

# Exploring the use of Strategic Intelligence as support tool in the Project Management field using advanced bibliometric methods

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## Abstract:

**Strategic Intelligence is being seen as a core activity in business, science, education or any field in which the use of high-value data, information and knowledge are vital to achieve their goals. The SI concept is also multidimensional, and it can be defined as a process to gather, analyze, interpret and disseminate high value data and information at the right time for use in the decision-making process. In this respect, the project managers are seeking to develop a culture of result orientation, focused on an effective decision-making and collaboration. Thus, the main aim of this contribution is to develop a bibliometric analysis to evaluate the performance and conceptual evolution of the authors and publications that are directly related to Strategic Intelligence from the point of view of Project Management.**

**Keywords: Strategic Intelligence; Project Management; Bibliometric network analysis; Information Management; Competitive Intelligence; Business Intelligence; SciMAT.**

## 1. Introduction

The Strategic Intelligence are precisely what make managing projects efficient and more effective. These can be described as the ways that we gather information, communicate, and generally get things done. With this in mind, it is interesting to analyze the use of Strategic Intelligence as support tool in the Project Management field using advanced bibliometric methods to understand the full impact of these in the Project Management Process: Initialing, Planning, Executing, Monitoring and Controlling and Closing [1-4].

In this way, the main objective of the present article is to analyze the role of the Strategic Intelligence in the Project Management field considering the PMBOK 6 Knowledge Areas (*Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communication Management, Project Risk Management, Project Procurement Management* and *Project Stakeholder Management*) using advanced bibliometric methods.

To do that, we target to quantify the main indicators related to bibliometric performance: published publications, received citations, most cited articles, most cited authors, data on geographic distribution of publications, among others. Lastly, using a bibliometric analysis software based on a bibliometric network, we will review the connections.

Bibliometrics can be defined as a set of methods and tools for evaluating and analyzing academic publication and citation in order to explore its impact

on a specific field and how it contributes to the progress of science in the main areas of research [5].

Furthermore, Strategic Intelligence is the result of an organization's effort to define, identify, gather, analyze, update and disseminate value added information about itself and its environment that support decision making process. Finally, Strategic Intelligence supports organizations sustain their competitive advantage by providing actionable insights and reliable input to decision makers at operational, tactical or strategic levels. [6-9].

## 2. Methodology and Dataset

Based on a prior review of the state of the art, we focused the analysis according to the terms related to Strategic Intelligence and the Project Management as knowledge area. In addition to carry out the bibliometric performance and network visualization map analysis, the publications related to the Strategic Intelligence and Project Management have been collected.

The data pertaining to Strategic Intelligence and Project Management were retrieved from Web of Science™ Core Collection using the following advance query: *TS=("project management") AND TS=("strategic intelligence" OR "business intelligence" OR "competitive intelligence" OR "market intelligence" OR "technology intelligence" OR "organizational intelligence")*.

In addition, the knowledge base was further refined and limited to Articles, Proceedings and Reviews published in English. This advance query retrieved a

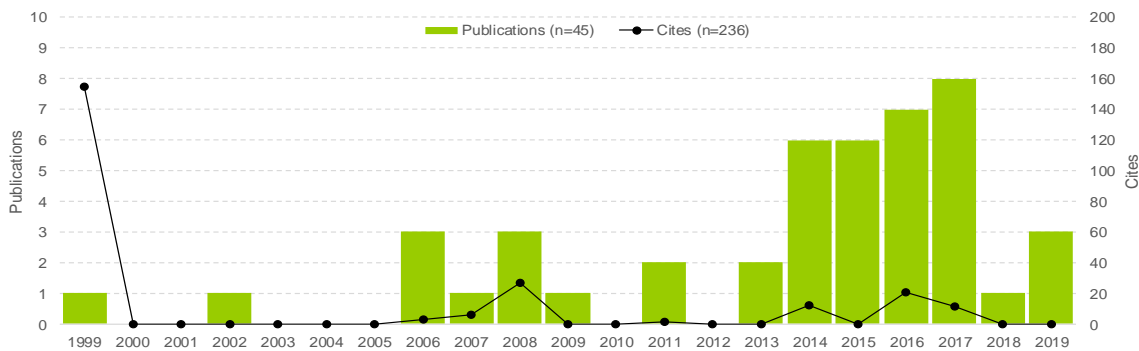


Figure 1. Distribution of Publications by year (1999-2019)

total of 46 publications, of which 45 are directly related to use of the Strategic Intelligence. To accomplish this, we downloaded all the publications and reviewed each abstract.

