Over the last half century, research communities across the world have been experiencing a range of noticeable changes in their mundane inquiry practices. Most significant of them have much to do with the emergence of digital research affordances and computer networks. Academic writing has moved from a pen and paper-based mode to digital word processing to collaborative writing platforms. Research dissemination has been supplemented with digital publishing opportunities, which include online journals, websites, blogs, and wikis. Research libraries have been complemented with online databases and powerful search tools. Data gathering has been enhanced by remote digital instruments. Data analysis and discovery processes have been complemented with the possibilities to ‘shuffle’ around large amounts of digital data and visual representations. In short, at least the part of research activity that constitutes the internal workings of scholarly practice has changed from being material to being digital, from being co-located in physical places to being distributed in virtual spaces—but has research become fundamentally different?

A quick scan through the list of the most prominent scientific discoveries of the 21st century leaves little doubt about the value of digital technologies—neither “Empirical Research on Cause and Effect in the Macro-Economy” nor “The Discovery of the Accelerating Expansion of the Universe through Observations of Distant Supernovae” nor “The Discovery of Quasicrystals” would have been possible without technology-enhanced research instruments, large digital datasets, and computational data analysis and visualization tools. While changes in research practices have perhaps been less universal than some eResearch protagonists expected, the emergence of new disciplines on the borders of traditional scholarship and technological innovation overall leads us to conclude that some changes have been deep in many research fields. New trans-disciplinary research fields—such as bioinformatics, ecoinformatics, cultural informatics, computational linguistics, and learning analytics—increasingly address the most challenging questions of the 21st century.

However, at the core of most radical developments in contemporary research have been not only the digital reconstruction in the material fabric of scientific practice, but rather noticeable rearrangements in the social fabric of knowledge production; this social fabric of knowledge production is referred to in this book as collaborative and distributed eResearch. The move towards more collaborative models of scientific practice can be observed on many levels: from top-down centralized research policies to self-organized forms of networked scholarship. For example, over recent years, the focuses of some governmental research programs have shifted from concentrating research capacities in strong research centers and laboratories to coordinating distributed research capacities by supporting networks, virtual institutes, and other collaboratories. Similar trends can be observed in the seemingly uncoordinated emergence of some distributed virtual research teams that bring together intellectual capacities of researchers with various disciplinary backgrounds and levels of expertise.
Nevertheless, genuine productive collaborative eResearch has been a challenge. For some, this is mainly a technical question: researchers simply need better collaborative research tools, services, and skills. For others, this is a matter of social and epistemological concern, to include disciplinary differences, conflicting mental models, data sharing issues, ethical concerns, and challenges establishing social presence.

One of the most distinct features of this volume is that it approaches the above mentioned issues from a range of perspectives. The chapters, taken together, present a wide-ranging account of collaborative eResearch, addressing technologies, applications, strategies, and practices. Several distinct and complementary threads run throughout the book.

First, the chapters discuss collaborative eResearch in a variety of disciplinary and multidisciplinary contexts, to include social and behavioral sciences, humanities, business, aerospace, geophysics, and education. This broad coverage of disciplinary domains and multidisciplinary fields clearly illustrates that distributed technology-enhanced research is not limited to exact and physical sciences, but rather includes increasingly social domains and the humanities.

Second, the volume presents a variety of aspects concerned with the development of innovative eResearch applications, including eResearch platforms, electronic databases, data sharing tools, and collaborative writing applications. Some chapters discuss new ontology-based system models and other complex system design decisions for distributed collaborative research. They illustrate that the development of new technological affordances is a complex engineering task that requires creativity and conceptual innovation.

Third, a set of chapters report empirical research in which eResearch methodologies have been applied for researching emerging collaborative eResearch practices. These contributions not only show the needs and challenges for understanding the social complexity of digital collaboration, but also illustrate the value of various digital research approaches, such as facial expression recognition, value network analysis, and social network analysis.

The overarching message that emerges from this collection is that many opportunities and challenges for distributed collaborative research unfold as we do eResearch. Scholars who work at this frontier should be involved in continuous innovation by developing new technologies and applications, adjusting their inquiry practices, researching, and fine-tuning what they do as they go. This timely volume offers an important contribution to future development of this technologically, methodologically, and socially complex research domain.

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October 23rd, 2011

ENDNOTES


For example, a virtual research group for investigating one massive online open course has emerged just within few months. See: Siemens, G. (2011). Researching open online courses. Retrieved 23 October 2011 from http://www.elearnspace.org/blog/2011/07/04/researching-open-online-courses.

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