Tendering and Supplier Selection

6

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Abstract

This chapter introduces the topics tendering and supplier selection in more detail. It explains that in a procurement context, a tender procedure initiates a process in which decision-makers start to make sense of the potential match between supply and demand. A specific difficulty for supplier selection in public tenders is that the supplier selection model needs to be published before the bids are received and insights developed after reading the bids cannot be used to change the supplier selection model. This chapter explains that to prevent unexpected insights after the tender closes, a buyer should explore and consult the market before the tender starts and listen carefully to suppliers. It also presents a nine-step supplier selection model that public buyers can use to indicate their preferences, since can have a positive influence on the quantity and quality of bids as it can explain suppliers what is needed and important. The chapter concludes by explaining that only by translating the ambitions and views of the buyer in the organizational design of the tender as transparent as possible, the best possible bids will be received.

Keywords

Sensemaking · Decision-making process · Aligning demand and supply · Tender procedure · Tender process · Market consultation · Supplier selection model

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Learning Objectives

After studying this chapter, the reader will be able to:

- Understand that procurement decisions should be considered as sensemaking processes in which legal and social rationalities intertwine.
- Understand how demand and supply need to be matched in a tender process.
- Understand that it is challenging in the context of public procurement to select the best bids.
- Understand the role of decision-makers in tender processes.
- Apply a supplier selection model to a specific situation and understand its effects.
- Understand the differences between relative and absolute scoring methods.

6.1 Introduction

During the tender process, important decisions are made about awarding the contract to a specific supplier. As public procurement becomes more focused on value rather than price only, supplier selection becomes increasingly complex. Furthermore, different stakeholders might hold different perceptions on which part of the purchase is more or less important, who will be the best partner to collaborate with, and who should be involved in the award decision. Therefore, purchase decisions are often more complicated than anticipated and often go hand in hand with increasing insights on the importance of certain values.

Section 6.2 introduces why a tender process should be considered as a managerial decision-making process that facilitates sensemaking between demand and supply. Section 6.3 describes the most essential tender procedures and decisions regarding the tender process. Section 6.4 shows how to develop a supplier selection model in nine steps.

6.2 Considering a Tender as a Decision-Making Process

The principles of EU public procurement law, such as equality, transparency, and proportionality, should be applied to all the supplier models developed by public buyers. These principles are applied to execute the policies developed, to ensure their mission, and to support their primary processes. However, the interpretation and execution of these principles could clash with the other values and rationalities that play a role during procurement processes. The underlying logic of the legal rationality is, for example, that an open procurement market and free movement of supplies and services would ultimately benefit all citizens.

The complexity and uncertainty of selecting a supplier in these complex value frames makes that decision-makers need time to understand the actual aims and opportunities of a tender process (Volker, 2010). In this uncertain context, the use of a predefined and structured aggregation system could ensure equality and fairness. Due to the dynamics of the organizational context in which a decision is made, changes could have occurred in the basic assumptions that are originally framed in the call for proposals. From a rational perspective, a buyer should be aware of the characteristics that come with the nature of awarding a contract and that the aims could be easily expressed in the constitution of the award criteria. However, in social terms, this differentiation can be difficult. Therefore, it could happen that decision-makers start to realize the effect of their request for proposals only after they have received the proposals submitted by the suppliers. For example, a high sustainability-level requirement can limit the number of suppliers that express interest in the job. Another example is that a proposed solution by tenderers is more expensive than was estimated by the procurement department at the start of a tender. If these scenarios occur, then a buyer could decide to withdraw the tender and retender using different award criteria or an increased budget. These are not easy decisions since a retender will take extra time and increases the transactions costs for both buyer and supplier.

Sensemaking in Tender Situations

The theoretical concept of sensemaking is the process of making something sensible (Weick, 1995). This involves an ongoing retrospective development of plausible images that rationalize what people are doing and focuses on the interplay of action and interpretation rather than the influence of evaluation on choice. This social process of construction and reconstruction of meaning enables individuals to collectively create, maintain, and interpret the world through interacting with others. The decision-making perspective on procurement addresses how people make decisions in practice and which situational characteristics influence these processes (Volker, 2010). From this perspective, it could be that, for example, the information on which requirements are based have become obsolete by the time a judgment is made. This makes the identification of decision criteria and allocation of weight to the criteria more complex. Furthermore, in a tender situation using open or restricted procedures with a traditional contract, the decision alternatives are developed by suppliers who submit a tender proposal, with limited possibility for the buyer to influence or control these options.

The process of making sense of the procurement decision starts with the translation of the aims of the buyer into a tender brief and the analysis of the tender project environment (Volker, 2010). During this sensemaking process, a public buyer must analyze the distinctive dimensions of the domain in which the supplier operates to understand the competition. However, from a psychological perspective judging the qualities of an offer always results from the interaction between an individual decision-maker and the alternative that is proposed by the supplier. If you, for example, want to buy new shoes, you explore the Internet, try the shoes on in one or more

stores and compare your preferred options. This shapes your preferences. As a result, judgments about the quality of the proposed solutions are made in relation to the existing values, structures, ambitions, and needs of that individual stakeholder and the potential they perceive for the future situation, which is usually then shared with other decision-makers. Example 6.1 shows how this process developed in a tender for the design of a city hall. In a tender procedure, this psychological decision process must be formalized and officially announced beforehand.

Example 6.1: Sensemaking in the procurement process of a new city hall

When starting to think about an architect to design a new city hall in a middle-sized town, it seems that every employee still required their own room leading to a substantial number of square meters. Yet, after a strong political debate and some financial pitfalls, the city council decided to introduce shared office spaces. Furthermore, to save money the local library will make use of the town hall as well. In this case, the requirements of the tenders and adjacent budgets changed in the same period that the tender was announced.

The town assigned a special tender committee to assess the bids based on a well-structured and transparent assessment protocol. During the assessment process the decision-makers checked to which extent the proposals fulfilled all the criteria as communicated in the tender brief. During this process it was seen that a decision-maker with an architectural design background was more concerned with the feedback from the architectural community than that of the potential users, whereas the representative of the civil servants was more interested in the functionality and aesthetics of the designs. The project leader mainly focused on the efficiency and effectiveness of the construction process and the shared office spaces, while the head of building maintenance and services was more concerned with the product quality and sustainability. The final award decision was motivated by a report in which the diversity of the argumentation of the committee members was nicely integrated.

