Title: **An in-depth analysis of a TTO's objectives alignment within the university strategy: an ANP-based approach**

Abstract

This paper presents the application of the Analytic Network Process for the analysis of the contribution of the third mission action plans to the research transfer policies set by the University Governing Body. The model is applied to the case study of the Technology Transfer Offices (TTO) of the Universitat Politècnica de València (Spain). The paper develops a rigorous decision-making tool that helps TTO managers analyse the effectiveness of TTO activities and their degree of alignment with the institution's objectives. This work considers TTO managers' qualitative information and value judgments about the activities performed.

Keywords: Technology Transfer Offices (TTO); Analytic Network Process (ANP); University strategic planning; Knowledge transfer.

1. Introduction

It is now widely accepted that universities play a crucial role in the economic development included in the Third Mission (or Stream) label (Molas-Gallart et al., 2002). This role has been extensively described and analysed by scholars for different university types and under different circumstances and perspectives to provide a roadmap of what third mission activities are and the actual possibilities of each university to get involved and carry out this sort of activities. On the other hand, on many occasions these activities have meant a new funding source for public universities since budget restrictions and an efficient use of economic resources have been imposed to these institutions by local and national governments. Therefore, universities face the dual challenge of demonstrating its social commitment and efficient budgetary expense to the society and, on the other hand, becoming an active organisation in the development of third mission activities to attract new financial resources. This double challenge has brought about the need to regularly design and implement strategic planning processes at universities, the third mission activities -and University Technology Transfer Offices (TTOs) as the structures responsible for the management of these activities-, being a key element in this process. However, there is no generally accepted (standard) method to verify systematically the performance of an institution's TTO: we do not know if TTO performance is adequate, if it can be improved, and if improvements are possible, how to intervene to improve efficiency and effectiveness (Resende et al., 2013).

In this respect, this paper offers an alternative approach to the strategic planning process of third mission activities at the university. There is a stream of literature that focuses on the incorporation and use of new indicators and quantitative information to show differences in

the analysis of university strategic planning processes (Molas-Gallart and Castro-Martínez, 2007), (Bonaccorsi and Daraio, 2008), among others. However, we want to root this paper into the *Structuralist School* of thought to highlight the idea of incorporating value judgements into this analysis as key information of those stakeholders that play an active role in the implementation of the third mission activities at universities. As Schumpeter (1933) suggested "Economic models are much too crude to provide solid foundations for economic policy, and, in addition, any policy needs to be based on controversial value judgements" (Andersen, 2009). Since strategic planning is a forecasting process of future actions in the light of current information, we consider that the incorporation of qualitative information in the form of value judgments is key to the university TTO planning process. Furthermore, R&D activities and the like can be considered as highly uncertain human activities and we cannot simply replace the human component of the planning activity with indicators or just quantitative information (Lipsey and Carlaw, 1998).

The paper shows how a Spanish Public University, that we can characterise as a polytechnic university, complies with its "third mission" and how these activities have become a key element in the strategic planning of the institution to the extent of having been institutionalised since TTO activities represent a large portion of the university budget. The university TTO is the service responsible for the management of most of the "third mission" activities and the definition of actions and resources allocated to each activity addressed to the fulfilment of the third mission. Hence the main objective of the paper is to analyse to what extent those activities carried out by the TTO office are correctly aligned with the University objectives set for the TTO as part of the strategic planning process of the University's "third mission".

In order to reach the objective, we propose an analytic method for the decision making process based on the Analytic Network Process (ANP) (Saaty, 2001) that represents an alternative method to traditional strategic planning. ANP is a generalization, for the case of network feedback, of the traditional Analytic Hierarchy Process (AHP) (Saaty, 1980). With this AHP/ANP method, we can include the perception and, therefore, the incorporation of value judgments of both the university governing body and the TTO personnel in charge of managing the "third mission" activities. In this way, we can offer a portrait of the degree of alignment between university governors when fixing the university "third mission" objectives and the TTO execution of those objectives. This methodological approach has already been successfully applied to different cases. For instance, it has been applied as a modified Total Quality Management (TQM) tool to carry out a university system analysis (Chen and Chen, 2012). Other closer application shows the alignment between strategic objectives of a firm and its web contents (Caballero-Luque et al., 2010). Another one focuses on the analysis of university technology transfer mechanisms: in particular, it measures the extent to which the goals of strategic objectives of a public university are aligned with the results obtained through its technology transfer mechanisms (Cortés-Aldana et al., 2009). Therefore, we can formulate our research questions in the following terms: to what extent activities carried out by the University TTO contribute to the university objective achievement set for the TTO. Has the university already set those objectives?

This paper represents a step further in the analysis of strategic planning as it endows the TTO managers and personnel with a methodological tool to think about the right orientation of the activities performed with the objective of making a better use of resources in a context of

budget restriction. The analysis is based on a bottom-up approach and has been carried out from the point of view of the technicians who have to design and execute actions that should contribute to the objectives that have been defined at the strategic level. We do not work at the level of the policy makers/managers who design the strategies, but at the level of those who must execute them.

The novelty of our methodological approach lies on the incorporation of qualitative information, in the form of value judgments (and therefore priorities), to analyse the extent to which the specific TTO activities add value to its main objectives in a self-evaluation process. It represents an attempt to combine a theoretical approach with actual policy-making value judgements. The inclusion of value judgements in the policy-making process has always been rather controversial and economists argued strongly for the strict separation between Economics (as a scientific discipline), and policy-making and politicians as the practitioners (Nau, 1996). The debate was opened up again by Nelson and Winter (1982) as part of the foundations for the Evolutionary Economic Theory and this paper is based on those foundations.

The paper is organised as follows. In Section 2 we make a review of the definition, design and management of the "third mission" activities and the strategic planning tools applied at universities as a key goal of many universities in developed and developing countries. In Section 3 we formulate research questions and we perform the problem characterisation. We also make an overview of the AHP and ANP methods. In Section 4 we describe the specific context of the Polytechnic University of Valencia "third mission" and its TTO as the

executive arm of these activities, setting and characterising the specific methodological process, and in Section 5 we draw some conclusions.

2. The University “third mission” planning process

It is now widely integrated into the vocabulary of university staff and politicians the notion and meaning of university “third mission” activities as those addressed to disseminate and transfer the new knowledge to the society as one of the university revenues of the investment allocated into these institutions. This is even more widely accepted and integrated into the society in developed countries, since the characterisation of university third mission activities can be traced at the Bayh-Dole Act (1980) in the USA as the first legislation dealing with intellectual property rights arising from federal government-funded research. It permits a university, small business or non-profit institution to pursue ownership of an invention over the government. In addition, it is also widely accepted for universities the model of managing these sort of activities at TTOs. There have been important efforts for the promotion of university technology and knowledge transfer activities and for the recognition of the possibilities that can be made available through creative knowledge transfer efforts and a much greater sophistication in handling those possibilities. We think that this, in the end, has come about because the universities have been the source of enlightenment for a recognition of the value of innovation (Bremer, 1998). Because of the increased emphasis on university technology and knowledge transfer on the one hand, and the search for additional financial resources on the other, most universities have now established TTOs (Friedman and Silberman, 2003). The size of TTOs and magnitude of their operations have steadily increased over the past decades (Bradley et al., 2013) and their performance measurement also has become a central issue (Sorensen and Chambers, 2008) (Vinig and Lips, 2015).

This growth has meant in many cases the incorporation of the TTO activity into the strategic planning process of the university and therefore the definition of clear objectives in technology and knowledge transfer activities as well as the resources and actions devoted to carry out the activities designed to fulfil those objectives. The literature has not found a clear relationship between university scientific excellence and engagement with industry despite some exception to the rule focused on the concepts of "collaboration breadth", as the scope of different channels, and "collaboration depth", or the extent that universities deepen into different channels (Wang et al., 2015). What has been found is that the relationship between academic excellence and engagement with business is largely contingent on the institutional context of the university department (D'Este et al., 2013). We also find studies in the literature focusing on the researchers' motivations to get involved in university-industry cooperation activities (Franco and Haase, 2015). Therefore, the room for a fine-tuned definition and planning process of *Third Mission* activities within the university is opened.

In parallel to the growth of "third mission" activities at universities, we observe a great concern in applying strategic market planning techniques to universities as a mean to attract students, since most universities are not set up with a strategic planning capacity. It is well known the need for a strong emphasis on university planning. As many scholars have recognised over the past decades, universities are good at operations, that is, efficient in doing the same thing day after day. In general, patterns of operations were traditionally established to meet the environmental conditions and opportunities but the ways of conducting their action plans are likely to persist long after these procedures have lost their effectiveness in new environments (Kotler and Murphy, 1981). This has been true for research and teaching

activities, but is also the case of “third mission” activities (Muscio, 2010). For most universities strategic planning is not a new issue. They are well aware of budgeting and scheduling processes as well as short-range planning, as the first and second levels of planning. However, the third level, long-range planning, is becoming part of the core managing activities since technology and knowledge transfer -as part of the “third mission” activities of the university- are also considered a strategic part of the university assets regardless of whether they are private or public institutions. They now operate within a much more competitive context and need to incorporate a greater market orientation into their strategic planning process in order to acquire a competitive advantage over other universities (Conway, 1994).

The strategic planning of “third mission” activities is usually incorporated into the university planning using classic planning tools, namely, SWOT analysis. This is a well-stablished method for assessing the formulation of strategies. This technique is linked to the resource-based planning and used in an iterative process embedded within the overall planning process (Dyson, 2004). It is also used for the analysis of those factors identified as strengths and weaknesses and those identified as environmental opportunities or threats for the overall performance of the institution. However, it has little to add to the alignment between the selection of strategies and goals concerned with third mission activities to be pursued in a certain period of time and the operationalisation of those activities designed to achieve the goals defined in the strategies.

More specifically, the capabilities of the TTO personnel who have to carry out its tasks and reach the objectives set by the university government have also been analysed. Weckowska (2015) concludes that the stream of literature in which this work is framed, namely practice-

based literature on learning, and strategizing literature should be brought together. Another piece of work, but in line with the previous one, is concerned with the definition and utilisation of indicators. However, it addresses the evaluation of university performance in "third mission" activities rather than the strategic planning process. In this respect the definition and use of indicators for university policy definition is still a fuzzy process since there is a high level of ambiguity in the definition of policy goals accompanied by conflict among policy stakeholders (Molas-Gallart and Castro-Martínez, 2007).

Other literature has focused on value added and generalisation of the TTO activity showing how their activity could be improved if a business model is applied (Landry et al., 2013). These authors argue that the value chain perspective allows for the integration of the offered TTOs' services into the value chain of firms. As for the business model perspective, it allows developing hypotheses about how TTOs create and deliver value for client firms. This analysis shows that different types of TTOs devise different types of business models that are centred on services linked to different stages of the value chain. Overall, these results suggest that managers of TTOs could improve their business models and increase value to client firms by increasing the degree of customization of solutions offered to clients that in turn, would also increase revenues from clients, and hence reduce TTOs′ vulnerability to reductions in government funding. However, this is a business-oriented perspective that can be of interest for certain university TTOs, especially those located at US and Canada, but our concern refers to the fact that in many European cases TTO personnel have to deal with teaching and scientific staff from the university as their primary clients, not firms. The point here is that one of the main tasks of TTO personnel is to manage researchers' and teachers' willingness to transfer their new knowledge which is prior to the firm's interests.

Other stream of literature, in which quantitative techniques are applied, focuses on the analysis of TTOs performance using Data Envelopment Analysis (DEA) to study the relative performance of UK's TTOs (Chapple et al., 2005). The study suggests a TTOs' downsize process to improve their relative efficiency. This study also concludes in terms of reconfiguring TTO to a more regionally-based sector focus. The case of US university TTOs has also been analysed (Anderson et al., 2007) applying DEA as a productivity evaluation tool in which the incorporation of many stakeholders from within and outside the university provides a comprehensive approach to the knowledge transfer process. In both cases, the focus of the analysis is on the relative performance of such offices to better match territory needs. However, these two cases are not concerned with the relative match between university goals and activities, set for the TTO by the university government, and the actual tasks and resource allocation carried out by the TTO to achieve those goals and activities.

We also want to mention another approach that analyses TTOs efficiency and effectiveness using a qualitative approach. In this respect, we have found two different methods to approach this analysis. The first study (Resende et al., 2013) proposes the development of the so called Best Transfer Practices which is a qualitative tool to assess and study TTOs and their host R&D institutions. The novelty of this study lies on the use of different qualitative methodologies (document analysis, participative observation, interviews and surveys) to generate data that lead to development of a theoretical framework. The theoretical framework, called Master Plan for Technology Transfer (TT), is a reference schema for best practices. The main point of this approach is the possibility to replicate the analysis to many different organisations as well as the use and application of the technology transfer professionals' value

judgements. The second study (Plewa et al., 2013) approaches the issue by applying the so called Actors-Resource-Activities, A-R-A model, to carry out in-depth interviews and analyses the interpersonal links developed between individuals through interaction. This study thereby adopts a factor-based perspective on relationship evolution by building on and extending existing literature that has outlined the relevance of success factors such as trust, communication, understanding, and the people engaged in University-Industry linkages.

Our ANP-based approach incorporates value judgements in an in-depth analysis and diagnosis of the TTO objectives and activities according to the strategy plans of the University for the TTO. We want to highlight the fact that the TTO has incorporated new activities to meet the increasing university need to provide client-oriented TTO services (in particular, for teaching and research personnel). This has led to an increase in resources that, in a context of containment of public expenditure, must be analysed to reorganise and make the TTO more effective. For this purpose, it was necessary to carry out a detailed analysis of the services offered by the TTO from the point of view of TTO managers and employees. In a future research stage the teaching and research university staff opinions will be also incorporated to this study to have a full picture of the alignment of objectives and activities.

