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REPORT

IN BRIEF

PREPARING THE WORKFORCE FOR DIGITAL CURATION

(2015)

A revolution in digital information is occurring across all realms of human endeavor. From distant satellites to medical implants, a range of sensors collects unprecedented quantities of digital information. Businesses, health organizations, and government agencies are also collecting vast amounts of digital data and other information. If accurate and accessible, such information has the potential to speed scientific discovery, spur innovation, inform policy, and support transparency.

However, the policies, infrastructure, and workforce needed to manage this information have not kept pace with its rapid growth, says *Preparing the Workforce for Digital Curation,* a report from the National Research Council. The immaturity and ad hoc nature of the field of digital curation so far has led to vulnerabilities and missed opportunities for science, business, and government. The report urges government agencies, scientific institutions, and others to work together to strengthen the policies, practices and workforce in the field of digital curation.

WHAT IS DIGITAL CURATION?

Digital curation is the active management and enhancement of digital information assets for current and future use. In some ways, digital curation is similar to other forms of curation. Regardless of whether a collection is physical or digital, a curator must appraise its value and relevance to the community of potential users, determine whether and for how long the asset should be preserved, document origins and authenticity, describe and catalog its content, arrange for long-term storage and preservation, and provide a way for the asset to be accessed and used.

However, digital information also poses many new challenges for curation – for example, the immense and ever-increasing quantities of material to be curated, and the need for management in the context of continually changing technology.

DEVELOPING THE FIELD OF DIGITAL CURATION

Although standards and good practices for digital curation are emerging, there is great variation in the extent to which standards and effective practices are being adopted within scientific disciplines, commercial enterprises, and government agencies. Many forces could drive advances in the field: organizations that can serve as leaders, models, and sources of good curation practices, for example, and government requirements for managing, sharing, and archiving information in digital form.

The report offers several recommendations for strengthening the field overall:

Organizations across multiple sectors of the economy should create inducements for and lower barriers to digital curation. The Office of Science and Technology Policy (OSTP) should lead policy development and prioritize strategic resource investments for digital curation. Leaders in information-sensitive industries should advocate for the benefits of digital curation for innovation, competitiveness, reputation management, and consumer satisfaction. Leaders of scientific organizations and professional societies should promote mechanisms for recognition and rewards for contributions to digital curation.

Research communities, government agencies, commercial firms, and educational institutions should work together to speed the development and adoption of digital curation standards and good practices. This includes developing standards for meaningful exchange of digital information across disciplinary and organizational boundaries, and interoperability between systems used to collect and analyze digital information and the repositories, data centers, cloud services, and other providers with long-term stewardship responsibilities.

Researchers in economics, business analysis, process design, workflow, and curation should collaborate to identify, measure or estimate, and predict costs associated with digital curation. The National Science Foundation, the Institute for Museum and Library Services, relevant foundations, and industry groups should fund such research. If implemented, successful research can help develop more efficient processes and automation tools that can save money and improve information products and services

Scientific and professional organizations, advocacy groups, and private-sector entities should explain and measure the benefits derived from digital curation. Benefits should include outcomes that generate measurable value, such as data's contributions to new product development – as well as less tangible benefits, such as the benefits accessible data confer over time to scientific research. Research on benefits is necessary for the development and testing of cost-benefit models and metrics, which can help in better understanding and improving outcomes.

WORKFORCE DEMAND FOR DIGITAL CURATION

Currently there is little data available on how – and how many -- digital curation professionals are being trained and the career paths they follow. Moreover, it is difficult to estimate current and future demand because digital curation takes place in many types of jobs. The primary source of statistics on employment in the federal government, the Bureau of Labor Statistics, does not track digital curation as a separate occupation. However, the current demand for digital curation professionals can be estimated by examining data on job openings for related occupations -- enterprise architects, data stewards, librarians and archivists, among others. Openings for almost all of these professions at least doubled between 2005 and 2012.

Tracking employment openings for digital curation professionals, enrollments in professional education programs, and the career trajectories of their graduates would help balance supply with demand on a national scale.

Government agencies, private employers, and professional associations should develop better mechanisms to track the demand for individuals in jobs where digital curation is the primary focus. The Bureau of Labor Statistics should add a digital curation occupational title to the Standard Occupational Classification when it revises the SOC system in 2018; this recognition would also help to strengthen the attention given to digital curation in workforce preparation. Agencies, employers, and professional associations should also undertake an effort to monitor the demand for digital curation knowledge and skills in positions that are primarily focused on other activities but which include some curation tasks.

STRENGTHENING EDUCATION

The knowledge and skills required for digital curation are dynamic and interdisciplinary. They include an integrated understanding of computing and information science, librarianship, archival practice, and the disciplines and domains that generate and use the data. Additional knowledge and skills for effective digital curation are emerging in response to data-driven scholarship.

Although the number and breadth of educational opportunities in digital curation have grown, existing capacity is low, especially for the initial education of professional digital curators and the midcareer training of professionals with credentials in another field. Graduate and postgraduate certificate programs for educating professional digital curators are expanding but are not putting out enough graduates to meet workplace demand. Online and in-person programs exist to train midcareer practitioners with little or no formal education in digital curation, but these are not sufficiently developed.

To help develop educational opportunities in digital curation:

OSTP should convene relevant federal organizations, professional associations, and private foundations to encourage the development of model curricula, training programs, instructional materials, and career paths that advance digital curation as a recognized discipline.

Educators in institutions offering professional education in digital curation should create partnerships with educators, scholars, and practitioners in data-intensive disciplines and established data centers. These partnerships could speed the definition of best practices and guiding principles as they mature and evolve, to help ensure that educational and training opportunities meet the needs of scientists in specific disciplines, analysts in different business sectors, and members of other communities that use digital curation systems and services.

In addition, federal agencies, private foundations, and industrial research organizations should foster research on digital curation that makes fundamental progress on problems with practical applications in their respective domains. Initial activities should focus on using conferences and workshops to help researchers in the public and private sectors develop coordinated research agendas and baseline analyses. The resulting agendas for research in digital curation should be tightly coupled with the curricula and offerings of educational programs to shape the field during a time of dynamic and dramatic growth and change.