ROBOTICS RESEARCH VISIBILITY IN BRICS COUNTRY: A SCIENTOMETRICS STUDY

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ABSTRACT

{*The paper highlight the attitude of research community of BIRCS countries in terms of their research publication on robotics, their citation style, self citation style, citing the articles, self citing the articles. Even an attempt made to know the average citation per document and h-index possessed by respective countries of BIRCS research community*}

Key words: *Robotics, Research visibility, BRICS and Scientometrics*

1. INTRODUCTION

Scientometrics is the art of determining & examining science and technology. Key study issues comprise the measurement of impact, reference sets of papers to examine the impact of periodicals and universities/institutes, perception of of scientific citations, mapping scientific fields and the invention of indicators for use in guiding principle and administration circumstances. In tradition there is a major overlap between scientometrics and other scientific fields such as informatrics and bibliometrics.BIRCS stands for an alliance of five key

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Emerging National Economies like Brazil, Russia, India, China and South Africa. The federation was initially known as "BRIC" prior to the addition of South Africa in 2010. The BRICS associates are all developing or newly industrialised countries, but they are famous by their large, fast-growing economies and noteworthy power on regional and global affairs.

2.LITERATURE REVIEW

The literature review reflects that there are many studies have been conducted on bibliometrics, scientometrics and informatics on various subjects but the researches haven't made any attempt on scientometrics study on robotic especially in BRICS countries.

3. OBJECTIVES

The main objectives of the study is to know the robotic research visibility in BRICS country especially to know;

- Citation style of research documents
- Reference citation style of research documents
- H Index of the research documents

3.1 METHODOLOGY

To collect the primary data for our study we used the bibliographic database like web of science(Data accessed on 1-31 March 2015). Then the primary data has been collected from web of science for a period 1990-2014 then tabulated and extracted the charts using MS Excel.

4. RESULTS AND DISCUSSION

4.1 Research Publications On Robotics

When we look into the table 1 it clearly indicates the research community of China snatched the dominant portion of the research publications by publishing the 59.7114 % documents(538), followed by India 17.8690 % (161 documents) and Brazil 15.5383 % (140 documents). The research community of South Africa claims 01.7114% on over all research publications on robotics.

Table 1: Research Document Published

BRICS Country	Document Published	%
Brazil	140	15.5383
Russia	047	05.2164
India	161	17.8690
China	538	59.7114
South Africa	015	01.6648

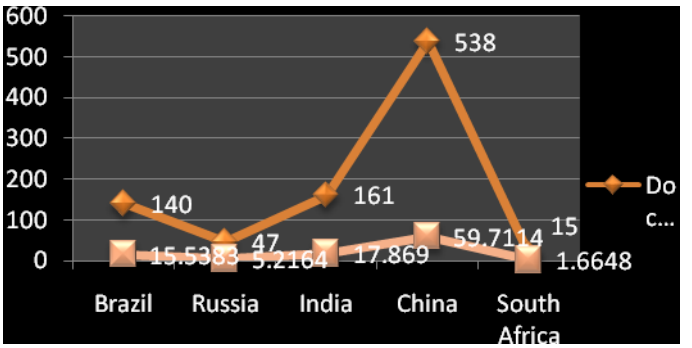


Fig 1: Research Document Published

4.2 Citation Style

A "citation" is the technique that we pass the message to the other researchers or readers that certain information/source in our work has taken from other source. The quality of research publication will be normally depend upon the number of citations gain for a particular publication. So we made an attempt to know the quality of the research papers of BRICS research community. Even though South African research community published less documents (15) but when we see average number of citation per document, South Africa tops first position by getting 9.9333 average of citation per research paper followed by Brazil with an average citation of 7.5643. Here India claims last position with average citation of 4.0559.

One more interesting thing about the research community in general and specific to BRICS country is, they have the habit of citing the self citation. It may be due to their area of research is same or to get more citation for their publications. However the research community of China has more tendency (80.1829%) to cite their own publications followed by Indian research community (9.4512%). But the research community of South Africa has very less tendency to cite their own publications (0.3049%).

Table 2: Citation Style

BRICS Country	Document Published	Citations	Average	%	Self Citations	%
Brazil	140	1059	7.5643	18.9412	025	7.6219
Russia	047	0272	5.7872	4.8650	008	2.4390
India	161	0653	4.0559	11.6795	031	9.4512
China	538	3458	6.4275	61.8494	263	80.1829
South Africa	015	0149	9.9333	2.6650	001	0.3049
Total	901	5591	6.2053			

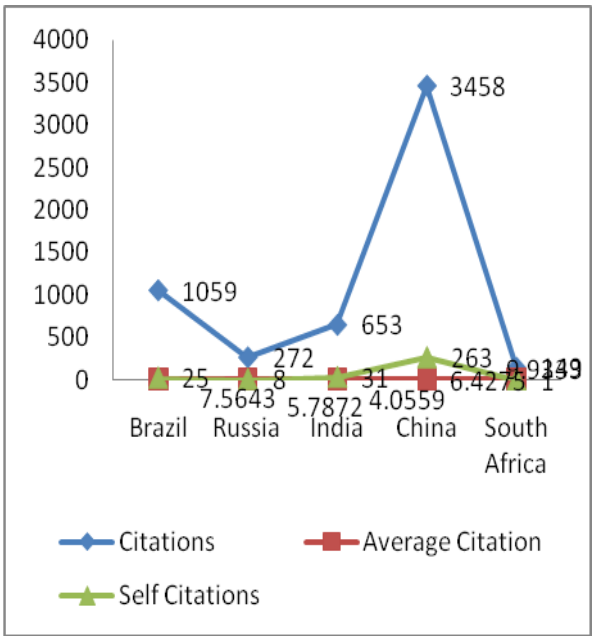


Fig 2: Citation Style

4.3 Reference Citation Style

Similarly in the way citation we made an attempt know the attitude of BIRCS research community in citing the articles. The table 3 provides the clear picture of the attitude of the BRICS research community. It shows that the maximum research community of China cities the 2919 articles for their research papers followed by Brazil research community (995) and Indian research community (579). Here once again the research community of South Africa cited less articles (146). When we see the average reference citation South African researchers claims top position with 9.7333 followed by Brazil researchers with the average 7.1071 and Russia (5.4681). Indian researchers claims last position with an average 3.5963.

