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## A decision support system in order to facilitate new financing actions in the public sector

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**Key words:** Evaluation and selection procedures, public administration, financing actions, multi-criteria models and methods, shared knowledge, integrated informative system.

**Abstract** This analytical in-depth study on the financing modalities adopted in the Region of Piedmont was carried out with the contribution of those directly involved in the decision-making process enabling to acquire, codify and organize important elements of information which can be used to increase the evaluation culture in the Region. Owing to an increased interest in making public financing actions more efficient, the results of this analysis are of particular interest as they can be used as a multi-criteria evaluation model and a decision support system aimed at facilitating and implementing new financing and monitoring actions in a context of organizational learning.

### INTRODUCTION

Financing actions at the government's regional level can be complex, and the evaluation procedure can be considered marginal as regards the implementation process which is based on operational planning activities, the collection of tenders, evaluation/selection, admission and granting of the financing, payment and control. The evaluation/selection is the activity aimed at choosing the projects to be financed, but in a process of continuous improvement it can take on a much broader scope. The outcomes of analyses carried out on any previous procedure enable to improve the following ones and are helpful in defining new calls for tenders and in some cases in planning the distribution of funds.

An incremental process of this kind is not always possible since it is difficult to acquire and transfer knowledge and competences due to the fact that subjects covering decisional positions are changed, thus dispersing the competences acquired; or, due to the fact that reduced time and budgets do not enable to analyse the outcomes and therefore to improve the models and procedures. Often, the funds available for financing projects are few compared to the amount of those potentially submitted, and the limits of time and availability of skilled human resources result in the externalization of the activities or in a prompt implementation of the procedures that thus end up being not very reliable or effective.

In 2003, the Nucleo di Valutazione della Regione Piemonte (NUVAL Piemonte - Evaluation Division of the Region of Piedmont) expressed the need to understand the competences developed within the regional administration in terms of evaluation and selection of the projects, as well as what kind of lacks were still present thus requiring intervention and support. Therefore, a research was carried

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out<sup>1</sup> which enabled to plan moments of reflection and in-depth study aimed at improving evaluation activities and procedures. In 2006, many officials and executives participated in workshops promoted by NUVAL aimed at increasing their evaluation culture (thought for subjects involved at different levels in the monitoring and evaluation activities within the Region). Another training course was organized in 2009 by the Region of Piedmont, aimed at teaching techniques for writing call for tenders and for selecting the projects viewed as tools for policy development (thought for executives and officials belonging to the Region and Provincial Administrations involved in the realization of investments regulated by the Programma Attuativo del Fondo per lo Sviluppo e la Coesione 2007-2013 - Funds for the Development and Cohesion Implementation Programme).

In the 1990s, interest in the evaluation and selection modalities started to increase due to reforms carried out in the public administration. Restrictions imposed on public expenditure by the community and national financial framework emphasized both the need to duly select the tenders and to pay attention as regards the procedures followed in using the funds.

The obligation to clarify the criteria and modalities adopted when evaluating financing requests and projects came into effect with the entering into force of administrative procedure regulations (L.241/1990). The new law changed the relationship among public administration, citizens and enterprises highlighting the need for transparency and objectivity in the administration's conduct.

In the mentioned years, the experience in managing community funds started to shift the attention from the formal procedure to the actual outcome, imposing compliance with specific timing as regards the use of the funds. The European Union intervened on competition protection and on the topic of partnership, regulating the participation of regional and local authorities and of local bodies in the planning phase of public financing actions. State policies, besides insisting on the simplification of the procedures and on the need of uniformity within regulations, also required the prompt conclusion of the procedures so as to create a favourable framework for economic and social development.

As regards the measures for reducing costs within the public administration aimed at financial stabilization and economic competitiveness (L.80/2005), the Region of Piedmont reasserted the will to safeguard the evaluation and selection activities of projects from reductions of expenditure imposed by the unfavourable framework of public finance through the Technical Assistance Plan of the 2007-2013 Fund for Development and Cohesion (Piano di Assistenza Tecnica del Fondo per lo Sviluppo e la Coesione 2007-2013) (Region of Piedmont, 2012 and 2014). In 2013, a process of internalization of the activities was launched with effects on regional procedures as regards the evaluation and selection of the projects.

The data and information collected during the 2003 research were analysed on the basis of this scenario creating a foundation of structured knowledge integrated in a support system capable of facilitating the acquisition of new competences, the exchange of good practices, and decisions as regards the creation of innovative financing procedures both effective and appropriate for the administration's needs.

The prototype of this system was developed on the basis of Piedmont's reality. However, its usability can be broadened to other decisional contexts, as auspicated in (Region of Lazio, 2003). Moreover, the different experiences and competences can be integrated in a single system.

The first paragraph of this study provides a description of the methodology adopted in the research and the results obtained as regards the codification of the activities and the definition of the basic procedure and process typologies. The paragraph concludes with a summary of the outcomes. The second paragraph describes the main elements of the *multi-criteria* evaluation model as regards the complexity of the financing action and its role within the support system.

<sup>1</sup> The work was developed within the ambit of the convention "Analisi dei processi nei metodi di selezione dei progetti (Analysis of the processes followed as regards the methods used for the selection of projects)". We thank Mr. Gualtiero Reinerio, at the time president of NUVAL, for his encouragement and collaboration.

## RESEARCH AND STRUCTURING OF THE INFORMATION ACQUIRED: METHODOLOGICAL ASPECTS

The aim of the 2003 study was to try to answer several questions, such as: “What procedures and modalities does the Region of Piedmont adopt when selecting projects? Can said procedures and modalities be categorized? In which situations are they adopted? Why? What are the characteristics of the implementation processes in which these procedures are inserted? Can these be categorized as well? Are there any meaningful experiences? Are any improvements possible (or necessary)? Is an in-depth study useful?”

