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A Systems Approach to Public Policies

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Abstract

The paper puts forward a systems conception of the public policies associated with any organisation. Using this approach it illuminates diverse questions of great theoretical and practical significance of the denominated "System for public policies", such as their boundaries, external and internal relationships and their epistemological problems. Other important considerations include the states and forms of representation, external and internal properties, and aspects of dynamic character.

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A SYSTEMS APPROACH TO PUBLIC POLICIES

Conception of the subject.

The literature relating to public organisations is abundant and very diverse as regards thinking about how to steer, administer, direct, manage or govern them. The intention underlying the task of governing any such entity is that it should pass from a "Current Situation" to a "Desired Future Situation". To achieve this, it is essential to find responses to three fundamental questions: What to do? How to do it? When to do it? The answers to these constitute the formula, sometimes considered "magic", termed "public policy" (Cansino, José M. et al. 2006).

The task of eliminating the unknowns inherent in each question is not a simple matter. It requires large doses of information, knowledge and inventiveness, which explains why finding good designers of "public policies" is so difficult. In the relational structure derived from associating each "What?" with its "How?", and each "How?" with its "When?", three important problems arise: 1) the choice of the best "What-How-When" chain is not always easy to make; 2) the lack of information, knowledge or imagination causes advantageous alternative "What-How-When" chains to be missed; 3) the process of choice may be subject to negotiation, due to the intervention of diverse interests, perceptions, ideologies, commitments, values, fads and whims, and this may lead to less beneficial chains being chosen.

Depending on the character of the public entity concerned, its policies may be general or sectoral, in so far as the content of the policies may result in their being regulatory, distributive, redistributive and institutional. In general, almost all public policies make use of these measures. Each public policy constitutes an entity that is characterised by the objective or objectives associated with it, by the financial, human, physical (material or energy), informational and organisational resources or means that were allocated to it, and by the actions imposed by the execution of the policy.

The policies that are in force at any particular time in any public entity are inter-related one with another. These relationships, which can be stronger or weaker according to the particular case and circumstance, mean that such policies may be considered not as a set but as a **“system” of public policies (SPP)**. The thinking behind this, as illustrated by figure 1, is that the philosophical categories (goals or purposes) and policy categories (ends or objectives) implicit in any particular "Desired Situation" are also, to a greater or less degree, a series of related elements (Stewart J. & Ayres R. 2001), that is, a system. We understand goals to mean the manifestations of certain wishes or desires that embody some atemporal and philosophical content. The chosen objectives, with a pre-eminently political significance, translate the goals qualitatively for a specified time horizon. Goals and targets represent, to a certain degree, the specification of the objectives in their time horizon.

Thus the conception of the public policies of an entity in system terms (related elements) is not the result of some mental deliberation: it is the consequence of that "Desired Situation" that results from the logical, creative and critical analysis of reality, after a thorough and repeated process of observation. Therefore, policies are mutually supported on each other to be executed and, to a greater or less extent, resources are transferred between them, according to the circumstances and events in which they take place. One of the factors that distinguishes or identifies them is the predominance that some have with respect to others in terms of volume of resources utilised.

Insert Figure 1 about here

Within the **system of public policies (SPP)** each specific policy constitutes a “subsystem” formed, in turn, by elements that are inter-related. Each of these elements is characterised by consuming resources and/or time in the course of being executed. The elements are nothing less than the **actions** that must be carried out in order for the policy to achieve its objective. These subsystems can be configured, preferably, as multifunctional systems of physical modification, of action, of observation

and of information processing. Also, in the light of the relationships between their inputs and outputs, they can accumulate functions of storage, of transport, of switching and of quantitative and qualitative processing of physical flows and information flows.

It should be emphasised that the **actions** referred to can, in turn, be configured as systems formed by other actions of lower level that could also be related to each other. Network Theory can be utilised to represent the processes of execution of the "SPP" corresponding to any public entity. In figure 2 and in the form of a bar chart, we detail, for each policy, the actions in series and in parallel comprising that policy, together with logical sequences. In a similar way we represent the relationships that link the different policies. In the model we have omitted information on the physical resources assigned to the actions, and the floating ranges of some paths that are not critical in character.

Insert Figure 2 about here

As can easily be assumed, the possibility exists of carrying out a normative modelling (planning) of each policy, with a variable level of decomposition of the actions. In consequence of this, it is feasible to establish an internal control of the development of the actions involved in such policies, to measure the degree of compliance with the objectives of performance, services and time, as well as controlling the physical and financial resources consumed.

