Public Decision Processes: The Interaction Space Supporting Planner's Activity

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Abstract. The aim of research is to test the model of interaction space as a tool to support the plan conception, in the context of a public decision process.

Interaction space model allows to analyze the interaction mechanisms that a public process generally activates, and help the planner, or more generally the analyst, to understand what kind of development the process could have, in order to address its progress.

The model has been tested during the planning process in Laurenzana, small village in the South of Italy. The paper describes the implementation and carries out some criticisms related to the not well structured relation between the space interaction model and the public decision process: once the interaction space is completely developed, the public process is generally at the beginning of implementation phase.

Keywords: Interaction space, decision process, planning process.

1 Introduction: Planning As a Decision Process

Spatial planning pertains to space transformation, when some problems are recognized, and a strategy needs to be defined in order to solve problems and produce improvement in conditions of territory and its inhabitants, taking into account several variables, several courses of actions, several stakeholders interacting eachother. Spatial planning, therefore, can be considered a decision process, and inherit all its characteristics.

According to Simon [1], decision process can be modeled as a sequence of five phases, three of which, intelligence, design and choice, are the core of the process, and the two last, implementation and ex-post analysis, concern more what happens once a decision is taken. A classic scheme of planning process takes into account some more detailed phases, considering also technical and bureaucratic moments of the process itself, as shown in figure 1, adapted from [2].

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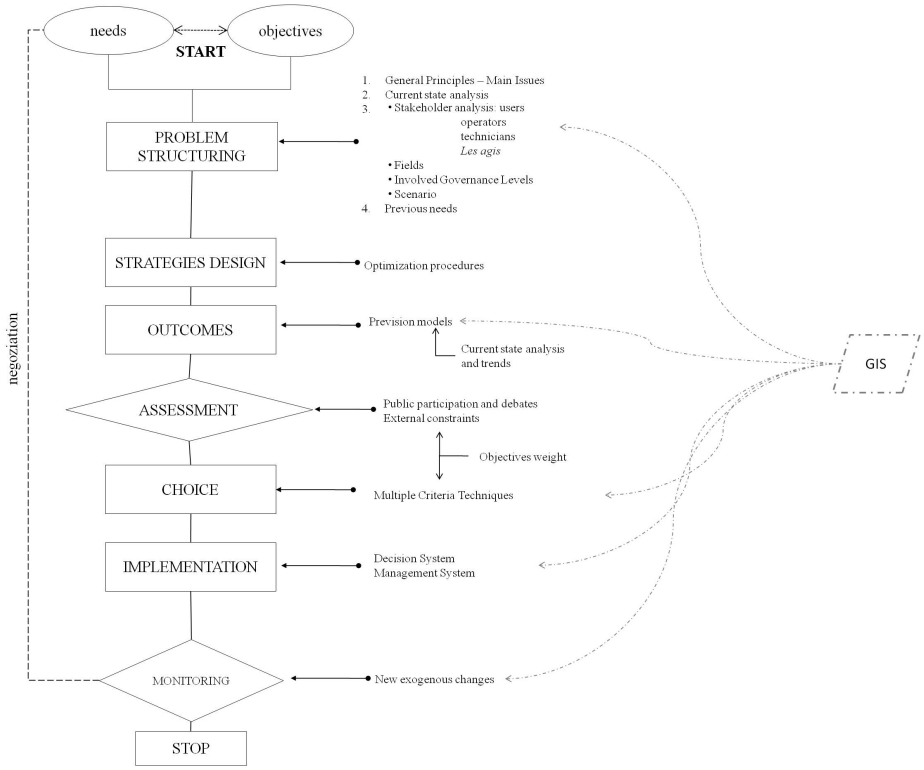

Fig. 1. Planning process, translated and adapted from [2]

Planning design, starting from recognizing inefficiency in cities and territories functioning [3], and searching reasons in inability to reach defined objectives and to respect planning principles [4], passes through an important phase of problem structuring, where analysis of current state is carried out, in order to clearly define needs and objectives, and then strategies. For each strategy, outcomes need to be forecast, in order to allow an assessment between alternatives and identify the optimal choice, to implement and monitor. Monitoring is important as it allows to identify gaps between forecasting and reality, and to adopt corrective actions.

GIS can support the whole process [5], not only in geographic information representation, but, moreover, in analysis, producing scenario and helping in choice [6].

In a comparison between the two schemes, it is interesting retrieve some analogies, as shown in figure 2.