The nature of the programmes and the characteristics of the different sectors of regional interventions have led to identify many realities and to assume that contextual elements play an important role in defining the evaluation and selection procedures (Patton, 1997). Thus, the analysis was oriented towards identifying the characteristics of the “contexts” to then structure the information acquired (Norese and Torta, 2007).

The choice of the financing actions taken into consideration as well as the informative and fact-finding sources was based on the will to have a representative group of activities within the whole regional conduct (in terms of organizational and/or financial commitment) sufficiently diversified (in terms of addressees), also keeping into account adoption frequency and implementation processes (Corbetta, 2003). Therefore, this study was based on the observation of 57 financing actions assigned to productive activities or programmes aimed at improving the criticalities present in a specific area capable of affecting the economic system directly, as well as interventions in sectors such as professional training, sports, education, culture and entertainment, residential construction and assistance (Florio, 1991). The financing actions examined concern the most important sectorial regulations and the instruments adopted by the community planning in the period 2000-2006 (Florio, 2003).

The first elements of information were collected by reading the calls for tenders and related planning documents verifying their readability and their effects on the evaluation/selection of the projects. In fact, it is through the call for tenders that the subjects involved are informed concerning the aims set by the administration. Moreover, the evaluation criteria – explicitly clarifying the desired aims - become an instrument of active communication, aimed at reducing the exclusion of projects due to errors of form and increasing the planning quality of the others. The calls for tenders approved directly by the regional executive are easy to trace by consulting the Official Gazette or the regional webpages. This choice gives the advantage not to “burden” the regional structures with requests for information involving them only in a second moment, that is when it is time to “validate” the information acquired enhancing it with further procedural knowledge obtained directly from who generated, experienced or underwent these processes.

The reading of the documentation highlighted interpretative difficulties caused by the use of a very diversified terminology or different modalities in writing the programmes. In reading the calls for tenders, the items considered representative of the procedures analysed were identified and a synthesised report was structured containing the following information:

- the description of the general characteristics of the financing action and of the planning context of reference, as well as information concerning the planning phase and the implementation process;
- general and detailed information concerning the evaluation/selection procedure (subject-matter, subject involved, provisions of reference, activities envisaged, timing, model stated by the call for tenders, modality for the definition and aggregation of the judgements, selection rules, financing rules, amount of tenders submitted, admitted and financed, motivations for exclusions, observations of the people in charge and of those who developed the activities).

Every report was combined with a scheme representing the different processes carried out and indicating both the involved actors and their mutual relationships. The scheme is very similar to the

kind used in the **problem formulation** methodology (Bowen, 1983) to describe the involved actors and their relationships.

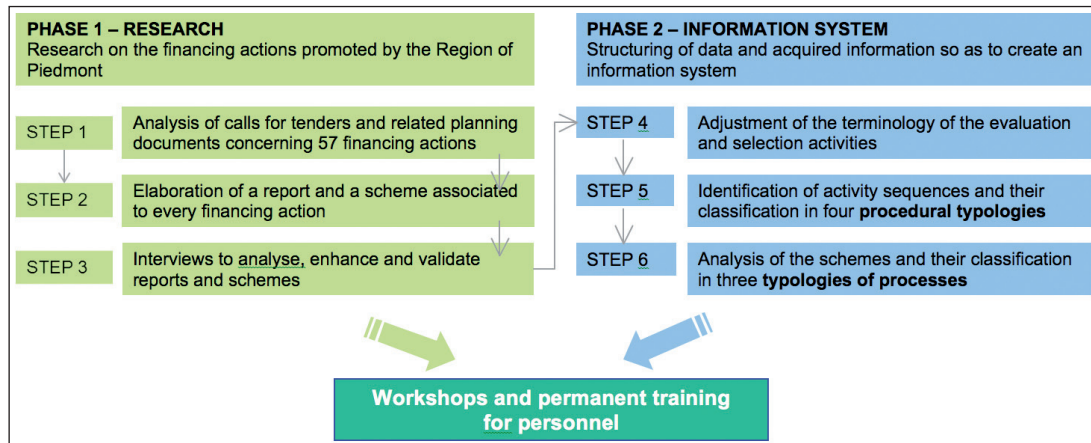
The 57 reports and related schemes were analysed, validated or modified through interviews carried out with those in charge of the procedures at regional level. Said reports were enhanced with information concerning the actual processes and the evolution of past and ongoing financing actions.

At the end of this research phase, all the reports and related schemes of representation were validated and the acquired elements were analysed and structured (the various carried out steps are summarised in Figure 1). The first step consisted in the attempt to organize the terminology used in the evaluation and selection procedures due to the interpretative difficulty highlighted when reading the calls for tenders. The work consisted in trying to reduce the plurality of words used to express the same meanings in the calls for tenders searching for a more correct terminology. With this aim, the language of the context and the literature of the sector were both kept into account.

Then, the different sequences of the various actions in the examined calls for tenders were identified, recognizing several distinct situations which can be traced back to four **basic procedural typologies**. Lastly, the 57 schemes representing the complexity of the procedures were examined tracing them back to three **typologies of processes**.

The aim of the second phase was to summarise the elements acquired in an information system in order to enable their transfer and sharing (organizational learning) and to facilitate the (shared) planning phase of the new financing actions. Workshops and courses were organised within the ambit of permanent training for officials and executives, enabling to share and discuss the acquired information (Ocellli, 2008). The described process is summarised in figure 1.

