

# Report of the Provost's Task Force on “Wisdom in the Age of Digital Information”

Cornell University  
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## **EXECUTIVE SUMMARY**

The world is changing from a place where information is difficult to find, bound by physical location, and defined by experts, to one where information is plentiful, hard to ignore, close at hand, and defined by the masses. This transformation is so pervasive that it is almost difficult to recall the not-so-distant age before information ubiquity. This new age has brought, and continues to bring, fundamental changes in how people express themselves, discover things, communicate with one another and spend their time. These changes concern the ways in which people live, work, study and play; they affect our culture, artistic expression and societal norms. In this report, we examine the role that broad-based research universities such as Cornell can, and in our view should, play in this emerging Digital Age – an age that raises questions about how we educate our students, ourselves, and society at large in a time when information culture profoundly alters issues fundamental to scholarship.

In surveying the faculty at Cornell, we find a broad range of interests and activities that can be characterized under the rubric of digital scholarship, not only in the physical, mathematical, computational and life sciences but also in the arts, humanities and social sciences. At the same time, we observe that these activities are often isolated and not widely visible to others on campus, particularly outside of “quantitative” fields. Given the fundamental and profound nature of the changes affecting society, we believe that digital studies must be nurtured and allowed to flourish, rather than kept at the margins of the curriculum. To that end, we have made a number of recommendations for substantively strengthening the education and scholarship at Cornell in the area of Digital Arts and Culture. These recommendations include establishing a new program of study, at both the undergraduate and graduate levels, and undertaking coordinated hiring of new faculty to support that program. In this report, we set these recommendations in the context of both the global impact and the local opportunities and challenges at Cornell.

## 1. INTRODUCTION AND BACKGROUND

The task force was charged by Provost Martin with:

1. taking an inventory of research, professional and teaching activities at Cornell that fall under the rubric of “Wisdom in the Age of Digital Information,” with a particular focus on the humanities and social sciences.
2. making recommendations about how the University can better support activities related to “Wisdom in the Age of Digital Information,” with an emphasis on cross- and inter-disciplinary activities that have substantive humanist, artistic, and social science components.

To that end we have been meeting periodically since March of 2005 and have gathered data from a number of sources, including the faculty survey conducted by all three of the Provost's task forces in the spring semester of 2005. This report contains our analysis and recommendations based on these data and our discussions.

The Digital Age is engendering widespread, fundamental change in how people live their daily lives. The breadth and depth of this change presents enormous opportunities for academic study across a wide range of disciplines. In Section 2 of this report we discuss how we see this change as involving culture, society, art and expression as much as it does technology per se. In light of such fundamental change, we believe it is imperative that Cornell invest both the intellectual energy and the additional resources to become widely recognized as an academic leader in the study of this new age. To this end we recommend specific actions in Section 3. While Cornell currently can boast of considerable activities related to the study of digital form, content and expression, these activities are often isolated and under-recognized. Although existing activities could form the seeds of broad-based excellence and collaboration, they risk withering rather than flourishing without appropriate attention and investment.

In understanding the scope of our charge, we have found it inappropriate to offer a precise definition of “Wisdom in the Age of Digital Information.” Instead, we have construed the expression broadly as encompassing general issues about how human activities affect and are affected by recent rapid changes in how information is created, shared and accessed. This raises a wide range of questions, including the following:

- How does digital information alter or challenge established institutions and practices – both within and beyond the context of the university? How does it affect research, teaching and learning? How does it affect communication among and between faculty, students, and the community at large?
- How does the omnipresence of digitally-encoded information alter or reinforce the ways that we conceptualize and perceive the world around us?

- How are notions of wisdom and information to be understood, and what are the relations between them?
- How can the tools of the digital information age assist scholarship in various disciplines? What role can the full variety of disciplines – including those in the arts, humanities, social and hard sciences, as well as those that are practice-based – play in our understanding and use of digital information?

In the remainder of this document, we paint a picture of changes occurring around us, in order to illustrate how questions such as these can be of broad interest across the arts, humanities and social sciences as well as the computing and information sciences.

In the next section we set the context for our recommendations, discussing how we see the Digital Age as being as much about culture, society, art and expression as it is about technology per se. In Section 3 we present our recommendations, the core of which is the formation of a new inter- and cross-disciplinary Program in Digital Arts and Culture. Section 4 provides an overview of activities that such a Program would entail, touching on some of the challenges in creating a program that will lead us to broad-based excellence in understanding, interpreting and guiding the Digital Age. Finally the Appendix contains our analysis of the results from the faculty survey in the fall of 2005 which were contained in our preliminary report and which we include here in order to provide context for our recommendations and evaluation.

