes does the Buyer play a role?*"

Process mapping does, however, have its drawbacks and a well-structured method and strict writing rules are required.

1.2.2 The disadvantages of process mapping

Though process mapping may have many advantages over text, some problems do exist. A certain number of faults can be found with flowcharts:

a) **Comprehension**:
A flowchart must be rapidly comprehensible, while remaining sufficiently complete so the user knows what he or she has to do. This is not always the case. They either contain too much detail (*good comprehension but document is too complex*), or not enough (*document is easy to read, but does not go into depth*).
Avoid unnecessary embellishments. A document should be understood by all and not just by the person who created it.

b) **Organization**:
Flowcharts often display actions linked by arrows, but do not specify those who are to perform these actions. Though comprehension has been improved greatly due to the display of the sequencing of actions, it is still not possible to determine "*who does what*" and consequently define the responsibilities and tasks of each person.

c) **Relationships**:
Certain graphic methods require that the position or role of the person doing the work be indicated and this is a definite improvement. There is, however, an essential element missing: the information that is sent between the action points (*and therefore between the people performing the actions*). This lack of "*customer/supplier*" relationship can lead to problems or misunderstanding within the company.

d) **Size**:
It is not uncommon to find process descriptions printed in A3 format, or worse, in A0 format. This may be useful for technical drawings (*i.e. electronic circuits, etc*), but not for describing processes. Flowcharts printed out over several pages are not practical either, as they force the reader to go back and forth between pages.

e) **Lack of uniformity**:
There are many different types of process maps (*flowcharts, flow diagrams, block diagrams, etc*.) used in the different departments within a company. Symbols used in one type are not necessarily the same used in other types. And even if they are, they may not have the same meaning!

f) **Complexity**:
Process maps often contain diamond-shaped symbols. These indicate binary choices (*yes/no, compliant/non-compliant*). These symbols are often used in flowcharts and can confuse the reader by introducing complexity (*there are a great many different*

steps involved, it is therefore complicated!). The user thus tends to follow the various choices without thinking and when a situation not described in the flowchart occurs, he or she does not know what to do.

To conclude, we have noted that writers use graphic shapes to summarize what they have written. The symbols thus created are not particularly useful because they are derived from a textual writing technique. Just as people should not write like they speak, writers should not draw like they write!

To solve problems linked to process mapping, a real language, such as those used for text, must be defined. But in this case it must be adapted to the simplicity and clarity of process mapping.

1.3 THE PURPOSE OF A BPM-SPECIFIC LANGUAGE

Mapping helps to avoid certain difficulties encountered when describing and implementing processes. Documents are clear, easy to use and to understand and they can therefore be put to immediate use.

As we have already indicated, process mapping is still lacking in certain aspects. Also, it appears that to get the most out of this method, a language and a set of rules is required. This language requires **vocabulary**, **syntax** and **grammar**.

Switching to another language is, of course, not a simple matter. And yet, if all the people in the company use the same vocabulary, it should put them on equal footing, thus increasing comprehension and making it easier to define a process **without ambiguity**.

"*When faced with a new language, everyone within a company is at the same level: he or she must accept it, learn it and try it out. There is no advantage for the financier, the jurist, the technician, or for the manager or the engineer. Everyone needs to participate equally.*"
(CF Mélèse – modular analysis of systems method)

A new language, even a visual one, cannot be used efficiently unless strict rules are followed. These rules should not, however, restrict the writers, but should, on the contrary, facilitate the description of their processes. Writers need not worry about format, if they follow these rules, and are thus free to concentrate on content only.

Using a modular description of processes is also important. This allows you immediate access to the essentials, while offering the possibility of greater detail if you need it. This modular aspect *("Zoom" concept*) renders documents more accessible and avoids repetition (*the same subject dealt with in several different procedures*).

Another important point: format. Though documents can still be printed on paper, it is clear that process mapping encourages users to read the document in electronic format (*via intranet, for example*).

This last point solves problems related to the management of documents (*distribution of new versions, deletion of outdated documents, etc*.), but also affects the way they are used. As the documents are in graphic format, they can easily be read on a screen (*PC or interactive terminal*). This is user-friendly. The user can simply click on a shape to obtain additional information, display a form and then open it, fill it out and save it.

Exploring all the company's processes is thus made easy and some would even say, "fun".

Before taking full advantage of what process mapping has to offer, it is important to understand that a language cannot be used efficiently unless it is based on a particular way of thinking.

A graphic language is only an efficient means of expression when supported by graphic thinking. In the next chapter we will discuss the various types of thinking and (re)define the concept of graphic thinking.

2 – Graphic thinking

This chapter deals with a sensitive subject: our way of thinking. It will be shown in this chapter that our thinking often depends on the way we express it. We have all been in the situation where an idea or concept was clear in our mind, but we were unable to communicate it to others.

We try to express our thoughts so that they will be understood, but this is not always satisfactory because the result is often too complicated or too superficial.

2.1 Textual thinking

To understand the way we think, we need to go back to the time when we were in school and were learning to read and write. From that moment on we were trained to think "textually".

This thinking process is based on sequential logic. To understand a situation you must read, in sequence, the words and sentences that describe the situation. It is only after having read everything that you get an overall view of the situation and can understand it and know what to do.

To describe a process dealing with a customer's order, textual thinking generally produces a document of several pages which defines, for example, how a secretary handles a customer's order and how she transmits these elements to a sales representative, who will analyze the order, possibly in collaboration with other departments or people within the company. Finally, perhaps after the sales manager has been involved, certain elements are then sent back to the secretary who will send them to the customer using the appropriate resources.

To carry out such a process, the actors (*secretary, sales representative, etc.*) will need to have read the complete textual description of the process to know what they are required to do. This is linear reading, beginning at the first word on the first page and ending at the last word on the last page. In this case, each person is required to read information not concerning him or her directly.

When this is applied to the company as a whole, it becomes clear that a great deal of time and energy are wasted in reading information that does not concern us. Textual thinking, with its linear and sequential nature, allows no other alternative.

It would be unfair to say that companies are not aware of this fact. We are beginning to see, during audits for example, an increasing number of processes that are not completely textual, but also contain flowcharts. We will now discuss a new type of thinking: semi-graphic thinking.

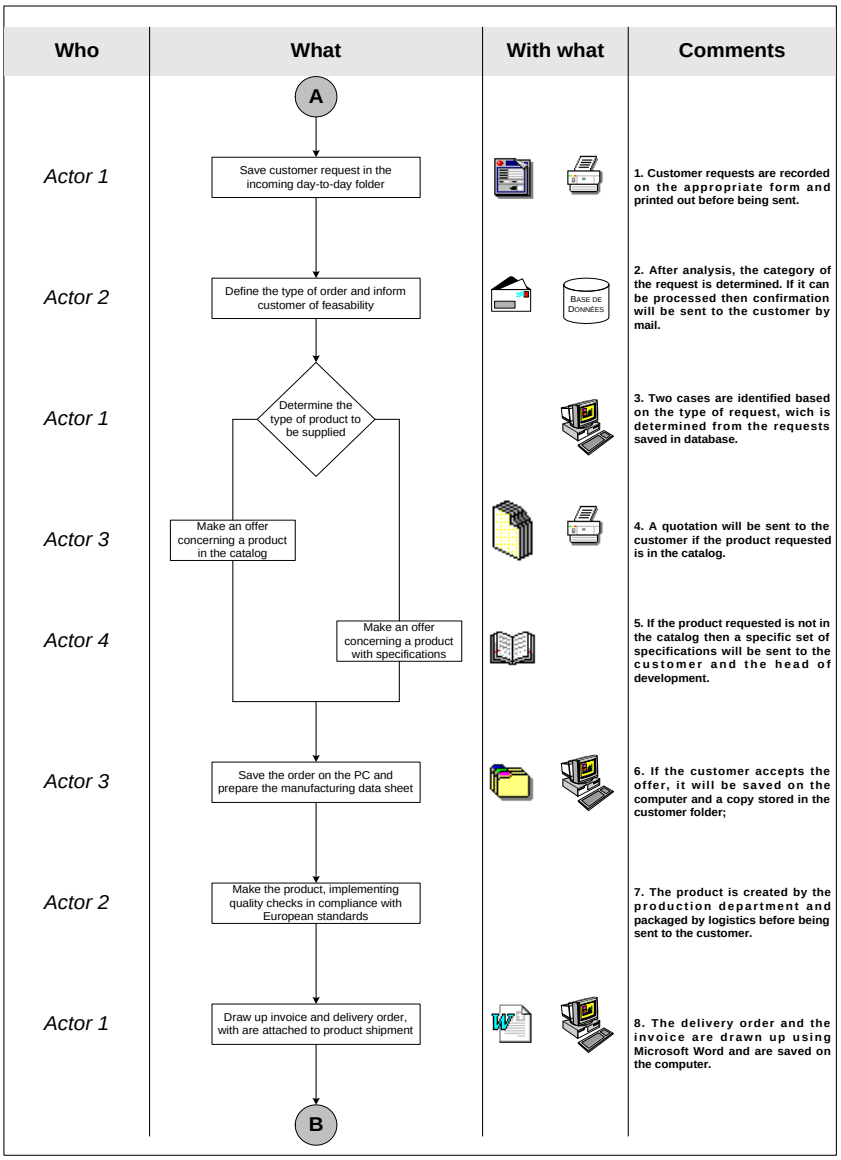
2.2 Semi-graphic thinking

To compensate for the unwieldy nature of textual process descriptions, documents created now frequently contain a "*text*" section and a "*graphic*" section. A flowchart is included to improve comprehension of the process.

This flowchart, however, merely reproduces in visual format what has already been written! The flowchart is simply a summary of the text and even if the text is removed from the document, the remaining flowchart is still only a linear and sequential representation derived from textual thinking. The sequence of the graphical shapes is based on logical and Cartesian analysis.

The flowchart always displays all the actions that must be performed by the players in the company, but does not allow the player to rapidly see what he or she is required to do. These charts are generally several pages long with a great many arrows and reference marks.

Expressing textual thinking in graphic format only gives the illusion of being simple and does not allow an intuitive and efficient understanding of the work to be carried out. Companies use process-mapping methods *(see figure 2.1)* without realizing that they are implementing textual, and therefore linear, thinking.



2.1 – Semi-graphic process (linear thinking)

2.3 Graphic thinking

Graphic thinking works quite differently. Its objective is to represent complex systems "*naturally*".

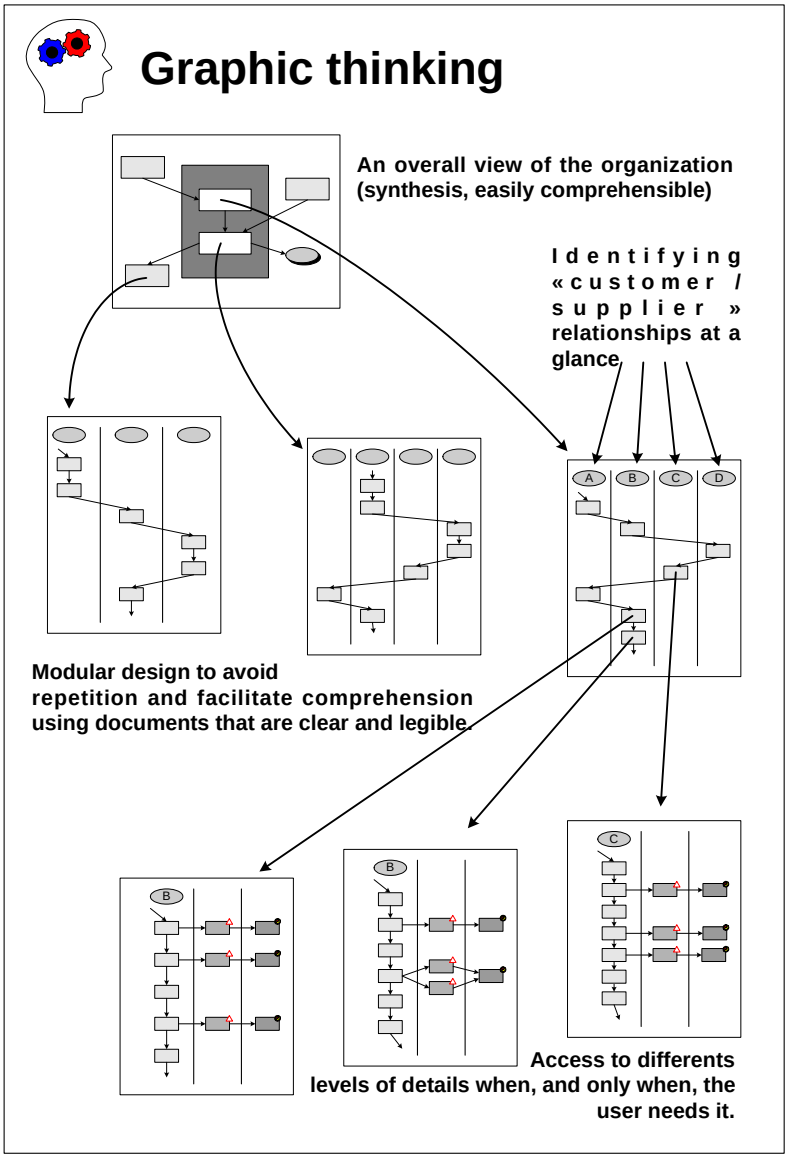
By "*naturally*" we mean the way our brain works. When we analyze a situation, we have an overall view of that situation. Our mind works by associating various ideas, automatically eliminating paths of thought that are of no interest or giving priority to ideas that have value.

This is exactly what we should be doing when describing processes. Processes should be displayed in modules, similar to a network of neurons, and we should be able to access information or knowledge, when we need it and via multiple paths, easily identifying "*customer/supplier*" relationships linked to information exchanged (*see figure 2.2*).

This type of thought process is very different from the linear textual approach, where everything is described sequentially.

With graphic thinking, information can be accessed rapidly and intuitively, whereas textual thinking requires us to review in sequence an entire series of events that do not interest us before reaching those that do.

In these conditions, describing processes using graphic thinking and process mapping is a major challenge for companies in terms of the communication, conservation and improvement of processes.



2.2 – Modular process (Graphic thinking)

Graphic thinking, due to its dynamic and user-friendly qualities, encourages participation and sharing and thus the development of a **collective intelligence** within companies. The concept of a **collaborative space** can thus be put forward.

To illustrate the linear and modular aspects of thinking described in this chapter and the difficulties in questioning the mode of thought we use, let us examine the way we read. We all think we know how to read and yet our performance in this area leaves something to be desired.

It has been demonstrated (*see Richaudeau and Gauquelin – Speed reading method*), that the way we read (*deciphering words and sentences in sequence*) is not the most efficient or the most appropriate for our brain. The brain is capable, by scanning a few points on a page of a book or of a column in a newspaper, of identifying the meaning of what is being read **(or rather of what is being seen!)**, and will summarize and memorize the essential points. These are the two key aspects of speed reading: **understanding** and **retaining** what you read.

And yet we continue to learn to read and write the traditional way when with a little training everyone could read quickly and intelligently. The same goes for our way of thinking. Linear and sequential thinking continues to dominate. Though the fallacies of syllogism, a form of reasoning often far-removed from reality, have been shown (*for example: "All that is rare is expensive, a cheap horse is rare, therefore a cheap horse is expensive")*, we continue to implement these types of reasoning in textual form, because only the written word counts!

N. Chomsky (*see Cartesian linguistics*) states that "*language and thought are linked*", and so to use a graphic language efficiently, you need to think graphically. This graphic way of thinking should allow a more intuitive and simpler understanding of a company's organization: "*A new form of understanding nature is being born out of the use of these new [computer] tools: understanding through synthesis rather than analysis*" (*see J. de Rosnay – The Symbiotic Man*).

Without entering into the domain of psychoanalysis, and before even considering whether a company has a soul (*see "Do companies have souls?"*), let us allow ourselves to give it a language so that it can express thoughts. In terms of how our brain operates (*see "our two brains" in the language of change*), the Qualigramme approach provides a logical description (**left brain**) of the perception of complex structures (**right brain**). Graphic language (*requiring use of the left brain*) will encode our perception of reality (*requiring use of the right brain*).

Non-linear thinking will free our right brain and increase its capacity for overall perception, "*holistic perception of relationships, models, configurations and complex structures" (see language of change*).

Graphic language is a constructive contradiction that the writer uses to esthetically describe structured thoughts thus encouraging both hemispheres of his brain to work together.

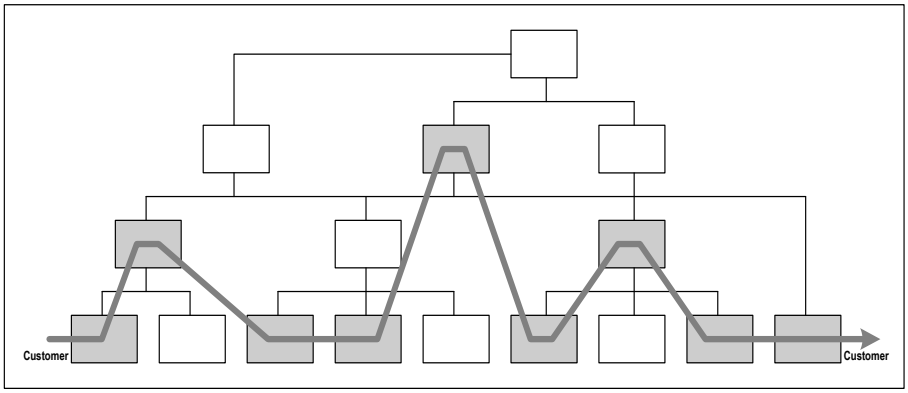
Using graphic language or graphic thinking is not necessarily enough to describe processes efficiently. It is also important to have an overall picture of the company's activities. The process approach allows such a preliminary analysis required before any description is possible.

2.4 Systems approach/process approach

We have emphasized the importance of communication, sharing and the exchange of knowledge and skills within the company and we will continue to do so because one of the main advantages of the process approach is that it encourages decompartmentalization of the company.

Though all companies still possess a hierarchical structure, their organization is more and more frequently centered around activities and products that **cross** their departments *(purchasing, sales, production, human resources, etc.)*. The 2000 version of the ISO 9000 standard has certainly played a role in the interest shown by companies in this type of approach.

This transversal Customer/Customer-orientated approach attempts to break vertical organizations that are too rigid and whose performance, responsiveness, and creativity are lacking in today's economic climate.



2.3 – Transversal approach

As the transversal approach indicates (*see figure 2.3*), each process only uses one of the areas described in a hierarchical structure. An organization adapted to this type of approach must be **modular**.

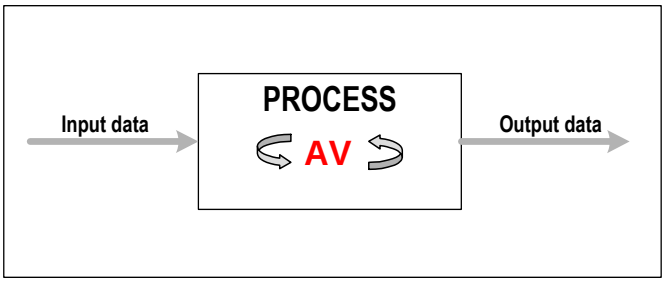
Here is a quick summary:

- textual thinking: linear / vertical and hierarchical organization,
- graphic thinking: modular / transversal organization, processes.

To implement a process approach, you need an overall view of your business, in terms of activities, resources *(human, technological, financial, etc)* and organization.

This is why the transversal approach, though attractive for businesses, is often difficult to implement. One of the most sensitive points is identifying interactive relationships. If several departments must work together on a process, it is important to know the privileges and responsibilities of each of those involved as well as the essential information they need to exchange.

Defining interactive relationships is therefore one of the factors ensuring that such an approach is successful.



2.4 – Process map

The other key aspect of the process approach is the importance of **added value**. A traditional process map (*see figure 2.4*) shows input data converted, with added value, into output data.

This concept of added value can also be indicated by mapping data that must enter and exit a process. A process with no input or output is quite useless!

Thus, clearly identifying information sent and exchanged within a process, and also between processes (**interaction**), is a key element of the description.

To map processes, one must understand them as a whole, while at the same time identifying their main components (sub-processes, for example). This type of mental gymnastics, which allows us to aggregate and breakdown processes, is known as **graphic thinking**.

We must provide the reader with simple, practical and useful elements so he or she can easily put to use this new type of thinking. These elements are what makes up the Qualigramme method graphic **language**.

3 – The seven basic principles of the Qualigramme language

The Qualigramme language was not created out of nothing. It is based on proven concepts that can reproduce the processes of a company in a practical, yet attractive format.

This chapter will present an overview of all the concepts upon which the Qualigramme language is based.

3.1 The OSSAD method

The OSSAD (*Office Support System Analysis and Design*) method was created after six years of research, developments and experimentation by a group of companies, laboratories and universities as part of a European project known as ESPRIT.

OSSAD's objective is to describe a system using an OSSAD-type language, taking into account not only the technical aspects of a company but also its organizational and human aspects.

These aspects are what differentiate OSSAD from other analytical methods such as Merise, Sadt, Axial, Sass, Consoi, and UML.

The table below gives an overview of the different types of methodologies.

Type of methodology	Perspective	Orientation	Example/method
Technological systems analysis and design	Solving fully specified problems	Automated tasks. Productivity.	Pétri Net Grafcet System dynamics
Information systems analysis and design	Solving unspecified problems.	Optimizing procedures. Efficiency. Project and participation approach.	SSA IEM Merise UML
Socio-technological project analysis and design	Solving local organizational problems. Reorganization, BPR.	Project management. Participation of stake holders.	Value analysis SI master plan CIM master plan
Systems approach to problem analysis and search for solutions	In depth search for the problem root. Transversality of responses. Self-organizing.	Problems determined. Objectives structured. Overall questioning. Process modeling.	AMS OSSAD RPP

Excerpt from lecture – 1996 – Silvio Munari – INFORGE – HEC Lausanne (Switzerland)
Title: "Organizations: a pluridisciplinary and participative approach".

OSSAD is a socio-economic method for modeling organizations. It deals with human-related issues, attempting to identify and describe them.

Its creators describe it as being "*designed to be used*". It provides the means for all to create a specific method for describing changes within a business. Aside from this methodology, OSSAD also provides a code of ethics that each person involved in the changes should follow to ensure that the transition goes well. We have based the methods described in this manual on OSSAD principles to determine the rules governing the implementation of a Qualigramme project.

OSSAD breaks reality down into two parts: an **abstract** part, which defines a company's goals, and a **descriptive** part, which is used to reach these goals.

OSSAD is the model on which we have based a language that meets requirements in terms of process description. We have followed the principles and philosophy of this method to ensure the implementation of a true systemic approach to which we are dedicated.

The method encourages taking action, and this is exactly what we have done! It has enabled us to take a fresh look at BPM concepts, focusing more on the **esthetic** rather the **technical** side.

3.2 The basic shapes of graphic language

In chapter 2 we indicated that a thought process requires a language to support it (*vocabulary, syntax and grammar*). The Qualigramme method is based on graphic thinking and requires a simple and ready-to-use graphic language.

This language uses graphic vocabulary, which includes 4 basic shapes (*see figure 3.1*)for structuring and building rules, grammar and a special syntax adapted to the graphic shapes to improve uniformity and legibility of documents created .

The following shapes are used in the Qualigramme language:

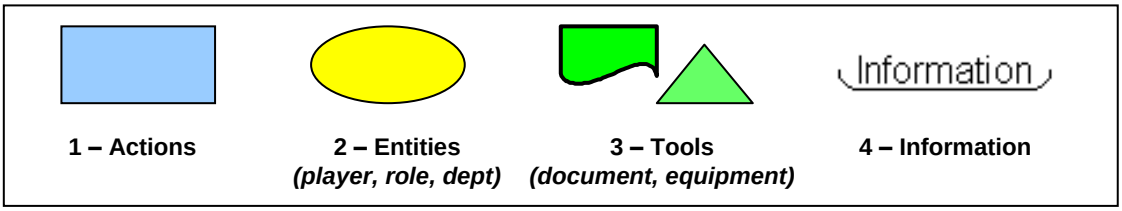


Figure 3.1 – The different types of Qualigramme language shapes

The language is used to represent all types of situations, via a company system approach describing the following:

- Entities concerned .....***(Who?)***
- Actions performed .....***(What? and How?)***
- Tools used .....***(With what?)***
- Information used and produced .....***(What information?)***
- How this information circulate .....***(From whom?, To whom? From what?, To what?)***

The graphic vocabulary is quite simple. Its objective is clear: it must be usable and understandable at all levels of the company. Figure 3.2 displays an example of how the language is used (*note the similarities with figure 2.4 - process map*).

