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The development of an AI journal ranking based on the revealed preference approach

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ABSTRACT

This study presents a ranking of 182 academic journals in the field of artificial intelligence. For this, the revealed preference approach, also referred to as a citation impact method, was utilized to collect data from Google Scholar. This list was developed based on three relatively novel indices: h-index, g-index, and hc-index. These indices correlated almost perfectly with one another (ranging from 0.97 to 0.99), and they correlated strongly with Thomson's Journal Impact Factors (ranging from 0.64 to 0.69). It was concluded that journal longevity (years in print) is an important but not the only factor affecting an outlet's ranking position. Inclusion in Thomson's Journal Citation Reports is a must for a journal to be identified as a leading A+ or A level outlet. However, coverage by Thomson does not guarantee a high citation impact of an outlet. The presented list may be utilized by scholars who want to demonstrate their research output, various academic committees, librarians and administrators who are not familiar with the AI research domain.

1. Introduction

The purpose of this study is to develop a ranking of 182 academic journals in the field of artificial intelligence (AI) based on the revealed preference approach, which is also referred to as a journal citation impact method. For this, Google Scholar was employed to obtain citations and calculate three relatively new indices: h-index, g-index, and hc-index.

Each scientific domain has its own identity, which is determined by unique research areas, methods of inquiry, leading institutions, prolific scholars, and specific academic courses or programs (Serenko, Cocosila, & Turel, 2008; Serenko, Bontis, & Grant, 2009). Publication outlets also shape an academic field since they inform others about the very existence of a specific area. By using scholarly journals, discipline researchers may share ideas, preserve knowledge, spread innovation, critique colleagues, propose theories, and accumulate references. A well-established set of academic journals has become a sign of discipline maturity (Paul, 2004; Polites & Watson, 2008). In fact, it is impossible to name a recognized academic field that does not have its own domain-specific set of outlets. For instance, when the knowledge management/intellectual capital (KM/IC) field emerged in 1990s, discipline researchers had to submit their manuscripts to general management, accounting or information systems journals. However, for the past 15 years, the KM/IC body of knowledge has been growing exponentially (Serenko & Bontis, 2004) reaching 20 KM/IC-specific outlets by 2008 (Serenko & Bontis, 2009b). By looking at the set of these journals, it is possible to conclude that the KM/IC domain has been officially accepted as a unique scholarly field (Serenko, Bontis, Booker, Sadeddin, & Hardie, 2010).

Since its birth in 1950s, artificial intelligence has evolved into a well-established, recognized academic discipline that has its own identity. First AI-specific academic outlets appeared in late 1950s–early 1960s, and their number has continued

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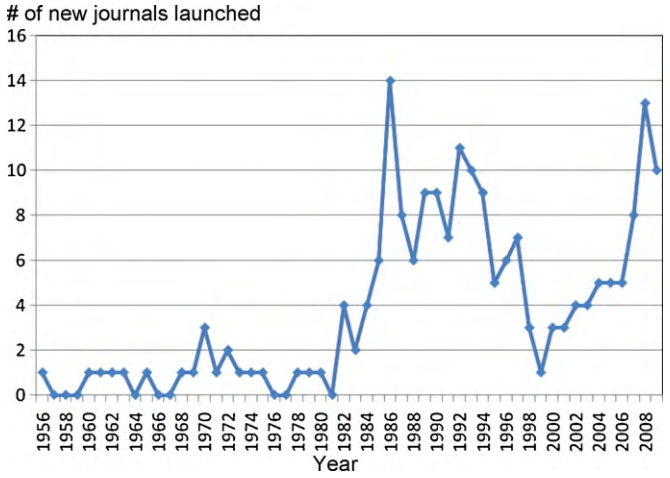

Fig. 1. Growth of AI Refereed Academic Journals.

to grow. A comprehensive search of the Ulrich's Periodicals Directory, Thomson Reuters Journal Citation Reports, existing AI journal ranking lists, Google Scholar, and the Internet identified a list of 202 refereed academic journals that mostly concentrate on various aspects of AI. It was observed that for the 1956–2009 period, on average almost four new AI journals were launched yearly. Fig. 1 demonstrates that there was a major growth in the number of new journals for the 1985–1997 period, and since 2002. As the number of outlets increases, so does the body of knowledge. This is consistent with the views of Price (1963) who suggests that in each scientific domain, the body of knowledge grows exponentially.

