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CHARACTERISATION OF TECHNOLOGICAL INNOVATION MANAGEMENT JOURNALS

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Abstract:

This paper seeks to characterise the publications of the technological innovation management forum. With this aim, it analyses four aspects: orientation, style, originality and readability. The information used for this study was obtained from the Emerald Management Reviews database (Emerald Group Publishing). The time period considered ran from 1996 to 2003. From the analysis, the work concludes an increasingly clear research orientation over the period. *Research-Technology Management* is the journal most oriented to practice. The work also finds a clear predominance of the academic style, with some room provided for the professional-journalistic style, and a certain loss of originality and readability in the publications over the period. Finally, the journals declare a more varied readership than they actually seem to have.

Keywords: Technological innovation management, journals, orientation, style, originality, readability.

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INTRODUCTION

In the technological innovation management (TIM) field we find different works that have analysed the main publications in which knowledge advances are made known. Thus, for example, the works of Linton and Thongpapanl (2004), Nieto (2003), Cheng *et al.* (1999) and Liker (1996). These authors have mainly focused on such questions as: identifying the publications where the work of this field can be published, and in particular, delineating a forum for the field² (Appendix A); establishing rankings of the publications on the basis of, for example, citation analyses; and identifying the fields with which the different forum journals are most linked, bearing in mind that TIM is an interdisciplinary field.

Linton and Thongpapanl (2004:125) point to *Research-Technology Management* as the most oriented to practice of the journals from the TIM forum. But this aspect can hardly be said to be central to their research, and nor do we learn anything about the orientation of the other forum journals from these authors. This is an important question, as various authors have pointed out (Kover, 1979; Shrivastava and Mitroff, 1984; Brinberg and Hirschman, 1986; Astley and Zammuto, 1992). These authors argue that the research and practical orientations to management problems are intrinsically different³. Nor do we learn anything about the style, readability or originality of the articles appearing in any of the forum journals. As Tranfield and Starkey (1998:352) point out, academic research has its own style, which does not coincide with the more professional style of the practitioners. We can therefore, according to Kelemen and Bansal (2002), talk about stylistic differences between researchers and practitioners, and even about differences of language use. We feel, therefore, that it is important to analyse the practical or research *orientation* of the forum journals. And very closely related to this is the *type of work* that is accepted for publication in these journals, in other words the *style* (professional-journalistic or academic). Questions such as the *originality* and *readability* of the work published, which are not normally considered, can help to enrich this characterisation of each journal analysed. It is the object of the current work to analyse all these aspects (orientation, style, originality and readability) in the publications considered here. We have obtained the information to carry out this analysis from the *Emerald*

Group Publishing Limited, and we consider the period 1996-2003.

Various types of reader could, in our opinion, find this work of interest. The potential readers of the journals, since the study could inform them about which TIM forum journals most closely match their practical or research orientation within the field, as well as which journals may be the most accessible to them. They can hence avoid wasting valuable time and money. The potential authors of forum journals, whom the work could guide, for example, about the style and orientation of the works published, and generally provide them with useful information in their attempts to publish in a particular journal. The journals editors, with their first-hand knowledge about the publication that they edit and about its editorial objectives, could learn about the perception that independent evaluators have about their journal, and above all, about how far their editorial objectives are being achieved. The anonymous referees of the TIM forum journals, for whom this article could provide more information about the journals and offer some help in carrying out their evaluations. Finally, the article may also be of interest to libraries, providing them with extra information that could help them to decide about purchasing, renewing or cancelling journal subscriptions, bearing in mind their limited resources.

This work is organised as follows: in the next section we describe the analysis carried out – i.e., the source of information used, the information obtained, the periods of analysis and aspects considered. All this with the aim of characterising the journals of the TIM forum. In Section 3 we present the results of the analysis, focusing on the practical or research orientation of the different forum publications, as well as their style, originality and readability. In the final section we offer some comments and the main conclusions of the work.

METHODOLOGY

As we said in the introduction, we focus our attention on the publications included in the TIM forum. This forum is made up of ten journals (Appendix A), all of which are included in the *Journal Citation Reports* of the Institute for Scientific Information (ISI).

To characterise the publications of the forum we used information from the Emerald Management Reviews (EMR) database of the Emerald Group Publishing Limited⁴, to which we had online access. In particular, we examined the annual lists of the top 400 accredited management journals and the rankings of these publications, all for the period 1996-2003. We also

² According to Macmillan (1989: 391), each research field has a forum of journals of reference that the specialist researchers have in mind. Authors should aspire to publish their papers in one of these journals, since if their work is accepted for publication by a forum journal, it gains the academic credibility of the scientific community in that field.

³ They differ, for example, in interests, conceptions or aims.

⁴ The information is available on Emerald's web page: www.emeraldinsight.com

considered the disaggregation by article type of these journals, although in this case information was only available for 1998 to 2003 (with the exception of the year 2000).