The scheme on the left, adapted from [2], takes into account an important aspect of decision processes: negotiation. It characterizes several phases during the process; in planning procedures, there exist some well defined steps, with protocols and procedures, to allow a comparison between decision makers, analysts, citizens and groups. In spite of this, sometimes negotiation can happen also out of structured protocols, implicitly, without rules, but with the strength to influence the process itself.

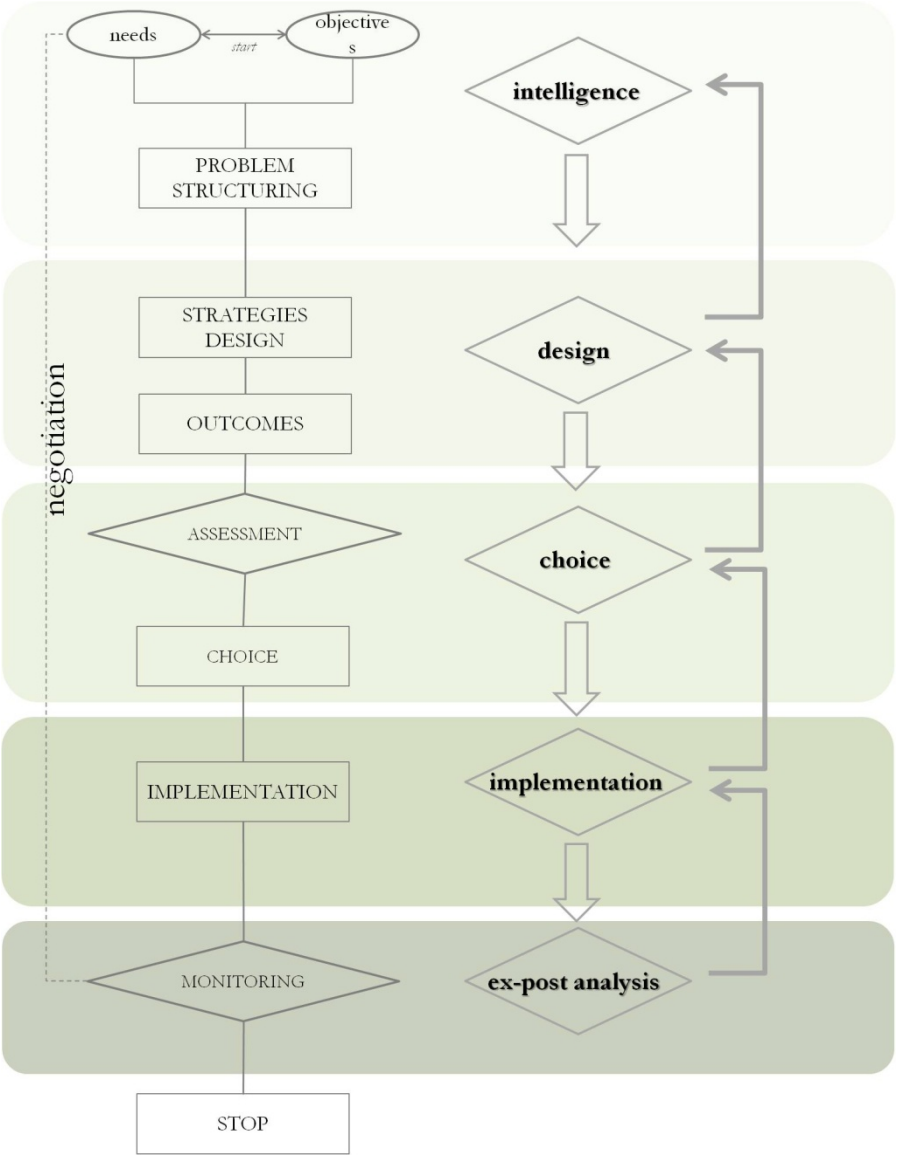

Fig. 2. Comparison between [2] scheme and Simon's scheme, in [1]

Therefore, in order to support planning process, analysts must be able to recognize all possible forms of negotiation in order to intervene, and try to control them. An useful tool to is the Ostanello-Tsoukiàs model [7], described in the following paragraph.

After a brief description of the model itself, it will be presented an application case.

2 The Ostanello-Tsoukiàs Model of Interaction Space

An analyst called to give its support in a problematic situation will define a representation of problematic situation [8], analyzing interaction mechanism between subjects involved in negotiation [9], identifying in a first moment all those elements related to the decision object.

In fact, the interaction space represents the virtual space where subjects interested in decision object transformation interact, trying to affirm their interests, using their own resources to influence the decision process. Interaction space is the place of negotiation mechanisms, both formal and structured ones and implicit ones.