Matching Supply and Demand

It is important to realize that during a tender, the values of a buyer (the demand side) are connected to the opportunities that are offered by the supplier (the supply side), which in turn are to be matched with specific goals and plans of the buyer (Volker, 2010). This sensemaking process as an interaction between demand and supply is visualized in Figure 6.1. The left side depicts the decision steps from a buyer's perspective, starting with the initialization phase of identification of the tender requirements and criteria to be included in a tender brief or ambition statement (step 1). These requirements and criteria have to be based on demand and market possibilities. For the shoes example, this means a buyer browses the Internet and visits stores to see what is out there. Next, the bids are received based on the tender requirements and criteria, which can be considered a confrontation of demand and supply (step 2). The buyer then starts with value judgments and decision-making by the individual members of an assessment committee, to be finalized by group

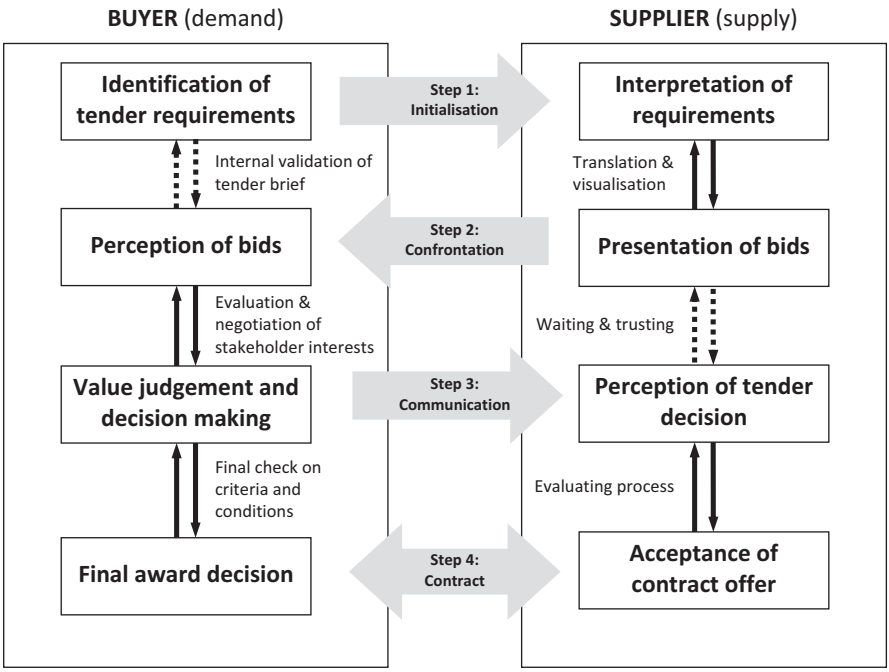

Figure 6.1 The decision processes of a tender as a result of the interaction between demand and supply (Volker, 2010)

decision-making within that committee to be communicated to the supplier (step 3) in order to award a contract to the supplier with the best bid (step 4).

The right side depicts the supplier's perspective. For them the tender process starts with the interpretation of the tender brief and ambitions of the buyer (step 1), followed by the interpretation, translation, and visualization of the proposed work, supply, or service. The bids that are developed by the suppliers confront the buyer with the procurement options (step 2). While the buyer is assessing all bids, the supplier needs to wait until an award decision will be communicated and processed by the buyer (step 3). If none of the other bidders complain and preferred supplier accepts the contract offer, a purchase has been done (step 4). These four steps show how the interaction between potential suppliers and the buyer can affect both the course and the outcome of the tender process if both the legal conditions and the social dynamics of the tender are acknowledged.

Tensions in Tender Decisions

Public procurement decisions can be accompanied by emotions triggered by the interactions during the tender process, the variety of decision-makers involved, and the political and societal context in which they operate (Volker, 2010). Although tender processes need to be transparent, objective, non-discriminatory, and

proportional, building trust between the buyer and supplier can be a prominent part of the tender. Interactions between the buyers and suppliers in a tender process—for instance, through interviews with key representatives—can enable buyers and suppliers to validate assumptions, and discussions between both parties can change the interpretation and values of the requirements and bids. The rather soft and ambiguous characteristics of these human interactions could, however, also make suppliers feel that they were not treated equally, and assessments might be perceived as subjective. There are also risks for corruption and favoring incumbent suppliers. Involving independent experts or external procurement professionals in the tender process could help to prevent this. Their judgments are sometimes more easily accepted by other stakeholders, like citizens or political parties. Fortunately, tender processes can also leave buyers and suppliers satisfied with the outcome of the selection process because the decision 'grows on them' and they may consider themselves as future partners for the delivery or development of specific works, supplies, or services.

Finally, decision-making in procurement situations is complicated because an object can mean, and can be, different things to different people. This means that different decision-makers can see the object differently depending upon their competencies, responsibilities, and their technical interests. Due to the complexity of the field in which a procurement decision is made, it is sometimes hard to involve the right people at the right moment. When buying, for example, new software, the director of the IT department will probably not be actively participating in writing the actual tender documents. Hence, it is important that this person is somehow involved in the whole procurement process. For instance, for large tenders, a purchasing project can be supervised and guided by a steering committee. This steering committee usually consists of the line managers (such as the IT director) and several other main internal stakeholders. As some tenders have multiple aims, these judgments can be complicated, made even more so by the fact that social responsibility and sustainability are increasingly popular public values that need to be incorporated in procurement. These perspectives and values need to be balanced in the tender documents to reach a final judgment about the quality of the proposed solution from a supplier or the supplier itself. Hence, an award decision should not only be considered as a rational assessment process, but also as a holistic judgment about the characteristics of the potential supplier.

6.3 Tender Procedures and the Tender Process

Tender Procedures

A tender is a procedure in which several parties are invited to apply for a contract. As addressed in Chapter 3, the EU Public Procurement Directives contain different types of procedures for tenders with a contract value above the thresholds. Each procedure has its own requirements which relate to the aims and conditions of the purchase. For tenders with a contract value below the thresholds, only the public

procurement principles (e.g., transparency and objectivity), national public procurement law, and organizational policies apply. There are no additional restrictions regarding how to organize a tender procedure. This can be used to the advantage of the buyers, such as only inviting social or sustainable entrepreneurs to submit a bid and therefore preventing any suppliers with high external costs (e.g., high greenhouse gas emissions) from winning a tender.