## **2. TOWARDS WISDOM IN THE AGE OF DIGITAL INFORMATION**

One of the hallmarks of the Digital Age is the transformation from a world in which information is scarce, difficult to find, bound by physical location, and defined by experts, to one in which information is plentiful, hard to ignore, always close at hand, and defined by the masses. These changes are so pervasive that one has to stop and reflect in order to recall a time when getting customized driving directions required a trip to the auto club, when doctors, travel agents and stock brokers were gatekeepers of information, and when news was first reported in the morning paper or on the evening network newscast. Yet this age of information ubiquity has not necessarily brought us greater wisdom or even more knowledge. Many would argue that, instead, the digital age has brought us lowered attention spans, spawned superficiality, and interfered with the ability to determine what is important. In any case, the Digital Age has had and continues to have a profound effect on how we create, disseminate, experience, and act on information that affects nearly every aspect of our lives.

The principles of what we now call the Digital Revolution were, at least to a large degree, created and produced by scholars in academic institutions. One can reasonably expect this revolution to have a decisive impact on the academic institutions themselves. In the course of the last half century, vast increases in computing power and algorithmic thinking have changed methods of research, most conspicuously in “quantitative” fields that rely on numerical and statistical methods. However the effects of digital processing

are also beginning to transform the methodologies of those scholars who analyze letters, words, and images. Since we have all started to work with one and the same machine – the machine Turing defined as “universal”, one that does not make any distinction between letters, numbers and pixels – we may find new links bridging the gap between the sciences and the humanities. Indeed one could even imagine a reversal of historical trends of division between quantitative and qualitative scholarship, a return to the unity of what the Greeks called *episteme*. Indeed, it is likely that the digital revolution will lead to a reshuffling of academic disciplines. While it is not possible to predict precisely how and when such changes might take place, it is possible, and in fact imperative, that we plan ahead and be prepared. Such preparation would include building educational programs, hiring relevant faculty, and encouraging cross- and inter-disciplinary work related to the study of digital information.

This Task Force strongly believes that an important goal for Cornell, and for academic institutions around the world, should be to promote deeper study, understanding and dialogue about the changes and the implications of the Digital Age. Many reactions to the Digital Age, both positive and negative, are reactive rather than critically reflective. For instance, generational differences in acceptance of new information systems are generally not based on deep understanding and reflection; rather there is an anti-information-age spirit or animosity towards change among certain faculty in striking contrast to an almost blind acceptance among students. Our challenge, as an academic community, is to engage in more informed and reasoned thinking and teaching about this new age, its effects, its promises and its limitations – perhaps to attain a modicum of wisdom about the age of digital information.

The Digital Age is changing the very notion of what constitutes knowledge. The role of web sites as repositories, for example, raises important questions about what makes a source reliable and how to identify such sources, as well as broader issues such as what constitutes social recognition and how it gets established in both the physical and digital worlds. Not only do such changes raise fundamental questions for scholars, they also have immense potential to affect the pedagogical responsibilities of the faculty. While much of the focus on teaching in the Digital Age has been on the use of technology in the classroom, the ubiquity of information raises more basic questions. For instance, to what degree does the role of a faculty member change from that of purveying information to students to that of guiding students to reflect on the information to which they have already been exposed?

Much of the power of teaching, for both the student and the teacher, comes from those incredible “aha” moments, when something is seen in a new light or a new connection is made. We believe that it is fundamental for Cornell to help ensure that these moments of analysis and insight continue to be an integral part of our students’ intellectual lives, as opposed to making them mere collectors or technicians of information. The rapid development of new information systems and resources makes such a challenge increasingly difficult to meet without building strong ties between those who are steeped in the technology, those who study society, those who study the individual, those engaged

in artistic explorations of the human experience, and those whose practice involves digital forms of creative expression.

The broad changes in societal and individual behavior brought by the Digital Age, as well as resulting changes in academic scholarship and pedagogy, are perhaps dwarfed by changes in the very nature of what constitutes information. For instance we are coming to understand many biological systems in terms of their function as information systems, not only with the unlocking of the genetic code but also with mechanisms such as the structure and function of proteins. We are also gaining new understanding of how complex biological systems function, for instance, through the use of digital imaging techniques that measure activity levels in the brain.

