

Chapter I

An Introduction to Bibliometrics and Informetrics

ABSTRACT

Author cocitation analysis (ACA) is a branch of bibliometrics. Bibliometrics/informetrics is one of the older areas of library and information science. The terms bibliometrics, scientometrics, and informetrics are often used synonymously. This chapter briefly overviews bibliometrics, including basic concepts, scopes, and study areas of bibliometrics. The areas of study cover bibliometric distribution, citation and cocitation analyses, and library use studies. The study of bibliometric distribution led to the invention of Lotka's law of scientific productivity, Bradford's law of core scatter in journals, and Zipf's law of word occurrence. The researchers in the citation and co-citation areas identify the pattern of how published documents are cited over time using many different approaches such as bibliometric coupling, document cocitation analysis, author cocitation analysis, and co-word analysis. This chapter also discusses assumptions, purposes, benefits, limitations, and criticism of ACA. The last section of this chapter includes discussions of several developments in informetrics and ACA. Since the late 1990s, a new subset of informetrics, webometrics/cybermetrics, has become part of the main stream library and information science research area. In ACA, there had been a series of intense debates on the use of Pearson correlations coefficients, r , as a similarity measure along with several new developments in ACA visualization tools such as Pathfinder networks (Howard D. White, 2003b), AuthorLink (Lin, White, & Buzydlowski, 2003), and VxInsight (Boyack, Wylie, & Davidson, 2002).

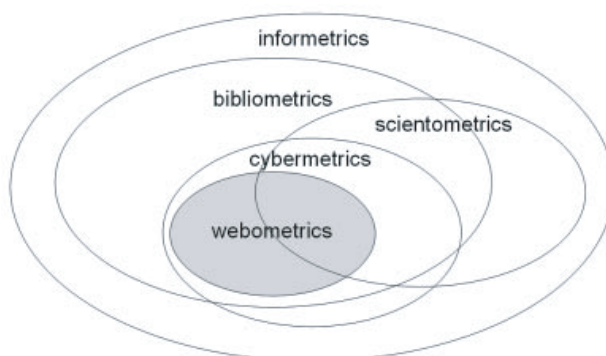
INTRODUCTION

The library and information science (LIS) field consists of informetrics, bibliometrics, scientometrics, cybermetrics, and webometrics. The terms bibliometrics, librametry scientometrics, and informetrics are frequently used interchangeably. Even in the late 1980's, all these terms were not clearly distinguishable each other. Wormell described the chaotic state of terminologies and the acceptance of the term "informetrics" this way (Wormell, 1998, p. 258):

The individual identities of the subfields "bibliometrics", "informetrics", "scientometrics" and "technometrics" are unfortunately not very clear, and there is chaos in the terminology. At the 1987 international conference some thoughts were given to changing the name of the discipline to "informetrics", and since the late 1980s there has been some support for use of this term. But alongside or parallel with this, both "bibliometrics" and "scientometrics" are frequently used terms. The field is becoming a scientific discipline including all the statistical and mathematical aspects connected with library, documentation and information problems with strong links to the theoretical aspects of information retrieval.

As Figure 1 shows, nowadays, informetrics is a broader term that encompasses electronic communication of media including the Internet and World Wide Web, books, and journals. Informetrics is defined (Tague-Sutcliffe, 1992) as "the study of the quantitative aspects of information in any form, not just records or bibliographies, and in any social group, not just scientists." The development of the Internet has expanded the scope of bibliometrics into electronic communication media.

Figure 1. Relationships among many subfields of library and information science fields



Source: Björneborn & Ingwersen (2004, p. 1217).

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