



BD Hubs: Midwest: “SEEDCorn: Sustainable Enabling Environment for Data Collaboration”

Midwest Big Data Hub

Accelerating the Big Data Innovation Ecosystem

One of four Big Data Regional Innovation Hubs (BD Hubs) funded by the National Science Foundation through award #1550320

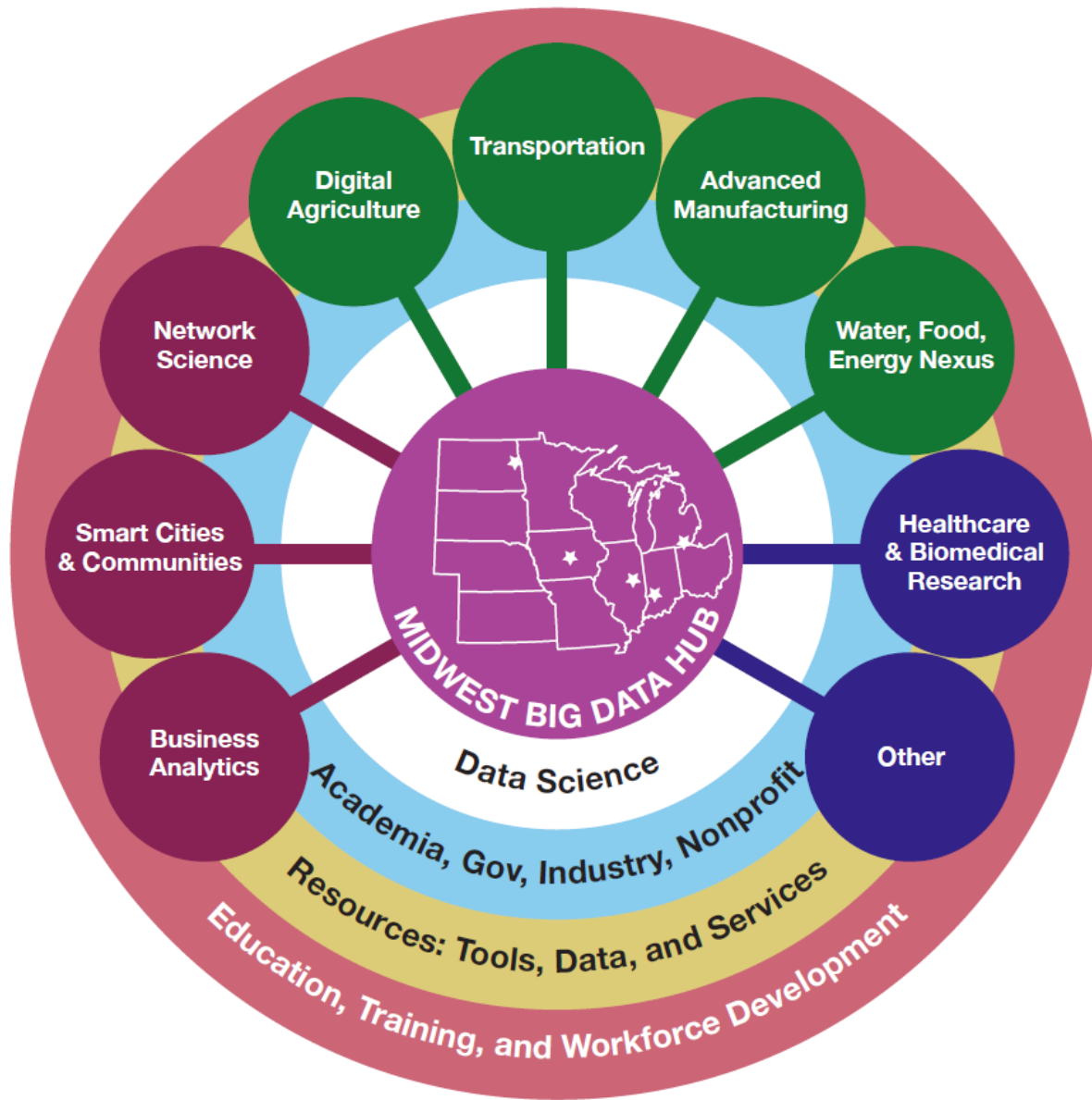
Education, Training and Workforce Development Ring

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Goals of the MBDH Education Ring

Coordination of training and of the development of tools, methods and materials for all levels and career stages of data scientists in partnership between academia, private industry, government, and NGOs.