A problematic situation can be modeled as a triplet of three components [8].

$$\mathcal{P} = \langle \mathcal{A}, \mathcal{O}, \mathcal{S} \rangle \tag{1}$$

where ***A*** represents the set of subjects intervening in the process, ***O*** the set of interests that each subjects introduces into the process, and ***S*** the set of resources used by participants to protect their interests. The IS is characterized by this triplet and relations between them.

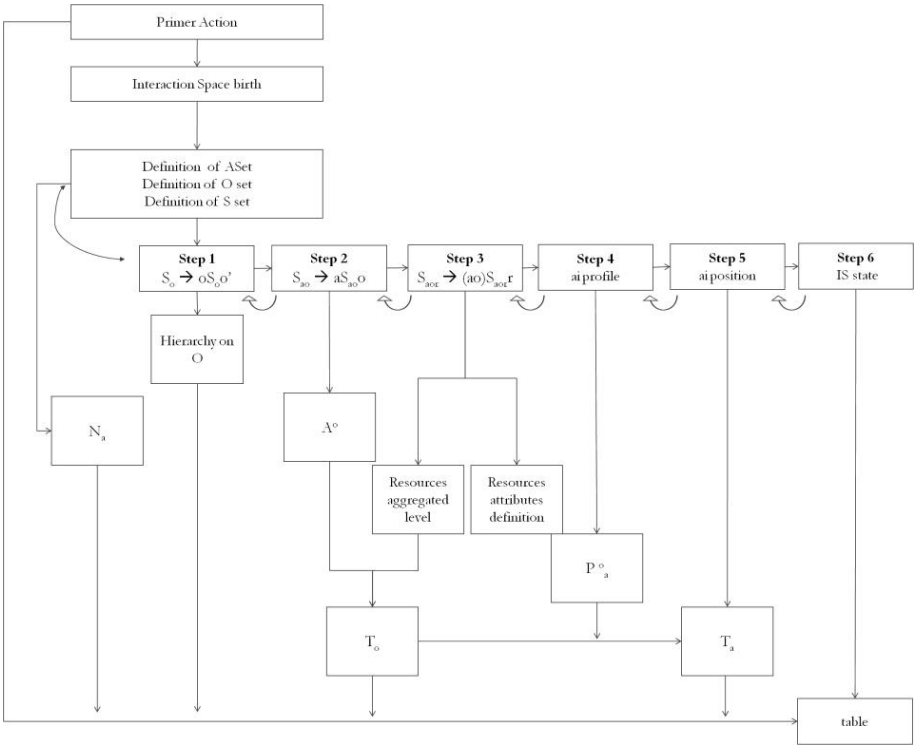

Fig. 3. The Interaction Space model, adapted from [7]

When a subject, that can be called promoter, promotes a transformation action on an object concerning its main interests and competences, he starts a primer action, implying birth of relation with other objects and other subjects: the Interaction Space is set. Then, the analyst can model all kind of relations between the three components of the triplet, and, through them, identify the state of interaction space.

Clearly, due to dynamicity in decision process, the state can change during the process itself, and it is important to define it in order to adopt strategies and actions to influence its development, mainly to avoid conflicts and negative situations.

Modeling consists in following some steps to collect all elements to identify Interaction Space state. Steps are schematically presented in figure 3. As the process is dynamic, steps can be iterated.

3 The Study Case: Laurenzana

Interaction space model has been tested during a real planning process, lead in 2007, in order to define the master plan of Laurenzana municipality.

Laurenzana, in Potenza province, South of Italy, is a small village, characterized by membership to a National Parc, Parco Nazionale dell'Appennino Lucano Val d'Agri – Lagonegrese, for almost 40% of its territorial surface, and at the same time, involved in petroleum extraction.

In the last decades nor the significant environment components, nor the economic importance of petroleum extraction became an element of development, and Laurenzana, as most of contiguous municipalities, is more and more depopulated, as the following graph synthesizes, and young people prefer to migrate in other bigger municipalities in the region or, more frequently, in northern Italian regions, where to find a job is more simple.

Despite these un-development conditions, municipality must accomplish to regional laws in the field of urban and spatial planning, and in 2007 started the process of masterplan definition.