Boundaries and problems

The space-temporal delimitation of the "system of public policies" (or of any of its subsystems: environmental policy, cultural policy, etc.) is usually a difficult task. This is because actions are taken and services are provided by a public entity that can sometimes affect people who are not residents in the territorial space for which that entity has responsibility; these effects may be favourable (e.g. holding entertainment, leisure and sporting events) or unfavourable (e.g. installing facilities for the

disposal of toxic wastes). It is also a fact that certain policies may have beneficial or adverse effects on future generations. Thus there have been innumerable examples of cases in which one generation of citizens have financed policies of "abundance" on credit, leaving subsequent generations to suffer penury to pay off the debts of the past, sometimes a very distant past. And vice versa; there have been generations that have made sacrifices beyond what can be imagined, undertaking policies of investment whose fruits were enjoyed only by the following generations. The current examples of such policies are in the pages of all the newspapers: policies pursued by countries whose fame has today reached a peak in the international context.

It should be stated that the boundary separating the SPP from its external context undergoes alterations or changes over the course of time, as a consequence of the inclusion and/or exclusion of various persons or elements. The difficulty in identifying this boundary is illustrated by the following model (Ortigueira & Ortigueira, 2001): "The springs are the source of pools, and these in turn are the source of streams; streams become rivers, and these flow in the sea. Can anyone say where is the exact point that separates the spring from the pool, the pool from the stream, etc.?"

The difficulty of answering the preceding question is evident in the field of public policies (SPP), in the delimitation of the physical, populational, organisational, financial, political, and most particularly, the legal boundary. It is thus here where two epistemological problems of the first order arise. The first, as we have just seen, is centred on the possibility of separating the SPP from its context or setting, and this problem could be approached from two complementary perspectives: one, the "substantialist" approach (the SPP is individualizable and separable from its setting); the other, the "existentialist" approach (only conventional entities - SPP's - exist, with fuzzy boundaries, which are identifiable by their diffuse behaviour in a given context). On the other hand, G. A. Daneke (2005) considered that "systems theory or thinking is essentially an alternative epistemic orientation" and that "serious theory building requires a revival of elements from Systems Theories."

The second problem, formulated under the hypothesis of separation between the SPP and its context, is centred on the direction of influence in the relationship between the system and its context. On this point, one of two approaches can be adopted: One is the "externalist" approach, under which the external environment determines the behaviour of the SPP. The other is the "internalist" approach, whereby the behaviour of the SPP is determined by internal concerns (Ortigueira & Ortigueira, 2002). Bowen S. A. & Heath R. L. (2005) established that "systems theory and rhetoric support the argument that an organization must be good internally and make decisions from an outside-in perspective".

In relation to the foregoing, we should draw attention to the protagonism that the approach focusing on the external orientation of public entities wishes to grant to the citizens or users – the customers – co-owners, like the influence that the customers of companies have. Its proximity to the "externalist" approach is more than evident. What is being sought is to reduce the weight exerted by the internal actors ("managers", governors, bureaucrats) on the behaviours or orientations of the SPP, in favour of the social agents or "actors" belonging to the external environment: the citizens, the customers.

At this point it is interesting to return to the topic of the "System of Public Policies" and its components or subsystems, that is, the specific public policies whose relationships actually create the particular entity (SPP). In the internal context of the SPP two interesting epistemological problems arise. The first problem lies particularly in the possibility of decomposing the SPP into specific public policies, favouring either the elements or the internal relationships of the SPP. And, on this point, two complementary approaches are viable: one, the "corpuscular" approach (there exist specific policies that are relatively individualizable, but which allow the properties of the global SPP to be taken into account through the interactions between the policies); the other, the "interactionist" approach (there are networks of multiple interaction in the heart of the SPP, which structure and bring to light several dense nodes that are assimilable to subsystems). Starting from the hypothesis of the decomposition of the SPP into specific strategies or policies, the second epistemological problem concerns the direction

of the relationship between the SPP and its strategies or policies. Two new approaches arise here: the "reductionist", in which the SPP is the synthetic expression of a set of strategies or policies that interact with each other in different ways, and the SPP can be explained by the properties of its specific policies. The second is the "integrant" view, in which the SPP is an indissoluble whole, which imposes certain limitations on the specific policies; its global properties are not reducible to the policies nor to its networks of relationships or interaction).

