

ICONDA: HISTORY AND PROSPECTS OF AN INTERNATIONAL INFORMATION SYSTEM [PUBLISHING, RETRIEVAL AND DISSEMINATION]

Markus Bauer¹, Jaime Acevedo-Alvarez²

ABSTRACT

ICONDA[®] The International CONstruction Database as a web based bibliographical retrieval system refers to more than 680,000 books, book and journal articles, research reports, conference proceedings and other non-conventional literature. The contents of the database cover approximately 650 journals that are regularly scanned and date back to 1976. Annually, the database grows by an average of approximately 25,000 records. It is produced by an international network of presently one supranational and 21 national input supplying organisations from 14 countries. ICONDA[®] is endorsed by the International Council for Research and Innovation in Building and Construction CIB and the International Union of Building Centres UICB.

The paper describes the various stages of development of the database and its dissemination in the architecture/engineering/construction (AEC) community and hints at the dynamics of its technological and political/economic context. The paper will also highlight on the latest steps to evolve this tool from firstly a bibliographical database to a single point of access for AEC relevant information and a comprehensive system for information suppliers and users that will cover the whole range of information publishing, retrieval and dissemination.

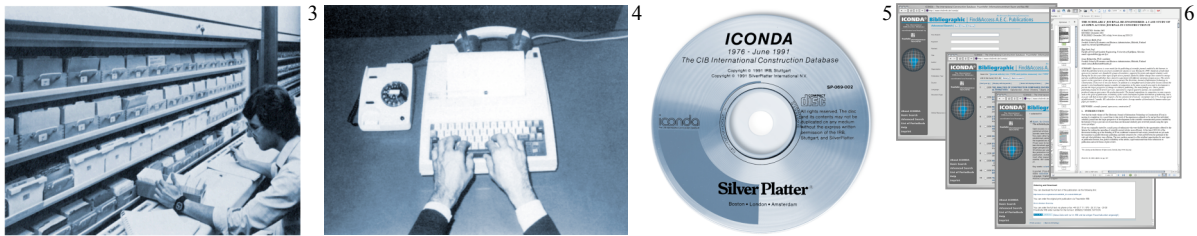
KEY WORDS

information technology, architecture, civil engineering, building construction, information retrieval, international database, information system, retrieval, dissemination.

¹ Dipl.-Ing. Architecture and Design, International Cooperation | The ICONDA[®] Agency, Fraunhofer-Informationszentrum Raum und Bau IRB, Nobelstrasse 12, 70569 Stuttgart, Germany, Phone +49 711 970 2627, FAX +49 711 970 2599, markus.bauer@irb.fraunhofer.de

² Dipl.-Ing. Architecture, International Cooperation | The ICONDA[®] Agency, Fraunhofer-Informationszentrum Raum und Bau IRB, Nobelstrasse 12, 70569 Stuttgart, Germany, Phone +49 711 970 2976, FAX +49 711 970 2599, jaime.acevedo-alvarez@irb.fraunhofer.de

INTERNATIONAL BUILDING DOCUMENTATION – THE ICONDA[®] SYSTEM



– THE 1ST GENERATION

International networking in this field started more than half a century ago: triggered by a resolution of the Housing Sub-Committee of the United Nations Economic Commission for Europe (ECE), an international conference on building documentation at Geneva in 1949 hosted experts from 17 countries, aiming at developing a building documentation index and focusing on issues of terminology, classification, abstracting rules, etc. To coordinate the international documentation network, in 1950 CIB's predecessor Conseil International de Documentation du Bâtiment (CIDB) was founded.⁷

Building documentation at that time technologically meant index cards, and networking meant exchange of paper card copies between the various national documentation centres.

The 1970s saw the first technical revolution in building documentation: electronic databases were introduced.

Compared to economic sectors like energy or chemistry, the economic building sector in most countries then had an unfavourable structure: many SME⁸, low level of industrial prefabrication, very low share of investments into research, in relation to the share of gross value added. The consequent lack of lobbying from the side of the potential end users put the building sector far behind other industries when we look at the pace of development in the field of internationalized electronic knowledge procurement and management.

National and corporate initiatives developed documentation databases detached from the mentioned "classical" international network, creating information insulae with proprietary classifications/terminologies, formats, languages, and it was not before the beginning of the 1980s that this 2nd generation of building documentation went international in the sense of networking.

