



No escape from the dominant theories: The analysis of intellectual pillars of technology management in developing countries

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ABSTRACT

This paper aims to identify the intellectual bases of the technology management (TM) literature generated in developing countries using citation and co-citation analyses and answer the question of whether the intellectual bases of the TM literature created by authors in developing countries diverge from those of the global TM literature. Based on a comprehensive bibliometric analysis of ten technology-innovation management (TIM) specialty journals through the period of 1998–2007, this study produces three important findings. First, the TM literature generated in developing countries is dominated by the knowledge and theories created in developed countries. Second, among these knowledge sources some authors from developing countries and focusing on the specialties of developing countries, such as Kim and Lall, come into prominence; however these authors are not even mentioned in the previous bibliometric studies covering overall TM research. Finally the researchers in developing countries tackle with the issues or topics specific to their own context through combining three major bulks of literature. These are (i) resource-based view (RBV)/core competencies and organizational learning related research; (ii) literature dealing with the evolutionary theorizing on economic change and growth and (iii) literature related to technological capabilities, technology transfer and industrialization in developing countries.

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1. Introduction

The share of the developing countries in the international technology management (TM) literature has grown rapidly in the recent period; in 2007 nearly one fourth of the literature was created with the contribution of researchers in developing countries (Table 1). However, TM literature created in developing countries mostly differs from its counterpart generated in developed world especially in terms of the research topics it focuses [1,2]. This study takes a step forward and investigates whether the researchers in developing countries utilize the same intellectual pillars with their colleagues in the developed world to understand the issues they specifically focused on. Thus the paper provides a comprehensive detailed bibliometric analysis of developing countries' TM literature covering articles published in ten technology-innovation management (TIM) specialty journals [3–6]. Considering that no study employs bibliometric techniques in the field of TM to understand the specific characteristics, knowledge maps and flows in the literature created in developing countries; this paper will contribute to the global TM literature. Furthermore, the understanding of theoretical development of TM in developing countries will contribute to the incorporation of particular issues, problems and theories of developing countries into the TM discipline.

Since the commencement of IEEE Transaction on Engineering Management in 1954 much progress has been accomplished both in the field of management of technology education [7,8] and in scholarly research with the launch of a number of TIM-specialty journals. In this process the number of researches focusing on the scholarly research generated by the scientific

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Table 1

Distribution of articles with authors from developing countries.

Journals	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Technovation (TVN)	11	13	20	21	21	21	26	36	21	19	209
International Journal of Technology Management (IJTM)	14	9	11	14	12	10	21	29	19	41	180
Technological Forecasting and Social Change (TFSC)	4	13	5	7	7	8	4	17	23	21	109
IEEE Transactions on Engineering Management (IEEE)	14	4	4	8	7	7	8	10	10	12	84
Research Policy (RP)	5	2	6	9	6	10	7	7	6	9	67
R & D Management (RDM)	3	1	4	7	10	6	7	4	5	9	56
Research-Technology Management (RTM)	1	2	2		1	1	2	2	3	4	18
Journal of Engineering and Technology Management (JETM)	1	3	2		1	2	1		2	3	15
Technology Analysis & Strategic Management (TASM)	2	3	3			1		5		1	15
Journal Of Product Innovation Management (JPIM)		1		2	2	1	1	1	1		9
Total	55	51	57	68	67	67	77	111	90	119	762
% in total TM articles	14	12	14	16	16	16	17	23	19	24	18

community of the TM field has increased. Among those there are a number of studies using bibliometric techniques to evaluate the development of the discipline; however most of them focusing on a specific journal [1,9–12] instead of the whole literature. Furthermore, due to differences between these journals in terms of the issues on which they focus [5] these bibliometric studies cannot provide a clear picture of the field. In spite of the renewed interest in the scholarly communication in TM a very few examples [2,13,14] focusing on the certain aspects of the literature in developing countries exists. This study aims to overcome these limitations.

The paper is divided into five sections. Section 2 reviews bibliometric research in TM literature; and it is followed by a section on the methodology employed in this paper. Section 4 presents and discusses the results of the empirical study and finally, Section 5 presents a summary, makes suggestions for future research, and indicates the limitations of the study.

2. A review of bibliometric research in TM field

Pritchard [15] provides an early definition of bibliometrics as a method of applying mathematics and statistics to the media of written communication in order to understand the nature and course of development of a discipline. Albeit their limitations citation and co-citation analyses are important bibliometric techniques which are widely employed in order to analyze the developments of scientific disciplines or sub-disciplines.

Since the mid-1980s citation and co-citation analyses have been utilized to investigate different facets of management literature and its subfields. Citation and co-citation analyses in management studies have most frequently served for identification of emerging scientific fields/subfields/disciplines, their boundaries and intellectual developments of these fields [16]. Culnan [17] focused on the intellectual development of the management information systems literature through author co-citation analysis. Pilkington and Liston-Heyes [18] investigated the process in which production and operations management had struggled to establish itself as an academic discipline by examining its literature using citation data obtained from the International Journal of Operations & Production Management. Ramos-Rodriguez and Ruiz-Navarro [19] and Nerur et al. [20] used Strategic Management Journal as a base journal for their citation and co-citation analyses. Among these two complementary studies the first one identified the most influential works on the strategic management research; however the second delineated the subfields; determined their relationships with each other and identified the authors bridging two or more conceptual domains of the strategic management research. On the other hand, Martinson et al. [21] focused on journals cited in or cited by Strategic Management Journal and provided a longitudinal portrait of the strategic management sub-discipline and a map of changes in the relationships among journals. Acedo and Casillas [22] used co-citation analysis to understand the intellectual structure of the international management research; Gu [23] focused on knowledge management literature and identified the authors, journals, research teams in the field; the last but not least Cornelius and Persson [24] provided a bibliometric analysis of the venture capital research.

TM literature has grown with great speed and become an academic discipline in the last two decades [1,25] and “once a scientific discipline has reached a certain degree of maturity, it is common practice for its scholars to turn their attention towards the literature generated by the scientific community” [19]. Early examples of studies focusing on TM field were [25–27]. Adler [25] provided a systematic literature review identifying the underlying themes and concepts related to technology strategy. Drejer [26] dealt with the evolution of the management of technology discipline through four schools of thought which were identified by the author from the literature. On the other hand, Allen and Varghese [27] analyzed the changes in the field of R&D management through articles appearing in R&D Management journal from 1970 to 1987.

In the 2000s, the number of scholars turning their attention towards the TM literature has increased. Among those Beard [28] proposed a model of categorizing the literature on the management of technology; Liao [29] focused on the way in which TM methodologies and applications had developed; and Ball and Rigby [30] investigated the number of author entries and their affiliations throughout eleven journals selected due to their coverage of R&D and innovation management literature.

On the other hand, there is a bulk of literature analyzing the evolution of certain TIM specialty journals. Linstone [31] reviews the evolution of Technological Forecasting & Social Change from 1969 to 1999. Callon et al. [32] analyze the contents of Research

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