**Figure 1** Research and structuring of the elements of the acquired information



### The evaluation and selection activities in the procedural typologies

In the panorama of the examined financing actions, the evaluation/selection procedures of the projects (“the preliminary investigations of the projects”) can consist in one or more of the following activities: **formal verification** [of admissibility], **compliance verification**, **merit evaluation**, **selection** and creation of an **order** of the projects.

The activation of one or more activities, according to different sequences, enabled to identify four basic procedural typologies in the examined calls for tenders. The typologies are described hereafter on the basis of an increasing level of procedural complexity and are indicated with alphabetical letters (from A to D).

The first typology (A) is composed of procedures which **verify only the formal requisites** indicated

by the call for tenders, or procedures which, besides what mentioned, **classify** the tenders in the absence of a merit evaluation. The classification is generated on the basis of the order of arrival (“chronological” or “protocol”) or drawing.<sup>2</sup> The formal verification consists in ascertaining the existence of “conditions of acceptability” (expressed in the call for tenders as regards the terms and modalities of delivery, the completeness and regularity of the required documentation, the possibility or not to cumulate the requests sent by the same tenderer) and of “legitimacy” when the characteristics of the tenders and of the projects to be carried out satisfy the conditions established by the call for tenders or are not expressly excluded.

In many cases the formal verification also consists in ascertaining the compliance, or non contrast, of the tender with regulatory aspects - to which the project has to be necessarily retraced - such as: standard parameters of reference, planning tools, environmental and landscape or sectorial regulations. In these cases the tender is considered in compliance only when it is consistent with all the “regulatory conditions.” The **compliance conditions** (parameters of reference and regulations) vary within the calls for tenders depending on the financing action and typology of the project, and the verification often entails technical knowledge.

An important observation is that the compliance verification is not always immediately identifiable: in the sequences indicated by the examined calls for tenders, the verification is often associated to those concerning formal aspects, while in certain cases it is not distinguished from the activities more exactly referable to the merit evaluation of the tenders. The compliance with the regulatory aspects result to be an a priori necessary condition and not an expression of merit. Analogously, in some activities the conditions of formal verification are not clearly distinct from the merit evaluation, generating exclusion for non-admissibility only at the end of the preliminary investigations.

The second typology (B) involves procedures in which the **merit evaluation** adds on to the formal verification and enables to give an order to the projects. The **evaluation** activity is carried out when a tender is preferred over another either locally (with regard to a single aspect) or globally. It is an activity which, for its own “nature,” entails the expressing of a judgement (of value) and implies that either the aspects which need to be kept into account so as to examine the tenders are indicated or the financing priorities to follow are defined.

The adoption of this procedure, which excludes a project only if it is not formally admissible or in compliance with the rules, enables the decision-maker to organise a classification of the projects, should there be the need to carry out repeated financing choices over time (when, for example, the classification has long-term value), thus in a following phase of implementation of the programme or due to budget limits, or when it is possible to integrate the funds available.<sup>3</sup>

The projects are ordered in terms of priority or preference, on the basis of general terms which each time are connected to the characterizing aspect defined in the planning phase of the activity (urgency of the intervention, compliance with the planning indications, promptness in the realization, etc.). The creation of the classification is carried out through a synthesis of the evaluations given by examining one or more aspects of the tenders and/or defining the priorities of the financing, or in the presence

<sup>2</sup> The adoption of this procedure is frequently found in the financing actions which envisage the appointing of a voucher, a bonus with which a refund is authorized after the final balance of the expenses born for the acquisition of services, or in the initiatives strictly connected to other services paid out by the regional or provincial administration and for which a formal verification and/or an evaluation/selection of the requests has already been carried out. This procedure is adopted also when the requirements necessary to examine all the requests is substantially in line with the financial availability, or in the cases in which the availability is insufficient but the decision is moved towards the integration of the financial availability or the reduction of the percentage of the financing (if it is a possibility expressly provided for by the call for tenders).

<sup>3</sup> This is frequent in financing actions combined with a planning activity and in those particularly “new,” or when there is not enough past knowledge concerning the amount and type of tenders which will be submitted (and therefore an “experiment” is carried out), or there is the need to encourage a certain type of planning.

of specific preferable characteristics of the project, such as the typology of the project or works envisaged, the territorial ambit of reference or the typology of the bidders.

Only in the third typology (C) the administration is engaged in the **selection** of the tenders, which follows the formal verification and the merit evaluation and uses different modalities of exclusion. The selection activity is carried out when there is (and is operational, not only present in the call for tenders) the possibility for a project to be excluded not for formal lacks, but due to the non-existence of the conditions of suitability (in relation to the aspects considered “necessary” for the admission to the financing).<sup>4</sup> In certain cases, an order is given after the selection, which means that the classification includes only the “suitable” projects.

In the financing actions taken into consideration, the evaluation activity is recognisable and often associated to the phrase “merit evaluation,” followed by a list of the aspects or criteria of reference. Instead, the selection activity is detectable from the envisagement of a **judgement of non-admissibility** for the financing of the tenders. What changes in the various calls is the modality followed for the exclusion of the tenders. The judgement can be expressed substantially in four ways: with a **global exclusion** (through a judgement expressed by the administrative division that receives the tender or by a group of experts within the organization, possibly integrated with external competences, or by a group of experts variously called technical committee, technical group, evaluation group, work group), or **analytical and local exclusion** (by envisaging a more or less articulated minimum score, or by defining conditions of admissibility and excluding the tenders that do not comply with the conditions defined in their whole), or **global - analytical and local exclusion** (a combination of the above mentioned, in which it is necessary to obtain both a positive judgement and the passing of a suitability threshold or conditions of admissibility) or an **exclusion per classes** (this envisages the definition of rules for appointing the tenders to homogeneous planning classes and the decision moves towards the use of the financial availability depending on the different classes).<sup>5</sup> Most of these activities are also subject to a “bank’s opinion,” since a bank can be engaged in the contextual granting of a loan to the applicants.

