Bibliometrics, Analyses on the Six Sigma Methodological Approaches to Scopes Database during 2007-2018

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Abstract- *The term "six sigma" comes from statistics and is used in statistical quality control, which evaluates process capability. Originally, it referred to the ability of manufacturing processes to produce a very high proportion of output within specification In this regard the Scopus is a premier research platform, helping to find, analyze, and share information in the sciences, social sciences, arts, and humanities. The present paper discusses the term "Six Sigma" as reflected in SCOPUS during the period during 2007 to 2018. The present paper investigates the highly productive authors, Document Types; it aims to find out the top contributing institutions, the preferred sources for publications, documents by country, Subject area, Source Type, Affiliation,*

Keywords- six Sigma , Scopes,

I. INTRODUCTION

The term "six sigma" comes from statistics and is used in statistical quality control, which evaluates process capability. Originally, it referred to the ability of manufacturing processes to produce a very high proportion of output within specification. Processes that operate with "six sigma quality" over the short term are assumed to produce long-term defect levels below 3.4 defects per million opportunities (DPMO). The 3.4 dpmo is based on a "shift" of +/- 1.5 sigma created by the psychologist Dr Mikel Harry. He created this figure based on the tolerance in the height of a stack of discs. Six Sigma's implicit goal is to improve all processes, but not to the 3.4 DPMO level necessarily. Organizations need to determine an appropriate sigma level for each of their most important processes and strive to achieve these. As a result of this goal, it is incumbent on management of the organization to prioritize areas of improvement.

II. CONCEPTUAL ANALYSIS

2.1 Six Sigma - is a method that provides organizations tools to improve the capability of their business processes. This increase in performance and decrease in process variation lead to defect reduction and improvement in profits, employee morale, and quality of products or services. Six Sigma quality is a term generally used to indicate a process is well controlled

2.2 Differing opinions on the definition of Six Sigma:

Philosophy— The philosophical perspective views all work as processes that can be defined, measured, analyzed, improved and controlled. Processes require inputs (x) and produce outputs (y). If you control the inputs, you will control the outputs. This is generally expressed as y = f(x).

Set of tools— The Six Sigma expert uses qualitative and quantitative techniques to drive process improvement. A few such tools include statistical process control (SPC),control charts, failure mode and effects analysis, and process mapping. Six Sigma professionals do not totally agree as to exactly which tools constitute the set.

Methodology— This view of Six Sigma recognizes the underlying and rigorous approach known as DMAIC (define, measure, analyze, improve and control). DMAIC defines the steps a Six Sigma practitioner is expected to follow, starting with identifying the problem and ending with the implementation of long-lasting solutions. While DMAIC is not the only Six Sigma methodology in use, it is certainly the most widely adopted and recognized.

Metrics – In simple terms, Six Sigma quality performance means 3.4 defects per million opportunities (accounting for a 1.5-sigma shift in the mean).

2.3 Scopus-

Scopus launched in November 2004. It is the largest abstract and citation database of peer-reviewed literature, featuring smart tools to track, analyze and visualize research.

With over 21,500 titles from more than 5,000 international publishers, Scopus delivers the most comprehensive overview of the world's research output in the fields of science, technology, medicine, social science and arts and humanities.

III. OBJECTIVES OF STUDY

3.1 To Study the Document types and number of documents in which 'Six Sigma' have been used.
3.2 To find out highly productive authors on Six Sigma.
3.3 To classify Document Type by country on Six Sigma
3.4 To identify documents on Six Sigma by year of publications.
3.5 To provide information writing for Research areas.

IV. SCOPE & LIMITATION OF STUDY

Document types and number of documents in which 'Six Sigma' have been used hence, the present Study is limited to search results on the title of 'Six Sigma' in SCOPUS database during 2007 to 2018. The result indicates that there were total 6528 documents on "Six Sigma" in Scopus during the period.

