Innovation Management Software Exploiting Multiple Criteria Analysis: The Case of Innovation Centre of Crete

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ABSTRACT

Innovation is a critical factor in building an organization’s culture of growth. Provided that it is properly blended with organizational development initiatives and aligned with the organization’s strategy, it supplies a compelling advantage for the growth process. Neglecting to encompass innovation in an organization’s culture could lead to shrinkage and even extinction, in the case of an intensively competitive market. Executive staff must consider innovative technologies and be aware of all growth opportunities. However, this staff is stressed under information overload. A need exists to reduce the information load and filter available technologies according to the specific needs of the organization. In this paper, the authors propose a recommendation approach to match the needs of an organization against existing technologies (innovative products or services). The organization expresses its customized needs by declaring its preferences over a small reference set of indicative technologies. Each technology is characterized by multiple attributes, in a way that the organization ultimately expresses the trade-offs between the attributes’ significance weights. This information is used to create the organization’s profile. The profile guides a recommendation process, according to which available technologies are evaluated against the profile and proposed to the organization in a descending order.

Keywords: Growth, Innovation Management Systems, Multiple Criteria Analysis, Organizational Culture, Technology Transfer

INTRODUCTION

Innovation does not always mean employing the very latest cutting-edge technology. On the contrary, it is less a question of technology and more a way of thinking and finding creative solutions for business or social problems. Considering the above perspective, innovation management techniques (IMTs) can be seen as a range of tools, techniques and methodologies
that help companies to adapt to circumstances and meet market challenges in a systematic way (European Commission, 2004).

The effectiveness of an Innovation Management Technique (IMT) is therefore the firm’s ability for knowledge management, an ability that exists either internally or through external support. To this end, smaller enterprises (i.e., SMEs) are underprivileged because of two identified difficulties for successful innovation management: access to information and limited external assistance (Carayannis & Bakouros, 2010). In this paper we propose an innovative management technique to mitigate these problems. The technique proposed implements a multi-criteria methodology through an information system and it emphasizes the process of technology transfer, matching the innovation products and potential users. More specifically, this work is to recommend innovations to users, based on their specific profiles.

The prospect of the proposed innovation management technique, seems ever more relevant as there is a growing trend to shift the attention of companies from the closed, internal research and development model towards the open innovation model (Christensen, Olesen, & Kjer, 2005; Rigby & Zook, 2002). Moreover, in case that companies find a way to reconcile their internal Research & Development (R&D) efforts with external sources of knowledge, they complement a critical factor to increase their innovation performance (Faems, Van Looy, & Debackere, 2005). Especially as the complexity and rapidity of technological change is high and it keeps growing, it is extremely difficult for an organization to remain innovative relying solely to the pool of its internal knowledge. Indeed, the more radical is the type of innovation, the more difficult it becomes to remain innovative (Cassiman & Veugelers, 2006).

Acknowledging this need for organizations to quest external sources, information systems that maintain databases of technology supply and demand have been developed. However, the challenge of accessing external sources for technology transfer is tackled by two major drawbacks: the extent to which the supplied technologies meet personal requirements/preferences and the time that it is needed to filter the information. To demonstrate the amount of information, let us consider the information system of the Enterprise Europe Network (http://www.enterprise-europe-network.ec.europa.eu/services/technology-transfer), which currently manages more than 13,000 profiles. In the case of the patents databases the corresponding figure is much higher. In addition, the supplied technologies are described by a variety of factors, criteria besides their thematic categorization (e.g., maturity, type of cooperation requested, etc.), making the search for information even more complicated. Therefore, searching by just filtering the subject categories or by entering keywords (the popular search options that are offered), may not be sufficient and may deter organizations from conducting a thorough search. This work proposes a way to resolve both of these limitations: the potential user of a technology declares his personal preferences by ranking an indicative (and fictional) set of technologies. Furthermore, the quantification of the weights is estimated through an ordinal regression technique. Then these weights are used in an additive function which calculates the value of each supplied technology (alternative) for the user, which is eventually used to recommend a list of a finite (small) set of technologies.

Besides the demand perspective (users seek for technologies), which is actually rewarding in the case of a plethora of supplied technologies, a slightly modified version of the proposed method can be utilized according to a different perspective, that of forging linkages (users are reached to get technologies). The latter perspective is beneficial in case of a small amount of available technologies. It suggests clustering the available technologies (with respect to their special features) and assigning each cluster to a technology transfer executive, who is distinguished by a specialized profile that fits the cluster’s silhouette.

An additional contribution of this work is the proposal of specific criteria to evaluate the matching of a technology with a user, and of