Lists of accredited management journals

With regards these lists, Emerald points out that the journals are selected each year by world-renowned management experts, both from the academic world and from industry. These experts, who base their decisions on their own professional experience, also make use of statistical information about the results of the journals and the feedback of the users and of libraries of reputed international centres in management (for example, Harvard University, MIT or Stanford University).

The journals included in these lists cover all areas of business management. They have been grouped, taking into account the specialist nature of their content and their editorial direction, into 11 categories covering different management areas. These categories are: *Accounting & Finance, Business Context & Economics (BC&E⁵), General Management (GM), Health Care Management, Hospitality & Tourism, Human Resource Management, Information Management, Marketing & Logistics (MK&L), Operations & Production Management (O&PM), Quality Management* and, finally, *Specialist Interest*. In 1996 and 1997 the category *Strategy (S)* also existed, but its publications passed to the *General Management* category from 1998 onwards.

Of the ten journals in the TIM forum, eight appear in the lists of 400 accredited management publications. The two journals not included are: *IEEE Transactions on Engineering Management* and *Journal of Engineering and Technology Management*. They will not be object of study here. Table 1 summarises information of interest about the eight journals that will be examined in the current work.

⁵ Henceforth, we shall refer to the Business Context & Economics category with these initials. The other categories that might also include any of the publications that are object of analysis here are also followed, in brackets, by their initials.

Table 1
TIM forum journals included in the Emerald lists of accredited management journals.

Journals	Country	Initials	Disciplinary Focus (adaptated of Linton and Thongpapanl, 2004)	Category in Emerald	Category in ISI (appendix B)
International Journal of Technology Management	Switzerland	IJTM	Management	O&PM	JCRSE : OR&MS, EM; JCRSSE: M
Journal of Product Innovation Management	USA	JPIM	Marketing, Practice in management, Development of the innovation	MK&L	JCRSE: EI; JCRSSE: M, B
R&D Management	United Kingdom	R&DM	Economics, Organizational Behavior	O&PM	---- JCRSSE: B, M
Research Policy	Holland	RP	Economics and Finance, Innovation Process	S (1996 & 1997) GM (1998- 2001) O&PM (2002 & 2003)	---- JCRSSE: M, P&D
Research Technology Management	USA	RTM	Practice in management of the science, technology and innovation	O&PM	JCRSE: EI; JCRSSE: M, B
Technological Forecasting and Social Change	USA	TFSC	Economics, Science and Technology, Forecasting and Impact Related	BC&E (1996- 2001) O&PM (2002 & 2003)	---- JCRSSE: B, P&D
Technology Analysis & Strategic Management	United Kingdom	TASM	Organizational Behavior, Strategy	S (1996 & 1997) GM (1998- 2003)	JCRSE: MS ----
Technovation	United Kingdom (Emerald) Holland (ISI)	Tech	TIM, Management, Entrepreneurship	O&PM	JCRSE: OR&MS, EI ----

Source: personal elaboration

Annual rankings of accredited journals

In the period 1996-2003, specialist reviewers from Emerald evaluated all the work published in each of the 400 journals that annually made up the list of accredited journals that we mentioned in the previous section. Their evaluation resulted in a score for each article of 1, 2 or 3

stars⁶ (maximum score) for each of the following four indicators: research implications (RI), practical implications (PI), originality (O) and readability (R).

At the end of each year, and for each journal, the scores conceded to all the articles in each of the four

⁶ Hence this is evaluated based on the content of the work and not on a citation analysis.

indicators are aggregated. With this, the journal’s *mean value* in each indicator is calculated for that particular year.

Thus, the annual rankings include, for each indicator and distinguishing by the thematic categories identified in the previous section, a hierarchisation of the mean value – i.e., between 3 and 0 – of the accredited journals of that year. Furthermore, for each journal analysed and for each

indicator (RI, PI, O and R), we have not only its mean value but also information about its position relative to all the publications from the category to which it belongs that year. From this we can characterise certain aspects of the journals (Table 2): the *orientation* (RI and PI), the *originality* (O) and the *readability* (R).

Table 2
Analysis to characterise the TIM forum journals

Indicators and Articles Type		Indicators				Articles Type		
		RI	PI	O	R	T	E	PJ
Orientation	Research							
	Practical							
Style	Academic							
	Professional-Journalistic							
Originality								
Readability								

Source: personal elaboration

In short, for the journals of the TIM forum included in Table 1 – i.e., those included in Emerald’s lists of accredited journals – we analyse the four above-mentioned indicators for the period 1996-2003 (Table 2) and, as we have explained, we do so considering the journal’s mean value and its relative position among the group of publications in its category each year.