States

Both the **SPP** and its constitutive strategies or policies are "**systems with states**". The state of a policy at a particular point in time "t" is nothing more than the qualitative expression of the attributes associated with its corresponding quantitative values. By way of example in table 1, we present the state of the "Policy for Infrastructures 1998-2005" (PI 98/05) of the entity H at the time $t = 1/1/2004$.

Insert Table 1 about here

A series of successive states of the SPP or of specific policies, represented by their corresponding "**Vectors of State**", is an authentic "**Scenario**" that can provide a lot of information on the evolution of the global system or on any of its constitutive policies.

The SPP itself and any of its policies (subsystems) are usually represented in terms of the "Finalist System", and are always associated with goals, objectives and targets. However, on occasions, a modelling is possible in terms of a "Causal System", which can allow some experimentation on the model, that is, some simulation: effects that particular changes made to certain variables produce in the behaviour of other variables. In figure 3 we give a very simplified illustration of a causal system connected, for example, to various town planning policies that can be activated by means of the

reclassification of plots of municipal land of various sizes, in various locations (north zone of the municipality X, 210 Hectares, west zone, 130 Hectares, etc.).

It is evident that these reclassifications would set off a chain of significant reactions on the promotion of housing or residential developments. Generally over the longer term, property investments would have effects on numerous other variables such as employment, personal incomes, business earnings, immigration, the income of the municipal Administration, etc., etc.).

Insert Figure 3 about here

Properties

It must be said that the analysis or evaluation of the System of Public Policies is strengthened when it is studied or investigated in respect of its external properties, that is, those properties that take into account the external context of the SPP. Relevant aspects of the SPP would be its openness, equilibrium, stability of that equilibrium and, particularly, its adaptability, understanding this as the capacity of the SPP to achieve its objectives despite unfavourable conditions in the external context.

The global approach of the SPP is strengthened when it is complemented with knowledge extracted from its internal reality. This leads, in full, to the decomposition of the SPP into "partial policies" (subsystems), which is possible when a particular SPP is quasi-divisible; that is, when it can be decomposed into two or more policies that may receive inputs, perform internal transformations and generate outputs (actions, services, etc.). These policies may be of very diverse types, such as direct, indirect, complex, static, stationary, temporary, physico-material, physico-energy, informative, etc. These policies are inter-related with each other, and with the external context of the global system (the SPP), by networks. These interactions can be multi-relational (with diverse types of relationships) or unirelational (with one single type of flow) in character.

The possibility exists of constructing a matrix [M] representative of the network that links together the policies of a particular SPP. This would take the form of a square matrix whose range N would be equal to the number of policies that together make up the SPP. This matrix could be of binary character (0, 1), such that when the policy EP7 has a relationship that affects policy EP12, for example, a 1 is entered in the box of the matrix where the output of EP7 (row) intersects with the input of EP12 (column), and a 0 is entered in the case of no relationship of influence existing between the policies. The external context of the SPP can also be entered in the matrix [M] as another policy that interacts with the rest. If there is any means by which the intensities of the relationships involved in the network can be expressed in quantitative terms, eg. by a decimal fraction of 1, the matrix would be further enriched as an analytical tool. Having completed the matrix, on a binary or decimal basis, it can be evaluated using the technique of Structural Analysis. This simply involves elevating in power the matrix [M], with the object of verifying if a certain level of stability is reached. Although the matrix may be multiplied by itself once or several times, the values of the principal boxes will hardly be altered if the system is stable. If such a situation of stability is achieved, the matrix would indicate which of the subordinate policies were playing the major role as determinants of the global behaviour of the SPP. It is evident that, if such influential policies can be identified, it will then be possible, by exercising a certain degree of control over them, to improve the overall level of functional excellence of the SPP, considered globally.

One very relevant topic concerns the coordination of the public policies within the framework of the global system that the SPP represents, from the “finalist” perspective in terms of its ultimate goals. In this respect it is obvious that the subordinate policies may behave either more or less “favourably” in contributing to the achievement of the goals of the SPP. Hence the degree of coordination is associated with this “favourability”. When the situation is one of low or negative “favourability”, there exist three alternative types of possible coordinating actions: 1) the exclusion or marginalization of the negative or unhelpful policies; 2) making the actions or performance of certain policies either much

more or much less predominant over the rest; 3) adjusting or modifying the characteristics of the particular policy that are adversely affecting good coordination.