³ Index card archives in the vaults of the Fraunhofer-Gesellschaft at Stuttgart, Germany. Image source: Wissmann, W. (editor) (1991). *Bauinformation in Deutschland*. IRB Verlag, Stuttgart, Germany, 360pp. (p 127).

⁴ First online access via acoustic coupler. Image source: dto. (p 128).

⁵ First CD-ROM version of ICONDA[®]. Image source: Fraunhofer IRB

⁶ ICONDA[®] online access via web browser. Image source: Fraunhofer IRB

⁷ Wissmann, W. (editor) (1991). *Bauinformation in Deutschland*. IRB Verlag, Stuttgart, Germany. (pp 67ff).

⁸ small and medium enterprises

– THE 2ND GENERATION

In 1984, the CIB working group W57 “Building Documentation and Information Transfer” launched the concept for an international documentation database:

- An English language database.
- Fed by input from countries that independently created bibliographic records.
- The chosen metadata format was a subset of the Common Communication Format (CCF)⁹ introduced by UNESCO, called ICONDA Communication Format (ICF).¹⁰
- Since there was (and is) no international accepted AEC¹¹ dictionary/thesaurus for indexing, it was agreed to translate the existing German indexing system FINDEX¹² into English.
- Fraunhofer IRB (Fraunhofer Information Centre for Planning and Building, Germany) proposed and was assigned to run the coordinating agency and operate the database.¹³
- The ICONDA[®] Board supervises content quality and decides on strategic issues.

Following this kick-off event, ICONDA[®] The International CONstruction DAtabase was launched in 1986, as the database of the International Council for Research and Innovation in Building and Construction CIB on the occasion of their 10th Congress in Washington DC.

ICONDA[®] was first accessible online via the hosting service of STN International.¹⁴

– THE 3RD GENERATION

In 1990, The International CONstruction DAtabase meets personal computing: SilverPlatter Information Ltd issues the first CD-ROM version of ICONDA[®].

– THE 4TH GENERATION (TODAY)

With the next technological revolution relevant for our field: personal computing joining the world wide web, ICONDA[®] becomes an AEC literature retrieval system for virtually everyone. Fraunhofer IRB as well as other hosts offer direct access to the database contents via www browsers.

Generally, the desired result of online literature search is not secondary information (bibliographic reference), but primary information (original full text).

⁹ Peter Simmons and Alan Hopkinson (editors) for the General Information Programme and UNISIST (1984). CCF: The Common Communication Format. Unesco, Paris, 185pp.

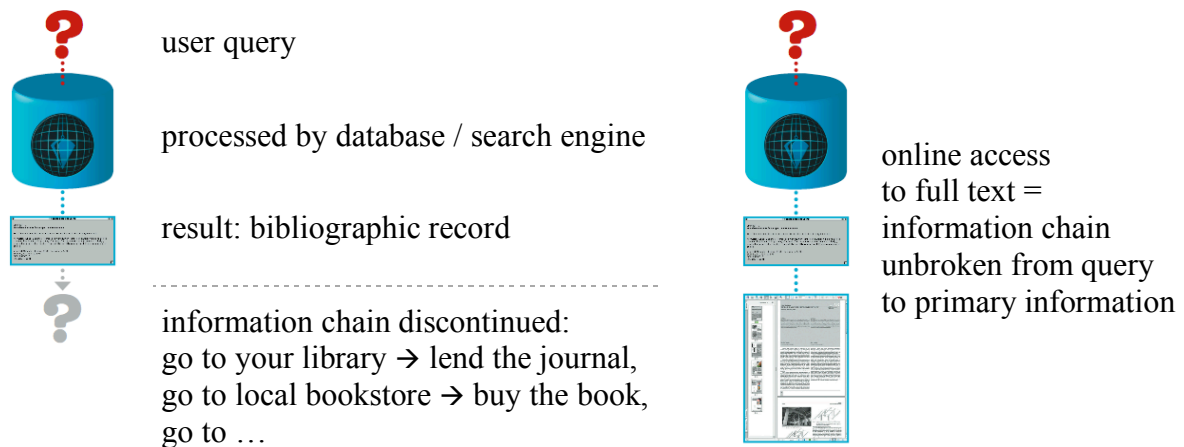
¹⁰ Informationszentrum Raum und Bau der Fraunhofer-Gesellschaft (editor) (3rd ed. 1990). ICONDA Communication format: format for the exchange of records in the frame of the International construction database. IRB Verlag, Stuttgart, Germany, 104pp.