The bibliometric methodology used here classified the main Strategic Intelligence research themes in the PM field in four categories: (i) Motor themes, (ii) Highly developed and isolated themes, (iii) Emerging or declining themes and (iv) Basic and transversal themes. Furthermore, the research themes within are represented as spheres, and its size is proportional to the number of publications associated with each research theme [10].

### 3. Performance Bibliometric Analysis of the Strategic Intelligence in the PM field

To understand how the Strategic Intelligence has evolved in the Project Management field in terms of publication, citations and impact, we evaluated their performance through analysis of the following bibliometric indicators: published publications, received citations, most cited articles, most cited authors, data on geographic distribution of publications and h-index.

The bibliography performance analysis is structured in two parts: (1) evaluation of the publications and their citations with the aim of testing and evaluating scientific growth; and (2) analysis of the authors, publications, journals and research areas to assess the impact of the publications.

#### 3.1. Publication and Citations

The distribution of publications and citations related to Strategic Management in the Project Management field per year are shown in Figure 1. It shows that the number of publications has increased in the last years.

Since the first publication related to the use and application of Strategic Intelligence, we can highlight three milestones in the use of the Strategic Intelligence in the PM knowledge area. The first was on 1999, when the first research was published. The second milestone was on 2006, where the publications of research started a continuous process. Finally, like the previous milestone, the third was on 2013 when the publications were continuous. This evolution reveals the growing interest in the Project Management knowledge area and use and research of Strategic Intelligence.

On the other hand, the distribution of citations per year is shown in the Figure 1. As with the case of the publications, the citation distribution showed a positive developmental trend in the period 1999-2019. Based on the results of the advance query applied in the Web of Science™ Core Collection, the citation performance is summarized in the following indicators: Average citations per publication: 5,24; Sum of Times Cited (without self-citations): 236 (233) and Citing articles (without self-citations): 235 (232).

#### 3.2. Most Productive and Cited Authors, Geographic Distribution of Publications, Research Areas and h-index (Citation Classics)

It is also important to know which are the most productive and cited authors, along with the geographic distribution of publications and research areas. It complements the bibliometric performance analysis of the use of Strategic Intelligence as support tool in the Project Management field and allows for an evaluation of where developments have occurred within these fields. Consequently, the most productive authors are shown in Figure 2.

Authors	Publications (n=45   %)
Bach, M. P., Celio, A., Gawdiak, Y., Hamranova, A., Jrad, R. B. N., Marsina, S., Pondel, J., Pondel, M., Putz, P., Shamshurin, I., Sundaram, D., Zoroja, J.	2 (4,44%)
Rest of authors (n=95)	1 (2,22%)

Figure 2. Most productive authors (1999-2019)

Along these years, the most cited authors are shown in Figure 4.

Authors	Citations (n=236   %)
Robey, D., Lyytinen, K.	155 (65,68%)
Sen, A., Ramamurthy, K., Sinha, A. R.	17 (7,20%)
Rennolls, K., Al-Shawabkeh, A.	10 (4,24%)
Habjan, a., Andriopoulos, C., Gotsi, M.	9 (3,81%)
Hahn, A., Saltz, J. S., Austing, S. G., Strickmann, J.	6 (2,54%)
Muller, L., Ashish, N., Batra, D., Bell, D., Hart, M., Maluf, D.	3 (1,27%)

Figure 3. Most cited authors (1999-2019)

It is important to mention that the most productive authors are not included in the list of most cited. It is important mention that these authors are related to the query used to obtain the publications and these don't have to be prominent authors in the PM field.

The most productive countries related to use of Strategic Intelligence as support tool in the Project Management field during the last 20 years are shown in Figure 4.

Country/Region	Publications (n=45   %)
USA	10 (22,22%)
China	3 (6,67%)
Poland, Herceg-Bosna, Croatia, England, Finland, Germany, India, New Zealand, Serbia, Slovakia, South Africa, Spain	2 (4,44%)
Rest of countries/regions (n=11)	1 (2,22%)

Figure 4. Most productive countries (1999-2019)

On the other hand, the sources with the largest number of documents published are *International Conference on Information Intelligence Systems and Applications*, *Advances in Production Management Systems Innovative and Knowledge Based Production Management in a Global Local World*, *Advances in Information and Communication Technology*, and *Lecture Notes in Business Information Processing*. It highlights that host the main publications, covering knowledge areas as: *Computer Science Information Systems*, *Management*, *Engineering*, *Electrical & Electronic*, *Telecommunications* and *Business and Finance*.