Two principal factors determine the degree to which the subordinate policies are subject to the discipline of coordinated action: one is the way in which such policies are organized; that is, their degree of centralisation (whether dominant policies exist) or decentralisation (all the policies are of equal weight); the other is the degree of relative homogeneity of the policies.

It should be stated that the process of investigation in the sphere of public policies is extraordinarily important. In any situations that are at all critical, you can be sure that policies of an SPP of different kinds and importance will be involved. Any disturbance taking place within the workings of a policy of certain importance can set off a chain of numerous adverse effects on the rest of the policies of the internal context of the SPP, as well as on various systems, entities, agents or actors operating in the external context of that same macro system or SPP. Similarly, a perturbation affecting the external context of the SPP can spread to all the policies of any particular public entity, creating a critical situation or problem. At the same time, it should not be forgotten that many small problems generated at the level of the subordinate policies can become an enormous global problem at the SPP level.

Dynamics

It is time now to establish some considerations in respect of the dynamics of the System of Public Policies and its components. We should begin by saying that the identity of the SPP as an entity and of any of its constitutive policies is marked by a certain permanence of their characteristics, that is, those characteristics that appear invariant over time. This “invariant” aspect refers to a “property” of the system for public policies of a entity X, or of any of its policies, that is maintained unaltered over time despite the changes or transformations affecting this system. Among these invariants are aspects like periodicities, reversibilities, changes of state, etc.

In the context in which the SPP is situated, any invariant of temporal nature possesses a relative value. And this, to the extent that no characteristic of the SPP (or of any of its policies) is preserved for ever in any particular context, leads to it being necessary to define a certain "field of validity" for each invariant, constituted by the total set of the periods of invariance associated with all the possible trajectories of the context. What this means is that the period of invariance is variable for each of the diverse characteristics of the SPP. What is called the "life of the SPP" (or of one of its policies) is the duration that the SPP or individual policy has over time, that is, the period of invariance common to all the characteristics that serve to define the particular SPP or policy. It should also be remembered that an SPP can survive as long as its constitutive policies are renewed.

Leaving aside the subject of the temporal invariants of the SPP, within its field of validity, we think it is time to consider the question relating to the characteristics and the attributes of the system that may, with more or less rapidity and intensity, evolve over time. These changes may be of the continuous type, when they express tendencies for the evolution of continuous characteristics, and of the discontinuous type, when they reflect breaks in the evolution of continuous characteristics (transitions). In practice, a principle of continuity has come to be postulated, according to which any apparently discontinuous evolution is, in fact, continuous: for a continuous characteristic, it consists of a disproportionate, very strong variation, and for a discontinuous characteristic, it is translated by a succession of small variations of amplitude, as small as may be desired. The presence of temporal discontinuities has the advantage, among others, of facilitating the division of the SPP into successive periods, with more or less clear boundaries. At each moment in time, some features of a previous state of the SPP and some germs of a future state are simultaneously observable. Undoubtedly all these questions are extremely important, above all because the world of the SPP can be really shattering. Many of the critical situations of the SPP, or of any of its policies, may have their origin in the lack of a scenario of prospective exploration that could anticipate possible futures that might occur in twenty or thirty years' time. The methods of envisaging scenarios based on trajectories marked out by "future

→ present" images (scenarios of tendencies, references and frameworks) and "present →future" images (scenarios of normative and tested anticipation) resolve this lack of exploratory foresight.

Three types of classification, in relation to certain problems raised, can be applied to public policies:

- 1) functional, when they promote the resolution of the problem;
- 2) dysfunctional, when they mess up or delay the resolution of the problem;
- 3) afunctional, when they do not any influence, positive or negative, on the problem.

In relation to a particular function of the social, cultural, recreational or similar type, two public policies could be classified in several ways: 1) substitutable, when they both fulfil this function equally; 2) complementary, when they cooperate in fulfilling the function; 3) antagonistic (Meek J.W. & Newell W. H. 2005) when one serves the function and the other prejudices it; 4) independent, when they do not have a simultaneous effect on the function considered.