AI researchers have a variety of refereed scholarly outlets in which they may publish their works. But how do these journals compare with one another in terms of their overall quality, scientific rigor, practical impact or contribution to the body of knowledge? The field of scientometrics, which is referred to as a science about science, may clarify this matter. Scientometrics is a well-recognized discipline (Straub, 2006) that is based on classical works of Robert King Merton, Derek J. de Solla Price and Eugene Garfield (Garfield, 1972, 1979; Merton, 1976, 1973; Price, 1963). Scientometric studies report on the topics investigated in a specific scholarly domain, utilized methodologies, productive individuals or institutions, collaboration processes, citation impacts and research anomalies. One important stream of scientometric research relates to the analysis of academic journals with respect to their usage, quality, and impact. A frequent outcome of such studies is the development of journal ranking lists.

AI researchers have always been interested in the rankings of their refereed academic journals. As a result, a number of AI journal ranking investigations have been completed (Bobrow, 1993; Cheng, Holsapple, & Lee, 1994; Cheng, Holsapple, & Lee, 1996; Forgionne & Kohlib, 2001; Forgionne, Kohli, & Jennings, 2002; Gupta, 1994; Holsapple, Johnson, Manakyan, & Tanner, 1995). Ranking lists of AI outlets have been also presented by www.Journal-Ranking.com. A search of the Internet on the keywords 'AI journal ranking' generates a number of websites that present such lists.

There are several reasons why journal ranking lists are important (Lewis, Templeton, & Luo, 2007; Lowry, Romans, & Curtis, 2004; Lowry, Humphreys, Malwitz, & Nix, 2007). First, scholars prefer to publish their works in the highest ranked journals available for each specific topic. There is a strong belief in the academic community that papers appearing in leading journals are of higher quality, more credible, more widely read, and well-cited. Second, scholars need to know where to look for popular theories, methods, approaches, and ideas. For example, some supervisors advise their doctoral students to cite articles from top journals in their dissertations. Third, officials from funding agencies tend to consult journal ranking lists when they evaluate grant applicants' previous publication records or assess the quality of their scholarly output supported by a grant. Fourth, educational institutions and their officials tend to rely on formal journal ranking lists. As such, hiring, tenure and promotion, and merit pay committees, which are often comprised of the individuals who are unfamiliar with each applicant's research domain, tend to consult journal rankings during their deliberations (Coe & Weinstock, 1984). In many schools, full professor applicants have to publish a number of articles in 'A' outlets to be successful (Starbuck, 2005). Fifth, journal editors, board members, and publishers may use journal ranking information to position and promote their journals. Sixth, libraries may also employ ranking lists to allocate their journal subscription resources.

Not everyone agrees with the arguments presented above. For instance, the fact that a specific work appeared in a leading journal does not necessarily mean it is of high quality. Authors may send their manuscripts to journals that are most suitable for a specific topic regardless of an outlet's ranking (Bonev, 2009). This is particularly true with respect to interdisciplinary and niche journals. Additionally, some schools disregard formal journal ranking lists. Despite these exceptions, ranking lists have become so widely used that it is difficult to deny their importance and impact on academia (Franke, Edlund, & Oster, 1990; Manning & Barrette, 2005; Oltheten, Theoharakis, & Travlos, 2005; Theoharakis & Hirst, 2002; Vokurka, 1996; Walstrom & Hardgrave, 2001). Therefore, it is critical to develop journal ranking lists based on reliable and valid scientific approaches.