

The World Brain as Seen by an Information Entrepreneur

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Most entrepreneurs in the information industry respond to "global" schemes such as UNISIST in a skeptical if not contemptuous fashion. With the rare exceptions of enterprises like the Manhattan Project or NASA or the Panama Canal, global enterprises just do not get planned. They evolve. If there exists a global communications network consisting of the various national telephone establishments, it is not because it was planned that way. It, too, evolved. Neither the Canal nor NASA required the social changes demanded by WISE (Kochen, 1972)¹. But if the International Satellite Communications System could be successfully negotiated after five years, why not a World Information Synthesis and Encyclopedia?

The very notion of an entrepreneur *seems* almost antithetical to the basic philosophy of socialist countries, where large-scale planning is presumably their very *raison d'être*. On the other hand, if WISE at first seems like an impractical dream to the *average* entrepreneur, it is not because he is incapable of dreaming about large enterprises. Rather, he knows how difficult it is to get them financed. I suspect that we will hear very little at this conference about the real costs of such an enterprise or about the potential impact it would have on existing establishments were it to be legislated overnight.

I presented a paper about the world brain in 1967 at the Syracuse University meeting on "The Foundations of Access to Knowledge" (Garfield, 1971)². In it, I tried to differentiate the many concepts of a world brain that one might have. That was not the first time I had discussed this concept. In my paper, "A Unified

Index to Science," presented at the International Conference on Scientific Information, in 1958, I described the index as an H. G. Wells type of world brain (Garfield, 1959).³ I also referred to Neurath's encyclopedia, which had inspired me as a library student under the sponsorship of the Grolier Society, publisher of the *Encyclopedia Americana*. That was in 1953–1954, when I not only wrote the primordial paper⁴ on the *Science Citation Index* but also did the groundwork on AMFIS (Avakian & Garfield, 1957)⁵—a Memex-type device that has not yet achieved economic viability.

When a utopian scheme like WISE is discussed, most entrepreneurs will assume, unnecessarily, that it will be a governmental function (Franklin, 1973).⁶ Since it is international in scope, presumably the United Nations is the only world governmental authority from which it would emanate. Amusingly enough, an UN WISE system suggests an acronym that is poignantly ironic. It could be financed by UNDP or the World Bank but, in any case, UNESCO is not an organization capable of successfully operating an enterprise of this scale. UNISIST could become the *spiritual* force behind the world brain or WISE. But actual work will probably be done on contract. The method of financing will determine whether entrepreneurs are involved. The socialist bloc participation will also depend on how it is financed. I can easily foresee Soviet–American cooperation. Various Soviet scientists have acknowledged the need to use English as the common language of science, and I suspect the Chinese will accept this too.

Except in the area of Nobel prizes, I have never been one to indulge in forecasting (Garfield, 1970).⁷ One can only speculate. Can one forecast all of the interrelated publishing and information activities extant today and project precisely how they will evolve in the future? I doubt it. How can we speculate whether or not they possibly can develop into WISE unless we can forecast the political decisions that are bound to determine the outcome? It would be a task worthy of a few doctoral programs in library

science to determine to what extent components of the WISE system outlined by Kochen already exist in various governmental or private enterprises. Then we could ask whether a system like WISE is better than the sum total of the various information industries that exist throughout the world. What is it that those separate, sometimes duplicative, services do not provide that WISE would offer us? In what respects would its IR (information retrieval) capabilities be better than access to the Tymeshare network and its ability to access numerous data bases? Are the primary shortcomings of that extant system the lack of a universal query language? I had some of these problems in mind when I first proposed the Unified Index to Science. On the other hand, now that 15 years have intervened, has the development of the ISI Unified Index to Science made that initial proposal obsolete? What is it about WISE or UNISIST that is not anticipated by this data base? It covers all of the major disciplines of knowledge. It makes no distinction because of languages. The system is international and universally available. The editorial boards are international, and ISI's marketing personnel operate through the world. Our users come from all the countries of the world. What then is missing from it as an acceptable international information system?