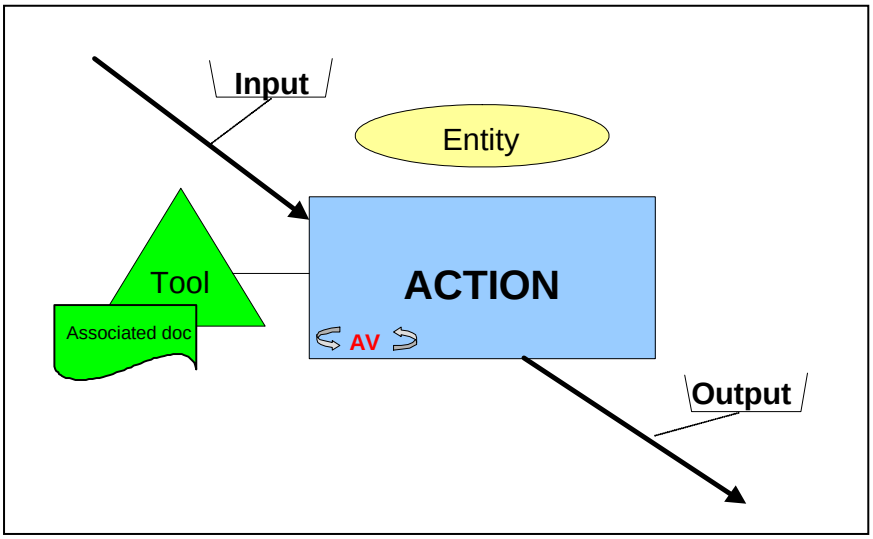


Figure 3.2 – Qualigramme language in action

In the following chapters concerning the description of a process, a procedure or a work instruction, we will discuss in detail the various graphic language shapes used, their different aspects within a given context and will also present a few additional symbols used as "punctuation".

3.3 Information flows

The Qualigramme language forces the user to map information (*information arrow*) flowing between **Entities**. Each **Action** shape used must therefore contain information at both the input and output. An action that does not produce information serves no purpose!

This may seem a bit excessive, but it is never-the-less required to:

a) **Identify Customer/Supplier relationships** (*internal and external*). Each immediately identifies the information he or she needs to perform an action and from whom this information must come. At the end of an action, each person knows exactly what information he or she must produce and to whom it must be sent (**mapping of interfaces**).

b) **Identify interaction between processes**: It is through this information that we can see the interaction between the different processes. Based on these exchanges of information it is possible to determine the indicators used to evaluate process performance.

c) **Identify the added value of an action**: The information produced by an action should have greater value than the information input. If this is not so, then the action serves no purpose!

d) **Evaluate the performance of an action (*in the process*)**: Identifying the action output information and comparing it with the input information helps to determine whether the action was performed correctly.

As indicated above, it is important to determine the nature of the information how this information circulates, if we want to describe a process correctly, and consequently computerize it.

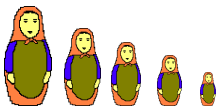
3.4 The company pyramid

Organizational elements, or representations of knowledge and skills, are not on a single level, otherwise they would be very difficult to use.

These elements are usually set up on three levels from the most general to the most detailed.

The top of the pyramid indicates the general principles. The middle level represents the organizational resources implemented to reach the general principles. The base of the pyramid includes the work instructions *(operating procedures and protocols)* that describe in detail how to carry out a specific task.

3.5 Nest of Russian dolls



The three-level structure is particularly well adapted to Qualigramme language. The graphic way of thinking, induced by graphic language, is largely based on aspects of aggregation/decomposition that enable users to access different levels in accordance with their needs.

Due to this structure, we can have an overall view of a situation *(represented by a process) (level 1)*, via the interaction between the process being examined and the other processes in the company, but we can also go down to a lower level for a more detailed picture of this process and take a look at the different components (*sub-processes for example*).

For each sub-process it is possible to access the procedures (*level 2*) used to implement that sub-process. Within these procedures, high-risk actions or actions requiring monitoring are subject to highly-detailed work instructions (*level 3*).

We can summarize this high (overall view) to detailed level approach as follows:

A **process** is comprised of:
- A set of procedures
  A **procedure** is comprised of:
  - A set of work instructions
    A work **instruction** is comprised of:
    - A set of basic **operations**

3.6 The Qualigramme pyramid

We have defined the basic principles of a process mapping language, but this is not enough for a complete description. Simplifying the language greatly facilitates description, but does not provide a method to carry out this description.

The Qualigramme language is based on a coherent structuring of the description, with three modeling levels in the form of a pyramid.

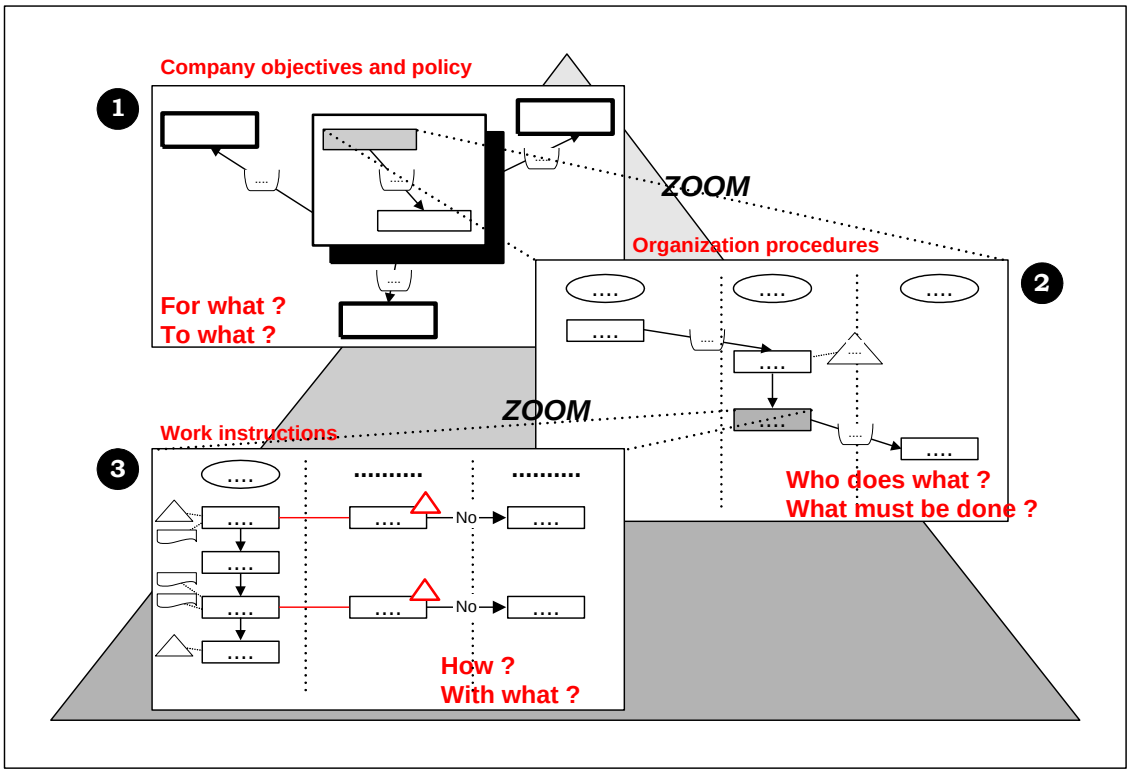
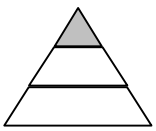


Figure 3.3 – Qualigramme pyramid (To what in the picture does not mean anything)

We will present the specificities of each of the three levels in the Qualigramme pyramid. A full description of each level will be provided in chapters 4, 5 and 6, including an explanation of the graphic vocabulary, the language and the structural rules.

3.6.1 Company processes *(Level 1)*: strategic approach

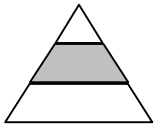


The first level in the Qualigramme pyramid represents the context and the strategical aspects of the company:

- Major tasks,
- Policies to be implemented,
- Objectives to be reached,
- Interaction between the various objectives identified.

The questions that need to be asked when creating a process map are: **Why?** and **To what?**

3.6.2 Organizational processes *(Level 2)*: organizational approach

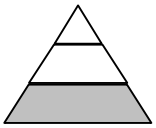


With the tasks, policies and objectives defined in the processes, we must now determine the way they are to be reached. This is the second level purpose which represents the organizational aspects of the company.

The main purpose of this level is to define the internal customer/supplier relationship, the **Who does what?**

The organizational procedures not only describe the actions to be carried out by the people involved, but also the information they are to exchange and the tools they are to use.

3.6.3 Operational processes *(Level 3)*: field approach



Now that we know **Why?** and **Who does what?**, it remains to be seen **How?** the work will be carried out.

The pyramid base, via the work instructions, is used to identify all the basic steps that a player must take to perform a task as well as the associated checks and appropriate corrective action.

Using these three levels, we can map the processes of the company, its organizational procedures and work instructions. These three components: the company, its organization and its work methods, taken into account by the Qualigramme structure, ensure that company skills and knowledge are mapped and memorized to be used as the basis for a future **collective intelligence**.

Each level can be dealt with independently of the others depending upon what the writer has in mind. It is not necessary to start with level 1, followed by level 2 and 3. Some companies begin the Qualigramme approach by assigning one level to each work group.

3.7 Qualigramme dynamics

Dividing processes into different levels is one matter, using them efficiently is another. The Qualigramme language not only maps a company's processes, it also helps to implement these processes in the best conditions.

Qualigramme is used to create dynamic relationships between process maps. This is the "***Zoom***" feature that creates links between processes, thus allowing **navigation** and facilitating access to processes.

Navigation is possible in three directions *(see figure 3.4)*:

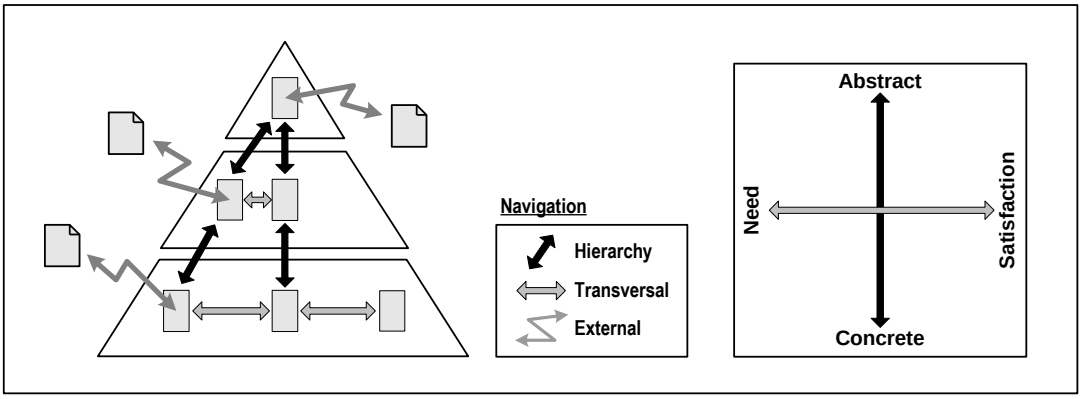


Figure 3.4 – The different types of Qualigramme navigation

a) **Hierarchical navigation**: concerns the aggregation or breakdown of the company. You can go from the concrete (bottom) to the abstract (top) or the opposite.

b) **Transversal navigation**: Used to follow (horizontally) the steps taken until a need is satisfied.

c) **"External" navigation**: accesses documents and tools (*external data*) used by the different levels of the pyramid. For example, the link between a form and a standard used by a process.

Links and navigation within the processes are only possible electronically (intranet for example).

4 – Process mapping *(Level 1)*

There are many definitions of the term process. Starting with an expressed need, they all deal with the making of the product or with the department that will meet the need by implementing associated resources and activities.

> Definition of Process according to ISO/DIS 9000: "*A system of activities that uses resources to transform input elements into output elements*".

Although everyone can be recognized in these definitions, we have to admit that as they are highly generic and vague, they apply to almost all the levels of the company. For example, the results of an interview conducted in the purchasing sector will produce:

- Purchasing operator: "*my process of writing raw material orders…*"
- Purchasing department manager: "*my raw material purchasing process…*"
- Purchasing manager: "*the purchasing process includes raw material purchasing, small supplies purchasing, etc.*"
- CEO: "*Controlling purchases helps us to meet deadlines, one of the seven customer-oriented processes of my company*".

So, everything is a process! It all depends at what level you are!

Since Qualigramme is a structuring language, it clearly states that the company processes are at the summit of the pyramid (*level 1*). They are designed to describe the invariant part of the organization (*invariant does not mean fixed, but stable over the long-term*).

The aim of describing the processes is to supply all the actors of the company with a clear, concise representation that will give them a better understanding of company objectives and allow them to implement these objectives.

Creating a Qualigramme chart that describes a process should:

- Give a greater understanding of process aim.
- Show the examined process in its own environment.
- Show the customers/suppliers (*external to the process studied*) and the information (*products, resources*) exchanged.
- Identify the interfaces (*contributions*) between the processes.
- Identify the procedures to implement in order to obtain the expected results.

4.1 Structuring rules

The aim of the structuring rules is to help the writer to identify the level of detail at which he is situated. To accomplish this, the rules are based on the recognition of the **human** (*roles, entities, actors*), **time** (*performing tasks chronologically*) and **resource** (*tools and documents*) **aspects**, that describe the level of writing with respect to the Qualigramme pyramid.

The first level of the pyramid represents, through process mapping, the objectives of the company and their interrelationships. These objectives are interdependent but the user can decide to display the details of each of these objectives, in whichever order he desires. There is no **chronology** imposed for consulting or understanding the different objectives.

This level of detail shows the relationships between the company processes and the external entities. Priority is given to representing the external interfaces of the processes *(exchange of resources)* but not representing the roles, departments or functions that these processes perform *(these will be described in detail at the level of the organization procedures)*.

Finally, this first level is stable in the medium to long-term. It represents the invariant part of the organization and, as such, must not mention the **tools** *(equipment or document)* that can change and develop very rapidly and more frequently.

The structuring rules for writing at level 1 are therefore:

- No internal roles,
- No resources,
- No chronology for the processes.

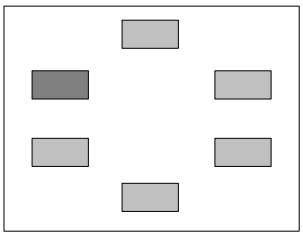
When these three conditions are united, the writer has no doubt as to the level of writing, and therefore of representation, that he must choose.

There are several representations that can be used to describe process mappings:

- Macroscopic mapping,
- Relational mapping,
- Detailed mapping,
- Transversal mapping

These more or less detailed representations mean that a process can be viewed using **different views**.

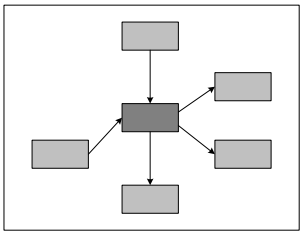
4.1.1 Macroscopic process mapping



It shows all the identified processes. It contains very little detail. It does not describe either the relationships between the different processes of the company or the external entities *(customers, suppliers, media, etc.)*, or what these processes contain.

It is generally the first chart of the pyramid and is therefore highly abstract.

4.1.2 Relational process mapping

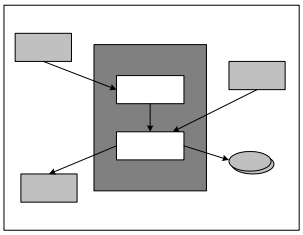


It is a more detailed display of process mapping. Theoretically, there are as many relational maps as there are processes.

It considers each process and clearly identifies the main relationships that exist between the **process examined** and the other processes or external entities.

It is very important to clearly understand that this is only one **specific view** of mapping that allows us, for the selected process, to show the **main information** that it requires to be produced as well as the information that it supplies.

4.1.3 Detailed process mapping



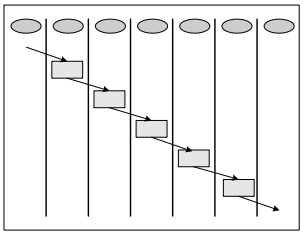
The third type of map, always located at the first level of the Qualigramme pyramid, corresponds to a more detailed view of a process.

It specifies process content. It integrates sub-processes (if any) and procedures.

This representation shows the main sub-processes of the relevant process. At this level of detail, it is necessary to define all the relationships between the sub-processes or procedures identified, as well as their interaction with the other processes of the company or external entities.

However, although this representation is very detailed, it does not show the trades or departments of the company that the process crosses. This is the purpose of the next map.

4.1.4 Transversal process mapping



The transversal process follows which trades or departments of the company contribute to its implementation. It identifies the actions they have to implement and the information that they must exchange.

With this type of map, which identifies the steps of the process through the different departments of the company, each department knows exactly what it must produce *(output data)* from the information supplied *(input data)*.

This customer/customer *(from the need expressed to its satisfaction)* overall view, does not mention the means used, but simply the main actions and the information flows exchanged.

The professions (*marketing, supply, logistics, management, etc.*) or departments (*sales, purchasing, R&D, assembly, quality, etc.*) that the process passes through are in columns to allow their mutual contributions to be viewed and understood rapidly.

4.2 Techniques of description

To illustrate the creation of a chart representing a process, we will use a concrete example associated with a commercial process, for which we firstly describe the detailed mapping before moving on to a more global level through relational mapping. Finally, we will illustrate the departments through which this process “passes”, with its transversal representation.

4.2.1 Introduction to the example

CARTO SA is a company specializing in the production of small office supplies.

The company management identified six main processes:

- Production — Manufacture a compliant product within deadlines
- Development — D*evelop a new product every 6 months*,
- Procurement — Purchase at a better cost,

- Management *Hold 25% of the world market*,
- Quality *Reduce and prevent non-quality costs*,
- Customer relations *Acquire new customers and create more loyalty*.

These processes are related to entities external to the company. The efficient running of the processes enables specific objectives for each of these external entities to be obtained:

- Customers *Customer loyalty*,
- Prospects *Hold 25% of the market share*,
- Suppliers *Control costs*,
- Standards organizations *Development of new products*.

To explain the identified processes to all of his employees, Mr. CARTO the CEO describes the "***Customer relations***" process and its contributions to the external entities and the other processes:

The "customer relations" process helps to attain the "Hold 25% of the market share" objective by canvassing our "prospects" and sending our company's "product documentation and information". This process also enables us to attain our "Develop one new product every 6 months" objective by supplying the "Development" process with the information concerning market "needs".

So, the "customer relations" must:

- *Process customer prospect orders,*
- *Take into account customer expectations (explicit and implicit),*
- *Implement quality requirements,*
- *Respect the sales objectives set by Management,*
- *Acquire the technical skills required to sell and maintain the products sold,*
- *Integrate the functions of the new products to create requirements with the customer prospects.*

But it must also:

- *Inform customer prospects about the company products,*
- *Generate customer satisfaction,*
- *Supply indicators (satisfaction) and proof (records) of the quality,*
- *Produce result indicators for the Management,*
- *Collect customer requirements and provide new avenues for the development of new products,*
- *Enable production to manufacture the customer prospect orders in the best conditions.*

To accomplish this, company management has decided to describe this "customer relations" process based on two sub-processes: "sales" and "after-sales". The first sub-process conquers market shares and the second increases customer loyalty. The "sales" sub-process itself is achieved by implementing two procedures "Canvass" and "Process order".

Detailed mapping shows that the "After-sales" sub-process needs to know the customer "history", which is supplied by the "Sales" sub-process, and that it handles all the requests coming from the customers (claims, faults, etc).

With this information, the "After-sales" sub-process can:

- *Indicate the nature of the malfunction and contribute to the development of new products,*
- *Deal with the customer quality claims so as to implement improvement actions,*
- *Respond to the customers in the event of a failure (dispatch spare parts, technical manuals, etc.).*

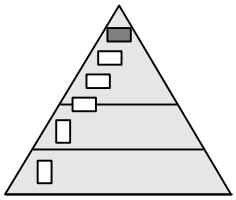
The "Sales" sub-process mainly requires the management sales objectives and customer prospect orders. This enables it to:

- *Send sales proposals to the customer prospect,*
- *Launch production operations,*
- *Record the order history to enable the "after-sales" sub-process to follow-up correctly.*

To illustrate his speech and ensure that the processes and company objective are well understood by all the employees, Mr. CARTO used the Qualigramme language. These maps are presented and commented upon where necessary in the following pages.

As can be noted from one representation to another (*relational to detailed, for instance*), the charts created in no way seek to exhaustively include all the objectives defined in the upper level! Only the objectives considered to be most relevant by the process managers are shown on the arrows.

4.2.2 Macroscopic process mapping



This is an overall representation situated at the top of the Qualigramme pyramid. This map (*see figure 4.1*) is the entry point for the organization. It shows the important external entities for which the company wishes to control the relations, together with the processes that contribute to this control.

Each process is represented by a rectangle with a shadow (*since the vocabulary is fairly easy for this level of description, we suggest that you refer directly to chapter 4.4)*

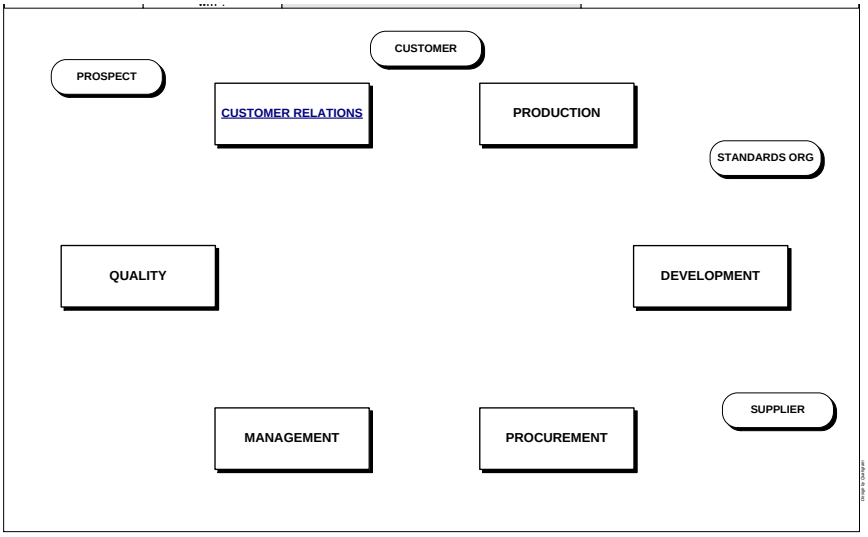
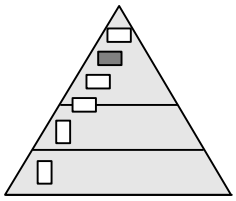


Figure 4.1 – Macroscopic process map

4.2.3 Relational process mapping



It provides an understanding of how the identified processes interact and contribute to each other as well as the context in which the studied process evolves. The chart shown in figure 4.2 shows the relations between the process "***customer relations***" and the other company processes, including the relations with the external entities.

To describe the relational mappings, it is vital to understand that only **the individual examination** of each process (*focus on a particular process at a given moment*) can show and cause the process purposes to be understood. A graphic description that contains all the contributions of all the processes would be completely illegible.

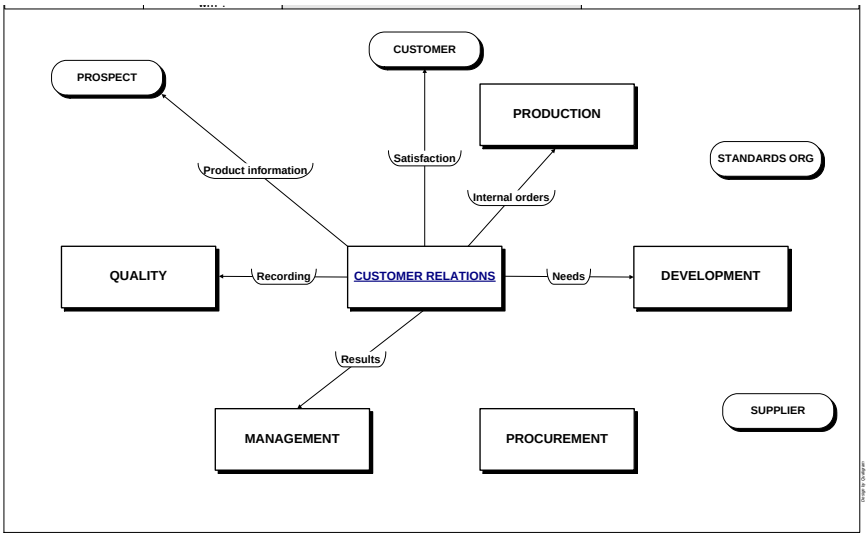


Figure 4.2 – "Supplier view" relational map

In our example, which has six main processes, six maps must be produced.

It is better to produce several clear maps than one complex and incomprehensible one.

However, another problem lies in wait for the author of a relational map: **The direction of the arrows**!

Indeed, the objective of such a map is to enable the examined process to be understood quickly. Hence, to simplify both the drafting and reading of these objectives, it may be relevant to distinguish **two types of view**: The "***supplier***" view and the "***customer***" view.

a) "*Supplier*" view: It corresponds to the main information (*products*) generated by the examined process. In this view, the process is the producer (*supplier*) of the other processes and external entities. Therefore, all the arrows point away from this process. The information on the arrows shows the nature of what is produced by the process (*see figure 4.2*).

   *This view can also be called "**Satisfaction**" because it shows the information that the process can satisfy with respect to the other processes or external entities.*

b) "*Customer*" view: This view expresses the essential information that the process must include or use when it is implemented (*see figure 4.3*). In this type of view, the examined process is the recipient (*customer*) of the other processes and external entities. All the arrows therefore point toward it.