The fourth and last typology (D) is characterized by evaluation/selection modalities substantially similar to the previous ones, but in this case they are combined and used several times, for example: formal verification, merit evaluation and selection; then the object changes and therefore a new merit evaluation is necessary, followed by an order of the projects. The real difference compared to the other typologies is linked to the fact that all the procedures are characterized by at least a **change of the object** during the evaluation/selection procedure. This change is present in two distinct groups of activities:

- in the first group, the evaluation/selection is carried out with reference to programmes, plans, project proposals (or project ideas or feasibility studies), and the preparation and presentation of the details of the project are requested only if the tenders are declared admissible, thus becoming subject to the second evaluation;

<sup>4</sup> The selection activity is frequently found in financing interventions which need or assume an activity of “direction” at regional level and are destined to local and public bodies. The tenders that obtain a positive judgement are divided according to financing rules aimed, above all, at avoiding the territorial concentration of the resources. Often, at the end of the division activity, a public distinction is made between the tenders immediately financeable and those placed “in waiting lists”, in other words financeable if resources are made available owing to expenditure, renounces or the appointing of “bonuses” connected to compliance with the forecasts of expenditure.

<sup>5</sup> The analytical exclusion is adopted frequently in financing actions that present numerous potential addresses, for which there is a financial planning that covers more years but is subject to the exhaustion of resources, or in very “specific” initiatives that refer to a large amount of addressees that go beyond the boundaries of a region. In general terms, the decider seems to be more “facilitated” in the adoption of this modality of selection due to the availability of past knowledge as regards the financing action and/or when the action to be developed originates from an articulated planning activity (which often terminates with the writing of a detailed and accurate programme).

- the second group consists in the projects concerning public works, which can be presented at different levels (preliminary, definitive and executive) as provided for by public works regulations of 1994 (the so-called Legge Merloni) and following amendments. The evaluation/selection can be sequential and carried out on the basis of different planning levels, which can entail, each time, a relevant change of the object to evaluate.

In all the typologies described the **object** of the evaluation activities is made of requests (the terminology used in the calls for tenders is rather variegated and goes from letters, to requests, requests of interventions, manifestations of interest, requests of facilitations) or projects (even in this case the terminology varies and goes from projects, to programmes, plans, requests/projects, requests/plans, intervention reports) at different levels of definition (including project ideas or feasibility studies). The documentation that must be submitted with the requests/projects varies depending on the nature of the project and the typology of the tender. Some calls for tenders provide for a distinction between the documentation which is to be submitted contextually with the request (“mandatory”) and that is to be sent within the closing date of the preliminary investigation (“integrating part of the request”), as well as between the documentation to enclose “only if there are the conditions” and that can be produced to enable a “better presentation of the project.” The possibility to ask for clarifications or enable the integration of the tenders is a possibility that varies depending on the typology of the financing action and the “formal” lacks found (the formal aspect is a specification made by most of those interviewed), but it seems to be strongly influenced by the relationship between the amount of tenders submitted and the financial funds available. The **frequency** of the procedures carried out coincides either with that of the call for tenders (which is usually annual), or with that of the collection of the projects (continuous or periodical if a collection “counter” is envisaged), or with the frequency of the writing of the plans (in these cases the collection of the projects has a long-term validity, usually three years). Very often the frequency of the collection of the projects also affects the order followed in their evaluation/selection (in the cases of continuous collection, an order is followed based on the presentation/data transmission; in the periodical collection of projects submitted in the same period of time, these are given the same order). In the financing actions subject to exhaustion of resources, in case of an equal outcome of the evaluation/selection, the order given to the projects remarkably affects financing decisions.

### **The typologies of processes in which the procedures are inserted**

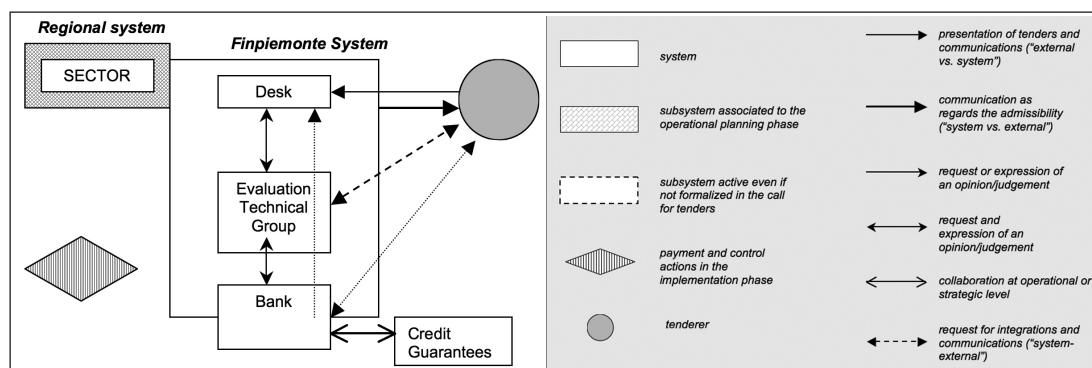
Depending on the different situations involved, it is possible to identify three **typologies of processes**: classic, delegated and innovative. In the **classic** typology, either the process is managed entirely by the regional system or the instrumental body carries out a relevant role. In the first case, all the activities (operational planning, collection of the tenders, evaluation/selection, admission and granting of the financing, payment and control) are in charge of the administrative division of the regional organization (direction or sector), but it is possible for organisms within the regional system or external organisms to provide their opinions (CONI Regional Committee, MIUR Regional Directorate, etc.), or there can be a consultation (with the cognizant board commissions or the representatives of the local autonomies, voluntary services or associations) during the writing and approval of the call for tenders, or the creation of an *ad hoc* technical organism, when expressing a judgement during the evaluation/selection of the tenders or when confirming the results of the preliminary investigations carried out by the sector.