Disaggregation by article type of accredited journals

For the publications included in the annual lists of accredited journals, Emerald also provides a percentage breakdown of papers by article type. This information, however, is not available for the whole time period considered (1996-2003), but for a shorter interval (1998-2003), and excluding the year 2000.

The alternative article types Emerald offers are as follows: “wholly theoretical”, “theoretical with worked example”, “theoretical with application in practice”, “literature review”, “survey”, “case study”, “comparative/evaluation”, “professional” and “journalistic”. We decided to simplify this rather disaggregated typology into three categories for the current analysis: theoretical (T), empirical (E) and professional-

journalistic (PJ). The first category – theoretical – groups the three article types “wholly theoretical”, “literature review” and “survey”. The second category – empirical – groups together “theoretical with worked example”, “theoretical with application in practice”, “case study”, and “comparative/evaluation”. Finally, the professional-journalistic category groups the remaining two options: “professional” and “journalistic”.

We consider that this information about the types of article published can help us to define the *style* (professional-journalistic or academic) of the journals.

Thus, the current work analyses, for the years 1998-2003 (except 2000), the TIM forum journals included in Table 1, focusing on the types of work that they have published according to this three-part classification (T, E and PJ). With this, and as we have mentioned, we aim to define the *style* of the different publications (Table 2).

CHARACTERISATION OF PUBLICATIONS

In this section we present the results of the analysis, which characterise the publications from the TIM forum included in Table 1. For this purpose, we structure this section in four parts, one for each of the aspects to be characterised in this study.

Research or practical orientation of publications

This section looks at the mean values and relative positions in the O&PM⁷ category of the publications from Table 1, in the period 1996-2003, for two specific indicators: RI (research implications) and PI (practical implications).

For the indicator RI, the mean scores of the set of publications considered (Figure 1) show an increasingly clear definition in their research orientation over the period. Thus, if at the beginning of the period their scores range from 1.3 to 2.4⁸, from the year 2000 all publications score over 2, and in 2003 five publications even achieve scores of between 2.5 and 3. In the last few years of the period considered, the journals with the strongest research orientation are: RP, R&DM, TASM and JPIM.

⁷ This leads us to ignore two of the publications from Table I when we analyse the relative position: those not included in the O&PM category in Emerald. Specifically: JPIM (in the MK&L category) and TASM (in the GM category). This exclusion is not, however, necessary when we analyse the average values of the publications. Furthermore, and for the same reason, RP and TFSC are only included in the O&PM category in 2002 and 2003, so they are only considered here for these two years.

⁸ We recall that the publications score between 0 and 3 (maximum score) for each of the four indicators.

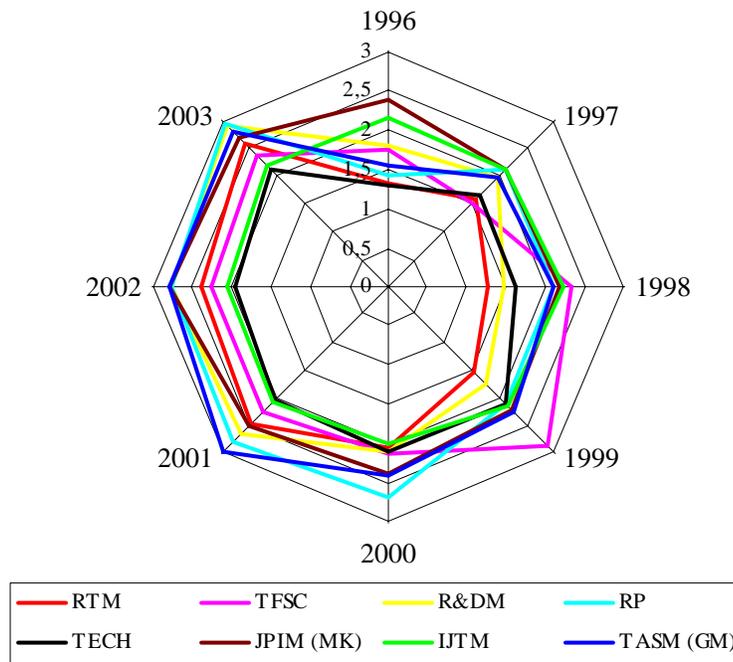


Fig. 1. RI – Publications’ average scores

Looking at the publications’ relative positions in the O&PM category⁹ (Figure 2), we can see that while in the first half of the period analysed the journal IJTM is the best placed, achieving a position among the top five journals in the category, in the final years RP and R&DM are the most research oriented. Some way behind, but still in the top 10, is RTM, which is, however, substantially worse placed until the year 2000. This is the forum publication with the least research orientation in the early years of the period analysed.

⁹ The number of publications in this category varies throughout the period considered, ranging from a minimum of 32 to a maximum of 38 journals.