V. METHODS AND MATERIALS

The growth of publications on the 'Six Sigma' was derived from the SCOPUS published by Elsevier. During the period 2007–2018, a total of 6528 records were found by the Title ("Six Sigma") And (Limit-To (Pubyear , 2018) or Limit-To (Pubyear,2017) or Limit-To (Pubyear, 2016) or Limit-To (Pubyear, 2015) or Limit-To (Pubyear , 2014) or Limit-To (Pubyear , 2013) or Limit-To (Pubyear , 2012) or Limit-To (Pubyear, 2011) or Limit-To (Pubyear , 2010) or Limit-To (Pubyear , 2010), Limit-To (Pubyear , 2009), Limit-To (Pubyear, 2008), Limit-To (Pubyear,2007), Necessary data was tabulated into separate sheets in terms of authorship pattern, geographical distribution of contributors, ranking list of Sources and collaborative measures, etc.

VI. REVIEW OF RELATED LITERATURE

Susana Portillo., (2016)., This articles "USING LEAN SIX SIGMA IN BUSINESS SURVEYS: PRACTICAL EXAMPLE" in The Lean Six Sigma (LSS) programme has proved a very successful driver of change and business process improvement in the Central Statistics Office (CSO) in Ireland since its introduction in 2010. This paper gives an overview of one of the first Lean Six Sigma projects carried out in the office, which proved extremely successful and one of the precursors of the introduction of the overall LSS programme in the CSO.

Kimberly Watson (2018) 17th Lean six sigma world conference "Enhancing Leadership Support for Your Lean Six Sigma Deployment" Review the literature on leadership. Talk to experts. Think about any corporate initiative you've been involved in. Every source will tell you that the single most important success factor for any major operational excellence deployment is leadership support. That's why no matter how well or poorly your deployment is going, looking for ways to further engage and support leaders is always going to be a step you should consider if you want to improve results.

Alessandro Laureani.,(2011) Emerald Group Publishing Limited publication the research paper "Standards for Lean Six Sigma certification", Purpose This paper aims to provide an overview of current Lean Six Sigma certification practices among different industries and organizations and puts forward a public standard.

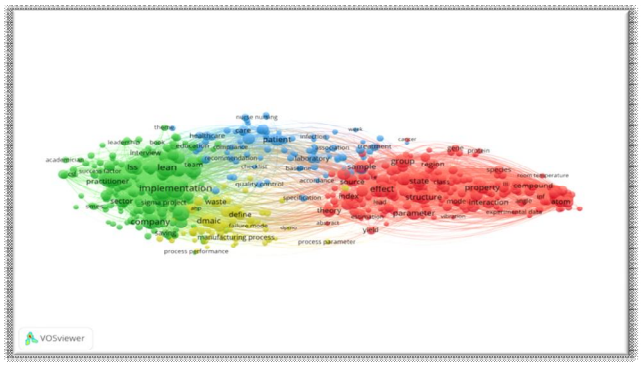
Veer D. K., Khiste G.P., Deshmukh Rahul k., (February 2018)., Publication Productivity of 'Information Literacy' in Scopus during 2007 to 2016., Asian Journal of Research in Social Sciences and Humanities., Vol. 8, No. 2, February 2018, pp.171-183.

Kale Vilas A., Deshmukh Rahul K. & Khiste Gajanan P. (2017) discusses the Consortia as reflected in Web of Science for the period from 1989–2016

VII. RESPONSE OF SCOPES DATABASE

Publication tram State us of Six Sigma over all on Scopes database the collected data is analyzed in Following Chat