We believe it is imperative for Cornell to increase its focus and investment in scholarship and education related to the Age of Digital Information, aside from investments in computing and communications technologies themselves. While Cornell has considerable strength on which to build, we are not currently poised to meet the challenges of leading our students and the broader society towards wisdom in this new age. In creating a Cornell for the Digital Age, it is critical that we build on these strengths, with the goal of tying together existing but often disparate activities into a more coherent fabric, rather than building new or potentially competing groups or structures. Of particular importance is that any new investment serve to strengthen and help draw together four organizational “pillars” for activities in this area: the Faculty of Computing and Information Science (CIS), the Institute for Social Sciences (ISS), the Society for the Humanities (SFH) and the proposed Cornell Public Institute for the Arts.

### **3. RECOMMENDATIONS**

In order to help Cornell become one of the world’s leading institutions in scholarly activities concerning the Digital Age, we offer several specific recommendations. These recommendations can be grouped into two categories: (i) to create a focal point for digital studies on campus, and (ii) to increase the intellectual breadth and depth of education and scholarship on the Digital Age. The first two of our recommendations fall in the former category, while the remaining proposals fall in the latter. Some of the recommendations, most notably numbers 6 and 7, might be suited to other inter- or cross-disciplinary areas of study that bridge across many fields, not just to the domain of our Task Force.

In this Section we briefly summarize our recommendations, and then expand on the central recommendation, of a new Digital Arts and Culture Program, in the following Section.

1. *Create a University-wide Program in Digital Arts and Culture (DAC).* In Section 2 of this report, we conveyed the magnitude of the ongoing changes in the Digital Age, emphasizing that these changes affect art, culture and society at least as much as they involve technology. We see an urgent need to develop and expand relevant educational opportunities at both the graduate and undergraduate levels

in the study of these artistic, cultural and societal aspects of digital technologies. Given strong student interest in this area, and the large opportunity for a substantial educational focus, we believe that a new program is critical to ensure the coherence and continuity of course offerings and potential degree programs. We believe that developing the requisite breadth and depth of such a program requires a broad-based faculty advisory committee, which would play a role analogous to that of the Computing and Information Sciences Council, or the Social Sciences Advisory Council.

2. *Develop lab, exhibition and performance space for digital scholars and practitioners.* An important aspect of creating a focal point on campus for Digital Arts and Culture is to have physical as well as intellectual manifestations of that focus. Digital studio and exhibition space is particularly lacking on campus, and would offer an ability to create and showcase works that currently cannot be adequately developed or publicly exhibited. Such a space would encourage students to exhibit their work, provide critical facilities for faculty scholarship and creative works, and help bring together and attract both existing and new faculty, students and visiting professionals.
3. *Engage in coordinated hiring of additional faculty in areas of digital scholarship and creative expression.* Ultimately our success in this arena depends not only on bringing together those on campus interested in studies of the Digital Age, but also on broadening and deepening the excellence of the faculty through new hiring. Given the inter- and cross-disciplinary nature of these studies, we believe it is imperative that faculty hiring be done in a coordinated manner, with participation by humanists, artists, social scientists and digital technologists. In Section 4 we consider in more detail three related models for coordinated hiring.
4. *Make coordinated investment in additional faculty for the recently created Information Science Program.* The profound changes of the Digital Age are appropriately approached from social sciences disciplines as well as from the arts and humanities. The existing Information Science Program takes more of a social science approach, whereas the proposed Digital Arts and Culture Program would take more of a humanistic and artistic approach. There is no clear boundary between these; in fact some current faculty in Information Science (as well as in Science and Technology Studies) bring the humanist, artistic and social science traditions together. Thus it is important to invest in faculty hiring in Information Science with the specific aim of building strong links with Digital Arts and Culture, taking advantage of possible synergies while avoiding unnecessary overlap.
5. *Increase the level of support for faculty and student endeavors in digital scholarship and artistic creation.* The creation of digital artifacts, the use of digital media, and the curation of digital collections all pose substantial challenges for scholarly work in the Digital Age. These challenges go beyond technical support per se, to the interaction of technical issues with those in the domain of

study. Thus we strongly recommend further development of such support services to be led by and housed in the Library, with technical assistance from CIT, rather than viewing the problem as solely that of providing more advanced technical support.