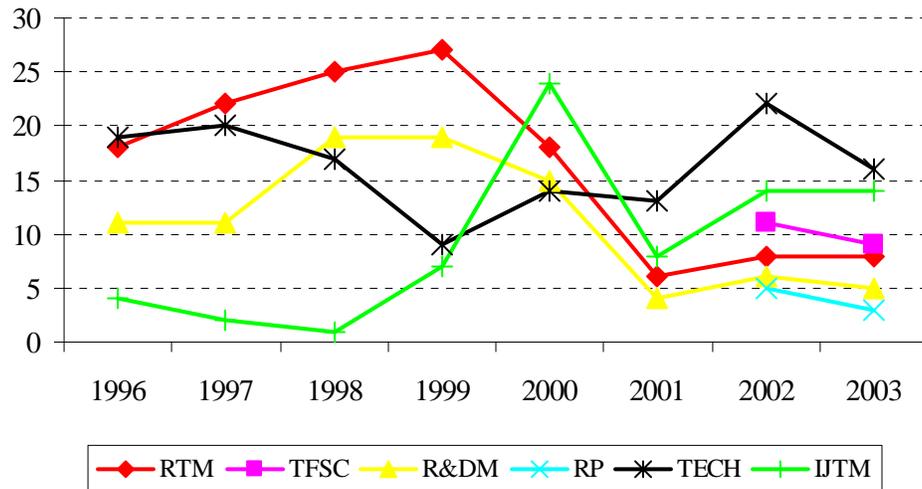


Fig. 2. RI – Publications' relative position in the O&PM category

We now look at the PI indicator, which measures the practical orientation of the publications. The mean values of the publications analysed present a relatively constant and highly similar interval of variation at the beginning and end of the period (Figure 3). Thus, in 1996 the publications' scores range from 1.21 to 2.56, while in 2003 they range from 1.38 to 2.75. We find RTM is the journal with the

clearest practical orientation, coinciding with Linton and Thongpapanl (2004:132). This becomes clearer in the final years of the period analysed, when this journal's scores are very close to the maximum. The publications with the least practical orientation throughout the period, among the journals considered here, are TFSC and RP.

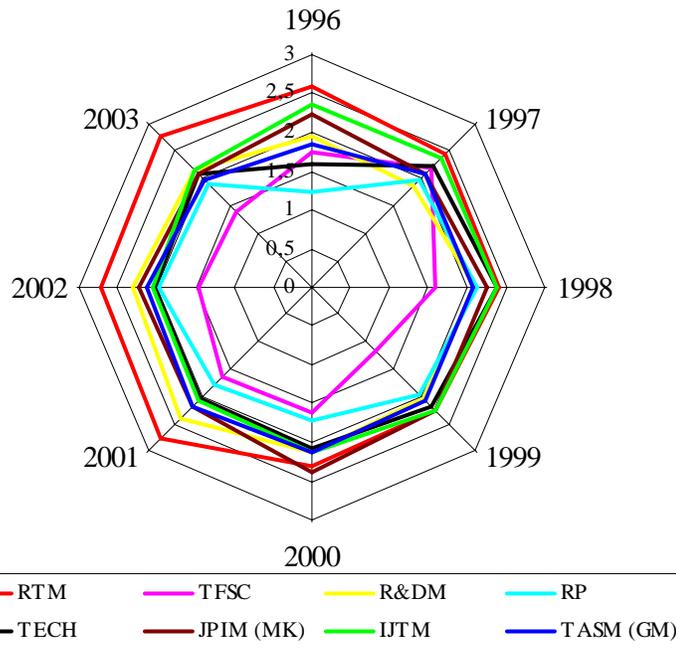


Fig. 3. PI – Publications' average scores

In the final years of the period of analysis RTM and TFSC stand out at the extremes – with mean values close to 3 and 1.5, respectively –, while the remaining publications' scores are grouped very closely together at an intermediate point between both extremes.

The relative positions of the publications in the O&PM category (Figure 4) show RTM as the journal with the clearest practical orientation among the journals analysed here, achieving a place in the top five in the

category at the end of the period. In the first half of the period analysed IJTM, and even TECH, are quite closely behind RTM, but from the year 2000 they lose ground in the ranking, falling to between 20th and 30th place. They are clearly less practically oriented than RTM. The reverse seems to have occurred with R&DM, which has a weak practical orientation at the beginning of the period, while this situation appears to have changed to some extent since 2000.