3. Problem Definition

Public universities have a strong social commitment reflected in the third mission of universities, which consists in stimulating and directing the application and exploitation of knowledge to the benefit of the social, cultural and economic development of our society. UPV-TTO is the body in charge of the implementation of action plans and activities that promote and facilitate the transfer of knowledge to society.

Since its creation in 1988, the action plans and activities developed by UPV-TTO have been changing to face the new challenges of the Universitat Politècnica de València. At present, the Universitat Politècnica de València is a large institution with 37,000 students, 2,600 teachers, a budget of approximately 300 million euro and R&D&I revenues of 25 million euro (www.upv.es). UPV third mission activities have increased considerably over the last few years. As described in the UPV website, The *Centre for Innovation, Research and Technology Transfer (CTT)* "is the executive unit of the UPV in charge of stimulating and managing the activities of knowledge generation and scientific and technical cooperation, promoting the collaboration of UPV researchers with local and national and international companies in the development of R&D&I programmes and projects"(www.upv.es). UPV-TTO develops a substantial number of activities that require large amounts of financial and highly qualified human resources.

However, the economic crisis and the subsequent need to cut public spending have led to significant budget reductions and restructuring at universities. As a result, UPV-TTO, like other UPV units and services centres, analyses in depth the activities to develop in order to identify those that are essential to "value" TTO performance and contribute to the objectives set by the University, making the best possible use of the scarce available resources.

The main objective of the present work is "to provide the TTO manager and his managing team with a methodological tool that allows them to analyse TTO performance, and whether and to what extent the activities performed contribute to meeting the objectives set by the University". Several fundamental questions emerged:

1. Are the University's objectives for the TTO well defined?
2. If well defined, are they all equally important?
3. Do TTO managers have the same perception of the importance of the objectives as the institution?
4. Each of the activities developed by the TTO, which objectives do they contribute to meeting and to what extent?
5. Are the priorities of the objectives met through TTO activities well aligned with the priorities formulated by the Institution?

Subjectivity is inherent in any decision-making process because it involves intangible knowledge and tacit preferences (Belton and Stewart, 2002). According to Saaty and Peniwati (2008), making decisions involves judging and judgments depend on feelings, thoughts and the ability of individuals to interpret information from these feelings by levels of preference, significance or probability. According to these authors, to make a good decision, decision makers (DM) cannot rely on their feelings. DMs have to take into account the stakeholders, what influences their decision and possible alternatives. They also need to think systematically about the impact of different influences on their decisions and use their experience. To address these issues, Thomas Saaty proposed the Analytic Hierarchy Process, AHP (Saaty, 1980), and its generalisation to more complex cases, the Analytic Network Process, ANP (Saaty, 2001).

These two methods belong to the group of decision-making approaches known as Multi Criteria decision analysis (MCDA) which covers a number of concepts, methods and techniques that seek to help managers or managing teams to make decisions that involve conflicting viewpoints and multiple stakeholders. All these techniques are well known and have been explained in detail in (Belton and Stewart, 2002; Figueira et al., 2005; Ishizaka and

Nemery, 2013). Wallenius et al. (2008) conducted a thorough literature review on the development of MCDA techniques from 1992 to 2007. This study analyses the articles published in the Web of Knowledge and reveals the exponential development of MCDA techniques, both from a theoretical point of view and applications in a wide range of fields. The authors also indicate that AHP is the most widely used MCDA technique.

Given that most organisational processes are highly affected by people's subjectivity, in this paper an analysis of the UPV-TTO activities implemented by the TTO managing team is proposed. The UPV is organised in three levels: i) political level, integrated by the governing bodies (personal and collegiate), ii) administrative level, integrated by all the administration services of the University and iii) academic level, lecturers, researchers and students. This paper focuses on the first two levels. The political level is made up of unipersonal governing bodies (Rector and its team (Vice-rectors), Secretary General and Financial Manager) and by the collegiate governing bodies (Social Council, University Senate and Governing Council). The administrative services of the university depend on each of the Vice-Rectors. Each Vice rector sets the policies and guidelines of his/her subordinate services, units and divisions. UPV-TTO is subordinate to the Vice rectorate of Research, Innovation and Transfer. Hence, this Vice-rector is responsible for determining the TTO's objectives, according to UPV's Strategic Plan, and for supervising its achievements. The TTO has an Executive Director and a Managing Team (MT) who are responsible for developing and executing activities in order to achieve these objectives. Therefore, the Vice-rector represents the political level and the TTO managing team the administrative level with the operational role. Figure 1 shows this organizational structure.

(Figure 1. UPV Organizational Structure)

The approach used in this study was the Analytic Network Process, ANP, which is briefly described in paragraph 3.1. The application of the ANP method to different fields is under investigation because, although the technical and mathematical foundations are well known, its application to highly complex real problems, the analysis of the resulting information and the conclusions that can be drawn, do constitute novelty.

This paper will apply the ANP technique, though not to make decisions in the sense of establishing a priority among a set of alternatives using different criteria, but to establish a priority among the objectives of the TTO, based on the activities carried out by the TTO. Therefore, the approach is novel. No similar applications of ANP and AHP have been found in the literature, although some studies have used AHP/ANP in the field of technology transfer. For example, Salimi and Rezaei (2015) used fuzzy AHP for the selection of universities that could collaborate with certain companies. Lai and Tsai (2009) used this technique to evaluate the efficiency of technology transfer between large companies and research institutes and small and medium companies; Lee et al. (2012) used AHP to determine intangible priority factors for technology transfer adoption. De Felice and Petrillo (2013) used ANP to examine the scope and feasibility of modelling a process that includes public participation for environmental assessment. In addition to the questions formulated above, we can add the following: what are the methodological challenges resulting from the use of such a complex technique as ANP?

3.1. AHP/ANP overview

The Analytic Hierarchy Process (AHP) and the Analytic Network Process (ANP) are two methods proposed by Saaty (Saaty, 2005a, 2001, 1980). They are theories of relative

measurement of intangible criteria (Saaty, 2005b) (Saaty, 2005b). AHP is a well-known technique that decomposes a decision-making problem into several levels in such a way that they form a hierarchy with unidirectional hierarchical relationships between levels. The top level of the hierarchy is the overall goal of the decision problem. The following lower levels are the tangible and/or intangible criteria and subcriteria that contribute to the goal. The bottom level is formed by the alternatives to evaluate in terms of the criteria. The AHP uses pairwise comparison to allocate weights to the elements of each level, measuring their relative importance by using Saaty's 1-to-9 scale, and finally calculates global weights for assessment at the bottom level. The method also calculates a consistency ratio (CR) to verify the coherence of the judgements, which must be about 0.10 or less to be accepted. Mathematical foundations and the steps of the AHP can be found in (Saaty, 1994, 1980).

The strict hierarchical structure of AHP cannot handle the complexities of many real world problems. As a solution, Saaty proposed the ANP, the general form of the AHP. ANP addresses the decision-making problem as a network of nodes or elements that can be alternatives and decision criteria, grouped into clusters. An element of a cluster can interact with or have influence on some or all elements of the same cluster or of other clusters in the network. The ANP network analyses the intensity of the perceived "influence" of certain elements (or clusters) on other network elements (or clusters), so that the resulting output is the distribution of influences among all network elements, i.e., to what extent an element has influence over the other elements of the network. The resulting model can better represent the complexity of real decision-making processes.

The influence of the elements in the network on other elements in that network can be represented in a supermatrix. This concept consists of a two-dimensional element-by-element matrix, which adjusts the relative importance weights in individual pairwise comparison matrices to build a new overall supermatrix with the eigenvectors of the adjusted relative importance weights.

The ANP comprises the following steps:

(i) Identifying the components and elements of the network and their relationships.
(ii) Conducting pairwise comparisons on the elements.
(iii) Placing the resulting relative importance weights (eigenvectors) in pairwise comparison matrices within the supermatrix (unweighted supermatrix).
(iv) Conducting pairwise comparisons on the clusters.
(v) Weighting the blocks of the unweighted supermatrix, by the corresponding priorities of the clusters, so that it can be column stochastic (weighted supermatrix).
(vi) Raising the weighted supermatrix to limiting powers until the weights converge and remain stable (limit supermatrix).

The steps and mathematical formulation of the ANP process can be found in (Aragonés-Beltrán et al., 2014; Saaty, 2005a, 2005b, 2001).

In this study, we have adopted an ANP-based approach because this method identifies the influences among TTO activities and between TTO activities and UPV objectives for the TTO. The analysis of the interdependencies between TTO activities and objectives allows the decision maker to reflect deeply on the contribution of TTO activities to the UPV objectives, on his preferences and on the problem itself, thus increasing his knowledge about the problem and feeling more confident in the decisions made.

4. The AHP/ANP modelling approach

4.1 Phase 0. Problem Formulation

The study grew out of a research project funded by the UPV, proposed by the authors of this article, who acted as the Facilitator Team (FT). The project came about after several conversations in which the Executive Director of the TTO showed the researchers (FT) his interest to have a tool that could analyse the contribution of TTO activities to UPV objectives. So, the present work was considered as an internal control tool to be subsequently submitted to the Vice-rector's knowledge for approval.

4.1.1 Description of the participants.

The TTO is organised in three sections coordinated by the TTO Executive Director: the financial and administrative section, the public funding section and the transfer section. Each section is under the responsibility of its Head of Section who receives the support of the technical staff. After project approval by the UPV, the Executive Director, in agreement with the FT, decided to create a Management Team (MT) formed by the Executive Director and the three Heads of Section. The TTO's MT played the role of the Decision Maker in a traditional decision making problem. The MT members are technicians with broad knowledge and proven experience in managing knowledge and technology transfer issues and in raising public and private funds in public and private fundraising for research.

4.1.2 Description of the model.

A first joint meeting, which lasted approximately two hours, between the MT and the FT, represented the kick off meeting in which the objectives of the study and the process to follow were determined. This sort of meetings is essential to involve participants in the process and should be carefully prepared by the FT. This meeting was conducted by the FT who in one hour explained the objectives of the work, the fundamentals of the ANP method, the role of

the participants and the information gathering process. After discussion, the MT considered the proposed work to be of great interest for him and expressed his commitment to participate in the study, identifying the following stages in the decision process:

1. Analyse and establish a priority order among the TTO objectives set by the UPV. This stage was carried out in two steps as described in sections 4.2.1 and 4.2.2.
2. Identify and analyse the activities and services provided by the UPV-TTO to meet the objectives. This stage is described in section 4.2.3.
3. Analyse the degree of achievement of objectives through the implementation of TTO activities and services. This stage is described in section 4.2.4.
4. Compare the degree of alignment between the weights assigned to the objectives and weights obtained in the analysis of the TTO activities and services. This stage is described in section 4.3.

Figure 2 shows the procedure followed in this study

(Figure 2. Steps of the analysis process)

The process has two phases: Phase 1: Preliminary Prioritisation of objectives (Institutional: set by the UPV for the TTO and Technical: the objectives as perceived by the TTO managing team), and prioritisation of the objectives met through TTO activities; Phase 2: Analysis of objectives alignment. The following sections describe in detail the steps of the process.

The information needed to implement each step was obtained in two ways:

i) we conducted face-to-face meetings, following the focus group technique, for the qualitative analysis of the objectives and activities identification;

ii) we prepared questionnaires to be answered by the MT members, by consensus or individually according to their expertise, and by the Vice-rector, for the quantitative assessments required by the AHP/ANP method.

4.2 Phase 1 Prioritisation of TTO Objectives.

This phase is the key part of the process. It includes the following steps.

4.2.1. Step 1. Analysis and identification of TTO objectives

The analysis and identification of the objectives of an administrative structure is complex (Gilad, 2015). In the second meeting with the MT, and chaired by the FT there was a deep reflection on the objectives of the TTO. It was concluded that TTO objectives are defined by the UPV through its "Charter of services". These objectives are based on the Strategic Plan of the UPV, which defines "the mission, vision and values" of the University. TTO mission is "to promote and facilitate the generation of knowledge and its dissemination and transfer to society" (UPV 2007/2014 Strategic Plan, 2007). Thus, the answer to the first question formulated in Section 3 reveals that the UPV has assigned a number of objectives to the TTO.

These TTO Objectives are:

O1. *Facilitate the participation of the UPV in sponsored R&D&I programmes*: The aim of this objective is to obtain national and European funds for research.

O2. *Channel research activities or technical support hired by companies or other entities*: This objective aims to attract financial resources from private entities. The TTO helps researchers in the drawing-up and negotiation of contracts and agreements in R&D&I with private companies and other entities.

O3. *Value and transfer R&D&I results*: The aim of this objective is to enhance and disseminate research results generated in the UPV. This includes protection of UPV industrial and intellectual property rights.

O4. *Management of research activities*: This objective consists in managing the research groups of the UPV in order to control the research activity and results produced at the UPV and thus develop specific policies for the support of research groups.

O5. *Scientific dissemination*: The aim of this objective is to help researchers in the social communication of their research activities, developing communication materials in all media and facilitating research dissemination.

4.2.2. Step 2. Preliminary prioritisation of TTO objectives

During the second meeting, it was evidenced that the UPV has no priority objectives set for the different areas and services; therefore, the answer to the second question formulated in Section 3 is negative. Therefore, at this stage the MT was asked to prioritise TTO objectives to know if they were allocating their resources properly. The MT also raised the idea that, since these same objectives were also prioritised by the Vice-Rectorate, it could be interesting to see if both agents had the same priorities. Thus, prioritisation of TTO objectives was proposed to be carried out from two perspectives, institutional, conducted by the Vice rector for Research, and technical, by the Management Team of the TTO.