The most common procedures for EU tenders are the open procedure (about 80%) and the restricted procedure (about 5%) but this ratio differs to a certain extent per industry and country. Other procedures are negotiated procedures, competitive dialogue, innovation partnership, and tender procedures that are not open to competition (Arrowsmith, 2014). The negotiated procedure, competitive dialogue procedure, and innovation partnership create more room for interaction between the buyer and suppliers in comparison to the open and restricted procedures. However, these procedures are for most sectors only allowed in specific cases of complex or unique projects. For the Defense and Utilities sectors, there are no special restrictions for applying the negotiated procedure (with advance notice). For social and other specific services, a buyer can develop its own procedure, including several dialogue rounds in which the options to fulfill the social requirements can be explored.

The preferred tender procedure often varies per industry (how many suppliers are there; how competitive or specific are the suppliers) and the type of purchase (what kind of services, supplies, or works are to be delivered; how complex or distinctive are these). For example, for a more complex product like the development of a new software system for a Ministry of Defense, procurers often prefer to have a stronger pre-selection and more interaction with the potential suppliers than for a tender for the delivery of office supplies. Before a tender is formally started, it is advised to conduct a market research and market consultation to better explain the ambitions of the planned tender and to ask tender candidates a few specific questions. In a market consultation, the buyer can also learn more about alternatives and how to assess them.

Different Phases of a Tender Process

To formally start a tender, the buyer must advertise the tender using a 'call for participation' or, in other words, a 'call for expression of interest' in the open European public procurement journal *Tender Electronics Daily* (TED) and on a national platform. The use of TED extends the potential supply market to include the entire European Union, although usually only national suppliers or international suppliers with a local office will participate. In the call, the buyers indicate objective and non-discriminatory criteria or requirements, the minimum number of candidates they intend to invite (usually at least five) and, where appropriate, the maximum number.

In an open procedure any supplier may submit a full bid. In a restricted procedure, any supplier may request to participate and only those suppliers invited by the contracting authority may submit a tender. Figure 6.2 visualizes the phases of a restricted tender procedure. A restricted procedure consists of two phases: a selection phase and a tender phase. In an open procedure, the selection and tender phases

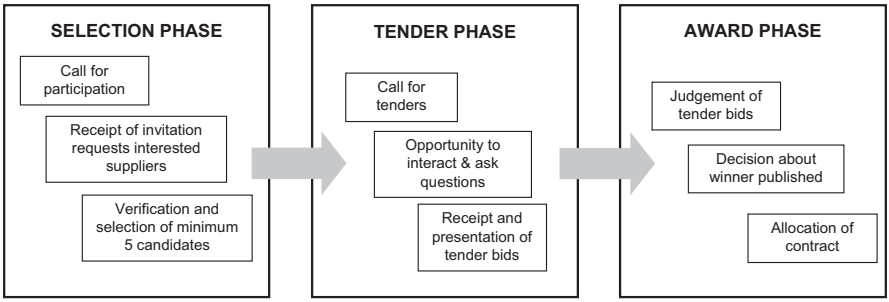

Figure 6.2 Phases and activities of a restricted tender procedure

are combined, which means that the submitted tenders are evaluated on their suitability and quality in the same deliberation. All tender processes close with an award phase.

During the *selection phase*, contracting authorities first must verify the suitability of potential suppliers. All suitable suppliers proceed to the next phase, or they can select suitable candidates using selection criteria, weights, scoring methods, and a selection method. Selection criteria are any general criteria not directly related to the subject matter of the public contract, such as environmental management standards, quality assurance, and references.

At the start of *the tender phase*, the contracting authority shares the relevant procurement documents for this phase. Based on these documents, suppliers can submit a bid. Before the tender phase, it is allowed to conduct an additional market consultation with the pre-selected tenderers. The advantage of such a market consultation is that the participants are involved to a larger extent with the project, as they are already pre-selected. In a restricted procedure, between the selection phase and the award phase suppliers must prepare their tenders. This is also called the tender phase. In an open procedure the selection and tender phases are integrated. The bid—which usually consists of an attractive proposal and a financial offer—needs to be submitted before a strict deadline. Sometimes suppliers can motivate these bids in a personal presentation. In other cases, the bids will have to speak for themselves.

During the tender, it is important to answer all questions from suppliers as clearly as possible, and it should be allowed for suppliers to ask follow-up questions. Typically, most questions can be asked and answered in such a way that no confidential information about the supplier is shared. In case the supplier does have a very specific question, it is allowed to ask a confidential question. A distinction needs to be made between static interaction to improve understanding by raising questions and providing answers during a tender, and a dynamic dialogue in which ideas are exchanged. In practice, written questions and answers are almost always used. Other forms such as a presentation by the buyer during an information meeting and visits to reference projects or suppliers are more common in certain domains than in other domains.

In the *award phase*, the contracting authority uses the supplier selection model to select a winner from the suitable candidates. The contract can be awarded based on either best price-quality ratio, lowest costs using a life cycle costing approach, or lowest price. If the contracting authority uses best price-quality ratio, a supplier selection model with award criteria, weights, scoring methods, and an award method are required. Award criteria must be linked to the subject matter of the public contract in question. Examples are quality, price, technical merit, aesthetic and functional characteristics, and environmental and social characteristics. All suppliers receive feedback from the contracting authority about their bid. The authority also explains why the winning supplier was selected. The following section explains how to develop a supplier selection model that supports the decisions made in the tender process.

6.4 Developing Supplier Selection Models

Many organizations in the public sector struggle with the pressure to make and explain sound supplier selection choices. Especially using sustainable and social criteria can be challenging because of the nature of such criteria, which is more often abstract and difficult (de Boer et al., 2006) to measure than monetary values such as price and tangible measurements such as technical strength or the number of certain characteristics. Nevertheless, it is important for public buyers to take such aspects into account, as is illustrated in Example 6.2.