The organism can be part of the regional system or an instrumental body, integrated by other components or supported by other services. In all these cases, the name and composition varies and goes from Technical Committee to Evaluation Group, Internal Technical Group, Technical Work Group, Directorate Group.



In the second case, the regional decider entrusts the instrumental body the activity of distributing the resources as well as carrying out the administrative functions, *in primis* the collection phase and the entire evaluation/selection procedure of the tenders.<sup>6</sup> This case is described in Figure 2, where the system and subsystems involved are identified adopting the scheme suggested in the methodology proposed in (Bowen, 1983). The different types of relationships are described in the key to symbols.

Figure 2 Example of a scheme representing the process



The two acting systems (regional and instrumental body) are represented as adjacent due to the instrumental nature of the body involved and of the close relationship existing between the two structures. The tenderer interacts with a permanent collection desk established at the instrumental body's premises. The body transmits the request to the group responsible for the evaluation/selection of the projects and to the bank, and then communicates the outcomes of the preliminary investigations to the tenderer. The group responsible for the evaluation/selection of the tenders can communicate with the tenderer in order to ask for clarifications and possible integrations. Should the requests obtain the group's positive judgement, the process for the acquisition of the bank's opinion is launched (that is the possibility to finance the proposed initiative, since the bank will be engaged in the contextual granting of a loan to the tenderer). The bank is chosen by the tenderer among those having agreements with the instrumental body. By obtaining the bank's favourable opinion, a regional consortium is launched in security of the loan (Credit guarantees). The payment and control activities (the striped rhomb in Figure 2) are carried out according to the European regulations for the use of structural funds and owing to paying organisms with their own payment modalities, not connected to the system described. Systems and subsystems involved in the case described can take on this role directly in other financing actions as regards this and other typologies. The dotted arrow connecting the tenderer to the bank and from this to the collection desk, highlights a form of communication not formalized in the call for tenders: the bank represents the interface with the tenderer, it informs the latter concerning the opportunity of the financing promoted by the regional administration and sends the request directly to the instrumental body.

In the situation defined as **delegated**, either a local body takes on an active role in the process (with a proxy which in some cases is only operational, in other cases also decisional) or there is the in-

<sup>6</sup> This is adopted frequently in the financing actions which envisage the granting of advance payments, through the abatement of a part of the interest rate financed by the bank with a coverage insured through a revolving fund, or through the capital participation of the applicant enterprise on behalf of the regional system with the intervention of a participatory fund. The characteristic of both these instruments is the capability to self-fuel itself for the effect of the mechanism of returns of the advance payments of the enterprises already financed.

involvement of a territorial or functional organizational level different or higher compared to the regional one. Community initiatives which insist on the territorial cooperation and involve an upper-regional and across-the-border dimension are managed by structures created *ad hoc* (Management Authority, Joined Technical Secretariat, Planning Committee and/or National Coordinators), but the regional system, called to carry out the collection phase or part of the selection procedure (delegated to the cognizant sectors) takes on a role totally similar to that of the delegated body previously described.

In the third situation (**innovative**), there is the involvement of the regional and provincial systems which, differently from the previous cases, take on a double role, depending on the phase of the process being carried out. There can also be the involvement of a third party, the Gruppo di Azione Locale (GAL - the Local Activity Group), which takes on the role of process manager. In both situations, the process is articulated in two phases. In the first case, the Province, once it has carried out an activity of animation/request towards potential recipients for the presentation of the ideas-projects and a selection of the admissible tenders (first step), invites the tenderers to write the projects to be submitted to the regional administration. Owing to the participation in a regional work group (mixed organism, composed of representatives of the two bodies), the Province then carries out the evaluation/selection of the detailed projects (second step). In the second case, a private organism is established (in the form of consortium company with majority private capital or of a limited partnership company), provided with its own organizational structures, with the approval and the financing of a programme of interventions subject to regional level, passing from the role of tenderer to that of process manager; the operational planning (writing of the call for tenders or invitation and diffusion), the collection, the evaluation/selection and the admission to the financing of the projects consistent with the local programme is entrusted to GAL. The regional system is engaged in spurring and helping the organisation of the programmes, in selecting the organisms with reference to the programme presented and in carrying out the verifications of compliance with the regulations of reference in guarantee of the respect of the principles of transparency, impartiality and competition protection.

### **A possible summarised representation of the outcomes**

A visual summary of the information obtained on the basis of the research and analysis carried out is provided in Table 1. The first column on the left refers to the financing actions taken into consideration. The Table is divided into two parts: the first associates to every financing action one of the four procedural typologies to which it was retraced, the modality of selection adopted (for the C typology) and the existence or not of a specific activity for giving an order to the projects. The procedural complexity increases moving from the column on the left - the formal verification - to the others in sequence towards the right.