AHP was used for the prioritisation of the objectives. Since there are only five objectives, their hierarchy is very simple. At the top of the hierarchy lies the goal of the problem. In This case, the goal is "Establishing a priority order among the objectives of the TTO." In the second level are the five objectives to prioritise. According to the AHP method, a matrix of pairwise comparison was established and two questionnaires were designed by the FT, one to be answered by the Vice Rector and the other by the MT (See Table 1). Figure 3 shows the hierarchy of TTO objectives.

(Figure 3.- Hierarchical model for the preliminary prioritisation of TTO objectives)

(Table 1. Example of the questionnaire about preliminary prioritisation of TTO objectives)

The FT sent the questionnaire to the MT by email. The MT answered the questionnaire by consensus among its members and forwarded it by the same means to the FT. In the case of the Vice-rector, the FT held a meeting with him to explain the AHP method. Subsequently the FT sent, by email, the questionnaire that had been answered by the Vice-rector. The answers to the questionnaire provided the priority order of the institution and of the TTO managers. According to the AHP method the inconsistencies of the pairwise comparison matrices were verified, all of which being within acceptable limits. Figure 4 shows graphically the results obtained in this preliminary prioritisation process. TTO managers give equal importance to objectives O1 and O2, while the Vice Rector gives more importance to O1 than to O2. However, the differences are small and both priority orders show a considerable degree of agreement. This first step helped both agents reflect on and analyse TTO goals more deeply.

(Figure 4. Preliminary prioritization of TTO objectives)

4.2.3. Step 3. Analysis and identification of TTO activities

This is a necessary step for the development of an ANP model for prioritising TTO objectives using TTO activities. To carry out this step, two more face-to-face meetings among the MT members, moderated by the TF, were needed. Each meeting lasted approximately two hours. In them, an in-depth analysis of each TTO activity was carried out. All members participated

actively and finally identified 31 TTO activities. These activities were grouped by organisational units into five clusters.

Cluster 01. *Disseminating, promoting and commercialising research results.*

This cluster develops activities aimed at disseminating the research results developed by UPV faculty and researchers and transferring knowhow to society. It includes:

A.1.1.- Extensive dissemination of official announcements of financial aids for R&D&I projects and activities

A.1.2.- Promotion and commercialisation of R&D&I results and findings

A.1.3.- Intermediation with the communication media

A.1.4.- Development of the technology offer

A.1.5.- Development of news for the communication media

A.1.6.- Publication of newsletters for dissemination of R&D&I results

Cluster 02. *Assistance and negotiation.*

This cluster develops the necessary measures to help researchers prepare applications for public R&D&I calls and agreements with private companies and other institutions. It includes the following:

A.2.1.- Assistance and support in public calls for financial aid for R&D&I activities and projects

A.2.2.- Assistance and support in the development of sponsored R&D&I activities

A.2.3.- Assistance and support in the development of R&D&I activities with private companies and other entities

A.2.4.- Negotiation and formalisation of R&D&I agreements with private companies

A.2.5.- Assistance and support in the development of contracted R&D&I activities

A.2.6.- Participation in associations, foundations, etc.

Cluster 03. *Administrative Management.*

This cluster develops the necessary measures to help researchers to perform administrative tasks involved in the creation and operation of research groups. It includes the following:

A.3.1 Processing of applications for public R&D&I funding

A.3.2 Management of UPV R&D&I support programmes

A.3.3 Support to subsidised R&D&I Audits

A.3.4 Claims prior to Payment Management of R&D&I activities

A.3.5 Management of UPV Research Units and Centres

A.3.6 Management of researchers in the UPV Official Register of Research Unit and Centres (ROE)

A.3.7 Accreditation and Qualification of UPV researchers

A.3.8 Validation of curricular merits of the research staff

Cluster 04. *Financial Management.*

This cluster develops the necessary measures to support researchers in the financial negotiations of R&D&I activities subsidised with public and private funds. It includes the following activities:

A.4.1 Processing of proposals for the opening of cost centres for funded R&D&I activities

A.4.2 Processing of proposals for financial support of subsidised R&D&I activities

A.4.3 Management of applications for in-advance payment of funded R&D&I activities

A.4.4 Management of income generated by subsidised R&D&I activities

A.4.5 Support services to justify expenditure incurred in the development of subsidised R&D&I activities

A.4.6 Payment proposal to partners in joint projects

A.4.7 Management of invoices generated in the development of R&D&I activities

Cluster 05. *Management of R&D&I results and Capacities*.

This cluster develops the necessary activities to ensure the exploitation of the capabilities of researchers and research groups as well as the protection and commercialisation of the rights of industrial and intellectual property. It includes the following:

A.5.1 Identification, cataloguing and promotion of transferable skills and capacities
A.5.2 Management of Industrial Property Rights
A.5.3 Management of Intellectual Property Rights
A.5.4 Transfer to Spin-offs

4.2.4. Step 4. Prioritisation of TTO objectives met through the implementation of TTO activities. The ANP Model

The use of the ANP model allows us to analyse the level of achievement of TTO objectives through the implementation of TTO activities. The model is based on the idea that every activity performed by the TTO can influence other activities and contribute to meeting TTO objectives. Similarly, the need to achieve TTO objectives also exerts some influence on the performance of certain TTO activities.

The ANP technique builds a network model of the problem structured into clusters containing elements that are related to/influence each other. The MT determines the influence relationships between model elements based on his knowledge of the problem. This is one of the most critical stages of the ANP approach because of the difficulty in identifying the elements (nodes) that will influence others and the relative intensity of influence. To gather the information required from the MT, the FT elaborated different questionnaires (see next sub-sections). Another face-to face meeting was necessary in order to explain MT members

how to complete the questionnaires. In this meeting, MT members agreed to individually fill in those parts of the questionnaire in which each member was an expert.

4.2.4.1 Influence analysis among network elements.

The ANP network is formed by the activities performed by the TTO, grouped into organisational units or sections and the cluster of TTO objectives. This cluster is similar to the set of alternatives used in conventional decision-making processes. The MT were asked about the influence of every node on the other node. They considered that in this ANP model all activities exert some influence on the objectives and vice versa. In order to obtain the relationships among activities the MT completed a questionnaire like the questionnaire shown in Table 2.

(Table 2.- Questions of the Questionnaire that identify relative influences among activities)

The ANP relationships are shown in Table 3, Influence matrix. Thus, 1 in position $r_{i,j}$ in the matrix means that the element in row i has influence on the element of column j. From Table 3, the elements and their relationships were introduced in SuperDecisions software (www.superdecisions.com), as shown in Figure 5

(Table 3. Influence Matrix)

(Figure 5. Representation of the ANP model)

The next step of the ANP model consists of establishing influence intensity among the elements of the network model.

4.2.4.2 Determination of element and cluster priorities

In this model, the MT sets the intensities of the influences identified above. The first step consists of assigning priorities to related elements in order to build the unweighted supermatrix. For this end, each element is analyzed in terms of which other element exerts some kind of influence upon it; then the corresponding pairwise comparison matrices of each element group are generated in order to obtain the corresponding eigenvectors.

The procedure is the following: let us suppose that some or all the elements (activities or objectives) e_{ik} of cluster C_k influence one element e_{ij} of cluster C_j (e.g. the four activities of the cluster "*02 Assistance and negotiation*" exert some influence on the activity "A1.2" within the cluster "*01 Disseminating, promoting and commercialising research results*"). To determine which elements (among those that have some kind of influence) of C_k have more influence on element e_{ij} of C_j, a reciprocal pairwise comparison matrix is built with the elements of C_k. In order to fill in each component of the matrix n(n-1)/2 questions (n being the number of elements of C_k that influence e_{ij}) have to be answered. This procedure is repeated for each cluster whose elements exert some influence on element e_{ij} of C_j. In this way, for each column of the e_{ij} elements of the unweighted supermatrix we can identify blocks corresponding to each of the clusters that exert some kind of influence on that element and whose values form the eigenvector that represents the relative influence of the elements of each cluster on element e_{ij}.

For this end, an extensive questionnaire about priorities was designed to be answered by the MT. The questionnaire was designed as a multiple-choice test and organised into tables that grouped the questions relative to the pairwise comparison matrices. The consistency ratios of the judgement matrices were always lower than 0.1, except for a few cases that required re-consulting with the expert who filled in the corresponding matrix. Tables 4 and 5 show an example of the questionnaire. Although this type of questionnaire contains many questions, they are easily answered by a MT with experience and knowledge of the problem.

(Table 4. Example of the questionnaire about prioritisation of elements)

(Table 5. Example of the questionnaire about prioritisation of clusters)

The data were processed with SuperDecisions software (www.superdecisions.com) obtaining the Unweighted supermatrix (Table 7. See Annex 1).

Given that in the case study different elements from different clusters have influences on one element the unweighted matrix is non-stochastic by columns. Thus, according to (Saaty, 2001), all clusters that exert any kind of influence upon each group have to be prioritised using the corresponding cluster pairwise comparison matrices (Table 8. See Cluster Weights Matrix in Annex 1). The value corresponding to the priority associated with a certain cluster weights the priorities of the elements of the cluster on which it acts (in the unweighted supermatrix), and thus the weighted supermatrix can be generated (Table 9. See Annex 1).

By raising the weighted supermatrix to successive powers, the limit matrix is obtained. In this matrix, all columns have the same values. With the help of Superdecisions software, the "Priorities" shown in the "Limit" column of the limit matrix and the normalised values by clusters are obtained. The values of the limit column indicate the influence of each element upon all the other elements of the system. Normalisation by clusters shows the relative influence of each element within the same cluster. Table 10 (See Annex 1) shows the Priorities obtained with Superdecisions software. Figure 6 shows graphically the normalisation of the Objectives cluster whose values indicate the level of achievement of TTO objectives according to the activities performed by the TTO.

(Figure 6. Prioritisation of Objectives –ANP)

TTO managers think that the developed activities highly contribute to meeting Objective O1 *"Facilitating the participation of the UPV in sponsored R&D&I programmes* " with an intensity of 36.3% and the achievement of Objective O2 "*Channelling research activities or technical support hired by companies or other entities*" with an intensity of 22.2%. The total priority of both objectives together sums up 58.5%.

Table 6 shows the prioritisation of TTO activities obtained with the ANP model. The most influential activity is A4.5 "*Support services to justify expenditure incurred in the development of subsidised R&D&I activities"*. This result seems logical as the first step to apply for financial funds is to know the terms and deadline of the calls.

(Table 6. Priority of TTO activities. ANP Model)

Figure 7 represents the ten most influential TTO activities

(Figure 7. The ten most influential TTO activities)

Other results obtained from ANP are the prioritisation of TTO activities within their cluster or group of activities. Figure 8 shows the weights of the activities within the cluster A1 *Disseminating, promoting and commercialising R&D&I results*. The most influential activity within this cluster is A1.2 *Promotion and commercialisation of R&D&I results and findings,* followed by A1.1 *Extensive dissemination of official announcements of financial aids for R&D&I projects and activities.*

(Figure 8. Weights of the activities within the cluster A1)

The weights of the TTO activities in cluster A2 *Assistance and negotiation* are shown in Figure 9. The most important activity is A2.1 *Assistance and support in public calls for financial aid for R&D&I activities and projects*. In this group the Priority values of the TTO activities are more balanced

(Figure 9. Weights of the activities within the cluster A2)

The priority of the A3 cluster *Administrative management* is shown in Figure 10. There are four priority activities within this cluster, all of which are aimed at helping researchers with administrative processes when looking for financial aid and funds.

(Figure 10. Weights of the activities within the cluster A3)

The priority of the A4 cluster *Financial Management* is shown in Figure 11. Activity A4.5 *Support services to justify expenditure incurred in the development of subsidised R&D&I activities* gets the highest priority value.

(Figure 11. Weights of the activities within the cluster A4)

Finally, Figure 12 shows the priority of the *Management of* R&D&I *results and Capacities* cluster. Priority is equally shared by TTO activities A5.2, A5.3 and A5.4

(Figure 12. Weights of the activities within the cluster A4)

Most resources are devoted to managing both industrial property and intellectual property rights.

4.3 Phase 2 Alignment.

In step 2, a preliminary prioritisation of goals from the point of view of the TTO managers and from the point of view of the Institution, represented by the Vice-Rector for Research was

obtained. Additionally, the previous step described the prioritisation of objectives through the analysis of the activities performed by the TTO. In this step, the degree of alignment of both prioritisations is compared. The results are shown in Figure 13.

(Figure 13. Analysis of objectives Alignment)

The objectives follow a pattern of alignment. However, ANP allows us to introduce certain variations. The preliminary prioritisation of objectives by the Vice-Rector and the TTO managers is similar: the Vice-Rector gives a somewhat greater importance to objective O1 *Facilitate the participation of the UPV in sponsored R&D&I programmes*, whereas for the TTO managers this objective is as important as O2 *Channel research activities or technical support hired by companies or other entities*. This result seems logical because, due to the current economic crisis, the concern of the Vice-rectorate for Research focuses on obtaining more European funds for research. Similarly, the activities performed to attract financial resources from private companies (O2) are not contributing to goal achievement. There is a difference between the political approach of the institution and the operational approach of the TTO. UPV strategic objective is to attract more funds, both public and private, through research. From the point of view of the Vice Rector, the sum of the weights of goals O1 and O2 accounts for 75%; however, the weight resulting from TTO activities only accounts for 58%. Therefore, it is clear that from the operational point of view, the TTO should develop new activities to correct this misalignment.

As regards objectives O4 and O5, a similar deviation can be observed between the Vice-Rector's and the TTO manager's consideration of the contribution of TTO activities to the objectives. This can reveal that too many resources are being allocated to these two objectives. O3 is the best-aligned objective.

