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Competitive Advantage - The Power of Online Systems

There is an increasing requirement for both Government and the private sector to understand the dynamics and subsequently the impact of a global economy on U.S. business and industry. Recent world events have lessened the need for intelligence as it pertains to military capacity and increased the need for competitive intelligence on both a national and international scale as it pertains to technology, innovation, product development, manufacturing, finance, market research, patents, education, management, and a host of other areas. Information technology is making the world smaller with blinding speed. And it is those of us who choose to take advantage of this technology and the access it provides to open source materials who will gain the competitive edge. To understand global interaction we must have global information. But global information does not yet exist as a singular entity. Instead, there are many sources of unclassified material as yet untapped by not only the Government but private industry. And unlike Government information which has focused almost entirely on foreign intelligence in the past, open source information is worldwide in scope and can tell us not only how well our competitors are doing, but how well we, as a nation and an economic power, are doing.

The challenge is to exploit open source materials. The way to do this is by identifying the various sources of information; understanding their format, scope, and content; learning how to effectively retrieve meaningful information; being able to process that information; and being able to manipulate, reduce, and analyze material such that relevant trends and relationships between disparate sources can be identified and used to better understand the economic impact upon the United States of a rapidly changing global economic environment.

Identifying Sources of Information

Open source information is any information that is obtained through non-intelligence means. This includes newspapers; magazines; newsletters; business, financial, and Government publications; professional, trade, and technical journals; patents, reports, books, theses, and many other types of professional writings. Open source information is important because it is a constant source of new information. New ideas, new theories, new concepts, new developments in science and technology can be readily identified from the writings of scientists, academians, theorists, and researchers. On any given day, open source materials can provide a snapshot of the world. Information on politics, economics, medicine, social science, business, Government, the environment, and many other subjects is readily available. Open source material can be used to track everything from people and events to industry trends and technological breakthroughs. Feasibility studies, technical or financial reports, patent information, international forecasts,

and statistics are all examples of pieces of a very complex information puzzle. Knowing where to find the relevant pieces of this puzzle and determining how each piece fits with the others is the ultimate challenge for both Government and industry analysts.

Prior to the development of electronic database systems, accessing open source information was time consuming and labor intensive, which perhaps contributed to the belief that it was also of little value. Now thousands of databases are available online worldwide. These databases are published by hundreds of different producers and are available via hundreds of online services and gateways such as DIALOG, BRS, NEWSNET, and DATATIMES to name a few. Online technology has proven that open source material is of exceptional value, that some of the best information on business, technology, research and development, and foreign trade and industry can be accessed with a few keystrokes and that this same information can be transferred electronically to users around the world in minutes.

For Government and industry analysts, these online services offer tremendous advantages in terms of access to open source materials. Vast amounts of information on almost unlimited topics can be reviewed and retrieved in record time. Information on most systems comes in a variety of formats to include bibliographic citations, directory information, statistics, and full-text articles. Documents can be downloaded online into a log file, ordered online from the system vendor, ordered directly from the database producer in some cases, or retrieved by a document retrieval service.

Inasmuch as access is vital to exploiting open sources, retrieving relevant facts from what is literally an ocean of information requires considerable skill and knowledge. Part of that knowledge is knowing and understanding what sources are available. There are nearly 3,000 databases online worldwide. There are hundreds, if not thousands, of electronic bulletin board systems in this country alone. CD-ROM has brought an entirely new dimension to information dissemination. And the use of Electronic Data Interchange and other information networks is forging ties between experts in business, industry, Government, university, and research communities. Effective use of these resources will demand flawless communications as well as practical and analytical skills.

Understanding Scope and Content

Even before the decision is made to use open source information, there is another far more important question to be asked. That is, what question are you trying to answer? Access to all of the open source information in the world will not produce relevant results if you are not asking the right question. The right

question will dictate what online systems to use; what specific databases to search; what keywords to choose; how to formulate the search strategy; and in what context to seek information. Online information is much like raw data - what is retrieved will have no particular order or organization. It will simply be information that is related via common search terms or concepts. To ask and answer the right question, a good analyst or information specialist will need substantive knowledge of both the scope and the content of individual databases. Knowing when a database was created or how often it is updated is not a good indicator of how current the information is because the time it takes to get information online may range from 24 hours for news wires up to as much as a year for technical articles and conference proceedings. Knowing content is critical. Many databases are subject specific, dealing with a particular industry or science. Others are categorized by type of publication, that is, newspapers, magazines, newsletters, product announcements, directory listings, and others. Some databases contain only a single publication or source. Having this type of indepth knowledge will speed the research process, maximize use of resources, and prevent retrieval of redundant or irrelevant information.

Retrieving Information

Retrieving useful, relevant information from the thousands of databases available online is not a simple task. It is important to know the strengths and weaknesses of a given database and also to know when the search request requires the searcher to have a certain level of technical expertise. Retrieving information requires the ability to construct a search strategy and the know-how to modify that strategy if and when it produces unexpected results. Most database producers and online vendors organize their data into groups of related information. Categories commonly used include: business and financial, marketing, technical and scientific, trade and industry, foreign business, medicine, computers, and tradenames. In addition, every database vendor uses a command language that is based upon Boolean logic. The effectiveness of a search strategy depends heavily on the searcher's use of special fields or codes set up by the database producer. Searching on specific fields such as title, author, Standard Industrial Classification Code, company name, and country is where the true power of online searching of open source information lies. Combined with Boolean logic, strong analytical skills provide for both speed and precision in information retrieval.