Example 6.2: True costs versus purchase costs only

This example illustrates the importance of taking the true costs of a tender into account. The true costs of a tender include not only the purchase costs and costs of use, but also the external costs. External costs are defined as costs created for others or society not included in the purchase price and the costs of use. Examples of external costs are greenhouse gas emissions or underpayment of staff. There can also be external *benefits* related to a bid from a supplier. These can be less challenging to consider. They can be part of the quality part of the bid of a supplier. Also note that a rational supplier has an incentive to 'sell' external benefits and 'hide' external costs.

Figure 6.3 shows two suppliers with different purchase prices and different external costs. Assuming that the level of quality is equal for both supplies, the more sustainable or social option is Supplier B. However, if price and quality are the only criteria, Supplier A would be selected.

Note that it is often the case that Supplier A can offer a lower purchase price than Supplier B, as Supplier B could have hidden expenses to prevent external costs. So, it is important for buyers to either pre-select only sustainable and social suppliers such as Supplier B, what would prevent suppliers such as Supplier A from participating in a public tender. Otherwise, buyers could include requirements and award criteria related to externalities, what would reward Supplier B's lower external costs compared to Supplier A.

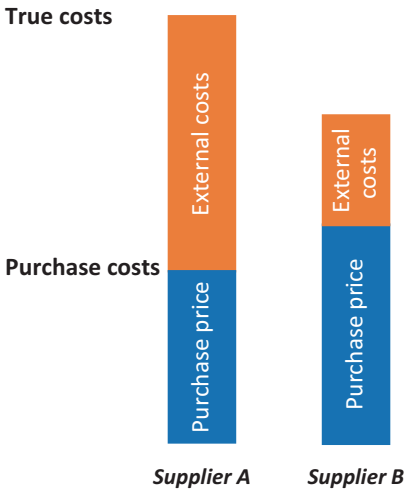

Figure 6.3 Example of different prices and external costs of suppliers

This section describes nine steps that need to be taken in order to develop a supplier selection model when a buyer uses best price-quality ratio to select the best bid based on normative decision theory:

1) Understand demand and supply possibilities;
2) Choose between lowest price, lowest costs, or best price-quality ratio;
3) Develop selection and award criteria;
4) Attach weight;
5) Draw scoring methods;
6) Choose a selection and award method;
7) Simulate bids;
8) Assess requests to participate and bids;
9) Justify tender decision.

As will be illustrated in this section, all steps can influence how suppliers develop their bid and which supplier wins a tender.

Step 1: Understand demand and supply possibilities
Before a buyer can develop a supplier selection model, they must understand what is needed and what the market has to offer. A buyer has several options to improve their understanding of supply and demand, such as analyzing spend, interviewing users, exploring the market, conducting a market and buyer consultation, and employing or hiring experts.

If it is not possible to develop a supplier selection model after using these tools, then an open and restricted procedure is unsuitable, and a negotiated procedure or a competitive dialogue should instead be explored. Alternatively, the buyer can choose to award the contract based on partner qualities (e.g., ability of the supplier to

cooperate) instead of qualities related to the project at hand. After having contracted the best suitable partner, there are more possibilities to collaborate while developing specific plans for the work, supplies, or services required.

Step 2: Choose how to award contracts
A buyer needs to decide on what basis the supplier will be awarded the contract. For choosing the Most Economically Advantageous Tender (MEAT), a buyer can use best price-quality ratio, lowest life cycle costs, or lowest price. With *Best Price-Quality Ratio (BPQR)* buyers award a contract based on price and quality criteria or on quality criteria only (in this case the price is determined by the buyer in the procurement documents). On average, about half of all EU tenders are based on best price-quality ratio. The other half uses lowest price only. There are large differences between EU Member States though. In countries such as France and the Netherlands, best price-quality ratio is more popular. In countries such as Germany and several Eastern European countries, lowest price is more popular. Note that in this book, the word (societal) impact is often added to best price-quality ratio, resulting in the best price-quality-impact ratio. Impact or external costs can be considered as part of the quality criteria, but as there are important differences between the quality of a purchase (such as the performance of a laptop) and the external impact it has on society (such as greenhouse gas emissions created by its production), quality and impact can also be considered as separate topics.

With *lowest life cycle costs* (LCC) buyers award a contract based on the lowest costs associated with the purchase during its complete lifetime, ranging from the purchase price, maintenance costs to external costs such as greenhouse gas emissions. Although several tools are available online, LCC can be a complex method to apply, as it is often difficult to quantify all related costs to a purchase. The method is rarely used in public procurement practice.

With *lowest price (LP)* buyers award a contract based on price only. A major risk of lowest price is that suppliers are selected with higher external costs or with lower quality standards. However, it can also be a suitable method. For instance, for simple commodities or for tenders in which no quality, environmental, and social differences between suppliers are expected. The method is simple to use and less prone to corruption and fraud than methods that include qualitative award criteria. It can also be a suitable method when the buyer has (hired) specific knowledge and prescribes the specifications. For instance, it can be prescribed that a new bridge should be build according to a certain design and that recycled materials should be used. A prescribed design typically limits innovation, but it also reduces transaction costs and makes it easier for SMEs to participate in public tenders. If a buyer uses LCC or lowest price only to award a contract, step 3 onward is not required.

Step 3: Develop selection and award criteria
If buyers understand what they can buy, they can start thinking about choosing the selection (if applicable) and award criteria that they will apply during the tender. Selection criteria and award criteria are quite distinct and are not to be confused. At

the selection phase the aim is to select those tenderers who are *capable* based on *general* properties. It should be relatively easy for tenderers to submit a request for participation for the selection phase and price is not a criterion. The tender phase assesses the *best tender* received from the pre-selected tenderers based on price and specific properties that must be related to the subject matter of the public contract in question (Arrowsmith, 2014).

In practice, criteria are often copied from the previous tender or are the result of brainstorm sessions. This can result in a broad set of (sub)criteria that may not always be distinctive and could overlap. Several techniques are available to prevent overlap, such as using tree structures or a goal setting technique. The latter means that the original (policy) goals related to a tender are translated to requirements and criteria. For example, the simplified goals of a tender for a public transport contract could be related to a fair price, more people using public transport instead of cars, and reduced CO_2-emissions to be measured with a tool like the CO_2 Performance Ladder (see Example 6.3).