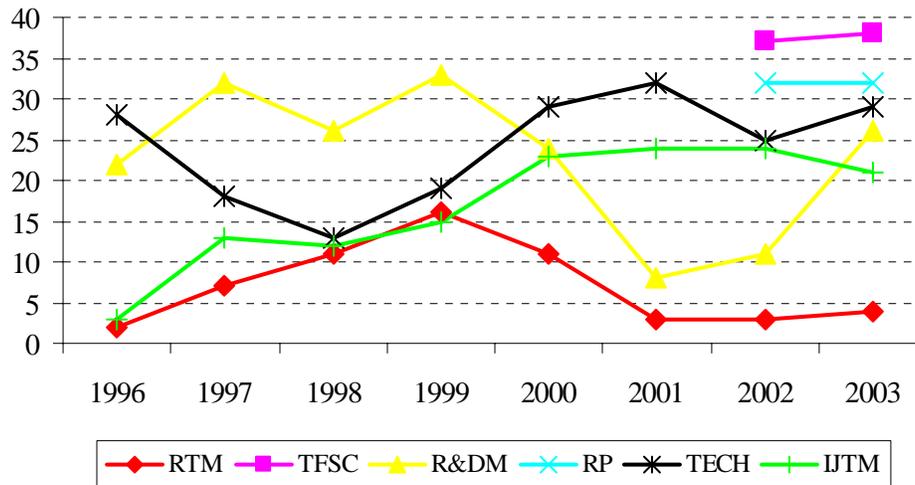


Fig. 4. PI – Publications' relative position in the O&PM category

RP and TFSC, which are only included in this category in the last two years of the period analysed, appear to be the publications with the least practical orientation.

Academic or professional-journalistic style of publications

To define the style of the TIM forum publications analysed we made use, as we have explained, of the

percentage breakdown by article type (theoretical, empirical and professional-journalistic) of the articles published in these journals between 1998 and 2003, not including the year 2000 (figures 5 and 6). Thus, the journals that essentially publish theoretical and/or empirical articles can be said to have a clearly academic style. In contrast, those publications basically including professional-journalistic works can be said to have that particular style.

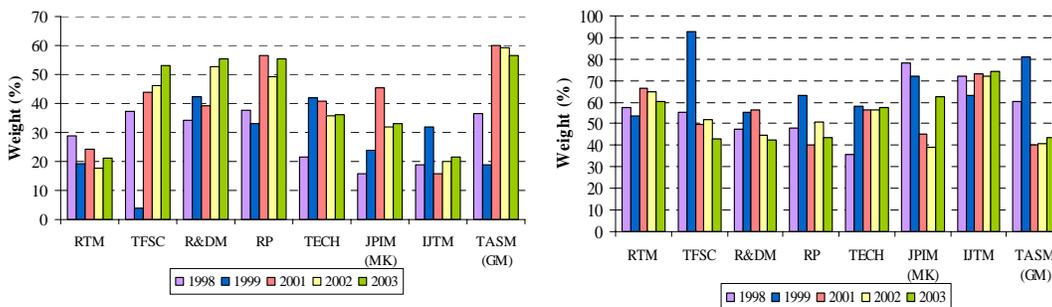


Fig. 5. Weight of the theoretical and Empirical articles in the publications

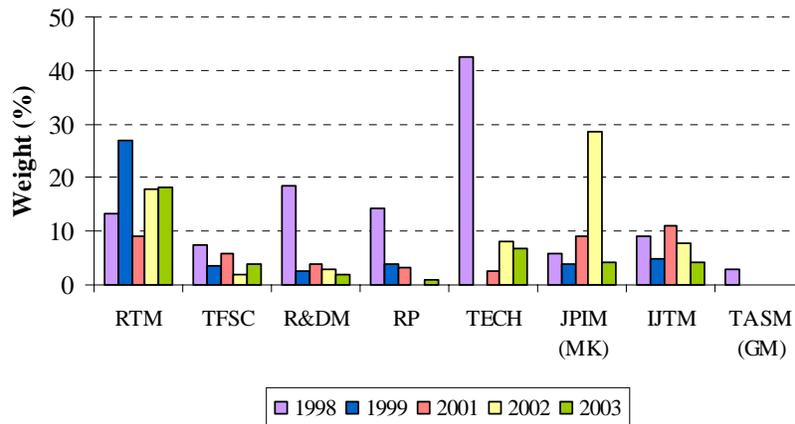


Fig. 6. Weight of the professional-journalistic articles in the publications

The predominant style in the different journals analysed here is basically and unequivocally academic. However, journals such as TECH and JPIM, and to a lesser extent R&DM and RP, have published a more or less significant – but never predominant – proportion of professional-journalistic style articles in some of the years analysed. This occurs, for example, in the case of TECH, a little over 40% of whose articles are classified as professional-journalistic in 1998. In the same year, R&DM and RP publish more of this type of work, reaching approximately 20% and 15% of the total, respectively. In 2002, rather than 1998, almost 30% of the articles published in JPIM are of that particular style.

The case of RTM differs from the ones mentioned above, and is also worth mentioning. Those journals only publish a significant number of professional-journalistic works in one particular year, while RTM does this in every year of the period considered, although it is true that its score does not exceed 27% at any time.

Originality of publications

We now look at the originality indicator, from 1996 to 2003, for the TIM forum publications analysed, considering their mean values and their relative positions in the O&PM category¹⁰.