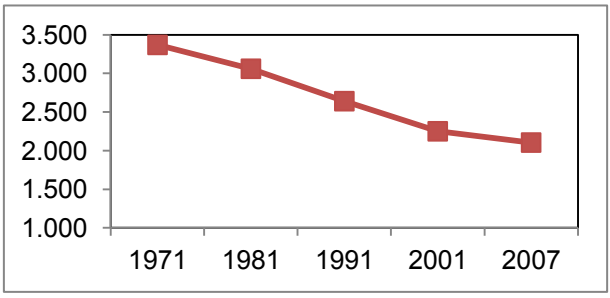

Fig. 4. Population trends during last decades in Laurenzana. Source: ISTAT

Between several strategies, one of them arose from indications of Regional Touristic Plan [10], focused on importance of traditions and cultural, historical heritage, strengthening the role of this kind of elements. In Laurenzana, a castle is present, and tourism can be developed around it, implying some decision at municipal level.

One other strategy arisen from Regional Touristic Plan is related to the concept of spreading receptivity as a development tool for tourism, called in Italian language, "borgo albergo". The document sustains the creation of new forms of receptivity, not concentrated in buildings uniquely devoted to this activity, but using empty houses, and financially sustaining holders in renovation actions.

These two issues are related to masterplan definition, but they require also a more enlarged debate to community, as they can influence the territory vocation, and, in order to become effective, need the cooperation of several stakeholders, not last the holders of empty houses. For these reasons, analysts involved in masterplan definition recognize the existence of a sub-process inside the main planning process, and retain it useful to study the interaction space model.

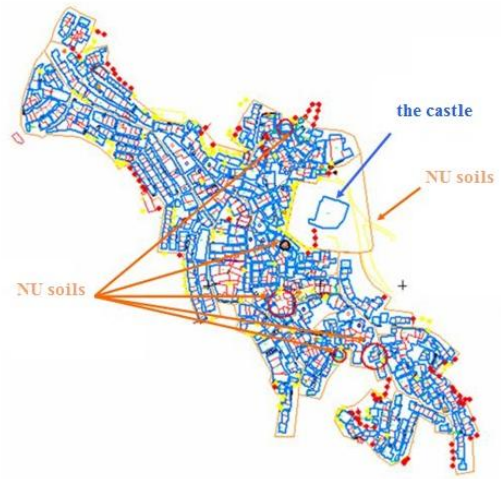

Fig. 5. The area interested by transformation: the castle and the area of empty houses in Laurenzana historical centre

4 Interaction Space

The need to open a debate concerning the future role of the castle and the possibility of making Laurenzana a "borgo-albero" can be considered as the Primer Action, determining the birth of the Interaction Space. Promoter is represented by analysts, in agreement with Local Administrators.

As the first step in order to model the Interaction Space is the representation of problematic situation, analysts identify the main useful elements to, answering to simple questions, as shown in the scheme in figure 6.

Answers are presented later in the paper, after a brief discussion.

As mentioned, primer action is represented by the need to find a role for the castle, also defining normative and management aspects, in order to make sustainable and efficient the choice of building a touristic development round about it.

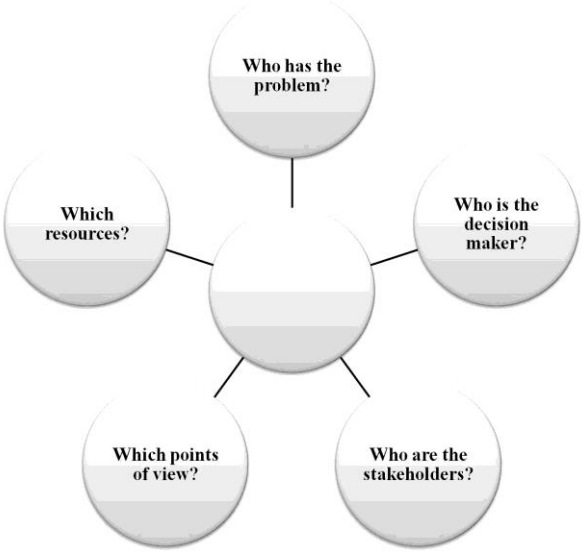

Fig. 6. Problematic situation: the fundamental questions to answer

Moreover, in 2007 the castle needed some renovation actions, implying also ground stabilization, as GNDCI group (National Group for Hydrogeological catastrophic events prevention) recognized some active processes of destabilization, and forbid access to the area. Each intervention on the castle, therefore, needs the advice of Sovrintendenza dei Beni Culturali (that is the Italian Institution with competences and veto power concerning cultural heritage).

