Analyze This: The Big Demand for Big Data Professionals

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The explosion in big data has led to a shortage of data analysts. This article explores records and information management professionals' options for pursuing opportunities in this burgeoning area of interest.

Big data – which ARMA International defines as "An information dataset that grows so large it becomes awkward to work with using traditional information management tools" – is an expansive, transformational force that can produce value and innovation within an organization. With its capacity to encourage scientifically based, data-driven decision making, it is an economic game changer.

Through its capacity for robust data analysis, big data is driving improvements in operational metrics pertaining to product improvement, cost reduction, customer loyalty, sales expansion, and marketing effectiveness.

For example, as the nation's largest non-profit provider of health coverage, Kaiser Permanente gathers petabytes of data on its nine million customers. (A petabyte is approximately equal to 1,000 terabytes.) It was an analysis of Kaiser Permanente's patient outcomes data conducted in conjunction with the U.S. Food and Drug Administration that led to the 2004 withdrawal of Vioxx®, an often-prescribed pain reliever that was determined to be associated with increased cardiovascular problems.

'Internet of Things' Drives Trend

A major factor in the big data trend may be machine-to-machine innovation, or the *Internet of Things*, defined by Gartner Inc. as the "network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment."

With the advent of wireless (and mobile) communications and the deployment of these virtually connected devices, data collection efforts have evolved to include the capture and storage of auto-generated information.

For instance, in the utility sector, embedded components report on various electrical power or water consumption-related activities. And, in the transportation sector, the Internet of Things provides site-specific traffic flow monitoring to assist law enforcement in community safety initiatives.

Analysts Are in High Demand

At Gartner's October 2013 Symposium/IT Expo, it was reported that more than four million new big data jobs would be created worldwide by 2015. However, due to a shortage of qualified individuals, only one-third of those positions are expected to be filled.

Depending upon the specific position, industry sector, and organization, big data jobs can demand expertise in information technology, information management, research methods, mathematics, statistics, and software applications. To be successful in a big data career, individuals should have expertise in many of these areas:

- Advanced mathematics and statistics for creating/modifying data algorithms and detecting statistical relationships within/between datasets
- Research methods to provide input into the synthesis of multiple datasets or the design of new data collection protocols
- Programming languages, such as JAVA
- Analytical/statistical applications, such as SPSS® and SAS®
- Network/information/data systems design and management
- Information governance principles
- Written and oral communications skills for delivering data-based reports and presentations to diverse audiences
- General business management principles

In addition, experience with tools and applications popularly associated with big data (e.g., Hadoop, Cassandra, and various visualization techniques) is beneficial. All big data jobs may not require the same level of expertise in each of these knowledge domains and tools. Certainly, some industries or organizations may have unique skills-related preferences that synch with their sector's business needs.

RIM Professionals Have an Advantage

Big data's connection to records and information management (RIM) is indisputable. A solid understanding of the records life cycle and the tenets of information governance

Certificate Programs in Big Data

Central Connecticut State University, New Britain, Conn.
Certificate in data mining
http://web.ccsu.edu/datamining/graduatecertificate.html

Columbia University, New York, NY
Certificate of professional achievement in data sciences
http://idse.columbia.edu/certification

Stanford University, Stanford, Calif.
Certificate in mining massive datasets
Certificate in data mining and applications
http://scpd.stanford.edu/ppc/massive-datasets-courses.jsp

Syracuse University School of Information Studies
Syracuse, NY
Certificate of advanced studies in data science
http://ischool.syr.edu/future/cas/ datascience.aspx

Academic Programs in Big Data

In January 2013, *Information Week* magazine prepared an online slideshow of an annotated roster of North American-based graduate (master's) degree programs related to big data. While this roster does not claim to be all-inclusive, it is a launching point from which RIM professionals can explore new academic ventures.

The programs offer diverse perspectives, varying durations (full-time programs can be completed in less than one year; part-time programs can take more than two years), and a range of enrollment criteria. Many public and private institutions are listed, including MIT, Harvard, and Columbia. Some programs provide an IT-centric educational plan while others have a business management or engineering orientation. A few schools provide a statistics-based approach.

Some schools require specific preparation and credentials, such as standardized test scores from the Graduate Record Exam or Graduate Management Admissions Test, or an undergraduate degree in a science-based knowledge area such as engineering or mathematics. Others require only a bachelor's degree that reflects attainment of a minimum grade point average.