Figure 7 shows the publications' average scores in terms of originality. Two different sub-periods are apparent: 1996-1999 and 2000-2003. Between 1996 and 1999 the journals are quite far apart, ranging from 1.08 to 2.33. Between 2000 and 2003, in contrast, the journals come closer together, and the range narrows to between 1.97 and 2.33.

¹⁰ As in Section 3.1 (orientation), in this section we must also ignore the publications JPIM and TASM for the relative position analysis. We also recall that RP and TFSC only belong to the O&PM category in the years 2002 and 2003, and so are only considered for these years when we analyse relative position. This remark is equally valid in the following section, when we study the readability.

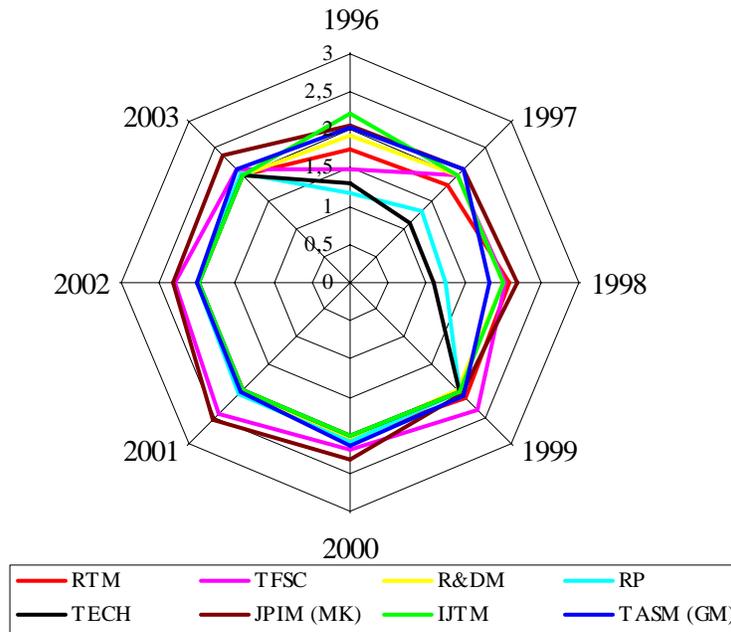


Fig. 7. O – Publications’ average scores

The journals JPIM and TFSC appear to stand out for their originality in the whole of the period analysed, although more clearly from 1999. From that year these two journals achieve the highest originality scores, but they do not exceed 2.5, except for JPIM in 2001.

For the remaining publications, their originality values come very close together from the year 1999, when they score around 2. Two journals have improved substantially in this respect – RP and TECH – as they do not even reach a score of 1.5 before 1999.

The publications’ relative positions in the O&PM category (Figure 8) also reflect, to a large extent, their increasing homogeneity with regards originality as the

period progresses. In the final years, only one TIM forum journal makes the top 10 in the category for its originality. Indeed, this is one of the two journals included in the category only in the years 2002 and 2003, and moreover it occupies first place among all the journals of the category for both years. Some journals, such as IJTM, RTM and R&DM, are well placed at the beginning of the period but appear to lose originality later, so that in the final year considered they rank around 25th in the category. These are also the least original journals of the eight publications analysed. TECH and RP have improved their originality, although it is true that RP is only included in the O&PM category in the final two years of the period.

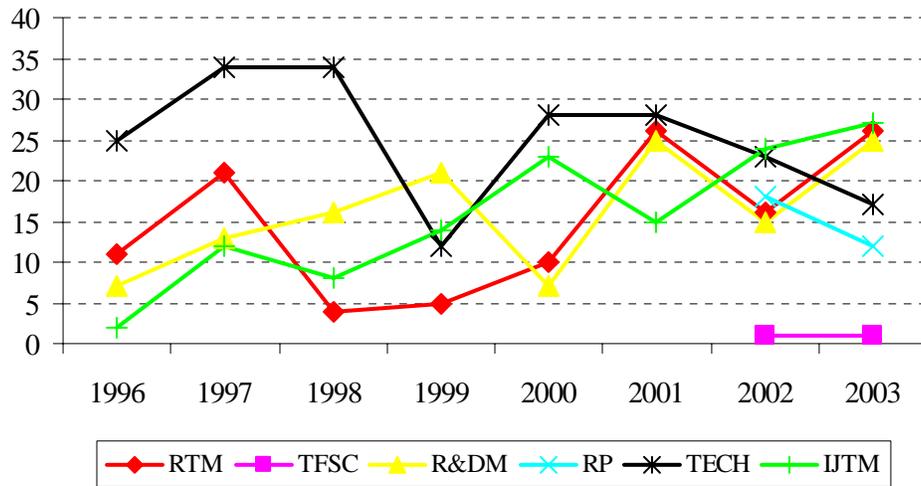


Fig. 8. O – Publications' relative position in the O&PM category

Readability of publications

For the publications that we are analysing, we now look at the readability indicator in the period 1996-2003. As in the previous cases we analyse their mean scores and their relative positions in the O&PM category.