5.- ANP Methodological discussion and limitations

To answer our research question we show the methodological challenges resulting from the use of such a complex technique as ANP. From the point of view of the MT the main challenge was to understand the method and answer more than 600 questions. For the FT the main challenge was to explain the method to the MT, so as to get them involved in the process as well as to make the answering process easy.

The authors, based on their long experience as FT, can give some recommendations to improve the ANP process:

1) Carefully prepare the first launch meeting, in which the ANP method must be explained in a simple way to people who will participate in the process (decision makers or experts), avoiding details of the mathematical process and focusing on what kind of information they will be asked. It must be noted that these people are usually experts on the problem under analysis, but not in the AHP/ANP method. We recommend this meeting be face-to-face and be attended by all the members who will participate in the analysis of the problem. At the end of this meeting, the FT must have achieved the engagement of all the participants.

2) Prepare the questionnaires described in this paper (a questionnaire that identifies the relative influences among activities, about prioritisation of elements and about prioritisation of clusters) in a systematic way, so that the mind of each expert focuses on the question that he/she must answer without having any doubts about it. It is very important to formulate accurately each of the questions that the decision maker/expert must answer, taking into account the context of the specific problem under study.
3) Carefully prepare the meetings to give instructions to fill in the questionnaires.
4) To perform the calculations, it is advisable to use the help of a computer software like Superdecisions and take special care when introducing the answers of the experts. It should be noted that this software does not perform multi-expert calculations, so if you have to add expert judgments, it should be done with the help, for example, of a spreadsheet.
5) It is relevant to supervise the inconsistency of each pairwise comparison matrix. This can be done with the help of Superdecisions. If some matrices are inconsistent, the FT must contact with the expert who has to check his/her judgements. In our experience, consistency usually is good when the experts have knowledge and experience in the problem.

In order to determine objectives and activities and how to assess them, face-to-face meetings work very well because the ideas that some participants bring to the debate suggest other ideas to others in a way that leads to conclusions fairly quickly. It is important to emphasise that the participants are experts in the problem under analysis

In this study, all the meetings and questionnaires have been described. We have to highlight that the MT did not have many methodological problems to answer the questionnaires. The MT members confirmed that the method made them think in depth about the actions that the TTO develops and its contribution to the objectives.

6.- Conclusions

This paper presents a methodological approach that allows TTO managers of a public university to perform a self-assessment analysis to know if TTO activities are contributing to meeting the *third mission* goals set by UPV in its strategic plans and to what extent. The model is based on the Analytic Network Process (ANP), which has shown to be an effective analysis tool that incorporates value judgements as a key part of the input information.

The method has allowed TTO managers to conduct a thorough analysis of the TTO activities carried out and whether they are properly designed to meet UPV those strategic goals. TTO managers have been developing the activities on a regular daily basis without much consideration on their degree of contribution to UPV goals or their implications. Therefore, there is room for a misleading interpretation of the “third mission” strategic objectives set by the university government body and the tasks undertaken by the TTO personnel to achieve those objectives. The use of this model has allowed TTO managers to identify the extent to which TTO activities contribute to meeting UPV objectives.

The paper also presents an analysis of the strategic plans proposed by UPV governing body and describes the priority order of the objectives from the point of view of the institution and the TTO managers. This answers the first three questions formulated in Section 3, showing

some misalignment between both actors. It is not a serious problem provided it can be identified and debated within the institution. Furthermore, this debate can help improve future strategic planning processes and policy formulation.

In a moment in which Spain is undergoing a severe economic crisis with a significant impact on public universities, this type of analysis, complementary to others already discussed in the literature, is essential to better allocate the financial resources to organisational units. As TTO managers are familiar with the operation of the Office, this analysis allows them to devote their effort to activities that substantially contribute to the achievement of the objectives and consequently to a larger and more effective university contribution to the society.

The model uses the ANP method based on the preferences of the decision maker. This method has allowed us to study all the influences detected by the TTO managers, among the different activities and between them and UPV goals. The novelty of this work is the application of ANP to an area where ANP had never been applied before and with a new approach based on the analysis of the effectiveness of TTOs performance. This technique allows for the detailed and complementary analysis of strategic planning processes equivalent to other widely used qualitative analysis techniques. The method can be extrapolated to the analysis of the TTOs of other universities, only by changing the activities and objectives, yet maintaining the procedure.

As a final and specific conclusion and responding to questions 4 and 5 of Section 3, UPV TTO develops activities which are well aligned with UPV goals. However, there is some misalignment that could be corrected with the development of activities aimed at encouraging

researchers to participate in R&D&I financed with public and private funds. It could also be advisable to transfer resource-consuming bureaucratic activities to other University Units.

This tool allows MT to verify the degree of fine-tuning between the political decision-maker level and the administrative executive level that has to carry out actions that contribute to fulfill the decisions of the political level

The main limitation of this work has to do with the scope of our research that in a first step is only addressed to TTO managers. We consider that a second step would have to take into account university researchers as the "third mission" stakeholders. A second limitation is related to the complexity of problem analysis based on ANP. The main problem is the large number of questions to be answered by the decision maker. In those complex cases the use of subnets (like Benefits, Opportunities, Costs and Risks) could be a good solution to address the complexity of the problems.

Future research will incorporate the views of researchers and TTO users to complete the analysis of this services unit of the university and will extend the application of this method to another university TTO.

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ANNEX 1

(Table 7.- Unweighted supermatrix. ANP Model)

(Table 8. Cluster matrix)

(Table 9.- Weighted matrix. ANP Model)

Table 10.- Priorities obtained by Superdecisions.

TABLES

Table 1. Example of the questionnaire about preliminary prioritisation of TTO objectives.

Which of the following two objectives contributes more to promote and facilitate the generation of knowledge and its dissemination and transfer to society? ☐ O1: Facilitate the participation of the UPV in sponsored R&D&I programmes ☐ O2: Channel research activities or technical support hired by companies or other entities. ☐ Equal importance							
To what extent?	☐ Moderate	☐	☐ Strong	☐	☐ Very Strong	☐	☐ Extremely

Table 2.- Questions of the Questionnaire that identify relative influences among activities

Mark with a cross which of the following activities of ***cluster 02: Assistance and negotiation*** *affect the* ***Activity A1.1. Extensive dissemination of official announcements of financial aids for R&D&I projects and activities*** *of* ***cluster 01***

A2.1	*Assistance and support in public calls for financial aid for R&D&I activities and projects*	☐
A2.2	*Assistance and support in the development of sponsored R&D&I activities*	☐
A2.3	*Assistance and support in the development of R&D&I activities with private companies and other entities*	☐
A2.4	*Negotiation and formalisation of R&D&I agreements with private companies*	☐
A2.5	*Assistance and support in the development of contracted R&D&I activities*	☐
A2.6	*Participation in associations, foundations, etc*	☐

Table 3. Influence Matrix.

		02						03						04								05							06				01_ALTERNATIVES				
		A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	A2.1	A2.2	A2.3	A2.4	A2.5	A2.6	A3.1	A3.2	A3.3	A3.4	A3.5	A3.6	A3.7	A3.8	A4.1	A4.2	A4.3	A4.4	A4.5	A4.6	A4.7	A5.1	A5.2	A5.3	A5.4	O1	O2	O3	O4	O5
02	A1.1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1
	A1.2	0	1	1	1	1	0	0	1	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	A1.3	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1
	A1.4	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	A1.5	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1
	A1.6	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
03	A2.1	1	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1
	A2.2	0	1	0	0	0	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1
	A2.3	0	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
	A2.4	0	1	0	1	0	0	0	0	1	1	1	0	0	0	0	1	0	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
	A2.5	0	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
	A2.6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
04	A3.1	1	0	0	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1
	A3.2	1	0	0	0	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1
	A3.3	1	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1
	A3.4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	1
	A3.5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	0	1	1	0	1	0	0	0	0	0	0	1	1	1	1	1
	A3.6	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	A3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	A3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
05	A4.1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	1	1	1	1
	A4.2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
	A4.3	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
	A4.4	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1
	A4.5	1	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	1	1	1	1
	A4.6	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1
	A4.7	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1
06	A5.1	0	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1	1
	A5.2	0	1	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	A5.3	0	1	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	A5.4	0	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
01 ALT.	O1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	O2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	O3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	O4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	O5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0

Table 4. Example of the questionnaire about prioritisation of elements

Compare the following elements in the cluster *03 Administrative management* according to their influence upon element *A1.1. Extensive dissemination of official announcements of financial aids for R&D&I projects and activities.* *Tip which has the greatest importance or influence:* ☐ A: *A.3.1 Processing of applications for public R&D&I funding.* ☐ B: *A.3.2 Management of UPV R&D&I support programmes* ☐ Equal importance							
To what extent?	☐ Moderate	☐	☐ Strong	☐	☐ Very Strong	☐	☐ Extremely

Table 5. Example of the questionnaire about prioritisation of clusters

Compare the following groups that have some influence upon the cluster: *Alternatives* *Tip which has the greatest importance or influence:* ☐ A: *01 Disseminating, promoting and commercialising research results* ☐ B: *02 Assistance and negotiation* ☐ Equal importance							
To what extent?	☐ Moderate	☐	☐ Strong	☐	☐ Very Strong	☐	☐ Extremely

Table 6. Priority of TTO activities. ANP Model

Nodes		Ideal	Distributive
A4.5	Support services to justify expenditure incurred in the development of subsidised R&D&I activities	1.000	0.093
A2.1	Assistance and support in public calls for financial aid for R&D&I activities and projects	0.778	0.072
A3.1	Processing of applications for public R&D&I funding	0.677	0.063
A3.4	Claims prior to Payment Management of R&D&I activities	0.671	0.062
A4.7	Management of invoices generated in the development of R&D&I activities	0.605	0.056
A3.3	Support to subsidised R&D&I Audits	0.576	0.054
A2.4	Negotiation and formalisation of R&D&I agreements with private companies	0.546	0.051
A3.2	Management of UPV R&D&I support programmes	0.524	0.049
A2.3	Assistance and support in the development of R&D&I activities with private companies and other entities	0.481	0.045
A2.2	Assistance and support in the development of sponsored R&D&I activities	0.458	0.043
A4.4	Management of income generated by subsidised R&D&I activities	0.420	0.039
A4.6	Payment proposal to partners in joint projects	0.380	0.035
A1.2	Promotion and commercialisation of R&D&I results and findings	0.376	0.035
A4.2	Processing of proposals for financial support of subsidised R&D&I activities	0.319	0.030
A2.5	Assistance and support in the development of contracted R&D&I activities	0.316	0.029
A2.6	Participation in associations, foundations, etc.	0.309	0.029
A4.1	Processing of proposals for the opening of cost centres for funded R&D&I activities	0.284	0.026
A3.5	Management of UPV Research Units and Centres	0.283	0.026
A3.6	Management of researchers in the UPV Official Register of Research Unit and Centres	0.248	0.023
A5.2	Management of Industrial Property Rights	0.212	0.020
A1.1	Extensive dissemination of official announcements of financial aids for R&D&I projects and activities	0.207	0.019
A5.3	Management of Intellectual Property Rights	0.199	0.018
A5.4	Transfer to Spin-offs	0.166	0.015

Nodes		Ideal	Distributive
A4.3	Management of applications for in-advanced payment of funded R&D&I activities	0.151	0.014
A3.8	Validation of curricular merits of the research staff	0.133	0.012
A5.1	Identification, cataloguing and promotion of transferable skills and capacities	0.112	0.010
A1.5	Development of news for the communication media	0.103	0.010
A3.7	Accreditation and Qualification of UPV researchers	0.065	0.006
A1.4	Development of the technology offer	0.057	0.005
A1.3	Intermediation with the communication media	0.053	0.005
A1.6	Publication of newsletters for dissemination of R&D&I results	0.046	0.004

ANNEX 1

Table 7.- Unweighted supermatrix. ANP Model.