👁 *This view can also be called "**Pending**" because it shows the information that the process must include with respect to the other processes or external entities.*

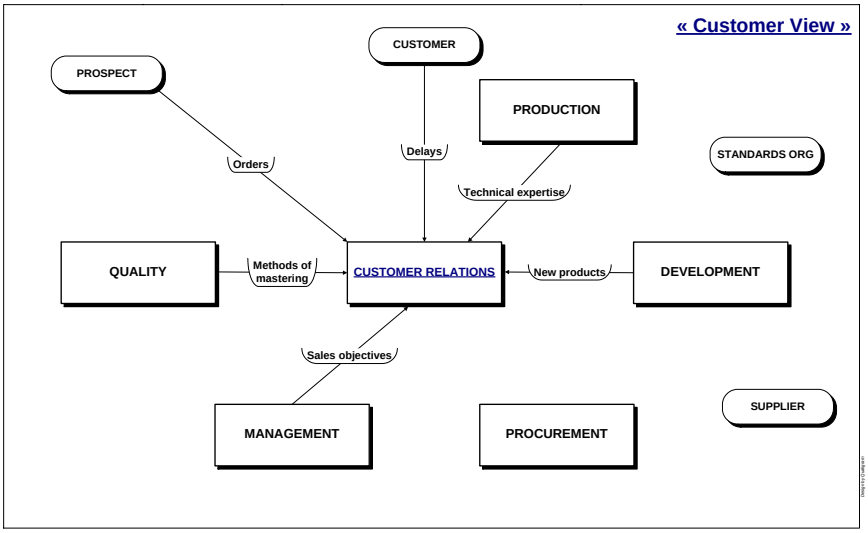
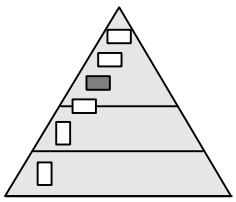


Figure 4.3 – "Customer view" relational map

👁 *For reasons of visibility, we strongly advise against representing the two views on a single chart by systematically positioning a two-way arrow between the examined process and the other processes and external entities.*

4.2.4 Detailed process mapping



The map for the "*customer relations*" process shown in figure 4.4 specifies the sub-processes and procedures that enable the objectives allocated to it to be reached.

This map specifies the detailed information flows exchanged between the elements represented (*two-way arrows can be used*).

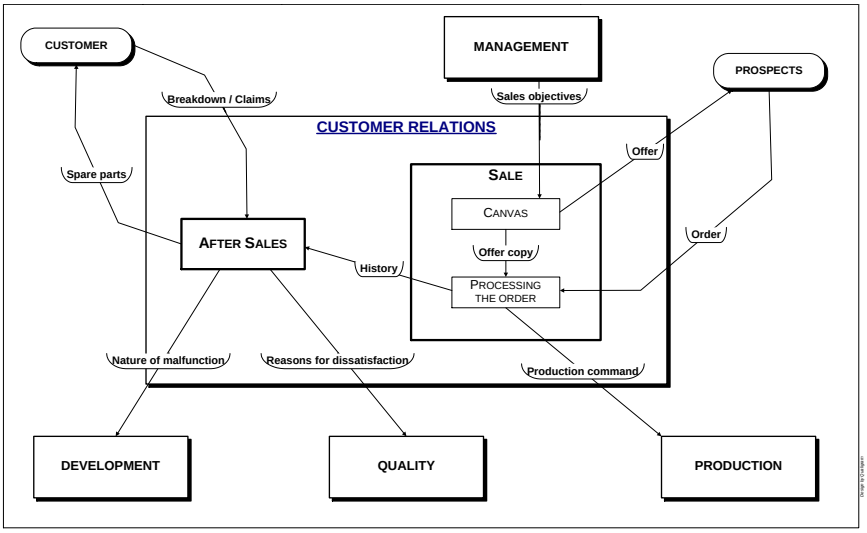
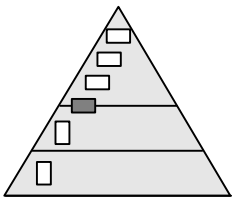


Figure 4.4 – Detailed map

👁 *At this level, each sub-process or procedure that describes the process* ***must have at least one arrow entering*** *(input data) and* ***at least one arrow leaving*** *(output data).*

4.2.5 Transversal process mapping



This representation is situated at levels 1 and 2 of the Qualigramme pyramid. Firstly because it is still an overall view, but also because it introduces both a notion of organization between the departments and chronology in the sequence of the actions.

The main advantage of such a map is that it clearly and chronologically follows the different stages that will satisfy the customer, starting from the collection of needs and finishing with the supply of the product or service that satisfies these needs.

To represent a transversal process, you must refer to chapter 5 with regard to vocabulary and writing rules, but you must follow the steps below. Identify:

- The departments (*or professions*) involved in the process,
- The external entities contributing to the process,
- The trigger element (*frequently a customer request!*) of the process,
- The input information of the process,
- The steps (*activities*) realized by the different departments.
- The information exchanged (*that triggers and results from each step*),
- The output information of the process

These steps result in the chart shown in figure 4.5. A few words are necessary concerning this representation.

Firstly, we chose to place the "*customer*" external entity in two columns, at the start and end of the process, to emphasize the path required to meet a need.

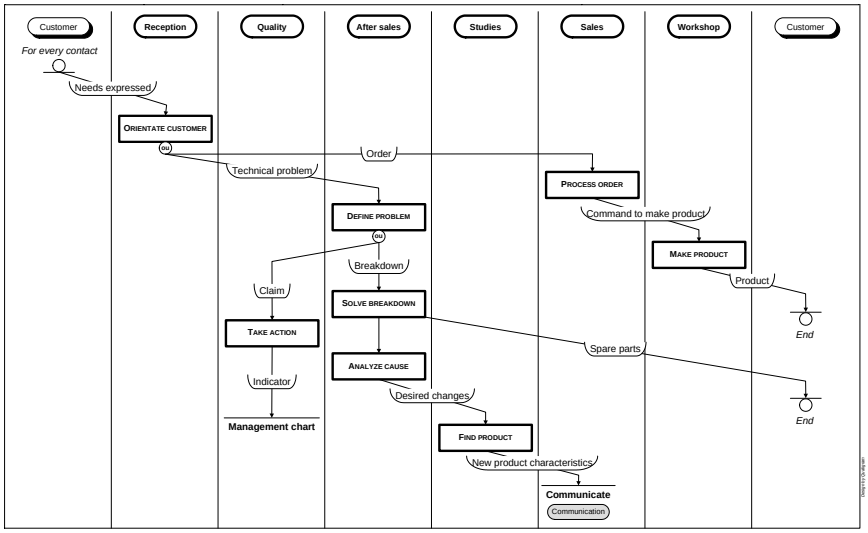


Figure 4.5 – Transversal representation of the process

Next, we can clearly see that this transversal process contains two parts. The first part calls upon the "*customer*" external entity and four company departments and concerns the "*after-sales*" sub-process. The second part concerns the "*customer*" and the "sales" and "workshop" departments. This is clearly the "*sales*" sub-process.

This transversal map is consistent with the detailed map (*see figure 4.4*). It provides additional details, particularly regarding the activity of the various company departments.

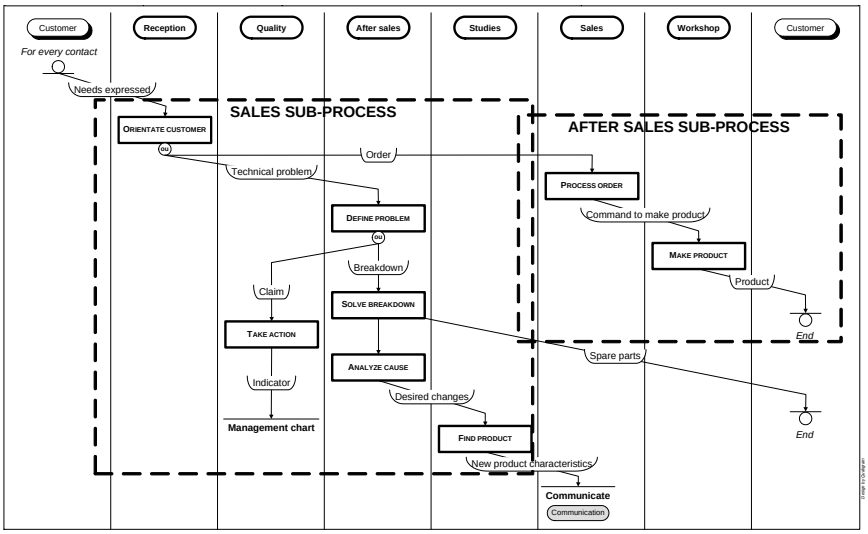


Figure 4.6 – Identification of the two sub-processes

However, this type of transversal representation must be considered with care. We would like to draw your attention to the fact that without non-linear thinking (*see figure 4.6*), some flows can be hidden (*e.g. the "order history" flow is not shown in the transversal map, whereas it appears clearly in the detailed mapping*) and non-productive inconsistencies ignored.

4.2.6 The limits of the linear approach

Throughout this document we have covered the necessity of employing graphic thinking for a graphic language. This is why we emphasize the fact that textual thought is the result of a linear division of reality that is not that of a system. It may therefore produce inconsistencies during process description. At the risk of not satisfying all the adepts of this type of description, we are going to show the risks associated with a linear approach to a process, particularly when such a description can lead to an aberration or even losing markets.

Director of the Lorraine Brewery, Mr. BREWER, a friend of Mr. CARTO, decides to describe the main processes of his business according to the principles acquired during his training in process analysis. He selected the process "***Barrel purchases***".

Here is the summary of the notes taken while interviewing the various people concerned:

"The packaging manager in the Purchasing department examines the state of the stock of recoverable packaging each week. He drafts a purchase order to replace the damaged barrels scrapped the previous week.
The purchaser specializing in the relationship with recoverable packaging supplies then consults several suppliers that he knows.
When he receives all the proposals in response to his request, he drafts a summary note and sends it to the purchasing manager.
This manager makes a decision and selects a supplier.
The purchaser then prepares the order, gets the purchasing manager to sign it and gives a copy to the packaging manager.
He waits for the supplier to confirm his request and files it while awaiting reception of the ordered barrels".

The representation of this process by using the transversal model of the Qualigramme language is shown in figure 4.7.

"Mr. Brewer communicates this purchasing process to the relevant persons. He notices a drop in beer sales after six months implementation.
Seeing that the market, due to the high summer temperatures, increased this year by over 20%, he immediately calls the principle executives of his company. The reasons stated concern, among others, the slowness of the new barrel purchasing process. Indeed, by following the procedure, the average time between a purchase order and reception of the barrels is approximately 8 weeks, which generates a waiting time that the restaurants and cafés cannot accept in high season. They therefore order more and more beers from the competitor".

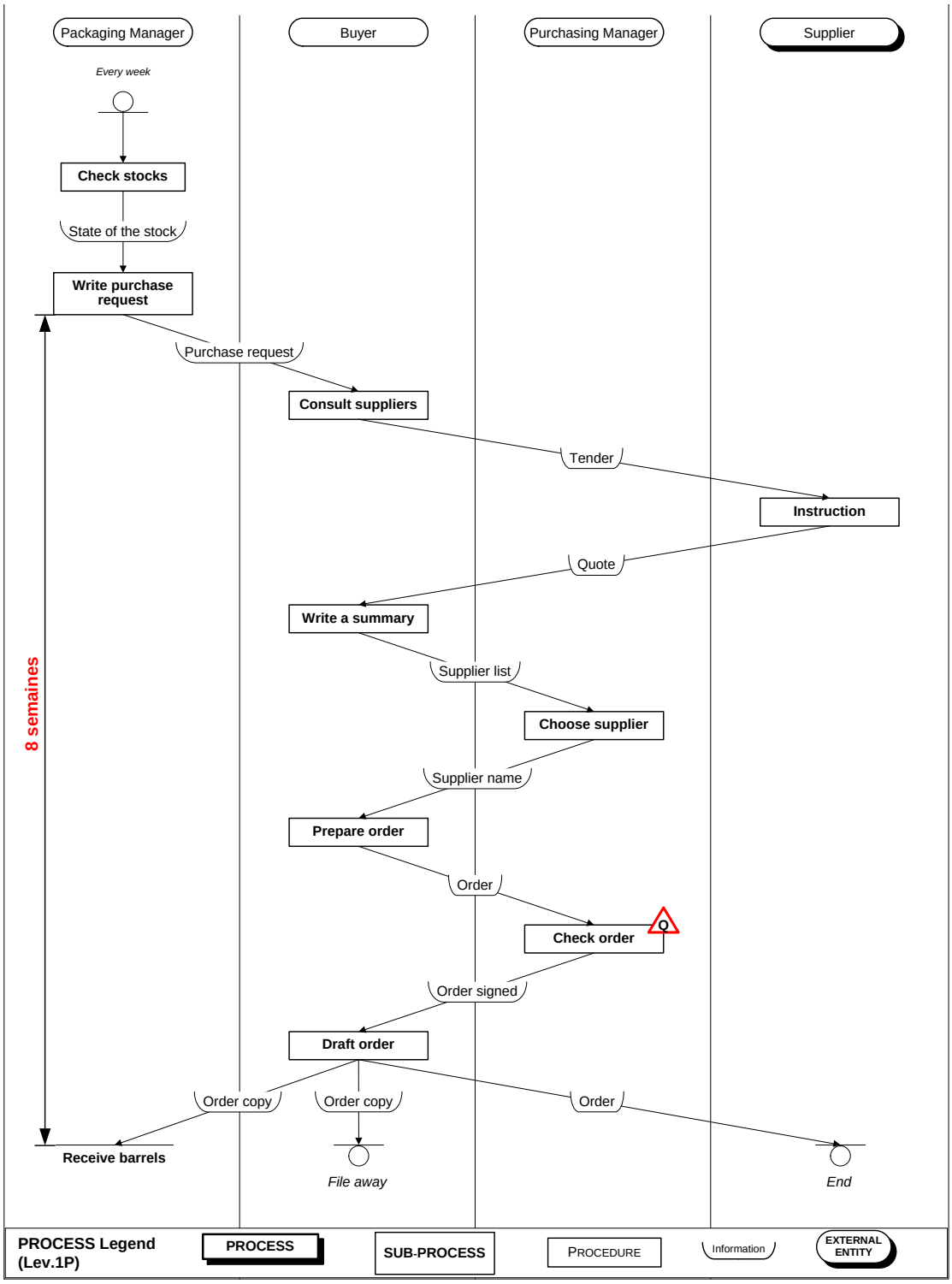


Figure 4.7 – "New barrel purchasing" transversal process

With a global, non-linear approach, Mr. BREWER would first of all have searched his notes for the main activities that enable the objective to be attained: "*purchasing barrels*". So, he would have identified the activities of stock analysis, supplier selection and ordering.

By identifying the "*Inputs*" and "*Outputs*" of each of the activities (*see figure 4.8*) and their destinations, our business manager would have easily seen that the purchase order leaves the stock analysis to reach the ordering activity and that identifying subcontractors can be done independently from this action.

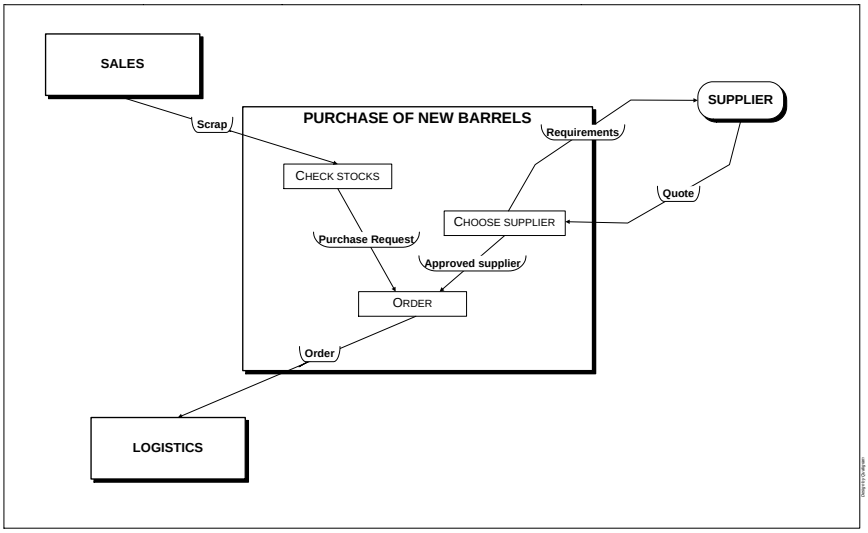


Figure 4.8 – "New barrel purchasing" relational process

With such an analysis, Mr. Brewer would have shortened the previously described process by 5 weeks, with the supplier being selected independently every six months.

To summarize, linear analysis forces the writer to follow the actions over time without seeking to identify the reasons for them. All that is required during an interview is for an action to be carried out just after the one described for an autonomous activity to become repetitive and dependent. This type of problem is often present in companies and is generally the consequence of short-term management.

A systems approach is based on the overall understanding of the activity. This improves company productivity substantially because it does not describe reality as a sum of tasks carried out one after the other, but gives priority to long-term management.

4.3 Writing rules

To enable efficient writing, the following rules, far from restricting the writer, guide him or her in the writing:

- Never exceed an A4 page *(portrait or landscape)*.
- At least 5 elements *(process, sub-process, procedure, external entity)*.
- At least 10 elements *(process, sub-process, procedure, external entity)*.
- Never place any role within the company in a process (*except transversal*).
- The sub-processes or procedures must have at least one input and one output.
- An external entity must only be represented when it supplies or receives an item of information.

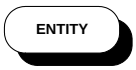
- Never cross the arrows.
- The name of the processes, sub-processes and procedures must never include *"And"*.
- The name of the processes, sub-processes and procedures must never exceed 5 words.
- The processes and sub-processes are expressed as nouns (*nominal form of the verb*).
- A procedure always takes a verb in the infinitive
- An arrow always comprises an item of information.
- The name of an information arrow never contains a verb.
- The constraint indicators are positioned in the top right-hand of the rectangles.
- The process objectives are positioned in the bottom left-hand of the rectangles
- Graphic shapes requiring comments will have a note.
- Create several relational processes to improve visibility.
- A process never contains resources *(tool, document)*.
- A process can contain 5 sub-processes at most.
- A sub-process contains 5 procedures at most.
- Never create a direct link between Level 1 and Level 3.
- Do not attempt to be exhaustive.
- Justify each rectangle by asking suitable questions.

4.4 Vocabulary

The vocabulary used to describe a process is very simple. It uses only three of the four basic shapes:

- Oval: Representing an external entity,
- Rectangle: Representing a process, sub-process or procedure,
- Information arrows: Representing the information exchanged between ovals and rectangles.

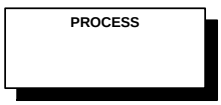
4.4.1 The external entity



This is a unit, department or external organization (e.g. suppliers or customers) who play a major role (principle actor) in carrying out the examined process.

Example: "*Bank*", "*doubtful client*" in the objective "*Reduction of outstanding debt*".

4.4.2 Process



This rectangle features a shadow and describes the examined process if possible in the form of objectives to give a meaning or aim to the actions to be performed.

Objectives are often the response to customer problems or requirements, whether or not they are expressed. The processes can be split into sub-processes (*see next shape*).

Each process is carried out by the implementation of resources: the procedures. A process can therefore contain several procedures in its rectangle.

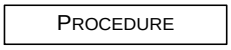
Example: "*Reduction of outstanding debt*", "*Reduction of overall costs*"

4.4.3 Sub-process

This is shown by a rectangle with a bold frame, the sub-process specifies the objectives of a process by detailing them. It underlines the fundamental points of the process.

Example: "*Reduction of outstanding debt*" in the process "*Improve cashflow*".

4.4.4 Procedure



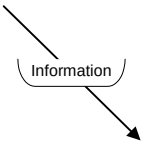
The procedure *(fine edged rectangle)* corresponds to an activity necessary for carrying out the process or sub-process.

The procedure determines who does what *(roles)* and with what *(resources)*. The content of the procedure will be detailed, by the zoom function, in another chart (*organization procedure – Level 2*).

Example: "*Controlling the customer situation*", "*Analyzing customer risk*".

4.4.5 Information arrow

It expresses the relationships between the entities, processes, sub-processes and procedures. Representing all the relationships provides a greater understanding of the context of the process and procedures (*systems approach to the company, viewing the interactions*).



The following three types of relationship must be distinguished:

a) Customer/external supplier relationship (*arrow between a process and an external entity*),
b) Contribution of a process with respect to another (*arrow between two processes or sub-processes*),
c) Result relationship (*arrow between two procedures*).

The information arrows at this first level are essential for illustrating the dynamics of process mapping.

Example: "*Call to tender*", "*Request for information*".

4.4.6 Performance indicator

The processes and sub-processes express company objectives. They must therefore be measured through indicators.

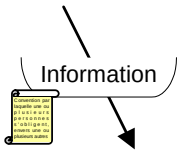
The symbol opposite draws the attention of the reader and gives access to the detailed explanation file for the indicator.

When positioned within a process, sub-process or procedure, this indicator measures the attainment of objectives linked with customer expectations, respect for normative requirements or requirements set by the company itself.

4.4.7 Interface indicator

The information arrows express the relationships (*contributions*) of the processes between each other or of processes with the external entities. These customer/supplier relationships may be subject to a clearly defined "***contract***" which contains specific undertakings.

The symbol opposite draws the reader's attention and gives access to the specific file that indicates the contract clauses.



When positioned at the base of the "*information arrow*" shape, this symbol means that a contract has been signed between the parties concerned by the arrow.

4.5 Syntax

The vocabulary alone cannot effectively represent a situation, you still have to be able to use and combine it correctly. This is the role of the syntax.

The following maps show the syntax used to describe the different representations of a process:

- Macroscopic map,
- Relational map
- Detailed map,
- Transversal map

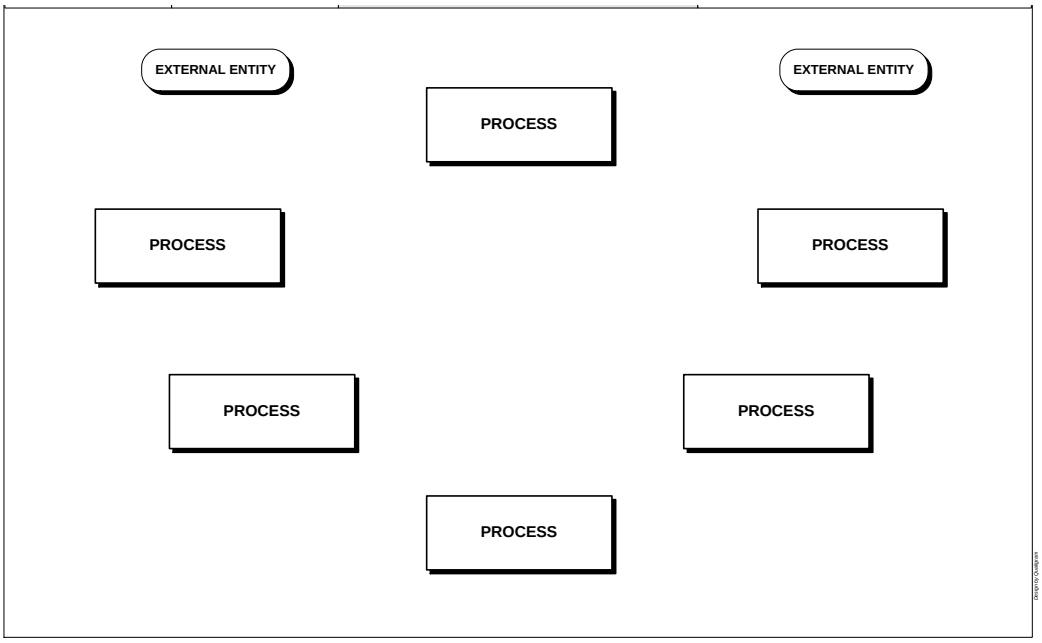


Figure 4.9 – Macroscopic mapping syntax

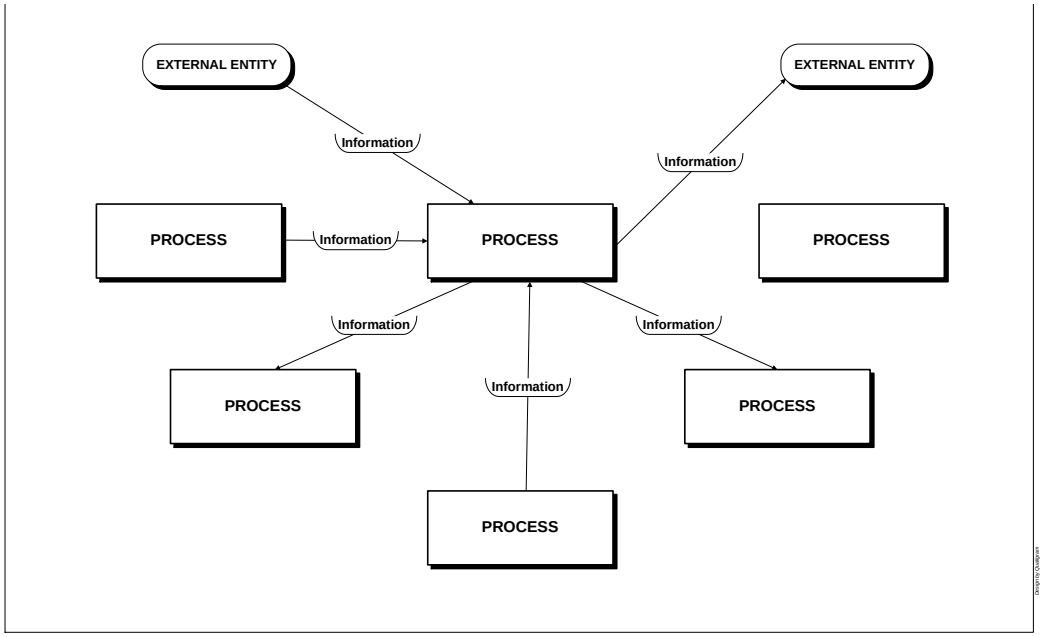


Figure 4.10 – Relational mapping syntax

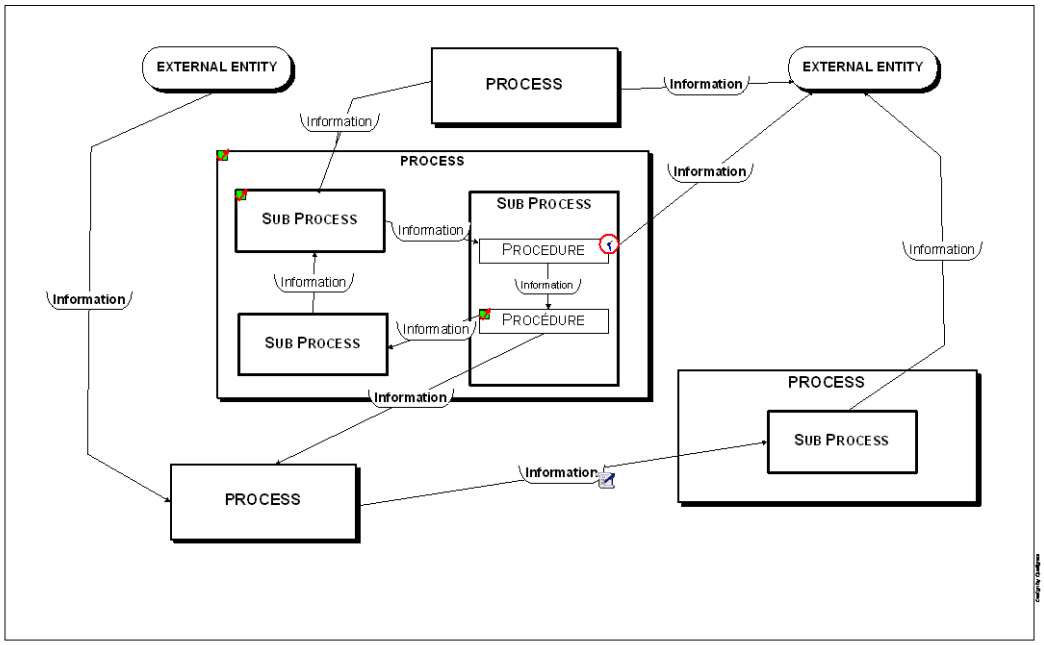


Figure 4.11 – Detailed mapping syntax

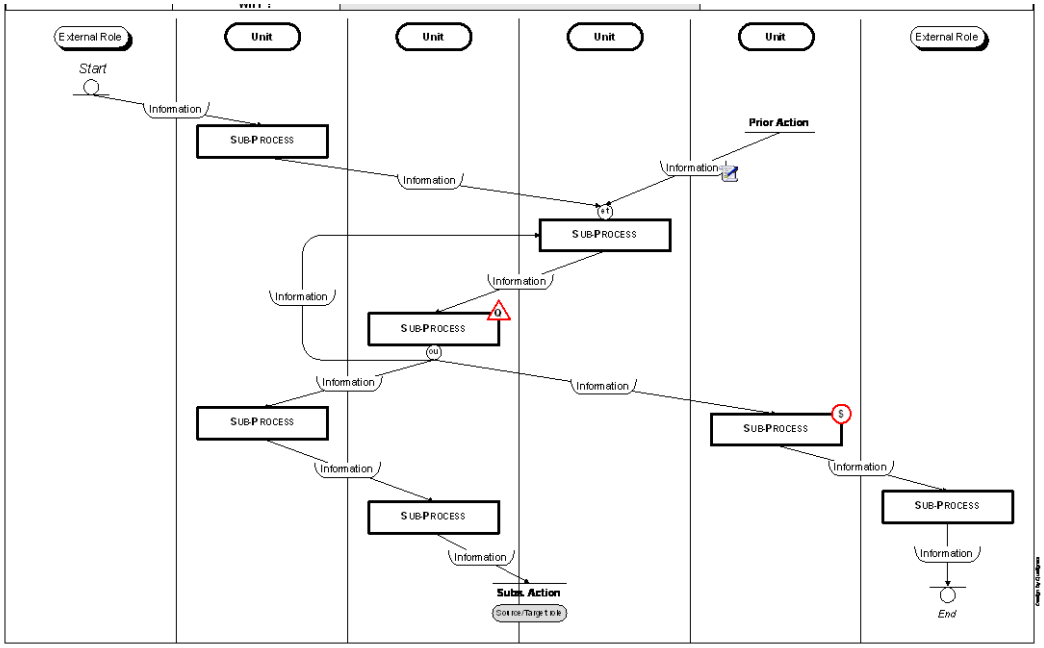


Figure 4.12 – Transversal mapping syntax

5 – Organizational processes *(Level 2)*

This level of mapping defines the procedures necessary to achieve process or sub-process objectives. Each procedure consists of a logical sequence of instructions but no implementation detail. It will be possible to provide this detail for each instruction at level 3 of the Qualigramme pyramid.

The procedures are the stage between the general objectives, described in the processes, and the detailed operations, represented by work instructions. The main aim of this level is to organize the actions of the people in the company.

To this effect, the Qualigramme language integrates and applies the **Internal Customer/Supplier Relationships** concept here, as it allows us to analyze the relationships between the different people involved in the procedure. It tells us:

- What is done before and after their action.
- Who carries out the work before and after the action.
- What these persons need to successfully complete their tasks.
- Which tools are required for the work.
- How precisely these persons' actions contribute to the finished product or service.

At this level, each chart:

- Is named after a higher level procedure *(Level 1 – Company Process)*.
- Is set out **chronologically**, from top to bottom *(time dimension)*.
- Specifies the roles *(who does what)* at the top of the page.
- Sets out the relevant instructions under each role.

The organizational structure at this level increases awareness of employees by involving and helping them to recognize their responsibilities in defining and executing the process to which the procedure relates.

5.1 Rules for Structuring

Organizational procedures at level 2 of the pyramid determine *"who does what"*. This infers that there are **several roles** or players who perform the actions, either individually or together. The roles in a mapped procedure will be set out in columns, enabling their respective actions to be quickly and easily identified.

The actions *(at this level, they are referred to as instructions)* are carried out in sequence. A completed instruction produces outgoing data that forms the incoming data of the next instruction. To understand and successfully carry out a procedure, it is advisable to specify the first instruction, then the next, and so on until the last instruction. All these instructions are therefore linked in **chronological order**, from top to bottom.

Lastly, **tools** (equipment or documentation) are sometimes necessary to carry out these instructions. At this mapping level, only the most important tools ought to be mentioned, rather than an exhaustive list, to acquaint the user with the main resources required to complete each instruction.

Therefore, the rules for structuring level 2 maps are:

- Several roles,
- The main resources,
- A vertical sequence of actions.

An operational procedure must only outline the defined situation. The graphic shapes *(Action box)* must contain only essential details, which is needed to limit risks and facilitate comprehension. We thus create concise procedures that are easily understood and applied.

Note that giving merely an outline does not mean that we should mask important aspects of the procedure, but that the fundamental actions alone will be illustrated in the chart. These actions may be "*filled out*" with comments or work instructions *(level 3)* which describe all the basic operations for a given action.

5.2 Stages of Procedure Mapping

In this chapter, we shall see how an organizational procedure is mapped. For this, we will use a real case example and follow step-by-step construction of the mapping.

The procedure to be mapped is based on how customer orders are processed.

The scenario is as follows:

The secretary enters the following details of each customer order on a commercial management software tool: the customer's name, the customer number, the date of the call and the items ordered. She then prints out a sheet containing this information and transfers it to a salesperson.

The salesperson assesses the order and decides whether catalog goods will satisfy the request or whether specific research is necessary. In the first case, he drafts a written response and transfers it to the secretary. In the second case, he completes the order form with details of his assessment and sends it to his sales manager.

The sales manager decides on the next step and sends his decision, yes or no, to the salesperson who, along with the R&D manager, determines the final response to the customer regarding his order.

The secretary types up the salesperson's assessment providing catalog goods prices, a quote for specific cases, or stating that the company is unable to meet the order. She sends the reply by post to the customer.

If the customer accepts the offer, he meets the salesperson to specify the final details and sign the order form. A contract review is also carried out during this meeting. The salesperson sends the order details to either the Warehouse, which delivers the catalog goods, or to the Research Department, which will proceed with the research project for a specific product.

5.2.1 Identifying the Roles

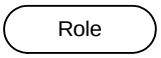
We can identify several roles in the described procedure:

- The Customer,
- The Secretary,

- The Salesperson,
- The Sales Manager,
- The R&D Manager,
- The Research Department,
- The Warehouse.

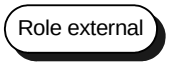
We can see that these roles are not analogous. The "*Customer*" is external to the company. The "*Secretary*", "*Salesperson*", "*Sales Manager*" and "*R&D Manager*" are internal roles of the company with clearly defined responsibilities. Lastly, the "*Research Department*" and the "*Warehouse"* represent company departments.

The basic shape *(an oval)* used to represent these different actors has three separate graphic designs:



A simple oval represents a **role** with defined responsibilities.
Internal roles: secretary, salesperson, Sales Manager, R&D manager.

A bold oval represents a **unit**, usually a company department. Note that this unit, as a rule, is composed of several roles *(see above)*.
Units: Warehouse, Research Department.



A shadowed oval represents a **role external** to the company.
External role: the customer.

Mapping these types of roles allows the user of the procedure to visually identify the procedure's participants easily.

When mapping a procedure, avoid including roles that are outside its purpose, and thus describing actions that are covered by another procedure. This leads to redundant elements and causes problems when updating or changing documents.

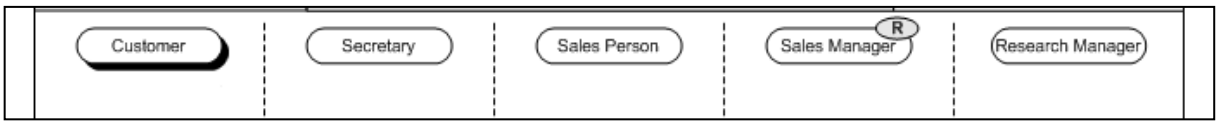
For example, in our case study, the "*Warehouse*" and the "*Research Department*" are mentioned in the description, but they are beyond the scope of this procedure's purpose which relates to **processing an order**. The purpose of the "*Warehouse*" is to package, store and deliver products. The "*Research Department*", for its part, carries out feasibility research.

As we can see, these fields are implicated in processing an order. However, as they are probably defined in specific procedures elsewhere, they do not need to be described in our order processing procedure. "*Warehouse*" and "*Research Department*" employees do not therefore appear as main roles in this procedure.

We use the shapes defined above to illustrate the procedure roles, as follows:

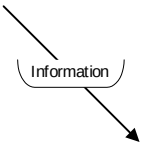
Once the roles are placed in columns, we will describe the actions that they carry out.

In a procedure, these actions are called **Instructions**. An instruction is always expressed by



a box *(one of four basic shapes of process-mapping language)* and it is always placed in the column of the role that executes it.

Each instruction is linked to other instructions by an arrow with an information basket *(one of four basic shapes of process mapping language)*.



The information on the arrow is to be taken in its widest sense. It represents information that can be immaterial *(a phone call)* or material, such as a document *(letter, fax, plan, etc)*, a product, raw material, a sub-unit, etc.

The first instruction of this procedure is performed by the "*Secretary*" who records the "*Customer*" order.

We cannot, however, place this instruction straight into the "*Secretary"* column without having first identified what triggers this initial instruction, and consequently, the procedure.

5.2.2 Identifying the Triggering Event

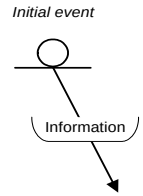
Now that we know which roles are implicated, we must specify how our procedure starts.

In this case, we are dealing with a "*Customer*" order. This means that we shall implement this procedure **for all** customer orders.

In basic process mapping language, the start of a procedure is not represented by a specific symbol. We shall therefore introduce a new graphic shape which is part of mapping language **punctuation**.

This punctuation, along with the basic shapes of the language, allow us to define the **syntax** of process mapping, as outlined in Chapter 6.6.

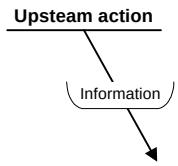
The following shape introduces the **start** of a procedure, also known as the **initial event**:



The entry point of a procedure is expressed by an underscored circle, from which descends an arrow with an information basket.
A brief text is written above the circle *(3 to 5 words max.)* which specifies the nature of the initial event.

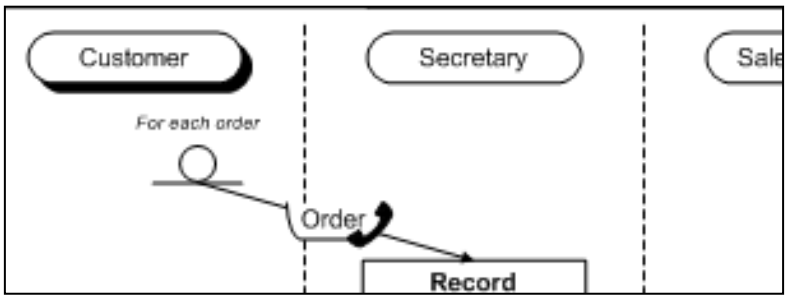
👁 *Do not confuse "initial event" and "triggering information".*
An initial event, however, is not the only way of starting a procedure. A procedure can be triggered by **another procedure** *(for example, a procedure for "non-compliance" may be initiated by a "check" procedure)*.

To map this scenario, we use a specific **"Upstream Action"** shape:



A line, from which an information arrow descends, represents the procedure which "*initiates*" the current procedure.
To identify the procedure that initiates another, its name *(or reference)* figures on the line as an upstream action.

The starting point of the procedure we are mapping is an initial event that represents the customer's order. To emphasize that the procedure is to be systematically applied, we shall call the initial event: **For each order**.



As the "*Customer*" made the order, the "*start*" symbol is in his column. The information transferred to the "*Secretary*" by the "*Customer*" is an order, which is represented by an arrow with an information basket containing the word "*Order*". If this order was made by telephone, we could add a "*Telephone*" symbol to indicate the method used.

Now that we have seen which roles are involved in the procedure and how it starts, we shall trace the instructions that must be carried out.

5.2.3 Tracing All Instructions in the Procedure

To be effective, this procedure must implement various instructions, listed below:

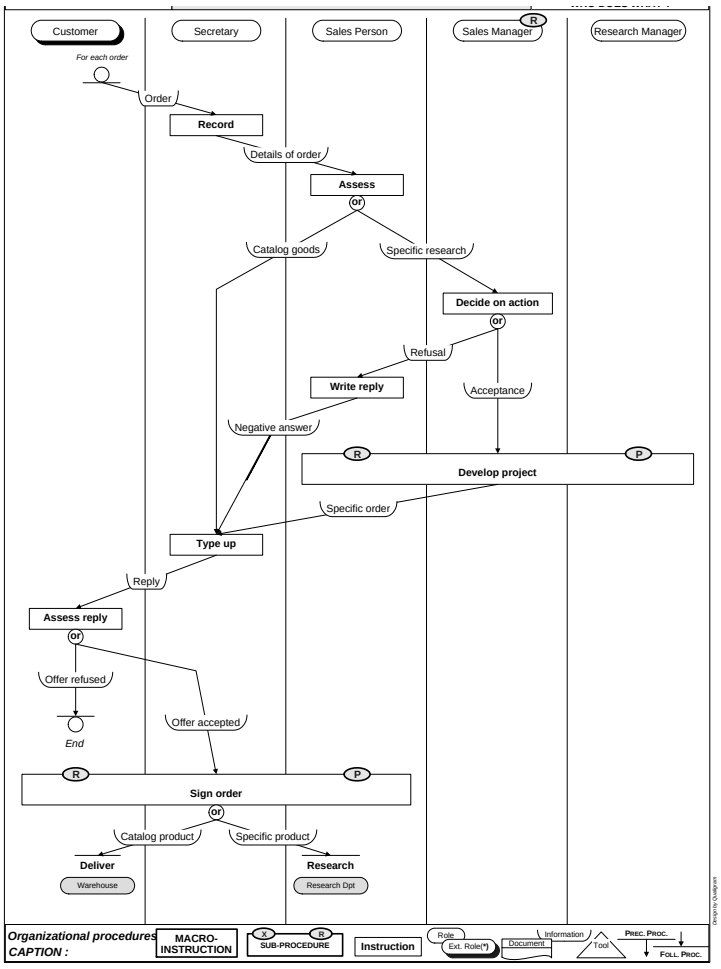


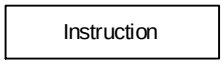
Figure 5.1 – "Processing an Order" Procedure

- "*Secretary*" **records** the order,
- She **prints** the order form,
- "*Salesperson*" **assesses** the order,
- He **sends** the reply to "*Secretary*" if catalog goods,
- If not, he **sends** his assessment to his manager,
- "*Sales Manager*" **decides** the next step and informs "*Salesperson*",
- If specific product, "*Salesperson*", with the approval of "*Sales Manager*", **determines** the reply to be sent to "*Customer*" with "*R&D manager"*,
- "*Salesperson*" **transfers** this information to "*Secretary*",
- "*Secretary*" **types up** the reply and sends it by post to "*Customer*",
- If "*Customer*" **accepts** the offer, he meets "*Salesperson*" to specify the final details and **sign** the order form. In the opposite scenario, it is the end of the procedure.
- Lastly, "*Salesperson*", **sends** the order after signature to the "*Warehouse*" for catalog goods, or to the "*Research Department*" for specific products, each of which also leads to the end of the procedure.

We can illustrate this data in graphic form by assigning each role its respective instructions (see figure 5.1).

The procedure is a set of instructions linked by arrows carrying the information. This information initiates each instruction and those that ensue.

The instruction is expressed in a single-line box.



An instruction briefly states *(4 to 5 words)*, what must be done. This text **must** have a verb in the infinitive. It is an action!

For procedure mapping to be effective and coherent, it is advisable to use simple, relevant **questioning** for each instruction.

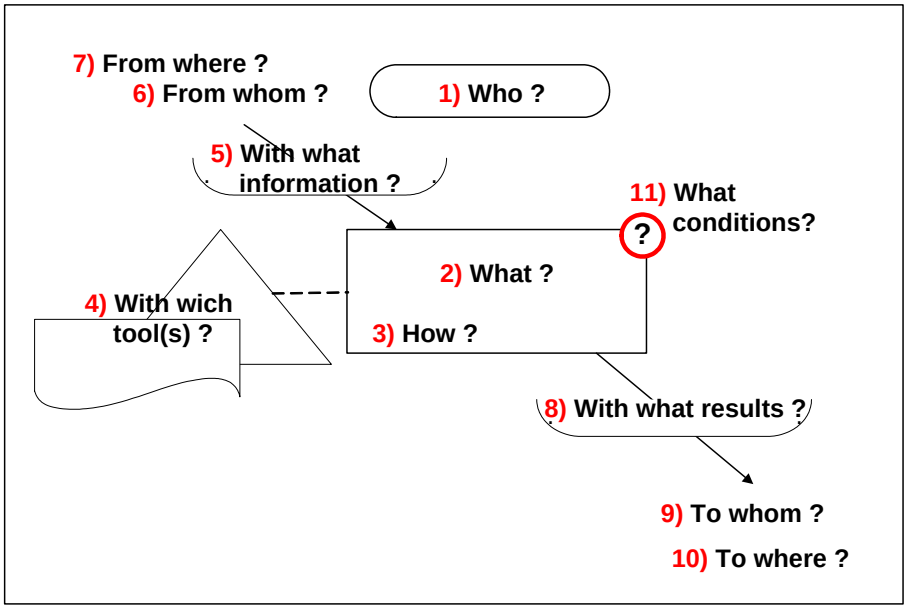
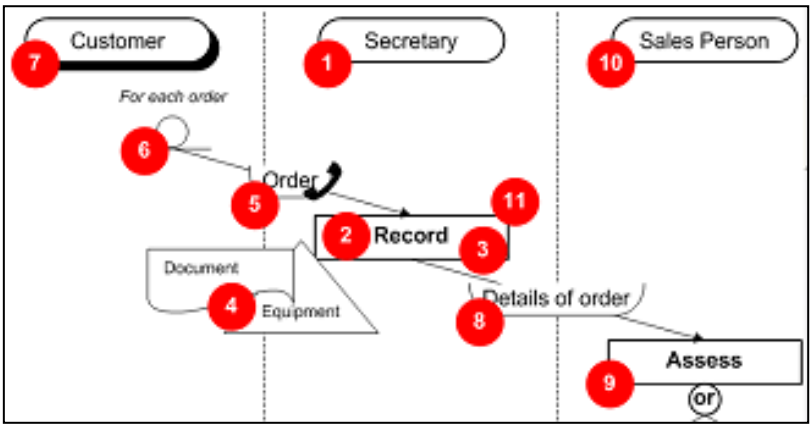


Figure 5.2 - Qualigramme Questioning

This questioning is put into context below using the "**Record the order**" instruction.



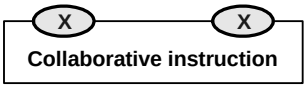
1) **Who?** .....: Places instruction in relevant column,
2) **What?** .....: Title of instruction,
3) **How?**.....: Method of executing instruction *(see Chapter 5.2.7)*,
4) **With which tools?**.....: Necessary tools,
5) **What information?**.....: Information that initiates instruction,
6) **From where?**.....: Source of information *("Start", "Upstream action")*,
7) **From whom?**.....: Role that supplies information,
8) **What information?** .....: Information resulting from instruction,
9) **To where?**.....: Destination of information *("End", "Downstream action")*,
10) **To whom?**.....: Person to whom information is sent,
11) **What conditions?**.....: Conditions of execution *(duration, cost, checks).*

This generic questioning can be applied to all instructions. It enables you to examine the immediate surroundings and expose elements that are essential to perform the instruction.

If these questions cannot be answered almost instantaneously, it means that:

a) Either, the writer is not able to answer them, in which case he must consult with the relevant people to map the procedure,
b) Or, the writer is describing a procedure that is not, in reality, performed in this way.

Several roles execute one action at two points in this procedure. This is depicted by a specific instruction shape, called the **collaborative instruction**.



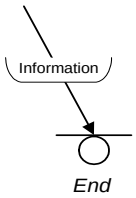
A collaborative instruction is an instruction carried out by **more than one role**, at the **same time.** The collaborative instruction therefore always straddles several columns *(at least two)* and as a result we must indicate which roles are implicated. To do this, we place small ovals at the top of the box indicating which roles collaborate along with their mutual functions *(one role decides whilst the other(s) participate)*.

In our example, the first collaborative instruction straddles three columns *("Salesperson", "Sales Manager" and "R&D manager")*, but only the first and last role collaborate to develop the project. This action is under the "*Salesperson's"* responsibility.

Several new symbols, which mainly indicate the end of the procedure, have been inserted into our case example.

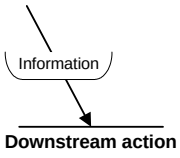
As explained in Chapter 6.3.3, a procedure must always have a *"start"*, represented by an *"initial event"* or an *"upstream action"*. There are also graphic symbols that indicate how the procedure ends.

The *"End"* symbol is the counterpart of the *"Start"* symbol. It is placed under the role that receives information that terminates the procedure.



The symbol is a circle with a line above it and *"End"* written underneath. It can also be used to indicate an end during the procedure.

The alternative method of ending a procedure is by initiating a procedure found downstream of the former. This is depicted by a graphic symbol similar to the aforementioned "upstream action".



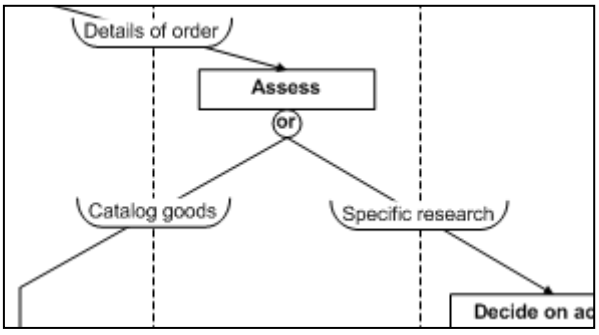
The information arrow lands on a line, below which is written the name *(or reference)* of the subsequent procedure.

Two further symbols in this procedure remain to be discussed.

The first graphic symbol deals with alternative actions to be carried out after an instruction. This occurs when the *"Salesperson"* assesses the details of the request and determines whether the latter can be met by supplying catalog goods **or** whether it requires specific research.

To express these two alternatives, we use the *"Or"* symbol.

This logical operator is placed below the instruction and indicates the different scenarios possible following an instruction. At least two arrows must issue from this symbol with information baskets containing the results of the instruction. The ***"Or"*** **replaces the *"diamond"* symbol**, which usually depicts a choice or a test.

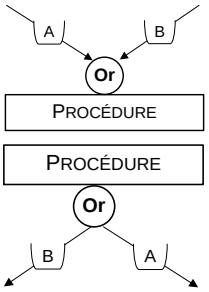


The *"Or"* symbol can also be placed above an instruction. This illustrates that the instruction can be performed if just one of the alternative incoming information exists.

The examples below demonstrate the different uses of this operator:

a) The instruction can be executed if either A or B are present:

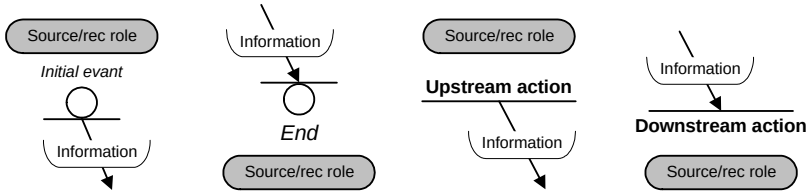
b) The instruction produces either A or B, but not both. This construction is used to express different alternatives *(test)* following an instruction:



The same construction applies to the "And" symbol.