Figure no 1



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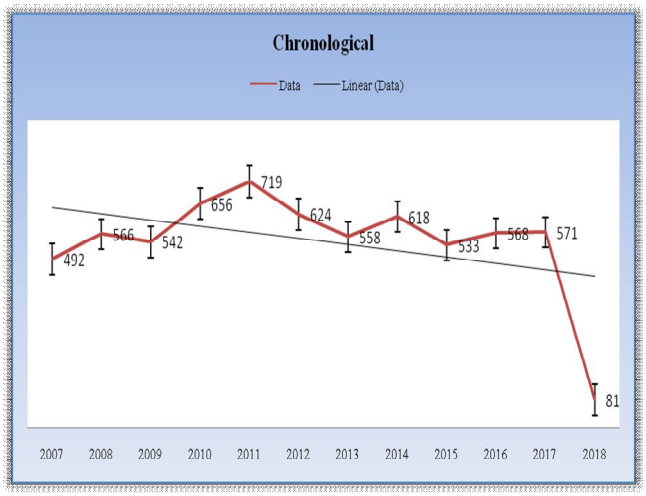
VIII. CHRONOLOGICAL ANALYSIS

Year wise productivity means the publication of Author counted chronologically to see most productive year in a particular year.

Figure no 3 Chronological



The figure n reveals that most productive year was 2011 as total productivity in this year was 719 followed by (656) 2010 and (624) in 2012. As regards the year wise productivity, the lowest has produced 81 publications in the year 2018 which is highest number in year wise publications during 2011 time period.

IX. SUBJECT WISE ANALYSIS

The author has analyses the compiled data by 27 different types of subjects and presented it in the Table no. 01

Table No 01

Sr No.	SUBJECT AREA	Data	% of 6528
1	Engineering	2297	35.18
2	Business, Management and Accounting	1300	19.91
3	Physics and Astronomy	1027	15.73
4	Chemistry	963	14.75
5	Materials Science	822	12.59
6	Computer Science	763	11.68
7	Medicine	718	10.99
8	Decision Sciences	650	9.95
9	Biochemistry, Genetics and Molecular Biology	376	5.75
10	Earth and Planetary Sciences	354	5.42
11	Environmental Science	308	4.71
12	Mathematics	282	4.31
13	Social Sciences	236	3.61
14	Chemical Engineering	219	3.35
15	Agricultural and Biological Sciences	191	2.92
16	Nursing	170	2.60
17	Economics, Econometrics and Finance	135	2.06
18	Energy	134	2.05
19	Pharmacology, Toxicology and Pharmaceutics	108	1.65
20	Immunology and Microbiology	82	1.25
21	Health Professions	52	0.79
22	Multidisciplinary	46	0.70
23	Neuroscience	43	0.65
24	Dentistry	21	0.32
25	Arts and Humanities	16	0.24
26	Psychology	15	0.22
27	Veterinary	14	0.21

The details of the subject wise analysis of the articles are shown in the Table No.1 the tram Six Sigma constituted the highest number of articles use in Engineering 2297 (35.18%) . The lowest constituted use in Veterinary Subject 14 (0.21%) number of articles. in subject Social Science the number of articles 236 (3.61%) respectively.

X. RANKING OF CONTRIBUTORS OF AUTHORS

The ranking of contributors of Authors is show in table No.2

Table No.2 Top five Authors

AUTHOR NAME	Data	Rank
Antony, J.	94	1
Does, R.J.M.M.	30	2
Devadasan, S.R.	24	3
Chen, K.S.	21	4
Kumar, M.	20	5

It was observed above authors rank table fist Top Five Antony, J. fist rank in Scopes database for 94 data Six Sigma terms. Second rank authorship Does, R.J.M.M. he was published 30 data & third ranks on Devadasan, S.R. he was published 24 data

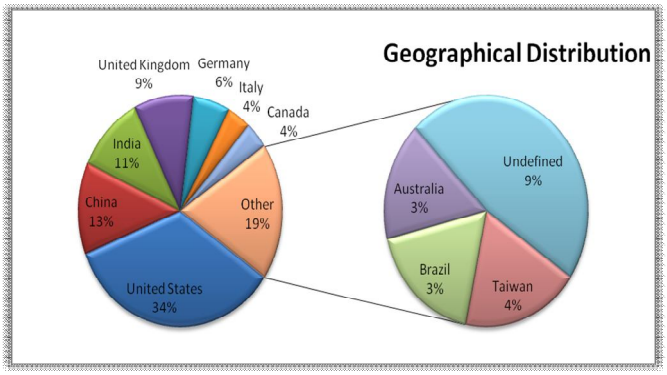
XI. GEOGRAPHICAL DISTRIBUTION OF CONTRIBUTORS OF ARTICLES