The second part of the Table associates to every financing action a process situation and one of the three typologies of processes of reference, with elements of different organizational and process complexity, increasing from left to right. The representation highlights which typologies of classic processes can be associated to very complex procedural typologies. Moreover, it highlights that in 2003 the innovative processes were very few, but already present. Nowadays, they can be considered processes consolidated in the financing practice at regional level, as witnessed by the recent analysis aimed at policies for the local development activated in Piedmont in 1996 (IRES, 2013).

This Table was used in workshops and training courses in order to analyse ongoing and future evolutions, among which those which could modify innovative typologies due to the possible disappearance of Provinces and due to the role which other territorial realities could take on, such as metropolitan areas. It was also the starting point for a new analysis, described in the following section,

aimed at developing a decision support system which, integrating the information acquired with a multi-criteria model and method, can facilitate the creation of new financing actions.

**Table 1** Procedural and process typologies associated to the financing actions examined

INTERVENTIONS Ref.n°	PROCEDURAL TYPOLOGIES						TWO LEVELS OF EVALUATION/ SELECTION	TYPOLOGY OF PROCESSES									
	FORMAL VERIFICATION	MERIT EVALUATION	SELECTION					Situation of processes	1	2	3	4	5	6	7		
			global exclusion	local exclusion	global and local exclusion	exclusion per classes										classic	delegated
57																	
56																	
20																	
48	Ord. ARRIVAL																
43	Ord. BY CHANGE																
14																	
29 bis		segmentation															
45		order															
42		order															
41		order															
49		order															
12		order															
28			order														
11				order													
19 bis			order														
38			order														
46			order														
7			order														
6			order														
13			order														
19			ord. ARRIVAL														
17			ord. ARRIVAL														
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21			order														
2			order														
24			order														
8			order	order													
18			order	order													
44			order	order													
47			order	order													
1			order	order													
4			order	order													
55			order	order													
40			order	order													
45 bis			order	order													
16			order	order													
3			order	order													
10			order	order													
51			order	order													
53			order	order													
37			order	order													
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33			order	order													
36			order	order													
5			order	order													
54			order	order													

### A SYSTEM TO SUPPORT DECISION AND DESIGN

The presence of uncertainties about the work environment (for example, the availability of time to complete and make a new financing action operational, of financial resources that can be used for this action, of required competences, and so on), the value system (not so clearly defined and well oriented objectives), or the organizational complexity (when actors or organizations are involved in the decision process with different roles and can reduce the action space of the others) make the design of a new financing action complex.

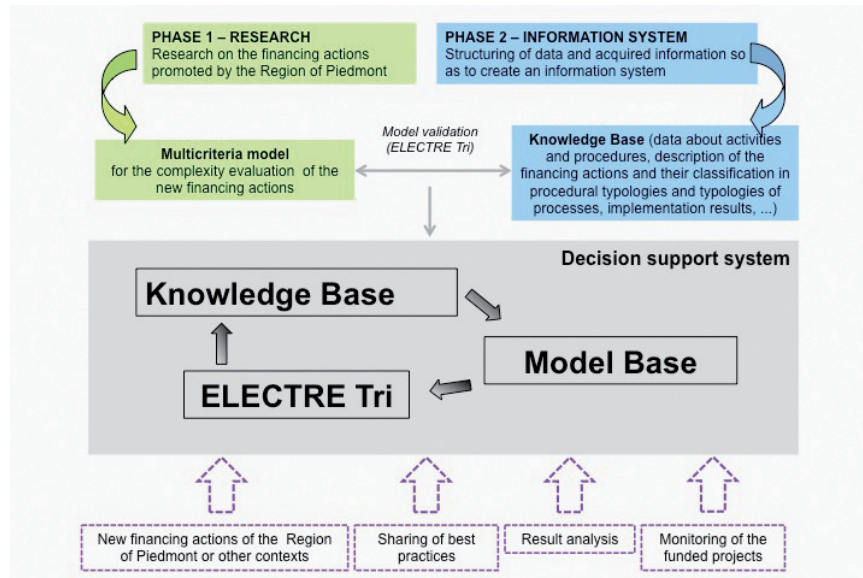
An interaction with some different experiences (in the same organization or in another regional or local premise) by means of a structured and transversal knowledge base could facilitate the elaboration of new financing actions and activate a process of competence acquisition and incremental improvement of processes, procedures and results.

A system to support decision and design of innovative financing actions was developed, as operational proposal for the Regional Administration and other similar decision contexts. An ELECTRE method (Roy, 1996; Figueira *et al.*, 2005) is used to assign each new financing action to a specific category of complexity and facilitates the elaboration of the new action by means of the known situations with the same complexity. An evolving knowledge base includes and integrates knowledge elements about previous financing actions, from different sources, and data about evaluation/selection activities and procedures. The combined use of the knowledge base and multicriteria model and method allows the user to know which procedures have been developed in his/her organization (or

in similar decision contexts), in relation to financing actions that present analogies with the new action, to be elaborated.

The decision support system, that integrates a knowledge base, a model base and the ELECTRE Tri method (see Figure 3), offers details about the main interesting procedures (their structure and use, and the main strength and weakness elements) and easy connections with the proponents and implementers of these actions and procedures, in order to acquire a direct knowledge of the results, actual difficulties and adopted strategies to limit their weakness.

**Figure 3** Decision and design support system



The knowledge elements, which the inquiry on the financing actions of 2003 had acquired, were used to identify the aspects that should be used to evaluate the complexity of a new financing action. These aspects were included in a multicriteria model for the ELECTRE Tri (Roy and Bouyssou, 1993; Yu, 1992) application, in order to assign a new action to a specific complexity category. A prototype of the system, including model, method and the knowledge base from the 2003 inquiry, was used to test and improve the model.