As municipality resources were not strong, an important issue related to the castle is its management, once renovation is concluded: an interesting proposal was the possibility to identify some local actors interested in castle management and able to find resources, as, for instance, the local Pro Loco (Pro Loco are associations, diffused on the whole Italian territory, composed by volunteers interested in maintain and promote local traditions)

The other issue is related to the presence of empty houses, particularly in the closest neighborhood of the castle. These houses, moreover, were not only empty, but also abandoned, in a decay condition, determining a negative impact on landscape. In several cases, houses were reduced to ruins, and needed a strong intervention. During masterplan definition, moreover, some other areas have been recognized, as contiguous to castle area, but not yet urbanized, representing a possibility in order to localize some attractive activities, as an open-air amphitheatre or a falconry school, renewing an old tradition of the region. In the following, all these areas, including the empty houses, and the not yet urbanized areas are called ***NU***. In order to take into account these areas, their owners must be involved in the decision process.

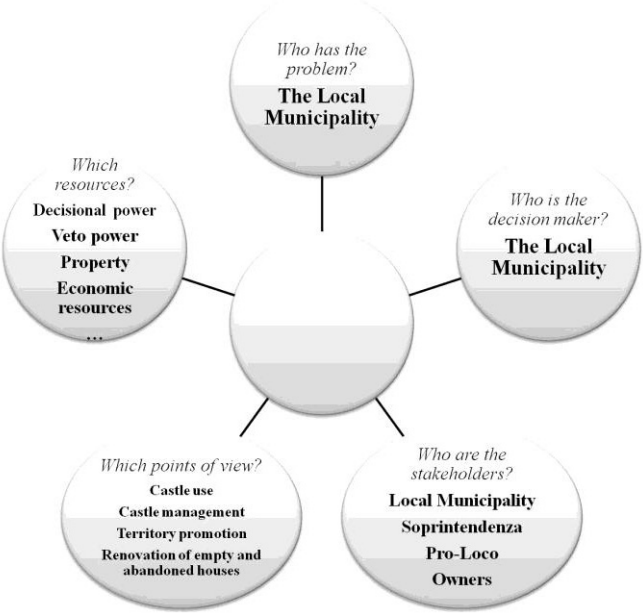

Fig. 7. Problematic situation: answers to fundamental questions

4.1 The Interaction Space Step-by-Step

Participants

As mentioned in the previous paragraph, a problematic situation can be modeled as a triplet composed by the set of participants, the set of objects and the set of resources, and model of Interaction space consists in identification of relation on these three set, following a step-by-step procedure.

At each step, some information need to be collected, in order to model relation. Concerning the set of participants, they are identified by their governance level and the role in the interaction space. This kind of information is useful to understand the possible dynamics, as it is a symptom of the strength of a certain participant to influence the process. In table 1 is presented a synthesis of identified participants.

Objects

In a more detailed analysis, the transformation concerning use and role of castle implies some other transformation also concerning other objects, as the mentioned empty houses. Table 2 presents a synthesis of identified objects.

Resources

Each participant enters in the Interaction Space with some resources, useful to promote its interests in the negotiation with other participants. Resources have been identified through interviews, but, even if a set has been defined, there is no certainty that the set is complete and represents all the resources really used during the process. For this reason, we can call identified resource as *possible*. They are presented in table 3.

Table 1. Identified Participants

Participant Set: A= { a_1, a_2, a_3, a_4, a_5, a_6}			
Participant	Notes	Governance Level	Role
Municipality Administration (a_1)	The Administration starts a debate concerning castle transformation, during masterplan definition. In reason of impossibility to manage the castle, due to scarce resources, it looks for someone, as Pro Loco, interested in.	Municipal	Promoter
Pro Loco (a_2)	It is a volunteer association, with the aim to promote traditions of its territory. It is composed by members and by an elected executive council.	Municipal	Invited
Owners (a_3)	Owners of NU are invited to enter into debate, in order to involve them into renovation of historical centre, through financial measures to transform their empty houses in a spreading receptivity elements. Therefore, they are invited to participate, but then, they are legitimate to participate to discussion, in reason of their property right on some soils. It was not simple to contact them.	Local	Invited/ legitimated
Soprintendenza dei Beni Culturali (a_4)	Soprintendenza, as the Institution with competences and veto power on cultural heritage, has the right to enter in the Interaction Space.	Regional	Legitimated
Analysts (a_5)	The analysts implied in masterplan design are involved also in modeling the interaction space, but they can be considered as participants, because they interact with other stakeholders, giving some technical support in choices	-	Legitimated
Region (a_6)	The Region is involved as the municipal planning tools must be coherent with regional planning tools.	Regional	Legitimated