Example 6.3: Stimulating carbon emissions by procurement

The CO_2 Performance Ladder is an instrument that helps organizations reduce their carbon emissions in the organization, in projects, and in the business sector (https://www.co2-prestatieladder.nl/en). Each organization certified on the ladder is subject to annual audits performed by independent and accredited Certifying Institutions (CI). Through these audits, a certified organization ensures the implementation of the CO_2 Performance Ladder in its management and projects. Furthermore, the certified organizations are evaluated annually for their ambitions and initiatives to reduce carbon emissions and continuous improvement.

Certified organizations receive a fictitious discount on the registration costs of tenders. The higher the level an organization has on the CO_2 Performance Ladder, the higher the award advantage. The buyer decides the award advantage an organization can receive on each level of the Ladder. Hence, the instrument is used as both a CO_2 management system and a procurement tool. This way the buyer encourages certified organizations to remain ambitious in their efforts to reduce carbon emissions.

Criteria can be quantitative (e.g., price) or qualitative (e.g., a plan of approach). For selection and award criteria several requirements apply, including (Arrowsmith, 2014):

- Criteria are not discriminatory.
- Award criteria should be assessable during the bid evaluation and during the contract period.
- The number of qualitative criteria should be limited to prevent excessive transaction costs for suppliers and assessors. Certain aspects that are not distinctive or are too detailed for the tender could be developed by the winning supplier during a verification or an implementation phase.

- It is allowed to tweak criteria during a tender in response to questions asked by suppliers, but significant changes could lead to an extension of the bid submission deadline.
- It is not allowed to change criteria after the bid submission deadline.

Finally, it is important that criteria are explained clearly and extensively in the procurement documents. A possible structure for the description for qualitative criteria is included in Example 6.4.

Example 6.4: Awarding public transport

- **Objective**
  Increase the usage of public transport usage, without attracting those that currently walk or cycle.
- **Required input**
  Please provide (1) a timetable; (2) a network map; (3) an explanation of differences between the new and current timetables; and (4) proof of why the plans are realistic and will contribute to the buyer's objective. A maximum of 10 pages is allowed.
- **Assessment method**
  Bids that are specific, that show that they are realistic and can achieve the objective will receive better scores. Certain combinations of assessments lead to specific scores; a bid that is not specific will be assessed as insufficient; a bid that is specific, but lacks proof related to realism and effectiveness will be assessed as satisfactory; and a bid that is specific and shows that it is realistic and effective will be assessed as very good.

Step 4: Attach weight

The contracting authority must specify the relative weighting which it gives to each of the criteria chosen to determine the tender with the best price-quality ratio. Those weightings can be expressed by providing a range with an appropriate maximum spread. Where weighting is not possible for demonstrable reasons as determined by the contracting authority, they must indicate the criteria in descending order of importance.

Not all criteria need to be weighted the same. The weights of the different aspects (price, quality, and/or societal impact) are awarded based on the specific context of the work, supply, or service being procured. For instance, in certain situations, quality is more important than costs, and the criteria for quality will outweigh the cost criteria.

For those not trained as procurement officers, the weight of criteria is the most important indicator for the importance of a criterion. The announcement forms on *Tender Electronics Daily* also suggest this. However, as is shown in step 5 and 6, this is not always true. For instance, when a buyer uses a threshold for a criterion or when a certain selection method is used, this can considerably influence the supplier choice as well.

Determining weight can be a challenging task for a procurement team, as there is often a trade-off between different policy objectives. In practice, several methods are used for determining weight. They can be the result of business case calculations, where criteria that add most value receive higher weight. They can also be the result of developing fictive bids and discussing in a procurement team to what extent the fictive bids receive the 'correct' score depending on different weighting. Finally, the Analytic Hierarchy Process (AHP) can be used to determine initial weighting. AHP acknowledges that the human brain has difficulties with comparing the importance of several criteria simultaneously. Hence, to make a more reliable decision, AHP compares each criterion pairwise to each other criterion. This can be done at different scales (e.g., a 5-point scale or a 9-point scale) where the procurement team indicates for each pair of criteria whether they are equally important or whether one criterion is slightly to very much more important than the other one. AHP tools are widely available for free on the web.

Step 5: Draw scoring methods

Scoring methods are used to assign a score to supplier bids for each criterion. Scoring methods can be qualitative or quantitative and absolute or relative. All types are explained in more detail below.

Qualitative scoring methods (also known as scoring rules) are used for assessing plans, designs, interviews, and so on. Scores for such plans, designs, and so on can be determined relatively or absolutely. An example of a relative method is to state that Supplier A scores much higher on criterion 1 than Supplier B. With methods such as Weighted Sum Model (WSM), scores are determined in an absolute way. An example of an absolute scoring table for assessing quality is presented in Table 6.1. The scoring levels used in the table are in line with earlier research which suggests that people generally use four basic levels of quality assessment: under-performance, basic performance, added value, and excellence (Walden et al., 1993).

Note that the scores in the table are not linear. The buyer indicates that 'good is good enough': bids of very good quality or excellent quality are rewarded, but only relatively as the difference with good and very good is only 20%, while the difference between satisfactory and good is 40%. Applying such a technique to tenders can be a simple technique that can contribute to either lower prices or higher environmental and social impact. This is because there is little to no incentive for suppliers to aim for very good quality. Instead, they have more financial room to increase positive environmental and social impact or lower their price.

Table 6.1 Example of a scoring table

Qualitative assessment per criterion	Score
Contributes very good to realizing the objective (excellence)	100%
Contributes good to realizing the objective (added value)	80%
Contributes satisfactory to realizing the objective (basic performance)	40%
Does not or barely contribute to realizing the objective (under-performance)	0%

Table 6.2 Poor example of a scoring table for quality or impact

Qualitative assessment per criterion	Score
Contributes excellent to realizing the objective	100%
Contributes very good to realizing the objective	90%
Contributes good to realizing the objective	80%
Contributes fairly good to realizing the objective	70%
Contributes satisfactory to realizing the objective	60%
Contributes quite satisfactory to realizing the objective	50%
Contributes poorly to realizing the objective	40%
Contributes very poorly to realizing the objective	30%
Contributes extremely poorly to realizing the objective	20%
Does not contribute to realizing the objective	10%

In practice, many different types of scoring tables are used. Although there is no academic proof for which scoring table leads to the highest bid quality, it is important that the scoring ranges for different types of criteria are similar. For instance, if the scoring range for quality is assigned using Table 6.2 (in contrast to Table 6.1), it is likely that scores of most of the suppliers will rank between 80% (good) and 50% (quite satisfactory). This means that the scoring range for quality is limited (about 30%), what makes it difficult for suppliers to stand out on quality. This is especially the case when suppliers can score between 0 and 100% for price. Reduced qualitative scoring ranges lower the importance of a criterion the same as a lower weight.

