



The Digital Object Identifier System

■ Norman Paskin / The International DOI Foundation

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It is a pleasure to write an introduction for this special issue of Wanfangdata Research's magazine, as part of the second COINFO meeting, Beijing October 2007.

The Digital Object Identifier (DOI®) system is a managed system for persistent identification of content on digital networks. Initiated in 1997, the DOI system builds on existing or developing standards, notably the Handle System® for resolution of names to data and the indecs™ (interoperability of data in e-commerce systems) framework for precise specification of an identified entity's attributes (metadata). DOI names may identify physical, digital, or abstract entities, at any level of granularity. Our new collaboration

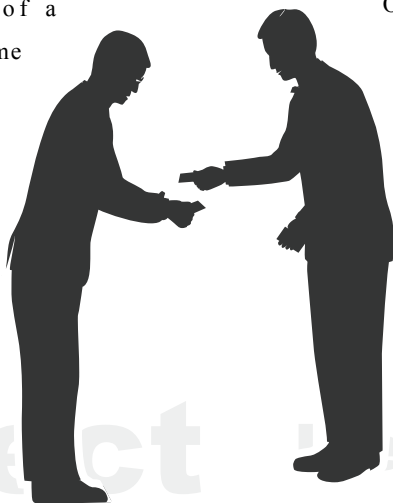
with Wanfang/ISTIC as the first China Registration Agency for DOI names is of great significance; increasingly, national and language barriers are being overcome on a linked digital world. The DOI System, by enabling persistent and predictable known links to content across a wide range of sources, is enabling the interconnection of content from multiple sources and the re-use and further development of content under a social and technical framework which recognises policy and copyright.

Through multiple resolution, a DOI name can be associated with multiple pieces of data, each of which may be dynamically updated. Once assigned, a DOI name can be used to locate an entity, or to provide services irrespective of changes in location

or management responsibility of the entity. The DOI system has been developed and implemented in a range of publishing applications since 2000. By 2007 over 30 million DOIs have been assigned.

The DOI system is managed by the International DOI Foundation (IDF), and is currently being standardised through the International Standards Organisation (in ISO TC46/SC9, the home of well-known schemes such as the ISBN and ISSN). The IDF is also involved in related activities which support or facilitate DOI uses for interoperability of persistent identifiers and metadata, treating each piece of content as an object in its own right, with a defined name (identifier) and attributes.

The DOI system has been developed to meet the needs of the intellectual property communities in carrying out any transaction (free or paid) through the use of persistent identifiers (unique labels for entities) with metadata (structured relationships between identified entities), as prerequisites for structured management of content. Applications were initially simple redirection to a single URL, but more sophisticated means of management are now being implemented, such as contextual resolution, where the result of a redirection is also a function of some additional information such as local holdings information. The best known current application of the DOI system is the Crossref cross-publisher citation linking service, which allows a researcher link from a reference citation directly to the cited content on another publisher's platform, subject to the target publisher's access control practices. This application will also be of interest to the Chinese publishing sector, and we hope to see our colleagues at Wanfang develop a service in collaboration with CrosRef which will facilitate this linkage for the Chinese literature. Of particular interest to ISTIC is the use of DOIs to persistently



identify original data used in the development of scientific research: whereas publications have long been citable, hitherto the original data as used in a publication may be lost to all but the original author, and the development of such a DOI service (by the IDF agency TIB, the German National Library of Science and Technology, with which ISTIC hopes to collaborate) holds considerable promise.

Other applications in government documentation, books, and data are available and further applications are under development.

DOI names – the strings that specify unique referents within the DOI System – follow a defined syntax, which may optionally incorporate other identifier schemes, and they may be represented in a number of ways for use in applications. This is important, as there are many existing ways to identify pieces of content: the task is to make these interoperate and to aid efficiency and effectiveness. DOI metadata provides attributes for definition of the entity being managed, which is of particular importance when

managed entities are often abstractions, and the choice of which possible entities to distinguish as separable is not absolute but dependent on function and context. The IDF maintains a social infrastructure of policies and formal agreements to ensure the consistent implementation of the DOI system as a reliable and persistent framework for identification.

The detailed technical advantages of the DOI System, such as appropriate granularity, first class naming, context, the use of international alphabets, and the provision of a social infrastructure have been described elsewhere¹, but underlie the potential for development of the DOI System in China, which we at the IDF warmly welcome.

¹ e.g. "Identifiers and Licensing Information, Overview and Introduction", presentations at the World Intellectual Property Organisation Seminar on Rights Management Information, September 2007: <http://www.doi.org/announce.html#events>