Table 2. Identified objects

Objects Set: O = { o_1, o_2, o_3, o_4, o_5, o_6, o_7, o_8, o_9, o_{10} }	
Object	Notes
Castle use (o_1)	Decision concerning castle use is the primer action determining Interaction Space birth.
Urban planning tools (o_2)	Castle use is therefore related to urban planning tools, as use must be defined by masterplan.
Territory promotion (o_3)	To decide that castle becomes relevant in order to tourism development in the area means to adopt a strategy of territory promotion.
Castle valorization (o_4)	Territory promotion through castle means enhance the value of castle itself.
NU (empty houses and other soils in the neighborhood) (o_5)	In order to adopt strategy concerning spreading receptivity, empty houses need to be taken into account.
Castle management (o_6)	As Local Administration has scarce resources, it is needed a solution for castle management, in order to optimize resource and results.
Economic development (o_7)	Castle and NU renovation, in order to promote territory can mean to promote the economic development on tourism.
NU soils renovation (o_8)	In order to adopt strategy concerning spreading receptivity, empty houses need to be not only taken into account, but also renovate in order to promote territory.
Soils tax removal (o_9)	A tool to promote actions on NU soils can be the removal of tax.
Intervention coherence and homogeneity (o_{10})	Each decision must be taken with reference to a general coherence of masterplan, and in order to give homogeneity to interventions.

Table 3. Identified resources

Resource Set: R = { r_1, r_2, r_3, r_4, r_5, r_6, r_7 }		
Resource	Notes	Type
Decisional power (r1)	This resource is available, in different way and different contexts, for Municipality Administration, Soprintendenza dei Beni Culturali, Region	Behavioural resource
Persuasion capacity (r_2)	Generally speaking, this kind of re source can be attributed to carismatic stakeholders. In this case, it characterizes the analysts, as facilitator of the process	Not quantifiable resource
Veto power (r_3)	Soprintendenza dei Beni Culturali can express its veto concerning castle transformation. Region has a more weak power concerning relation between municipal masterplan and regional planning tools.	Behavioural resource
Expert knowledge (r_4)	This is a resource that analysts can use supporting the process.	Not quantifiable resource
Economic resources (r_5)	Municipal Administration can use some economic resources in order to program activities, sometimes with help of Region, through programs aiming at sustain local actions for promoting territory. Generally, for this last kind of fundings, Pro Loco can be a beneficiary.	Quantifiable resource
Property right (r_6)	NU owners have property right on their soils.	Not quantifiable resource
Support policies (r_7)	Other kind of resources, generally promoted by Region, in order to support local territories.	Quantifiable resource

Relations on the set A, O, R.

Once elements in the Set A, O, R are identified, hierarchy of object must be built. This implies to make explicit relation between objects, considering projection and evocation. The obtained hierarchy is schematically presented as a graph, in the following figure.

