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Collaborative Integrated Resource Networks for the Advancement of Science

Issue Statement

The Federal government, its agencies, and its research entities must form extensive, fully integrated collaborations among themselves and with private and non-profit holders of information assets and resources nationally and globally to maximize the value of scientific information and resources to support the advancement of science, thereby benefiting industry and the public.

Background

Consistent with the federal mandates related to information dissemination (including USC Title 44, Public Printing and Documents, Paperwork Reduction Act of 1995, and OMB Circular A-130) the Federal government has traditionally recognized the value of sharing its research and development results with others in the science and technology community; and was a leader in developing and using emerging technologies to provide electronic communications infrastructures to allow for the exchange of vast amounts of data and information among remote users.

This early involvement led to the development of the World Wide Web and its application on the Internet, the most comprehensive means of locating, accessing, and using information in the history of mankind.

This innovative electronic infrastructure and its extensive technological capabilities for compiling, assimilating and using the extensive information holdings of the Federal government gave rise to E-Government as agencies found new ways to transact their information dissemination business in a digitized electronic environment.

Situation

As the rapid pace of technology advancement and application continues unabated, the exponential growth of information is occurring at an even faster, almost unfathomable, pace. The growth of information, while enabled by technology, threatens to outgrow the technological capabilities for effectively using it.

The capabilities offered by the electronic era allow for the creation, accumulation, and retention of information at a wide variety of sites, from a large database at a National Laboratory to a small information system on a user's desktop. This information must be combined and made accessible and useful in the context of a large body of information and resources.

It is unrealistic to think of standardization of these diverse data sets in any sense other than the obvious essential aspects (i.e., it must be digitized). Usefulness must be gleaned from the innate context of the system or site on which it resides, then technologically combined with other pertinent information and resources to provide a basis for knowledge creation.

Digitized information and the capability to find and use it are global in nature. They reside at countless remote locations, on multiple disparate platforms, in numerous different formats and are held not only by Federal agencies but also by industry, academia, non-profit institutions, and others in the international information community.

This vast community must be encouraged to work in collaboration to develop effective networks that capitalize on widely dispersed sources, assimilating the cumulative information, resources and capabilities of both the public and private sectors into widely available knowledge bases. These interconnected knowledge bases provide an infrastructure for the advancement of science.

Facts

In the global economy of the 21st century, educators and researchers must have the information they need to optimize their performance in both the classroom and the laboratory.

This is critical at a time when the U.S. falls well below many countries in both science and math achievement, and the U.S. is losing ground in the patents issued in comparison to patents issued to foreign citizens.

The face of scientific research is changing. Research within basic scientific disciplines yields interdisciplinary applications, and the lines of distinctions between the individual disciplines are becoming increasingly blurred.

Information grows exponentially, and its use and value in research and development depends on the ability to combine it with other information from other sources to make inferences and create new knowledge.

Technology is making it impossible to clearly define lines of distinction between public sector, and private sector roles.

Information as an integral part of a science research and development infrastructure is becoming a reality with the development of enabling technologies and tools that make possible the use of information in ways inconceivable less than 20 years ago.

Partnerships and multi-organizational collaborations to attain a common goal or outcome are essential to the future of information in the advancement of science and technology. Information source or ownership issues must be accommodated within the context of advancing science for the benefit of mankind.

Conclusion

Scientific and technical information cannot be treated as “organizationally” bound. With the rapid advancement of information technology, traditional lines of distinction, such as government, industry, or international information, are no longer valid.

Science is broadly discipline based, but even those lines of distinction are blurring as new disciplines including many aspects of those more traditional designations emerge.

Freely available access to information is a cornerstone of the U.S. commitment to its citizens. While some elements both nationally and internationally tend to treat their information holdings as a strategic commodity to be used to attain specific interests, Federal agencies view their holdings as resources rightfully belonging to the U.S. public. Reconciliation of these two views must be accomplished in order to maximize the value of information in the advancement of science.

There must be a concerted effort to encourage collaboration among all parties in the public sector, the private sector, and academia to actively participate in the development and continued growth of integrated networks. Such collaborative efforts will meet the requirements of the new electronic era scientists, as well as others with a need for scientific information and resources, while providing the next generation of scientists with necessary resources and educational tools.

Extensive, non-restrictive funding opportunities must be liberally provided for multi-organizational collaborations to develop innovative means for making scientific and technical information and resources readily available in a useful infrastructure that maximizes value and return on investment.