6. *Provide support for Ph.D. students to undertake a semester and/or summer of intensive study to build cross-disciplinary strength in digital studies.* The minor field at Cornell provides an excellent opportunity for doctoral students to study outside their chosen area. However, for a humanist, artist or social scientist to gain true expertise in computing or digital studies (or vice versa) requires more than a few courses spread out over several years. The goal of such a program would be to supplement the current minor with an extra semester or summer of intensive study to build this kind of cross-disciplinary expertise.
7. *Provide resources to facilitate joint teaching across units.* Co-teaching interdisciplinary courses benefits both the students and the faculty, creating opportunities for scholars to learn from one another, and helping define new frontiers where traditional disciplines come together. However it is generally difficult for departments and programs to justify the resources for co-teaching such courses, while at the same time being impractical for faculty to do so as an extra load. Additional support for the development and early offerings of such courses would be particularly helpful in this area because of broad traditions of individual scholarship – where collaboration in teaching can deeply inform scholarly activities that are interdisciplinary without being collaborative.

The Task Force is fully aware that the 1999 report to the Provost entitled “Cornell in the Information Age” identified Digital Arts and Culture as one of several key focal areas for the new Computing and Information Science (CIS) initiative. We believe that in the intervening years the need for investment in this area has only grown. Moreover, the success of CIS in the development of the University-wide Information Science program suggests both parallel and different models for developing a successful Program in Digital Arts and Culture. We speak to some of these at the end of the next section.

#### **4. ON DIGITAL ARTS AND CULTURE**

Developments in computing and communication technologies along with the cultural impact of the Internet have led to paradigm shifts crucial to an understanding of culture and the arts. Experiments in visual and multimedia digital communication have coincided with advances in social computing that deeply impact our understanding of wisdom in the information age. The complicated role of these new systems in ongoing research projects at Cornell – the Human Genome Project, post-9/11 security, robotics, mobile communication, cartography, archivization, psychology, multimedia visualization, music, performance, and art – have elevated the importance of analyzing the impact of new digital practices on historical and artistic notions of the body, race, gender, ethnicity, identity, and economy. Artistic, musical, and literary projects now actively investigate

these intersections while raising important questions about the role of wisdom in the digital age. As a result, theoretical and conceptual models have risen from Cornell classes, archives, conferences, performances, and exhibitions that could have an important impact on a better understanding of the social responsibilities and artistic potential of digital technologies. A more extensive creative and conceptual synergy between faculty studying and practicing digital arts and culture at Cornell – across the arts, humanities, social sciences and computing and information sciences – will position our faculty and students at the creative and intellectual edge of wisdom in the information age.

At Cornell, we perceive interdisciplinary approaches to Digital Arts and Culture to intersect across three central axes:

1. *Digital Arts*: Practice, exhibition, and analysis of digital practice in visual arts, theatre, film and video, music, architecture, creative writing – from the studio to the web, from the library to the museum.
2. *Digital Culture*: Critical approaches to the Internet and the culture of computing: the organization and distribution of knowledge (from cultures to sexualities), scientific paradigms (from genomics to robotics), the Web, games and mass culture, television and film, multimedia, public spaces (from libraries and museums to performance spaces, sports arenas, and congressional chambers).
3. *Digital Theory*: Theories of virtuality and virtual reality (from philosophy, psychoanalysis, and linguistics to literary and art theory to emergent Internet communities), theories of interactivity, theories of digital art and performance.

Pedagogical and research initiatives organized around Digital Arts and Culture would establish a structure with which to capitalize on preexistent and emergent Cornell strengths in these areas. Cornell is home to a number of ambitious research initiatives in the study and practice of digital arts and culture. Innovative research and curatorial projects currently in place include those in: the Program of Computer Graphics; the Rose Goldsen Archive of New Media Art (Kroch Library); the Multimedia Lab and Digital Arts in the Art Department; computing emphases in Architecture and Landscape Architecture; digital production and performance initiatives in the Department of Theatre, Film, and Dance; the Digital Music Program; History of Art; Apparel Design; Cornell Digital Library; Cornell Digital Museum; the John S. Knight Writing Program; the Society for the Humanities; the Africana Studies Center Digital Catalogue of African Art; Visual Studies Program; the Graduate Field in Film and Video Studies; Academic Technology Services; the Herbert F. Johnson Museum of Art. Add to these projects, parallel initiatives in human social systems: The Program in Science and Technology Studies; the Human Computer Interaction Lab in the Department of Communication and Information Sciences; and the Theory Center Visualization Group. These initiatives have been recognized for their individual contributions to the development of research and performance in digital arts, visualization, performance, and the humanities.