The remaining graphic symbol is a rather unusual oval. It represents a *"source or recipient role"*. We use it with the "*Start*", "*End*", "*Upstream action*" or "*Downstream action"* symbols when we want to specify **who** starts or ends a procedure, without creating a specific column for this role. In our case example, the "*Warehouse*" and "*Research Department*" are recipient roles.

This shape tells us:
a) which role produces or receives information,
b) which role carries out upstream or downstream action in a given procedure.



This symbol is used to simplify a procedure when, after mapping, a defined role is found to have only procedure start and end symbols and no instructions. In these circumstances, we must delete the column and display the role as an information source or recipient.

This symbol also represents an "*External role*", a "*Unit*" or an "*Internal role*" so we do not recognize it by the role that it represents. Nevertheless, we advise you to use a smaller font size and a particular color (e.g. light gray) to shade this oval and distinguish it from others.

Before mapping this procedure, we would like to draw your attention to the following points:

- Transfers *(send reply to "Customer", "Secretary", etc)* are not represented by boxes, but are directly expressed by information arrows,
- A specific box is not attributed to the "*Secretary's*" act of printing the customer order. This action is summarized within the "*Record*" action.
- Instructions performed together *("Salesperson" and "Customer", "Salesperson" and "R&D manager")* are represented by a collaborative instruction which straddles several columns. The roles implicated in these collaborative instructions are identified by symbols of responsibility *(R for coordinates, P for participates)*,
- Inactive roles are identified all the same using the source / recipient role symbol,
- All information baskets on arrows are filled in,
- A key summarizes the shapes of the graphic language.

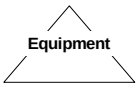
5.2.4 Inserting resources (equipment and documentation)

Now that we have identified the complete process of the procedure, we shall complement it with the resources *(equipment or documentation)* necessary to carry out certain instructions.

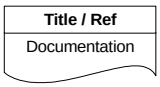
In our case example, we know that:

- "*Secretary*" enters the orders on a software tool,
- "*Salesperson*" must know the Company's "*Catalog*" products in order to assess the order,
- "*Secretary*" uses a typewriter to type up the reply,

Qualigramme graphic language uses two distinct symbols to illustrate resources: A **triangle** represents equipment *(computing software, typewriter)*, a **box with a curved edge** depicts a documentary resource *(products catalog)*.



Equipment required to carry out an instruction *(machine, office tools, communication tools, etc).*



Documentation required to carry out an instruction. This could be a check-list, a scale, a form, a memorandum or a standard.

We have inserted some resources *(triangle and curved-edged box)* into the chart and attached them to their respective instructions with a dotted line (see figure 5.3).

In addition, we also see several numbered boxes on some shapes in the procedure.

These numbers are important as they will enable the user of the procedure to refer to **annotations**. Annotating the shapes is an important stage of process mapping using the Qualigramme language.

5.2.5 Annotating shapes

Although the advantage of process mapping lies in its comprehensibility *(one page holds all essential data),* the downside is that it does not provide detail.

To compensate for this, the Qualigramme language proposes a simple solution, which consists of annotating each graphic shape **where necessary**, with a comment of a few lines explaining the reasons behind this shape.

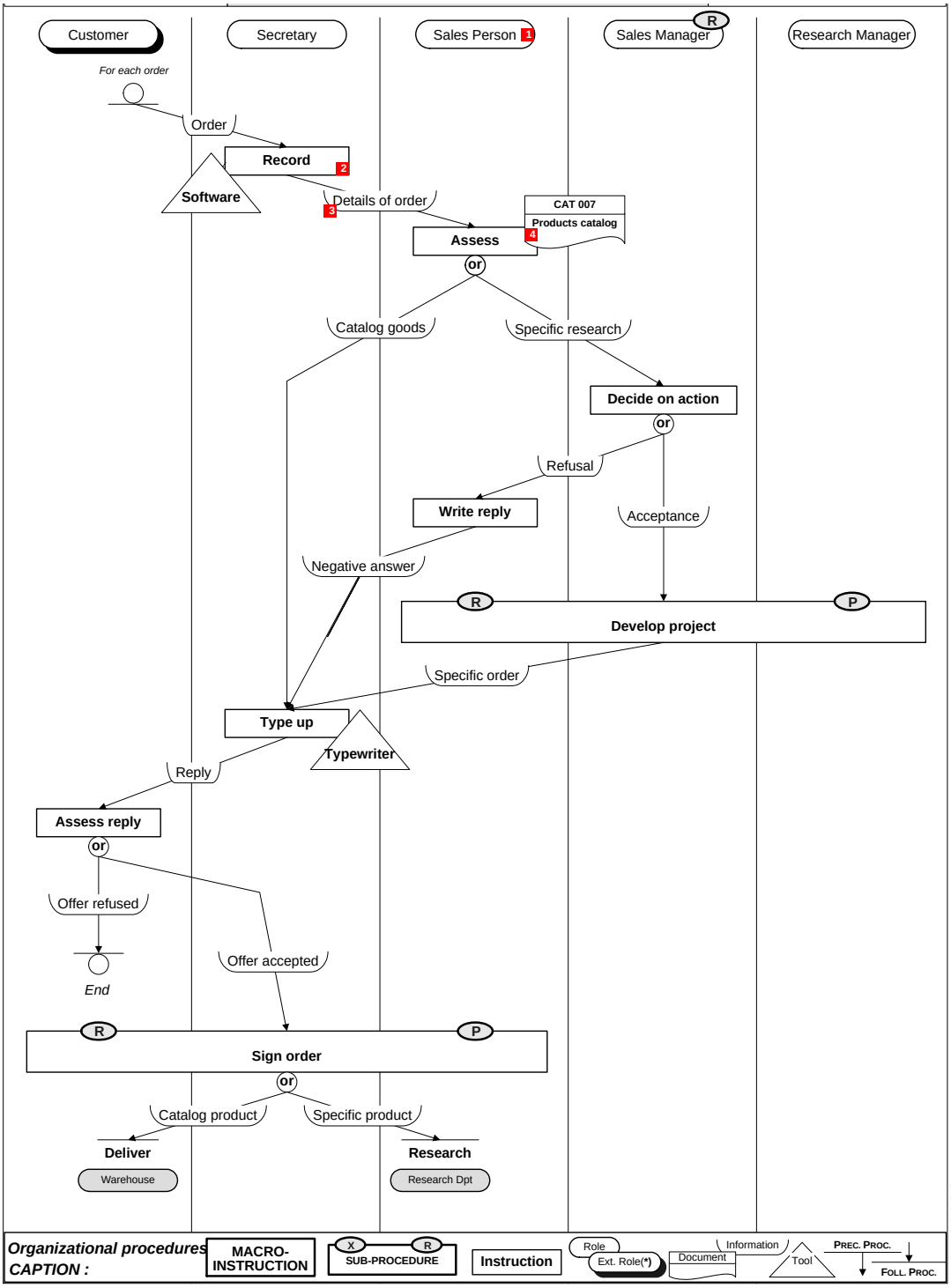


Figure 5.3 – "Processing Orders" Procedure With Tools and Annotations

The annotations (numbered boxes) in the procedure refer to:

1. ***Role: "Salesperson"***
   Person in charge of customers.

2. ***Instruction: Record***
   Recording the order must include:
   - *Customer's name,*
   - *Customer number,*
   - *Date of call,*
   - *Items ordered.*

   The Secretary prints the order form once she has entered this information into the software.

3. ***Information: Order details***
   The details of the order are summarized on the sheet completed and printed by the secretary.
   This sheet also mentions the order and payment history of the customer.

4. ***Document: CAT 007***
   The catalog is updated and printed in December of each year, for the next year.
   It is valid from January 1st through to December 31st of the same year.

Any shape may be annotated. However, the annotation is not suitable when instructions require a greater level of detail.

If this is the case, it is advisable to create a **Work instruction** *(level 3 Qualigramme pyramid)*, by using a "***Zoom***".

As work instructions are not required for all cases, we have described the circumstances in which they must be created.

5.2.6 Defining instructions to be created

The "Zoom" elaborates upon an instruction shape by providing detail for a level 2 *(organization procedure)* instruction box in a level 3 document *(work instruction)*.

The zoom should not be systematically used for all instructions in a procedure, rather just for those that either present a risk, need monitoring, or those to be computerized (Workflow).

In Chapter 6, we describe how a work instruction *(also called an operating procedure, protocol, etc)* is mapped. Therefore, we will simply specify here that this mapping level contains:

- all basic operations necessary for **a role** to carry out the instruction,
- and where necessary, it specifies self-checks for managing this risk or monitoring or to ensure that the Workflow works correctly.

For our case example, we decided that the "*Salesperson"'s* "*Assess*" instruction requires particular attention, as incorrect assessment in the past led to delivery of unsuitable catalog products resulting in several customer complaints.

In order to point out that this instruction zooms to another document, we display the word *"Assess"* using a separate color and underline it in the flowchart.

We did not attach a work instruction to any other instructions in this procedure as they do not present a particular risk or require special attention.

5.2.7 Different ways of saying "*How*"

There are four ways of expressing how to execute an instruction when process mapping with the Qualigramme language (see figure 5.4):

- The annotation: all shapes can be annotated. This is a short text of a maximum of ten lines. If the annotation is too long, it indicates that the instruction requires many basic operations. If so, you should perhaps create two instructions!

- Zoom: This may only be used for the "*Instruction*" shape. The zoom enables you to create a new graphic document explaining precisely how to execute an instruction (*box shape*).

- The substantiating document: Attached to an "*Instruction*", the "*document tool*" symbol refers to a textual procedure, memorandum or check-list which explains, in detail, how to execute an instruction.

- The macro-instruction: The "*macro-instruction*" is mentioned in the vocabulary (Chapter 5.4). The principle of the macro-instruction lies in exposing three or four main operations that execute and manage the instruction. The macro-instruction is used mainly when the small number of operations does not justify the creation of a level 3 graphic document, for example.

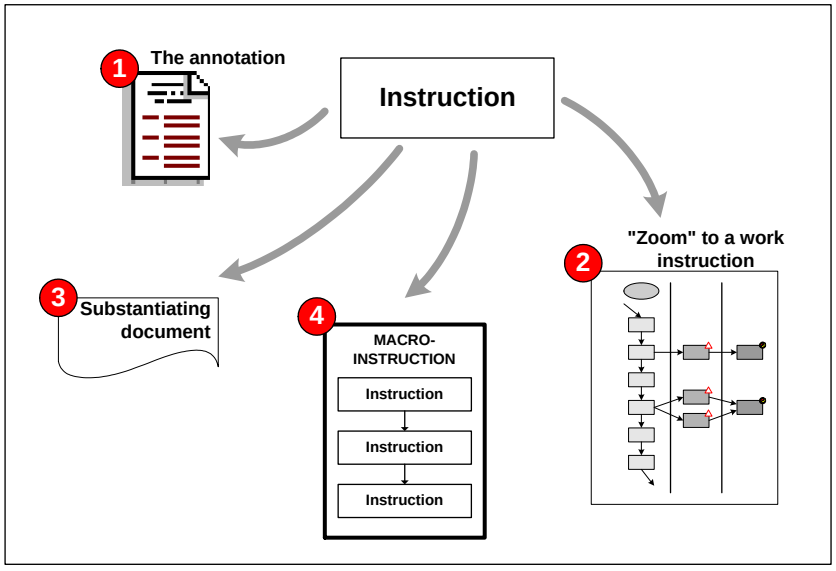


Figure 5.4 – Different ways of saying How

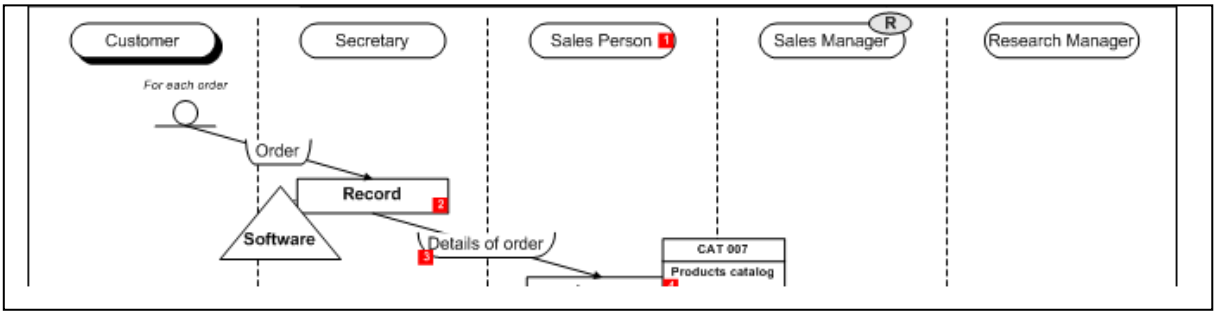
5.2.8 Responsibility in the procedure

Various players' responsibility and authority in the procedure can be identified at two levels.

On an overall level, so as to identify which role can solve an issue or take a decision when necessary in the procedure.

For example: the role in charge of the procedure can stand in for or replace one of the other roles. A symbol for the type of responsibility helps us to identify this managing role, as shown below for the "Sales Manager".

A procedure generally has at least one managing role. Depending on the circumstances, it may be necessary to ascertain more than one.



Responsibility is not identified solely at the global level of the procedure. It can also be defined in collaborative instructions, depending on the context.

5.2.9 Summary of How to Create a Procedure

The main steps in procedure construction are:

- Identify the roles concerned,
- Put the roles into columns,
- Ascertain the factor *(initial event)* or procedure that initiates the first instruction, specifying the source role and the information sent,
- Describe all the stages *(instructions)* of the procedure, specifying the recipient role and the information sent,
- Ascertain the event that ends the procedure *(end or downstream procedure)*,
- Fill in the arrow information that links up the instructions,
- Add the resources *(equipment and documentation)* that help perform the instructions,
- Check the annotations *(legible, comprehensible, size)*,
- Define which instructions must be elaborated *(zoom to level 3)* if they pose risks or require special attention.
- Identify the responsibilities within the procedure.

5.3 Mapping Rules

The following rules, although not intended to restrict the drafting process, are provided as guidance for effectively drafting graphic procedures:

- A graphic procedure should be limited to an A4 sheet,
- A procedure consists of a maximum of 6 roles,
- A role is never given a person's name,
- Do not put more than 10 instructions in a procedure,
- Do not construct a procedure if it contains less than 5 instructions,
- An instruction never includes "*AND*",
- An instruction consists of 5 words max,
- An instruction always contains an infinitive form of a verb,
- An instruction must always have incoming and outgoing information *(an instruction that gives rise to nothing should be deleted!)*,

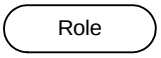
- Outgoing information is by nature different to the incoming information *(instruction's added value)*,
- Arrows must always contain information,
- The information arrow's name never contains a verb,
- Justify the instructions by using questioning,
- Annotate the shapes as you go along,
- Avoid crossing the information arrows,
- A resource *(equipment or documentation)* is always attached to an instruction,
- "*Clip art*", designed to improve understanding, must not be excessive so as to maintain legibility,
- The procedure must contain a "*managing role*",

5.4 Vocabulary

This chapter provides a complete list of all the vocabulary used to express a procedure as a flowchart.

It consists of four basic shapes *(oval, box, arrow with information and equipment – triangle – or document – curved-edge box)* and syntax elements (start, end, conditions, alternatives).

5.4.1 The Internal Role



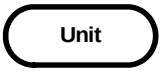
A role is played by a person entrusted with certain tasks *(functions)* depending on qualification or skill. Each identified role is shown in an oval shape at the top of the page.

Once all roles have been distinguished, they must each be placed at the head of a column in which we also put their respective instructions during construction of the procedure.

Do not confuse the name of the role with a function or a person. A role is always generic and can be played by different people. The role of "Quality Auditor" for example can be held by several people within the same body without these people belonging to the same department or carrying out the same tasks.

Example: "*Secretary*", "*Head of personnel*", "*Quality Engineer*".

5.4.2 The Unit



The unit is a close-knit group, of usually equal roles. Whilst **Internal Roles** have **Instructions** beneath them, **Units** have **Sub-Procedures** placed in their columns.

Each identified unit is represented in an oval shape at the top of the page, so that it heads a column to enable sub-procedures to be placed directly into this column during procedure construction.

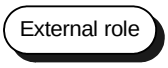
Examples of units:

- "*Quality Assurance*": "*Quality coordinator"* + "*Auditor*" + "*Representative*"
- "*Project Team*": "*Research Coordinator*" + "*Marketing manager*" + "*Finance Director*"
- "*Purchasing Department*": "*Purchasing coordinator*" + "*Purchasing agent*" + "*Purchasing Secretary*"

***Attention**: a department is often the same as a unit, but sometimes a department corresponds to just one role if all the employees in the department can carry out the same*

*task. For example, in certain procedures, the **Role** of "Hostess" may be preferred to the **Unit** "Reception" if all Reception employees can fulfil this role.*

5.4.3 The External Role



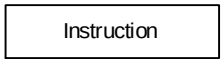
An external role is played by an actor outside the company *(often from an external company)* for whom the procedure is carried out *(Customer)* or who has been asked to perform a given task *(Supplier)*.

Each identified external role is depicted in an oval shape at the top of the page so that it heads a column in which instructions for this role are written.

Examples of external roles: *"Bank", "Customer", "Regulating body", "Media", "Professional organizations", "Supplier"*

👁 *The external role only appears in a procedure if he executes instructions. Otherwise he is represented by the "Source/recipient role".*

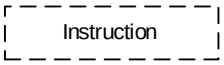
5.4.4 The Instruction



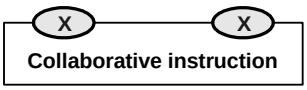
An instruction groups together similar, basic operations that must be carried out in the workplace. It describes these operations with a brief text of 4-5 words and at least one verb in the infinitive form.

Example: "*Sign contract*", "*Create quote*", "*Record request*".

The instruction is always expressed in a single-line box, except when it represents an alternative *(see 5.4.6 – The Macro-Instruction),* in which case, it is expressed in a dashed box:



5.4.5 The Collaborative Instruction

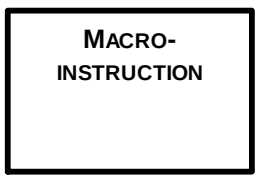


A collaborative instruction is an instruction executed by **several roles simultaneously.**

The small ovals at the top of the box indicate which roles work together, as well as their mutual functions *(one role might make a decision, whilst the other(s) participate)*.

Example: "*Choose a supplier*", "*Decide*".

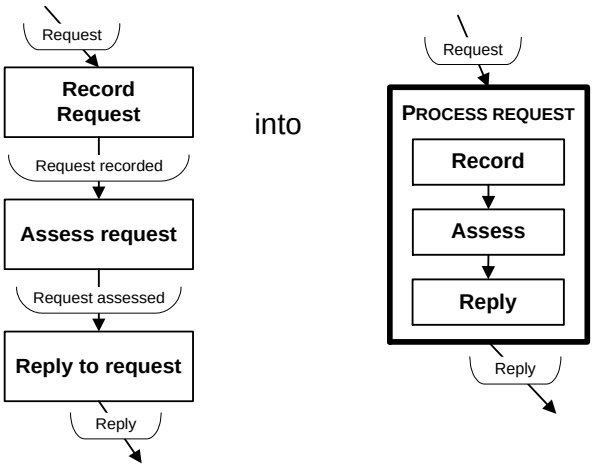
5.4.6 The Macro-Instruction



If several successive instructions are under the responsibility of one single role, we can group them under one overall heading.

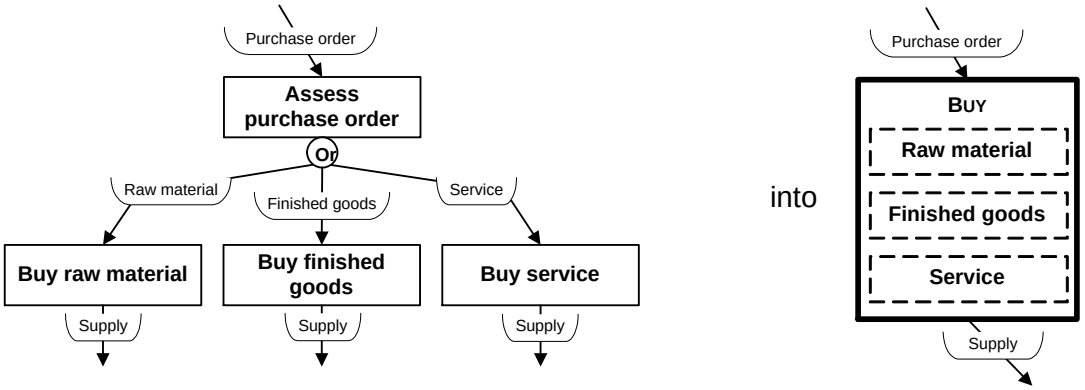
We thus simplify the chart by enclosing these instructions within a macro-instruction. The macro-instruction is a way of stating how an instruction is carried out. It also means that we do not need to "Zoom" to a lower level chart.

A macro instruction can, for example, condense the following instructions:



👁 The arrows between the instructions signify "AND". First, you must Record the request, then Assess and lastly, you must Reply.

The macro-instruction also allows you to provide different alternatives. In this case, the instructions in the macro are no longer linked by arrows and appear instead in a dotted box:



👁 The absence of arrows between the alternative instructions signifies an "Exclusive OR". You must Buy either a Raw Material, or a Finished Product or a Service.

Macro-instructions simplify the design of the procedure and make it easier to read. They should therefore be used to this effect as often as possible.

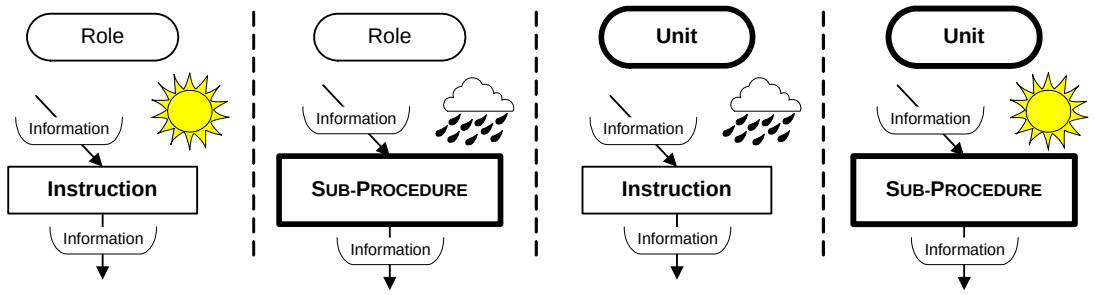
5.4.7 The Sub-Procedure

The Sub-procedure is an activity required to execute a procedure. It is a chart of the same level as the procedure *(Level 2)* which defines who does what *(roles)* and using which *resources*.

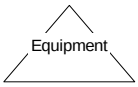
Example: The "*Evaluate supplier*" procedure is required in a purchasing procedure.

👁 As the sub-procedure leads to the creation of another second level chart, it must consist of several roles. Thus, the sub-procedure always appears in the column of a Unit and never in that of a Role.

The following examples show the correct *(sun)* and incorrect *(rain cloud) syntaxes.*



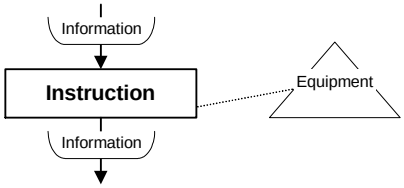
5.4.8 Equipment



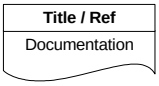
Material resources needed to perform an instruction *(machine, desk equipment, communication equipment, etc)*.

Example: "*Computer*", "*Caliper rule*", "*Microsoft Word*".

Equipment must always be linked to its respective instruction with a dotted line:

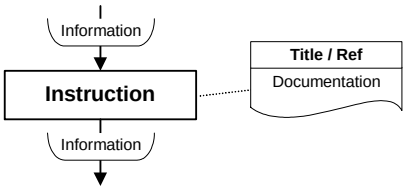


5.4.9 Documentation



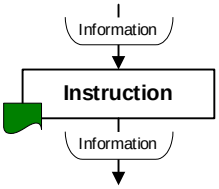
Documents necessary to execute an instruction. This could be a check-list, scale, a recording document, a memorandum or standards document.

Example: "*Contract model*", "*Standard*", "*Check-list*".

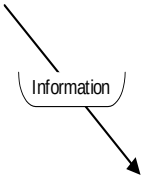


The document must always be linked to its respective instruction with a dotted line:

The user's attention can be drawn to a recording document by placing the symbol as follows:



5.4.10 The Information Arrow

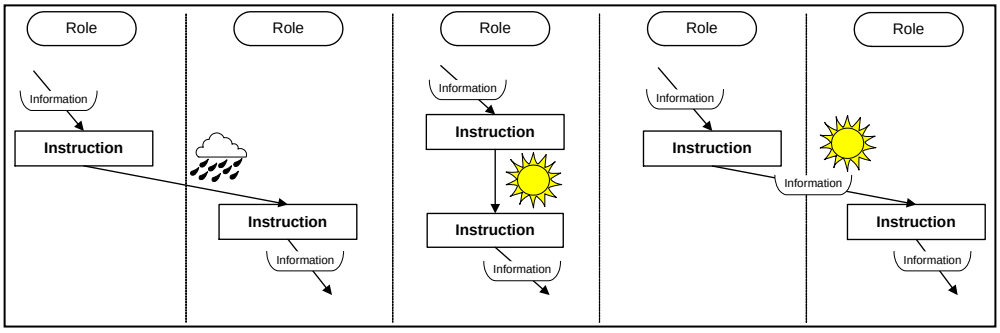


This information is an essential item that both justifies the existence of each instruction and visually interprets the information flow (*customer relationship / internal suppliers*).