Close collaboration with all spokes re education and training.

- Big Data education programs at participating institutions
- Workforce development
- Community college instructors and K-12 teachers
- Data sharing and open access issues
- Big Data education in support of STEM initiatives
- Ethical, legal, social impacts of Big Data
- Diversity in data science

Education Programs at MBDH Institutions

Levels of competencies

- Literacy in data science (e.g., a single course)
- Competency in the context of the work place - knowledge applied to a discipline/application (e.g., certificate, plus programs)
- Specialist – professional degrees (BS, Masters in analytics, Masters in data science, certificate in data science)
- Research – advanced capabilities

Several institutions have developed courses and programs and are interested in sharing experiences and resources.

Workforce Development

- Develop and share concepts and materials for continuing education events in the area of Big Data, targeted at specific professional communities
- Create on-line, modularized, and sharable curriculum. Investigate individualized learning strategies as a solution to diverse (STEM) perspectives of the data science student
- Develop and deliver on-line and residential continuing education programs in Big Data for instructors at small colleges
- Create a community of practice around which data sets and corresponding course or capstone projects are shared for the use by instructors in the area of Big Data

Community College Instructors and K-12 Teachers

Many states have written additional statistics (data) skills into their new core curriculums, resulting in the current ‘emergency’ situation characterized by instructors at community colleges and (high school) teachers who have no data background or data sense.

- Develop a continuing education platform for teachers/ instructors with focus on Big Data and data collaboration among natural and social sciences (ELSI)
- Develop an on-line, possibly MOOC-style introductory transition course about (big) data and data sense to share across high school – community college – college platforms

Data Sharing and Open Access Issues

Data sharing among MBDH institutions

- Open access discussions and clearing house
- Infrastructure

Data sharing with industry and other stakeholders

- Big Data collaborations with industry often complicated by confidentiality and IP issues surrounding data
- Complicates realistic case studies and useful data sharing processes
- Develop guidelines for data sharing in educational contexts through the councils of the MBDH, in collaboration with the corresponding education groups of the other three regions

Big Data Education in Support of STEM

Data collection, analysis and handling are crucial skills in the natural and social sciences, in engineering, statistics, software development etc. They allow students to relate phenomena in these areas to their daily experiences and to obtain a deeper understanding of and appreciation for STEM principles.

- Develop instructional approaches to key issues of science and engineering by letting data in these areas ‘speak for themselves’. Such approaches to units and modules would be appropriate for middle and high school grades, as well as transition and introductory college courses

Note that Data Science also folds in many social sciences as well as ELSI aspects.

Ethical, Legal and Social Impacts of Big Data Diversity in Data Science

- Computer science and data science are among the least diverse disciplines, even becoming less diverse over time
- MBDH can increase diversity in computing and data science by developing and sharing of materials and events based on culturally sensitive pedagogy among participating universities, community colleges, and K-12 institutions
- MBDH can provide a tool for research experience opportunities for underrepresented minority students, especially through summer research assistantship at the participating R1 universities
- The Education Ring can serve as a tool for organizing experiences, events and conferences for underrepresented students groups from the Midwest

Enabling Structure of MBDH Education

- Big Data Leadership Council with academic, industry, NGO, government membership – advise on the overarching components of MBDH Education
- Big Data Education Council with academic membership of the interested institutions in the Midwest – coordinate development of educational programs with all MBDH spokes and rings; and with the other three regions
- Institutional Big Data Education Coordination Groups – these interdisciplinary groups plan and implement big data curricula at each participating institution, feed back to Education Council
- Institutional Big Data Steering Committees – coordinate Big Data approaches (research, education, outreach and engagement) within each institution

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