Cornell faculty associated with these innovative research projects have given equal attention to the initial development of pedagogy in what could be termed “digital

studies.” Creative initiatives in digital instruction in writing, cinema, music, and art have introduced students and faculty to new trends in scholarly production that promise to revolutionize the means and nature of academic production in the future. Bold efforts have been made by a broad group of humanities, arts, and social science faculty and instructors to introduce students to the latest digital developments in their fields. This includes courses on the impact of computer technology on society, the globalization of communications, the history and theory of electronic art, critical approaches to the Internet, human perception, the theory of virtuality, and digital practice in art, theatre, cinema, dance, music, architecture, and gaming. Our recommendation is that we develop structural possibilities for students across Cornell to benefit from opportunities provided by individual Colleges, such as recent structures in the College of Arts and Sciences that permit students to study Digital Art and Culture: the new undergraduate track in Comparative Literature in Literary, Visual, and Media Studies, the minors in Visual Studies and Computing and the Arts (a collaboration between Music, Psychology, and Information Science), the opportunity for College Scholars and Independent Majors to pursue studies in digital arts and culture.

Given the promising results of these early efforts to teach and research the arts and humanities in “virtual form,” Cornell is poised to position itself as a leading East Coast center of such research and pedagogy. What makes Cornell unique in this field is the potential of its collaboration in digital research projects in computing science, social science, the humanities, and the arts. If such projects were encouraged to collaborate in jointly sponsored research and pedagogy, they could provide the framework for one of the East Coast's leading centers in digital visualization and performance. Few institutions can boast of these results nor so imagine the expansion of their practical and critical potential.

## **A Program in Digital Arts and Culture**

We envision a Digital Arts and Culture Program that offers courses and degree programs at the undergraduate, masters and doctoral levels. The need for a new program is driven by these educational imperatives – particularly the need to provide a stable home for resulting course and degree offerings. We see a Digital Arts and Culture program as tying together existing and new courses in a variety of departments and programs, as well as creating new courses of its own. The program would serve to shape these course offerings into coherent curricula in the study of arts, societies and cultures in the Digital Age. In many ways, the new Information Science (IS) Program can serve as a model for these educational offerings, in that it has created an undergraduate minor available to students in any college, an undergraduate major available to students in the three largest colleges, and a doctoral program. These educational offerings in IS are met through a combination of previously existing and newly created courses, some of the new courses being offered by the IS program itself, some in combination with other units.

Any vibrant educational program at a research university such as Cornell must have strong ties to scholarly activities of the faculty. To be successful, the new program

should provide a focal point for research, scholarship and professional practice related to digital arts, media, culture and society. Information Science (IS) again provides a helpful analogy: one important aspect of the success of IS has been the physical space that was designed specifically for that program in order to encourage inter-disciplinary interactions. For Digital Arts and Culture, an important such focal space would be studio, performance and exhibition space for digital projects. Not only is such space largely missing on campus at the moment, it would be sensible from a perspective of both cost and collaborative efficiency to have a shared facility as part of the proposed new program.

Whatever organizational structure is developed for a new Digital Arts and Culture Program, the Program should have close connections with the arts and humanities as well as with computing and information science. In particular, it will be important to coordinate the activities under the Digital Arts and Culture Program, which come from the humanistic and artistic traditions with those under the Information Science Program, which come from the social science tradition. For instance, it will be important to respect both the traditions of individual scholarship, often more prevalent in the arts and humanities, and those of collaborative scholarship, often more prevalent in the sciences (as discussed further in the appendix). We believe that building a successful Digital Arts and Culture Program will require careful attention to the formation of a broad-based advisory group, such as the role that the CIS Council has played in the development of Computing and Information Science.