¹¹ Architecture, Engineering, Construction

¹² Informationszentrum Raum und Bau der Fraunhofer-Gesellschaft (editor) (1985). FINDEX: Facet-Oriented Indexing System for Architecture and Construction Engineering. IRB Verlag, Stuttgart, Germany, 304pp.

¹³ Wissmann, W. (editor) (1991). *Bauinformation in Deutschland*. IRB Verlag, Stuttgart, Germany, 360pp. (pp 78ff).

¹⁴ dto. (p 130).



With full text information becoming increasingly available online, the demand for direct access from the query results grows. Before this background, the main bulk of work for the last two years has been developing ICONDA[®] from a reference database to a system for full text procurement by linking bibliographic records of:

- shippable print titles to vendors'/providers' sites
- open access documents to download pages on full text servers
- journal articles to the digital full texts at the respective vendors'/subscription providers' sites

via Digital Object Identifier (DOI) or other links provided with the metadata.

At this present stage, ICONDA[®] The International CONstruction Database is:¹⁵

- One of the worldwide most comprehensive web based systems for bibliographic reference and full text sourcing in the scope of architecture, engineering, construction and related fields. Its combination of thematically comprehensive scope, indexing depth (down to the scale of single journal/book articles) and the expertise of the producing professionals from the AEC field makes it unique.
- It contains more than 680,000 references¹⁶ to books, book and journal articles, research reports, conference proceedings and other non-conventional literature that is normally outside the public domain.
- Linking to more than 25,000 online full texts.¹⁷
- Chronological scope: systematic indexing from 1976 until today.¹⁸

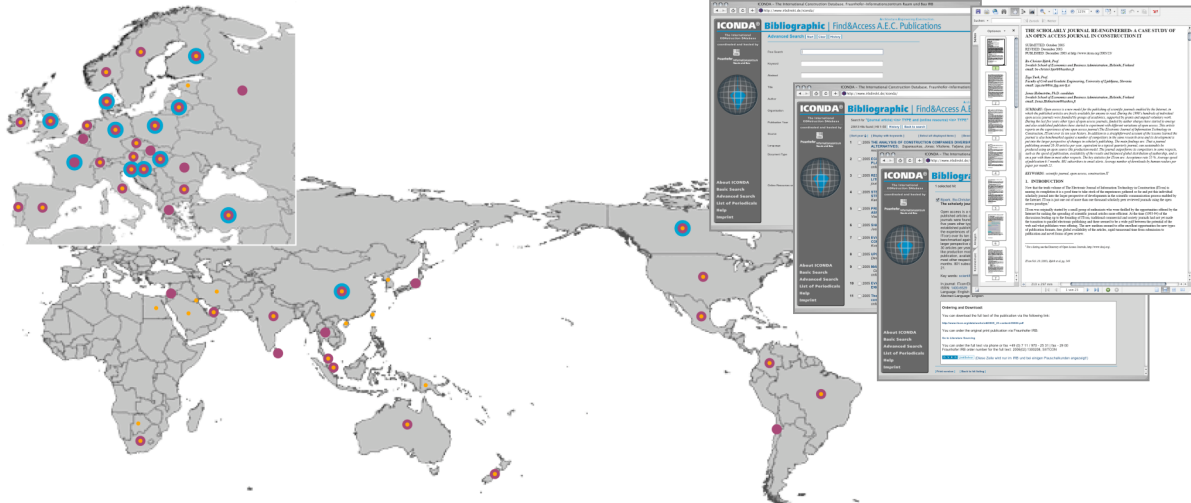
¹⁵ source of all following information: The ICONDA[®] Agency. 2006 Feb 20

¹⁶ 686,941 (2006 Feb 20)

¹⁷ 26,835 (2006 Feb 20)

¹⁸ random titles may be from older publication years

- Approx. 650 journals¹⁹ are regularly scanned and indexed.
- Annual growth: approximately 25,000 records.