If the information is irrelevant, so is the instruction. An item of information can constitute communication, the result of an activity, a document, message, validation, product, etc.

Example: "*Signed invoice*", "*Book of account*", "*Customer request*".

All instructions must receive information (initiating) and produce information (result). The information is optional if placed between two consecutive instructions carried out by the same role. The following examples illustrate correct *(sun)* and incorrect *(rain clouds) syntaxes*.

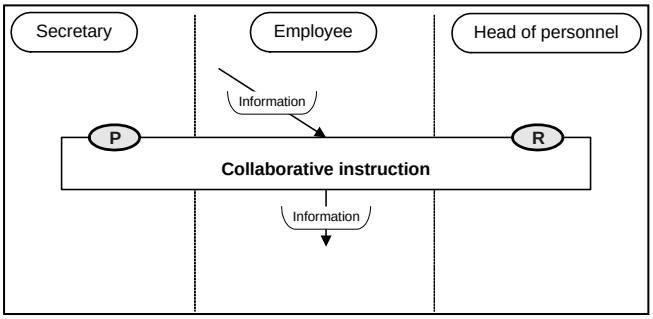


5.4.11 Types of Responsibility

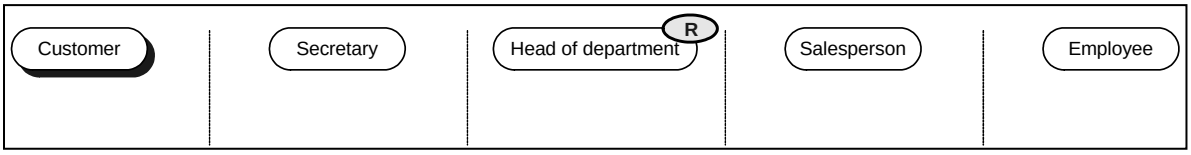
This symbol determines which role is responsible for the procedure or, in a collaborative instruction, how each role is implicated (Coordinates, Participates, Informs, Advises, etc).

Example: "*The secretary*" **participates** (P) in candidate selection with the "*Head of Personnel*" who **coordinates** (R) this action.

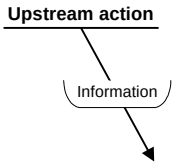
"*The employee*" does not take part in the collaborative instruction.



It is possible to place the type of responsibility directly onto a role to indicate that it is responsible for the progress of the procedure, or has a responsibility and/or authority with regards to its implementation.



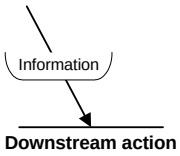
5.4.12 The Upstream Action



The preceding procedure that sends information to the current procedure.

Example: "*Candidate search*" will initiate the "*Choosing a candidate*" procedure.

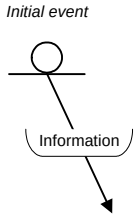
5.4.13 The Downstream Action



Procedure subsequent to the current procedure which ensures that the process continues.

Example: "*Choosing a candidate*" will be set off by "*Candidate search*" and the "*List of candidates*" information.

5.4.14 Start of the Procedure



This graphic symbol is used to represent:

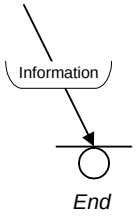
- a random trigger,
- an event,
- information issuing from an external body.

It can be put at the start or during the procedure.

Example: "*Customer's telephone call*", "*Each Monday morning at 08h30*".

👁 A note above the "Start" symbol specifies the trigger (initial event) or the intervals at which it occurs.

5.4.15 End of the Procedure

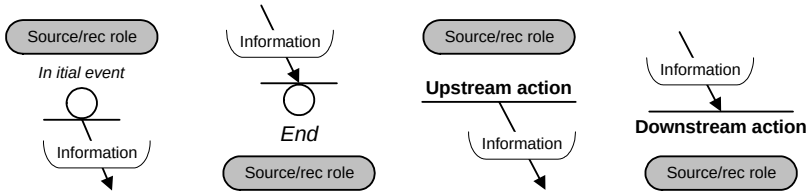


This graphic symbol is used to end a procedure or to indicate an end that occurs during the procedure. "*End*" is printed below the symbol to illustrate this.

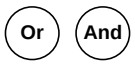
5.4.16 The Source / Recipient Role

This symbol is used in addition to the "*Start*" and "*End*" or "*Upstream action*" and "*Downstream action*" symbols, to indicate which roles produce or receive an information, as well as those that carry out action upstream or downstream from a given procedure.

Source/recipient roles are arranged as below:



5.4.17 The "And" and "Or" Operators

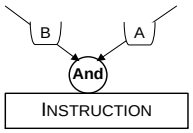


These logical operators show how information entering or leaving an instruction is processed.

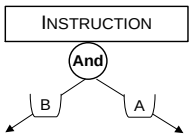
The "*Or*" symbol notably replaces the "*Diamond"* symbol which is often used in process mapping.

The examples below illustrate the uses of these operators:

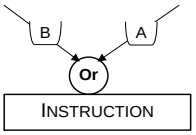
a) The instruction can only be carried out if both information A and B exist:



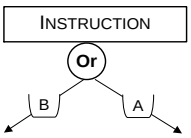
b) The instruction produces both information A and B:



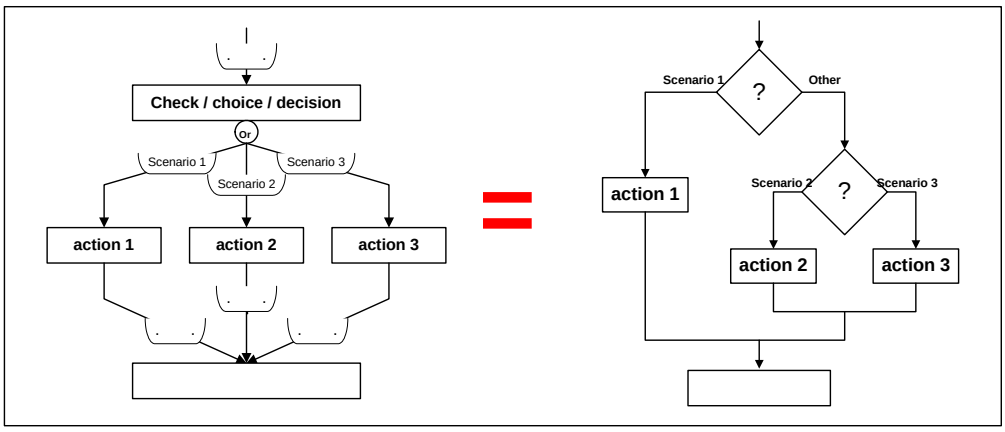
c) The instruction can be carried out if either information A or information B are present:



d) The instruction produces either A or B, but not both at the same time. This construction is used to deal with alternatives (test) produced after an instruction is executed:



The "*Or*" symbol represents several alternatives in a checking or choosing instruction, unlike the "*Diamond*" which needs several overlapping shapes to represent the same situation.



Example of typical alternatives: There are three possible scenarios after a "*Deal with non-conforming product"* instruction:

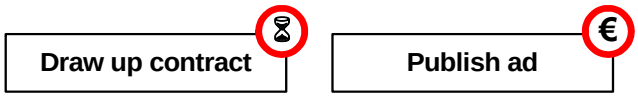
1) Discard,
2) Modify, repair,
3) Accept (by waiver of non-conformity).

5.4.18 Indicating Conditions

An instruction can be subject to a condition regarding time limits or cost. This indicator must be placed at the top right of the instruction. It draws the reader's attention to the condition and points out its existence.

👁 *The nature of the condition must be described in an annotation. You may draw a specific symbol in the circle representing the condition (e.g. € for cost, or ⌛ for time).*

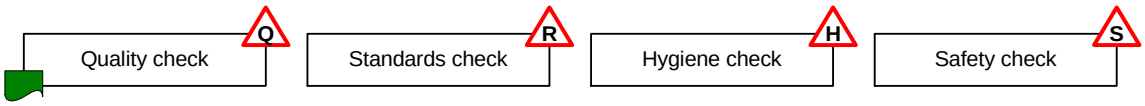
Example: "*Draw up contract (in less than 24h)*", "*Publish advert (max. budget of 25 K€)*".



5.4.19 The Instruction to "Check"

The check triangle is attached to an instruction and displays the type of check carried out. This indicator must be positioned at the top right of the shape. A letter in the triangle indicates the type of check (*Q: quality, H: hygiene, S: safety, R: regulations, etc*).

Example: "*Check order form*", "*Check signatures*",

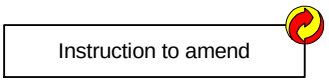


👁 *An instruction to check is usually accompanied by a record symbol.*

5.4.20 The Instruction with corrective actions (I do not fully understand this but "amend" does not make sense)

The recycling symbol is attached to the instruction and means that an instruction with corrective actions is applicable. This indicator must be placed at the top right of the shape.

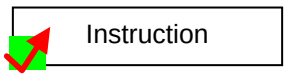
Example: "*Repair product*", "*Undertake action*",



5.4.21 Performance Indicators

As in level 1 mapping, instructions mentioned in the procedure may be subject to objectives. The attainment of these objectives must therefore be measured using indicators.

This symbol draws the reader's attention and accesses a detailed explanation of the indicator.

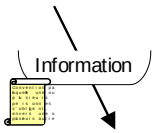


Found at the bottom left of the instruction box, this symbol identifies that the indicators have been set.

5.4.22 Interface Indicators

Information arrows express the interface between instructions and therefore, the roles that execute them. This customer / supplier relationship may be regulated by a clearly defined "***contract***" which contains specific commitments.

This symbol draws the reader's attention and accesses the specific file containing the clauses of the contract.



This symbol is placed on the "*information arrow*" basket and shows that a contract has been signed between the parties indicated by the arrow.

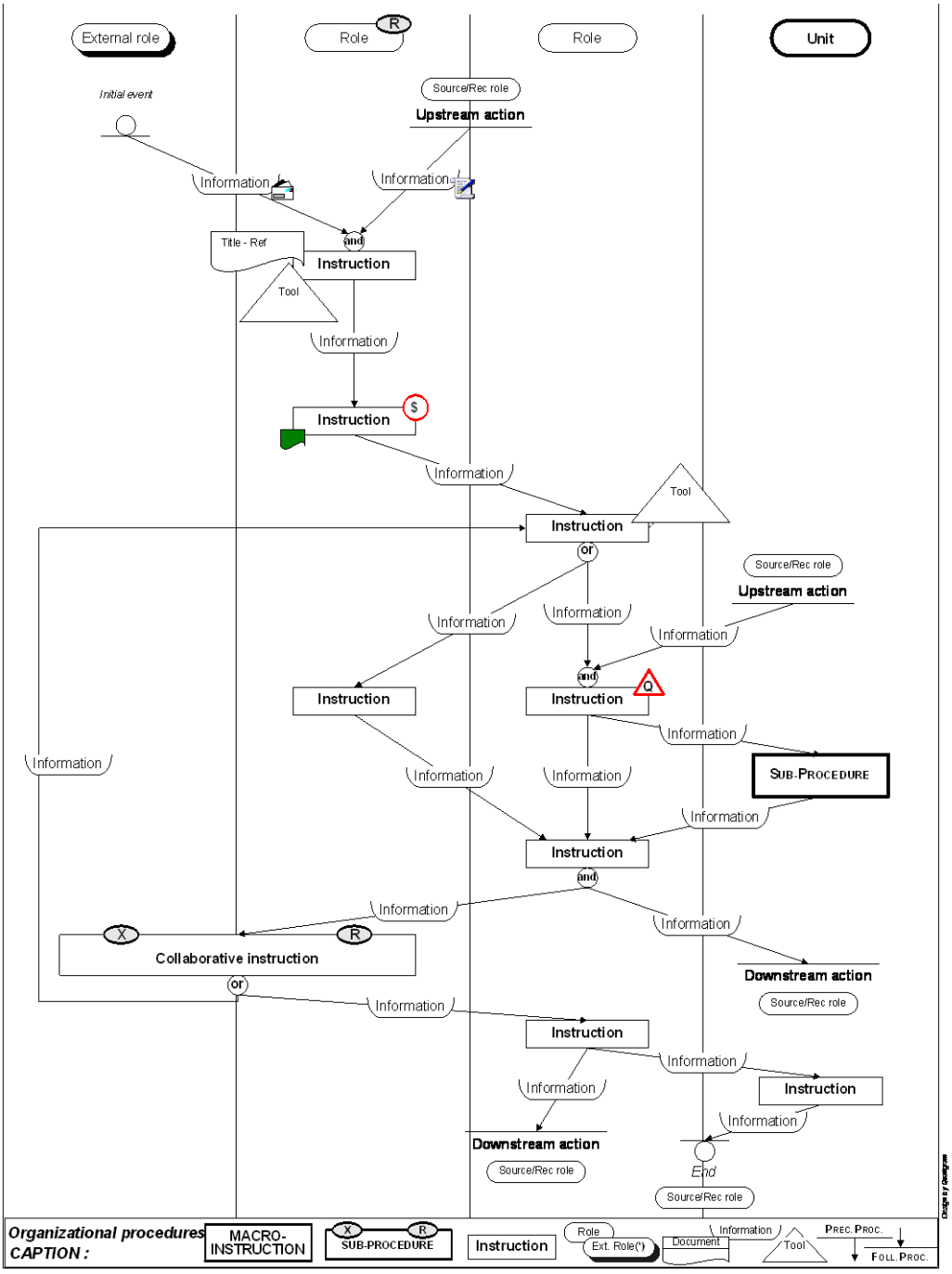
5.5 Syntax

Although the graphic language is simple, the forms of this language must be coherently "*organized"* in order to render the procedure understandable and truly operational. We achieve this coherence by respecting a mapping syntax.

This syntax, i.e. the method of organizing the basic shapes and "*punctuation*" symbols of the Qualigramme mapping language, is revealed on the next page.

Do not search for a structure in this presentation; it is simply everything we are able to do whilst respecting the rules of mapping:

- All instructions have an incoming and outgoing arrow,
- The starting and ending points of the procedure, and the source / recipient roles are defined,
- The role that has global responsibility for the procedure is identified,
- Record documents *(small, green shapes on the bottom right of instructions)* are visible, as are the checks and conditions,
- *"And"* and *"Or"* symbols refer to alternatives relating to the instruction,
- Instructions are correctly placed under roles, and sub-procedures under units,
- The small red *numbered* boxes on some shapes mean that they are annotated, and provide access to additional detail for these shapes,
- Graphic symbols *(clip art)* illustrate and facilitate comprehension,
- Symbols for conditions, checks,performance and interface indicators are placed as shown.



Syntaxes Used to Set Out a Procedure

6 – Operational processes *(Level 3)*

The work instructions *(operating procedures, protocols)* are located at the third level of the Qualigramme pyramid. They are derived from organizational procedures and are indicated by basic operations.

This is the fully detailed description of a process that must be controlled in order to ensure the quality and safety of the product or service.

The work instruction enables:

- Self-checking to be carried out *(quality, safety, hygiene, environment)*.
- The achievement of critical and difficult tasks to be controlled.
- List of all the tools or documents required to carry out the work instruction to be listed.
- Integration of a self-checking plan and clear identification of corrective actions.

Each chart at this level:

- Uses the title of an organizational procedure work instruction.
- Defines all the operations, self-checking actions, documents, tools and data related to carrying out the work instruction.

A summary document is therefore obtained that includes all the Quality requirements in a logical, readable and applicable order.

The main element that must guide the writer when creating a work instruction, relies on identifying the risks or monitoring that must be carried out at the level of certain basic operations of the work instruction. Indeed, a work instruction that contains no operation with risks may not need to be described. The skills of the employees are often sufficient in this case.

6.1 Structuring rules

Work instructions at level 3 of the Qualigramme pyramid are fully detailed with respect to the actions to perform *(called Operations at this level!)*.

A work instruction shows in detail all the steps required to perform a task or activity carried out by a **role**.

These operations are carried out one after the other and the output data for an operation contain the input data of the next operation. Hence, there is a **chronology** in the order of the operations, just as at the level 2 or organization procedure.

Finally, the work instruction gives specific information as to "*How*" the relevant role must carry out the identified operations. For this, it is necessary to describe in great detail, **all the resources** used, no matter the nature of those resources, physical resources or documents.

The structuring rules for writing at level 3 are:

- One single role,
- All the resources,
- Vertical chronology of the operations.

These simple rules enable the writer to clearly determine the level of writing suitable for the situation represented.

A work instruction gives specific information as to "***How***" a task or particular activity allocated to a clearly identified role must be carried out.

A work instruction must be written in great detail and define all the steps required to perform the task or activity described. If the number of steps is too great and overloads the work instruction, a second work instruction must be written to keep the readability and operational nature of the document.

6.2 Steps in writing a work instruction

This section describes how to write a work instruction. To achieve this, we will use a concrete example and follow the construction of the work instruction step by step.

To illustrate the writing, we are going to describe the "*Analyze*" work instruction carried out by the "*Salesperson*" role in the procedure "*Handling telephone calls*" studied in chapter 5.

The task is carried out as follows:

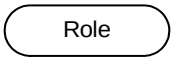
> *When the secretary sends the salesperson the form containing the information relating to the customer order, he checks all the information (customer name and number, date of the call and reason for the call), and carries out a search on the history of the orders using the sales follow-up software. If the salesperson does not have all the information on the form provided by the secretary or requires more information, he contacts the customer directly.*
>
> *If the client does not exist in his database, the salesperson creates a new customer form. Otherwise, he moves directly on to analyze the order.*
>
> *For this, he studies similar requests from other customers, he consults the "on-the-shelf" product catalog of the company and also the competitor catalogs.*
>
> *After this study, he determines whether the customer request can be met by a catalog product or whether a special study must be carried out. In the first case, the salesperson responds directly in writing, which he transmits to the secretary. In the second case, he fills in the order form with the elements of his analysis and sends the form to the sales manager.*

6.2.1 Identifying the role

According to the example above, we can identify the single role:

- Salesperson

This role is represented by the basic shape used in graphic language *(an oval)*.



A fine-edged oval that represents a **role** with identified responsibilities.

Internal role: Secretary, Salesperson, Sales manager, R&D manager,

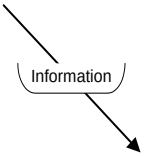
Figure 6.1 – Creating the work instruction columns

As soon as the role is identified, it is placed in a column. We create two other columns for the self-checking plan and the corrective actions.

Now, let us identify the operations that enable the work instruction to be carried out.

An operation is always represented by a rectangle *(one of the four basic graphic language shapes)*. This operation is always placed in the column of the identified role.

Each operation is linked to the others by an arrow with an information basket.



The information on the arrow is to be understood in the widest sense. It represents information that can be both immaterial (*telephone call*) and material, such as a document (*latter, fax, plan, etc.*), a product, raw material, a sub-assembly, etc.

The first operation is naturally performed by the "*Salesperson*", who must verify the information given by the "*Secretary*".

This enables the trigger for this work instruction to be identified.

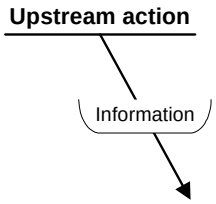
6.2.2 Identifying the trigger

There is no special symbol in basic graphic language for indicating the start of the work instruction. So we will introduce a new graphic shape at this point that is part of graphic language *punctuation*.

This punctuation, combined with the language's basic shapes, allows us to define the *syntax* of the process mapping.

For the current example, the information comes **from another work instruction**, performed by the "*Secretary*". This is the "***Record***" work instruction.

To represent this situation graphically, we use the "***Prior action***" shape:



A horizontal line, from which an information arrow points, represents a prior work instruction that "*calls up*" the work instruction described.
To identify the work instruction, we indicate its name *(or its reference)* above the horizontal line, as the prior action.

In the work instruction that we are creating, the trigger is a prior action carried out by the "*Secretary*".

The information sent by the "*Secretary*" to the "*Salesperson*" contains the elements of the request for quote and we know that this information is sent on a sheet of paper.

This is represented by an arrow with an information basket containing the text "*Request details*" to which a graphic "*file*" symbol is added that expresses graphically how the information is exchanged between the "*Secretary*" and the "*Salesperson*".

The work instruction must also show **who** sends the information to the "*Salesperson*". There are no columns containing the role "*Secretary*". Another graphic shape must therefore be used to specify the source of the information.

Source/rec role

This shape must be used in addition to the symbols "*Start*" and "*End*" or "*Prior action*" and "*Subsequent action*", to indicate what is the role that produces or who will receive the information, as well as who carries out the prior or subsequent action for a given operation.

Representation of the start of the work instruction (figure 6.2):

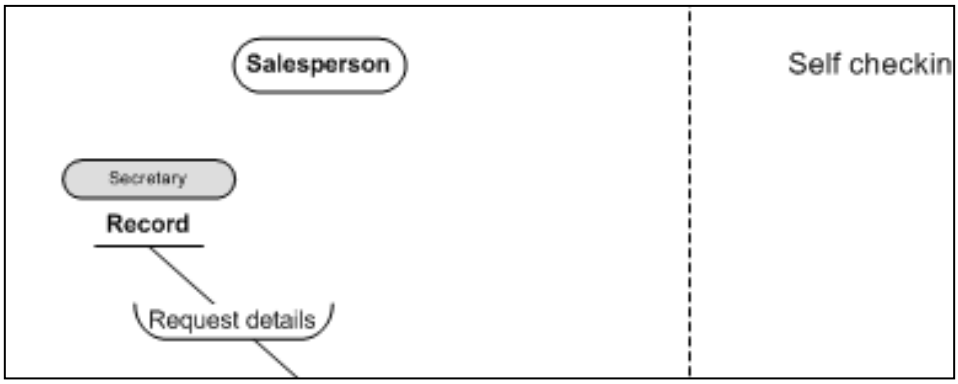


Figure 6.2 – Start of the work instruction

6.2.3 Identifying the operations that make up the work instruction

Operation

An operation is the smallest element that can be represented in a work instruction. An operation cannot be split up any further. It describes what the role must perform in a short text *(4-5 words)* that must have a verb in the infinitive.

In our work instruction the fundamental operations are:

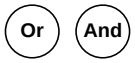
- Check the request elements *(customer name, customer number, reception date, reason)*,
- Search for customer order history,
- Create a new customer sheet *(if necessary)*,
- Analyze similar requests
- Examine the company product catalog,
- Examine competitor catalogs,
- Determine the type of response,
- Draft a hand-written proposal for the "*Secretary*",
- Fill out the request form for the "*Sales manager*".

Let us convert these elements into graphic form by supplying the role with the operations that it must perform (*see figure 6.3*).

Please note that in the work instruction described, the elements that trigger or terminate the operation are identified *(source and target roles, information received and produced, prior and subsequent work instructions)*.

The arrows containing information are filled in, except for the operations performed successively by the role.

A specific shape, the "*Or*", enables different alternatives to be handled *(e.g. for a known customer or a new customer)*. Another logical symbol, similar to the "*Or*", can be used. It is the "*And*".



These logical operators indicate how the information that enters or leaves an operation is to be handled.

When representing a work instruction, it is important to take into account the correct level of detail that must be represented **according to the users' level of skill**. Providing the role with multiple operations to perform is unnecessary if the role has a minimum of training or experience in the subject.