While Cornell has seeds of excellence to help define a new Digital Arts and Culture Program, the deficits are such that building a world class program will require the hiring of several new faculty members. Coordination of this hiring is essential both to help create a coherent overall program as well as to ensure appropriate breadth, depth and quality. There are three models that we find appropriate for coordinated hiring, all three of which have been used in various inter- and cross-disciplinary efforts at Cornell. The precise mix of these models we feel would best be left to those administering the program and to the advisory committee. These three models are: (i) joint appointments between departments or programs in the humanities or arts and those in the computing and information sciences, (ii) joint appointments between departments or programs in the arts or humanities with assistance from computing and information sciences faculty in the hiring process, and (iii) appointments in a single department or program, with assistance from departments or programs in the other two areas (the three areas being arts, humanities and computing and information science). By “assistance” in hiring, we mean helping attract and recruit inter-disciplinary scholars, even when those scholars will reside in another department or unit. A recent example of such assistance can be found in hiring in computational biology, where CIS has played a role in helping attract faculty to a department outside of its purview (in the College of Agriculture and Life Sciences).

## APPENDIX. RESULTS FROM SURVEYING THE FACULTY

In the results of the spring 2005 survey of the faculty we see a number of areas of promise as well as of potential need. This appendix reproduces the analysis of the survey results from our initial report. This analysis drove many of our deliberations and discussions, and the resulting recommendations.

There are five main observations that we have made based on the faculty survey results:

1. The faculty survey revealed relevant activities in many departments and units. But it also revealed that the people involved in these activities are often unaware of one another despite the apparent potential for productive interactions.
2. Many of those faculty whose work is most related to issues of digital information are at the assistant professor rank (particularly those working outside the physical sciences and engineering). While this is perhaps to be expected for emerging areas, it potentially raises concerns about mentoring and support.
3. There are few mechanisms in place to facilitate coordination among projects concerned with the relationships between computing and the arts and humanities. The situation is better in certain areas of the social sciences largely due to investments in the new Information Science program, which provides a home for faculty whose research is concerned with computing and information systems. More broadly, the new 2005-2008 Institute for Social Sciences (ISS) theme project on “social and information networks” reaches out to faculty whose research is not about information systems per se. If the university wishes to develop internationally recognized groups in areas of digital research and practice in the humanities and arts (to complement its initial investments in the social sciences), analogous investments in faculty hiring and new programs will need to be made.
4. If the university wishes to support cross- and inter-disciplinary work, it will need to provide appropriate resources for faculty pursuing such projects. Some areas in the humanities and social sciences benefit increasingly from innovations that draw on the ideas and tools of the information age, and vice versa. Since interdisciplinary work may be collaborative (as is typical in the sciences) or individual (as is typical in the humanities), appropriate support structures will need to accommodate both of these traditions of inter-disciplinary work.
5. The traditions of the humanist and social scientist, which take into account the relationship of people to each other and to the world around them, drawing on aesthetic, ethical, moral, and cultural values, are well situated to contribute to wisdom in the digital age. The humanist and social scientist, while less likely to have worked with large datasets of information than the scientist and engineer, possess important analytical and interpretational skills often complementary to

their colleagues in these other disciplines. As they begin to apply their expertise in understanding literature and life from a human perspective to the phenomena of the digital era, they will provide insights and advance our knowledge. Their explorations may be aided by the development of critical digital texts or other large funds of data (visual images, for example, or demographic information).

Our faculty survey questions were relatively open ended. These questions were set in the context of the broad scope of the charge to the Task Force articulated in the Introduction. While the broad nature of these questions poses a challenge to those analyzing the data, we wanted to be as inclusive as possible. We have been encouraged by how many faculty members see their work to be related to this theme. The faculty survey is notable for several other reasons. There was a high response rate, indicating that this topic is one which resonates within the Cornell community. The content of the responses reveals passionate engagement with the themes of wisdom and the ways in which digital technology and information is affecting scholarship, teaching, and learning. Responses document a high level of creativity and innovation in the disciplines in both the use of digital applications as well as the examination of the digital in society and culture. At the same time, there were strong cautionary reactions to the topic, indicating anxiety about the changes the academy and society are experiencing in an increasingly digital age. Some respondents flatly reject the implication that computation and digital developments are universally relevant to all fields of academic inquiry.

Our analysis has focused primarily on question 1, “What aspects of your research or professional practice could be considered under the rubric of ‘Wisdom in the Age of Digital Information’?”. The responses make clear that the term “Wisdom” is at best confusing to people and sometimes prompted arguments that digital information is antithetical to wisdom. However, it is also clear that the use of the term did cause many respondents to think beyond the scope of the simple every day use of computers and digital information systems.