Finally we shall consider some of the dynamic properties of the SPP of a particular entity X. As a first step we will speak of the reversibility or irreversibility of the policies. Thus, for example, the execution of a policy to privatise a publicly-owned company does not involve something irreversible, insofar as the possibility exists of the government re-acquiring the business that was sold, re-employing any personnel dismissed, etc... Naturally, there exist cases where the policy could be irreversible.

As a second step, we will speak of convergence and divergence, associated with the evolution of a public policy. Thus, following the creation of any policy, it may be that the number of citizens who become linked to it or support it shows tendency to increase over the length of time. This process characterised by the increase of elements and relationships associated with the policy can be described as convergent. Such a thing may occur, for example, when a particular government initiates a policy to

combat illiteracy. Initially, and for a certain time, it may happen that a process of convergent evolution continues, but that later this becomes divergent as the population in question becomes literate, that is, as the initial relationships people establish with the policy are broken.

As a third step we shall speak of self-learning, the capacity possessed by a public policy or a SPP when it is capable of adapting to its current context taking into account the experiences of the past. And we can also talk of self-organisation, when the policy or the SPP is capable of evolving in order to improve its performance in achieving its goals, in the face of changes in its internal and external contexts. Self-organisation can translate into two types of fundamental structural modifications: one refers to the mode of organisation of the policies, in the sense of either a simplification or a complication; the other concerns the types of behaviour of the policies, in the sense of either a homogenisation or a differentiation.

Remarks

The **identity** of a public policy is in function of the structure or system put in place when articulating the "Desired Future Situation" for the Entity X, particularly at the level of goals. It is these **goals** that determine the **nomenclature of the policies**. In the case of a municipal administration, for example, we could speak of the policies for the areas of Culture, Sports, Education, Town Planning, Environmental Protection, Finance and Taxes, Youth, Women, Security, Social Services, Economic Development, Health, etc. However, it is appropriate to state that normally, behind the whole process described, is the special configuration of the organization chart (structure) of the entity. In other words, there exists a "**Family Policy**" because there is a "portfolio" with that title for which a politician appointed to that position has responsibility. The possibility also exists, naturally, of **annulling** the **identity** of that policy, and assigning the performance of the corresponding work, duties, services, etc. to one or more other policy identities (portfolios). And it could happen that the family policy keeps the same goals as before its transfer, as well as the same controls on efficiency,

efficacy, etc., associated with it. It would also be possible to keep those same goals, but subordinated to other goals (as means to an end) bound to policies of higher rank. These situations usually come about in the cases of changes to individuals' competences at the upper levels of the organisation chart of an entity. Thus, for example, the disappearance of the Councillor or Department responsible for "The Family" in a particular Municipal Council would mean the transfer of responsibilities, services etc for Old Persons to the Department responsible for "Health", and of those for Mothers and Children (welfare of mothers, residences for mothers, children in need and orphans, sanctuaries and maternity homes, adoptions, etc.) and those for Housing (access to residential property, assistance to low-paid workers, special assistance, etc.) to the Department for "Social Welfare".

Despite the apparent connection between the identity attributed to a public policy and a more or less "specific" function of that name, reality reveals the existence of other simultaneous functions. What we want to emphasise is that **public policies** in most cases have a **multifunctional** character. Thus, for example, a "Sports Policy" could be interpreted, in part, as a "Health Policy" in being orientated towards "preventive medicine". In effect, the resources that are allocated to sport are transformed into a kind of "mental vaccination" against harmful social phenomena such as drug addiction (abuse of alcohol, tobacco, etc.); and, simultaneously, into a "Security Policy", in so far as the practice of sports and exercise, by virtue of the values and behaviours inculcated, contributes to the policy objective by reducing delinquency. The "Sports Policy" also fulfils an educational function (knowledge), a cultural function (principles, values, beliefs, rites, myths, language, etc.), and an economic function (movement of money, employment, press, radio, TV, etc.). And by ordering things differently it is easy to see how the "Environmental Policy" very clearly affects the "Sports Policy" (those who take part in sports and exercise), the "Health Policy" and the "Economic Development Policy". This last policy could also affect the Health, Security and Town Planning policies. The "Economic Development Policy" interacts with the "Finance and Taxation Policy", etc., etc.

It is interesting to note that a good part of the policies of Public entity “M” influence and are influenced by its external setting or context, both temporal and spatial, since it can be considered that the policies practiced by other entities of similar or different nature fall within this setting. The "Environmental Policy" practiced by Municipal Council K may help or harm the policies of another Municipal Council R. This situation explains the need to adopt inter-institutional models of Governance that take into account the existence of K, R, and other strategic agents, to be able to achieve levels of excellence in the results of particular policies formulated by K and R.