Perhaps other nations distrust control of this system in the hands of an American-based company. This is understandable, but ISI's financial continuity increasingly depends upon the continued support of foreign countries. Furthermore, we might seriously consider legal and other means whereby "control" or regulation might be delegated to some international body like the United Nations.

Individual countries like the Soviet Union and China might feel that such an international information system could be turned off overnight by an action of the U.S. government. If the United States can prevent IBM computers from being available to such countries, theoretically it could also prevent the export or transmission of information. However, at the worst stages of the

cold war, scientific information exchange was never restricted. But these are political and not scientific questions.

It is not surprising that few people today would be prepared to accept the conceptual reality of ISI's data base as an existing *universal* system in machine language and in print. Despite its vast size, even the All-Union Institute for Scientific and Technical Information (VINITI) would have to take into account the USSR's Institute of Social Sciences Information and the Medical Abstracting Service of the Academy of Medical Sciences, if it were to be comparable with ISI's present scope. However, a unilateral decision at high levels might pull all these diverse Soviet efforts together, and, with a huge translation effort, produce a unified system.

The English language abstracting services, all of which are discipline-oriented, may gradually be amalgamated through on-line services. This may exert pressure for a unified indexing approach. It is interesting that when the *Index Medicus* went on-line, title-word searching became respectable.

It is interesting to speculate what size the world brain would have been in 1937 when H. G. Wells first made his proposal.⁸ If the literature has been doubling every seven years or so, then the total literature he was then concerned about was from one-half million to one million articles and books. That much material is indexed by ISI each year! Our *Citation Indexes* include references to well over three million different papers each year. I doubt that Wells could have asked for more. He would have been concerned about a proper library of the original documents. The only library that comes close to such comprehensiveness is the National Lending Library in the United Kingdom. For current material, ISI does have a comparable service. As costs of satellite telefacsimile transmission go down, a single world center might provide access to original documents as we now store them.

Derek Price has also reminded us that the world brain need *not* concern itself with a great deal of information, much of which

we are already processing. In this respect the work at ISI and elsewhere to define what is significant is very relevant.

Consider a group of local decision makers. Should a jet airport be constructed? What is the effect of noise or jet fuel pollution on the nearby mushroom industry? In an earlier time, the project might have been held up until a research project was conducted. Today, I would hope that someone would have sense enough to suggest that there might be considerable relevant information on this in the literature. Tomorrow, an even more enlightened group might have a terminal available to do such a search while the meeting is in progress. This means that all future policy-making bodies must employ professionals who know how to obtain such information or use such terminals.^{9,10}

It also means that, if such systems are to be acceptable to decision makers, we will have to go beyond the present capability of information and document retrieval systems. Charles Bernier (1970)¹¹ coined the term "terse conclusions." These will eventually be incorporated into titles of source documents. In this way, local committees and other potential users can make *timely* use of the factual information that is carried in such compressed indexing statements.

Terse conclusions, among other data, are expensive to compile. No single organization can afford to do it under present circumstances. The abstracting services might, but it would mean a drastic change in abstracting philosophy. Publishers can do it, but then it means a large-scale educational effort. However, greater obstacles have been overcome in the past. International cooperation will be required to transform WISE into a true encyclopedia.

But the world is not yet ready to support the cost of such efforts. When Eisenhower was U.S. president, the *Index Handbook to Cardiovascular Drugs* got a boost because he had a heart attack. The world is crisis-oriented and fickle. The behavioral scientists would do better to figure out a way to make man see a potential information crisis before it occurs. Getting people

to pay for optimal information systems in advance is like getting people to stop smoking because of the threat of cancer 20 years later.

In spite of what I just said, I propose that Saul Herner's proposition (Herner, 1956),^{1,2} now 20 years old, is still valid. More often than not there is too little technical *information*, not too much. What may be true is that there is too much technical opinion, and decision makers face dilemmas in choosing between the varieties of opinions. When have facts really confused an issue?

The world brain will undoubtedly be something more than an elaboration of the present ISI data base. However, if it tries to subsume everything now produced by the world's multi-billion-dollar information industries, it will never happen. If we aim to satisfy the in-depth needs of the research scientist and the scholar, the world brain also will meet the needs of policy makers and decision makers of all kinds.

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