- ICONDA[®] Coproducers: 1 supranational and 21 national organisations in 14 countries
 - [Supranational] CIB
 - Canada NRC Institute for Research in Construction
NRC Research Press
 - China Tongji University
 - Croatia Croatian Association of Civil Engineers
 - Denmark The Royal Academy of Fine Arts
 - Finland Technical Research Centre of Finland VTT
 - France Centre Scientifique et Technique du Bâtiment CSTB
Institut de l'Information Scientifique et Technique INIST
 - Germany Fraunhofer-Informationszentrum Raum und Bau IRB
 - Hungary Budapest University of Technology and Economics BUTE
 - Lithuania Vilnius Gediminas Technical University VGTU
 - Poland Building Information Centre COIB
 - Slovenia University of Ljubljana, Central Technological Library CTK
Electronic Journal of Information Technology in Construction
University of Maribor
 - Spain Centro de Información y Documentación Científica CINDOC²⁰
 - Turkey Istanbul Technical University
 - United Kingdom Arup
Building Research Establishment Ltd BRE
Royal Institute of British Architects Library & Bookshops²¹

¹⁹ 647 (2006 Feb 20)

²⁰ new in 2006

²¹ new in 2006

Presently, the main contributors to The International CONstruction Database are:

- Arup (UK):
a global firm of designers, engineers, planners and business consultants with offices in more than 30 countries²². The enterprise has a huge international AEC library and produces its own literature documentation database to meet the information needs of their several thousand employees.
- Fraunhofer IRB²³ (DE):
the central AEC information facility in Germany delivers the main input for the German language domain and in its function as the ICONDA[®] Agency coordinates the input, operates the database, and is responsible for marketing, accounting as well as the acquisition of new partners for contribution, hosting and distribution.
- INIST (FR):
the national centre for scientific and technological information in France produces the database PASCAL, a multidisciplinary, multilingual bibliographic database that covers the core world literature in Science, Technology and Medicine back to 1973.²⁴
- RIBA Library²⁵ (UK):
RIBA's international architecture library contributes an increase of journal titles by approx. 50%, sources coverage raised from 24 to 45 countries, and a correction of the dominance of engineering towards architectural content and boost the share of English-language sources (compared to 2005 and previous years).

Most of the publications from the USA covered by ICONDA[®] are indexed by Arup, INIST, and RIBA Library.

- ICONDA[®] Sources: from 45 countries²⁶

• AE	• CL	• FR	• IT	• NZ	• SK
• AT	• CN	• GB	• JP	• PL	• TH
• AU	• CO	• GR	• LK	• PT	• TR
• BE	• CZ	• HR	• LT	• RO	• US
• BG	• DE	• HU	• MX	• RU	• ZA
• BR	• DK	• IE	• MY	• SE	
• CA	• ES	• IL	• NL	• SG	
• CH	• FI	• IN	• NO	• SI	
- Main users are:
Academic and R&D institutions (mostly subscriptions), large planning and building enterprises (dito), planning and building SME (mostly non-subscribing random users).

²² Source: www.arup.com/aboutus.cfm

²³ www.irb.fraunhofer.de

²⁴ Source: www.inist.fr/en/PRODUITS/bbd.php

²⁵ www.architecture.com/go/Architecture/Reference/Library_898.html

²⁶ country codes according to ISO3166-1 (http://en.wikipedia.org/wiki/ISO_3166-1)