Quantitative scoring methods are used for assessing tangible qualities such as prices, delivery times, and CO_2-reductions. Like qualitative criteria, quantitative criteria can be assessed relatively or absolutely. An example of a popular linear relative scoring method for price is:

$$2 * \max\ points - \frac{Price\ supplier\ i}{Lowest\ price} * \max\ points$$

An example of a curved relative scoring for price is:

$$\frac{Lowest\ price}{Price\ supplier\ i} * \max\ points$$

As can be seen from the figures, the curved relative scoring method has a strong incentive for suppliers to offer as cheap or as expensive as possible, while compensating with over-the-top quality (Figure 6.4).

In contrast to relative scoring methods, absolute scoring methods are independent of how other suppliers bid. An example of a linear method is depicted in the left method in Figure 6.5 based on the following scoring method:

$$\max\ points * \frac{10{,}000 - Price\ supplier\ i}{2000}$$

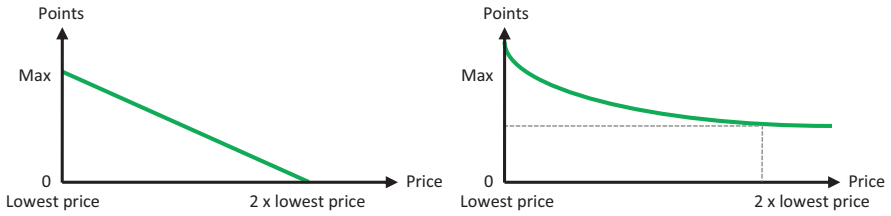

Figure 6.4 Effects of linear and curved relative scoring methods on number of points to be scored by suppliers depending on bid price

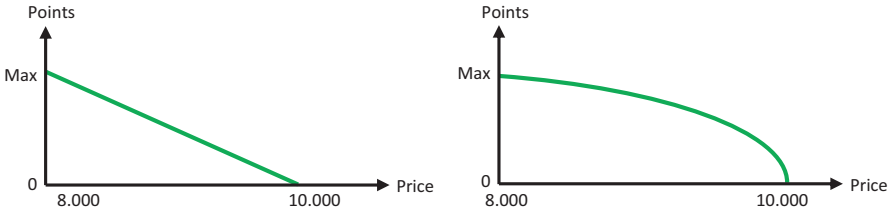

Figure 6.5 Effects of different absolute scoring methods on number of points to be scored by suppliers depending on bid price

The figure right shows the effects of:

$$\max\ points - \frac{\left(\max \text{points} \times \left(8000 - Price\ supplier\ i\right) / 2000\right)^2}{\max \text{points}}$$

The effect of the figure on the right is that suppliers are incentivized to offer a lower price. However, this incentive decreases which in turn incentivizes suppliers to invest more in quality and impact compared to investing in an even lower price. Also note that absolute scoring methods provide more information to suppliers compared to relative methods, as minimum and maximum prices are indicated. Drawing such figures during the preparation phase of every best price-quality ratio tender is an important step, because it increases insight into the actual behavior of a mathematical formula.

In academic and professional literature, there is an intensive debate about the application and effects of *relative and absolute methods*. Relative methods are easy to apply as no market knowledge is required for setting a suitable minimum and maximum price. However, as relative scoring methods provide suppliers no guidance regarding an acceptable price range, there is a strong incentive for suppliers to offer low prices. With relative scoring methods, it is always interesting for a supplier to offer a lower price as it will increase its score and possibly lower the scores of the others. This focus on price reduces bid quality and environmental and social impact. Empirical data and mathematical modeling also show that relative scoring methods could lead to lower price-quality ratios compared to absolute methods (Albano et al., 2008; Telgen & Schotanus, 2010).

A specific issue related to many relative scoring methods is rank reversal. Rank reversal is a change in the ranking of bids from suppliers leading to a new winner after adding or removing a non-competitive bid (Schotanus et al., 2021). In supplier selection, rank reversal can occur when buyers use multi-criteria selection methods in combination with a relative scoring method for price. For suppliers, the possibility of rank reversal means that winning a tender can depend on whether a non-competitive supplier participates. In other words, there can be a non-competitive bid that influences who wins the tender. Relative scoring methods that allow rank reversal also conflict with the principles of transparency and equal treatment (Manunza, 2018).

Step 6: Choose a selection and award method
Setting up a selection and award method allows the buyer to make tender decisions. An example of a popular method is the Weighted Sum Model (WSM). In WSM, all suppliers are awarded scores on all criteria. These scores are multiplied with the respective weights of the criteria. The supplier with the highest total score wins the contract. Many variants of WSM are used in practice. An example of such a WSM variant for the tender phase is illustrated in Example 6.5.

Example 6.5: WSM variant highest impact method for supplier selection

The highest impact method involves two selection rounds. In round 1, the buyer assesses price and quality. In this example, the buyer has set high-quality requirements, leaving little room for quality in the award phase. Therefore, the highest weight is attached to price (30 points can be achieved for price and 5 points for quality). Price scores were calculated using an absolute scoring method. The buyer has indicated in its request for proposal that all bids with scores of 25 points or more proceed to the next round.

In this case, Supplier C is rejected as it does not meet the threshold for a decent price-quality ratio. In the next round only impact (e.g., social return) is considered. As there is only one criterion, no weights are required. The bid with the highest impact wins the tender, in this case Supplier B.

Note that alternative methods are possible that lead to similar results. For instance, a buyer could use WSM with three award criteria and use only one assessment round. The buyer could attach a very high weight to impact (e.g., 80%) and set a minimum threshold for the price-quality combination equal to 25.