		02						03						04								05							06				01_ALTERNATIVES				
		A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	A2.1	A2.2	A2.3	A2.4	A2.5	A2.6	A3.1	A3.2	A3.3	A3.4	A3.5	A3.6	A3.7	A3.8	A4.1	A4.2	A4.3	A4.4	A4.5	A4.6	A4.7	A5.1	A5.2	A5.3	A5.4	O1	O2	O3	O4	O5
02	A1.1	0.606	0	0.025	0	0.026	0.500	1	0.125	0.167	0.125	0.167	0	0.875	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.590	0.050	0.040	0.288	0.030
	A1.2	0	0.429	0.096	0.303	0.137	0	0	0.875	0.833	0.875	0.833	0	0.125	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.637	1	1	1	0.132	0.306	0.227	0.335	0.147
	A1.3	0.059	0	0.369	0.043	0.425	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.105	0	0	0	0.063	0.116	0.032	0.137	0.315
	A1.4	0	0.429	0.089	0.262	0.099	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.066	0.105	0.163	0.072	0.111
	A1.5	0.054	0.143	0.348	0.392	0.313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.258	0	0	0	0.073	0.308	0.421	0.082	0.283
	A1.6	0.281	0	0.074	0	0	0.500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.076	0.115	0.116	0.085	0.114
03	A2.1	1	0	0	0	0	0.750	0.750	0.125	0.041	0.025	0.046	0	0.833	0.750	0.125	0	0	0	0	0	0.519	0.192	0.530	0.193	0.125	0.167	0	0.158	0.065	0.082	0	0.546	0.051	0.047	0.125	0.368
	A2.2	0	0.479	0	0	0	0.250	0.250	0.875	0	0	0	0	0.167	0.250	0.875	0.125	0	0	0	0	0.305	0.727	0.302	0.574	0.875	0.833	0	0	0.023	0.024	0	0.175	0.033	0.052	0.125	0.180
	A2.3	0	0.116	0	0.333	0	0	0	0	0.561	0.258	0.252	0	0	0	0	0	0	0	0	0	0.054	0.038	0.052	0.102	0	0	0.143	0.211	0.133	0.174	0.333	0.054	0.433	0.306	0.125	0.088
	A2.4	0	0.306	0	0.333	0	0	0	0	0.238	0.563	0.077	0	0	0	0	0.875	0	0	1	1	0.060	0.024	0.055	0.071	0	0	0.143	0.523	0.543	0.555	0.333	0.059	0.296	0.363	0.125	0.095
	A2.5	0	0.098	0	0.333	0	0	0	0	0.160	0.155	0.625	0	0	0	0	0	0	0	0	0	0.063	0.019	0.061	0.061	0	0	0.714	0.108	0.237	0.165	0.333	0.055	0.169	0.196	0.125	0.088
	A2.6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.111	0.017	0.036	0.375	0.180
04	A3.1	0.455	0	0	0	0	0.500	0.372	0.058	0	0	0	0	0.521	0.304	0.125	0	0	0	0	0	0.423	0.661	0.740	0.875	0.143	0.125	0	0	0	0	0	0.474	0.114	0.122	0.061	0.063
	A3.2	0.455	0	0	0	0	0.500	0.467	0.359	0	0	0	0	0.296	0.489	0	0	0	0	0	0.133	0.375	0.211	0.060	0	0.111	0	0	1	0.750	0.250	0.833	0.189	0.040	0.101	0.322	0.175
	A3.3	0.091	0	0	0	0	0	0.116	0.456	0	0	0	0	0.093	0.053	0.875	0	0	0	0	0	0.055	0.064	0.140	0.125	0.697	0.875	0	0	0	0	0	0.096	0.054	0.100	0.074	0.059
	A3.4	0	0	0	0	0	0	0	0	0.875	0.833	0.875	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.033	0.488	0.097	0.034	0.061
	A3.5	0	0	0	0	0	0	0	0	0	0	0	0	0.043	0.100	0	0	0.875	0.250	0.156	0.036	0	0.064	0.060	0	0.049	0	0	0	0	0	0	0.053	0.198	0.263	0.178	0.196
	A3.6	0	0	0	0	0	0	0.045	0.128	0.125	0.167	0.125	0	0.047	0.055	0	0	0.125	0.750	0.185	0.101	0.108	0	0	0	0	0	0	0	0	0	0	0.101	0.042	0.143	0.270	0.078
	A3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.659	0.383	0	0	0	0	0	0	0	0	0	0	0	0.027	0.020	0.082	0.024	0.114
	A3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.347	0.039	0	0	0	0	0	0	0	0.250	0.750	0.167	0.028	0.043	0.093	0.037	0.254
05	A4.1	0	0	0	0	0	0	0.089	0.059	0.077	0.077	0.077	0	0	0	0	0	0	0	0	0	0.723	0	0	0	0.116	0	0.091	0	0	0	0	0.087	0.071	0.207	0.093	0.333
	A4.2	0	0	0	0	0	0	0.179	0.158	0.077	0.077	0.077	0	0.405	0	0	0	0	0	0	0	0	0.564	0.194	0	0	0	0	0	0	0	0	0.307	0.065	0.105	0.412	0.111
	A4.3	0	0	0	0	0	0	0.127	0.153	0.077	0.077	0.077	0	0	0	0	0	0	0	0	0	0	0.066	0.583	0	0	0	0	0	0	0	0	0.059	0.064	0.073	0.135	0.111
	A4.4	0	0	0	0	0	0	0.046	0.135	0.077	0.077	0.077	0	0	0	0	0	0	0	0	0	0	0.316	0.194	0.633	0.044	0.309	0.091	0	1	1	0	0.036	0.061	0.076	0.253	0.111
	A4.5	1	0	0	0	0	0	0.379	0.426	0	0	0	0	0.481	1	0.833	0	0	0	0	0	0.108	0	0	0	0.765	0.049	0	0	0	0	0	0.368	0.054	0.084	0.051	0.111
	A4.6	0	0	0	0	0	0	0.179	0.069	0	0	0	0	0.114	0	0.167	0	0	0	0	0	0.119	0	0	0.304	0.075	0.642	0	0	0	0	0	0.125	0.103	0.139	0.018	0.111
	A4.7	0	0	0	0	0	0	0	0	0.692	0.692	0.692	0	0	0	0	0	0	0	0	0	0.050	0.053	0.028	0.063	0	0	0.818	0	0	0	0	0.018	0.583	0.318	0.037	0.111
06	A5.1	0	0	0.500	0.600	0.625	0	0	0	0.403	0.069	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.638	0	0	0.275	0.211	0.622	0.567	0.609	0.613
	A5.2	0	0.333	0.167	0.200	0.125	0	0.500	0.500	0.177	0.365	0.455	0	0.333	0.333	0	0	0.500	0	0.333	0.333	0	0	0	0	0	0	0	0.155	0.584	0.110	0.158	0.431	0.208	0.206	0.215	0.157
	A5.3	0	0.333	0.167	0.200	0.125	0	0.500	0.500	0.153	0.399	0.455	0	0.333	0.333	0	0	0.500	0	0.333	0.333	0	0	0	0	0	0	0	0.138	0.135	0.567	0.092	0.281	0.113	0.133	0.128	0.072
	A5.4	0	0.333	0.167	0	0.125	0	0	0	0.268	0.167	0.091	0	0.333	0.333	0	1	0	0	0.333	0.333	0	0	0	0	0	0	0	0.069	0.281	0.323	0.475	0.077	0.057	0.094	0.048	0.157
01 ALT.	O1	0.631	0.086	0.057	0.044	0.043	0.506	0.622	0.643	0.040	0.038	0.040	0.552	0.621	0.624	0.653	0.075	0.084	0.170	0.360	0.288	0.659	0.692	0.671	0.678	0.692	0.692	0.077	0.304	0.121	0.101	0.069	0	0	0	0	0
	O2	0.055	0.035	0.054	0.089	0.049	0.176	0.151	0.062	0.622	0.310	0.163	0.101	0.164	0.146	0.050	0.694	0.082	0.173	0.373	0.261	0.167	0.077	0.187	0.088	0.077	0.077	0.692	0.228	0.403	0.301	0.201	0	0	0	0	0
	O3	0.054	0.415	0.366	0.453	0.304	0.102	0.089	0.137	0.235	0.443	0.423	0.164	0.095	0.047	0.188	0.111	0.080	0.045	0.145	0.318	0.053	0.077	0.042	0.080	0.077	0.077	0.077	0.243	0.409	0.522	0.549	0	0	0	0	0
	O4	0.094	0.043	0.050	0.076	0.080	0.036	0.032	0.054	0.075	0.152	0.279	0.139	0.056	0.098	0.052	0.057	0.674	0.563	0.070	0.102	0.060	0.077	0.049	0.077	0.077	0.077	0.077	0.207	0.027	0.059	0.149	0	0	0	0	0
	O5	0.165	0.422	0.473	0.338	0.524	0.181	0.106	0.105	0.028	0.057	0.095	0.045	0.064	0.084	0.057	0.063	0.079	0.050	0.052	0.031	0.062	0.077	0.051	0.076	0.077	0.077	0.077	0.018	0.039	0.018	0.032	0	0	0	0	0

Table 8. Cluster matrix

Cluster Node Levels	Cluster 01	Cluster 02	Cluster 03	Cluster 04	Cluster 05	Objectives
Cluster 01	0.095	0.035	0.025	0.023	0.322	0.102
Cluster 02	0.124	0.084	0.076	0.037	0.059	0.584
Cluster 03	0.083	0.142	0.205	0.289	0.247	0.241
Cluster 04	0.033	0.284	0.283	0.533	0.036	0.050
Cluster 05	0.169	0.078	0.043	0.000	0.225	0.024
Objectives	0.496	0.377	0.368	0.118	0.110	0.000

Table 9.- Weighted matrix. ANP Model.

		02						03						04								05							06				01_ALTERNATIVES				
		A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	A2.1	A2.2	A2.3	A2.4	A2.5	A2.6	A3.1	A3.2	A3.3	A3.4	A3.5	A3.6	A3.7	A3.8	A4.1	A4.2	A4.3	A4.4	A4.5	A4.6	A4.7	A5.1	A5.2	A5.3	A5.4	O1	O2	O3	O4	O5
02	A1.1	0.069	0	0.003	0	0.003	0.059	0.035	0.004	0.006	0.004	0.006	0	0.022	0.025	0	0	0	0	0	0	0	0	0	0	0.023	0	0	0	0	0	0	0.060	0.005	0.004	0.029	0.003
	A1.2	0	0.046	0.012	0.032	0.017	0	0	0.031	0.029	0.031	0.029	0	0.003	0	0	0	0	0	0.035	0.035	0	0	0	0	0	0	0	0.213	0.322	0.322	0.334	0.013	0.031	0.023	0.034	0.015
	A1.3	0.007	0	0.046	0.005	0.053	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.035	0	0	0	0.006	0.012	0.003	0.014	0.032
	A1.4	0	0.046	0.011	0.028	0.012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.007	0.011	0.017	0.007	0.011
	A1.5	0.006	0.015	0.043	0.042	0.039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.086	0	0	0	0.007	0.031	0.043	0.008	0.029
	A1.6	0.032	0	0.009	0	0	0.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.012	0.012	0.009	0.012
03	A2.1	0.149	0	0	0	0	0.116	0.063	0.010	0.003	0.002	0.004	0	0.063	0.057	0.010	0	0	0	0	0	0.019	0.007	0.020	0.007	0.005	0.006	0	0.010	0.004	0.005	0	0.319	0.030	0.028	0.073	0.215
	A2.2	0	0.067	0	0	0	0.039	0.021	0.073	0	0	0	0	0.013	0.019	0.072	0.014	0	0	0	0	0.011	0.027	0.011	0.022	0.032	0.031	0	0	0.001	0.001	0	0.102	0.019	0.030	0.073	0.105
	A2.3	0	0.016	0	0.047	0	0	0	0	0.047	0.022	0.021	0	0	0	0	0	0	0	0	0	0.002	0.001	0.002	0.004	0	0	0.005	0.013	0.008	0.010	0.021	0.032	0.253	0.179	0.073	0.052
	A2.4	0	0.043	0	0.047	0	0	0	0	0.020	0.047	0.006	0	0	0	0	0.096	0	0	0.106	0.106	0.002	0.001	0.002	0.003	0	0	0.005	0.032	0.032	0.033	0.021	0.034	0.173	0.212	0.073	0.056
	A2.5	0	0.014	0	0.047	0	0	0	0	0.013	0.013	0.052	0	0	0	0	0	0	0	0	0	0.002	0.001	0.002	0.002	0	0	0.027	0.007	0.014	0.010	0.021	0.032	0.099	0.114	0.073	0.052
	A2.6	0	0	0	0	0	0	0	0	0	0	0	0.182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.065	0.010	0.021	0.219	0.105
04	A3.1	0.045	0	0	0	0	0.052	0.053	0.008	0	0	0	0	0.107	0.062	0.027	0	0	0	0	0	0.125	0.196	0.219	0.259	0.041	0.037	0	0	0	0	0	0.114	0.027	0.029	0.015	0.015
	A3.2	0.045	0	0	0	0	0.052	0.066	0.051	0	0	0	0	0.061	0.100	0	0	0	0	0	0.038	0.111	0.062	0.018	0	0.032	0	0	0.256	0.185	0.062	0.214	0.045	0.010	0.024	0.078	0.042
	A3.3	0.009	0	0	0	0	0	0.016	0.065	0	0	0	0	0.019	0.011	0.192	0	0	0	0	0	0.016	0.019	0.041	0.037	0.202	0.259	0	0	0	0	0	0.023	0.013	0.024	0.018	0.014
	A3.4	0	0	0	0	0	0	0	0	0.124	0.118	0.124	0	0	0	0	0.296	0	0	0	0	0	0	0	0	0	0	0.296	0	0	0	0	0.008	0.118	0.023	0.008	0.015
	A3.5	0	0	0	0	0	0	0	0	0	0	0	0	0.009	0.020	0	0	0.291	0.089	0.045	0.010	0	0.019	0.018	0	0.014	0	0	0	0	0	0	0.013	0.048	0.063	0.043	0.047
	A3.6	0	0	0	0	0	0	0.006	0.018	0.018	0.024	0.018	0	0.010	0.011	0	0	0.042	0.268	0.053	0.029	0.032	0	0	0	0	0	0	0	0	0	0	0.024	0.010	0.034	0.065	0.019
	A3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.188	0.109	0	0	0	0	0	0	0	0	0	0	0	0.006	0.005	0.020	0.006	0.027
	A3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.099	0.011	0	0	0	0	0	0	0	0.062	0.185	0.043	0.007	0.010	0.022	0.009	0.061
05	A4.1	0	0	0	0	0	0	0.025	0.017	0.022	0.022	0.022	0	0	0	0	0	0	0	0	0	0.394	0	0	0	0.062	0	0.050	0	0	0	0	0.004	0.004	0.010	0.005	0.017
	A4.2	0	0	0	0	0	0	0.051	0.045	0.022	0.022	0.022	0	0.115	0	0	0	0	0	0	0	0	0.308	0.106	0	0	0	0	0	0	0	0	0.015	0.003	0.005	0.020	0.006
	A4.3	0	0	0	0	0	0	0.036	0.043	0.022	0.022	0.022	0	0	0	0	0	0	0	0	0	0	0.036	0.318	0	0	0	0	0	0	0	0	0.003	0.003	0.004	0.007	0.006
	A4.4	0	0	0	0	0	0	0.013	0.038	0.022	0.022	0.022	0	0	0	0	0	0	0	0	0	0	0.172	0.106	0.345	0.023	0.168	0.050	0	0.036	0.036	0	0.002	0.003	0.004	0.013	0.006
	A4.5	0.040	0	0	0	0	0	0.108	0.121	0	0	0	0	0.136	0.283	0.253	0	0	0	0	0	0.059	0	0	0	0.407	0.027	0	0	0	0	0	0.018	0.003	0.004	0.003	0.006
	A4.6	0	0	0	0	0	0	0.051	0.020	0	0	0	0	0.032	0	0.051	0	0	0	0	0	0.065	0	0	0.166	0.040	0.350	0	0	0	0	0	0.006	0.005	0.007	0.001	0.006
	A4.7	0	0	0	0	0	0	0	0	0.196	0.196	0.196	0	0	0	0	0	0	0	0	0	0.027	0.029	0.015	0.034	0	0	0.446	0	0	0	0	0.001	0.029	0.016	0.002	0.006
06	A5.1	0	0	0.111	0.115	0.139	0	0	0	0.032	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.149	0	0	0.064	0.005	0.015	0.014	0.015	0.015
	A5.2	0	0.064	0.037	0.038	0.028	0	0.039	0.039	0.014	0.029	0.036	0	0.014	0.014	0	0	0.035	0	0.020	0.020	0	0	0	0	0	0	0	0.036	0.132	0.025	0.037	0.010	0.005	0.005	0.005	0.004
	A5.3	0	0.064	0.037	0.038	0.028	0	0.039	0.039	0.012	0.031	0.036	0	0.014	0.014	0	0	0.035	0	0.020	0.020	0	0	0	0	0	0	0	0.032	0.030	0.128	0.021	0.007	0.003	0.003	0.003	0.002
	A5.4	0	0.064	0.037	0	0.028	0	0	0	0.021	0.013	0.007	0	0.014	0.014	0	0.062	0	0	0.020	0.020	0	0	0	0	0	0	0	0.016	0.063	0.073	0.111	0.002	0.001	0.002	0.001	0.004
01 ALT.	O1	0.377	0.048	0.037	0.025	0.028	0.315	0.235	0.243	0.015	0.014	0.015	0.451	0.228	0.230	0.258	0.040	0.050	0.109	0.184	0.148	0.080	0.084	0.081	0.082	0.082	0.084	0.009	0.035	0.013	0.011	0.008	0	0	0	0	0
	O2	0.033	0.020	0.035	0.050	0.032	0.109	0.057	0.023	0.234	0.117	0.061	0.082	0.060	0.054	0.020	0.369	0.049	0.111	0.191	0.134	0.020	0.009	0.023	0.011	0.009	0.009	0.084	0.026	0.044	0.033	0.023	0	0	0	0	0
	O3	0.032	0.233	0.239	0.254	0.199	0.064	0.034	0.052	0.089	0.167	0.159	0.134	0.035	0.017	0.074	0.059	0.048	0.029	0.075	0.163	0.006	0.009	0.005	0.010	0.009	0.009	0.009	0.028	0.045	0.057	0.063	0	0	0	0	0
	O4	0.056	0.024	0.032	0.043	0.052	0.022	0.012	0.020	0.028	0.057	0.105	0.114	0.021	0.036	0.021	0.030	0.403	0.362	0.036	0.052	0.007	0.009	0.006	0.009	0.009	0.009	0.009	0.024	0.003	0.006	0.017	0	0	0	0	0
	O5	0.099	0.237	0.309	0.190	0.342	0.113	0.040	0.040	0.011	0.022	0.036	0.037	0.023	0.031	0.022	0.033	0.047	0.032	0.027	0.016	0.007	0.009	0.006	0.009	0.009	0.009	0.009	0.002	0.004	0.002	0.004	0	0	0	0	0