- ICONDA® Subscriptions: 185 in 44 countries

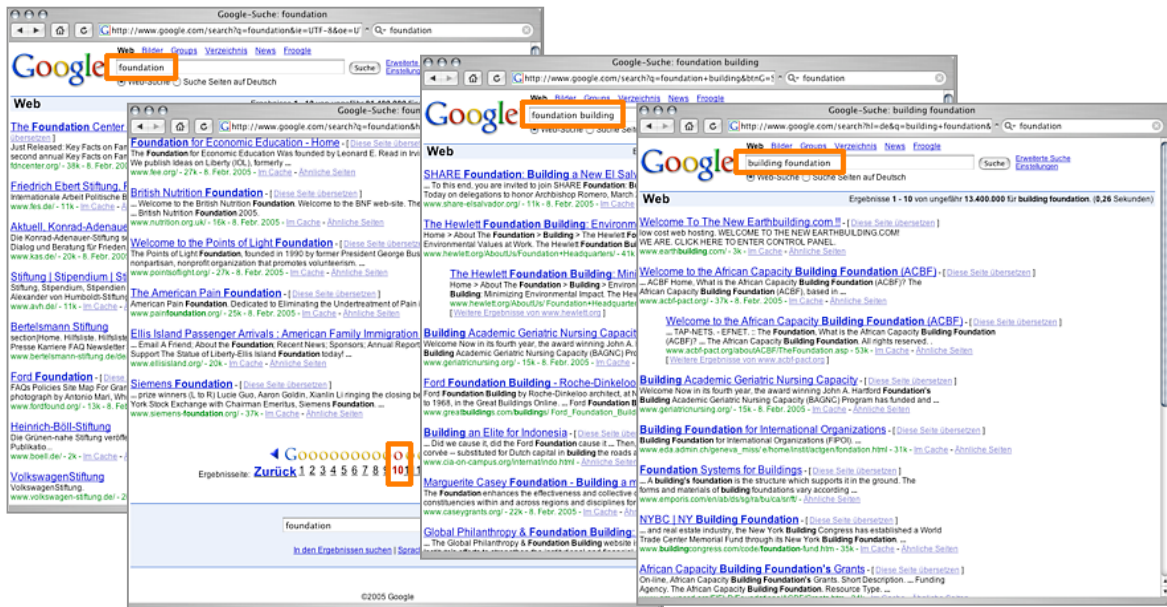
Africa	America	Asia	Europe	• HU	Oceania
• BW	• BR	• AE	• AT	• IE	• AU
• EG	• CA	• CN	• BG	• IT	• NZ
• ZA	• CO	• HK	• CH	• LT	• PG
	• MX	• IN	• CZ	• NL	
	• PE	• IR	• DE	• NO	
	• US	• KR	• DK	• PL	
		• KW	• EE	• PT	
		• MY	• ES	• SI	
		• SA	• FI	• SE	
		• SG	• GB	• TR	
		• TW	• HR		

– WHAT NEXT?

There’s a whole Google outside – so, what’s missing?

The “Google revolution” has had great impact also on the AEC information market: user (= searcher) behaviour as well as their expectations have changed. The mostly random users from the field of AEC practice, demanding quick and direct answers, have been determined (and often been frustrated) by their experiences with the new online search engines.

To give an example, assume you are a professional from the building trade in search of information on foundation, and enter your keyword(s) in Google:



In comparison: entering the same search terms in ICONDA® delivers exclusively records relevant for architecture, engineering, construction.

Here lies the great challenge for specialist information services: to offer the simplicity of use that people are familiar with, in combination with the blessings of tailor-made services: preselection of content by experts from the same thematic field as the users, specialist vocabularies and information structures (eg classifications) that facilitate quick orientation.

Apart from publications retrieval, there are other domains of information procurement that show similar characteristics: initiatives between the levels of international and individual, operating online/virtual and other services that are all limited to thematic, national or corporate information segments.

The experiences of Fraunhofer IRB as a national information centre as well as those of ICONDA[®] as an international information network, for instance, identify technical approvals as one field of information procurement with strong demand from the building industry side, especially against the background of the merging of European markets. An increasing number of national technical approvals is being issued in ETA (European Technical Approvals) versions, calling for a clustering access platform.