Table 6.3 Example of highest impact method

Criteria	Price	Weighted price score	Weighted quality score	Subtotal
Bid A	1800 €	30	3.6	**33.6**
Bid B	2500 €	21.6	3.4	**25.0**
Bid C	2600 €	21	3.0	**24.0**

Table 6.4 Example of highest impact method after withdrawal of one supplier

Criteria	Impact score	Rank
Bid A	3.0	2
Bid B	7.0	1

Besides WSM, there are many more selection and award methods that could be applied in public procurement. The methods can be classified as following:

- *Compensatory versus non-compensatory or semi-compensatory methods* (De Boer et al., 2001): compensatory methods such as WSM allow suppliers that have a low score on one criterion to compensate this with a good score on another criterion. Non-compensatory methods are strict and do not allow (very) low scores to be compensated.
- *Monetary versus point methods* (Bergman & Lundberg, 2013): in WSM and many other methods, suppliers receive points for all criteria, including price. Another approach is to convert quality and impact assessments to money values, meaning that better assessments result in higher values. With a monetary method, quality and impact values can be deducted from the price of a supplier. The supplier with the lowest 'virtual' price wins the tender.

Award methods can influence which bid wins, but it is also important to realize that the bids themselves can differ if a different method is used. If a buyer uses the highest impact method, rational suppliers are likely to offer a decent price-quality ratio that aims to maximize positive impact (or minimize negative impact).

Step 7: Simulate bids and tweak the supplier selection model
After step 6, all elements of the supplier selection model have been developed. Before the supplier selection model is finished, a final check needs to be done using hypothetical bids. This final check means that a buyer checks whether the model as a whole functions as intended. To this end, the buyer can create different hypothetical bids and calculate whether the bid that is considered by the procurement team to have the best scores actually wins the tender. Examples of hypothetical bids are the bids described in Tables 6.3 and 6.4. Typically, the hypothetical bids cover a cheap bid with low quality and impact scores, an expensive bid with high quality and impact scores and one or two intermediate bids.

Step 8: Assess requests to participate and bids
When the tender closes, the bids received need to be assessed. Quantitative parts of bids, such as price, are usually easy to assess. It is often only a matter of filling in the price in the formula which was published in the tender documents. Qualitative parts of bids, such as a plan of approach, a planning, or a conceptual design, often need to be assessed by human assessors. Assessing such qualitative elements can be challenging for several reasons. It can be difficult to put into words why a certain bid is better than another, without revealing confidential information about the bid of a

winning supplier. In addition, assessors are often inexperienced, and assessments are completed in addition to their daily responsibilities. It is therefore important to prepare the assessment process early and explain it in detail to all those involved.

Two aspects are crucial in the organization of qualitative assessments. Firstly, how the bids will be assessed is explained in the procurement documents. New assessment criteria or elements cannot be added during the assessment process. It may be appealing to do so, especially when working with assessors who are not trained in procurement. An independent person (e.g., a procurement officer) who supervises the assessment process should check that no new elements have been added to the assessment and ensure that all assessment aspects mentioned in the procurement documents are assessed and mentioned in the feedback to the suppliers. The independent person can also make sure that the order in which the assessors speak alternates. Assessments are also done without knowledge of prices to prevent assessors being influenced by this information.

Secondly, several assessors (preferably at least three) should assess all bids individually. The judgment of a group of assessors can be considered as an inter-subjective consensus decision (Volker, 2010). The involvement of experts can also contribute to the quality of decisions and managing the decision process, especially when dealing with purchases that are not part of the daily routine. All assessors should start, where possible, by assessing different bids individually. The first bid is typically assessed somewhat differently than the last one, because of the knowledge gained during the assessment process, among other things. This principle should also be applied during plenary group meetings.

There are different ways to reach a common judgment for the group. Figure 6.6 shows that a distinction can be made between an individual judgment and multiple judgments of the decision-makers and between the separate qualities and holistic quality of a proposal (Volker, 2010). This leads to six different ways to reach a common judgment and two major decision approaches.

The first option to approach a decision is to aggregate the individual judgments without interaction between the different decision-makers in a form or system (e.g., Excel) and average the scores (Relation 2 and Relation 6 in Figure 6.6). From a legal perspective, this is referred to as the independent expert model. This method shows weaknesses in the measurement scales of the intangibles but shuts out social influences. It can therefore be perceived by the outside world as more accurate. Disadvantages of this method are that insights of other decision-makers are not shared, and decisions are not as easily accepted. Examples of methods that are based on this principle are the Delphi Method, which is based on a ranking of individual judgments of several design qualities without social interaction of the decision-makers (Relation 6) or the Song Festival Method, in which countries independently express their grades based on holistic individual judgments about the quality of the proposal (Relation 4). The Olympic Scoring System, used for sports such as gymnastics or figure-skating, is based on individual judgments about qualities (Relation 2) that are expressed as holistic judgments and compared to those of other members of the expert panel (Relation 3) to present a ranking that shows the final winner (Relation 4).

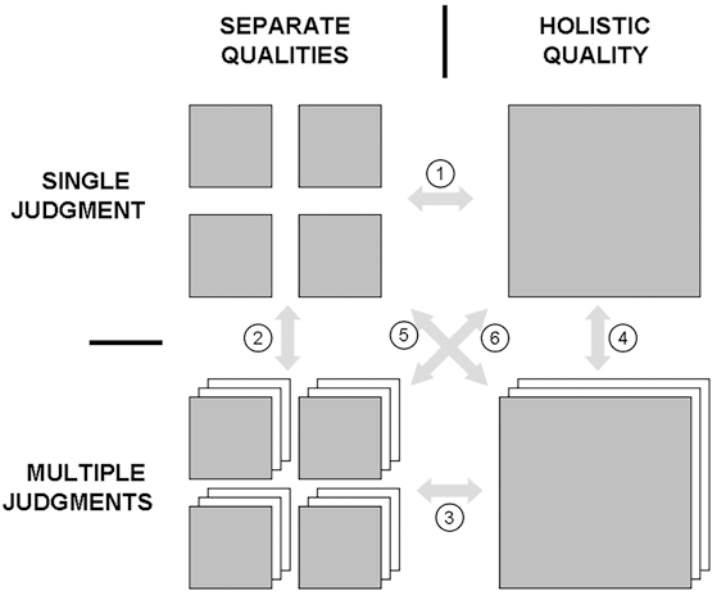

Figure 6.6 Four points of departure and interrelations for assessing the qualities of bids (Volker, 2010)