The structure of the multicriteria model is here described. A synthetic definition of its parameters and how the method application was used to facilitate their calibration are then proposed.

### Structure of the multicriteria model

Aspects, such as lack of experience or limited knowledge of the innovative elements that characterize the new procedure and the uncertainties of the process in which it will be inserted, were included in the model, to evaluate the whole complexity that can be associated to a new financing action. Some aspects were synthesized in four criteria: Innovation complexity, Design complexity, Decisional and organizational complexity and Adequacy guarantees, that can be required in relation to the final user.

#### *The innovation complexity*

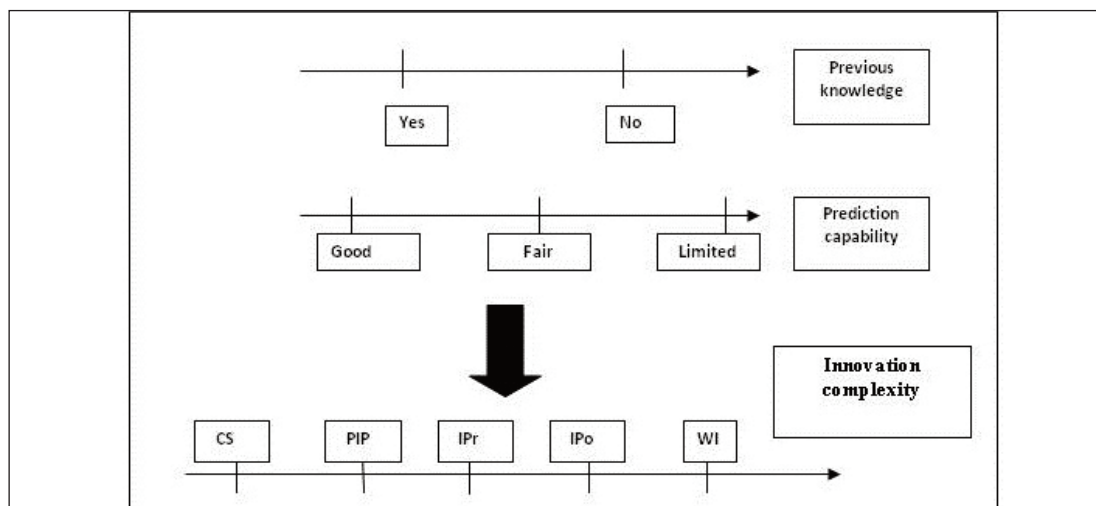
The elaboration of a new financing action is more difficult when innovative elements have to be included, because they could not be understood and clearly perceived and, as a consequence, the quality and the number of the financing demands could be limited. The innovation complexity is there-

fore linked to the previous experiences and the prevision capability. Previous experience of the specific context (the sector, the nature of the financing procedure, the possible impact of the innovation elements on the objectives of the new procedure, ...) and knowledge of the available operational resources can facilitate the development of an innovation procedure. The opposite situation is an evident source of complexity.

The work is easier if the size and quality of the financing demand can be estimated. Problems may be associated to a very high number of financing demands but also to a very limited number. And the quality determines the number of projects that can be financed. When size and quality can be estimated, the problems can be reduced and controlled. Uncertainty about these factors makes the new procedure not so oriented and potentially low effective.

The combination of these two elements is used to evaluate the complexity of a procedure in relation to its innovation level. The Figure 4 describes the procedure that generates the five evaluation states of this criterion, and the associated ordinal scale, combining the (two and three) evaluation states that are associabile to the factors previous experiences and prediction capability.

**Figure 4** Generation of the evaluation scale for the criterion **Innovative complexity**



The minimal Innovation complexity is associated to a stable or consolidated situation, with a good prediction capability and previous experiences. This evaluation state is called Classic situation (CS). The evaluation state PIP (Partial Innovative Policy) is relative to the presence of previous experiences but only fair prediction capability, because the innovation elements of this policy imply incomplete and less reliable prediction of the financing request size.

IPr (Innovative Procedure) is associated to a consolidated or poorly innovative policy, without previous experiences and with fair or good prediction capability; IPo (Innovative Policy) results from the combination of previous experiences and a limited prediction capability; WI (whole innovation) is relative to an innovative procedure, without previous experiences, and an innovative policy, that implies a limited prediction capability.

### ***Design complexity***

An important aspect is the presence of a reference framework, in relation to technical or juridical regulations and habitual behaviours. The design of a new action may be complicated by a multiplicity of procedural constraints. At the same time technical references and a regulatory framework should

be present to better orient the definition of a new procedure or policy.

Another important element is the availability of resources, such as experience and knowledge, time and people for the action management during the application, and financial resources, for funding and managing the procedure. The financial resources for a *routine* procedure are often less than for a new procedure, but in this case the knowledge of the operational context and the experience are very limited.

The combination of the two factors (reference framework and resource availability) is used to evaluate the Design complexity, starting from two evaluations for the reference framework (multiple regulations and habits; simple procedural habit) and other two for the resource availability (limited or rich). The ordinal scale and the four evaluation states of the criterion Design complexity are generated by means of the same procedure that is described in Figure 4.

### ***Organizational and decisional complexity***

The criterion is connected to the required involvement of actors or organisations, with different decisional or operational functions, and to the time availability for the procedure management.

Also in this case, the ordinal scale and the six evaluation states of the criterion are the results of the combination of three evaluations for the first factor (no involvement, operational function delegation, required involvement) with other two for the second (time constraints, in developing and implementing the procedure; lack of specific time constraints).