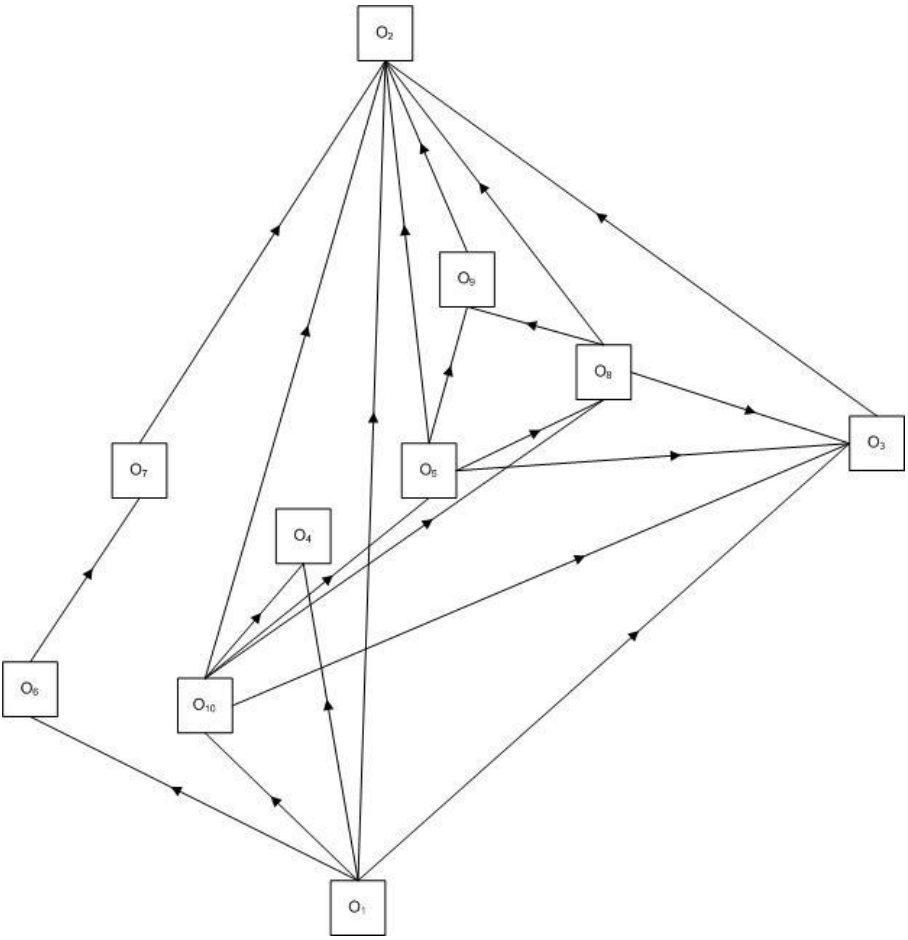

Fig. 8. Hierarchy of objects

In the second step, each object is related to one or more participants. This step imposes some revision of the first formulation of A,O,R sets. Figure 9 shows the identified relation for each participant.

Third step implies the assignment of resources to each identified relation between a participant and an object, that is to each arc of the previous scheme. This relation has been built considering also that resources are not only considered if they are available, but also if they are used, they are necessary, they are searched. Therefore, table 4 represents an excerpt of the table synthesizing this information; for each resource is

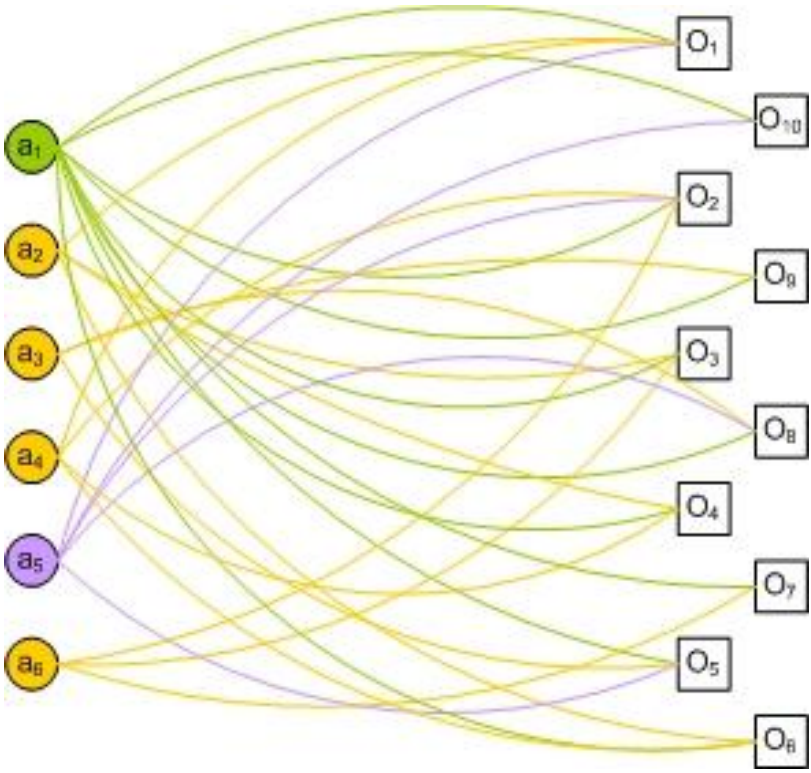

Fig. 9. Assignment of objects to participants

indicated with "D", "U", "N","R" if it is available, used, necessary or searched. In each row is indicated the relation between participant and object, and in each column a resource. The cells present a value (D,U,N,R) if that resource is used for the relation between participant and object.

Considering these three first steps, it is possible to define some information necessary to identification of state of interaction space, as the participants profile, and their position in the interaction space, and continue the process until the sixth step, that consists into identification of IS state.

Interaction Space state

At the moment t-1, the Interaction Space is characterized by Primer Action: Municipal Administration, during masterplan definition, decided to open a debate concerning the role of the castle in the touristic development of the village.

At the moment t, a limited number of participants is entered into the IS, the meta-object, identified in the castle in reason of relations of projection, has a strong meaning, and each interest in the IS is strongly dependent by the course of decisions. Adopting [7] model, the IS is characterized as showed in table 5.