Another more interactive and preferable approach for public procurement decisions is to discuss the differences between the individual judgments on a holistic level and define one judgment for the group (Relation 4), discuss the separate qualities with the other jury members and then reach a decision (Relation 6), or discuss the proposals on a holistic level (Relation 3). The more differences in perspectives, the more difficult it is to discuss issues, but nonetheless in every situation a consensus or average outcome must be reached, as is acknowledged in case law. The consistency of the judgment means that arguably only using aspects that can be measured or assessed on a certain scale could be seen as a solid base for discussion. However, leaving out or quantifying the intangible characteristics does not benefit the validity of the judgment. The fact that more information can be put on the table during the discussion and discussions contribute to decision acceptance can be considered beneficial. At the same time, there is more pressure to conform, and the possibility of one or two members dominating increases the chances of groupthink and group shift.

In this context, a clear distinction should be made between an individual judgment, a judgment of a group, and a decision about the winning tender. Aggregation can turn individual judgments into group judgments and fragmented qualities into holistic qualities. This can be done through discussion and/or summation. In a discussion, the differences between the individual judgments are discussed first, and then one consensus judgment for the group is defined. An important disadvantage of a consensus judgment is that one assessor can intentionally (using hierarchy power) or unintentionally (the first assessor who explains its judgment can have an

unintentional effect on the others) influence the other assessors. Summation is a more quantitative process of adding up each individual judgment, either by voting or collecting individual preference statements, to take the calculatable average as the final decision. Both methods can be regarded as inter-subjective. Both these systems are acknowledged in case law as the consensus model and the individual assessor's model.

To prevent decision conflicts, it is important to align the decision frames throughout the process to other stakeholder groups, such as citizens, other political parties, or line management. Often experts are involved that could have a frame of reference with which they perceive the proposals. These experts are generally able to use their knowledge and experience in an efficient way, trusting other panel members not to overlook high-quality submissions or make invalid judgments. From previous research we know that experts are better at seeing the significance of information, identifying important cues for risks, estimating consequences, and judging autonomously (Volker, 2010). Experts also feel the need to discuss and harmonize their preferences with other members of the group, which contributes to legitimization of the decision to the participants and society. Additionally, less experienced decision-makers could benefit from a discussion to build up their own frame of reference which could enable them to speak the language of the experts involved in the selection process, better control their emotions, and use intuitive judgments.

Step 9: Justify the tender decision

The obligation to announce the selection and award criteria enable the tender candidates and tenderers to know what to expect during the assessment phase. For each tender, decision-makers need time to go through several iterative and incremental stages of decision-making, even more so when tender procedures take several months to execute (Volker, 2010). In this context, transparency about the actual decision processes (e.g., who was involved, when, what kind of perceptions were in place) is not always the same as the transparency required by the legal framework (e.g., which criteria will be applied, what is the weight of these criteria).

After a decision has been made, a public organization must justify the decision to their own organization, to the public, to society, and to the suppliers that participated in the tender. These multiple responsibilities are often described as 'the many hands that make it difficult to identify one single person responsible for a decision'. In justifying a decision, a decision-maker is simultaneously confronted with the legal structure of the decision procedure and the psychological decision process of sensemaking, as explained in Section 6.1. Justifying a decision requires expertise, however tender and award committees do not only consist of domain-specific procurement professionals, but often include numerous stakeholders with different backgrounds. Therefore, without strategic aims and suitable means, stakeholder involvement could merely increase the uncertainty during the decision process and decrease the support of a decision. It also increases the difficulty of explaining a decision and therefore the transparency of a tender decision. Additionally, the involvement of external advisory experts can change the power balance and culture within an organization or team, therefore the roles and responsibilities of the decision-makers should be addressed, and the decision panels trained in how to increase the level of trust and alignment among the stakeholders.

Current procurement law requires buyers to clearly motivate their decision and transparently communicate the 'story' behind the decision based on the original supplier selection model. This indicates that current public procurement law is based on assumptions like the first generation of rational decision theories from the field or organization sciences (Beach & Connolly, 2005). These models perceive the process of decision-making as a sequence of problem definition, identification of decision criteria, allocation of weight to the criteria, development of alternatives, and evaluation of alternatives with the use of the decision criteria as set out in the beginning.

This generally increases the level of trust in the buying authority and could therefore support the strength of the decision among stakeholders. Simply supplying a matrix sheet with some numbers does not fulfill this need because it does not offer the level of transparency that is desired by the stakeholders, including the suppliers. Hence, the procurement professional needs to be able to explicate the underlying tensions and dilemmas that have occurred during these often political and sensitive decision processes.

6.5 Summary

This chapter introduced the topics tendering and supplier selection in more detail from a decision-making perspective. It explained that in a procurement context, a tender procedure initiates a process in which decision-makers start to make sense of the potential match between supply and demand that enables the purchase of a work, supply, or service. Hence, supplier selection should be considered as a sensemaking process across different stakeholders with different interests and political aims. However, a specific difficulty for supplier selection in public tenders is that the supplier selection model needs to be published before the bids are received. Therefore, insights developed after reading the bids cannot be used to change the supplier selection model. To prevent major unexpected insights after the bid submission deadline, this chapter explained that a buyer should explore and consult the market before the start of a tender and listen carefully to potential suppliers during the tender procedure. This chapter subsequently explained that buyers can indicate their preferences in a nine-step supplier selection model. These combined steps have a positive influence on the quantity and quality of bids because they lead to supplier selection models that explain to potential suppliers what is needed and what is important. Only by translating the ambitions and views of the buyer in the design of the tender as transparent and structured as possible, the most promising bids will be received. The assessment process can be supported by a tender and award committee that judges the bids individually and then reaches a consensus as a group. This allows the public buyer to select the supplier that matches the demands on all levels of the organization and increases both the external and the internal support for a tender decision.

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