Table 10.- Priorities obtained by Superdecisions.

Name	Normalised By Cluster	Limiting
A1.1	0.246	0.014
A1.2	0.447	0.026
A1.3	0.063	0.004
A1.4	0.067	0.004
A1.5	0.123	0.007
A1.6	0.054	0.003
A2.1	0.269	0.054
A2.2	0.159	0.032
A2.3	0.166	0.033
A2.4	0.189	0.038
A2.5	0.109	0.022
A2.6	0.107	0.021
A3.1	0.213	0.047
A3.2	0.165	0.036
A3.3	0.181	0.040
A3.4	0.211	0.047
A3.5	0.089	0.020
A3.6	0.078	0.017
A3.7	0.021	0.005
A3.8	0.042	0.009
A4.1	0.090	0.020
A4.2	0.101	0.022
A4.3	0.048	0.010
A4.4	0.133	0.029
A4.5	0.316	0.069
A4.6	0.120	0.026
A4.7	0.191	0.042
A5.1	0.163	0.008
A5.2	0.307	0.015
A5.3	0.288	0.014
A5.4	0.241	0.012
O1	0.363	0.092
O2	0.222	0.056
O3	0.177	0.045
O4	0.131	0.033
O5	0.107	0.027

FIGURES

Figure 1. UPV Organizational Structure

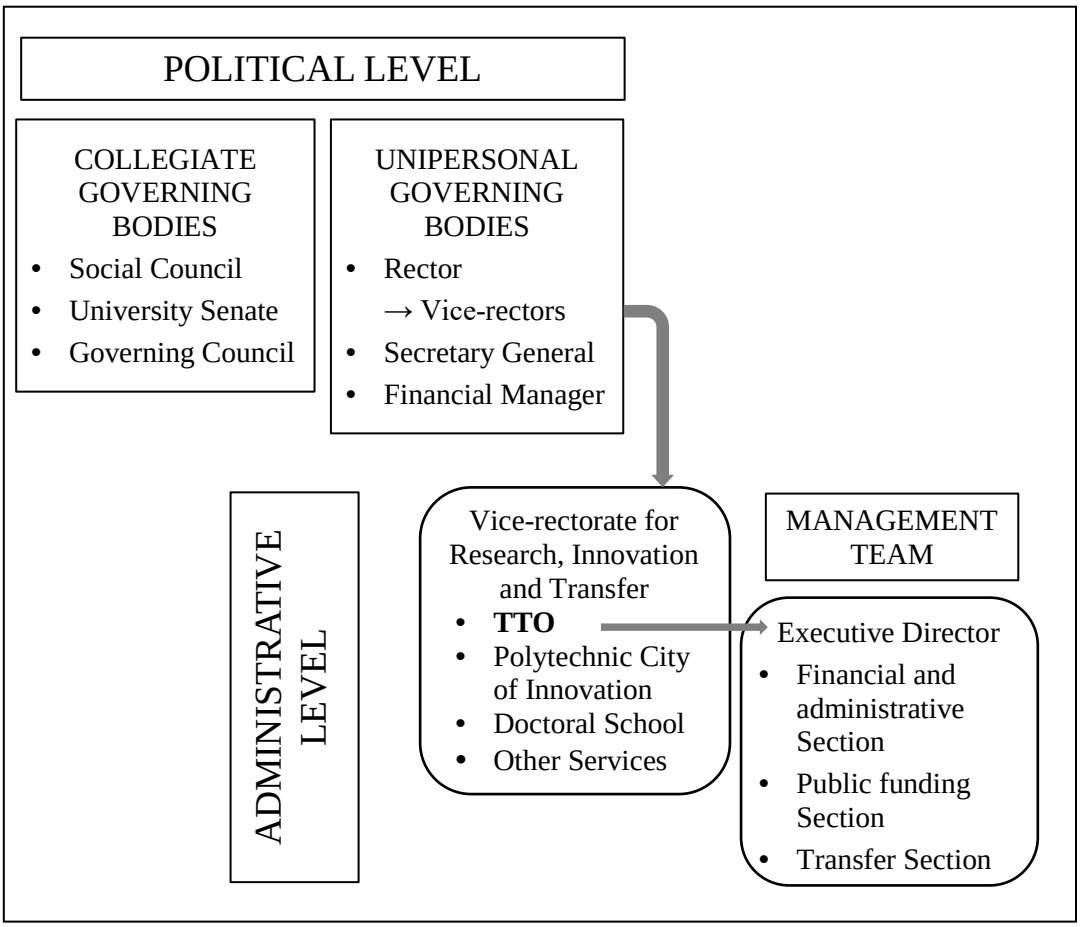

Figure 2. Steps of the analysis process

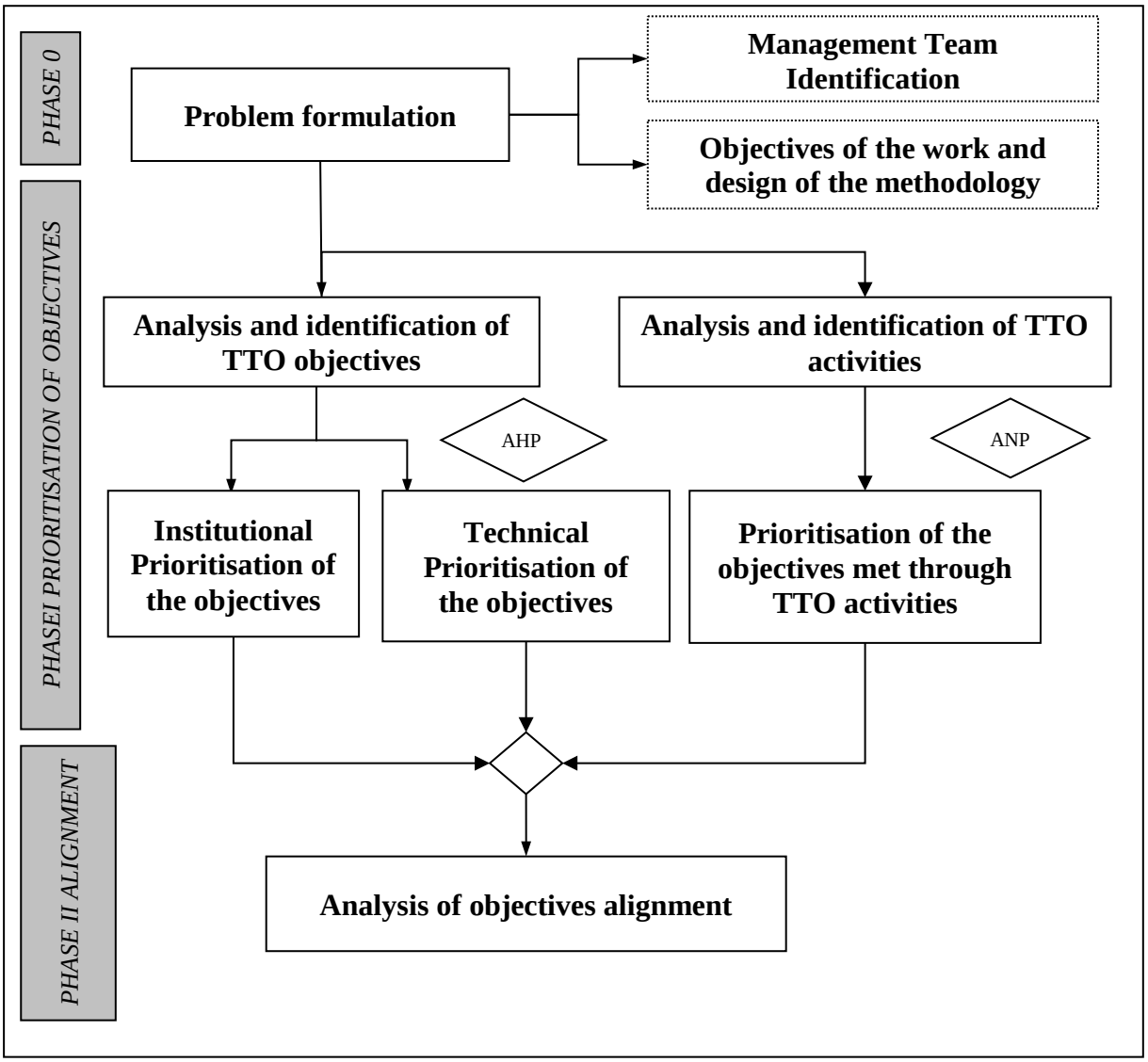

Figure 3.- Hierarchical model for the preliminary prioritisation of TTO objectives.