### ***Adequacy guarantees***

The elaboration of a new procedure may change, in terms of complexity, also in relation to the need of adequacy guarantees because an acceptance or reject of a founding request can generate problems in “more sensitive” sectors. Some situations require “untouchable” (and therefore long-lasting) procedures. The guarantee need is related to the sector nature (delicate, such as the sectors at high social impact, or not delicate, such as when public interventions for public administrations are funded) and to the (negligible or not) dimension of the financing act. The combination of these evaluations generates an ordinal scale that distinguishes four levels of guarantee need as evaluation states: low (negligible financing for a not delicate sector), intermediate (not negligible financing for a not delicate sector), high (negligible financing for a delicate sector) and very high (not negligible financing for a delicate sector).

### ***Model parameters***

After the definition of the model structure and the evaluations for each criterion, the model parameters (the importance and veto power of each criterion, the categories, the reference profiles and the thresholds) were calibrated adopting a “joint” approach, in which an analytical tool was used together with a conceptual analysis of the ELECTRE Tri application to the 57 financing actions of the investigation and its results.

The analytical tool, ETA, the ELECTRE Tri Assistant procedure that is included in the SW ELECTRE TRI 2.0 (Mousseau *et al.*, 1999), was used to identify parameters consistent with the knowledge that had been acquired during the investigation, above all in terms of importance of the criteria and assignment of some real or fictitious (but suggested during the inquiry) actions to specific complexity categories. Other possible analytic approaches that support the model parameter definition are proposed in (Dias *et al.*, 2002; Dias and Mousseau, 2006; Mousseau *et al.*, 2006). All the analytical tools require a structured and reliable knowledge framework, which is used to calibrate a model that could guarantee an actual and effective support.

The other analysis focused attention on the assignment of the old 57 financing actions to the three

complexity categories, which were defined High, Intermediate and Low, for the sake of simplicity. A long sequence of tests was developed in order to test parameters and modelling hypotheses, in relation to the parameters that were defined with more difficulties. When the analytical tool cannot help or the preference system is not sufficiently clear, an interval of uncertainty can be associated to the relative parameters. In this case, the tests were activated in relation to the different possible parameters, in the identified intervals, and ELECTRE Tri was used to understand the effects of the different parameters on the assignments to the complexity categories. When a result, which was too different from the indications that had been received during the investigation, underlined a possible weakness of the model, new tests were activated to identify the nature of the weakness and to limit it. At the same time the robustness of the result was analysed.

This joint approach was useful also to understand which could be the difficulties when the system is proposed and used in other premises, how the methodological approach could become easier and effective and how much time the application will require in other operational and decisional contexts.

## CONCLUSIONS

This in-depth study aimed at identifying the competences developed in the Regional Administration as regards the evaluation and selection of projects and understanding how to intervene in order to fill possible gaps, produced outcomes utilised in different situations. In fact, said outcomes were proposed as guidelines for a critical analysis of the evaluation and selection procedures of projects during workshops and training courses organised for executives and officials of the Region and the Provincial Administrations, and as cognitive structures aimed at building competence among recent university graduates and those engaged in a University Master in Analysis of Public Policies.

In 2012, the Region reasserted its will to strengthen the skills within the Public Administration in managing decisional processes of institutional cooperation, in organizational set-ups and in the evaluation and selection activities of projects. In this scenario, the luggage of knowledge acquired with this research, structured and sent to various premises throughout the years, has stimulated a new approach of analysis, not aimed at distinguishing between “good” or “bad” processes/procedures but between more or less complex financing actions.

The new aim is to provide support when planning financing actions, either because they are particularly innovative, or in order to reorganise the activities. It is necessary to contribute in the spreading of knowledge and competences because the non-simple activity of planning financing actions makes it urgent to simplify procedures and the internalization of activities which used to be delegated externally (Spina, 2006).

Knowing that it is not possible to create a scheme applicable to every situation, even due to the heterogeneity of the ambits of implementation, a support system was created enabling to identify the level and type of complexity of every innovative activity providing information and connections to procedures with analogous characteristics already implemented.

In 2003, a prototype was developed and tested through 57 financing actions during the 2000-2006 community planning. Updating the information collected as regards the innovative processes implemented in the planning period 2007-2013, would enable to anticipate the implications of the implementation which will occur at the closing of the new 2014-2020 planning of the structural funds, currently ongoing (COM, 2010). The decision support system, after its updating, could be put at disposal of the Directorates of the Region of Piedmont which intend to implement a new procedure. This could be enhanced with many elements of information after every new attribution.

The system could be used elsewhere, in analogous conditions, using the first experience developed in the prototype as a starting point and conceptual reference. This could stimulate the integration of

other procedures and financing actions – implemented also in contexts different from the Region of Piedmont – in the existing system, in a view of inter-operability. In this way, a base of shared knowledge could be developed among more administrations as well as an integrated informative system supporting the planning of financing actions, in particular the evaluation and selection activities. A system of this kind could generate best practices acting as point of reference (a system of this kind was developed and proposed in Norese, 2009) when many Directorates have to cooperate within the ambit of Integrated Planning (Piedmont IRES, 2013).

The system, through the geographical reference of the interventions financed, could become an actual Geographical Informative System capable of working side by side with the complex process of the new financing action as regards complex elements associated to a specific sector and possible impacts/effects on the territory. Moving in this direction, it could be used in many ways. For example, the territorial representation of the interventions financed, through appropriate reports, could support the different Regional Directorates both in the *ex-post* evaluation of the allocated financing and in the orientation of future actions.

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