Finally, the search query used in the database Web of Science™ Core Collection has an h-index of 6 [11]. Using as reference the h-index value, we could identify the following relevant publications to this research:

- (155 Cites) Learning failure in information systems development (Lyytinen, K; Robey, D).
- (17 cites) Data warehousing infusion and organizational effectiveness (Ramamurthy, K.; Sen, Arun; Sinha, Atish R.).

- (10 cites) Technology Acceptance Model for Business Intelligence Systems: Preliminary Research (Bach, Mirjana Pejic; Celjo, Amer; Zoroja, Jovana).
- (10 cites) Formal structures for data mining, knowledge discovery and communication in a knowledge management environment (Rennolls, Keith; AL-Shawabkeh, Abdallah).
- (9 cites) The role of GPS-enabled information in transforming operational decision making: an exploratory study (Habjan, Andreja; Andriopoulos, Constantine; Gotsi, Manto).
- (6 cites) Big Data Team Process Methodologies: A Literature Review and the Identification of Key Factors for a Project's Success (Saltz, Jeffrey S.; Shamshurin, Ivan).

To effectively analyze, the next step is to determine the use of Strategic Intelligence as support tool in the Project Management field using SciMAT, software tool for constructing and visualizing bibliometric networks [12-14].

#### 4. Network visualization map of Strategic Intelligence in Project Management field

The main Strategic Intelligence themes in the Project Management field from 199 to 2019 are: DATA-ANALYTICS (72 publications), AGILE-METHODS (14 publications), PERFORMANCE MEASUREMENT-SYSTEM (12 publications), INFORMATION-MANAGEMENT-CAPABILITY (8 publications) and PROJECT-MANAGEMENT-TOOLS (6 publications). The research themes are distributed in all four quadrants. The most productive quadrants are the (ii) Highly developed and isolated themes and (iv) Basic and transversal themes. It is important to mention that the quadrants (i) Motor themes and (iv) Basic and transversal themes concentrate the most important themes to development of the PM field. In this way, these themes are: DATA-MINING-(DM), PERFORMANCE-MESAUREMENT-SYSTEM, PROJECT-MANAGEMENT-PROCESS, INFORMATION-MANAGEMENT-CAPABILITY, AGILE-METHODS and DATA-ANALYTICS.

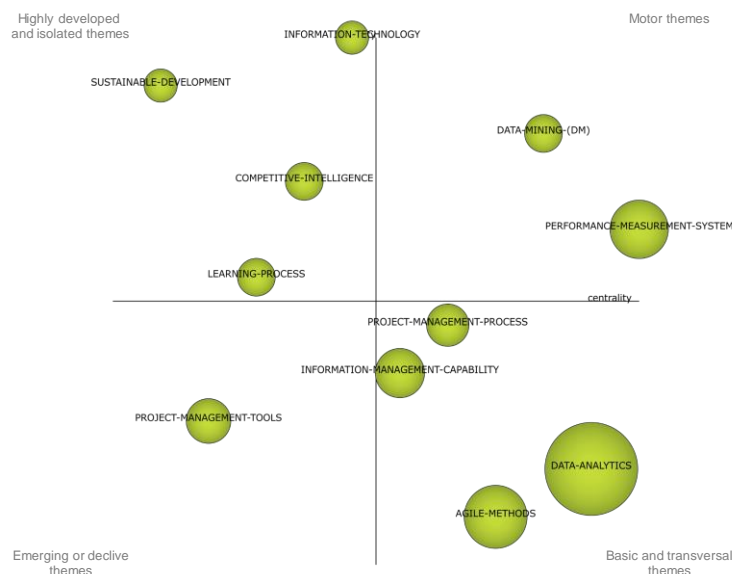


Figure 5. Main Strategic Intelligence themes in the Project Management field

## 5. Conclusions

The size of literature related to use of Strategic Intelligence as support tool in the Project Management field showed a noticeable increase in the last years. Given the large volume of citations received in this field, it is expected that the use of Strategic Intelligence in the PM field will be seen as part of the projects.

Strategic Intelligence as support tool in the PM field needs to be encouraged, particularly in the new industrial sectors and collaborative projects. In this way, Strategic Intelligence is related mainly to the *Project Integration Management*, *Project Scope Management*, *Project Procurement Management* and *Project Stakeholder Management*, but has interaction with all of the knowledge areas of PM. Keep in mind that the focal point of reference for all the items are the Strategic Intelligence as support tool in the Project Management field, the following research themes highlight DATA-ANALYTICS, INFORMATION-MANAGEMENT-CAPABILITY, AGILE-METHODS and PROJECT-MANAGEMENT PROCESS.

Finally, some future work is necessary to provide a more in-depth examination of the use of Strategic Intelligence in the PM field. This work should include an identification of common process and tools, and the integration of new project management strategies.

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