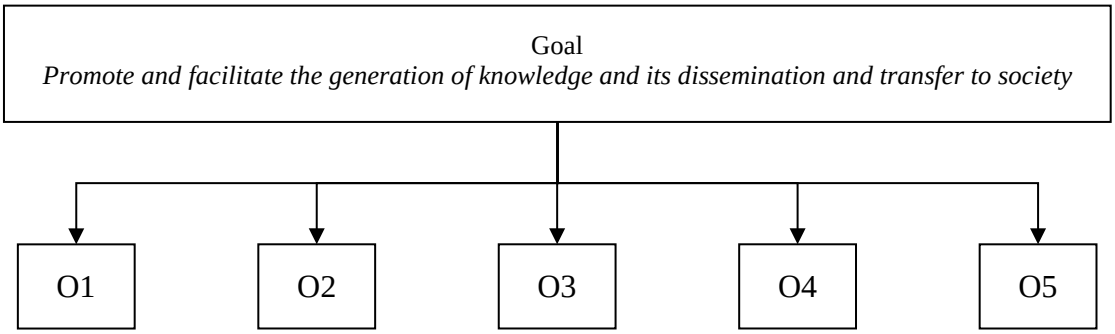

Figure 4. Preliminary prioritization of TTO objectives

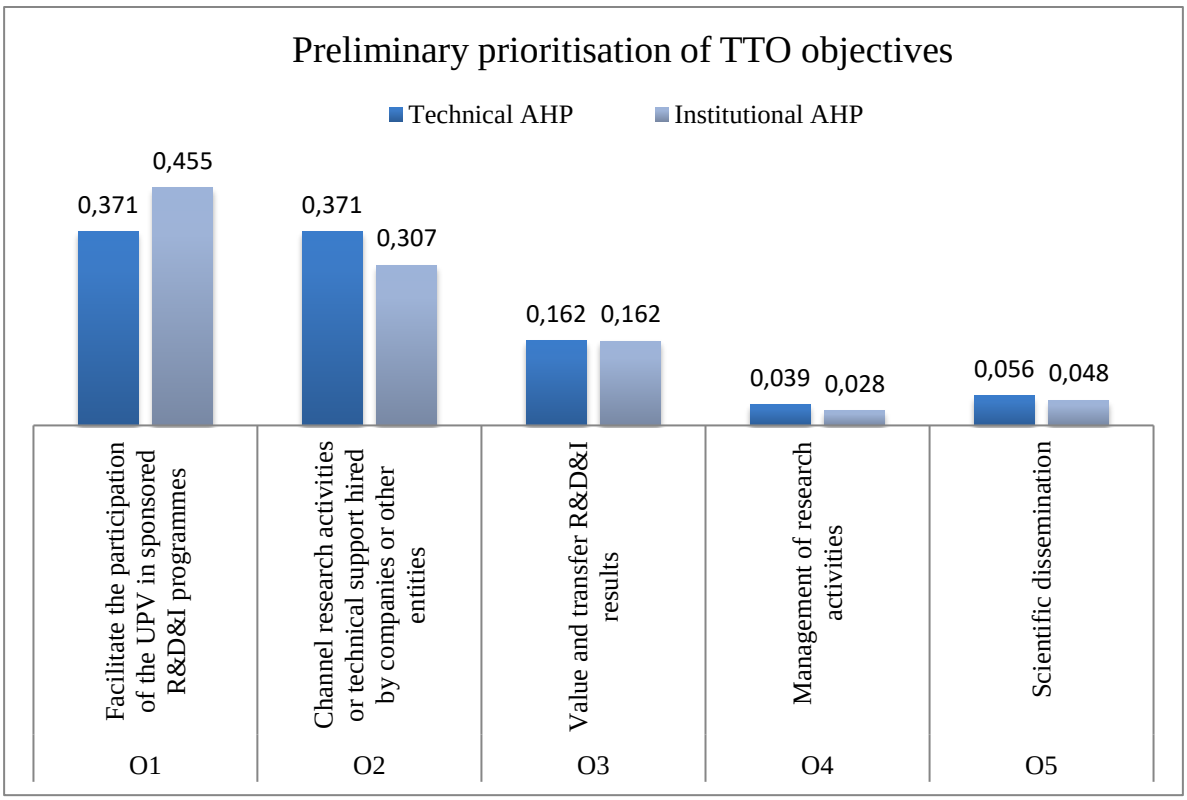

Figure 5. Representation of the ANP model

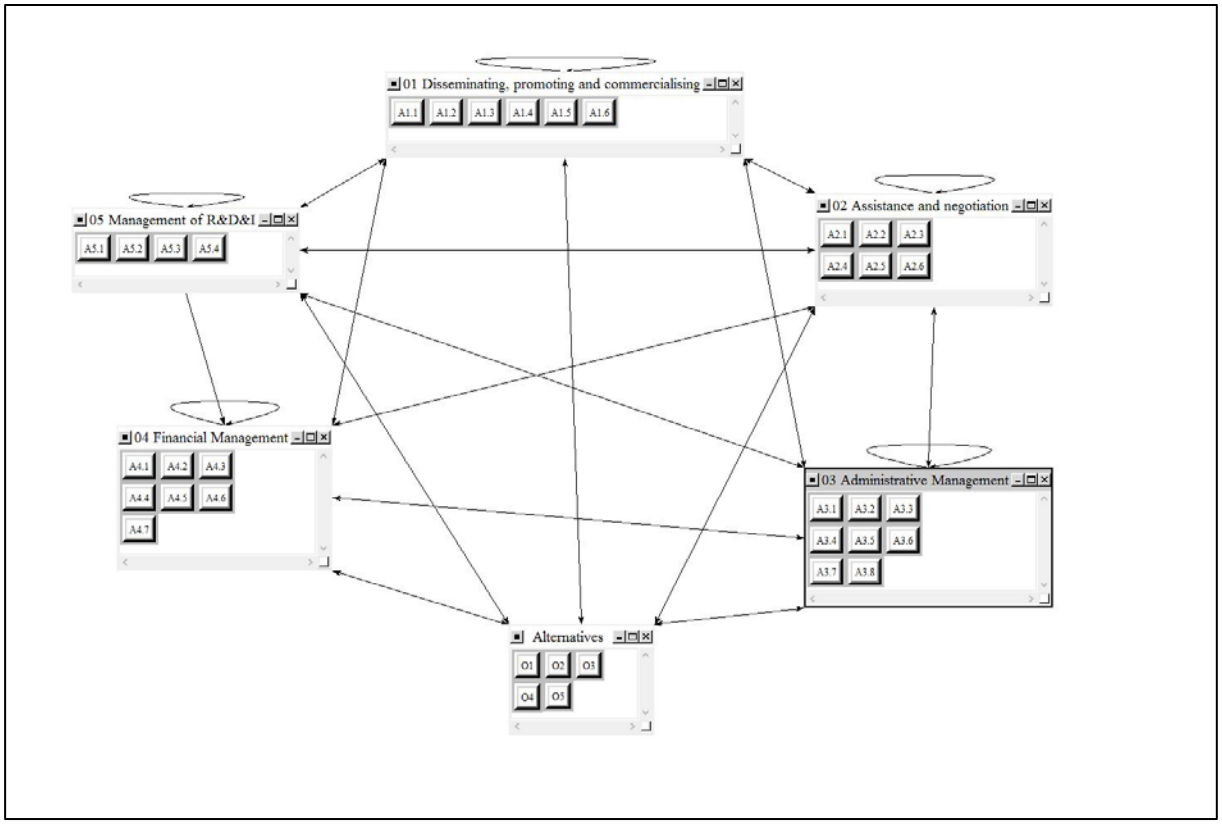

Figure 6. Prioritisation of Objectives –ANP

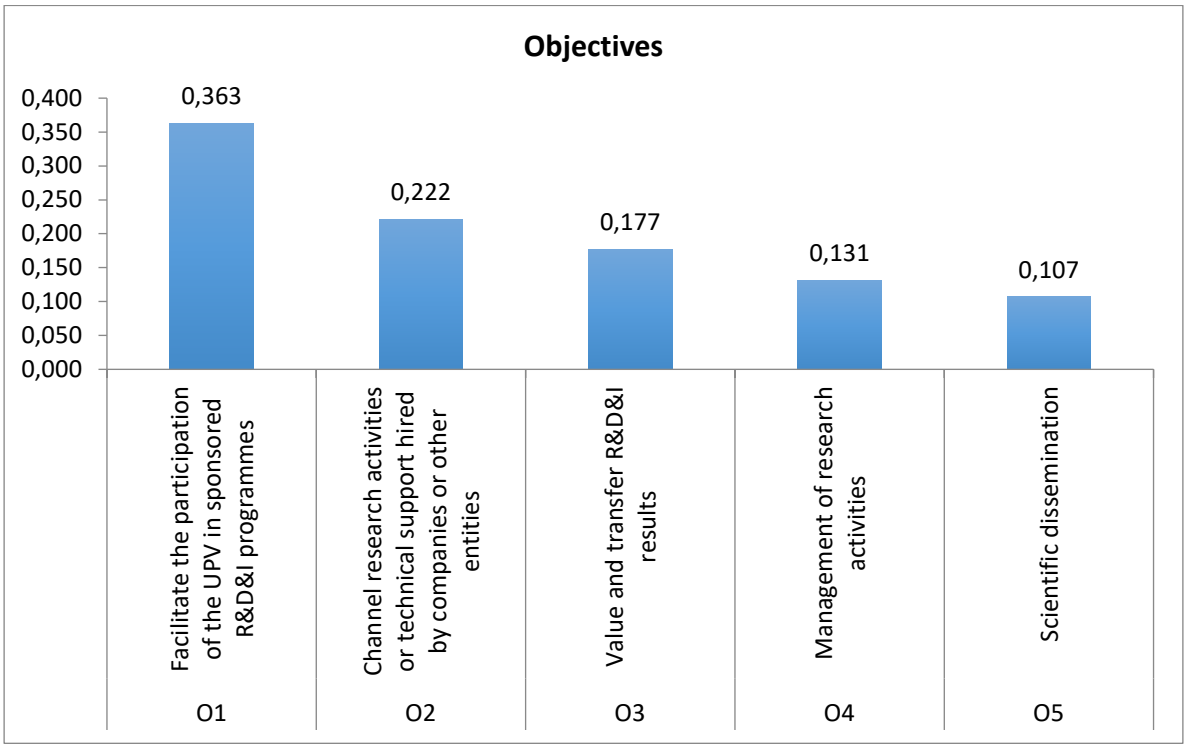

Figure 7. The ten most influential TTO activities

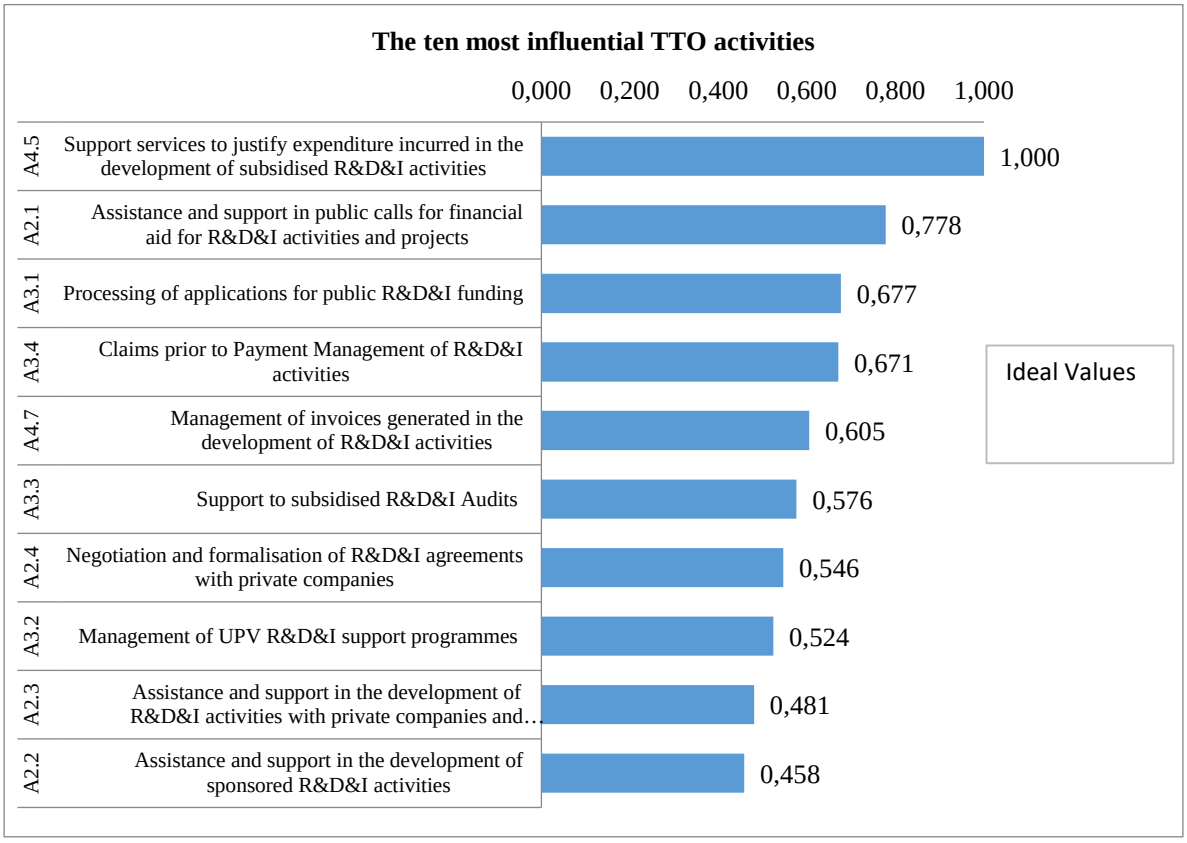

Figure 8. Weights of the activities within the cluster A1