As occurred in the case of originality, in the analysis of the mean readability scores we appreciate two different time periods (Figure 9): from 1996 to 1998 and from 1999

to 2003. In the first period the mean scores of the publications move in a wider interval range – basically from 1.4 to 2.77. In the second period (1999-2003), there is a marked homogeneity among the different publications, at least in terms of their readability. Although it is also true that this homogeneity is stronger in some years than in others in this second period. Thus, for example, in 2001 the journals' mean scores range from 1.93 to 2.08.

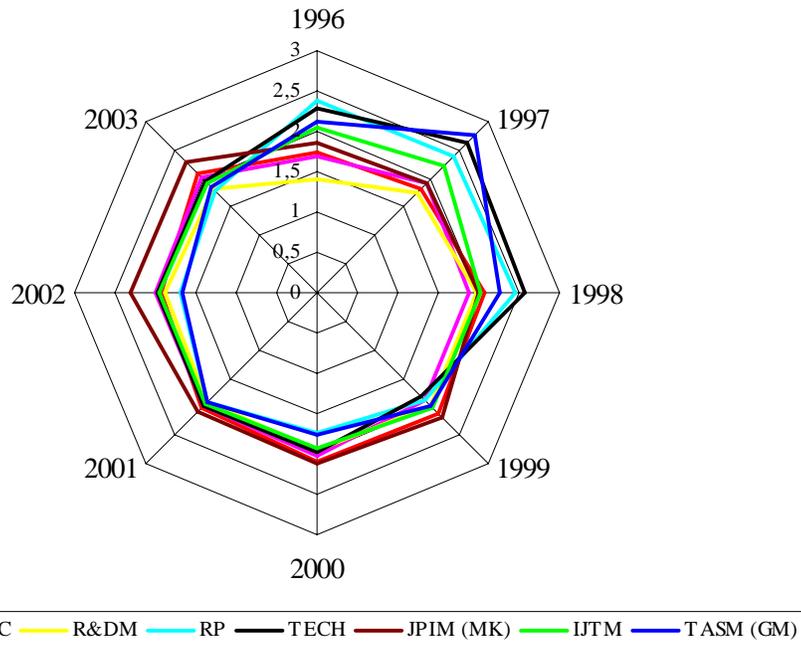


Fig. 9. R – Publications' average scores

From 1999, but not from 1996, JPIM scores the highest in readability, but at no time does it exceed 2.5. TASM, RP and TECH, which score over 2 in the first three years, do not do as well from 1999 onwards. RTM, which is among the least readable journals between 1996 and 1998, is among the easiest to read from 1999, despite the fact that its readability score remains largely unchanged throughout the entire period analysed.

When we look at the publications' relative positions in the O&PM category (Figure 10) there are clear differences as the period progresses. Thus, in the early

years TECH and IJTM are the best placed, particularly TECH, which manages a top-five ranking in the category. From 1999 these two journals lose considerable ground, dropping to 22nd and 24th in 2003, respectively. In turn, RTM has been improving its ranking in the category since 1998, with the exception of a significant reversal of fortunes in 2002. In 2003 it makes the top five most readable journals of the category, and is the most readable of the TIM forum journals considered here. R&DM does not appear to have stood out at any time for its readability.

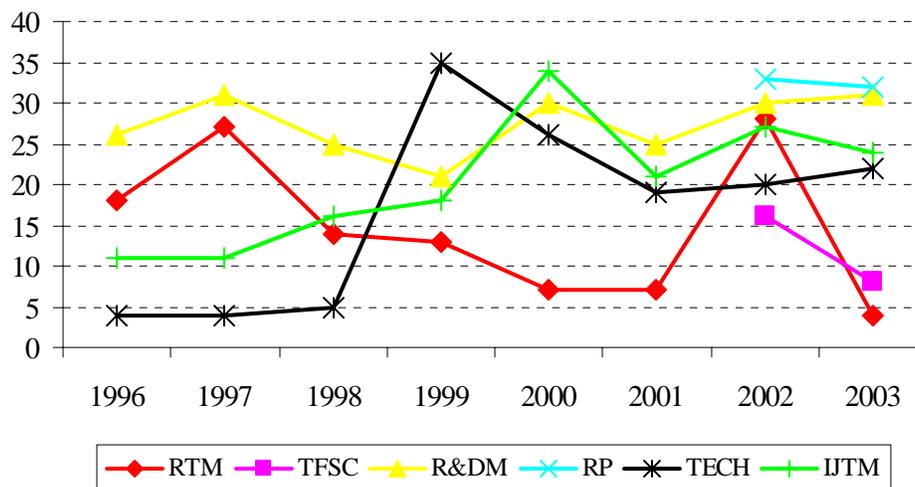


Fig. 10. R - Publications' relative position in the O&PM category

The two publications that only enter the O&PM category in the last two years of the period analysed – i.e., RP and TFSC – occupy very different positions. Thus, RP does not make the top 30, and is the least readable of the group of TIM forum publications considered here. Meanwhile TFSC is the second most readable forum journal, and moreover enters the top 10 of the O&PM category in 2003, behind RTM but some way ahead of the remaining forum publications' rankings in the category.

