Chapter 17
Informetrics Research Methods Outlined

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ABSTRACT

This chapter provides a conceptual scope of informetrics by defining the concept and demonstrating its relationship with bibliometrics, scientometrics, webometrics, cybermetrics, and altmetrics. It demonstrates that informetrics is a quantitative research design that assumes a realistic ontology and objectivism as the epistemological perspective. Based on the data that was extracted from Scopus as well as a content review of selected calls for papers, the chapter highligts methods and areas of informetrics research as reflected in the literature that was published in the subject domain and its sub-domains between 1991 and 2018. The author-supplied keywords, which were the items of analysis, yielded 96 interconnected research methods and 361 areas in which informetrics research can be applied or undertaken. Finally, the chapter provides informetrics students and developing researchers with an outline of the elements that would constitute their research proposals and research methodology chapters of their theses and dissertations.

INTRODUCTION

The purpose of this chapter is to outline the research methods and possible research areas in informetrics. The chapter uses informetrics techniques, particularly content analysis of the author-supplied keywords in informetrics research published between 1991 and 2018, to determine research methods in informetrics as well as possible areas in which informetrics studies may be conducted. A total of 16 154 articles were extracted from the Scopus database and analysed using VosViewer software to identify the keywords that described informetrics research methods and focus areas of informetrics research. The chapter is organised as follows: firstly, it offers the scope of informetrics; secondly, it briefly discusses the development of informetrics research; thirdly, it explains informetrics in the context of research methodology;

fourthly, the chapter outlines research methods; fifthly, it outlines possible research areas in informetrics studies; and finally, it provides developing researchers and students of informetrics with an outline of how to design and structure an informetrics study.

SCOPING INFORMETRICS

Informetrics constitutes all quantitative measures of "patterns that show up not only in publications but also in many aspects of life, as long as the patterns deal with information" (Diodato 1994, p. ix). Hood and Wilson (2001, p. 294) observe that the term "comes from the German term 'informetrie' and was first proposed in 1979 by Nacke to cover that part of information science dealing with the measurement of information phenomena and the application of mathematical methods to the discipline's problems, to bibliometrics and parts of information retrieval theory, and perhaps more widely".

According to Egghe and Rousseau (1990, p. 1), informetrics deals with the measurement, mathematical theory and modeling of all aspects of information. The authors argue that informetrics largely "borrows tools (techniques, models, analogues) from mathematics, physics, computer science and other metrics". Informetrics is an umbrella term that encompasses bibliometrics, scientometrics, webometrics, cybermetrics and altmetrics (Björneborn & Ingwersen, 2004; Onyancha, 2014). Onyancha's (2014) graphical representation of the relationship between the aforementioned concepts, as shown in Figure 1, is an adaptation of Björneborn and Ingwersen's (2004) illustration.

Figure 1 demonstrates the distinct but intertwined and overlapping relationships among the concepts. It is not therefore uncommon to witness the interchangeable and synonymous usage of two or more of the concepts in literature. The concepts, however, have unique applications as exemplified in their definitions.

Figure 1. Overlaps between informetrics, bibliometrics, scientometrics, cybermetrics webometrics, and altmetrics (Source: Onyancha, 2014, p. 51)
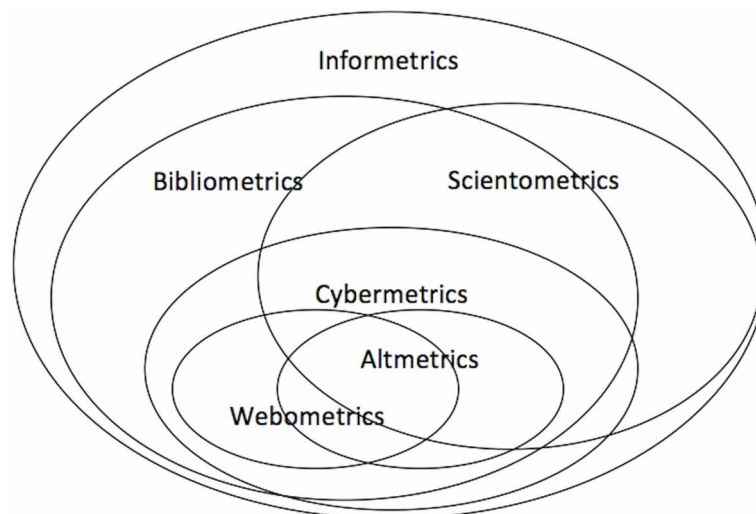
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