It appears to us appropriate to call attention on the relative character possessed by any public policy, as we have defined. This leads us to the consideration of ranking of public policies. All this is in function of the entity that is taken as reference, its current situation and its desired future situation. This means that it is possible to speak of "macro-policies", "normal policies" and "sub-polícies", in the same way that we speak of macro-systems (or super-systems), systems and sub-systems, etc.

This latter statement explains fully the utilisation, on a complementary basis, of the four pairs of epistemological approaches that we have considered. It also explains why the systems conception, the systems approach, is so valuable for illuminating public policy issues. Without a doubt, a path, little utilised to date, has been opened up for understanding better the complexity of the structure, functioning and dynamics of the system of public policies.

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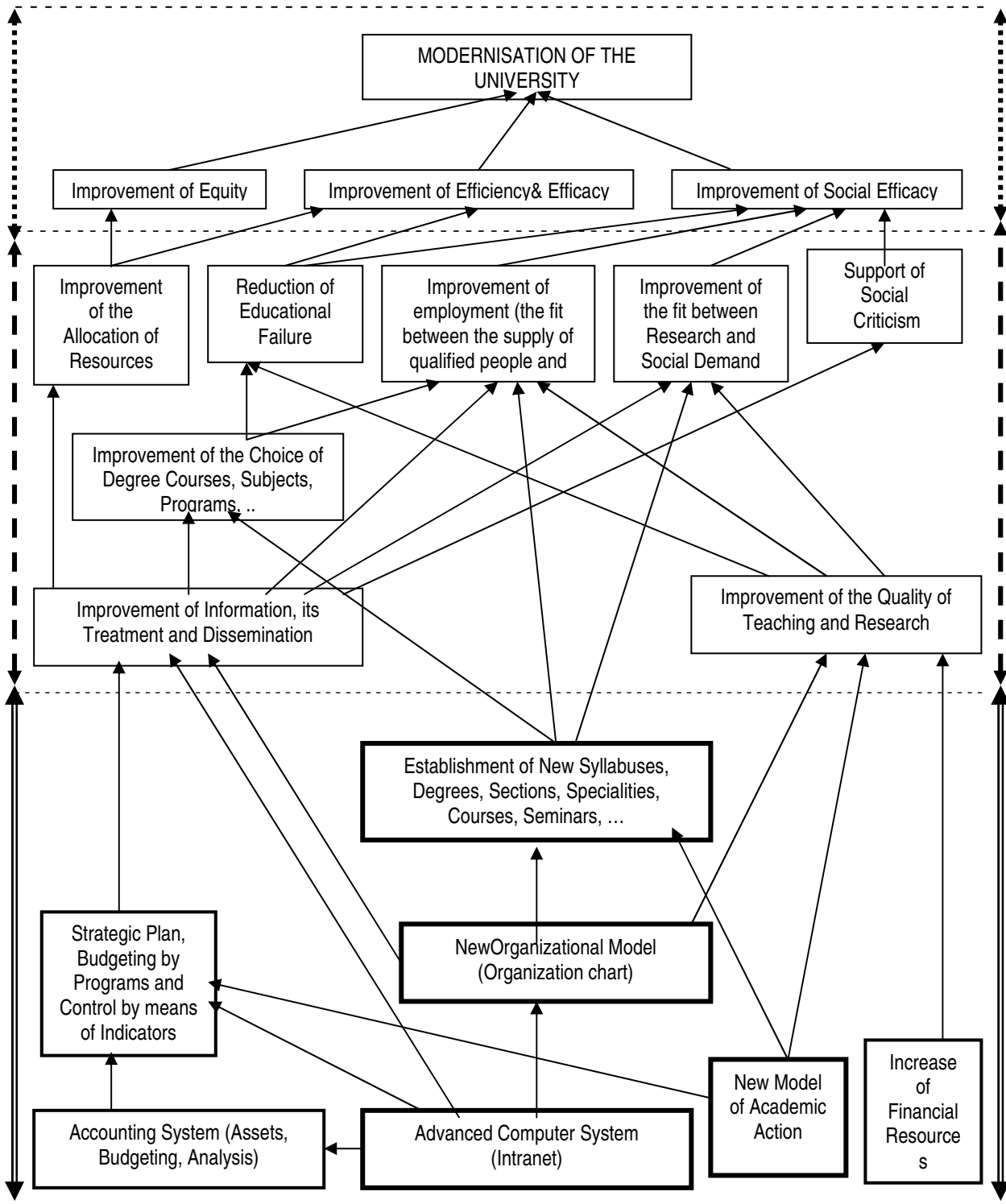
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Figure 1: System of Outcomes, purposes and goals of an institution.