For instance, in the work instruction that we have just created, the first operation is called "*Check the request elements*". However, we could have replaced this concise operation by the following four operations:

- Check the customer name,
- Check the customer account number,
- Check the date of request recording,
- Check reason for the request

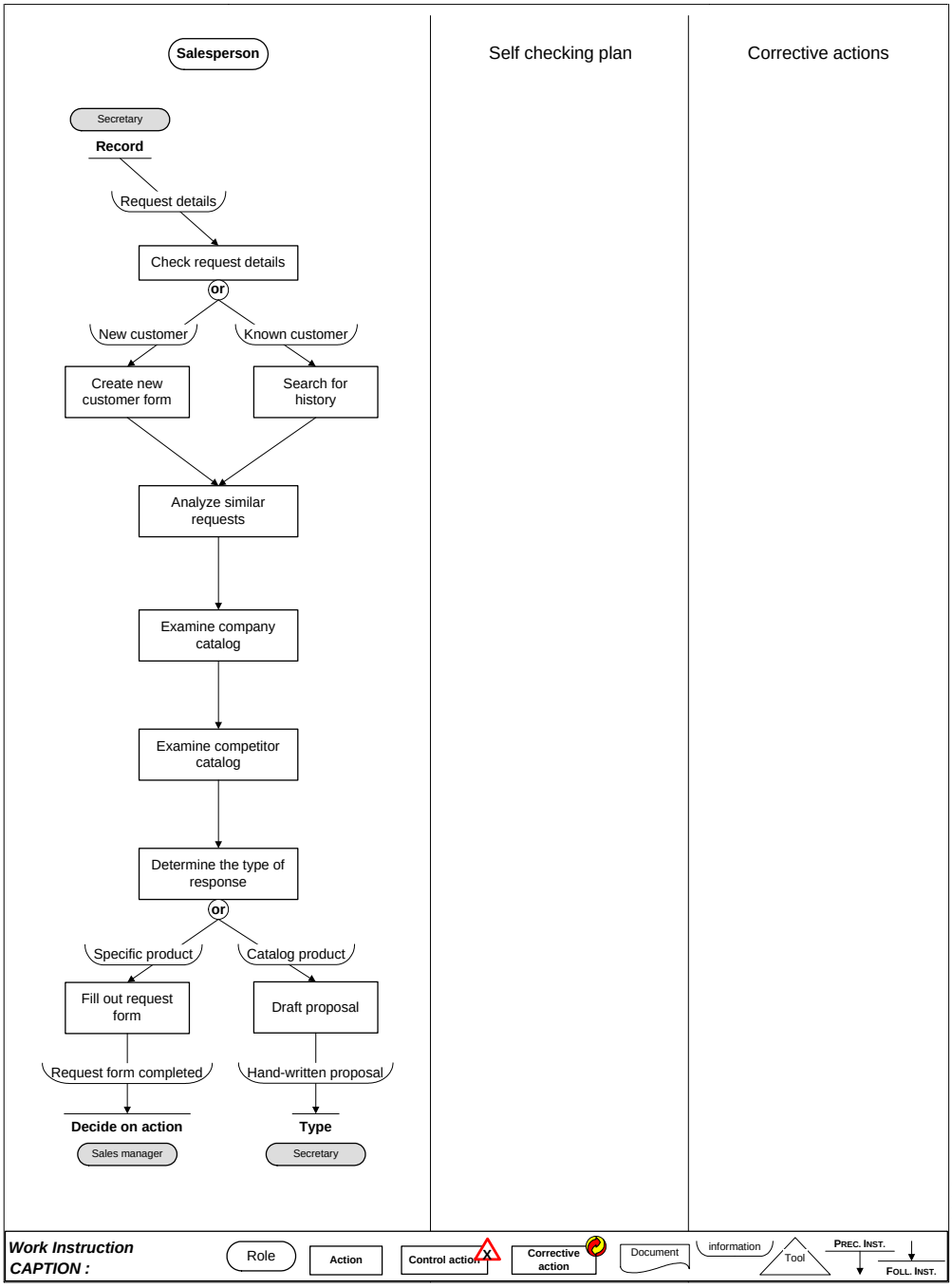


Figure 6.3 – Complete work instruction

Would the work instruction have been clearer with these four operations rather than with a single one? Or, on the contrary, would it have appeared to be more complex? Everything depends on the users' level of skill.

Moreover, you must remember that a work instruction is never set in stone and that it must change over time according to the problems observed or the audit results.

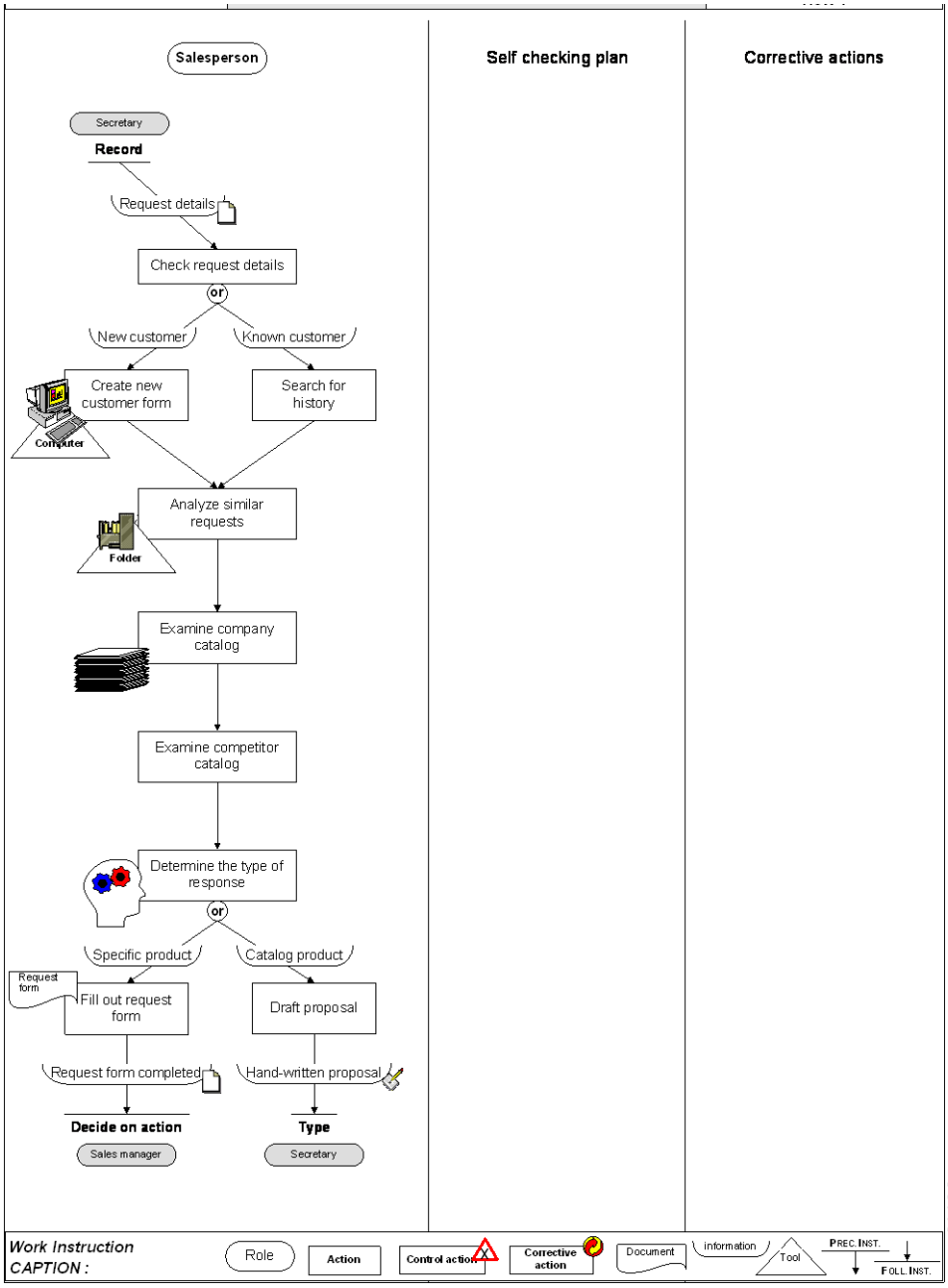


Figure 6.4 – Complete work instruction with clip-art

Placing tools and documents

To improve the graphic understanding of the instruction and specify the resources *(equipment or documents)* to use, we have added the "*Tools*" shape, as well as "*clip-art*" objects on the chart (see figure 6.4).

The different symbols added to the work instruction are designed on the one hand to make it less austere and on the other to increase immediate visual understanding. Indeed, with these

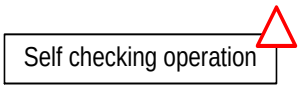
graphic symbols, the user understands what has to be done with the tools to be used even before reading the content of the operations (*rectangle*).

In addition, the graphic aspect of the symbols (*various colors and shapes, etc.*), adds to the work instruction and makes it more "*fun*" for the user.

However, the basic purpose of the work instruction must not be forgotten, which involves controlling risks or exerting vigilance. For this, the writer has a special column that enables him to express a "***self-checking plan***".

6.2.4 Determining self-checking operations

In order to master the risks, it is necessary to identify the operations for which problems or non-conformities have been identified in the past. Then, for each of these operations, the monitoring element*(s)* that will prevent these problems from reoccurring must be located.



The check operation is identified by a "*danger*" symbol placed on the top right of the check operation. This operation always takes the form of a question.

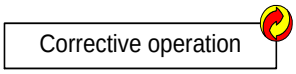
In our work instruction, we can determine the checks on the following operations:

- "*Check the request elements*": The correspondence between the customer name and customer number must be ensured to prevent sending a proposal to a customer other than the one that made the request (*last year, 7% of the proposals were misdirected, displeasing customers who had not ordered anything as well as creating delays in processing customer requests*).
- "*Analyze similar requests*": This analysis gives an improved response to customer requirements and determines the costs and precise response times that will ensure an efficient contract review.
- "*Draft the proposal*": To ensure that the proposal is complete, you must confirm that it contains: Address for delivery and invoicing, product reference, quantity ordered, unit cost excluding taxes, etc.

The work instruction (see figure 6.5) mentions these checks but the operations to be performed if these checks are insufficient must also be determined. An rule also specifies that a self-checking operation always possesses at least one corrective action.

6.2.5 Identifying corrective actions

To identify the corrective actions to be implemented if a self-checking action is insufficient, a third column is available in the work instruction.



The corrective action is represented by the "*recycling*" symbol, at the top right-hand of the operation. It is always a short text with a verb in the infinitive.

In our example, the work instruction specifies, for operations requiring monitoring, which self-checking operations are implemented and the corresponding corrective actions.

If a corrective operation does not totally resolve the fault, it may be diverted to another more suitable work instruction or handling procedure.

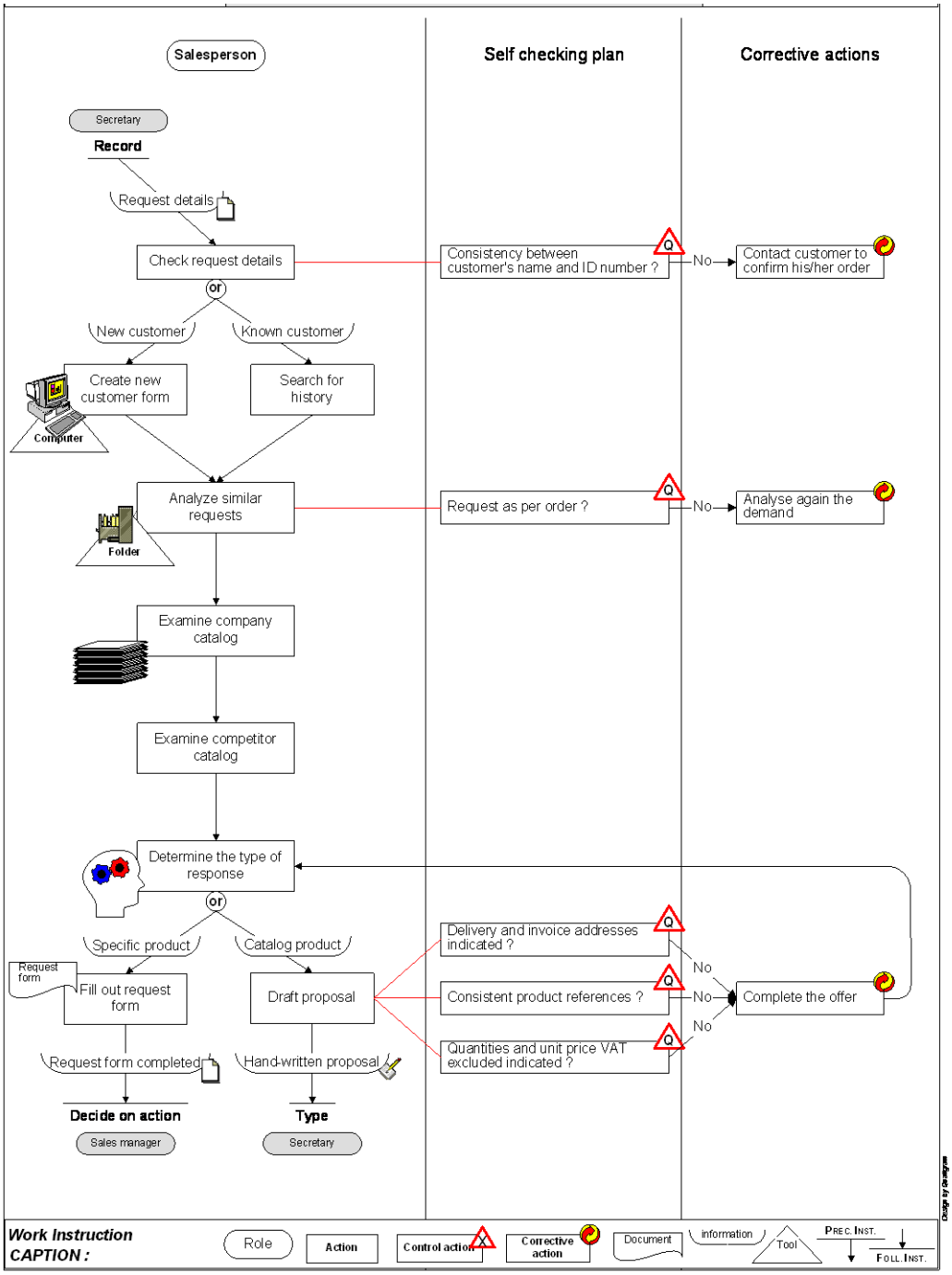


Figure 6.5 – Work instruction with self-checking and corrective operations

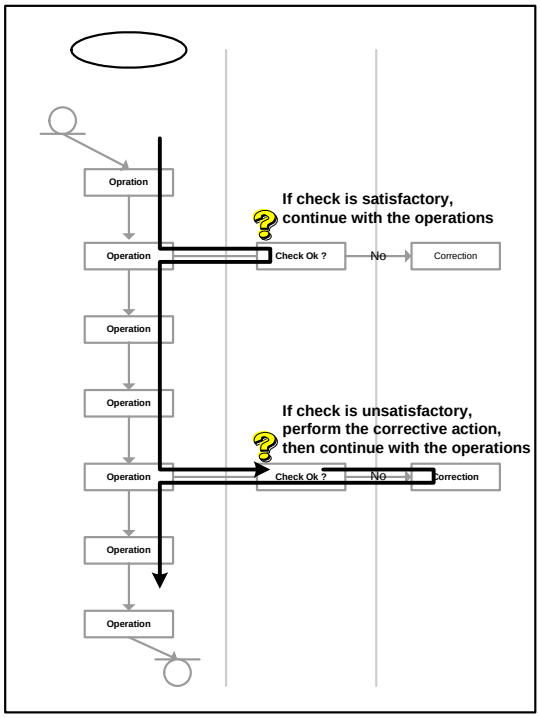
6.2.6 Comments

We finish mapping the work instruction by adding comments to some of the shapes that require an extra level of detail. These comments enable the user of the work instruction to access, if necessary, detailed explanations that will increase his understanding of the operation or to find out about the exact nature of the tools (equipment or document) to be used.

When attached to the "*role*" shape, the comment specifies the skills required to perform the work instruction under proper conditions.

When the comment is located on the "*basket*" of an "*information arrow*", it specifies the different elements that make up the information and the means of transmission (*if it is not already shown by a graphic symbol!*).

6.2.7 Reading the work instruction



The figure opposite shows the way to read a work instruction.

When an operation requires a self-check and the check is satisfactory, the operator moves on directly to the next operation.

However, the corrective action is carried out if the self-checking is unsatisfactory. Only after this check, if the corrective action was successful can the operator move on to the next operation.

6.3 Rules

This chapter lists the rules for structuring a work instruction.

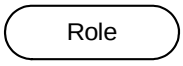
- A work instruction never exceeds one A4 page,
- A work instruction has only one role *(within the company)*,
- A role never specifies the name of a person,
- A work instruction contains 10 operations at most *(excluding check and corrective operations)*,
- A work instruction contains 5 operations at least *(excluding check and corrective operations)*,
- Never cross the arrows,
- The name of an operation never contains an *"AND"*.
- The name of an operation never contains more than 5 words.

- The name of an operation always takes the form of a verb in the infinitive,
- The name of a self-checking operation is always expressed by a question (*requiring a binary response of the "Yes/No" type*),
- The name of a corrective operation always takes the form of a verb in the infinitive,
- An operation always contains one arrow at the input and one at the output,
- The information that triggers the first operation and is the result of the last question is always mentioned on the arrow,
- The work instruction always includes at least one start and one end,
- The destination and source roles for the work instruction must be mentioned,
- The level of detail for the work instruction is inversely proportional to the skills of the people who will carry out the operations,
- Operations that present risks or require monitoring must have at least one check operation,
- A check operation always has at least one corrective operation,

6.4 Vocabulary

The vocabulary is composed of the four basic shapes (*oval, rectangle, arrow with information and equipment tool – triangle – or document tool – wavy-edged rectangle* -) to which syntax elements are added (*start, end, constraints, check operation, corrective operation, etc.*).

6.4.1 The role (*internal*)



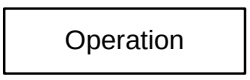
A role is played by an actor who is entrusted with a certain number of tasks *(responsibilities)* depending on skills. The work instruction role is shown in an oval shape at the top of the page.

Once identified, the role is positioned in the first of the three columns comprising the work instruction. The other two columns concern the self-checking plan and corrective actions.

You must not confuse the name of the role with a function or person. A role is always generic and can be performed by different people. In a work instruction, the role identified must be consistent with the one defined in the organizational procedure *(level 2)*.

Example: "*Secretary*", "*Quality engineer*", "*Assembly operator*", "*Welding operator*", "*State registered nurse*", "*Hospital service employees*".

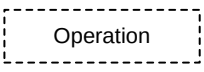
6.4.2 Operation



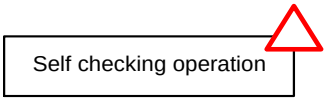
An operation is the smallest element that can be encountered in a work instruction. An operation cannot be split up any further. It describes what the role must perform in a short text *(4-5 words)* that must have a verb in the infinitive.

Example: "*Assemble the parts*", "*Fill out the patient file*", "*Store away*".

The operation is always represented by a fine-line rectangle, except when there is a choice, in which case, the operation has a dashed frame:



6.4.3 Self-checking operation

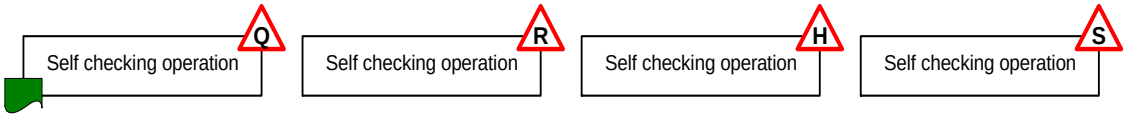


In combination with the operation shape, the check triangle shows the nature of check to be implemented. This indicator is situated at the top right-hand of the shape. A letter within the triangle specifies the nature of the check (*Q: quality, H: hygiene, S: safety, R: regulations, etc.).*

Only operations that present a **risk** or require particular monitoring have a self-checking action.

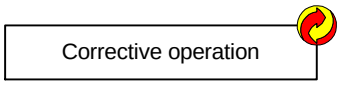
A self-checking action generally has a corrective action attached to it.

Example: "*Check the order form*", "*Check the signatures*",



A self-checking operation can be associated with several corrective operations.

6.4.4 Corrective operation



In combination with the operation shape, the recycling sign means that a corrective action is implemented. This indicator is situated at the top right-hand of the form.

A corrective operation is always linked with a check operation.

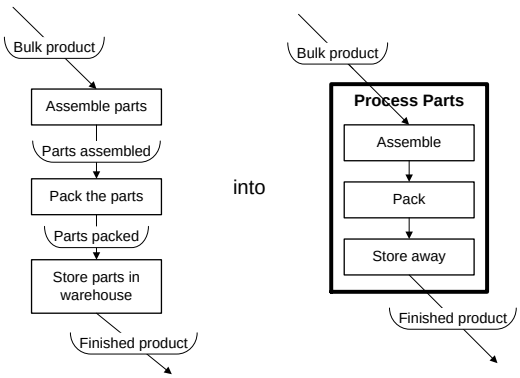
Example: "*Repair the product*", "*Begin an action*",

6.4.5 Macro-operation

When several successive operations involve the same activity, they can be grouped under a more general title.

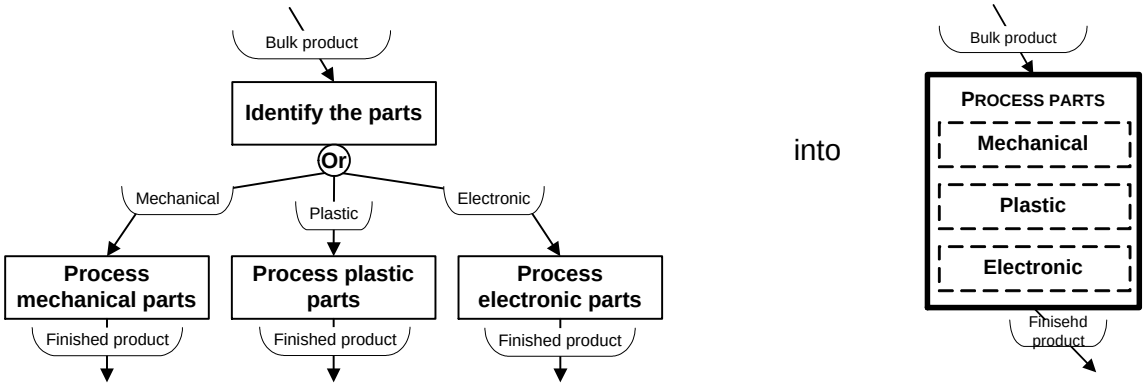
In particular, you can choose to simplify the chart by surrounding these operations with a macro-operation.

For instance, a macro-operation can summarize the following operations:



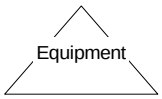
The arrows between the different operations represent an "AND". You must firstly "Assemble the parts", then "Pack them" and finally "Store away".

The macro-operation also enables different alternatives to be shown. In this case, the operations shown in the macro-operation are no longer linked by arrows and take the form of a fine-line, dashed rectangle:



The lack of an arrow between the different operations represents an "Exclusive OR". The operator must "Handle the mechanical parts" or the "Plastic" parts or the "Electronic" parts.

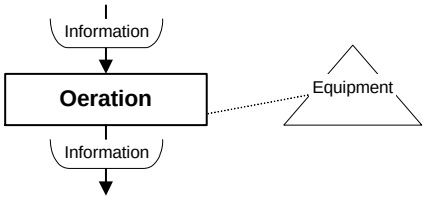
6.4.6 Equipment tool



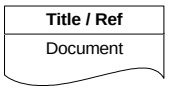
Equipment required to carry out an operation *(machine, office equipment, communication tool, etc.)*.

Example: "*Computer*", "*Caliper rule*", "*Microsoft Word*".

The equipment tool must always be connected to the operation that uses it by a dotted line:



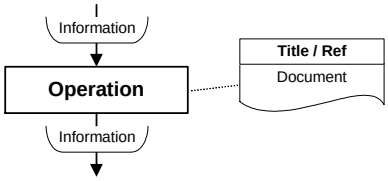
6.4.7 Document tool



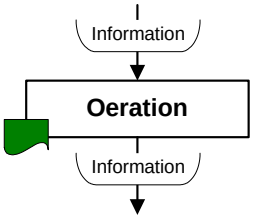
Document required to carry out an operation. This may be a check-list, a product range, a registration form, a memo or a standards document.

Example: "*Contract model*", "*Standard*", "*Check-list*".

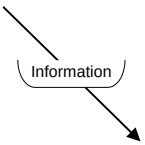
The document tool must always be linked with the instruction that uses it by a dotted line:



For a registration document, it may be interesting to position this document as follows in order to attract the attention of the user:



6.4.8 Information arrow

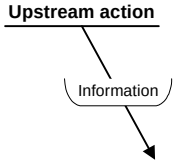


This arrow is an essential element for determining the information that will trigger or which is the result of a work instruction. This particularly enables the information flows to be shown (*interface relationships*).

Between each work instruction operation, the information can be indicated but it is not essential because it is the same role that carries out all the operations.

Example: "*Assembled part*", "*Check-list*", "*Production range*".

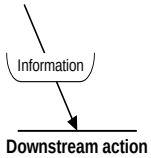
6.4.9 Upstream action



Previous work instruction that contributes to the current work instruction by transmitting information.

Example: "*Prepare the sub-assemblies*" will trigger the work instruction "*Assemble the parts*".

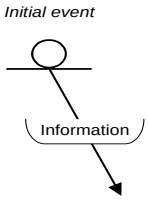
6.4.10 Downstream action



Work instruction used after the work instruction mentioned.

Example: "*Assemble the parts*" will be triggered by "*Prepare the sub-assemblies*" and the information "*Sub-assemblies to assemble*".

6.4.11 Start of the work instruction

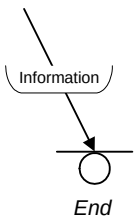


This graphic symbol must be used either for a random or event-based triggering of a work instruction, or for an information item coming from an external entity. It can be positioned at the start of the work instruction or be an input during its implementation.

Example: "*Upon reception of customer parts*", "*Every Monday morning at 8.30*".

A note above the start indicates the trigger element (initial fact) or the frequency.

6.4.12 End of the work instruction

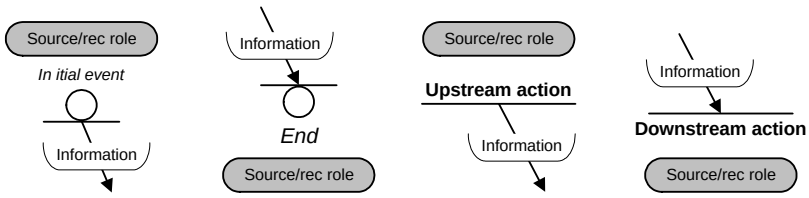


This graphic symbol must be used to close a work instruction or to indicate an end during the implementation of the work instruction. To this effect, "*End*" is indicated beneath the symbol.

6.4.13 Source / Recipient role

Source/rec role

This shape must be used in addition to the symbols "*Start*" and "*End*" or "*Prior action*" and "*Subsequent action*", to indicate what is the role that produces or who will receive the information, as well as who carries out the prior or subsequent action for a given operation.