Geographical distribution of contributors of articles is shown in table

Table No.3 Geographical Distribution of contributors of articles

COUNTRY/TERRITORY	Data	% of 6528	Rank
United States	1847	28.29	1
China	688	10.53	2
India	577	8.83	3
United Kingdom	506	7.75	4
Germany	312	4.77	5
Italy	204	3.12	6
Canada	200	3.06	7
Taiwan	192	2.94	8
Brazil	183	2.80	9
Australia	170	2.60	10
Undefined	481	7.36	

Figure no 3



From the table & figure it is found that there are a total of 6528 contributors from the analysis it has been observed that the highest numbers of contributors are from United States with 1847 articles and the percentage is (46.22%) as well as the Undefined number is of 481 article.

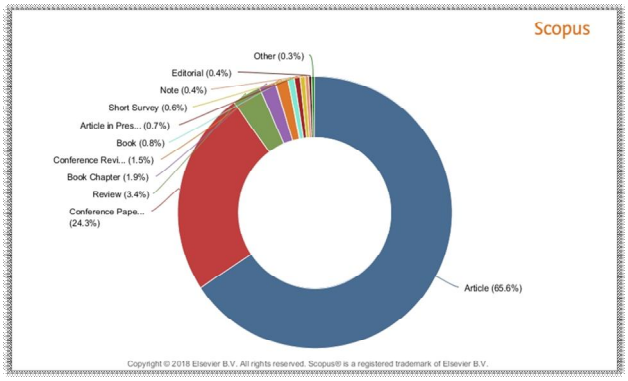
XII. TOTAL PUBLICATION OUTLET

Publication outlet means a form in which the articles, News paper and books are published. Publication outlet by College Librarian to publish the total 6528 publications which is presented in Table No. 4

Table No. 4

DOCUMENT TYPE	No. of
Article	4285
Conference Paper	1586
Review	225
Book Chapter	126
Conference Review	98
Book	53
Article in Press	44
Short Survey	36
Note	29
Editorial	24
Letter	20
Erratum	2

Figure no. 4



It can be observed from table No. 3 and figure no. 4 Revels that out of the total publications the highest percentage i. e. 4285 (%) of publications were articles; followed by 1586 (%) Publications were published in Conference paper from. While, 50 (5%) Publication was published in Review writing. 126 (3%) publication were published in Book Chapter. very few i.e. 2 Publications were published as Erratum.

XIII. AFFILIATION TRENDS OF ARTICLES

Affiliation trends distribution of articles is shown in table No.5

Table no. 5 Top Five Affiliations

AFFILIATION	Data	No of
University of Strathclyde	57	1
CNRS Centre National de la Recherche Scientifique	48	2
Chinese Academy of Sciences	45	3
University of Amsterdam	43	4
Universidade de Sao Paulo - USP	43	4
Heriot-Watt University, Edinburgh	42	5
University of Malaya	42	5

The details of the Affiliation wise analysis of the articles are shown in the Table No.5 the Affiliation University of Strathclyde constituted the highest number of articles 57. The CNRS Centre National De la Recherche Scientifique constituted 48 numbers of articles.

XIV. CONCLUSION

- During 2007 to 2018. The result indicates that there were total 6528 documents on “Six Sigma” in Scopus during the period. The most productive year was 2011 as total productivity in this year was 719 articles.
- The highest number of articles use in Engineering 2297 (35.18%) subject.
- Contributors are from India with 577 articles and the percentage is (8.83%).

An Epilogue

The data suggest that there was a significant research activity in the field of “Six Sigma” during the study period. The contribution of documents on Six Sigma indicates that healthy pattern of progress in this field.

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