Table 4. Excerpt of table of assignment of resources to relation between objects and participants

	r_1	r_2	r_3	r_4	r_5	r_6	r_7
Sa_1o_1	U						
Sa_2o_1		D					
Sa_4o_1			U				
Sa_5o_1		D		U			
Sa_1o_2	U				U		
Sa_4o_2			U				
Sa_6o_7		D			D		D
Sa_1o_8	U						
Sa_3o_8		D				U	
Sa_5o_8		D		U			
Sa_1o_9	U						
Sa_3o_9		D				U	
Sa_1o_{10}	U				D		
Sa_5o_{10}		D		U			

Table 5. Characteristics of Interaction Space

IS characteristics	
Participants number N_a	Several
Participants type T_a	Any kind but Opportunist
Objects type T_o	Any kind
Meta-Object meaning M	Strong, Stable Meaning
Interaction Space State at t-1, I_{t-1}	Primer Action

The recognized IS state is the Controlled Expansion (CE). In this state, the Meta-Object is used by the principal actor as a way to control the IS. Participants act in the space in order to find a solution, in a cooperation and negotiation climate.

5 Results

5.1 Model Results

Knowledge of Interaction Space state allows to understand the possible evolution of process and what kind of actions can be undertaken, helping the analyst to influence the process itself, avoiding some negative dynamics.

As the role of analysts was related to masterplan definition, the Interaction Space was dissolved when design was concluded. Decisions concerning castle and neighborhood were not yet mature, but they need to find formalization also in the masterplan. Therefore, masterplan assigns to castle and NU areas the urban regime of "areas for collective uses", and imposes different way to operate on the NU areas, considering different role for private owners.

5.2 Process Conclusion and Remarks

This decision must represent the Institutionalization for Interaction Space, and its conclusion. The definition of rules is the normal closure for a masterplan,

Therefore, some remarks are necessary: even if the planning process seems closed, as shown in the figure 1, it can be considered characterized also by implementation and monitoring, in order to follow the realization of forecast strategies and actions. In the reality, the plan is made effective, so strategies and actions are adopted and realized, but generally this happens without an analyst following the process, and generally the possibility to adjust some choices, if outcomes are different from the foreseen ones, is not considered.

Concerning the interactions space, moreover, the absence of an analyst means that no one can takes care of possible interactions, and if a conflict overcomes, it can be not controlled.

Therefore, in order to make effective the interaction space model, it is important to define a longer path for analysts, to make them active also when the decision is taken and the actions must be implemented.

References

1. Simon, H.A.: Administrative behaviour: a study of decision making processes in administrative organizations. Mac Millan, New York (1947)
2. Las Casas, G.: Processo di piano ed esigenze informative. In: Clemente, F. (ed.) Pianificazione del Territorio e Sistema Informativo. FrancoAngeli, Milano (1984)
3. Pontrandolfi, P., Lanza, V., Tilio, L.: I Laboratori di Urbanistica Partecipata a Potenza: sperimentazione di tecniche e strumenti. In: Las Casas, G., Pontrandolfi, P., Murgante, B. (eds.) Informatica e Pianificazione Urbana e Territoriale, Atti della Sesta Conferenza Nazionale, INPUT 2010, Libria Edizioni, vol. 3, pp. 393–402 (2010) ISBN 9788896067475

4. Las Casas, G.: Una cultura della pianificazione in un approccio rinnovato alla razionalità del piano. In: Francini, M. (ed.) Modelli di Sviluppo di Aree Interne ad Alta Ruralità, Scuola Estiva 2006. Centro Editoriale e Librario Università della Calabria (2006)
5. Goodchild, M.F.: The state of GIS for environmental problem solving. In: Goodchild, M.F., Parks, B.O., Steyaert, L.T. (eds.) Environmental Modeling with GIS, pp. 8–15. Oxford University Press, New York (1993)
6. Chakhar, S., Mousseau, V.: An algebra for multicriteria spatial modelling. Computers, Environment and Urban Systems 31(5), 572–593 (2007)
7. Ostanello, A., Tsoukiàs, A.: An explicative model of public interorganizational interactions. European Journal Of Operational Research 70, 67–82 (1993)
8. Tsoukiàs, A.: On the concept of decision aiding process: an operational perspective. Annals of Operations Research 154(1), 3–27 (2007)
9. Mazri, C.: Apport méthodologique pour la structuration de processus de décision publique en contexte participatif. Le cas des risques industriels majeurs en France. Ph. D Thesis, not published. Université Paris Dauphine (2007)
10. Regione Basilicata, Piano Regionale Turistico, L.R. 34/2006 (2001)