Online Graduate Degree Programs
As noted in the *Information Week* slideshow, many universities offer full-time and part-time options for individuals pursuing big data graduate degrees. And, while several of these universities offer specific or select courses in a virtual setting, exclusively online programs of study are rarer. For RIM professionals who seek the convenience of an online program, these big data graduate degree programs and certificate programs may be worth investigating.

City University of New York, New York, NY
Master of science in data analytics
http://sps.cuny.edu/programs/ms_dataanalytics

DePaul University, Chicago, Ill.
Master of science in predictive analytics
www.cdm.depaul.edu/academics/Pages/MS-in-Predictive-Analytics.aspx.

Harrisburg University of Science and Technology, Harrisburg, Penn.
Master of science in analytics
http://online.harrisburgu.edu/online-graduate-degrees/masters-in-analytics/degree-program

Northwestern University, Evanston, Ill.
Master of science in predictive analytics
www.predictive-analytics.northwestern.edu/request-info

University of California, Berkeley, Berkeley, Calif.
Master of information and data science
http://datascience.berkeley.edu/

are foundational elements from which sound data analysis can be conducted.

Iron Mountain's 2013 "Emerging Trends in Law Firm Information Governance" report highlights the synergy between RIM and big data in the legal setting. In the e-discovery process, for instance, there are many tools and applications that can uncover and manage previously un-mined information troves. As a result, the importance of records-related security, retention, preservation, and disposition is magnified.

In law firms, RIM professionals are now expected to shepherd a vast landscape with an ever-widening horizon. As the report states, big data is heralding a "movement from a relational, structured, database-driven world toward a semi-structured, social media-driven world."

Career Growth Demands Education

Although it may be possible to work in some capacity as a data analyst without a college degree, it is unlikely that an executive or management position in big data would be attainable without advanced knowledge and academic preparation. The complexity of the massive datasets being programmed and manipulated for organizational decision making demands well-developed, scientifically based analytical skills.

It is possible to find a college or university with a non-degree, certificate program in big data studies; often, however, the entry requirements mandate an undergraduate degree. (See sidebar "Certificate Programs in Big Data" for schools offering this option.) Increasingly, organizations are seeking candidates with graduate-level education to fill big data jobs. (See sidebar "Academic Programs in Big Data" for a list of universities.)

Check Career-Guidance Resources

Many factors should be taken into consideration when considering a career change. An individual's knowledge, skills, aptitudes, attitudes, and preferences should be inventoried and examined as candidly as possible. It may be helpful to consult a career development professional to more accurately investigate your options.

There are numerous career interest inventories, including John Holland's Self-Directed Search® and the Strong Interest Inventory®, that can help increase self-knowledge and self-awareness for vocational planning purposes. The professionals in the career services office at a college or university can offer help with these assessment inventories and can provide other career-related guidance.

Personal insights also might be found in volunteering, job shadowing, or networking (both in-person and online via social media platforms). Many multi-media career development books and materials are available for research as well.

For general advice pertaining to careers in information fields, *The New Information Professional: Your Guide to*

Careers in the Digital Age, which is available at *www.arma.org/bookstore*, is very useful. Most notably, its "Career Action Plan" can be a particularly effective aid. In addition, the well-known favorite *What Color Is Your Parachute?* by Richard N. Bolles is updated annually and continues to serve as a useful handbook for job seekers everywhere.

Consider Professional Certification

Many RIM professionals have already discovered the career benefits of obtaining the Certified Records Manager (CRM) or Information Governance Professional (IGP) certifications. If further academic training is not desired and data analysis-related experience is already on your resume, then big data certification may be a career development route to consider.

The Maryland-based Institute for Operations Research and the Management Sciences offers a designation for Certified Analytics Professionals (CAP®). This association provides networking opportunities, publications, and continuing education in operations research, management science, and analytics. Certification candidates must meet eligibility requirements prior to sitting for the exam. Test fees, as well as a schedule of testing dates and locations, may be found at www.informs.org/Certification-Continuing-Ed/Analytics-Certification.

Look Before You Leap

Career mobility is an important consideration in today's business world. However, in challenging economic times, opportunities for advancement may not be plentiful, and job security can be elusive. Against that backdrop, the prospect of a position in big data can represent an enticing sea change – but, it is wise to explore all options before taking the plunge and sailing into uncharted waters. **END**

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