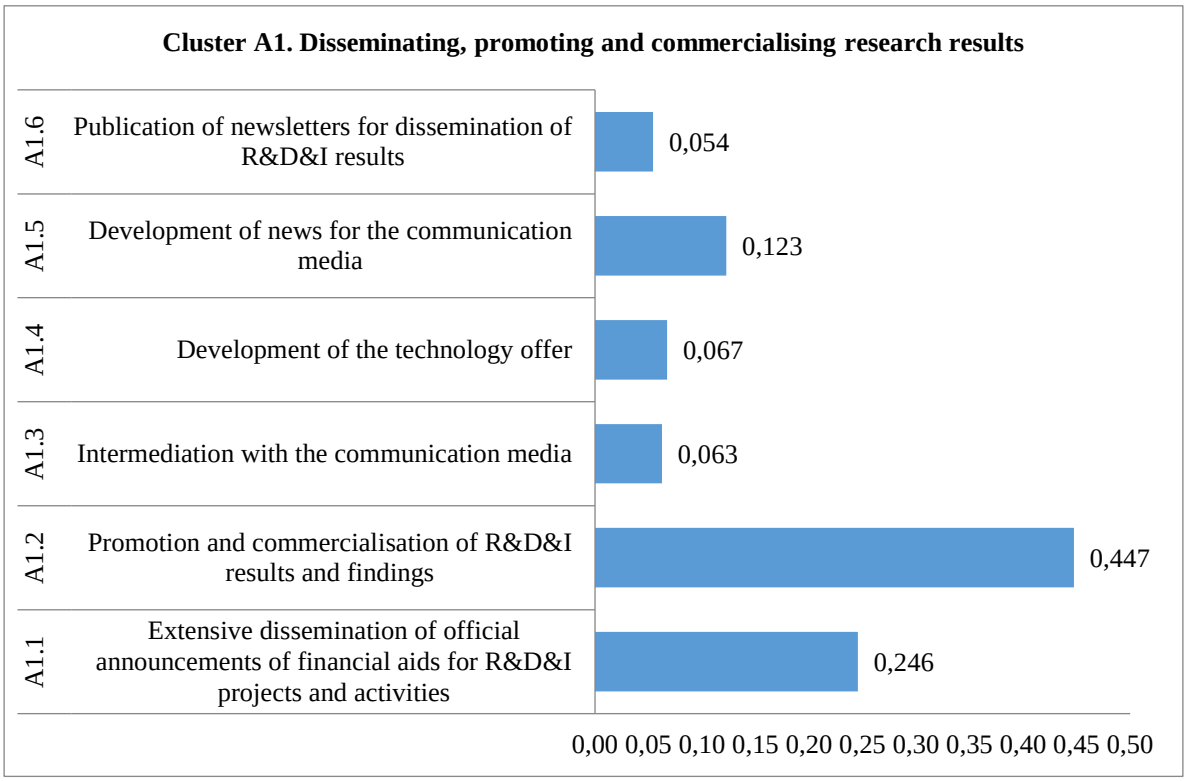

Figure 9. Weights of the activities within the cluster A2

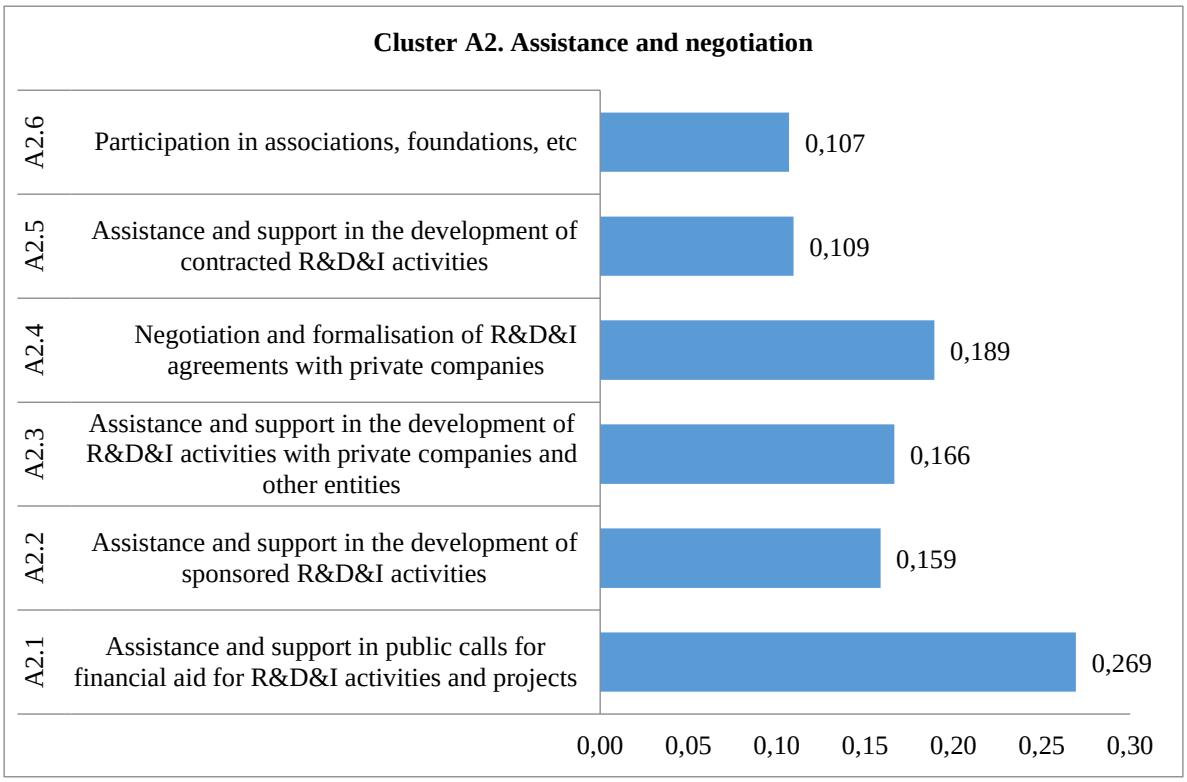

Figure 10. Weights of the activities within the cluster A3

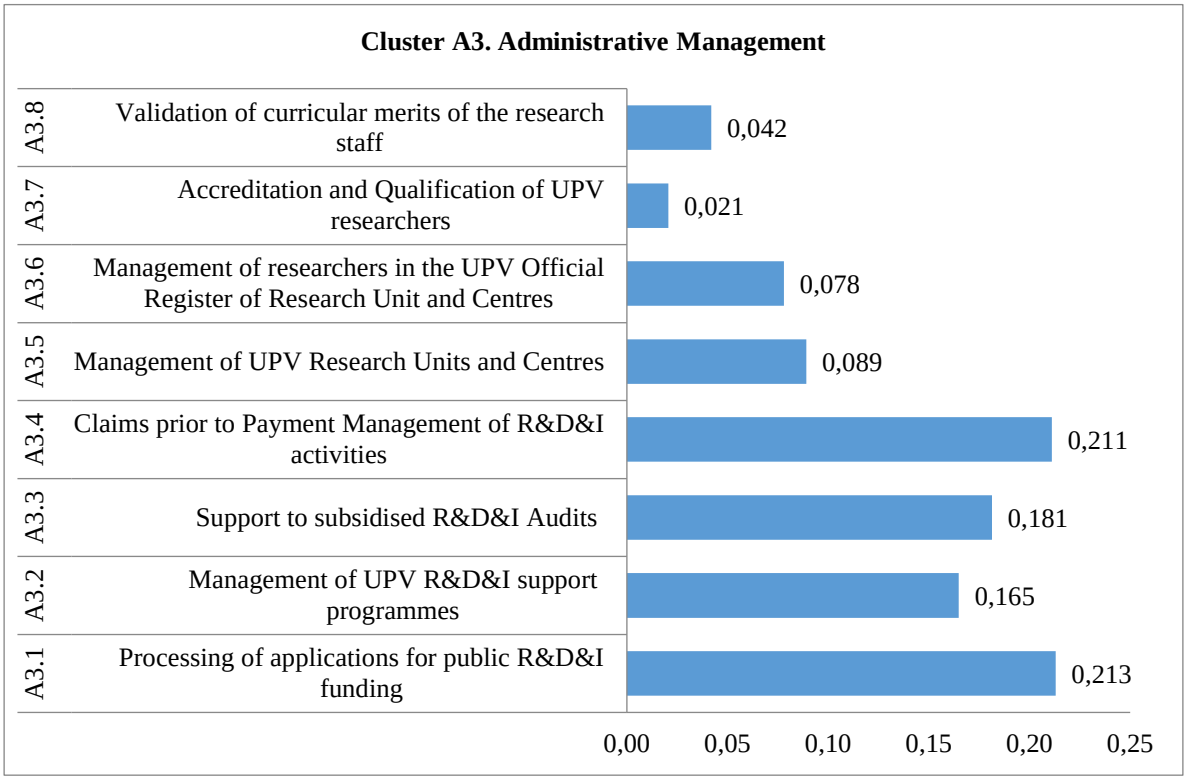

Figure 11. Weights of the activities within the cluster A4

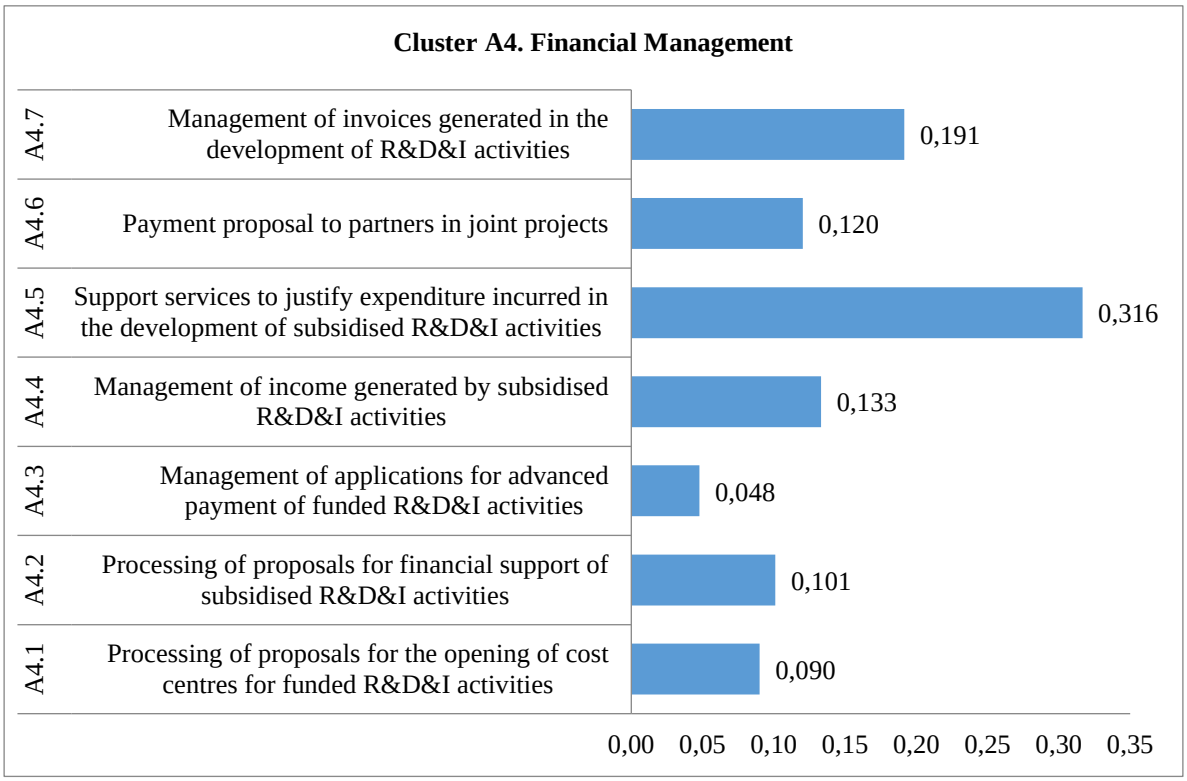

Figure 12. Weights of the activities within the cluster A4

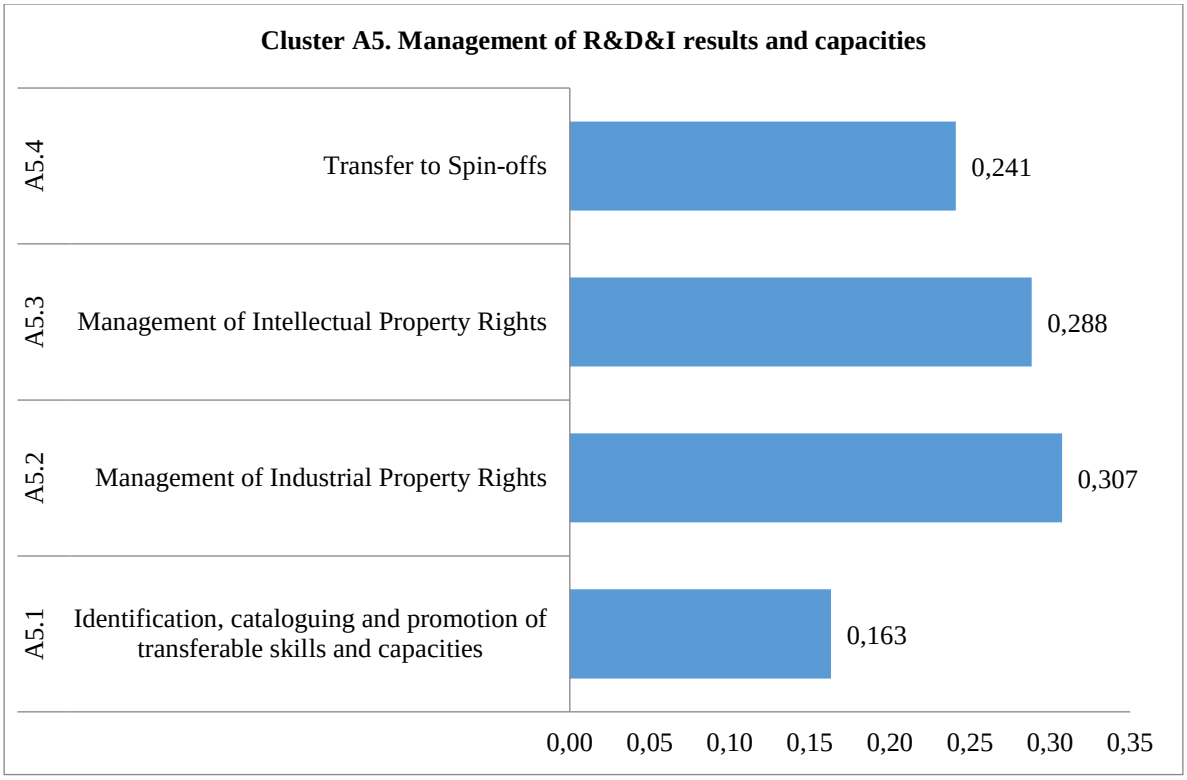

Figure 13. Analysis of objectives Alignment