To better understand the results we have developed some categories that we believe capture important and recurring aspects of the responses.

1. **Digital form and digital publication of scholarly artifacts and works.** The digitization of information is having a profound effect on many fields. For instance, digital images and three-dimensional models of rare artifacts make certain information about those artifacts widely available without necessitating travel to remote sites. At the same time, the very nature of what constitutes publication is changing, as digital information created by and for experts is made available widely. Several Cornell projects can be praised for providing international leadership in these areas, such as Kevin Clinton’s Computerization of Greek Inscriptions, the arXiv, an e-print repository of scientific papers initiated by Paul Ginsparg now operated by Cornell Library, and the use of 3D body scanning in Textiles & Apparel.

2. **Digital culture and digital society.** The digital age is ushering in large changes in our culture and our societal structures. How we shop, are entertained, and find information is changing. In the business world, companies that have not adopted efficiencies enabled by global information networks are at a competitive disadvantage. The study of digital culture and society can be found in a broad range of departments and units at Cornell, including Science & Technology Studies, Art History, Economics, Information Science, Communication, Anthropology, Sociology, English, German Studies, Comparative Literature, Cognitive Science, Theatre, Film, and Dance, Music, Applied Economics and Management, the Johnson School, the Law School, the Hotel School. Yet such activities are often undertaken by a single faculty member with little interaction with related work on campus, despite the cross-cutting nature of the area.
3. **Digital dissemination for the general public.** Increasingly the University is creating Web-based material for non-specialists. Sometimes this is done by individual faculty or research groups, sometimes as part of extension activities, and sometimes as part of sponsored research projects. Some notable examples include the Lab of Ornithology's bird sighting site, the Legal Information Institute's web site of important legal information, the Library's digital library initiatives, the Theory Center's SciCentr, and the Information Science Program's NSF funded National Science Digital Library (NSDL).
4. **Digital art and digital performance.** Increasingly faculty and students are capitalizing on digital technologies for the creation of installations and performances. For instance, the studio dance program explores movement of the human body and its relation to technology. For some the technology is not "fore grounded" but integrated into the structure of the work. For others, new media themselves form a key aspect of what is being expressed and considered.
5. **Digital modeling.** The breadth and depth of what is possible with computational models continues to increase by leaps and bounds. In the physical sciences and engineering, it is customary to simulate all manner of experimentation and prototyping. In fields such as linguistics, computational models of language are becoming more prevalent. In fields such as archeology, one is beginning to see computational models, for instance in the creation and matching of scans of ancient artifacts.
6. **Digital pedagogy.** Course Web sites, discussion boards, email, and instant messenger are all widely used for teaching. The Web makes it easy for students to find out certain things, perhaps at the expense of others. There was considerable disagreement among the faculty over the benefits and drawbacks of digital tools in teaching and learning. A substantial number of faculty members expressed the concern that students had become less inquisitive and less able to discern the quality of sources than had their predecessors from the print-dominated generations.

7. **Databases.** Both special purpose scientific databases and general databases gathered for other purposes are having a large impact on many fields of study. In the biological sciences, many faculty members mentioned the importance of gene and protein databases. In the quantitative social sciences, geographic information systems have been having a big impact, for instance enabling detailed demographic studies. Easily searchable collections of texts have also affected certain aspects of humanities research.
8. **Data mining and discovery.** Databases are designed and highly structured, whereas much of the data from the every day world is relatively unstructured. The emerging areas of data mining and discovery, backed by technical advances in machine learning, artificial intelligence and statistics, are enabling scholars in many fields to better understand large datasets. For instance, astronomers and computer scientists at Cornell are working together to help automatically interpret the terabytes of information from the Arecibo radio telescope.
9. **Computational biology.** This area involves the use of algorithms, databases and models specifically designed for problems in biology, such as genomics or the study of protein folding. This is a large area, which many biologists listed as important. The central importance of digital information to this area is so evident in our survey we felt it was important to highlight its overlap with the focal theme "Life in the Age of the Genome."
10. **Digital information and computing research.** There is a wide array of leading research at Cornell in the underlying science and technology of the digital information age. There are some strong ties between this research and other research areas in the physical sciences and engineering. There are some nascent ties to the social sciences, largely through the new Information Science program and allied departments such as Communication and Science & Technology Studies. There are relatively few ties to the arts and humanities, which is one of the challenges that we believe should be addressed by additional focus and investment.