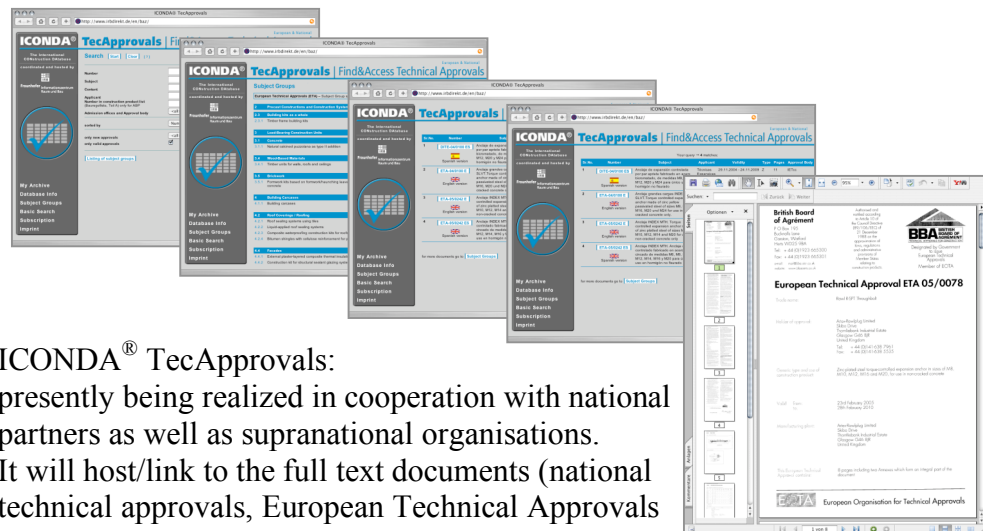
Further fields to turn to are research reports, standards, exporting, tender and legal information, etc.

ICONDA[®] Board and Agency have come to the conclusion that the next step of evolution is to expand The International CONstruction DATABASE from a system of full text retrieval and procurement to a single point of access for all kinds of information relevant for the AEC professional markets and academic communities.

The following work packages will be the essentials of the project:

- **Networking:**

The sources, expertise and contacts of the ICONDA[®] partners network to build up additional services, like



ICONDA[®] TecApprovals: presently being realized in cooperation with national partners as well as supranational organisations. It will host/link to the full text documents (national technical approvals, European Technical Approvals ETA) issued by the partnering approval bodies.



ICONDA[®] Research:

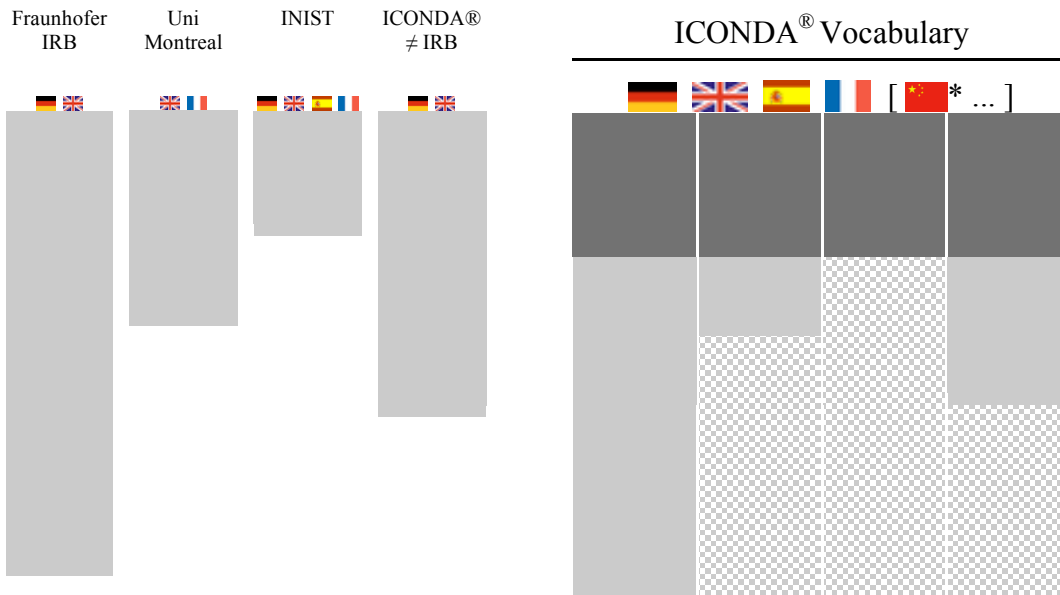
the intensified cooperation between CIB and Fraunhofer IRB results in an agreement that ICONDA[®] will include the metadata of CIB Working Commissions Reports for dissemination. Full texts that are not yet available in electronic form will be digitalized by Fraunhofer IRB's IT/media services and hosted on their full text server. Additionally, all CIB member organisations will be offered a common publication and distribution platform for their research reports.