Self citing articles is a common attitude of all research community may it BIRCS countries or others. In case of self citing articles also, researchers of China claim top position with 76.2376 % followed by Brazil researchers (11.3861%) and India (9.9010%) Here once gain the research community of South Africa claims least self citing articles with 0.4950%.

Table 3: Reference Citation Style

BRICS Country	Document Published	Reference Citation	Average	%	Self Reference Citation	%
Brazil	140	0995	7.1071	20.3227	023	11.3861
Russia	047	0257	5.4681	5.2492	004	1.9802
India	161	0579	3.5963	11.8260	020	9.9010
China	538	2919	5.4256	59.6201	154	76.2376
South Africa	015	0146	9.7333	2.9820	001	0.4950

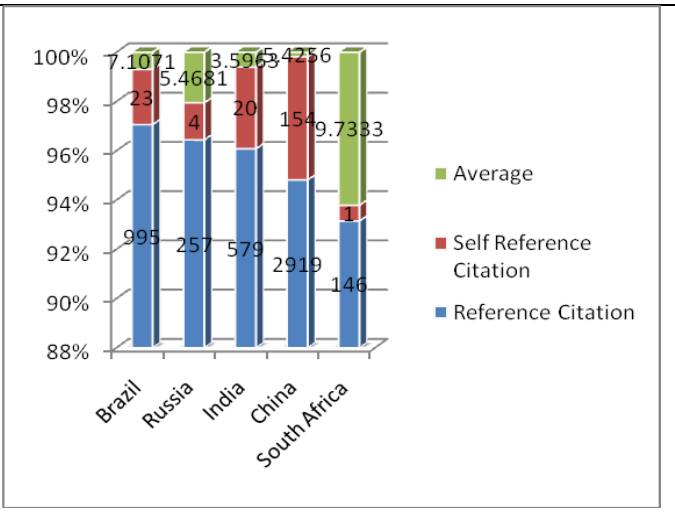


Fig 3: Reference Citation Style

4.4 H Index

The h-index is an index that attempts to measure both the productivity and citation impact of the published body of work of a scientist or scholar. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other publications.

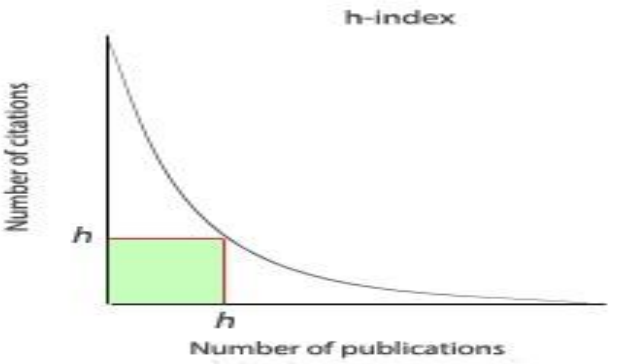


Fig 4: h index

We made an attempt to know the h index of the research community of BRICS countries. The table 4 reflects that the research community of China have highest h index of 26 which is more than one-third of h index of BRICS countries followed by Brazil with 19 h index which more or less equivalent to one-fourth h index of BRICS countries. The South Africa claims minimum of 5 index.

Table 4: H Index of the Research Documents

BRICS Country	H Index	%
Brazil	19	26.3889
Russia	09	12.5
India	13	18.0556
China	26	36.1111
South Africa	05	6.9444

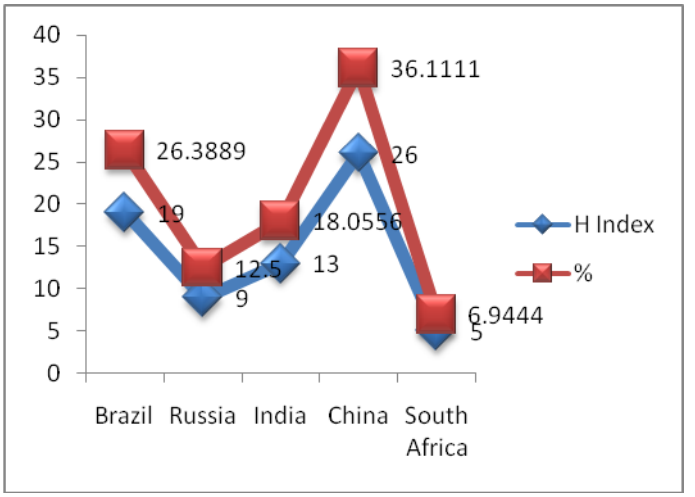


Fig 5: h index

5. CONCLUSION

The result of our study shows that the research community of China published the more research documents on Robotics (538-59.7114 %). Even in the case of citation and self also the research documents published by China community get more citation (3458) and the same community have more self cited (263-80.1829%), but when look in terms of average of citation per document South Africa possess more with 9.9333. In case of "h index" also the research community of China have highest h index of 26 which is more than one-third of h index of BRICS countries.

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