Caption: Links: Goals ◀-----▶; Objectives ◀---▶; Targets ◀==>

Figure 2: The development of the policies and their interactions.

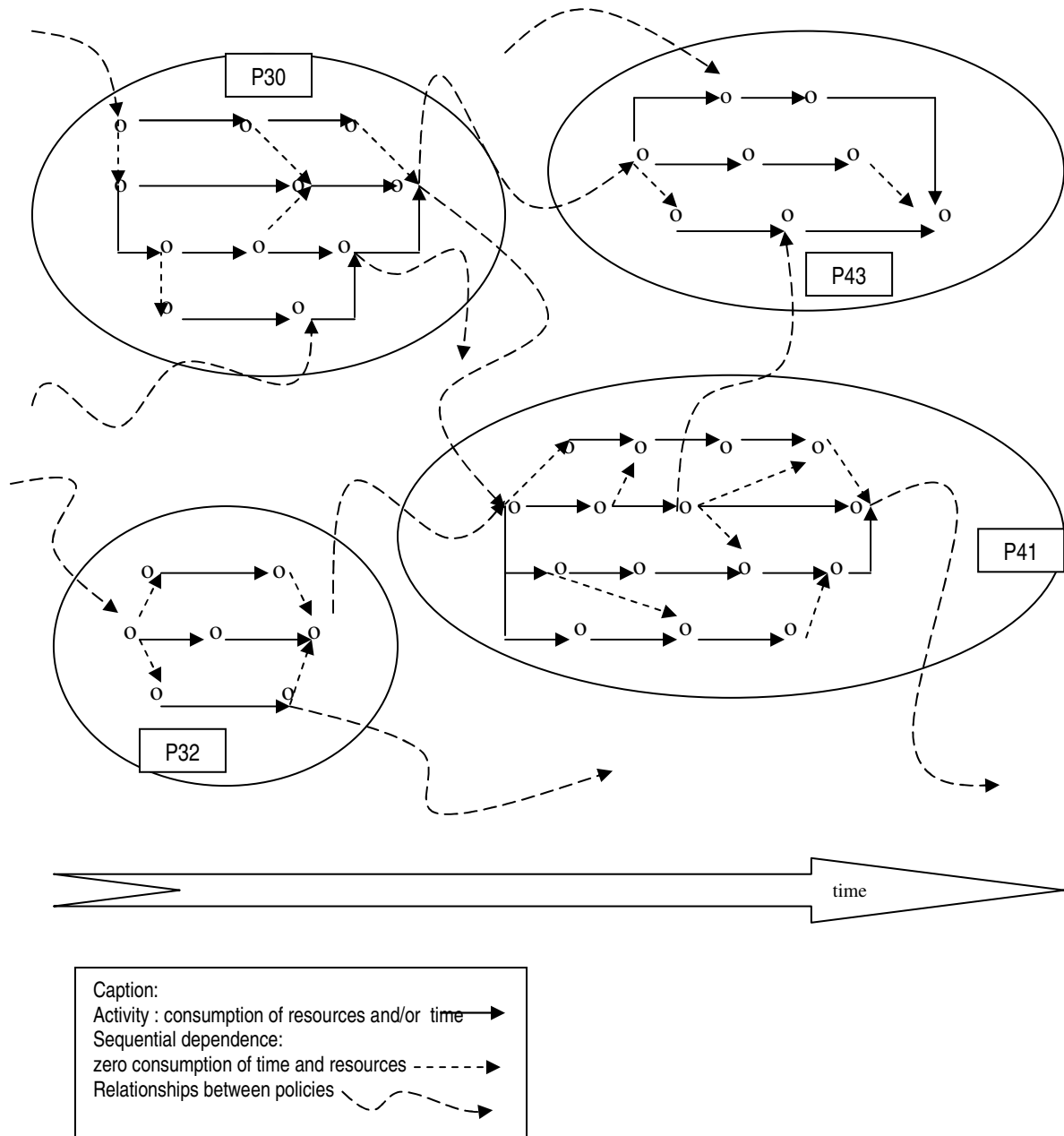
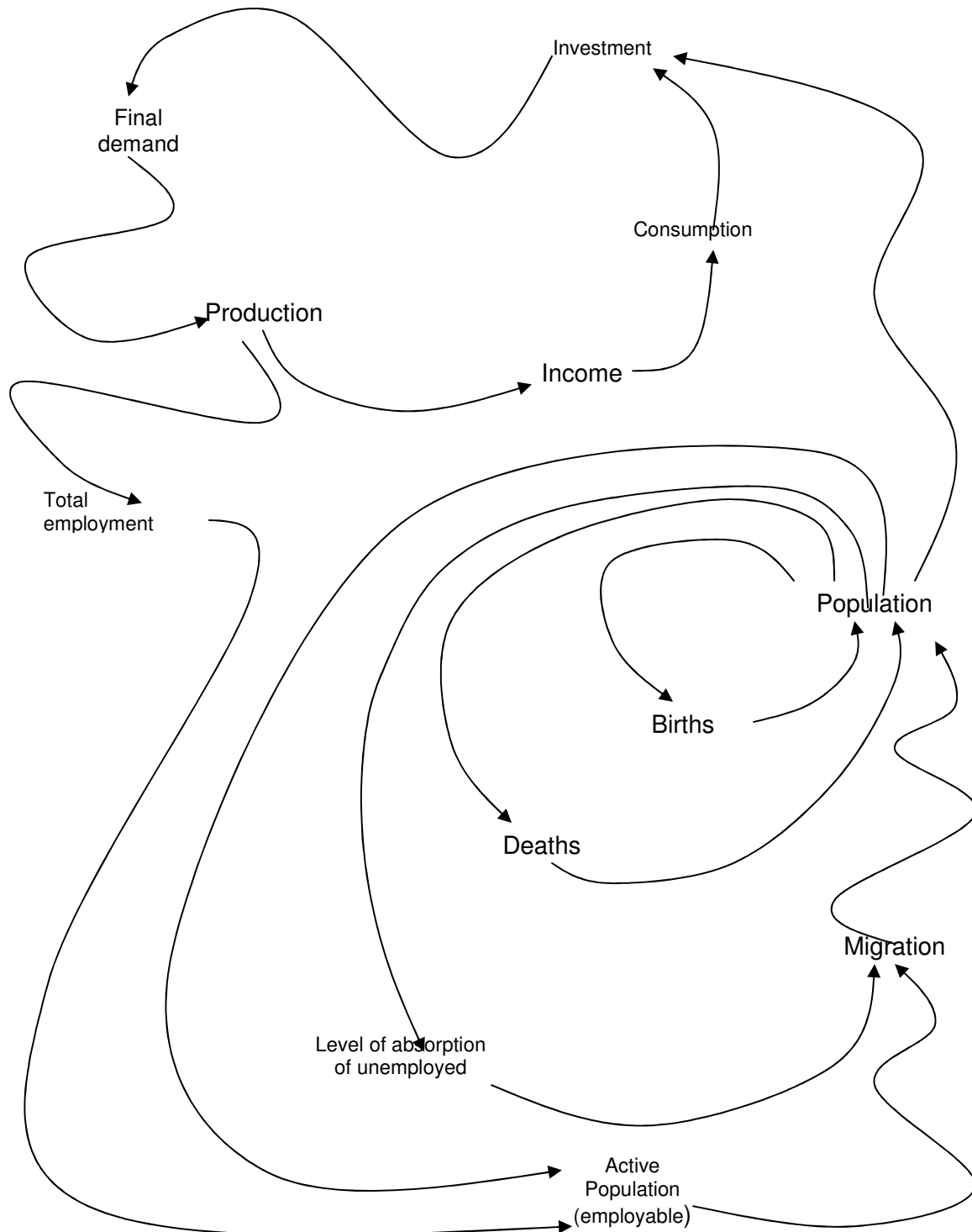


Table 1: Vector of State of PI 98/05

ATTRIBUTES	Km. constructed on date 1/1/2004
Motorways	180
Dual carriageway roads	210
Railway lines	128

Figure 3: Causal system associated with a public policy.
Source: authors' own elaboration.



SOURCE: Authors' own elaboration