• **Multilingual use:**

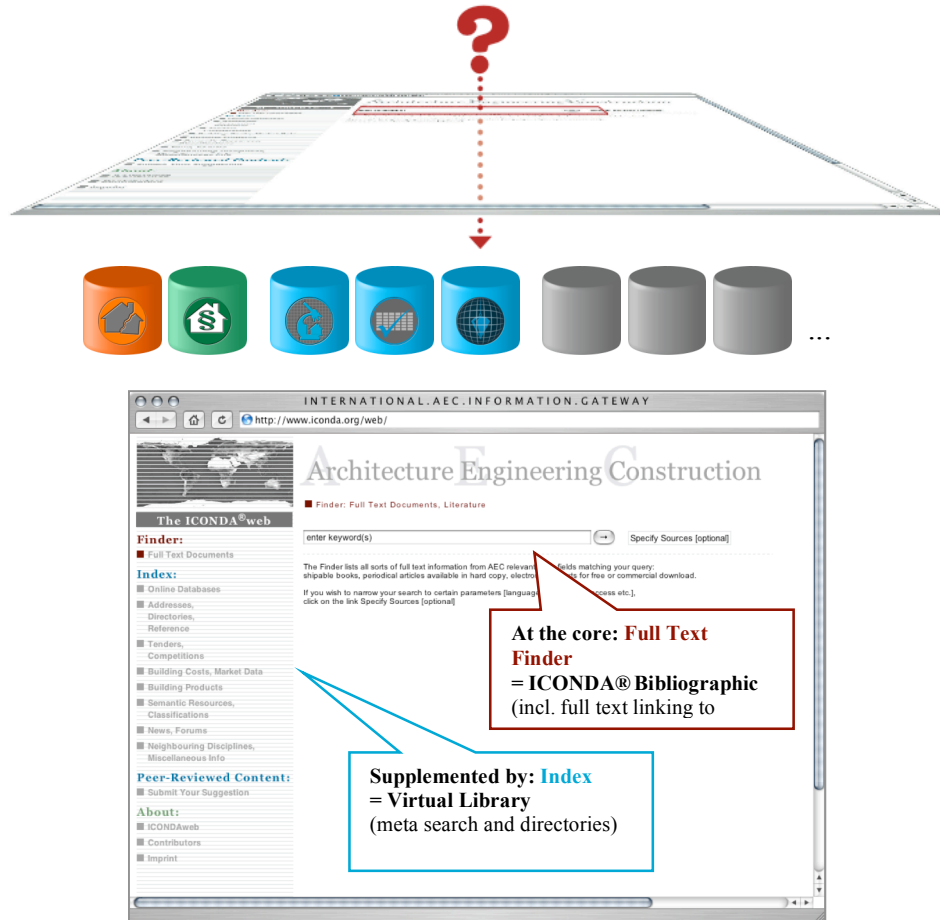
Facilitating cross-(languages-)border use of the portal services by implementing a multilingual vocabulary developed by Fraunhofer IRB and partners, whose terminological sources are being merged, cross-matched and amended to build a "flat", but four-language translation and search aid: English–French–German–Spanish. Thus, metadata of full texts can be delivered and stored in any of the four languages, while users can also search in any of these.

So far, the contributing bodies to this project are:

- Fraunhofer Information Centre for Regional Planning and Building Construction IRB, Germany (approx. 40,000 terms in German-English).
- IF Research Group, University of Montreal, Canada (approx. 18,000 terms in English-French).
- Institut de l'Information Scientifique et Technique INIST, France (approx. 12,000 terms in French-English-Spanish and partly German).



- **The ICONDA® web:**
Clustering these and all other sources and services available within one platform as single point of access, implemented to a a peer-reviewed virtual library (listings of online databases and directories, supplemented by meta/federated searches) built around the core of ICONDA® Bibliographic as the full text finder.



RESUME

To bring the international information system of ICONDA® to the desired level is an ambitious project. The authors consider it a great advantage that the process of building the envisioned international single point of access for the diverse AEC communities has not to be done from scratch: Utilizing all the resources that the production and dissemination network of the International CONstruction DATABASE has to offer, plus the infrastructure and expertise of Fraunhofer IRB as an information transfer specialist, the ICONDA® project with all its components has a unique backing to propel the suggested strategies successfully and sustainably.