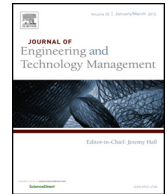




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# An in-depth analysis of a TTO's objectives alignment within the university strategy: An ANP-based approach

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### 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.

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## 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*

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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 generalisation, 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

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