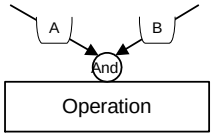


6.4.14 Or and And operators

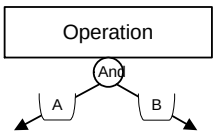
Or And

These logical operators indicate how the information that enters or leaves an operation is to be handled. The following examples show the various uses of these operators:

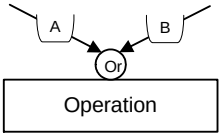
a) The operation can only be carried out if information A and B are present:



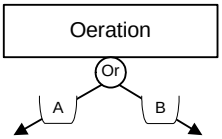
b) The operation produces the information A and B:



c) The operation can be carried out from the presence of one or other of the information items A and B:



d) The operation produces either A or B, but not both at once. This construction is used to handle different alternatives (test) following an operation:

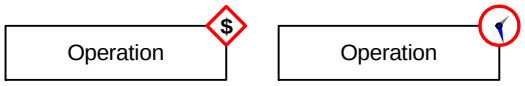


6.4.15 Constraint indicators

$

An operation can be linked to an expected constraint in terms of deadline or cost. These indicators, which must be placed in the top, right-hand of the operation, show these constraints and attract the attention of the reader.

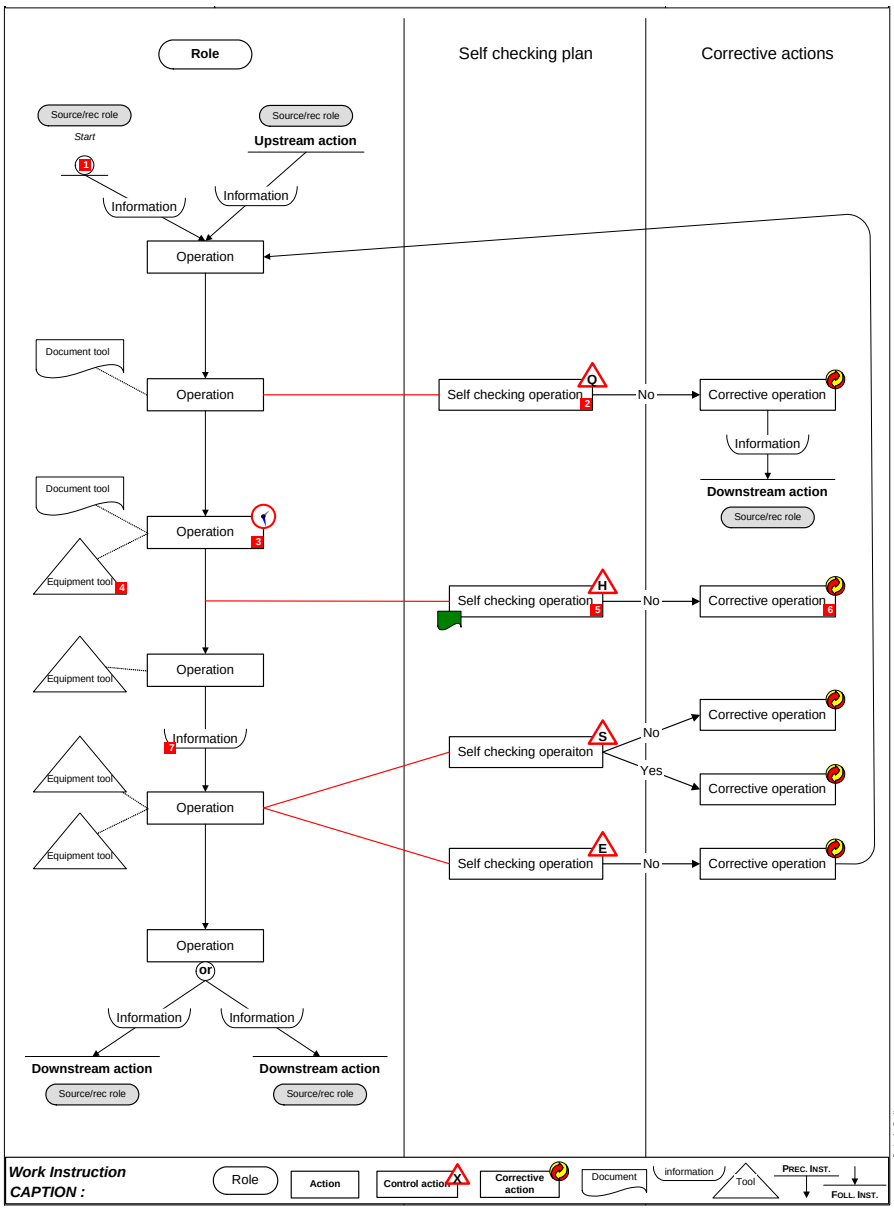
Example: "*Draft the contract (within 24 hours)*", "*Insert an advertisement (maximum budget 25 thousand Euros)*".



6.5 Syntax

The figure below shows the syntax, i.e. the way in which the basic shapes and "*punctuation*" symbols of the Qualigramme language are organized to create a work instruction that can be understood.

The following chart includes all the possibilities available. There is no logic to the symbols displayed.



Presentation of the syntactic shapes associated with a work instruction

7 – Implementing a Qualigramme project

A process-mapping project with the *Qualigramme* language is implemented in much the same way as any normal project. This effectively means managing a project over time while respecting the deadlines and objectives assigned.

However, using the Qualigramme language involves the different actors of the company more easily through the common graphic language used.

This chapter contains recommendations and advice for bringing a process-mapping project to a successful conclusion. For this, we introduce the notion of "***writing principles***".

7.1 The rules

In order to implement an organization project efficiently, it is important to define the behavior rules that the various participants must adopt. This chapter therefore aims to introduce a few major rules (*seven, to be exact!*) that specify the attitudes and abilities to develop or improve during a Qualigramme process-mapping project.

These codes are based on common sense. They are generally inspired from the OSSAD method.

7.1.1 Participation

It is not especially original to state that "*ten heads are more intelligent than one*", but even so, it is important to recognize this fact. This is the reason that participation was established as the first basic principle of the Qualigramme writing code.

Participation enables know-how to be written down efficiently and consensually. It is facilitated by the visual aspect of the method and the simplicity of the concepts used.

However, participation does not mean anarchy or popularity-seeking. It must therefore be controlled, supervised and managed to prevent sterile discussion and provide an efficient, operational description of know-how, while making it easier to appropriate objectives related to the company processes, follow the organization procedures and use the work instructions.

7.1.2 Pragmatism (*problem orientation*)

Pragmatism is required when describing know-how in graphic form, as this does not mean creating "*art for art's sake*", but rather representing an organization with an operational aim in view.

It is often said that some paintings can only be understood by the artist that created them. An analogy can be drawn with process maps produced by certain consultants, which are often only intended for the intellectual gratification of their creators.

Pragmatism places emphasis on the reason the processes are being mapped. This is either because the company wants to solve problems and realistic solutions must therefore be found or because it wants to increase its profits.

Pragmatism therefore encourages greater awareness of the purpose of our actions.

7.1.3 "Marketism" *(customer orientation)*

Marketing is the study of markets and attentiveness to the company's environment to adapt its product to customer requirements.

We suggest "marketism" as an analogy to pragmatism. As mentioned above, pragmatism attempts above all to resolve short-term problems. Marketing suggests to focus the company's attention on the customer as indicated in ISO standards and Quality approaches. The customer becomes the center of attention, the target.

Even though it is obvious, we feel that within the description of the processes it is necessary to retain the notion that above all, taking care of the customer is taking care of the future.

So, before seeking to model the entire company, let us seek to identify the trajectory of the customer within the company, the impact of non-quality and the recognition of these requirements.

7.1.4 Adaptability

The graphic language used by the Qualigramme method is very simple. It is this very simplicity that enables it to be adapted to the mapping of many different situations independently from their complexity levels. Using many different formats to describe situations with accuracy is not a guarantee of efficiency. On the contrary, it is achieved to the detriment of the legibility and understanding of the situation examined.

You do not need "*a hammer to swat a fly*", so the graphic language must be adapted to the situation described within the limits of the rules set by Qualigramme.

7.1.5 Aggregation and breakdown

Breaking down a problem into several smaller problems that are easier to understand enables this problem to be resolved more easily. This common sense principle applies to the description of processes or writing procedures.

The "*funnel technique*", described in chapter 4 enables a situation to be broken down into several situations that are easier to understand. The breakdown provides an extra level of detail that improves the assimilation of the situation.

It is also possible, when dealing with a highly detailed situation, to "*climb*" to a higher level to understand its context.

The principle of aggregation and breakdown gives different views of the organization, from the most detailed to the most global and vice versa.

7.1.6 Iteration and experimentation

Experience and common sense show that it is impossible to "*plan for everything on paper*", particularly when describing an organization. So, Qualigramme recommends a prototyping approach to situations. This means that the real needs of both customers and company employees are understood more easily.

Process mapping makes it easier to represent a situation and makes it easier to implement the situation, thus producing the required modifications. When the described situation has been adapted, it can again be measured against reality "*in the field*". So, by making minor changes and without constantly revolutionizing the working methods of the operators, fully operational and efficient organizational procedures and work instructions will be developed.

Experimentation is one of Man's capabilities, and more specifically one of the brain and memory capabilities. Memory stores the information, then experience structures it and creates the critical pathways (*neuron connections*).

Iteration is linked to continuous improvement, particularly in the area of quality (*Deming wheel*) and results in good performance. Common sense instills in us the reflex to "*seek continuous improvement*". In the Qualigramme method, this principle of iteration combined with experimentation enables the organization and its know-how to be questioned so as to remain alert and not to rest on one's laurels.

Prepare – produce – assess – react: a continuous circle.

7.1.7 Graphic thinking

The last principle is designed to "*put an end to the page turner*". We have expressed this idea throughout this document, but repeat it again here. We must free the way we write by rejecting linear, sequential thinking that forces everything to be described in detail, and move toward a modular method.

> The global approach to situations from a simple, synthetic graphic view enables the organization and know-how of the company to be easily understood and described. It especially allows these to be made available in a practical format accessible to all employees.

7.2 Managing a Qualigramme project

The rules described above are not enough for managing a process-mapping project efficiently. The following is a pragmatic approach to the main stages involved when managing a Qualigramme project.

7.2.1 The four project management phases

A Qualigramme project is not limited to merely describing the processes. The different phases described below indicate the added value of each phase.

a) Describe

This is obviously the key phase and is the reason for the project. It concerns:

- Involving the Management team: defining the project objectives and planning,
- Motivating the employees: mapping the processes using their know-how and the objectives set by the Management,
- Increasing the awareness of supervisory staff: to leave the operators time and check the coherence of the processes described.

This is therefore an approach that involves all company employees, irrespective of their hierarchical level.

b) Control

This phase involves the project manager:

- Master Black Belt: 6 sigma project
- Quality manager: ISO 9000 certification or excellence project
- Project manager: within the framework of project management,
- Analyst or client: project computerization.

The Manager must ensure that the processes described are coherent (content and format), that project progress deadlines are met and that costs are controlled.

c) Communicate

This is one of the key phases of the project. Indeed, if communication is not used properly, all previous efforts will have been in vain. It is therefore vital and involves:

- The project manager: who chooses method of communication and explains the processes.
- The participants: who must understand and implement the processes.

The risk of this phase lies in resistance to change as well as in the type of communication used. This communication must be adapted to those involved.

d) Implement

Implementing the processes described is the purpose of the project. It validates the conformity and adaptation of the processes with in-the-field practices. It is obviously designed for the shop floor personnel.

e) Improve

A process description can never be static. Processes continually adapt to the company activities and the activities themselves are conditioned by customer requirements.

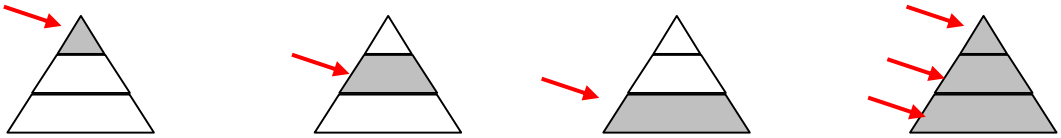
Hence, continuous checks that the processes described are in line with the real activity of the company must be made. Any deviation must give rise to an adaptation of the description or in-the-field practices (taking actions).

In addition, the company is not self-sufficient. To ensure continuity, the company must compare itself with its competitors and, if possible, be more successful than they are. To achieve this, the company must identify performance indicators (objectives to reach), follow these indicators and make any necessary improvements if these objectives are not attained.

7.2.2 How to manage a Qualigramme project

There are several ways to approach a process description. Qualigramme's 3-level structure guides the writer from the most general to the most specific. However, each level can be understood independently depending on the aims of the writer. It is not mandatory to begin by representing levels 1, then 2 and 3. Some companies begin their Qualigramme method by project groups, each working on one of the pyramid levels.

This means that four approach types can be identified:



Strategic Approach | **Organizational Approach** | **Operational Approach** | **Combined Approach**

f) Strategic approach

This approach involves determining the main processes then identifying the procedures required to control these processes and attain their objectives. Finally, for the procedures with work instructions requiring a particular check or monitoring, it is possible to describe the relevant level-3 charts.

The disadvantage of this approach is that some of the know-how can be "*forgotten*". If it is not part of the realization of one or more processes, it will not be described in the procedures or work instructions.

This approach requires the full commitment and involvement of the management team, together with a phase of reflection and analysis that is fairly long.

g) Organizational approach

Writing organization procedures can begin very quickly as they are much more rapid to implement. Indeed, with respect to company activities and products or standards requirements, it is enough to determine the list of procedures to describe.

This approach is typical of what companies carried out for the 1987 and 1994 versions of the ISO 9000 standards!

When the procedures are mapped, they can be detailed by work instructions (*level 3*). It is also possible, starting from procedures, to climb the pyramid and identify the company processes from the objectives they meet.

h) Operational approach

Widely used in the health sector (*laboratories, clinics, hospitals, etc.*) where organizations tend to represent their protocols *(level 3)* by priority, this approach has the advantage of being rapidly implementable and enables detailed and accurate in-the-field knowledge to be mapped.

It does not, however, enable the control of internal or external customer/supplier relationships because it is centered on the operations carried out by a role, rather than on the information exchanges between different roles.

This approach also tends to create a large quantity of charts.

i) Combined approach

This approach is a blend of the previous three approaches. It involves setting up several groups:

- The management team for the processes,
- Intermediate supervision for the procedures,
- Operators for the work instructions.

The main objective of this approach is to rapidly describe the processes and mobilize all the personnel simultaneously on the project.

The main risk, even with good planning, is to create charts that cannot be assembled consistently when links between the three mapping levels are set up. It may be necessary to rewrite procedures or purely and simply abandon others, with all the disappointment and loss of motivation that this may cause for their authors.

7.3 Qualigramme, for which projects?

A company does not begin a process description approach without reason. The aim of this chapter is to present the advantages of the Qualigramme language when applied to different projects.

7.3.1 Project management

A project often corresponds to a process for which start and end dates have been defined. Describing, analyzing, clarifying and measuring the process is to improve its efficiency each time it is implemented.

As expressed above, managing the processes rationalizes the activity. It:

- Maps the situation analysis simply and rapidly (graphic language)
- Communicates the different project phases in a user-friendly manner (map).
- Creates project models (methodologies) that can easily be used again (capitalization and control),
- Specifies how and with what resources the planned tasks are to be performed,
- Allocates resources to needs (optimization of resources).

The transformation of a process into a project, while leaving a certain amount of freedom of action (difference with the Workflow), provides a structured framework for carrying out these activities. In this, it limits the variability of the service provided and thus increases overall quality.

7.3.2 Workflow (BP Automation)

The Workflow automates an activity or process by making it easier and by imposing the circulation of documents between the players of the company. Within the framework of a Workflow implementation, Qualigramme:

- Easily describes the process to be computerized (graphic language),
- Identifies the roles and therefore the people involved in the process,
- Identifies and controls the documentation associated with the process,
- Clarifies the relationships between operational employees and computer engineers,
- Communicates the Workflow operation in an understandable form.

7.3.3 Quality

Whether the approach is one of certification (ISO 9000) or excellence (EFQM, Malcolm Baldrige), the processes must be identified, implemented in a controlled manner and improved. Qualigramme therefore facilitates:

- Process description,
- Process communication,
- Control and update of process mappings.

Qualigramme is particularly well suited to meet the requirements of the ISO 9000:2000 standard with regard to identifying process interactions, defining responsibilities and managing adapted resources (skills and knowledge).

7.3.4 ERP

An ERP is an integrated software package. It provides tools for the company processes making sure that all the phases of a process are completed. It is also a collaboration tool that enables information common to all the functions of the company to be shared.

The ERP connects and synchronizes the departments within a company. Transversal computerization of the company's activities requires that processes be identified and clarified.

Concerning ERP implementation in a company, Qualigramme easily:

- Analyzes and describes the processes to computerize (time saving),
- Communicates globally on the process (simple language),
- Smoothes communication between line personnel and computer engineers
- Documents the process functions and makes training easier.

7.3.5 6 Sigma

Management of a 6 sigma project is broken down into several steps: DMAIC (Define, **M**easure, **A**nalyze, **I**mprove, **C**ontrol).

Applied to such a project, Qualigramme makes each of the steps easier by:

- Describing process mappings (green belt – common language),
- Controlling the project steps (black belt – progress methodology)
- Managing improvement actions
- Communicating the optimized process and its control methods,
- Simulating organizational changes (impact analysis, indicators).

7.3.6 Knowledge Management

Knowledge Management capitalizes upon the knowledge and skills of the company with the New Information and Communication Technologies. Using Qualigramme makes KM projects easier by:

- Rationalizing existing processes (explicit process mapping)
- Mapping trade skills and know-how (transmitting them more easily).
- Identifying and controlling knowledge (documentation management),

- Identifying skills that are lacking,
- Making these elements available intelligently (interactively) via internet/intranet.

7.3.7 Simulation

Simulation allows a company to forecast the performance of a process. It is used for many areas of activity and operates from a computer model that represents the process, to which different scenarios are applied. The scenario that provides the best result validates the process.

Using Qualigramme to describe the process to be modeled:

- Directly involves the operating employees, who describe the process themselves before sending it to the analysts (relevance),
- Communicates the process easily after the simulation (simple language),
- Easily modifies the process to describe different scenarios (time saving)
- Simulates the impact of a change in organization.

8 - Conclusion

Throughout this document, we have described and proposed a structured method combined with a simple graphic language for describing processes.

To this end, we have evoked the issues involved with this description, but also listed the various hindrances and obstacles that may affect it. Process mapping has undeniable advantages, but is not yet fully satisfactory because it is too heterogeneous and unstructured in its implementation.

Indeed, traditional mappings are generally derived from linear thinking, representative of textual thought, which describes in detail and sequentially the different actions or tasks to perform in order to control a process.

The Qualigramme language draws upon the advantages of process mapping by avoiding its disadvantages to provide a company with a structured and consistent framework that enables it to describe processes in a simple and easy-to-use format.

However, the Qualigramme language is not merely a sophisticated mapping system, it is above all a new way of approaching the description of company processes in modular form *(graphic thinking)*.

The Qualigramme method provides a common language for all company employees, irrespective of their hierarchical level. This simple language can make communication easier, particularly by involving everyone in the mapping process. It is also one of the key factors for a successful project of change (*ISO 9000 certification, accreditation, BPM, BPR, KM, 6 sigma, etc.*).

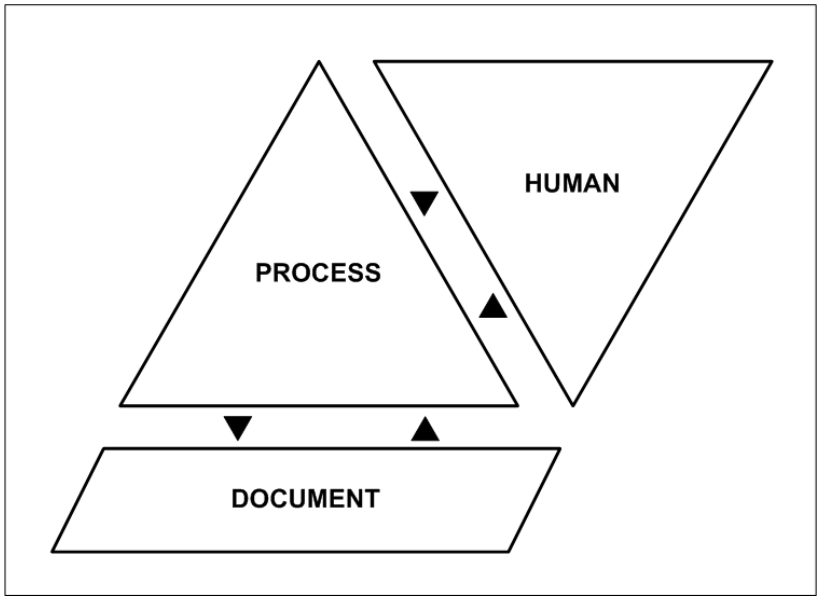
This common graphic language expresses and structures collective thought known as "*collective intelligence*". Hence, it not only describes and identifies the elements necessary for carrying out the company processes, e.g. with a view to customer satisfaction, but also ***memorizes*** in a structured manner and ***capitalizes on*** these processes to enhance the company organization.

However, describing the processes is not enough. Controlling employee skills and deploying suitable tools, particularly documents, remain on the agenda in order to move towards greater efficiency.

The conjunction and interaction of three factors, linked to the **processes** of the company, its **employees** and its **documentation**, form the architecture for managing the knowledge and skills that will enable the company to ensure its serenity and continuation in both current and future markets.

Hence, all the concepts and techniques presented here form the first stage in the much more ambitious and global project that foreshadows the management of "*trade*" knowledge, which we have called P.H.D Management™ *(Process, Human, Document)*.

The concepts of modularity and links *(interrelationships)* between the processes can be fully applied to human factors *(cell flowcharts, role models, skills models*, and to the documentation aspects of the company.



Summary of the P.H.D. Management project

However, these concepts rely both on the graphic description and ***dynamic consultation*** of the processes and can only be implemented with a maximum of efficiency through suitable processing and consultation tools. Indeed, the notions of modularity and links cannot be used with a paper representation.

Knowledge that cannot be accessed is sterile knowledge. So, it is by giving all personnel access to this knowledge that the company can truly develop a "*collective intelligence*" and formalize the intangible capital that is a new and indispensable wealth in the current economic context dominated by the advent of the service sector.

Appendix 1

Summary of the Qualigramme language rules

This appendix gathers together all the rules and advice to be used when describing the processes. These rules must not be considered to be constraints, as nothing prevents the reader from breaking them, but more as guide that will enable him or her to produce documents that are clear, understandable, and easy-to-use. In a word, operational. The following rules are not listed in order of importance or level of writing. **They are destined to be read, forgotten, reread, broken, read again, understood, and finally to become part and parcel of the natural reflexes**.

Lev. 1	Lev. 2	Lev. 3	Rules
X	X	X	Never exceed an A4 page *(portrait or landscape)*.
	X	X	10 actions at most *(rectangle)*
X	X	X	5 actions at least *(rectangle)*
X			No internal roles in a process *(only customer or supplier roles)*
	X		6 roles at most *(in portrait format, 8 in landscape format)*
		X	1 single role in a work instruction
	X	X	The role descriptions never contain the name of a person
	X		The roles identified contain at least one action *(rectangle)*
X	X	X	Never cross the arrows
X	X	X	The name of a rectangle never contains an *"AND"*.
	X	X	The name of a rectangle always contains a verb in the infinitive
X			The name of a rectangle always contains a substantive (*nominal form of the verb*)
X	X	X	A rectangle always has one input and one output
X	X	X	The name of a rectangle never contains more than 5 words.
X	X	X	An arrow always has an information item *(except between 2 actions carried out consecutively by the same role)*
X	X	X	The name of a rectangle never contains a verb denoting transmission *(send, receive, emit, distribute, transmit, etc.)*
	X	X	The procedure or work instruction always has at least one start *(initial fact or prior action)*
	X	X	The procedure or work instruction always has at least one end *(end or subsequent action)*

	X		The role responsible for the procedure is identified
	X		The responsibilities of the collaborative instructions are defined
	X		A Work instruction is located under a Role, and a Sub-procedure under a Unit
	X	X	The source and target roles are identified
	X	X	The arrows start from the base of the rectangles and arrive at the top of the rectangles, except for "return" arrows, which arrive at the side
	X	X	The "And" and "Or" operators are always centered above or below the rectangles
X	X	X	The constraint or performance indicators *(time, cost, check, etc.)* are located at the top, right-hand of the rectangles
X	X	X	Graphic shapes that require extra detail are given a text note or hypertext link to a document.
		X	Self-checking operations take the form of a question
X			Create several relational processes to improve visibility
X			A process never contains resources (tool, document)
X			A process never contains more than 6 sub-processes
X			A sub-process contains 5 procedures at most
X			Never create a direct link between Level 1 and Level 3
X	X	X	Do not attempt to be exhaustive
X	X	X	Describe what is essential to control any risks and be understood
X	X	X	Justify each rectangle by asking suitable questions.
	X		The arrows always point downwards (except for the return loop)
	X		The arrows always go from left to right
	X		Only three "Or" operators are permitted!
	X		A chart always contains one procedure. Breaks in chronologies are not permitted
X	X	X	The name of an information arrow never contains a verb.
	X	X	The equipment and document tools are always attached to one rectangle, and to one rectangle only.
	X	X	Information arrows never start from roles.
	X	X	Return loops must be used sparingly.
X	X	X	An information arrow always goes from one rectangle to another rectangle.