To date there is no standardized command language for information retrieval. There is common use of Boolean logic and database management, but in many instances the power and effectiveness of the retrieval software between online systems is significantly different. There are numerous variations for truncation of terms, date and range searching, sorting, even the way records are displayed. The analyst must define the target information and then select specific

search terms; decide what date ranges to search; and identify what countries, people, or industries are involved. Then, the analyst must be able to determine what open sources would most likely have the type of information being sought.

Besides commercial systems, there are many databases operated and maintained by Federal, State, and local governments as well as colleges and universities, research laboratories, and private companies. Where direct access is not available or allowed, many times individual facilities will perform queries for a nominal charge. The advantage in using some of these smaller systems is that valuable contacts may be made with experts in the field. Then, in addition to retrieving written information, the analyst may be able to speak directly with the author or authors of such material and gain invaluable insight. Another advantage is the ability of some facilities to provide additional services. For instance, not all foreign online systems are searchable in English or provide English translations of original materials. Foreign language departments of universities may provide this service. They may also provide computer resources and have the ability to process data or put it in a more usable format for the analyst.

Processing Information

Information downloaded from an online database system is usually formatted in ASCII (American Standard Code for Information Interchange). ASCII data can be directly uploaded or converted and uploaded to just about any type of computer system, regardless of hardware, operating system, and applications software. For the analyst, this means that statistical data sets can be used with SAS, SPSS, or another statistical package, with a minimum of formatting. Text data can be used to create case specific and searchable databases using hypertext, relational, and other database capabilities. Data can also be manipulated through database management systems to create custom reports or to spot trends as with geographic information systems, desktop mapping, and demographics. Custom presentations may be developed through graphics, animation, video, and multimedia packages. Analysts might even be trained one day through interactive computer-based training or expert systems using real life case studies with information drawn from open sources. This courseware might then be stored on CD-ROM or video disc and disseminated to learning labs for self-paced training in how to maximize use of online systems and other resources as well as how to process and analyze information. The point is to use technology-based tools to format information from a variety of sources such that it can be interrelated. The relevance of each piece of information must be determined. Where does it fit in the information puzzle? What other sources or experts might be used to fill in information gaps? This is what the analyst must learn to do, perform a multidimensional analysis that will create a multidimensional picture.

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Good communications, information sharing, and use of information technology are essential to achieving this end. As analysts discover the value of open source information, they will also discover the need to identify and use multiple sources of open information to create a complete picture. Access will mean not only access to information but access to the technology and the applications that when used together will help analysts to see relevant relationships.

Analyzing Data

Corporate intelligence has been used as a marketing tool and competitive weapon for many decades. Businesses have long sought to outdo their competitors by obtaining information faster and acting on it faster to gain the upper hand. Open source materials can provide a wealth of information on almost any area of business. Market share, technological innovation, financial status, mergers, and changes in top management are but a few examples.

In a global economy, this information takes on even greater importance. We are no longer competing against ourselves on a national level playing by our own rules and measuring ourselves by our own standards. We now must deal with international competitors in a global environment where there are global rules and global standards that may or may not complement our own.

If they are not complementary, then we are at risk in a number of areas, and risk assessment will be a large part of what Government and industry analysts will do. They will need to look seriously at foreign investments, economic conflict, and foreign ownership, control, or influence of U.S. companies. At the same time they will need to look at the technological sophistication of not only our foreign competitors, but ourselves. We have spent far more time and effort tracking the competition than tracking our own progress. Where do we fit into the economic puzzle, and what must we do to achieve and sustain economic growth in a global economy?

This is where the use of open source information becomes critical. No where is there more information on U.S. companies, industries, science and technology, education, and Government than in the avalanche of open source information available through online systems. The economic health of our country may well depend on the ability of analysts or information specialists to effectively tap into these resources; retrieve relevant data; process that data; and develop an accurate assessment of our competitive standing. This assessment must be ongoing. As the technological environment changes, so will the business

environment. Through technology businesses have increased the speed of product development, improved the quality of products and services, and even changed the basis of competition for entire industries.

This is why multidimensional analysis is critical to our economic success. Without it, analysts will miss the comings and goings of interrelated events that could have major impact. For instance, what U.S. companies have the state-of-the-art technology and what foreign interests do they have contact with that might pose a threat of technology transfer? There are numerous possibilities, any one of which, if missed, might allow that transfer to take place. Analysts will need to research many areas, such as what the company's financial status is, whether or not it is a prime candidate for a merger, takeover, or buyout; who the key executives are and what are their backgrounds; who the potential buyers are and how this will affect their ability to compete; how this will affect U.S. ability to compete; what technologies are involved; what foreign governments are involved; whether or not these foreign interests have ever transferred technology illegally to countries hostile to the United States. The list goes on.

Many, if not all, of these questions may be answered through open source information. Private industry has been doing it for years. What has changed are the methods and the tools used to gather, process, and analyze this information. Technology has brought us online systems, searchable databases, geographic information systems and desktop mapping, marketing software, videoconferencing, computer-based training, multimedia systems, and much more. The challenge is not only to learn how to use these tools, but how to combine their use with other resources to complete the puzzle. Combining the skills of the analyst with the ability of private industry to locate and retrieve appropriate open source information is the first step in creating an alliance that will allow U.S. business, Government, and industry to swing the competitive balance in our favor.

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