COMMENTS AND CONCLUSIONS

Using information provided by *Emerald Group Publishing Limited* for the period 1996 to 2003 we have aimed to characterise the publications in the technological innovation management (TIM) forum. Our characterisation is clearly not complete, since we have only considered orientation, style, originality and readability. Nor have we studied, for example, the journals' thematic profile or methods of analysis used. These and other questions could

be tackled in future research. Furthermore, we have not been able to include two of the forum journals in the analysis, while another two journals could not be considered in the analysis of relative rankings for the whole period.

Several conclusions can, however, be drawn from the analysis carried out. Thus, for example, the following: an increasingly clear definition in the research orientation of the forum journals analysed; a very strong research orientation in journals such as RP, R&DM and TASM; RTM as the journal with the clearest practical orientation, coinciding with Linton and Thongpapanl (2004:132); a predominance of the academic style in the journals considered, although some do find room for articles in the professional-journalistic style, either occasionally (TECH and JPIM, for example) or more regularly (RTM); a certain tendency to homogeneity among the publications reviewed, in terms of both the originality and readability of their articles; and a decline in originality over time, and even

perhaps readability, in the articles published by the forum journals considered.

The characterisation carried out here allows us to say that the journals have a clear research orientation and an essentially academic style. RTM, however, stands out as the forum journal with the strongest practical orientation, and as one that provides some room for the professional-journalistic style. Oddly, this journal is also considered among the most readable. It is striking that TFSC does not include researchers among its potential readership, and that practically all the journals analysed coincide in declaring that they are directed at both academics and managers or practitioners in firms¹¹. It may well be that these journals' editors intend to target a varied audience, but that subsequently they focus more on a particular type of reader. As we said in the introduction, the orientation, style and language of academics differ sharply from those of practitioners. Thus, if authors write their articles with academic readers in mind, they can hardly expect their work to be directed at practitioners at the same time.

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¹¹ We consulted the web pages of the different journals analysed, essentially considering the information they provide about their audience.

ABBREVIATIONS LIST

B	Business
BC&E	Business Context & Economics
E	Empirical
EI	Engineering Industrial
EM	Engineering Multidisciplinary
EMR	Emerald Management Reviews
GM	General Management
IJTM	International Journal of Technology Management
ISI	Institute for Scientific Information
JCR	Journal Citation Reports
JCRSE	Journal Citation Reports Science Edition
JCRSSE	Journal Citation Reports Social Sciences Edition
JPIM	Journal of Product Innovation Management
M	Management
MK&L	Marketing & Logistics
MS	Multidisciplinary Sciences
O	Originality
O&PM	Operations & Production Management
OR&MS	Operations Research & Management Science
P&D	Planning & Development
PI	Practical Implications
PJ	Professional-Journalistic
R	Readability
R&DM	R&D Management
RI	Research Implications
RP	Research Policy
RTM	Research-Technology Management
S	Strategy
T	Theoretical
TASM	Technological Analysis and Strategic Management
TECH	Technovation
TIM	Technological Innovation Management
TFSC	Technological Forecasting and Social Change

APPENDIX A

TIM Forum Journals		
Journal	Year of origin	Impact Factor JCR ISI – 2004
IEEE Transactions on Engineering Management	1954	0.573
Research-Technology Management	1958	0.677
Technological Forecasting and Social Change	1969	0.461
R&D Management	1970	0.479
Research Policy	1971	1.536
Technovation	1981	0.231
Journal of Engineering & Technology Management	1984	0.281
Journal of Product Innovation Management	1984	0.885
International Journal of Technology Management	1986	0.284
Technological Analysis and Strategic Management	1989	0.500

Source: adaptation of Linton and Thongpapanl (2004), Nieto (2003) and Cheng et al. (1999).

APPENDIX B

Initials of categories within which the journals analysed here fit in the *Journal Citation Reports* of the Institute for Scientific Information (ISI)

<i>Journal Citation Reports</i> Science Edition (JCRSE)	EI : Engineering Industrial
	EM : Engineering Multidisciplinary
	MS : Multidisciplinary Sciences
	OR&MS : Operations Research & Management Science
<i>Journal Citation Reports</i> Social Sciences Edition (JCRSSE)	B : Business
	M : Management
	P&D : Planning & Development